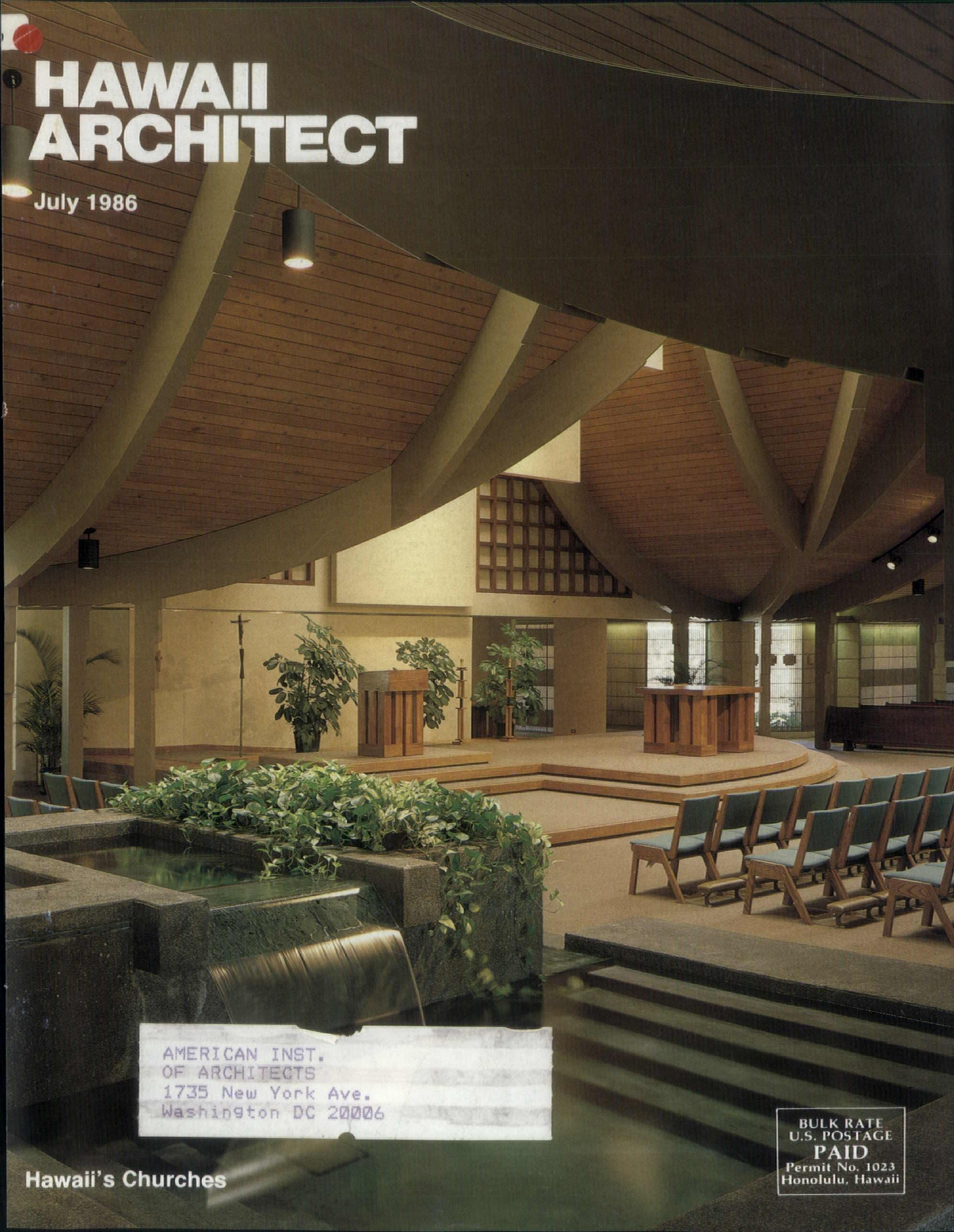
HAWAII ARCHITECT

July 1986



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Volume 15, Number 7 **July 1986**

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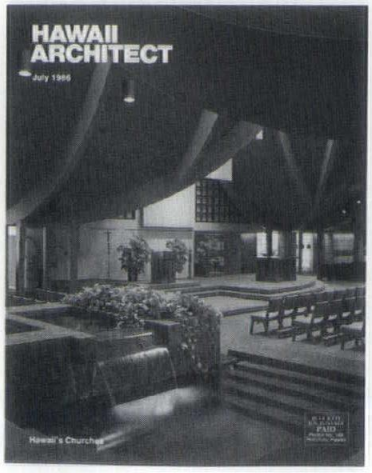

Cover: *Placement of the baptismal font at St. Anthony-Kailua near the altar platform and in the midst of the assembly facilitates full congregational participation. Photo by David Franzen.*

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NEWS

Parrish Elected CSI President

George Parrish, CSI, CCS, senior associate and chief specifications writer at Chapman Desai Sakata, Inc., was recently elected president of the Honolulu Chapter of the Construction Specifications Institute (CSI) effective July 1. One of nine certified construction specifiers in Hawaii, he has 20 years of professional experience in architecture.

Other CSI officers and directors for 1986-87 are Alan Shelmerdine, CCS, first vice president; Ron York, second vice president; Bruce Christensen, secretary; Roy Nihei, treasurer; John Ida, director; Doug Schmauder, director; and Marilyn Vrana, director.

Free Seminar Offered

On Friday, July 25, the Gypsum Drywall Contractors of Hawaii will offer a free seminar for architects, associates, engineers and specifiers at the Pagoda Hotel International Ballroom from noon to 5:30 p.m. A light lunch will be available from noon to 1 p.m., with heavy pupus and cocktails from 5:30 to 8:30 p.m.

The topic of the seminar is fire protection and sound control. Moderator will be Gene Erwin, Technical Director International Association of Wall & Ceiling Industries, Washington, D.C. Speakers will be Yoichi Ebisu of Y. Ebisu & Associates Acoustical & Electronics Engineers, Honolulu; Clyde Tucker, California and Hawaii District Manager of Chicago Metallic Corporation, San Francisco, California; Michael Gottert, Sales Representative of Manville Export Corporation, Honolulu; Paul Quigg, Senior Research Associate Fire & Structural Systems, United States Gypsum Company, Libertyville, Illinois.

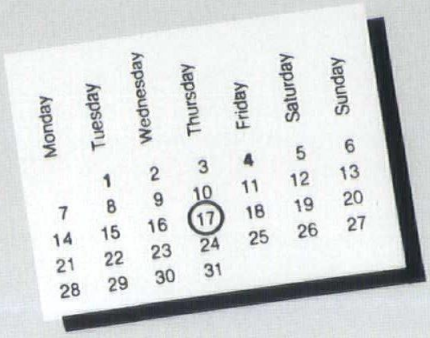
Attendance is limited so make your reservations early by calling the Gypsum Drywall Contractors of Hawaii at 839-6517.

HEADLINES

TAKE A BREAK!

by Kim Thompson, AIA

Before reading any further, circle Thursday, July 17, on your calendar! This is the day we have reserved the Hawaii Kai Par Three Golf Course and Sea Life Park for our July General Membership Meeting. The theme of our meeting is simply to take a break and spend an enjoyable summer afternoon and evening together.



All members are requested to report to the golf course beginning about 3 p.m. (exact times and rules will follow in a flyer). Even if you have never conceived of playing golf, now's your chance — the First Annual AIA Duffers Open!

This event is to be followed by dinner and an awards ceremony at Sea Life Park. The park will be open for us — so bring your friends and family.

See you there!

JRLL Moves to New Offices

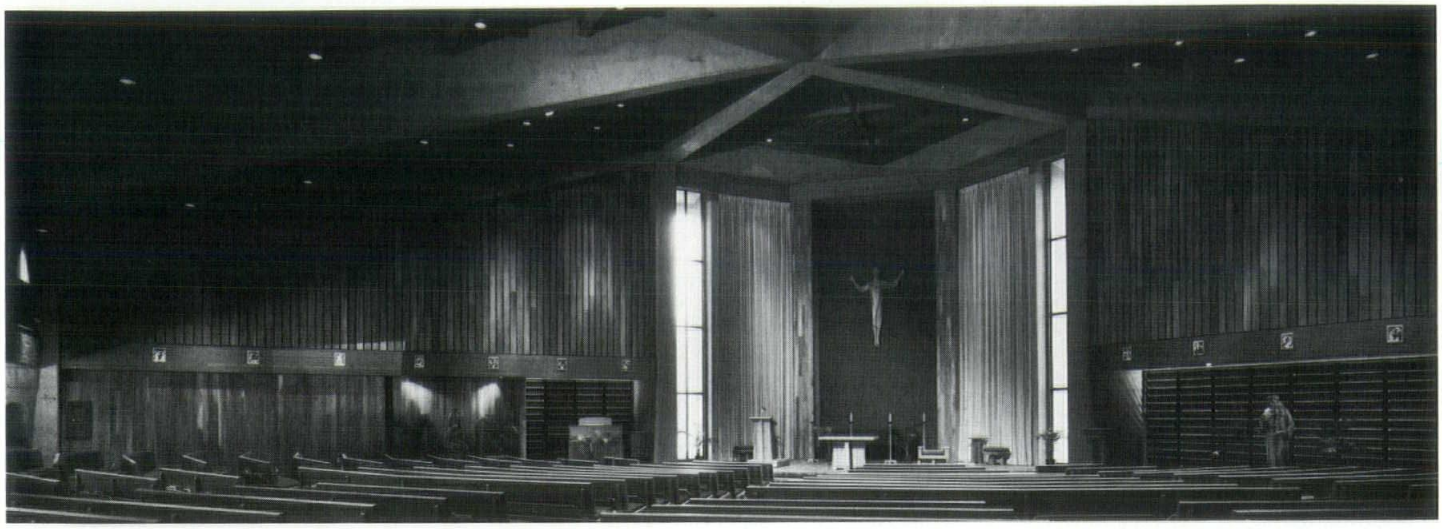
Architects Johnson Reese Luersen Lowrey have moved to 1001 Bishop Street, Pauahi Tower Suite 750, Honolulu, Hawaii 96813. Their phone number remains the same.

SEAOH Invites AIA Members

The Structural Engineers Association of Hawaii will hold its Annual State Convention on August 22 and 23, 1986 at the Sheraton Kauai Hotel and invites all interested parties to attend.

In addition to technical sessions, activities for the whole family are scheduled, such as tennis, golf and sightseeing tours.

For further information and registration forms, please contact Stanley Uehara, Publicity Chairman, 1986 Convention, SEAOH, P.O. Box 3348, Honolulu, Hawaii 96801.



The St. Anthony-Wailuku worship space floor slopes toward the altar platform in a fan-shaped seating arrangement. Photo by Augie Salbosa. Shown below is St. Anthony-Kailua.

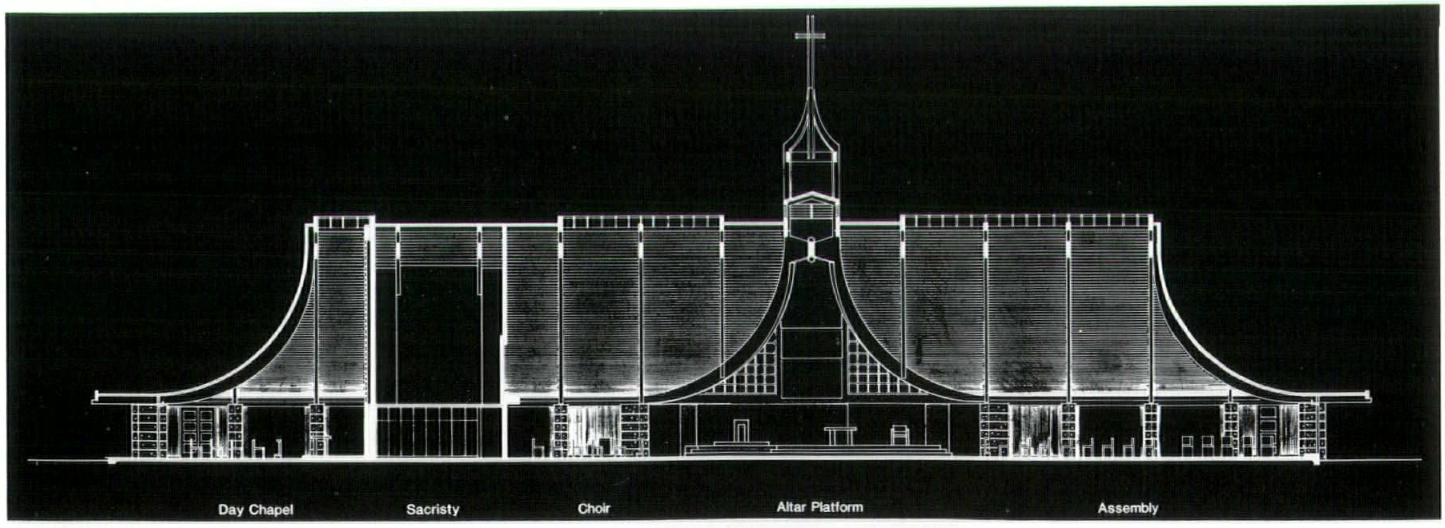
CATHOLIC PARISHES

by Robert S. Tsushima, Johnson Reese Luersen Lowrey

A Renewal of People and Space

It has been said that if a Catholic parish pastor wished to get the attentive ears of his parishoners, all he had to do was to suggest that a renewal of the worship space was about to take place.

While we in the design profession can speak of this time of renewal of the worship space for the Catholic communities with enthusiasm, it has not been universally accepted with warmth by many in the pews. Changes in the way we live and travel and the way we do business are inevitable and most often well received. Somehow there is little comfort to many when their image of the last bastion of steadfastness becomes the source of promoting changes in the manner in which liturgy is celebrated, and necessitating changes in the space in which such



celebration takes place.

The actions of the Second Vatican Council of 1962-1970 produced dynamic revisions in the rituals of worship for the Catholic community that have made unprecedented demands on the space.

A Passive Versus Active Space

For several centuries in the Church, it seemed that it was only necessary for one to be present, solemnly, quietly and virtuously as a spectator. Therefore the church buildings reflected that posture where there were two distinct areas: one with the altar for those with active roles and another with the pews for the spectators. The communion rail marked the border. The altar and the priest-celebrant were remote, and the focus in the space was shared with an array of side altars and statues.

The first document of that Vatican Council, entitled "Constitution on the Sacred Liturgy," called for extensive renewal in the rituals but more importantly mandated more active participation by the assembled community and expressed this by saying . . . "In the restoration and promotion of the sacred liturgy, this full and active participation by all the people is the aim to be considered before all else; . . . and when churches are to be built, let great care be taken that they be suitable for the celebration of liturgical services and for the active participation of the faithful."

Guidelines For The American Church

The earlier quoted Vatican II document directed all of the conferences of Catholic Bishops to prepare guidelines for the design and renewal of worship spaces. This was accomplished by the United States Catholic Conference in 1978 with their "Environment and Art in Catholic Worship" document.

It is a praiseworthy document which provides principles to guide rather than offering rigid directives of space allocation. This is made clear with their stated principle . . . . "Because different cultural and subcultural groups in our society may have quite different styles of artistic expression, one cannot demand any universal sacred forms. This is not to say that liturgy makes no demand upon architecture . . . its demands are two: quality and appropriateness."

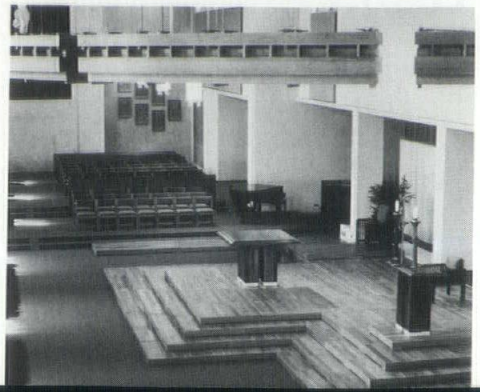
The document frees the designers to bring to the process of designing new or renewing existing worship spaces their full range of creative skills.

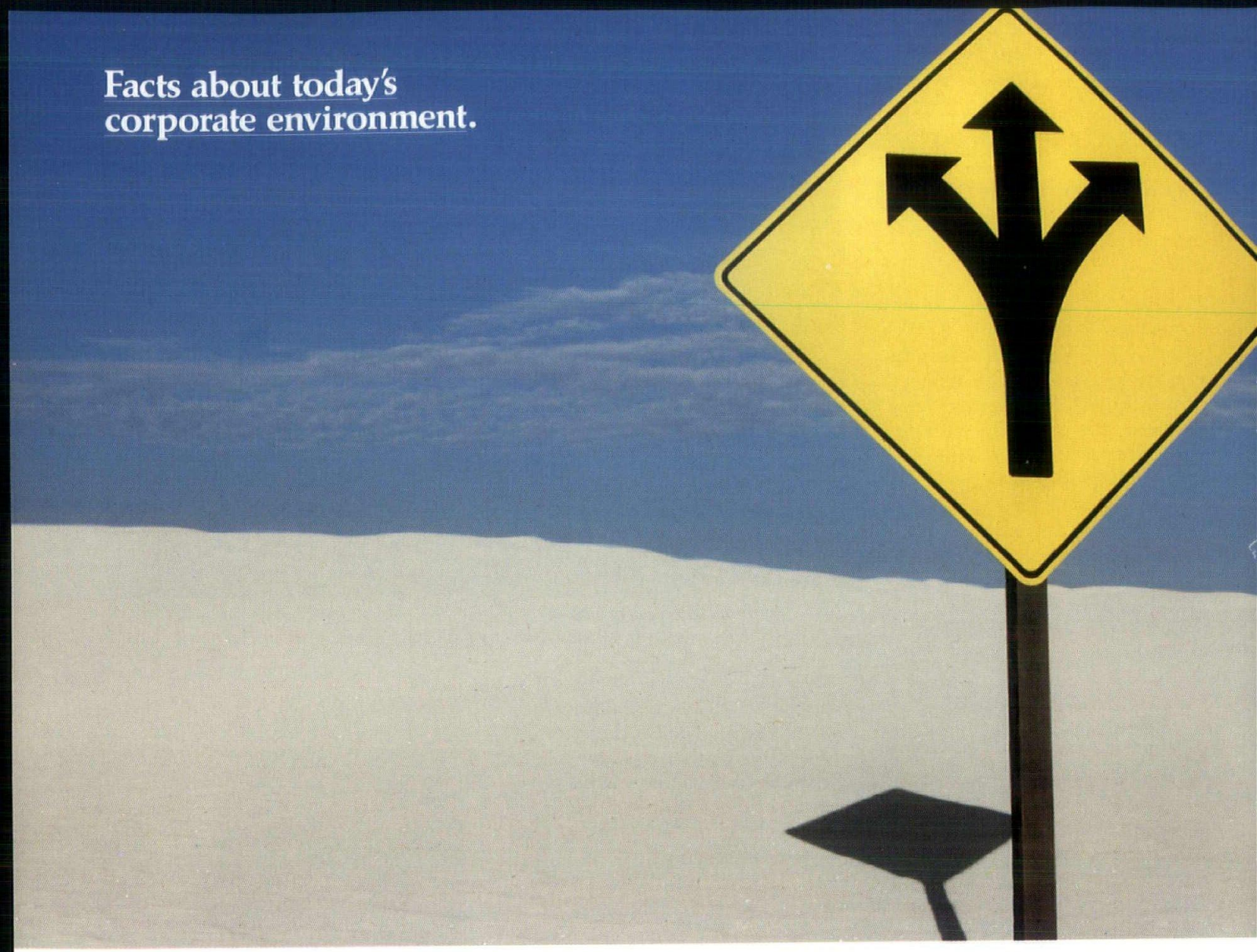
Mobility and Flexibility

A demand for mobility of the people and flexibility of the space are primary to meeting the demands of a variety of sacramental rites. In addition, the parish community is challenged to consider the needs of the larger community in which the parish is situated to allow for a breadth of possible uses of the assembly area. This prompted the St. Anthony Parish leadership in Wailuku, Maui to accept the design of their new parish church (after a disastrous fire) which included a worship space suitable and flexible for secular gathering, such as visits by symphonic and choral groups from Honolulu.

At St. Anthony-Kailua, the fellowship lanai and garden allow an uninhibited flow from exterior to interior spaces. Photo by David Franzen.

Worshippers at St. Anthony-Wailuku are greeted at a large trellised fellowship lanai and garden (above) before entry into the church. Photo by Augie Salbosa. A renewed worship area of the Co-Cathedral of St. Theresa (below) locates the altar platform in the midst of the assembly. The entire altar platform is composed of movable sections for maximum flexibility. Photo by Ron Sutton.





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Johnson Reese Luersen Lowrey, with Hans Riecke, proposed a floor plan that placed the altar/stage platform area in one corner with the assembly of nearly 800 fanning out on a sloping floor. Additional seating for approximately 200 is possible in the generous covered lanai.

The concept of gathering the people around the altar and inviting active participation with flexibility and mobility is even more amply demonstrated in Johnson Reese Luersen Lowrey's renewal design for St. Anthony-Kailua Church and the Co-Cathedral of St. Theresa.

At St. Theresa, the space for the liturgical rite was relocated from the traditional location of the sanctuary at the end of a deep nave to the side, centrally located in the midst of the assembly. The entire altar platform is composed of more than a hundred individual movable parts for maximum flexibility. This accommodates the needs of the parish community as well as the needs of the diocese when it serves as the co-cathedral for the Diocese of Honolulu. Several cultural performances, including a recent Bach concert, have served the larger local community.

Hospitable Environment

The Environment and Art document says . . . "the environment is appropriate when it is beautiful, when it is hospitable, when it clearly invites and needs an assembly of people to complete it." To promote hospitality, fellowship lanais are developed in the area of convergence of paths for greeting before services and for sharing of friendship and refreshments following a liturgy.

At St. Anthony-Kailua an existing garden wall was dismantled to create an open, trellised entry and fellowship lanai. Heavily landscaped areas have been included proximate to these fellowship lanais for each of the projects.

Full Immersion Baptistry

Besides the primary worship

The original St. Theresa Church (above) reflected a traditional linear position with the sanctuary removed from the worshipping community, who were seated in rigid inflexible rows of pews. Photo by Ron Sutton. The full immersion baptistry at the Co-Cathedral of St. Theresa (right) uses natural basalt rock from a local quarry and marble from the former communion rail. Photo by Ron Sutton.

space, the revisions to the rite of initiating an adult in baptism make demands of a baptistry that are unique in the recent history of the Church. The revisions also included enhancing more fully the sign of water in the sacrament. Baptism for adults by full immersion in water required depth and breadth for two in the pool as well as a sense of "place" rather than simply an implement holding water.

At both St. Anthony-Kailua and the Co-Cathedral of St. Theresa, the baptistry is located in the area of the primary entryway and yet proximate to the altar platform and visible to the gathered community. Its location and design promotes the active use of the font for blessing oneself upon entry.

The design offers three optional forms for baptism:

- A high font allows for full immersion of infants or affusion over the forehead of adults.
- A large pool, containing a depth of 32 inches of water, allows for full immersion of adults.
- A shallow pool with 12 inches of water is where an adult or young child stands for baptism by affusion over the entire body.

A water circulation system provides movement through the three pools and enhances the sacramental sign of "living and flowing water." The system includes a water treatment process with bromine that keeps the water clean and odorless.

A Process To Lessen The Hurt

This article began by indicating the hurt and confusion that greets a designer when working with a parish committee. What is necessary to minimize this is an educational process that begins with a committee that eventually includes the total parish community. When an architect and his liturgical design consultant provide such a process, the community will have a chance to understand the reasons and needs for renewal of worship spaces. Only then can a healing process be possible. **HA**

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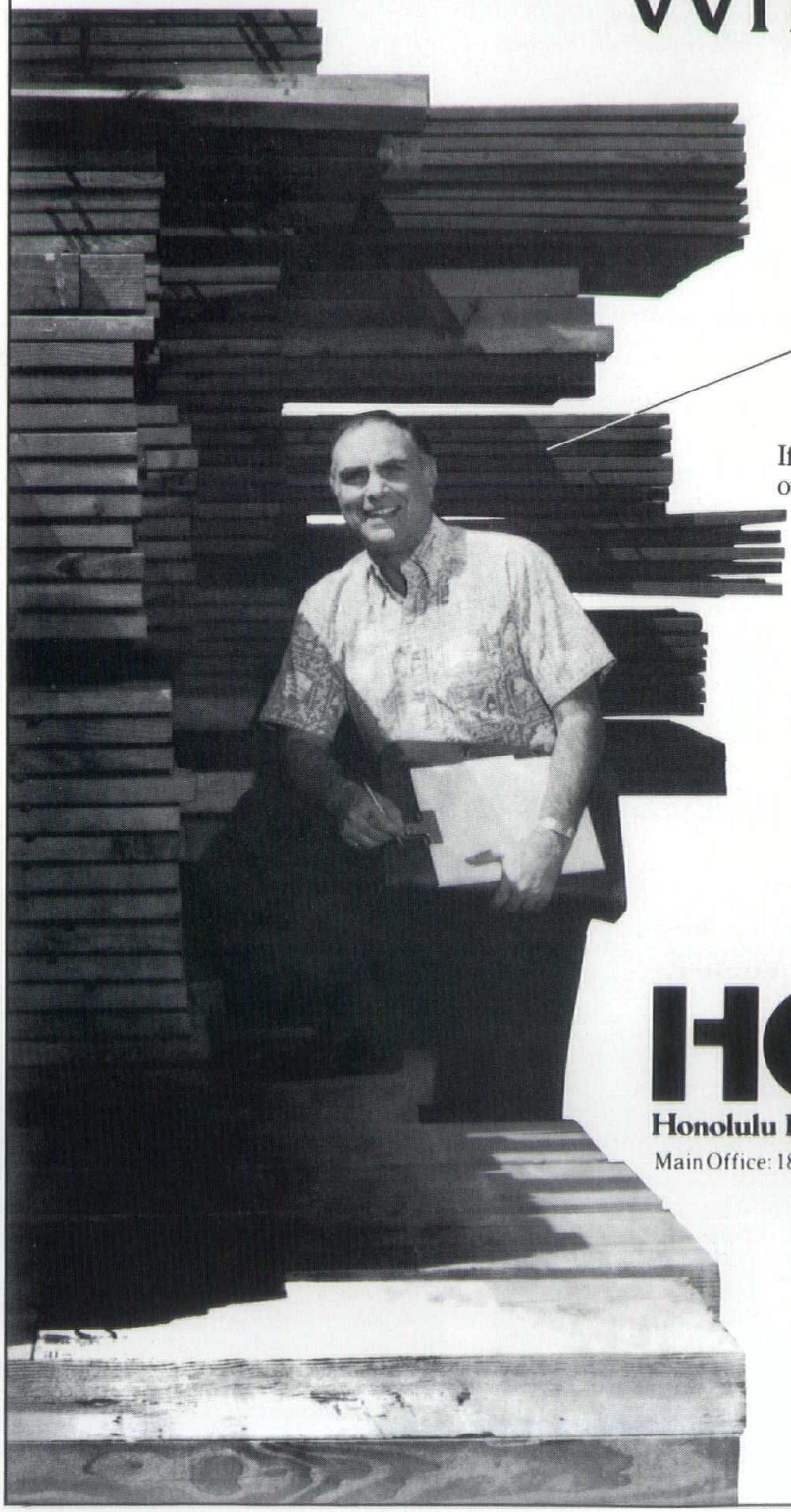

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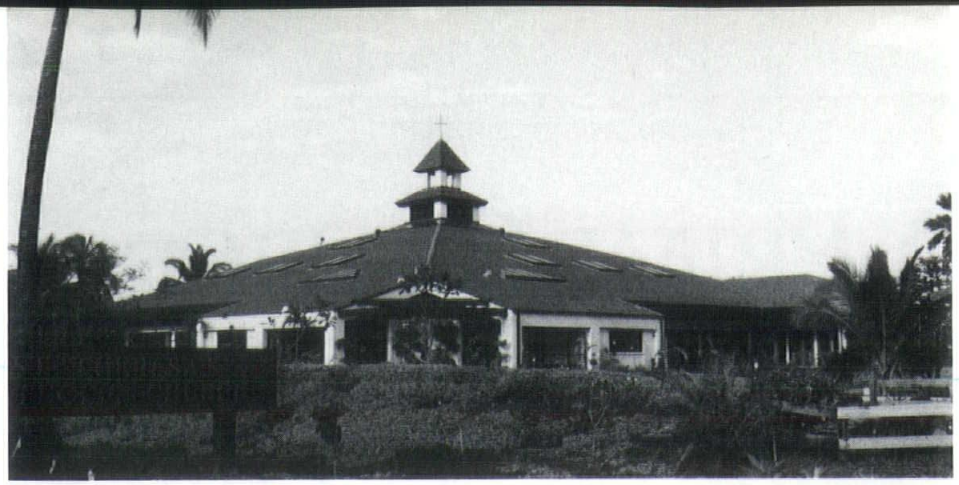
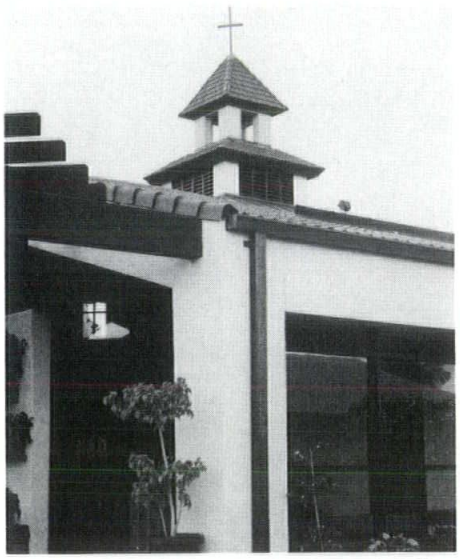


St. Theresa's Catholic Church, completed in April, 1985, is sheltered from traffic noise by an earthen berm. A bell tower was located at the highest point of the roof to save the cost of building a separate tower.

ST. THERESA'S CHURCH

by Hans Riecke, FAIA
Riecke Sunnland Kono Architects Ltd.



Construction included masonry walls with a plaster finish, rough-sawn glulam roof beams, exposed roof decking, concrete roof tiles and clay tile flooring in the nave. Fire sprinklers were installed throughout the church. Evenly distributed skylights make it unnecessary to use artificial lights during daylight hours. Wooden louvers on all sides of the nave at people level and fixed louvers in the bell tower provide natural ventilation.

The pew area (left) is sloped toward the altar in order to improve visibility. Seating capacity is approximately 500 persons.

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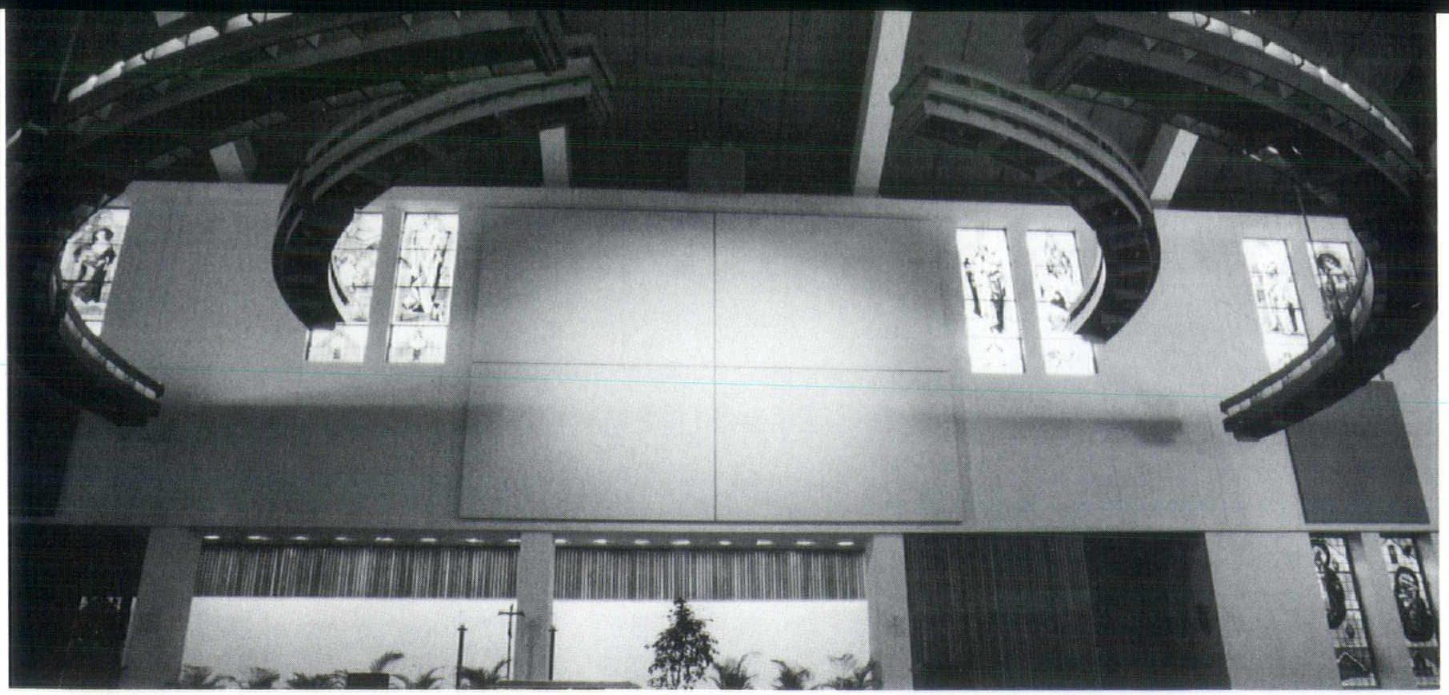


Concentric wood rings with neon lights are segmented into 12-foot arcs with monopoint floodlights underneath in each bay.

CREATING DRAMATIC CHURCH LIGHTING

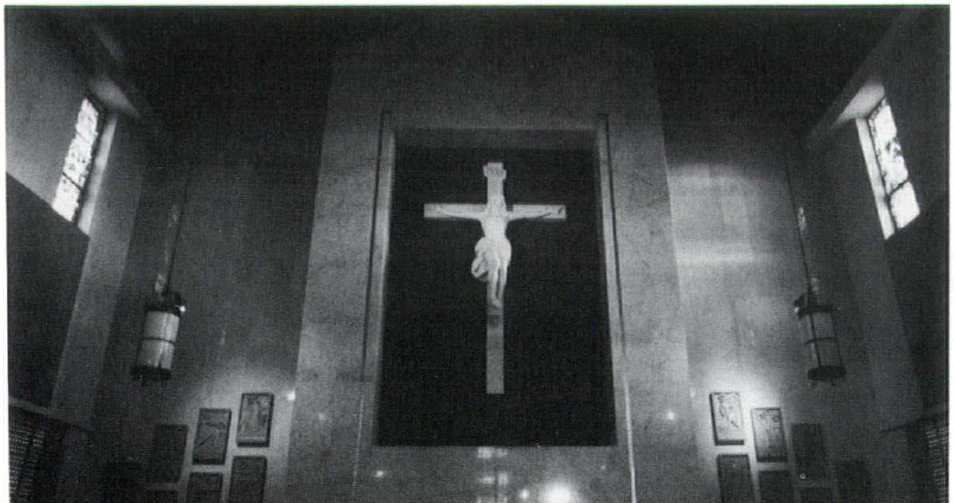
by Rick Chong, Albert Chong Associates, Inc.

Architects and lighting designers are initially burdened with the responsibility of creating a church with the right ambience. Most will agree, how a church is lighted is extremely important. The lighting design should enhance the architecture, be aesthetically pleasing in location, integrate with the forms and colors of the space and through controls be able to create mood, focus and drama thoughout the stages of a service. Basically, the lighting design should incorporate general lighting, accent lighting and controls.

In 1985, St. Theresa Church, also known as the Co-Cathedral of Hawaii, underwent an extensive renovation. The church has a cross-like plan. Originally, the altar was located in the top portion and the congregation was seated in the long section and cross arms, facing the altar. The church is dominated by a high vaulted ceiling over the long section.

The original general lighting system consisted of hanging gothic lanterns evenly spaced over the congregation in the high vaulted ceiling section. Areas in the cross arm were illuminated with recessed downlights with a fresnel lens. The altar area was illuminated with fluorescent strips and flood lights. The crucifix was illuminated with floods that were located under an overhead canopy that was removed. With a new layout being developed, the lighting system was in need of major renovation.

The new layout developed by the architects, Johnson Reese Luersen Lowrey, placed the altar platform at the intersection of the cross-like floor plan. The congregation sits on three sides of the altar, which has modular movable sections and can be arranged in numerous



The marble crucifix and Stations of the Cross are lighted with floodlights mounted on relocated Gothic lanterns.

configurations and heights. A new baptismal pool is situated at the intersection and is offset to one side of the hall.

With the new arrangement difficult problems and various design constraints for the lighting design were apparent immediately. Since the lighting for the previous altar was originally inadequate, there was a need for new general lighting for the new pews. Also, the new platform required a new lighting system that had to be located inconspicuously, had to be flexible enough to illuminate any task on the movable platform without illuminating the entire platform and without re-aiming, had to create focus and had to be controlled from various points throughout the church. The baptismal pool, Stations of the Cross and crucifix lighting also had to be located inconspicuously and had to be controlled from various points.

Mounting luminaires on the existing walls and columns to illuminate the new platform was undesirable. Working closely with the architect, it was decided to design and suspend two concentric wood rings that were sectioned into 12-foot arcs, each with four bays underneath. The mounting height and position of the rings was governed by necessary lighting angles. Monopoint floodlights with 150W R-40 lamps were placed in each bay. Luminaires 90 degrees apart were connected to the same dimmer and aimed at a point on a predetermined grid. This solution provided illumination selectively and enabled the entire congregation to observe the action taking place. Also, mounted on the top of the arc sections are monopoint luminaires with barn doors and color gels that can create pattern and color on the acoustical backdrop. Neon lighting provides a mystical internal glow in each wood arc and also provides light for meditation.

The position of the wood rings required the removal of hanging lanterns. The lanterns were relocated to the old altar area and are suspended to the same height as existing lanterns.

Lighting the baptismal pool, Stations of the Cross and crucifix presented unique problems. Surface mounting and suspending luminaires was undesirable. It was decided to carefully mount floodlights with 150W R-40 lamps on steel bars that were attached across two existing adjacent iron supports on top of the gothic lanterns. The wiring was routed through the existing hanging chain.

All luminaires are controlled by a system that consists of a single dimming panel with a micro processor control unit. The entire lighting system can be controlled at three points — platform, choir loft and sacristy. The system features smooth dimming, fade control and preset modes that can be brought up by the single push of a button on the control console.

The new flexible and dynamic lighting system provides the basic types of lighting — general and accent, is carefully, harmoniously and aesthetically placed throughout the architecture, accents the architectural form and structure, enhances and creates color, provides focus, sets moods and creates drama. **HA**

Gothic lanterns provide general lighting at the Co-Cathedral of St. Theresa. Two concentric wood rings provide accent lighting.

Albert Chong Associates, Inc. has received awards for the lighting design of St. Theresa's Church from the Illuminating Engineering Society.

The exterior of St. Theresa is illuminated with area lighting and direct/indirect corridor and entrance lighting. Stained glass windows are illuminated from within. Photos by Rick Chong.

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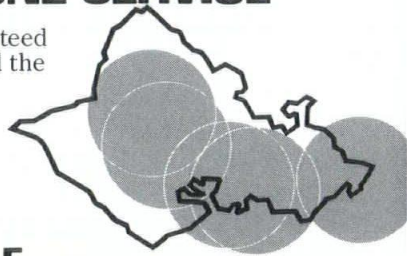

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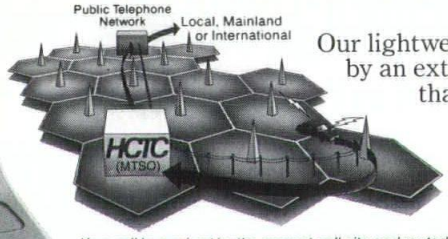

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ERICSSON

FOCUS ON THE FAMILY

by Dee Crowell, AIA, Urban Works, Inc.

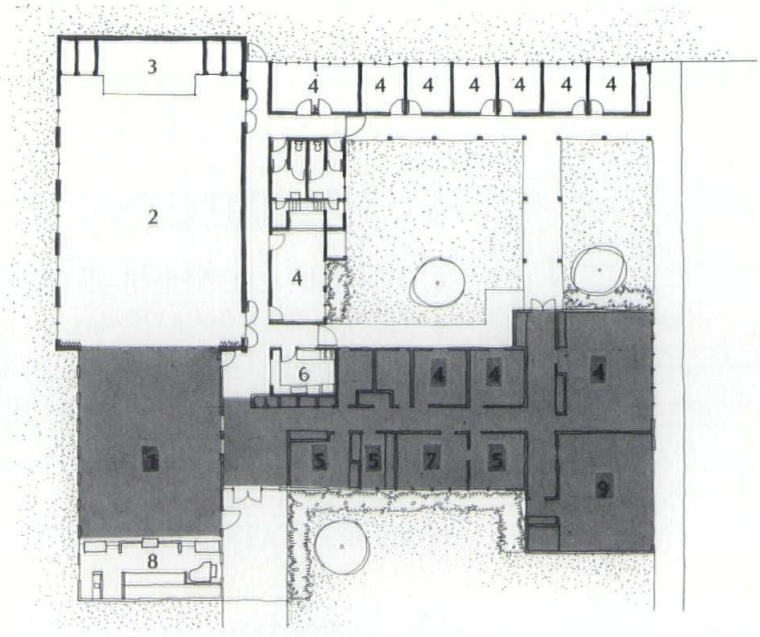
Doing work for the Church of Jesus Christ of Latter Day Saints has proven to be a rewarding, varied and busy experience. It has allowed us to do work on the islands of Hawaii, Lanai, Kauai and Oahu. We have also worked on a prototype building for construction in the South Pacific that has given us on-the-job training with the metric system.

With more than six million members and 1,600 stakes, the Mormon Church has thousands of buildings all over the world. The Church is divided into seven areas. Until recently, Hawaii was part of the Hawaii Pacific Area. A recent reorganization has Hawaii now in the North America West Area, which includes Hawaii and California. Evan Larsen is the new Hawaii Area Physical Facilities Manager.

No matter which area Hawaii is in, construction of any bulding requires approval of Church headquarters in Salt Lake City, Utah. This high degree of centralization may seem cumbersome, but the Mormon Church leadership is very thorough and efficient. All funding for construction comes out of Salt Lake City. They do not initiate any construction unless they have the cash "in hand." They don't have to wait for financing. This assures a contractor or consultant that he will be paid, provided he performs the work satisfactorily.

A high degree of centralization creates a very sophisticated client with a finely tuned, specific program. With very few exceptions, they build the same program all over the world. Not only are the building area

The Ewa Beach Chapel by CJS Group, Ltd. uses a continuous roof ventilation monitor to enhance natural ventilation and create a major form element.



Now nearing completion is the addition of the Kekaha Branch in Kekaha, Kauai. The existing portion is shaded. Facilities include a chapel (1), cultural hall (2), stage (3), classrooms (4), offices (5), a kitchen (6), library (7), rostrum (8) and relief society room (9).

requirements specific, the Mormon Church also has a Technical Guidelines Manual that covers everything from preliminary design to construction closeout. They also have the forms to fill out to go with it.

Membership size determines the size of any buiilding. Qualification for a new building or an addition is clearly laid out in a five-year plan that each stake must prepare.

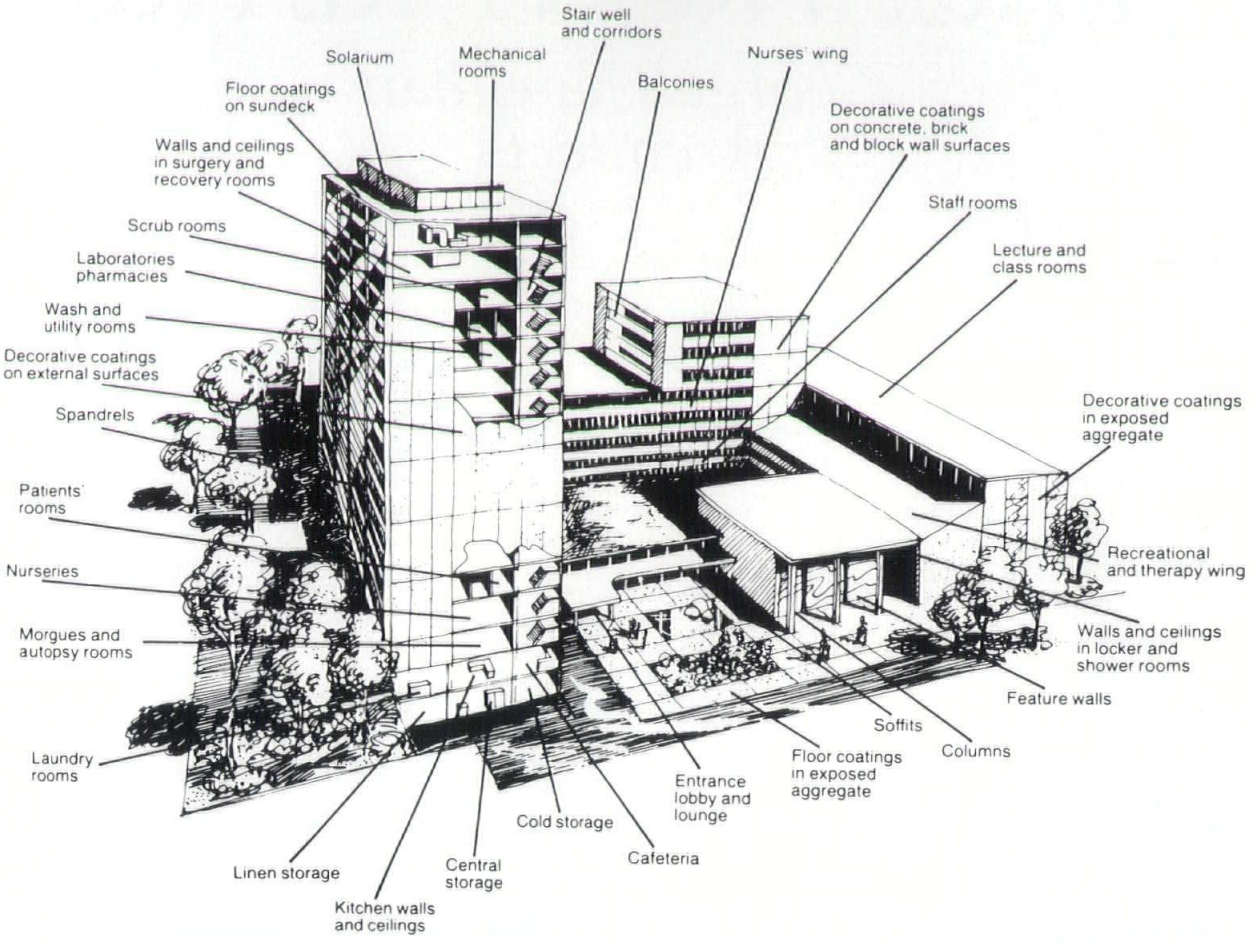
Church buildings are designed to support the family, the basic unit of the Mormon Church, by providing facilities for activities that are family related. Besides the usual church program of chapel, offices and classrooms, Mormon churches also include a cultural hall and genealogy library.

The cultural hall serves as a multipurpose social area. It is used to hold meetings, classes, receptions, baby *luaus,* and Boy Scout activities. The floor area is large enough and ceiling high enough to permit full court basketball and volleyball. A stage is also provided for plays and recitals. The cultural hall is always located to the rear of the chapel with a folding partition between the two spaces that can be opened to provide overflow seating for the chapel.

Usually, a Stake Center has a genealogy library. The library contains catalogues of vital statistics (births, deaths, marriages, etc.) kept by the Church's Genealogical Society in Salt Lake City. Anyone, even non-Church members, may have access to this information by ordering from the catalogues. Microfilmed copies of the records are sent to the library for use. Tracing genealogies is another integral facet of the Mormon Church's concern for families.

Evan Larsen says, "We build to satisfy our needs, not our wants." Mormon Church buildings are used every day of the week so they are designed to be simple, practical, functional and durable. They strive to make the best use of their resources and symbolize the Mormons' belief in the work ethic.

Imagine



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A BEACHFRONT RETREAT

George Heneghan Architects

Clem Lam, AIA, of the Kailua-Kona architectural firm of George Heneghan Architects executed the beachfront Conference Retreat in Puako on the Island of Hawaii to reflect the casual Hawaii lifestyle within a setting of quiet elegance. The Retreat consists of a main house, a guest house, and public spaces for guests to enjoy the relaxed island atmosphere. The design of Honuala'i and its manicured grounds encourages the easy flow of activity between the facility and its seaside setting.

The theme, PUAKO, Flower of the Sugar Cane, is evident in the original design of cast iron entrance gates and interior courtyard gates. The floral design is echoed in a *koa* wall sculpture and a carved glass firescreen.

Conference facilities include formal and informal conference rooms, and the use of state-of-the-art communication and video equipment. The common areas of the facility function for large numbers of guests: the dining room accommodating 20 for formal, sit-down dinners with a kitchen to support such occasions; and a contiguous living room, lanai, and pool terrace for receptions of several hundred. The travertine dance floor located between fountains and pool is illuminated with tiny lights and equipped with a sound system for evening entertainment. Each bedroom with its private lanai enjoys a unique view and identity.

In recent years the office of George Heneghan Architects has received AIA Design Awards for a Mauna Kea Fairways Residence, the Honokaa Federal Credit Union, the Third Circuit Court Facility in Captain Cook as well as their own Kailua-Kona offices. **HA**

Architect
George Heneghan Architects, AIA

Project Architect
Clemson K.M. Lam, AIA

Electrical Engineer
Albert Chong & Associates, Inc.

Structural Engineer
Richard M. Libbey, Inc.

Consultant
Pravin Desai, AIA
(Preliminary Floor Plan Design)

General Contractor
Tune Construction

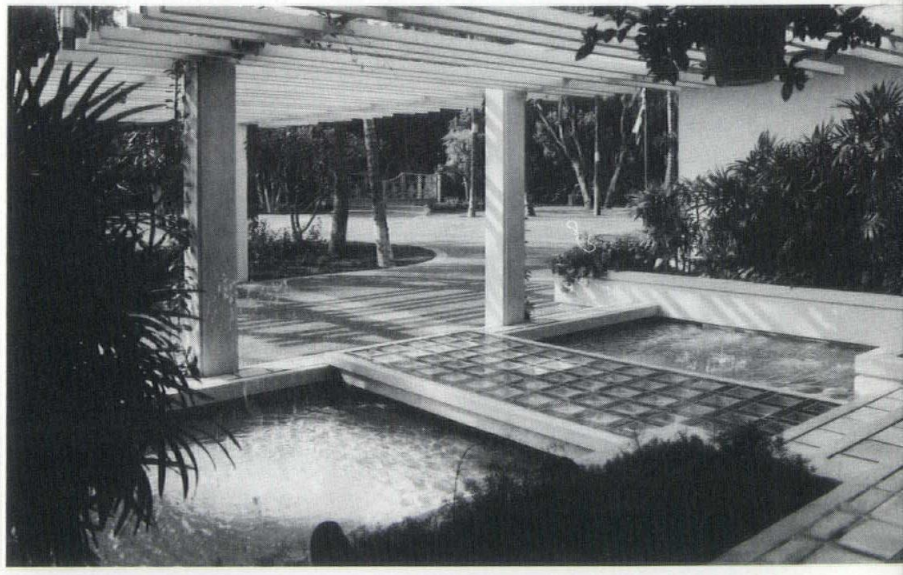
Landscape Architect
Brenda Tamasese

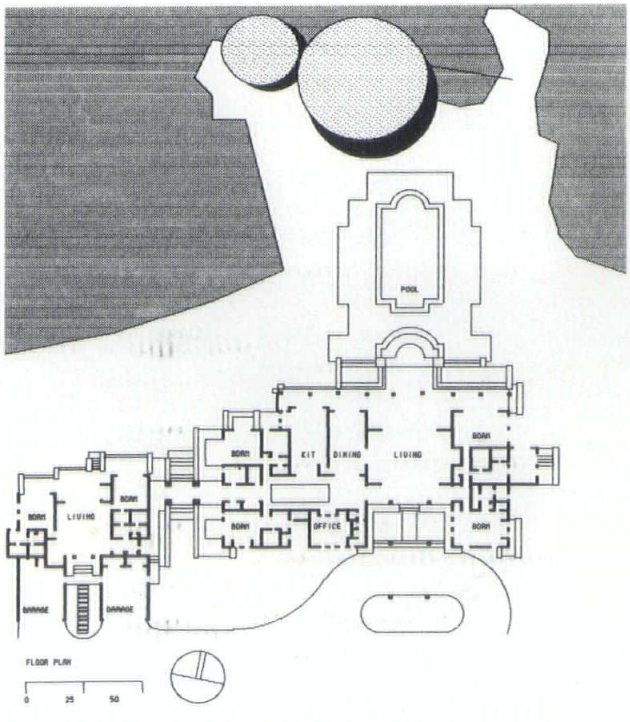
Photographer
David Franzen

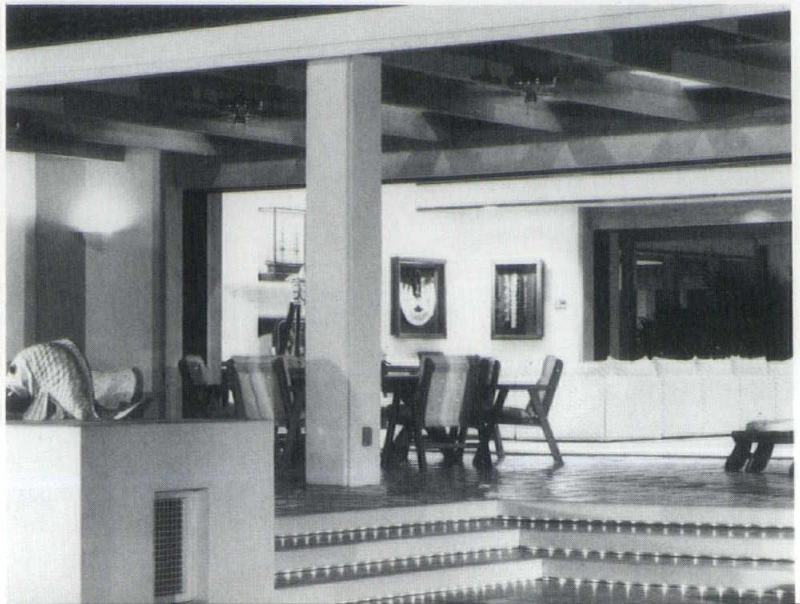
Interior Design
Win Sullivan

Koa Furniture and Cabinets
Parks & Parks

A beachfront Conference Retreat on the Island of Hawaii, designed by George Heneghan Architects, received the only 1986 Award of Excellence given by the Hawaii Society/AIA. Photos by David Franzen.

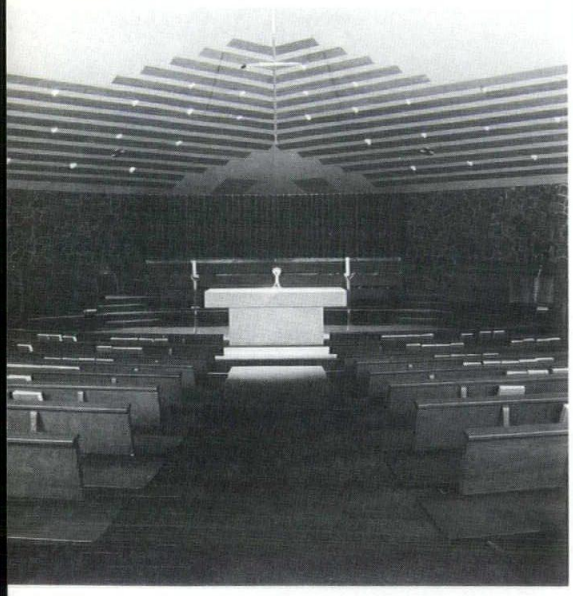






CHAPELS DESIGNED FOR THE YOUNG

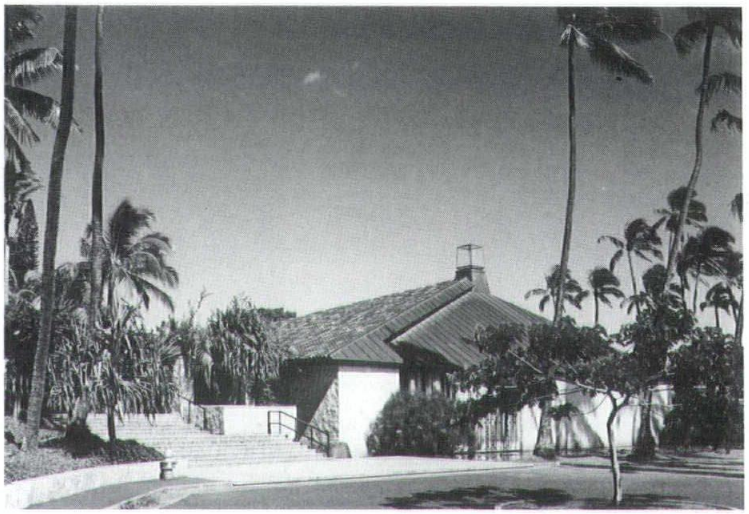
by Alan W. Rowland, AIA, Ossipoff Snyder & Rowland, Architects

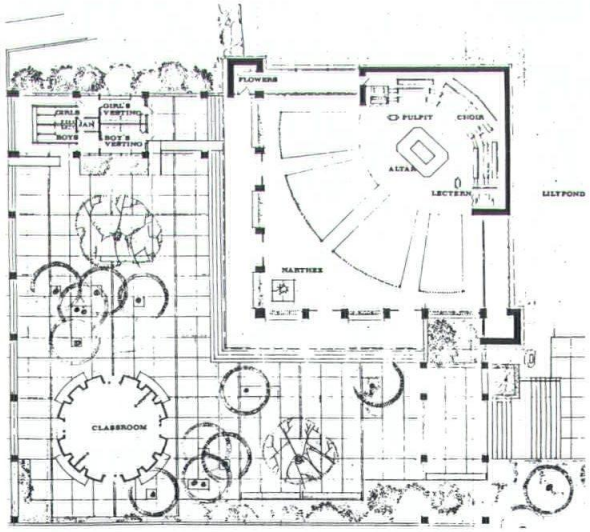


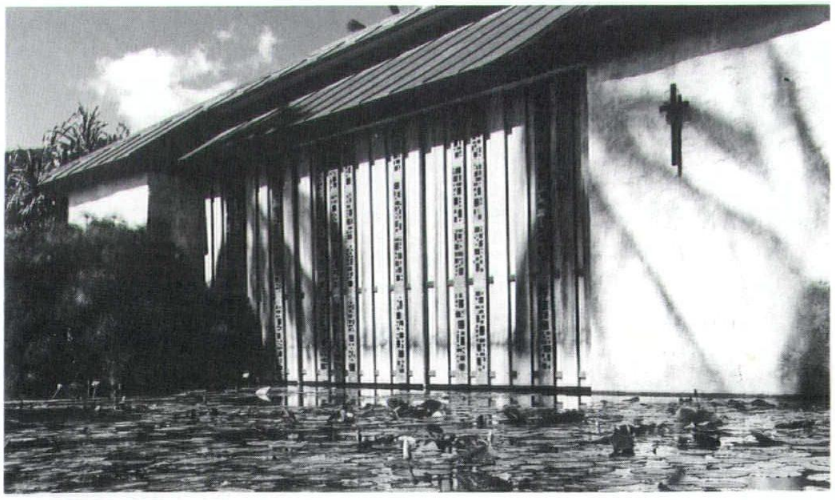
Pews that fan out from the altar are designed to enhance a gathering around the altar experience for Punahou students. Subdued lighting has a calming effect on ebullient youngsters. Photo by Rick Regan. At the peak of Robert Thurston Memorial Chapel's roof (right), a lantern provides natural and artificial light to the altar below.

Two school chapels done by our office are interesting in their design philosophy differences.

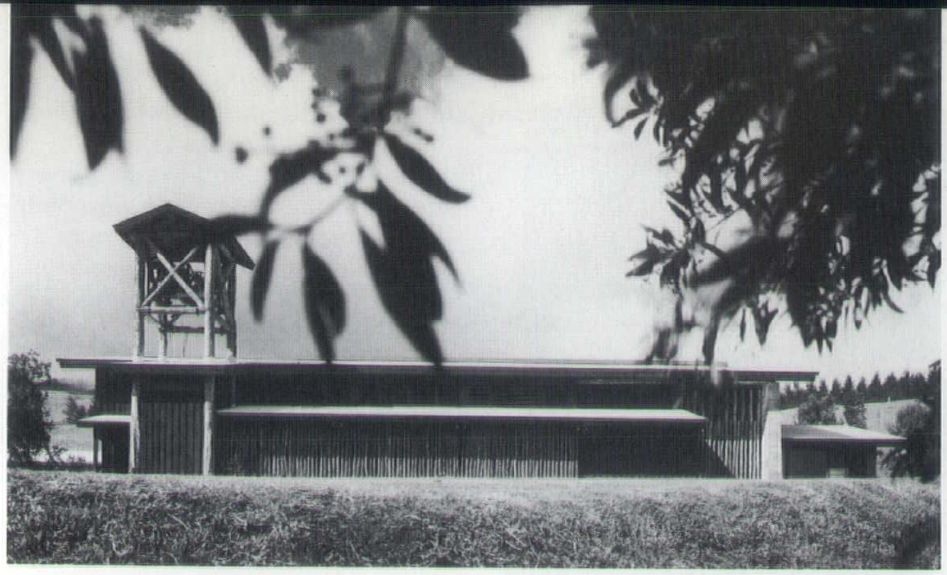
Punahou's Robert Thurston Memorial Chapel in a suburban location provides a comfortable setting for chapel services for boys and girls in approximately equal proportions from grades 1 through 12. The number of students attending chapel dictated a seating capacity of approximately 450 and, to enhance a gathering around the altar experience, a fan shaped plan. The chapel roof shape and spans involved required less than straight forward structural steel roof framing, all acoustical plaster-concealed.



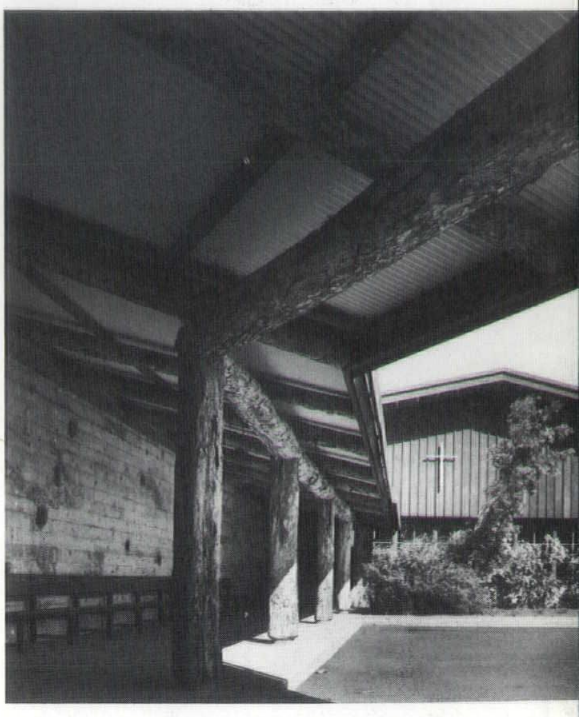




A portion of Punahou's lily pond extends into the chapel's interior space.



The chapel at Hawaii Preparatory Academy, set in a rugged, rural area, was designed to express the virtues of simplicity, directness, strength and honesty.



Wide eaves protect students from Kamuela's ample precipitation.

Ohia *tree trunks are used as supporting columns in the chapel at Hawaii Preparatory Academy.*

An excerpt from Val Ossipoff's remarks at the chapel's dedication best describes the parti:

"The form of the chapel, the arrangement of the pews within, the positioning of the altar — all are such that, hopefully, the congregation would be made to feel an active participant in the services held here and that by such participation it will feel that the chapel is truly its own. The congregation generally is composed of an ebullient group of youngsters. In an attempt to subdue just a bit high spirits, which tend to have a correspondingly high noise level, we purposefully subdued the internal lighting. I hope this will

achieve the desired objective. On the court side, generous eaves extend from the building and one goes down a few steps to gain their shelter and tucks under them as a little chick must do when seeking shelter under its mother hen's outspread wings.

I hope that a sense of belonging has been achieved, a sense that this building, the court and lanais which surround it, forming what might even be called a "Hawaiian cloister," is a special and unique part of the campus."

The "Hawaiian cloister" composition includes heavy redwood timber trellises on parged stone piers that organize court entrances, peripheral offices, toilets and choir robing rooms, with a freestanding cylindrical classroom building asymmetrically related to the chapel.

To integrate the chapel with the lily pond, which is so much a part of Punahou's lore, two walls rise from it (with care not to disturb the spring from which the school takes its name), the sloping floor starts several steps below the court level and a portion of the pond penetrates the interior space.

Evident materials are relatively few: parged bluerock masonry, redwood trellises and siding, variegated grey barrel roof tile and, on the subducted chapel roof, standing seam copper. At the roof's peak, a lantern provides both natural and artificial light to the cut coral stone altar directly below.

Collaborating fine artists were Ruth-Adell Anderson who executed the woven screens, Erika Karawina who designed the stained glass planks, and the late Jean Charlot whose 32 door panel copper repose scenes from Jesus' life were executed by Evelyn Beveridge.

The chapel at Hawaii Preparatory Academy is in a rugged, rural setting, one that is blessed by ample precipitation and a cool, strong pervasive wind.

The earlier history of this Episcopal related school at Kamuela, Hawaii is one of having

primarily male students. It is now acceptably co-ed. At the time of the chapel's dedication in late 1966, however, it was to such predominately male students assembled that Val Ossipoff's remarks help us appreciate its "simple plan" and straightforward character when he said:

"You, young men, believe in simplicity, in directness, in strength and in honesty; and it is these virtues which I have tried to express in this building.

SIMPLICITY through its plan which is a simple rectangle, the narthex and sanctuary being barely demarked by a screen of *Ohia* sapplings and the barest of altar rails.

Simplicity too through the repetitive use of the same materials. The same *Ohia* screen as denotes the narthex is used on the exterior to shield the colored glass wall.

Ohia again, but slightly refined, forms the cross over the altar.

DIRECTNESS through the use of materials in a direct way. There are no moldings, no curlicues. Concrete is left to look like concrete and wood looks like wood. No paint obscures its natural grain.

STRENGTH AND HONESTY, again through the use of unplastered concrete with some rock showing, clearly indicating that there is a mass to this wall — that it isn't paper thin.

Ohia tree trunks used as supporting columns, by being left alone as they grow in the forest with the bark on, look and feel strong.

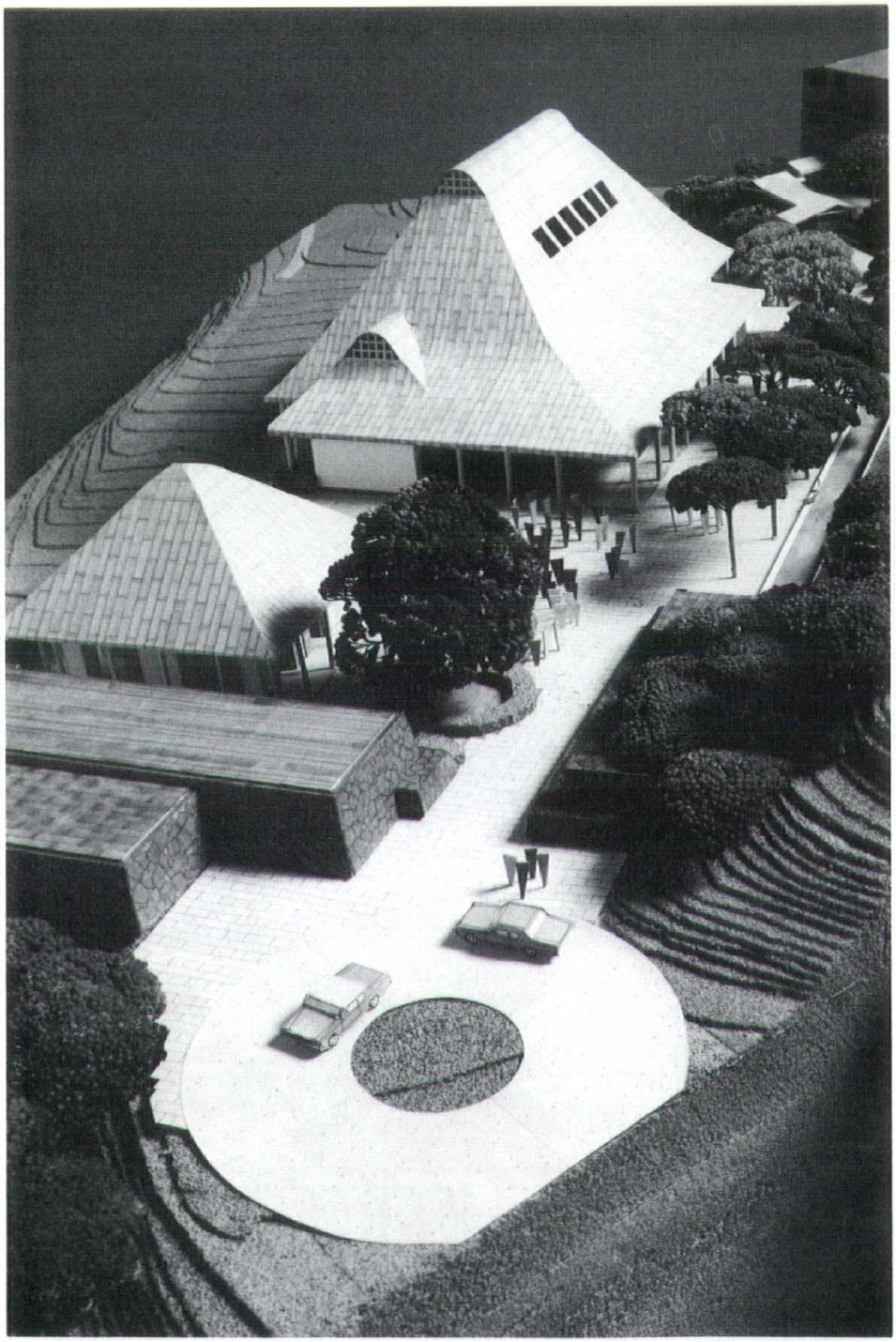
The board on board ceiling adds to the feeling of strength through its rugged texture.

No thin finish coat of cement is on the floor. The basic rough concrete floor slab is left exposed.

This is not a chapel for the effete society I described a few moments ago but is a chapel for you, strong boys: a rugged building with no nonsense, a building where you may find solace when you need it, and one in which I hope you will feel at home to worship as you will." **HA**

MEMORIAL TO A PRINCESS

by Dwight Pauahi Kauahikaua, AIA and Daniel Chun, AIA



Above is a model of the Bernice Pauahi Bishop Memorial Chapel and Heritage Center under construction at the Kamehameha Schools. Photo by Augie Salbosa.

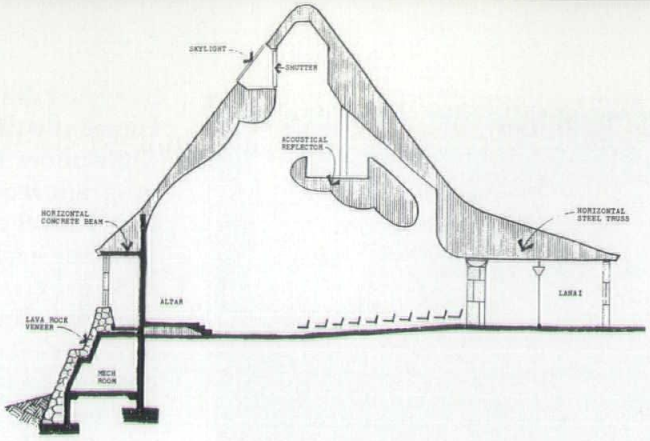
The Bernice Pauahi Bishop Memorial Chapel and Heritage Center is now under construction at the Kamehameha Schools. Designed to commemorate the Centennial of the Schools, it is the permanent replacement for the now-demolished chapel donated by Charles Reed Bishop in 1897 and designed by C. W. Dickey in a style complementary to the Bishop Museum.

Based on extensive programming sessions with school committees and the trustees, a 500-seat chapel well-suited to organ and choral music is planned. An adjacent Heritage Center is to house furniture and personal effects of the Princess. The Schools also established three criteria to direct the design of the complex:

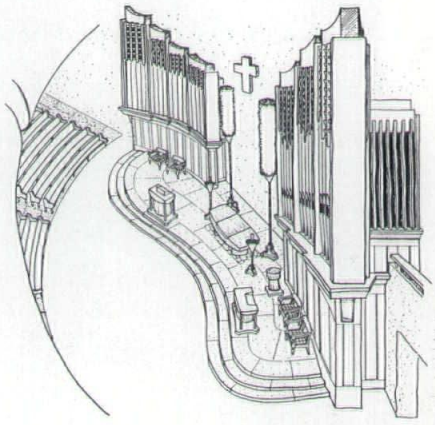
- The complex should be a unique creation of the Kamehameha Schools and a memorial to Bernice Pauahi Bishop.
- Hawaiian character should be very evident.
- The chapel should be perceived as a religious structure. Although the Schools are nondenominational Protestant, the buildings should reflect a design orientation toward congregationalism.

The unique mission and orientation of the institution suggests that the project evoke an idealized Hawaiian past. Both the Schools and the architects know that the true clients are the future beneficiaries of the trust.

Along with site planning concepts and building forms, Hawaiian materials are extensively incorporated into the facility. The



A sketch of the interior shows furniture, the pipe organ and featherwork being designed.



total design responsibility extends from use of native crafts to demanding engineering criteria.

Acoustics

Acoustical perfection is an important technical consideration for a chapel serving the Kamehameha Schools. The conflicting demands of both sacred music and speech are rarely satisfied in existing religious structures. Put simply, a large "hard" room with no sound-absorbing surfaces has the acoustical quality associated with historic cathedrals—a long reverberation time. At the same time the spoken voice is often too weak to be heard or amplified beyond understanding. A "soft" room of carpeting and mineral tile is a suitable acoustical setting for amplified speech but is so destructive of the qualities associated with liturgical music.

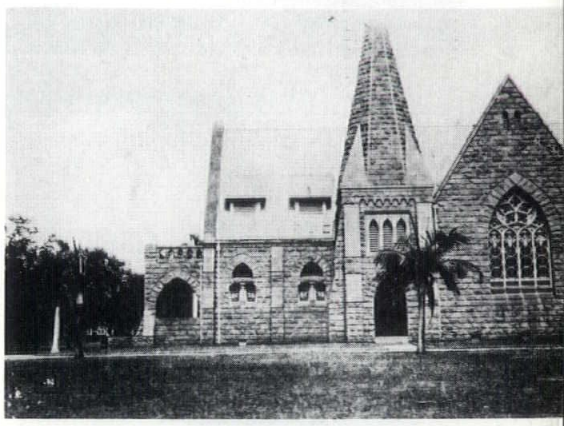
These conflicting demands shaped the design of the chapel from the outset. A decision was made in favor of a large "hard" room because long reverberation times cannot be successfully achieved by any other means. Good speech intelligibility would be achieved through proper shaping of the interior surfaces and electronic assistance.

The boldly scaled roof results in a ceiling fifty-six feet high which is covered with two-inch thick plaster. The hardness and weight of this ceiling performs the same acoustical function as stone vaulting without the associated decades of construction time. Interior walls and floors are concrete. Windows are half-inch thick tempered glass. This "hard" room is a suitable acoustical environment for the 3200-pipe organ and a cappella singing for which the Kamehameha Schools are justifiably famous.

Good speech intelligibility is achieved with a wide fan-shaped seating plan of only ten rows of pews. Suspended above is an acoustical reflector of the same thick plaster which provides "early reflections" of the amplified human voice. Without this reflector the human voice would drift to the full height of the ceiling with resulting loss of speech intelligibility. Assisting this reflector are some 183 speakers distributed on the pew backs and synchronized by computer delay. Thus, the spoken voice may be kept at a comfortable conversational level avoiding fatigue caused by the booming and garbled sound associated with most reverberant "hard" rooms.

Day Lighting

The unusually high ceiling and the acoustical reflector allow natural light to be brought in and manipulated for dramatic effect and human comfort. A large scale model was constructed and various locations of skylights tested. The most effective position initially proved to be at odds with acoustical requirements. Ceiling surfaces were ultimately shaped primarily for acoustical considerations and secondarily for day lighting ones. An electrically-operated shutter controlled from the pulpit was installed to plunge the chapel into darkness or bring forth light.



The original Bishop Memorial Chapel was built of cut stone from the Kamehameha quarries. Several hundred stones were salvaged and brought up to Kapalama Heights about 40 years ago to await incorporation in the new chapel. Photo by Robert Kauahikaua, KSB '27.

As the congregation is seated under the acoustical reflector, the direct rays of the sun should be diverted from this area. The chapel walls extend high above the reflector leaving their final resolution a mystery to the congregation. The higher regions of the chapel thus function like a dome for sound, light and that sensation of infinite space which is conducive to worship.

Structure

As the Schools have developed, the "buildable" sites on Kapalama Heights have been exhausted. The chapel site was selected by the Belt Collins master planning team for

its visual drama and prominence. Hence the nearly forty-foot cross slope under buildings in which program requirements dictate a single-level complex.

At the earliest stage of design an elevated platform was the base for these buildings due to the equation of high elevations with every positive social and environmental attribute. The topography later proved to be too steep for conventional retaining walls of the height required. Service areas and large cavities had to be stuffed into the downhill slope with their lava rock veneered walls acting like buttresses for the actual retaining wall hidden deep in the hill.

Kamehameha Schools also requested that the buildings have a feminine character as they were to be a memorial to a woman of 19th century deportment and delicate physical stature. This is largely accomplished by hiding the heavy structural elements behind screens of eleven-inch diameter columns — most of which are only carrying rainwater from the roof.

The horizontal thrust of the steel framed roof is resisted not by vertical buttresses but by horizontal members which structural consultant Ray Keuning designed into the lanai ceilings. The *mauka* side is a horizontal steel truss heavier than the roof beams and the *makai* side is a thick concrete horizontal beam exposed as the finished ceiling.

Kamehameha Schools requested that a crescent-shaped seating plan be designed in conflict with the consistently rectangular shape of Hawaiian buildings. Therefore, the six oversized columns carrying almost half the compressive load of the roof were arranged in a sweeping arc with resulting structural complications.

The single-level program requirements, steep slope of the hill, simple roof form, and then calculated acoustical shapes cause the geometry to go through several difficult gyrations. At the same time the complex must project a sense of both grace and solid strength. **HA**

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The Team:
Leland Onekea (seated), A.I.A., Architect
Phil Urquhart, Project Engineer, Allied Builders System
Connie Manuel, Owner's Rep., McDonald's Restaurants

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Central Union Church

RESTORING A LANDMARK

by Ruth E. Pratt

Sixty-four years ago, Japanese stonecutters shaped lava rock for the stone walls of Central Union Church. For the next three months, the main sanctuary at Central Union will be closed while those stones are cleaned and the interior is restored.

As project architect, Spencer Mason Partnership finds Central Union main sanctuary restoration challenging, not because it needs major structural work, but because work is being done to refurbish the sanctuary without altering its appearance. The Central Union restoration commission, chaired by Richard C. Dearing, is a working commission which is helping to guide the work toward maintaining that appearance.

Three major areas of improvement are cleaning and refinishing, lighting and acoustics.

Experiments for the best cleaning methods took weeks of testing. It was found that concrete cornices cleaned easily with a water wash up to 600 psi, rust stains on exterior stone and mortar joints responded to a ferrous stain remover, an akaline cleanser followed by a neutralizing after-wash worked for interior plaster, and good old razor blades removed paint from windows.

Lighting levels needed to be increased and the challenge was to add light which accented without detracting from the monumental classical interiors. Wattage was increased in the original Italian lanterns and flourescent strips were hidden behind cornices.

During current renovations, scaffolding fills the nave of the Central Union Church main sanctuary. Photo by Ruth E. Pratt.

Acoustical engineer Ron Darby studied the sanctuary and proposed changes to the interior to alter acoustical performance. Existing acoustical tiles will be removed from the entire interior and the barrel vault ceiling will be replastered to match the existing beach-sand finish plaster, so that the ceiling surface will reflect sound. The rear of the church will be given absorbent surfaces which will blend unobtrusively with reflective surfaces of the sides and front of the church.

A spidery network of steel scaffolding fills the 53-foot high nave which until last week was filled with pews. The small room where brides and babies used to wait is now lined with hardhats and computer printout sheets. Ed Kellett, president of Kellett Construction, is construction manager for the restoration and is orchestrating the project. Restoration of the 109 pews, for example, involves a complex accounting to ensure that balcony pews are installed after the balcony has been finished but before the nave has been carpeted so that the new carpeting is not ruined by the forklift required to move pews. A system of musical pews was devised to save Central Union storage fees.

Other team members include Kahala Construction, Architectural Acoustics, Kikuta Painting for cleaning, Okazaki-Sugai for plastering and scaffolding, EIN Electric, National Carpet and Island Movers. **HA**

THE CAD REVOLUTION

by Robert H. Hartman, AIA

Approximately two and one-half years ago, two Hawaii architects, independently of each other, chose to venture into the high-tech realm of computer-aided drawing (CAD). That small and seemingly tentative venture in 1984 has grown into a thriving, exciting, often frustrating and somewhat fragmented CAD explosion throughout Hawaii's A/E community!

Those earliest venturers were architects Clarence Fong and Robert H. Hartman. Fong put his micro-computer-based AutoCAD system on-line sometime in January or February of 1984, using an IBM PC micro computer, and I put my micro-computer-based Heath/Zenith 100 AutoCAD system on-line in March, 1984.

Today there are more than 75 firms in Hawaii with AutoCAD, several with VersaCAD, one architectural firm plus the University of Hawaii School of Architecture with PRIME/Medusa Systems, two architectural firms with Sygma systems, one architectural firm with a McAuto system, one architectural firm with a Hewlett-Packard based Holguin system and one architectural firm with a SKOK system.

The Navy at PacDiv chose a high-end system, ComputerVision, with a price tag of more than a million dollars, far in excess of what local firms can possibly deem prudent capital investments.

With the exception of AutoCAD and VersaCAD, the systems listed above are mini-computer based, with price tags ranging from $150,000 to $250,000. AutoCAD and VersaCAD systems can be put in place for about $20,000 per work station, including software.

With not more than 30 months of on-line experience in CAD technology, what does this portend for the A/E profession and, more important, what does the advent of CAD portend for the A/E's clients? What makes CAD superior to previous methods of preparing contract documents?

Let's take those questions in reverse order. What makes CAD superior to previous methods of preparation and assembly of contract documents?

1. Probably *the* most revolutionary aspect of CAD is the ease with which revisions to previous drawings can be managed. There was a time, not too long ago, when CAD was hailed as a cost effective technology only when used on projects which had a high degree of repetition, such as hotels, condos and hospitals, where basic room arrangements were flipped, mirrored, reversed and rotated. Today, successful CAD programs have proven their worth in "one-off" designs for residential, commercial and institutional projects because entire floors, portions of floors or areas, or individual spaces can be easily, painlessly revised and adjusted as project design progresses from schematic to design development and finally into contract document phases. (The SKOK brochure, circulated more than 18 months ago, contained the stark phrase *"...and on the seventh day the client said he would like to make a few changes,"* a circumstance no longer dreaded when the drawings are in a computer data base.)

2. CAD offers the ability to "cut and paste" in the very earliest schematic design stages. This is what I call the process of placing furniture, fixtures, equipment and even potted plants into the plans at the very earliest design stages. Our office has been doing this at the concept design stage for the past 12 months, using our CAD library of symbols. No longer is there a doubt in anyone's mind that room or space is large enough to comfortably accommodate the functions which have been programmed into that space. With CAD, each series of revisions to a plan or elevation results in a fresh plot, virtually a new drawing.

3. As all disciplines which comprise the design team begin to implement CAD, *if their hardware/software systems are compatible,* the transfer of design information becomes an almost painless task. No longer is it necessary for the architect to "pull" a sepia print of a floor plan, at an early stage of contract document preparation, in order to provide consulting engineers with "backgrounds" on which to do their respective drawing. That transfer of "background" information, utilyzing CAD, can be

done at any time, with the engineers simply deleting or electronically erasing all of the architectural information which is extraneous to their engineering drawing requirements.

Our Kailua office has been doing a series of Radio Shack retail stores, both new and remodel. After we have completed an architectural floor plan, fully noted and dimensioned, we make a copy diskette from our Zenith 100 hard disk, take the diskette to Syntech, Ltd.'s office in Honolulu and copy that diskette onto Syntech's IBM hard disk. (We are both running AutoCAD software.) Syntech then deletes or "freezes" all of the architectural information from their new file, retaining only the drawing information they will need to do the electrical and mechanical design.

The Radio Shack drawings are pretty straightforward and seldom require extensive cross-checking. Therefore, when we have completed our design work, we each plot our own final contract document sheets for building permit, bidding and construction purposes. In this particular case, Radio Shack uses AutoCAD software in their headquarters offices in Fort Worth, Texas, operating Tandy 2000 computers. The Hawaii-generated drawings are sent via Federal Express to Radio Shack in Fort Worth as floppy disks, where they play them back on their computer for final review and approval. None of this rapid and accurate exchange of drawing information would be possible were it not for CAD.

How can the owner or client benefit from CAD? The Radio Shack scenario is one example.

As more and more owners or clients begin to implement in-house CAD, perhaps only for facilities management purposes, their dealings with architects and engineers who utilize compatible CAD systems will result in much more usable facility management data needed by the owner long after the A/E has completed a

specific project. The Kahala Hilton has such a system in-house, as does Bob Cleve at Kaiser Permanente Health Systems and the Queen's Medical Center. All three institutions have selected AutoCAD. At each of these institutions, facility data or drawings, which are furnished to them in disk or cartridge format, will enable them to maintain an internal data base in a timely and accurate manner. Seldom, in a large facility, has there been any in-house method to accurately track who is occupying a specific space within a building. CAD is the key to achieving this archival capability.

The Queen's Medical Center's in-house CAD system will be used initially to build a CAD facility data base totaling more than one million gross square feet of medical, office and support space. Five floors of the new Queen Emma Tower at Queen's have already been CADamized by our office and the Queen's CAD staff will soon begin adding the surrounding buildings.

A further benefit to the owner through CAD-generated drawings is a minor one, but nevertheless worthy of consideration. Machine plotted drawings can be very precise. Machine lettering just 1/16 inch in height is very readable. Hand lettering at 1/16 inch is all but impossible. What this can mean, if carefully analyzed by the design professional, is that overall drawing sizes can be safely reduced by use of smaller scales than would be possible with hand drawing. On large buildings, smaller scale can result in fewer match lines segregating various wings or quadrants of a building floor plan. Fewer match-lined quadrants results in a better overview of the building.

Even where the complexity of a

specific project may dictate staying with 1/4 inch scale floor plan drawings for construction purposes, those drawings, if resident in a CAD system's data base, can be regenerated for or by the client at a reduced scale for management purposes. CAD drawings can be plotted at *any* scale. Our office was able to produce highly readable 1/32 inch scale drawings of each floor level of the Queen Emma Tower at the Queen's Medical Center.

"What does the CAD revolution portend for the A/E profession?" As owners begin to see CAD-generated drawings being prepared for their projects, they will tend to seek out similar advanced technology services from other consultants. Mainland-based clients who have projects being developed across the country, and who have had mainland exposure to CAD technology, will naturally look for similar capabilities in Hawaii's design firms.

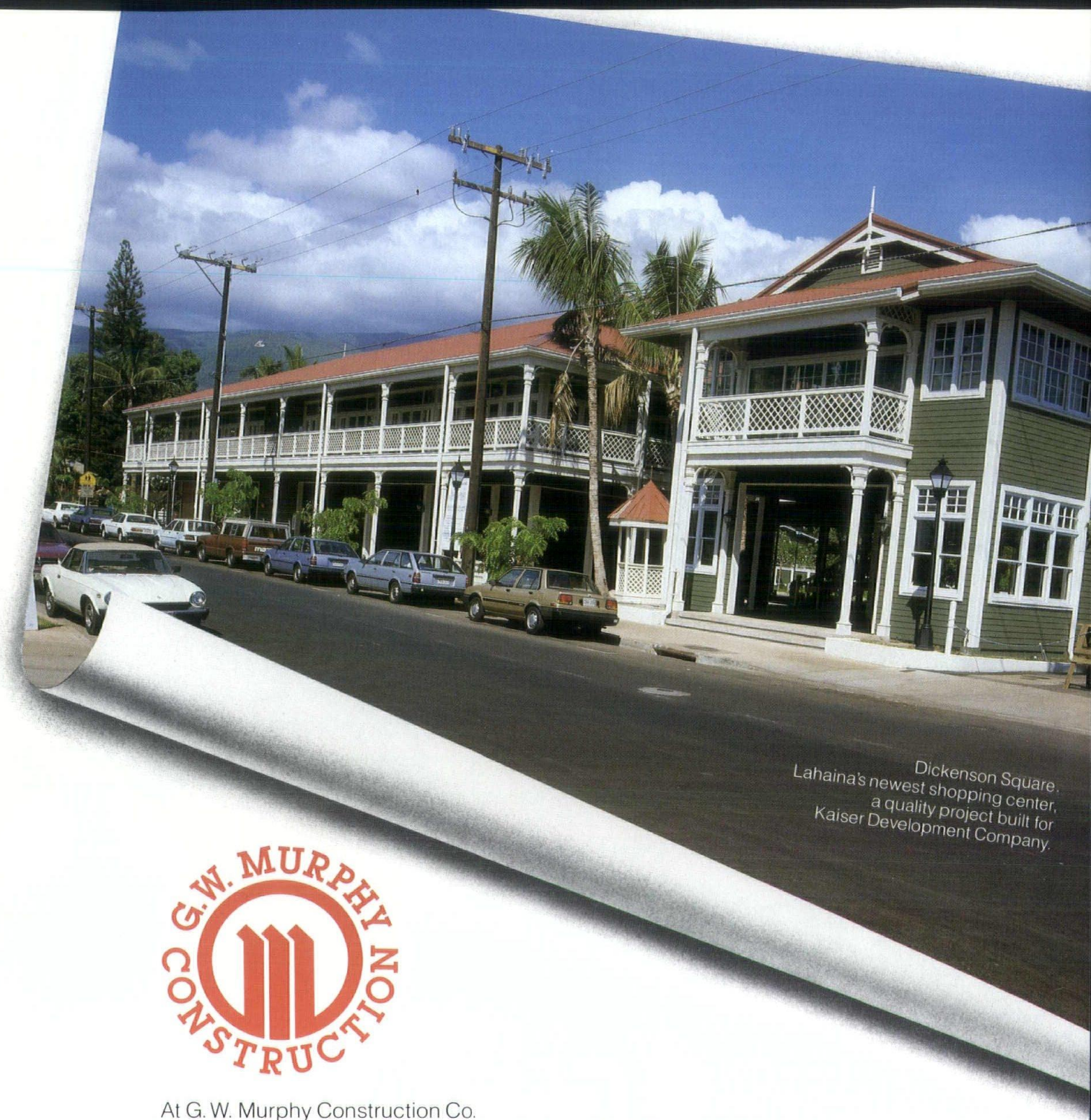
Those design firms that resist CAD, or see CAD only as a passing phenomenon, may slowly see their client base erode.

Design firms that are delivering completed projects using CAD technology should be able to market facility data base management to those clients for whom they did the new building's drawings. As an example, the Queen Emma Tower at Queen's Medical Center was dedicated only a few months ago. Our office has prepared a CAD data base of some 250,000 square feet comprising the ground through fifth floors. Many of those floors had unassigned spaces within them, most of which are now being filled. Our data base is being updated to reflect those infills, so that Queen's has a practical and economical method of tracking *all* occupancy changes.

Similar facility data base activities are expected to occur in the near future at Kaiser Permanente's health care facilities and, with the advent of the in-house AutoCAD, at the Kahala Hilton.

Successful entry into the CAD field, however, takes much more than acquisition of software and hardware. At the office of Norman Lacayo, who chose a high-end system, Prime Medusa, the commitment to CAD started with Lacayo and grew into an essential tool in the development of his projects. All technical personnel have varying degrees of proficiency on CAD and three work stations are shared by all. Lacayo's approach is an excellent example of the kind of commitment it takes on the part of senior management to make CAD work!

There are too many offices in Honolulu where managing principals have approved the purchase of a CAD system, only to figuratively turn their backs on it once it arrives, leaving the development of in-house proficiency to a "technician," often a lower echelon employee with little or no authority. The new technology is exhibited as an example of the office's acknowledgment of hi-tech, but is



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non-productive due to absence of management support.

In early 1985, the Hawaii CADD Users Group (HCUG) was formed, meeting monthly at the HS/AIA offices. HCUG is not limited to any one CAD system. It tries to answer to the needs of all users since all users share the same triumphs and frustrations about pen types for plotting, plotting media and, most important, plotters themselves (sometimes the most frustrating link in the CAD chain).

Because of the proliferation of AutoCAD systems in Hawaii, a Hawaii AutoCAD Users Group (HAUG) was established in April, as a spin-off from HCUG. Ten of the 32 members are from Douglas V. MacMahon's (DVM) electrical engineering office. MacMahon has made a personal commitment to achieve a high level of productivity within his office and is exchanging drawing information, via AutoCAD diskette, with the CJS Group Architects, Ltd.; Wimberly Whisenand Allison Tong & Goo,

Architects, Ltd. and our office. DVM's system is about six months old.

The relatively low acquisition costs of micro-computer-based CAD systems has resulted in more engineering firms than architects, in Hawaii, fast becoming CAD proficient. There is an emerging CAD integration among the design disciplines, which is bound to increase each firm's ability to produce more work, with fewer people, in less time. And if the architect is the driver of the overall design team, the CAD architect will seek to use similar CAD-based consultants. If one consultant on the design team is either non-CAD based or non-compatible CAD based, overall economy and productivity increases are almost impossible to achieve.

One final thought regarding the impact of CAD on the design professional—CAD technology, once mastered, can make the process of design an absolute joy! **HA**