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- Computers in Design
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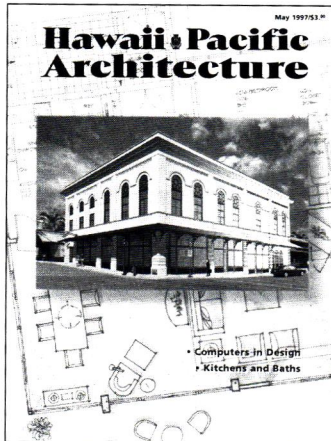
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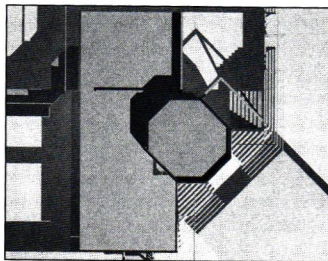
IN THIS ISSUE ...

Computer aided design and drafting is no longer a specialized function used by only a small number of architects; today, its use and applications are widespread throughout the profession. This issue explores CADD use from liability, copyright and construction standpoints, while Hawaii architects offer personal opinions on the use of computers in their practices. *Hawaii Pacific Architecture* acknowledges Urban Works, Inc., and Envision Architecture for their contributions of CADD drawings to this issue.

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The cover composite image depicts the transition from a traditional hand drawing to computer aided design using ArchiCAD by Graphisoft. Envision Architecture, Honolulu, was contracted by Spencer Mason Architects to develop a virtual building model to show the renovation of the Toyama Building in Hilo. Envision Architecture is affiliated with the firm of Carleton Hawpe & Associates and is an authorized reseller/trainer for ArchiCAD.



8 CADD: Better Than Ever



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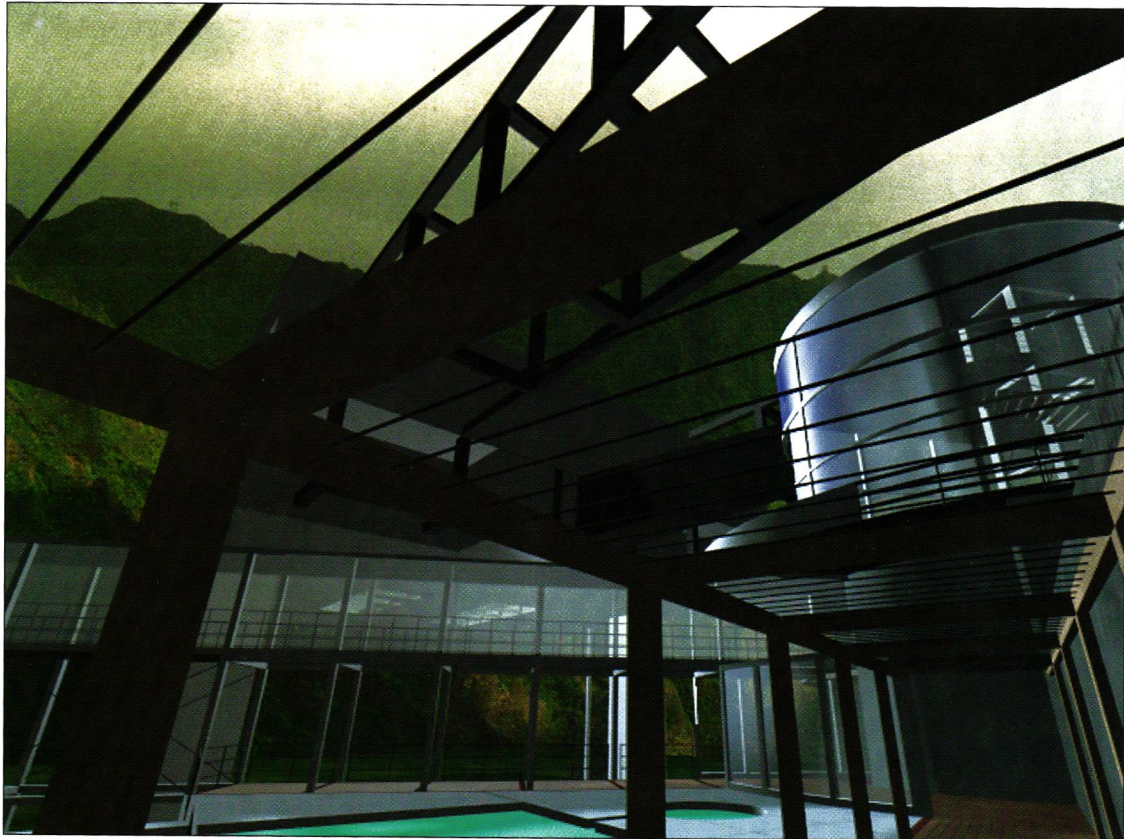
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Local architects offer views

CADD: Is the Promise a Reality?

by Brian Shimomura, AIA



Courtesy of Urban Works

The birth of the computer age has created many benefits to modern society. Though with every gain there is a loss, and the architectural field of practice has been no exception.

Much has been said about computers and their application in the architectural profession. One view is that though CADD has introduced a technically refined presentation, it lacks the aesthetics and artistic appeal of hand-drafting. Others have embraced the technology without looking back.

Local architects recently responded to the following question on computer technology and its use in architectural practice:

“Computer technology and computer-aided design and drafting (CADD) have

been integrated into modern architectural practice and in many instances have replaced hand-drafting technology altogether. What is your opinion on this effect on our profession, and how has it affected your personal practice?”

“I personally am not a part of the computer/CADD literacy generation but have subscribed and benefited from the advantages that it offers from the very beginning. Today, it’s not an asset—it’s a given. It will never, however, replace the human elements related to design that are the spontaneous and dynamic aspects of creativity.”

Wes Deguchi, AIA

GYA Architects, Inc., Honolulu

Continued on page 6

Continued from previous page

“Computer technology has greatly enhanced the power of an individual to communicate with clients and consultants. Our firm has embraced this shift and will continue to explore graphics, rendering, Internet and e-mail technologies in providing better service to our clientele.”

*Charles Kaneshiro, AIA
CJS Group Architects Ltd., Honolulu*

“The Internet and other paperless technologies in addition to CADD are redefining the way we work. However, I’ve seen big advances in the abilities of low cost single purpose consumer CADD programs. These will supplant the high end programs for simple residential design. This will put a strain on the traditional residential architectural practitioner.”

*Merrill S. Kittinger, AIA
Architecture & Planning, Kailua-Kona*

“CADD can make the architect more efficient but can mask professional abilities behind computer prowess.”

*Jeffrey Y. Nishi, AIA
Jeffrey Nishi & Associates / Architects,
Honolulu*

“Advances in computer technology provide opportunities to improve both the quality of services and the speed at which the services are delivered to the client.”

*Troy M. Miyasato, AIA
Urban Works Inc., Honolulu*

“Having utilized CADD for a majority of our projects since 1986 – it’s but a tool in the implementation of architecture conceived in the human imagination.”

*A. Kimbal Thompson, AIA
Kimbal Thompson Associates, Ltd.,
Kailua*

“Computer technology and CADD have increased the efficiency of architects to produce construction documents and make drawing revisions. However, hand drawn preliminary and schematic designs are still the route to take when working with clients initially.”

*Gary Andrada
Cobeen, Tsuchida & Associates, Inc.,
Honolulu*

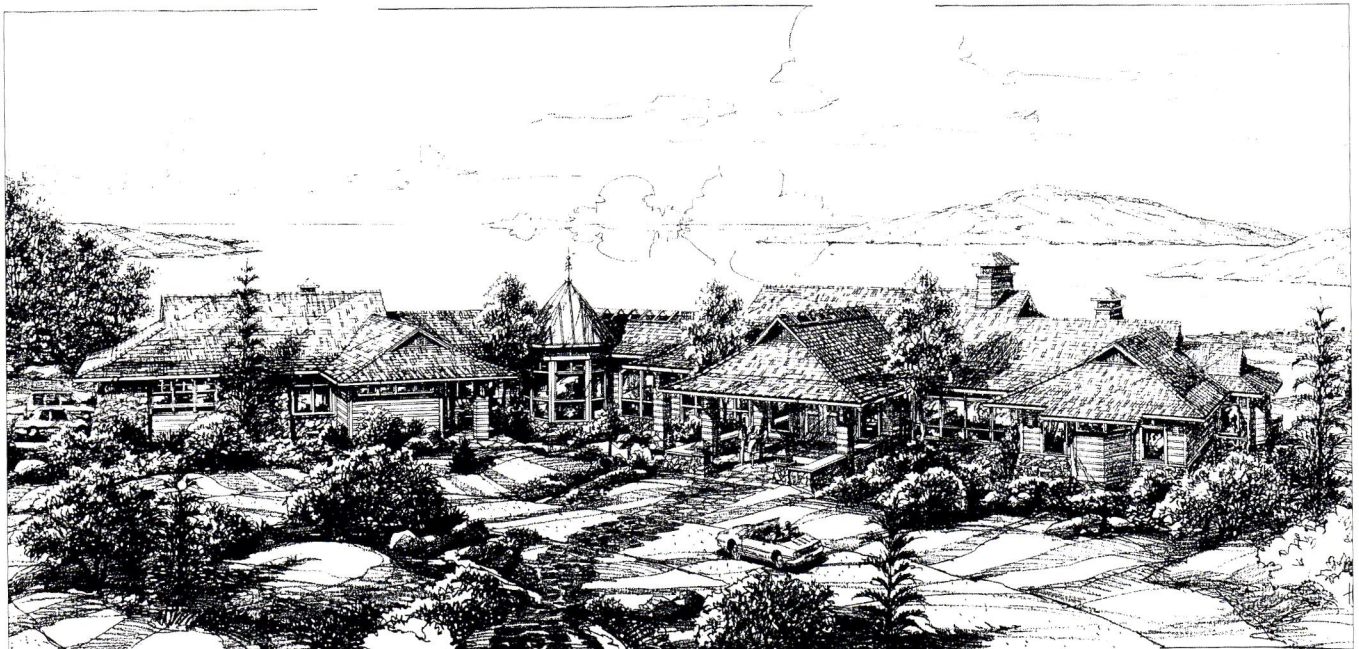
“CADD has created a new field and has challenged us as architects technologically by providing us with a tool to design and save time in providing solutions.”

*Sandi P. Quildon, AIA
SPQ: Sandi P. Quildon, AIA,
Kailua*

“Our office is a totally automated practice from programming, schematic design to construction documentation. The computer (CADD) is the essential tool. We couldn’t do the large projects without it. Especially with lower fees, tighter deadlines and increased competition, the computer is our saving grace.”

*Eric Taniguchi, AIA
GYA Architects, Inc., Wailuku*

Many architects feel that although CADD is an important design tool, the aesthetic appeal of hand-drafted drawings can't be beat.



Shaefer residence – Kula, Maui. Rendering by Jim Hayes; architect: Brian G. Boelter, AIA.

"Multidimensional computer graphics capabilities for planning, design, drafting and modeling are fascinating and add value to the creative process. It is a major challenge, however, to stay ahead of advancing technologies. Overall, it facilitates and enhances our communications."

*Andrew Charles Yanoviak, AIA,
Honolulu*

"While the computer has aided drafting and editing of drawings, it still cannot replace the artistic element of rendering by hand."

*Steve Fukunaga
Belt Collins Hawaii, Honolulu*

"It is just a matter of time before CADD will be in all architects' offices. The goal of this technology is to be more efficient in communicating our designs to the client and contractor. Pursuant to this, all architects should be aware that CADD drawings are only as good as the contents which are being input and their coordination."

*Calvin S. Higuchi, AIA
Hiyakumoto & Higuchi
Architects, Wailuku*

Calvin Higuchi's quote perhaps sums it up best: CADD can be a wonderful tool, but the human creativity behind the machine remains the most important element in architectural design.

Brian Shimomura, AIA, is an architect in private practice in Maui.

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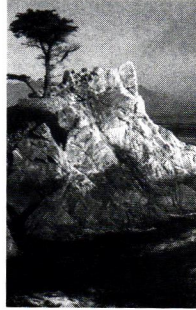
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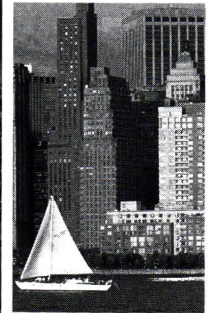
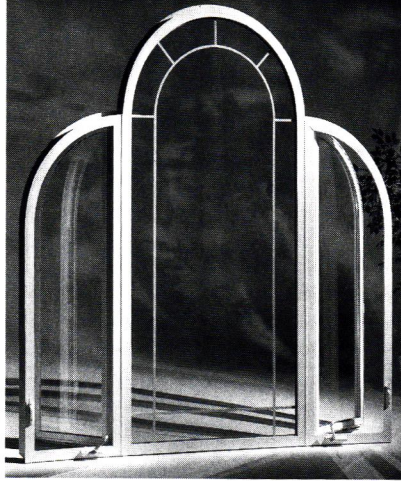
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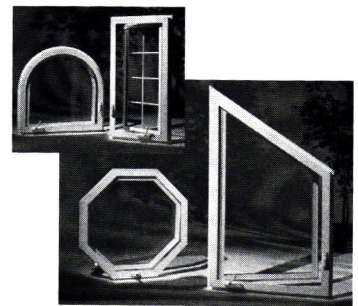
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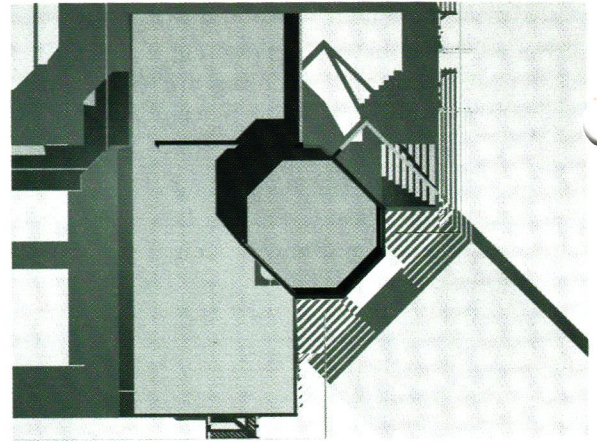
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A computer on every desktop

CADD: Better Than Ever

by Felicia Provencal



Starting in the early 1980s, the PC revolution changed the way architects create and present design ideas. Once an expensive and esoteric tool used only by the largest firms, the computer aided design and drafting (CADD) workstation has become an essential element of any competitive office.

With processor and memory prices falling and software becoming more intuitive, the

dream of “a computer on every desktop” is now within reach of any company, regardless of size. Every task from estimating building costs to producing photo-realistic representations of the built environment has been made more efficient due to the use of sophisticated computer techniques.

Prior to the 1980s, the only types of computer systems seen in design firms were either the limited computers used for accounting and



CADD drawings courtesy of Urban Works

other office tasks, or the mainframe CADD systems that required extensive training and an in-house "guru." In 1982, CADD programs for the personal computer were introduced and for less than \$9,000, the small office could afford a CADD workstation. As we move further into the '90s, desktop computers have become even more affordable and the programs require much less training.

New and Improved

The two areas in the architectural field in which CADD programs have made the most progress are in their design capabilities and rendering. CADD programs in the '80s were little more than drawing programs. It took almost as much effort to create a CADD drawing as a drawing done by hand. The CADD drawing was easier to read and revise but did not offer any more information than its hand-drawn equivalent.

Today's CADD programs offer a wide variety of design tools. Products such as AutoCAD and Microstation can associate intelligent information with the CADD objects. By opening a CADD drawing, it is possible to extract information such as door and window schedules, space planning diagrams, area and linear quantity takeoffs, and occupancy data with a few clicks of the mouse.

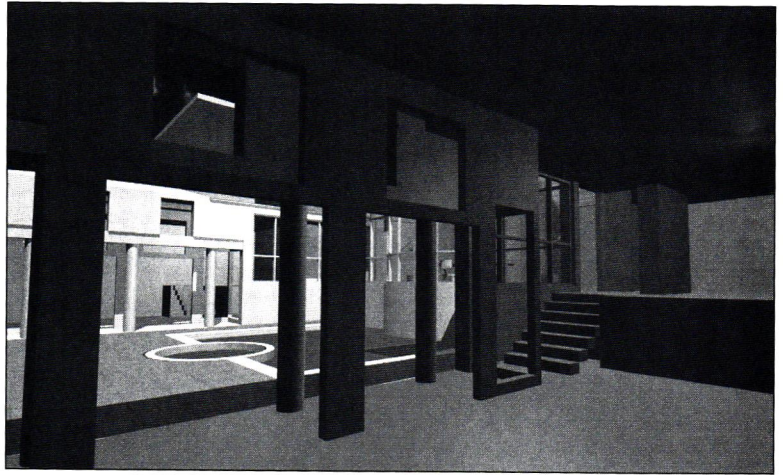
Much of this is due to the development of design programs written to complement the drafting features in standard CADD packages. Software packages by Softdesk, Ketiv and Eagle Point all run inside existing CADD packages. Programs such as ArchiCAD combine both drafting and design features.

With the CADD program providing raw numbers, the design packages can translate the drawing and extract the information the designer needs. For example, the computer can calculate the amount of floor area to be covered by a particular brand of carpeting or the total load on an electrical circuit. With these features, the CADD drawings become more than part of the plan drawing set; they become part of the entire construction plan document set.

When considering the amount of information a CADD program can generate, those using the software must remember that the design is only as good as the designer. While a CADD program can make a drawing easier to read, it cannot guarantee a good design. Only a licensed professional can do that.

Project Previews

In the area of rendering, computers now



make it possible to accurately predict what a project will look like when built. With large libraries of finished surfaces and the ability to merge proposed designs with actual photographs of a project site, clients can now preview the design months before the ground is broken. Rendering packages also allow clients to request changes much earlier in the design stage than ever before. Basic rendering options can be used in most current CADD programs, but some of the more powerful options are available through rendering-specific programs such as 3D Studio.

Prior to rendering, architecture firms relied on artist renditions, scale models and plan sets to convey design ideas. With three-dimensional computer rendering, clients can view a design from any perspective in the context of the actual site. Adjacent sites and buildings as well as trees, people and other objects can be judged accurately.

Firms that prefer the look of hand-drawn illustrations will often use a wire-frame of the site created in CADD as the "backbone" of the illustration. This process creates a finished piece that has all the artistry of an illustration and all the accuracy of a CADD model.

Companies looking to implement CADD in their production and those who want to expand or upgrade their systems are offered a wide variety of reference sources. Trade publications, independent publishers, vendors and Internet resources can all provide information and assistance in determining what solution is right for each situation. Today more than ever, firms looking to buy into the computer revolution have options to fit every budget and design need.

♦ Felicia Provencal is a Softdesk registered consultant based on Maui. She offers consulting, training and customization services and teaches computer and CADD courses at Maui Community College.

This allows the client the unrestricted right to modify or reuse the design documents.

If a client retains ownership, the design professional should insist upon protection from liability that may result from the inappropriate reuse of the materials. The designer should determine why the client wants the electronic files. If it is for facility maintenance or future repair work, the client should be made aware that information stored magnetically can easily be damaged and its accuracy cannot be depended on indefinitely.

A detailed ownership of instruments of service clause should be included in the contract. A clause should also be included detailing CADD ownership rights, software specifications and compatibility for hardware. It should also state that hard copy plans and specifications take precedence over electronic files in the event of a dispute.

Also recommended is an acceptance period, 30-60 days at the most, after which the design professional is not responsible for deterioration or defect. Finally, a waiver and indemnity for claims should be included for unauthorized reuse or changes made to the electronic files by the client or others.

There isn't much the design professional can do to prevent unauthorized modifications once the electronic files are turned over. Therefore, title blocks, logos, seals and signatures should be removed. Hard copies should be kept of everything that is transmitted.

If a client insists on ownership of documents in electronic form:

- Tie the ownership transfer to receipt of final payment of fees.
- Include a strong waiver and indemnity provision.
- Refer to the documents as instruments of service.
- Disavow any warranty of merchantability and fitness for any particular purpose.

Another CADD issue involves requests by contractors to use the de-

sign professional's electronic files to assist the contractor in preparing shop drawings. If the design professional agrees, a strongly worded letter agreement should be signed and an appropriate fee should be charged. The use of the design professional's electronic files saves the contractor substantial time and money, but only increases the design professional's liability.

Liability problems related to CADD use are very real. If the design professional is not required to

deliver materials in electronic form, he shouldn't volunteer to do so. If there is a contract requirement that can't be changed, the implications should be carefully considered and the design professional should be appropriately protected.

Mary Yoshimoto is an account executive with Finance Insurance, Ltd. Some information for this article was taken with permission from the new edition of The Contract Guide – DPIC's Risk Management Handbook for Architects and Engineers scheduled to be published this year.

Maryl Nails Down The Details.

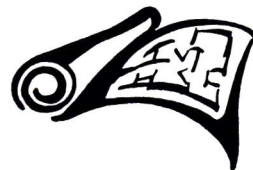
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Copyright law

Retaining Ownership Rights

The expansion in use of computer-generated drawings has resulted in simplifying the reuse of designs. Without your knowledge or consent, your designs could be reused for another project, unless you have protected them by contract and copyright.

The following is an excerpt from The Contract Guide - DPIC's Risk Management Handbook for Architects and Engineers (S. Dixon and R. Crowell, 1993, DPIC Companies, Inc.), which explains the value and importance of retaining ownership rights over your designs.

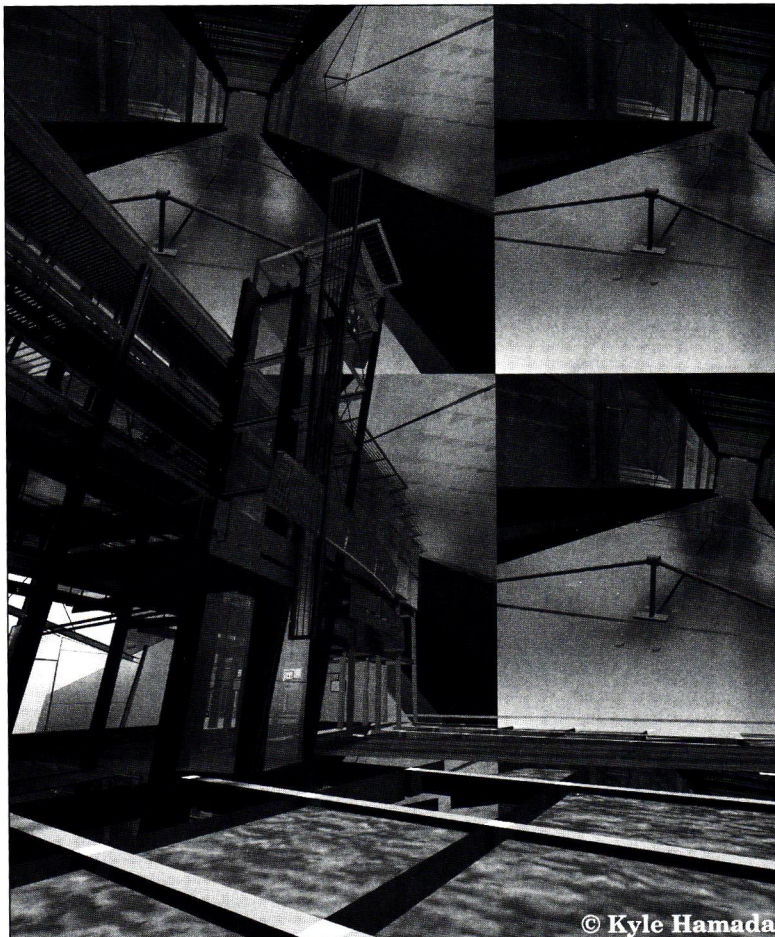
Copyright law defines “architectural work” as the design of a building as expressed in plans or drawings, but not individual standard features. The owner of a copyright to an architectural work has the exclusive right to reproduce it, to make derivative works from it, to grant licenses to use the work, to sell the work and to otherwise deal with the copyright. In general, these rights last throughout the life of the owner and extend 50 years beyond that.

Prior to 1990, design professionals had only limited protection under copyright laws. While the drawings for a building design could be protected, the building design itself could not. Anyone with a camera, a tape measure and a calculator could copy a structure without infringing upon the copyrights of the building's designer.

However, the 1990 Architectural Works Copyright Protection Act amended the U.S. copyright laws to provide more extensive safeguards for the designs of architects and engineers. The Act prohibits unauthorized construction of buildings depicted in copyrighted drawings created on or after Dec. 1, 1990. Simply put, prior to the Act, an architect's or engineer's drawings were protected by law – now, for the most part, the actual buildings are, too.

The Problem

Although your rights as a designer have been strengthened by the legislation, it is up to you to safeguard these rights. It is a simple matter to sign away all these hard-earned protections with the stroke of a pen. How? By agreeing, in a client-written contract, to give up your ownership and rights – including copyrights – to your client or even your client's lender.



© Kyle Hamada

For the most part, such a requirement is inappropriate for traditional design projects. Be aware, too, that if you do contract away your copyrights, it is possible you might not be able to use derivatives of your own design for another client.

The Solution

Although your copyrights exist as soon as you create your drawing or design, it is such a simple matter to mark your designs with an accepted copyright notice that we recommend you do so on every copy of every document you create. You should also register your documents with the United States Copyright Office, a simple and inexpensive procedure that will assist you in the enforcement of your rights. If you file a registration within three months of publication, you should be eligible for certain rights granted under federal law that are not otherwise available, such as the right to file for an injunction, to claim statutory damages, and perhaps to recoup reasonable attorney's fees should you prevail against someone who infringes upon your copyright.

If you neglect to register your copyright, you still have some protection. Although by delaying registration you forfeit certain rights, you still have up to five years after publication to add or correct a copyright notice. It is far better, however, to elect one person in your firm to see that all your designs are promptly copyrighted as a matter of office routine. In addition, consider requiring your employees to agree in writing that they are employed on a "work for hire" basis, so that only your firm – and not your employees – can register the copyrights.

To avoid any misunderstandings, your client contract should always address copyrights. It should clearly state that you will retain the copyrights to your drawings and design, as well as the ownership of those documents.

Before you agree to sign away any right, seek qualified legal counsel. Copyright law is a highly specialized field, and you need a knowledgeable attorney to advise you on your ownership rights. If you do transfer all or any portion of a copyright, either from a consultant to you or from you to another party, you should record that transfer in an appropriate filing with the United States Copyright Office by sending the office a copy of the instrument evidencing the transfer (or an

abbreviated form to be used for this purpose) along with the required fee.

Should you decide to contract away your copyrights, you will need some additional protection. Your contract should have provisions that guard you against unauthorized reuse and unauthorized changes to your designs.

Additional information is available at www.DPIC.com, DPIC's Internet Loss Prevention Library.

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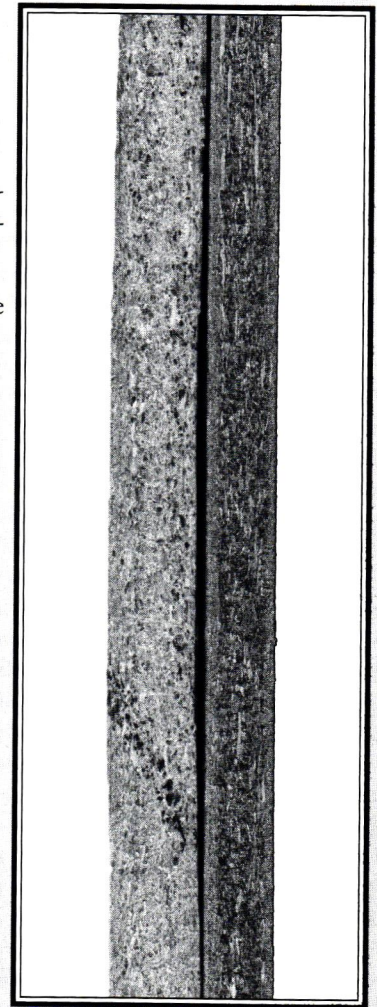
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Computer design from the construction perspective

Builders' CADD

by Bill Curtis

There is an art to the cycle of the creation, adaptation and utilization of space. The owner envisions the need, the architect clarifies and defines the intent, engineers detail specific properties and the builder coordinates the assembly of the components. The efficient utilization of time for all parties involved has always been an important factor in creating successful projects, and the effective use of computer aided design and drafting (CADD) is increasingly an important tool for developing productive partnerships within our industry.

CADD is a labor-saving tool that can be as important for the builder as it is for the architect and engineer. By developing a model that integrates the intent of the design with the structural and mechanical properties required to accomplish the end product and working out potential conflicts before construction commences, the efforts of all parties can be more productively focused during building. This can allow for the creation of a superior product in less time due to increased coordination among the various trades and professions involved.

My primary usage of field drawings is to consolidate information presented in the plans and specifications, often from several different sections, into a reference worksheet that can be used by the project foreman to

simplify the process of layout and construction and provide a easy reference to verify that which has been built. Examples of where these drawings may differ from the architectural drawings include:

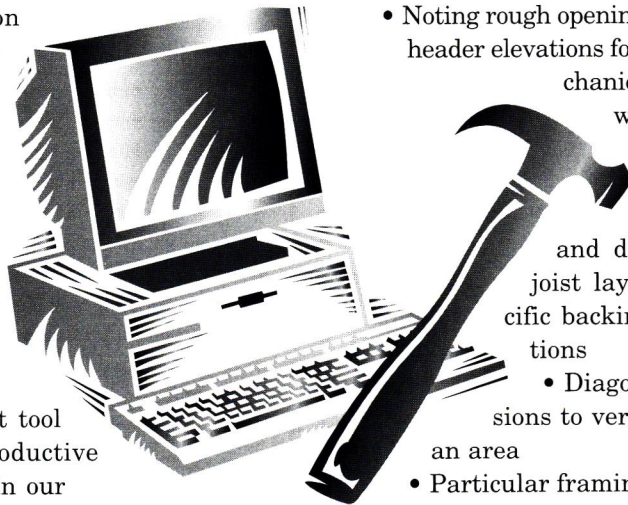
- Converting centerline and face of finish dimensions to face of framing dimensions
- Noting rough opening sizes and sill and/or header elevations for doors, windows, mechanical, electrical, HVAC, wall and ceiling penetrations
- Indicating the beginning point and direction of stud and joist layout; identifying specific backing requirement locations
- Diagonal reference dimensions to verify the squareness of an area
- Particular framing details and/or sub-assemblies to be used

On larger projects I may also include cumulative dimensioning for certain areas to make it easy to mark off different locations from a single pull of the tape measure.

An Important Preview

By modeling the framing ahead of time and overlaying various mechanical, electrical and structural elements that need to be taken into consideration, you can identify conflicts that may occur that are not apparent by viewing individual sections. It will bring to your attention where the critical framing dimensions are to accommodate close tolerance items. Sometimes it can allow you to suggest a slight design modification to allow for a more optimal utilization of resources.

A recent example occurred on a split pitch



A recent example occurred on a split pitch roof our company was building. By slightly modifying the design dimension we were able to eliminate the need for a 4-inch rip on the lower portion of the roof sheathing and bring the width of the last piece of plywood to an optimal width along the ridgeline. This offered savings to the owner with no noticeable effect on the overall design.

Today's projects often have intricate wall, soffit and ceiling treatments utilizing built-up framing elements, often with curved or vaulted surfaces. This type of construction is appropriate for metal stud framing for structural as well as partition and ornamental members.

My employer taught me the concept of lofting for developing non-linear surfaces which he has used in his other passion, the construction of racing yachts. While the surfaces we create are not nearly as complex as those involved in creating a high performance boat hull, CADD allows the user to develop a model to dissect the elements of simple and compound curves and create a plan to quickly and accurately develop these surfaces in the field.

While it's easy to develop an arc given the center point and a known radius, it becomes more involved when the center point of that arc is behind a wall in the next room, in an adjacent building or even across the street. By drawing an arc in a CADD model, objects are not in your way to get to the center point. You can then reduce or increase the radius of the curve by the thickness of the finish material(s) to be applied to obtain the shape required for the rough framing.

Points of tangency can also be easily obtained in CADD to connect multiple arcs. This shape, which now represents the face of framing, is divided into stations and an x-y coordinate developed for points along the curve. These stations usually correspond to the structural requirements to support the element (i.e. 16 inches or 24 inches on center

spacing), but you can reduce the station distance to create a better definition of the curve where and when required.

Once in the field the creation of a complex shape is reduced to that of connect the dots, and once the finish material is applied the shape emerges (similar to the sheathing of a complex roof structure).

One example was the framing of the Planet Hollywood Restaurant in Lahaina, where more than 100, 8-1/2 x 11-inch drawings, that could

be easily faxed to the general contractor and architect for confirmation and archived and indexed for field personnel, were developed to define the framing elements.

Establishing Boundaries

Another important use of CADD for the builder is in the initial site layout of a project. By modeling the property line azimuths and distances builders can verify that the boundaries indeed come full circle and accurately enclose an area. In



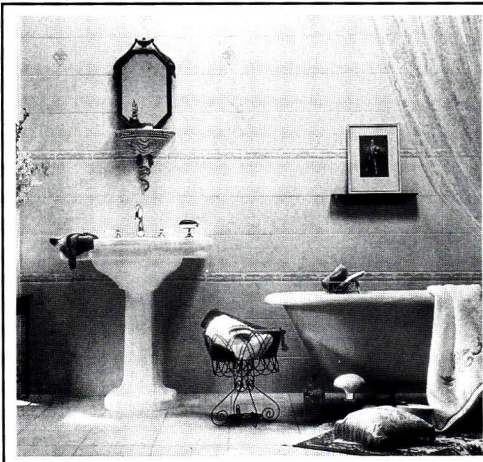
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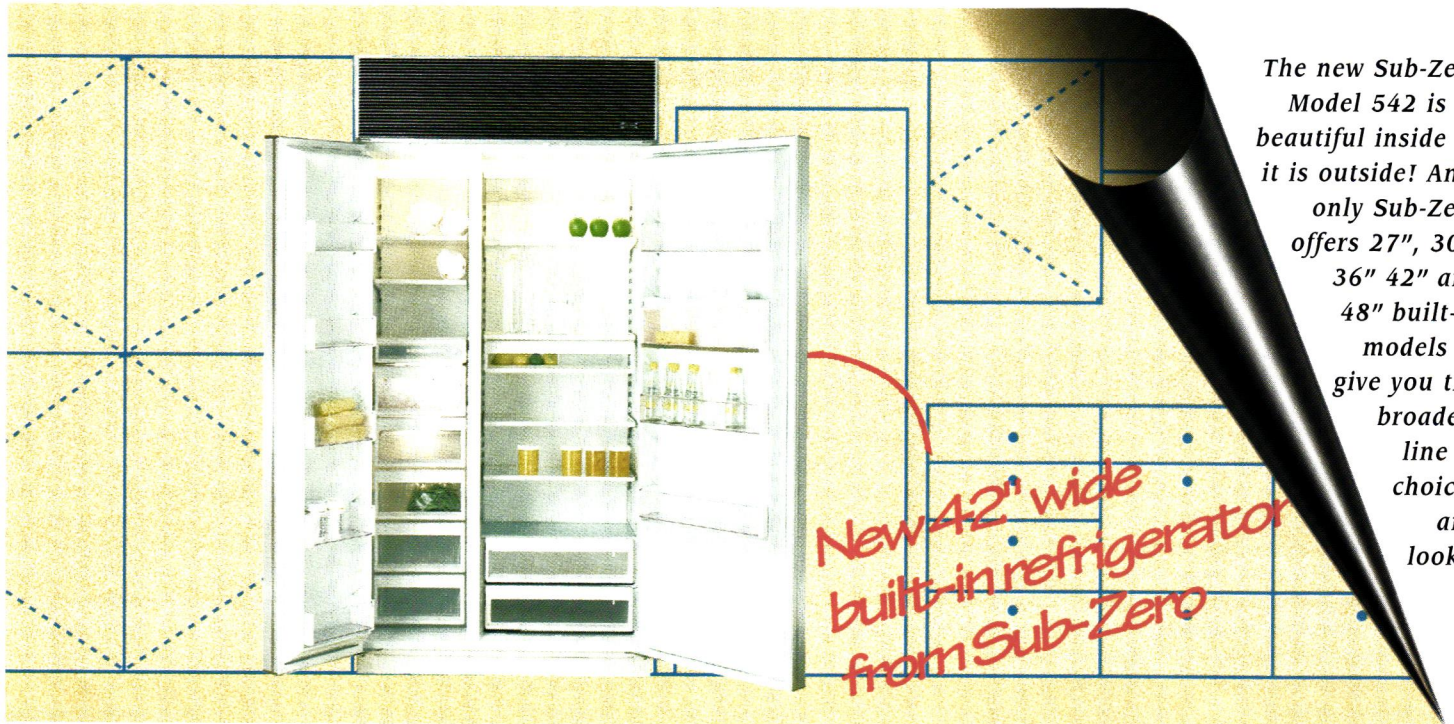
large, complex property boundary descriptions it is possible for a transcription error to occur and CADD allows the non-surveyor to verify the space plan accurately. Once the boundaries are set, components of the project can be incorporated onto the site plan and reference dimensions may be determined in the model from established boundary and control locations. This again speeds the process of laying out and developing offsets and verifies that items are located correctly. Control locations may also be added to the site to assist the builder even though they may not be necessary for the architectural or engineering definition of the project.

With all parties within the building cycle becoming more effective in CADD, it's just a matter of time before we develop standards and methodologies that will allow us to realize the greater potential of fully integrating our individual efforts and become more efficient in the building process as a whole. In a world not too far away we could have:

- The civil engineer, drawing from a "library" of existing conditions, enhances these to reflect new requirements to satisfy a space design.
- The civil building contractor documents newly discovered and modified items from the original plan reflecting the actual infrastructure created and topology modified.
- The architect takes this accurate space model and develops structures and landscaping to place upon it.
- The civil, electrical and mechanical engineers design the necessary support systems.
- And the general building contractor who, like the civil building contractor before, notes the actual conditions created and makes available back to the "library" an accurate representation of what was created.

♦♦ Bill Curtis is a project manager with Consolidated Builders Inc., Kahului, and an enthusiastic CADD user since 1984.

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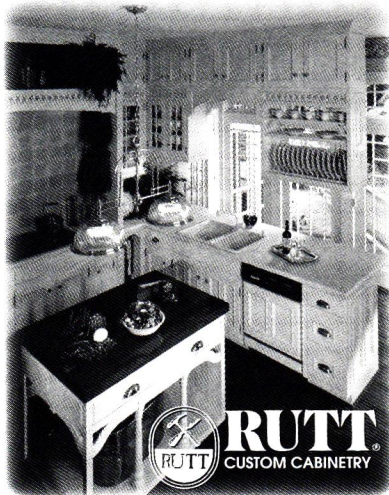


SUB-ZERO

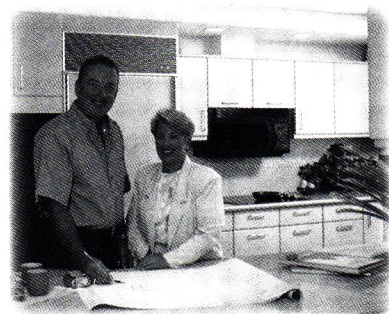
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Trends in kitchens and baths

The Comforts of Home

by Jamie Kemp

In the 1980s, American consumers desired a European flair in kitchens and bathrooms. Smooth, sleek, ultra-modern design was the rage. Today, however, kitchen and bath designers are being asked to create distinctive styles that meet the demands of modern family living but still offer a sense of comfort and warmth.

Michael Smith, a certified kitchen and bath designer and president of Kitchen Concepts Plus, said today's harried lifestyles are the most likely factor in the return to more traditional design.

"Many professionals work in today's stark, clean line offices and when they return home at the end of a busy day, the comforts of traditional elements are sought for family gatherings," Smith said.

"Incorporating the appliance sleekness into today's kitchen is still very popular, but today's homeowners seek a more natural feel to the room's interior. Gone is the heavy emphasis of steel, glass and glossy lacquer, being replaced with lighter wood tones and natural stone," he said.

Mike Ferguson, general sales manager of Central Pacific Supply, agreed that design trends are lean-

ing toward a more "natural" look. Ceramic tile in natural colors and textures is increasing in popularity in kitchens and bathrooms. Also well-received is "stone-look" tile, which offers the appearance of natural stone without the maintenance normally associated with stone or marble, he said.

Although design trends have returned to a more traditional style, appliances remain as modern as ever. Homeowners continue to prefer built-in appliances that use the latest technology, or commercial-type ranges and refrigerators formerly found only in restaurants.

Gone is the heavy emphasis of steel, glass and glossy lacquer, being replaced with lighter wood tones and natural stone.

Mike Beranis, sales vice president of Sub-Zero Distributors, said the new Viking electric ranges provide a good example of what homeowners are currently looking for in kitchen appliances. The 30-inch wide, self-cleaning range and the 30-inch rangetop feature a glass ceramic cooktop and heavy-duty construction, design and styling. The ranges are popular with "home chefs" who enjoy using professional quality appliances, Beranis said.

Today's homeowners can enjoy the best of both worlds: the convenience of today's appliances in the comfort of traditional design.



**Posedly
Named AIA
Fellow**

Penny Hamilton
Posedly was recently named a Fellow of the American Institute of Architects.

She will be invested into the College of Fellows at AIA's national convention in New Orleans this month.

Posedly has practiced architecture for 31 years. She graduated from the University of Arizona, was president of Posedly Lugo Architects, Tucson, Ariz., and president of the AIA Southern Arizona Chapter.

Posedly moved to Hawaii in 1987 and is currently staff architect and project engineer for The Queen's Medical Center. She has served as secretary and on the Board of Directors for the AIA Honolulu Chapter and is the governor's appointee to the Architectural Access Committee. She's also active on the AIA Women in Architecture Committee and in Aloha United Way.

Posedly and her husband, Tom, also an architect, live in Honolulu.

**Maui Chapter Sponsors
Student Building Event**

The annual AIA/Maui DOE Student Toothpick Bridge Building Contest and LEGO Building Contest will be held May 10 at Maui Mall. For more information, call Brian Shimomura, AIA at 874-5177.

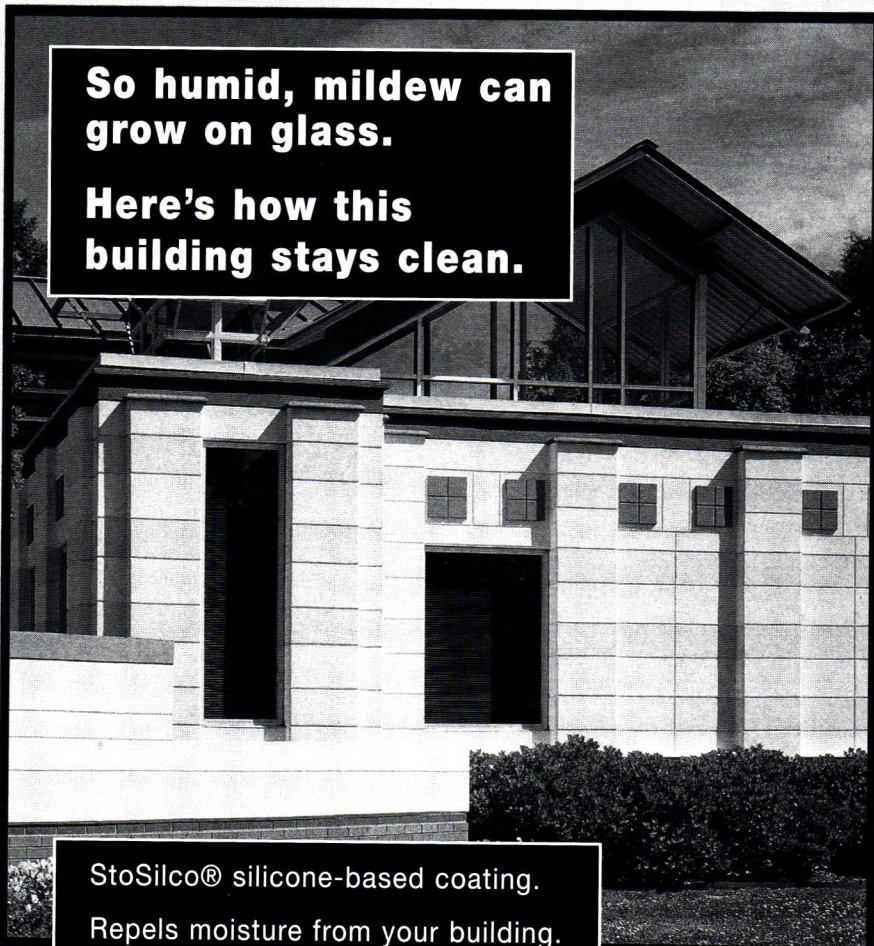
**CADD Software Featured
at Computer Expo Maui**

Seminars on using CADD software programs will be among the highlights of the Computer Expo Maui, May 14-17 at the Grand Wailea Hotel Resort. The trade show also features a two-day trade exhibit. For more information, call 484-1848.

BIA to Hold "Garage Sale"

Appliances, countertops, doors, lumber and tools will be among the items available at the Great BIA Home Im-

provement Garage Sale, May 31 from 9 a.m. to 3 p.m. at Robert M. Kaya Builders, 525 Kokea Street. For more information, call 847-4666.



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Chinatown Manor

Chinatown Manor represents the City and County of Honolulu's dedication to the revitalization of Chinatown. The project is the first phase of the Kekaulike Revitalization redevelopment program.

Chinatown Manor is a transitional rental housing development for laborers and the underprivileged. Retail space was incorporated to reflect the urban model of street-front retail and subsidize the rental income.

The primary design concept was to reflect historic Chinese design vocabulary with eclectic period facades, materials, details, proportions and colors.

The project provides secure, affordable rental housing and viable retail space, encourages pedestrian activity and bus ridership, and adheres to National Historic Preservation District requirements. Social, aesthetic, health and economic issues were addressed and resolved through thoughtful analysis and design.

Jurors' Comments

"It is an appropriate response to the Chinatown district, possessing a clear, simple concept, done economically and well on a tough, irregular site."



A pleasant courtyard greets apartment residents.

Credits

Owner/Client:

Department of Housing and
Community Development

Architects

Kober/Hanssen/Mitchell Architects
Mitsunaga & Associates Inc.

Contractor

Hawaiian Dredging & Construction

Consultants

Civil: R.M. Towill Corporation

Mechanical: Miles Onishi & Associates

Landscape: Brownlie & Lee

Electrical: Ho & Okita, Inc.



Facade detailing is evident in this mid-block view.



The Nuuanu River fronts the anchor building at the corner of River and Hotel streets.

STEEL STYLES

Project Profile:

LILIHA MEDICAL PLAZA

While the design teams of John Hussey Architect (JHA) and Nowak-Meulmester & Associates (NMA) Structural Engineers have designed numerous medical office buildings for their client Pacific Medical Buildings (PMB) in California and Nevada, this particular building presented unique challenges.

The site of the existing medical facility sits in the middle of a residential neighborhood. The office building itself is tucked into the tight southeast corner of a demolished parking garage since rebuilt and enlarged on another portion of the site.

The task was to design a 106,850-square foot, five-story plus two level basement medical office building with as light a structural system as possible. This was to minimize the number of 24-inch and 36-inch diameter drilled concrete piles to support the structure in the layers of volcanic rock soil underneath the structure.

Additional requirements were a partial two level basement as well as two below grade, 18-foot high concrete oncology radiation vaults with 6-foot thick, cast-in-place concrete walls and 8-foot thick roof sections.

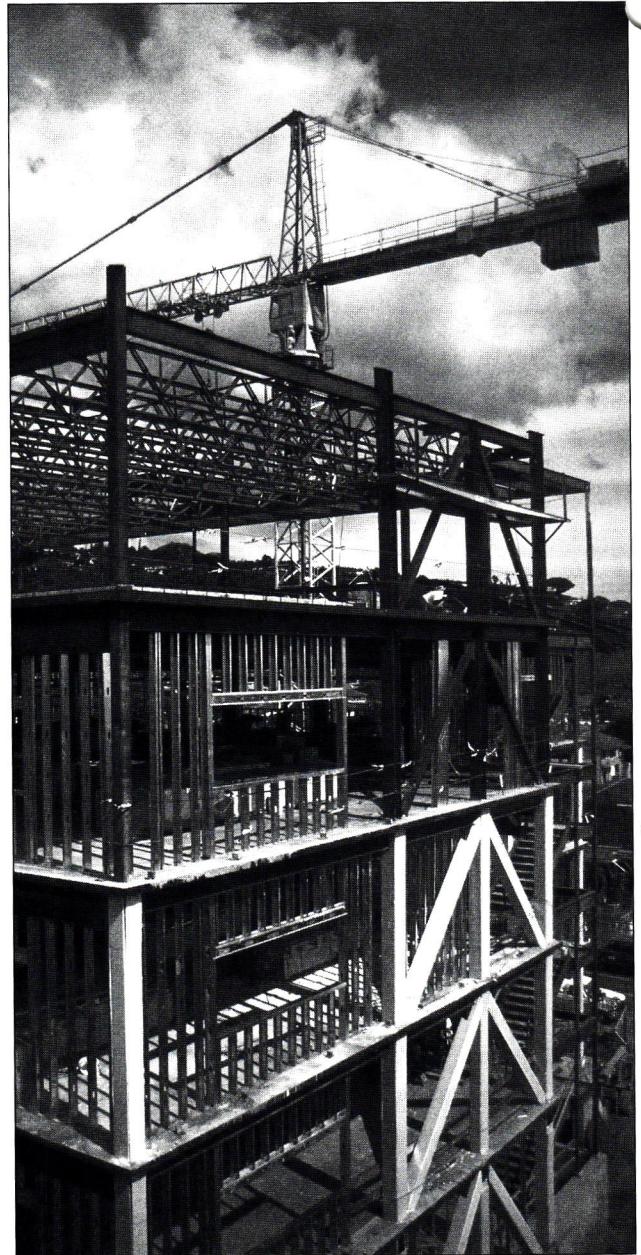
Due to the increased need for basement space as well as on-grade parking, the architect moved the radiation vaults horizontally partially beyond the perimeter of the five story superstructure. The roof of the radiation vaults created a pad to house mechanical air handlers. Since the air handlers couldn't be exposed to view because of their location near Liliha Street, a 10-foot high, cast-in-place concrete screen wall was designed to hide them.

To take advantage of the 11-foot difference in slope between the north and south sides of the building, the architect provided on-grade parking at the south end of the site and placed the two level basement and radiation vault into the north end of the site where grades are highest.

To provide maximum fire protection for the roof of the on-

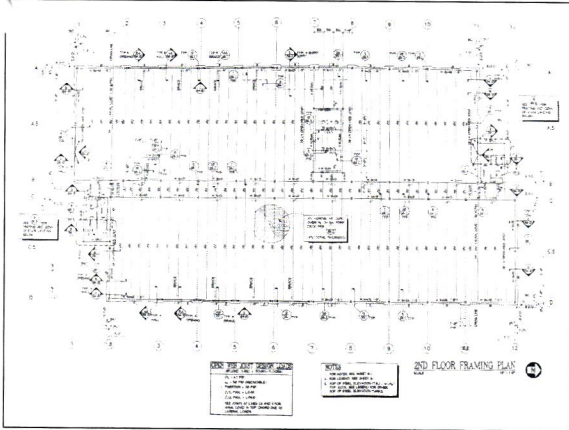
grade parking, the architect chose to design the first elevated level as a cast-in-place floor system. Due to the special requirements for parking and drive aisles for ambulances at the south end as well as column free space for lab requirements on the north end, the cast-in-place concrete level required the same 47-foot span on the concrete beams as the superstructure above.

Jim Wiseman, NMA's project



Steel-braced frames along north and south elevations provide seismic resistance.

STEEL STYLES



interior corridor and 42 feet on the other side. To accommodate that requirement as well as a 12-foot, 6-inch floor to floor height, NMA chose a steel open web joist system spanning to perimeter and interior corridor columns spaced 16 feet on center. The open web joists allowed mechanical air

ducts to be threaded through the open webs. engineer, designed a one-way, 7-inch thick concrete slab spanning 16 feet to post-tensioned concrete beams spanning the same 47 feet as the steel open web joist spans above.

PMB's medical office lease space requirements were for column free lease spaces of 47 feet on one side of a double loaded

ducts to be threaded through the open webs.

While only in seismic zone 28, the project engineer chose a special movement resistant space frame to reduce steel tonnage in the longitudinal direction where window openings were maximized by the architect. For the transverse direction, braced



Shown here is the 47-foot span open web joist at the second floor.

Photos by Bill Hagstott

LILIHU MEDICAL PLAZA

Credits:

Developer/Owner

Pacific Medical Buildings

Architect

John Hussey Architect
San Diego, CA

Structural Engineer

Nowak Meulmester
San Diego, CA

General Contractor

Mortensen Construction
Honolulu

Steel Fabricator

Graham Steel Corp.
Kirkland, WA

Steel Erector

Mutual Welding Co., Ltd.
Honolulu

frames were utilized to reduce steel tonnage and take advantage of a minimal number of window openings.

To give the building a warmer look and blend in with the surrounding residential neighborhood, the architect chose to provide mansard metal standing seam roofs with a four in 12 pitch.

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Recalls owner's representative Alvin Cecil: “Allied Builders' coordination with hospital staff was hand-and-glove superb. They brought order out of chaos for us, and they accomplished all the change orders we requested and still got the job done on time.”

Adds Coleman: “Work with Allied Builders again? In a heartbeat...”
And heartbeats were what this job was all about.



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