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IN THIS ISSUE...
Today's technology allows architects to do more than ever in service to their clients. From Computer Aided Design to Internet communications, architects in both large and small firms enjoy the benefits of technology while still providing the human interaction necessary to a successful practice.

COVER: An anchor store at The Shops at Wailea is realistically represented using a variety of CAD software packages, scanned photographs and manual rendering. Rendering courtesy of Architects Hawaii.

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April/May 1999
April 1999

Dear Readers of *Hawaii Pacific Architecture*:

This April/May issue is the last issue of *Hawaii Pacific Architecture* to be published under the contract between PMP Publishing and the American Institute of Architects Hawaii State Council. Changing times require evolving ideas for informing the public about architecture and its clientele.

When PMP Publishing took over this responsibility some 14 years ago, the magazine was a black-and-white publication with a subscriber list of about 1,000 architects and their close associates. The subscriber list has grown to over 5,000 people consisting of elected officials, developers, financiers, community leaders, professionals, and other important citizens in our community.

The magazine has won awards from the publishing industry. In its pages can be seen the result of enlightened patronage harnessed with the architect's dreams and the builder's well-crafted object. Not only new designs were featured, but articles on Hawaiian thatched houses and historic military architecture have appeared. These magazines form an invaluable record of design issues and accomplishments over a significant period in Hawaii's history.

The American Institute of Architects thanks PMP and its employees for their years of dedication to architecture and to this magazine. Gratitude is also expressed to the past and present *Hawaii Pacific Architecture* Editorial Board, the numerous contributors of articles and photographs, and our loyal advertisers.

Aloha and Mahalo,

Daniel Chun, AIA
President
As the clock ticks towards the next century, architects can’t help but wonder what the new millennium holds in store for architectural design. Once an esoteric and expensive tool used only by the largest firms, the CAD (Computer Aided Design) workstation has now become an essential element of any architectural office.

While some architects fight the notion that CAD is an unpleasant necessity for doing business which is relegated to other people if possible, others believe it is the best thing that has happened to the building design profession, providing a boost in profitability and the ability to offer new services. Depending on how CAD is implemented in the office, either of these statements could be true.

For many architects, making the transition from manual drafting to drafting software to 3D supporting architectural software hinges in part on the philosophical approach a firm follows, the types of building design it does, and how it develops the design. In most cases, the smartest path is to add a station or two devoted to 3D visualization. More clients are starting to ask for, and even expect, perspec-
A single wireframe model provides multiple views of different parts of the project.

tives and rendered walk-through animations, turning the competitive advantage gained through leading-edge implementation of technology into an increasingly short-lived event. The Internet is a good example of this phenomenon. Touted as the future of networking and collaboration, it has been the focus of incredible media attention both within the public and the profession. At our firm as at many other architectural firms, an increasing number of clients began to ask if we could communicate with them directly using e-mail systems, FTP (File Transfer Protocol) or other tools of the information super-highway. At the same time, we needed better tools to communicate and share information with our consultants. Today, as a direct response to these external market forces and our internal functional needs, we have implemented a leased fiber optics line to our office, and every employee in our company has direct access to the Internet.

New Techniques

The architectural fields in which CAD programs have made the most progress are in their design capabilities and perspective rendering. In the area of 3D renderings, walk-throughs, fly-throughs and lighting, studies can be very effective in showing a client how the finished product will look — to the point of showing how the light will shine through the different windows in the building at different times of the day and year.

Easing the transfer into three-dimensional computer rendering can be accomplished by developing wireframe models that are then manually rendered. This is a viable solution bridging the distance between different approaches. For example, for The Shops at Wailea we enabled our clients to preview the design months before the ground was broken using a large library of finish surfaces and the ability to merge proposed designs with actual photographs. Using a variety of different software packages, the base wireframe model was generated in AutoCAD, while sunlight, materials, water features and the sky were rendered with AutoArchitect and 3D Studio Viz, as envisioned by Alain Geronimo, a designer with Architects Hawaii. We worked closely with Nick Kaars, Designer on the color system using a custom-designed viewable color chart to obtain the subtle desired color variations on the computer screen as well as on prints. To add photorealism, Earl Ma, also a designer, created a digital “entourage” image library with scanned photos of people and trees using Adobe’s Photoshop and Illustrator. By digitally separating each entity, we manipulated scale, location, and sharpness individually without affecting the others. Finally, we sketched in cast shadows for these figures free-hand using a graphics tablet and digital pen.

The current development of architectural software demonstrates a major trend toward building comprehensive 3D CAD models. From CAD models, all the plans, sections, elevations and even details can be automatically generated. Drawing coordination also will be automatic, as changes to the model are reflected in all the relevant drawings and details. Until recently, however, it was too difficult and time-consuming to actually attempt this with real building projects. However, due to the massive increases in inexpensive micro-computing power, better operating systems and architecturally specialized programs with vastly improved artificial intelligence, this idealized way of de-
signing buildings is now moving toward realistic professional practice. The 3D visualizations are a side benefit, since comprehensive models must work in 3D.

**The Creative Process**

Has computer technology changed the way architects think, the way we design and express creativity? The answer is a definite yes and no. I don’t believe technology has any influence on the actual design creativity or the development of design solutions. It is a tool aiding the professional. As such, it has added to the traditional way architects present their ideas. Technology can add excitement. It can help designers express themselves in a variety of stimulating ways, using a diverseness of media.

Does all of this mean we have reached the end of this technology curve? No, the future continues to look very exciting and the accelerated speed of technological advances shows no signs of slowing down. The constant struggle of our relatively slow-moving industry trying to keep up with fast-paced technology on which we increasingly depend, will not cease. For those architects still waiting for a more intuitive interface, aiding in implementing design ideas without having to fight the often disliked “technology beast,” there is a shimmer of hope on the horizon based on the development of the following new tools:

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Bettina Mehnert, AIA, is a senior associate and director of information systems at Architects Hawaii Ltd. Mehnert is a board member of AIA/Honolulu Chapter and serves on the advisory board of Honolulu Community College. A member of theAssociation of Computer Aided Design in Architecture, she lectures on CAD production techniques, operations and procedures, and has authored and edited computer publications.

In the area of 3D renderings, walk-throughs, fly-throughs and lighting, studies can be very effective in showing a client how the finished product will look — to the point of showing how the light will shine through the different windows in the building at different times of the day and year.

3D models. Since most works of architecture share a physical environment with other buildings, input technologies will capture not only the designer’s intentions, but the urban design context as well. User-generated CAD models, such as those proposed for new buildings or alterations, can be matched and tracked into the contextual scene for an affordable level of photorealistic environmental simulation.

- Some input technology, such as the “traditional” goggles-and-glove mode of virtual reality (VR), melds the input and display environments. Multiple participants can take a virtual walk through proposed designs while interacting with each other inside a virtual space.

As reported at the 1998 Microprocessor Forum, the typical AEC
What is the purpose of examining the use of computer technology in architecture? Is it to make architectural methods more efficient, or to push the boundaries of the architect's creative spirit? I graduated from the University of Hawaii School of Architecture in the spring of 1997 and represent the first generation of computer-savvy students to come out of the school. I believe technology has greatly enriched my design experience.

During my 100-level studio year, I was hired by an architect who operated his firm exclusively with computers. This firm, Entheos, introduced me to an architectural software package that focused on the 3D model. I was so excited about the software that I purchased the fastest computer I could afford. During this time at the firm, the manual drafting boards were replaced with computers and I received the opportunity to train under an architect while using the latest in digital tools.

In my 100-level studio course, a few students were using the computer but mostly for CAD drafting or word processing. I had the opportunity to collaborate with fellow student Brian Fujiwara and Associate Professor Spencer Leineweber, FAIA on the completely digital international design competition called Mas Alla De Frontera. We were instructed to submit computer-generated renderings and animations with no physical drawings. It wasn't so much the design...
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problem that was challenging as was using the computer as a design tool. Although our design didn’t win first place, the experience was a catalyst that would form my initial training as an architect.

**New Challenges**

When I entered the 200 level, the school was going through an exciting transition, moving to a new facility. There seemed to be a changing of emphasis, with a new focus on computerization and exploration which contrasted with the traditional curriculum. This facility was designed to incorporate computers as an integral part of the design studio. It took a full year to initiate the first completely digital design studio pioneered by Leineweber. We were required to supply our own computers and use ArchiCAD modeling software. We discarded the drafting boards and produced everything on computer. For our final presentation, we used Apple Computer’s QuickTime VR technology which allowed us to navigate through the 3D model interactively.

As I entered the 400 level studio I had the opportunity to be under the instruction of Amy Anderson, a talented designer and architect. She designed the course entirely on the concept of “exploration” and eliminated many traditional forms of instruction. We explored design ideas through various media such as writing, video, models and computers. We were encouraged to use FormZ, a free-form, three-dimensional modeler to explore initial design concepts. Through exploration, I was able to derive forms that were difficult to create by traditional means. This experience allowed me to free my mind and create beyond what I thought I was capable of doing.

When I graduated, I continued to work at Entheos, working on 3D design models and construction documents. As an intern, I was focused on the design process and its role in the digital environment. I was amazed at how initial concepts would flow into each phase and eventually into the finished product. We termed this process “visual reality,” which reinforces the concept of “what the client sees is what the client gets.” One of the key benefits is that as the project is being constructed, the digital image shown is very close to the work produced thus instilling more confidence in the client. Another benefit is that the architect is forced to resolve the design in the early phases thus eliminating potential problems that may occur throughout the life of the project.

**Great Expectations**

Clients are expecting more these days from design professionals and computers are allowing clients to be more involved in the creative process than ever before. The marketability of architects today largely depends on their commitment to technology.

Clients are expecting more these days from design professionals and computers are allowing clients to be more involved in the creative process than ever before. The marketability of architects today largely depends on their commitment to technology. As of January 1999, the office of Entheos and Okita • Kunimitsu & Associates, Inc. (OKA) combined talents to create a new company known as Okita • Kunimitsu • Entheos International, LLC (OKE). The goal of this company is to provide state-of-the-art design services across the entire project spectrum, which allows me to continue my pursuit of technology in architecture.

With each successive experience, I am convinced that the more we open ourselves to technology, the closer we will get to freeing our minds and take architecture to the next plateau. It will take the commitment of both intern and experienced architect to make the future of architecture both exciting and fun. I encourage students, interns and architects to be open-minded, visionary and fearless of technology and architecture.

**Jeffrey R. Matsuki is a project manager at Okita • Kunimitsu • Entheos International, LLC (OKE). He has also worked for Kerry Hill Architects in Singapore.**

**New Products**

**Deltek Offers Front Office Software**

Deltek Systems, Inc. recently announced the development of a Web-enabled product application suite that focuses on the front office functions of project businesses.

The new software will help users identify opportunities, manage customer relationships, administer projects, improve project communication, recruit employees, and manage the cost and performance ratio of projects.
From Academy to Practice
by Joyce M. Noe, AIA

Students at the University of Hawaii School of Architecture who already are offered a strong technology emphasis will benefit even more with the establishment of a new degree program. The school's new Architecture Doctorate (Arch. D.) degree program was recently approved by the Board of Regents. The professional program is designed to focus on "integrating professional and international experience with an improved curriculum."

To achieve the Arch. D. goal of excellence in practice and international experience, the new curriculum will include more integrated student access to computer and information technology design processes. Advanced technology skills and knowledge relative to the design process are tools for informed decision making. Proficient skills in three-dimensional modeling and information technology make alternative solutions easier to document and assess.

Computer and information technology also provide a basis for efficient collaboration and conflict resolution because technology allows all members of a team to have access to project information. Use of the Internet, e-mail, and Websites will streamline student-practitioner dialogue; remote collaboration technology can enrich and expand the international exchange program; and all provide alternative venues for teaching and learning.

Expansion of the established focus on professional practice and Asia-Pacific exchange opportunities, inclusion of supervised internships, and utilization of technology will make the Arch. D. program one of a kind in the nation.

The human contact and interaction that are essential to the success of the new program will be enforced with student exposure to cutting-edge practice methods. The School of Architecture has traditionally enjoyed the benefits of strong support from the professional community as design jury critics and lecturers. Since 1994, several leading practitioners have participated as adjunct faculty in a unique professional practice program. They expose students to the realities of practice and conversely gain insights into student capabilities and needs. This exchange beginning early and continuing through the curriculum is designed to provide a seamless transition from academy to practice and result in improved intern performance.

Joyce M. Noe, AIA, is an associate professor of architecture at the University of Hawaii at Manoa.

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Computer Technology and the Spirit of Architecture

Technology in the one-man office

Professional Practice, Personal Service

by Wayson Chong, AIA

One-on-one service is the hallmark of the very small architectural firm. Without gatekeepers such as secretaries, accountants, technicians and other support staff, clients deal directly with the designer on a personal as well as professional level.

In my 28 years of practice, I have seen firsthand how technology has enabled me to establish advances in my practice to the point where I alone can perform the work of several individuals that would normally have to be hired. These advances have evolved from the original answering machine, pager, fax and cellular phone, to new computer communications and technology which have begun to supplant many of those early functions. By embracing these technologies instead of resisting them as some of my contemporary colleagues have done, I have been able to leverage the professional value of my firm.

I switched from hand drafting production and design work to a fully computerized one-man practice in 1989. The computer allows me to experiment with new applications including CAD, word processing, spreadsheets, multimedia, visualization, animation, virtual reality, online services and more. I actively market on the Internet with a Web page which has enabled me to obtain commissions from all parts of the world.

I'm also a beta tester for two mainland computer aided companies. One of them, Chief Architect by A.R.T., is an object-oriented program and the other is Summit3D, a virtual reality program. These programs have begun to change my architectural practice to that of a digital office nearing the so-called "paperless" office of the future. Clients have confirmed that responsiveness to their needs and the ability...
I have found that a good three-dimensional "walk through" without "bells and whistles" is usually sufficient for the residential market in which I specialize.

Although the telephone remains my primary means of communication, I also extensively use e-mail. Internet communications using chat lines, NetMeeting and video camera linkages show some promise but have not advanced far enough for the small office practice I have developed. Faxes and e-mail are fast becoming the mode of choice in the written word and/or graphic transmissions required in my office.

Photorealistic renderings can also be done, albeit with a lot more effort and cost for publication.

Wayson Chong, AIA, is an architect in private practice in Honolulu.

Interior and exterior drawings give clients a good idea of how the design will be executed.

As the computer industry rapidly develops, I anticipate that the architectural profession will be solidly entrenched in 3D object-oriented CAD programs now only just beginning to take shape. I look forward to this new millennium in CAD development and in other technological advances that allow my one-man office to thrive.

Wayson Chong, AIA, is an architect in private practice in Honolulu.
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Computer Technology and the Spirit of Architecture

Lighting controls for luxury residences

Simplicity Requires Sophistication

by Richard Moss, P.E.

Custom and luxury residences require high quality architectural design. Lighting design must enhance and complement the quality of the architecture. Lighting controls must be an integral part of the quality of the lighting design and easy for the owner to use.

Lighting control can be achieved with simple dimmer switches, or sophisticated systems requiring extensive planning to achieve that are also easy to use. Lighting control switches can set “scenes” for the various functions or moods that can be anticipated in a luxury residence.

Lighting control systems can include individual wallbox dimmers that can control incandescent, low voltage, and/or fluorescent lamps (with matching dimming ballasts), or on/off control of equipment; master dimmer switches interconnecting and controlling several individual dimmers; or remote dimmers controlling other individual and/or master dimmers.

Types of systems include “local” systems with pre-set pushbuttons that create scenes or moods as desired which can be controlled from any number of remote locations; “distributed” systems integrating the local systems plus individual dimmers; “radio” (wireless) systems that don’t require interconnecting wiring; and “central” microprocessor controlled systems that integrate control of lighting, audio/visual and equipment (fans, draperies, etc.), which are completely software controlled and offer the ultimate in flexibility.

Central Dimming

Central dimming control systems can have many capabilities.

Switches are only 2" x 4" (or narrower) with up to eight or nine pushbuttons in each station. Programmable pushbuttons can control just about everything, from anywhere, with just one button including draperies, equipment, or anything that can be turned on or off.

The buttons can be labeled for their specific function (e.g. “Downlights,” “Wallwash,” “Chandelier,” “Draperies”).

One (or more) button(s) can turn off all lighting or set the house into a random vacation mode that emulates your last

Lighting plays a big part in enhancing interior design.

Photo courtesy of Lutron
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week of occupancy. The handheld controls can be operated remotely and exterior lighting can be automatically controlled with adjustments for seasonal variations.

There are also more exotic qualities to lighting system design.
- Remote interface allows the homeowner to call in and turn on the water heater and pumps so that the hot tub is ready when he arrives.
- The system can be integrated with security systems to turn on all or designated lighting during an alarm.
- It can integrate with audio/visual systems so that control station buttons match.
- The system can be modified or changed if the clients' wishes evolve or change.
- It may offer remote telephone access for diagnostics and modification.
- Graphical interface and controls can be implemented for gadget-happy clients who have lots of free time.
- The system can control just about anything that runs on electricity.

Design of lighting control systems can require merely reading manufacturers' literature and specifying the appropriate devices, to consultation with a manufacturer's representative for more detail controls, or the services of an experienced engineer to prepare detail control diagrams and schedules when a sophisticated central system is appropriate.

The above systems can require slight or significant additional design time to make them easy for the owner and can add $1,000 to more than $50,000 to the cost of a custom residence.

We recommend that the specifications for a central system require the contractor to be factory trained and certified prior to beginning construction. We also recommend that after the owner has three months' experience with the system, the contractor's lighting control technician return to the project to complete final adjustments, in the presence of the owner, to ensure that the system is working (it is impossible to predict with 100 percent accuracy what the client will ultimately desire).

A sophisticated system is only as good as the quality of installation. Make sure the contractor is qualified. "Low bid" will not necessarily result in the lowest cost to the designer.

Richard Moss P.E., is president of MOSS Engineering, Inc., an electrical/lighting engineering consulting engineering firm. Projects have included 20/20, First Hawaiian Center, One Archer Lane and KITV 4 Television Station.

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Lightweight forming systems

**Concrete Housing Made Affordable**

Hawaii design and construction professionals are taking another look at using concrete in residential construction following a recent seminar sponsored by the Building Industry Association and the Cement and Concrete Products Industry of Hawaii.

The seminar focused on lightweight handset forming systems, along with specific design, scheduling and production suggestions which reduce the labor and equipment requirements of constructing single-family concrete homes. Diverse attendees including residential builders, developers and design professionals were provided a technical presentation and demonstration and participated in a discussion on the system.

Presentations were given by George Stewart, CCPI Concrete Housing Committee member; Jim Adams, principal of JAI Structural Engineers; Pete Cooper, Construction Management & Development; Owen Chock, architect; and Tony Gregory, president of Ikaika Masonry.

**Saving Costs**

Utilizing lightweight forming systems, the cost of erecting the concrete perimeter walls of a typical single-family residence can be reduced by 25 to 30 percent, according to seminar participants. The lightweight forming systems are suited to the requirements of residential

Continued on page 27
Environmental aspects of building restoration

Old Buildings Bring New Challenges
by Greg Mescan

The renovation of older buildings creates many challenges. These challenges not only involve the resolution of engineering and architectural issues but also must address environmental issues.

Older buildings most likely will contain certain coatings, insulations, fixtures and other materials which may pose a health hazard to the public and personnel involved in renovation activities. Because of this, there exists a need for a survey to determine their composition, location and quantity. Additionally, because of the presence of these materials there is a variety of required worker protection safeguards which must be in place in order for work to proceed.

Older buildings typically may contain lead-based paints; asbestos-containing floor tiles, insulation and roofing; and Polychlorinated biphenyls (PCBs) to name a few.

**Asbestos can be found in a variety of older materials including siding, floor tile, joint compounds, adhesives, insulation, roofing felts, wallboard, cement pipe and acoustical plaster.**

**Lead-Based Paint**

Lead-based paints will most commonly be found in pre-1978 buildings. To determine if lead-based paint is present, a survey will have to be conducted by a certified inspector or certified risk assessor. The inspector will conduct a surface-by-surface investigation which will involve the collection of paint chip samples and/or the utilization of an X-ray fluorescence (XRF) device. In addition to a survey, a risk assessment should be conducted to provide the renovator with information as to what hazard the presence of lead-based paint poses in the building, as well as providing the renovator with the means to accurately determine how to abate the paint.

Lead-based paint abatement options include removal of the paint, replacement of lead-based paint components with non-lead-based paint components, encapsulation of paint areas and enclosure of the areas containing lead-based paints.

In addition to a survey, a risk assessment consideration must be given on how to properly dispose of lead-based paint materials. The disposal options will be based upon whether the material qualifies for disposal at a permitted non-hazardous sanitary landfill or if it must be disposed of in a hazardous waste permitted disposal facility. Disposal options are based on whether the waste after testing is characterized as either non-hazardous or hazardous.

**Asbestos Removal**

Estimates indicate that more than half of the large multi-story buildings constructed during the 1950-1970 time period contain some form of sprayed asbestos-containing materials. Asbestos can be found in a variety of older materials including siding, floor tile, joint compounds, adhesives, insulation, roofing felts, wallboard, cement pipe and acoustical plaster. Older buildings will commonly have asbestos-containing materials throughout the structure.
Again, a survey and risk assessment should be conducted in a similar fashion as in lead to determine presence, amount, location and type. Actual determination of asbestos presence will have to be made by laboratory instrumental analysis.

Asbestos abatement must be done by qualified, trained workers guided by a supervisor knowledgeable in proper worker safeguards, removal techniques and disposal requirements.

PCBs

Polychlorinated biphenyls were commonly utilized in electrical transformer-cooling oils and light ballasts because of their enhanced flame retardance and insulating properties. Their use was banned in 1979 by law. Even today, there are many electrical components with PCBs remaining in older buildings.

Concrete Housing Made Affordable

Continued from page 25

Construction and the reusable forming panels are designed to set up and disassemble quickly. The systems require less labor than traditional systems and eliminate the need for heavy onsite lifting equipment.

In a specific example, the load bearing perimeter wall system of a 1200-square foot unit was completed by a four-man crew in four days, including form set up, placement of window and door openings, electrical conduit and structural reinforcing material, concrete placement and form breakdown. Seminar participants concluded that this value-packed concrete perimeter wall system would be within five to 10 percent of the cost of traditional wood or light gauge steel framing systems on a typical home. For more information, call the Cement and Concrete Products Industry at 833-1882.

Disposal of these PCB-containing components must be done in a fashion to ensure full compliance with the law. Disposal typically will be at a permitted hazardous waste disposal facility.

There are numerous state and federal environmental regulations which address each specific area of environmental concern and provide the guidance necessary to ensure compliance with the applicable laws. To ensure compliance itself would almost be a full-time occupation for several people. There is relief out there to aid building renovators in ensuring they remain compliant within the maze of regulations. This relief comes in the form of a professional full-time environmental consulting firm which specializes in compliance and regulatory issues and remediation.

Greg Mescan is project superintendent for The Nakoa Companies, an environmental consulting firm based in Honolulu specializing in asbestos, lead, UST removal, AST installation and demolition.

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April/May, 1999 Hawaii Pacific Architecture 27
The Toyama Building, originally the 1908 Masonic Temple/Bishop Trust Building, is one of Hilo's most substantial historic structures. The Toyama Hawaii Corporation purchased the 28,000 square foot, three-story building in 1992 and retained Mason Architects to design modern, high-quality retail/office spaces. Historic building elements such as the canopy, storefronts and original paint colors were restored in accordance with Department of Interior standards.

Significant existing interior materials and finishes were saved, particularly in the Temple Room and public areas. Modern lighting, electrical data, telephone systems, air conditioning and fire sprinklers were carefully incorporated in the building. The structure was upgraded to meet current seismic requirements and made handicapped accessible. Floor area was added to make the rehabilitation project economically viable for the owner. The new work was designed in a style compatible with the design of the original building.

**Jury's Comments:**

"The renovation displayed a lot of expertise in historic preservation."

The restored storefronts, marquee and ornamental wrought iron brackets are compatible to the building style.

**Credits**

Client: Toyama Hawaii Corporation

Architect: Mason Architects, Inc.

Contractor: J.E. Merk Construction

Consultants:
Structural: Afaq Sawar
Electrical: Wallace T. Oki
Mechanical: Prepose Engineering Systems

Photos by David Franzen
Hallmark Kitchen & Bath
This Modula kitchen illustrates perfectly how the four functional areas of a well-designed kitchen can be integrated for maximum efficiency. Modula's flexibility opens up new perspectives for creative design: a mix of contrasting materials such as light birch cabinets, stainless steel and basalt grey laminate.

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MARMOL provides fabrication and installation of products in addition to supply. An example is the "Puako" house by Adams Design. The master bath, counter tops, tub deck and floors for this Kona project, designed by Jack Adams, were made using a combination of marbles from Greece and Turkey.

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