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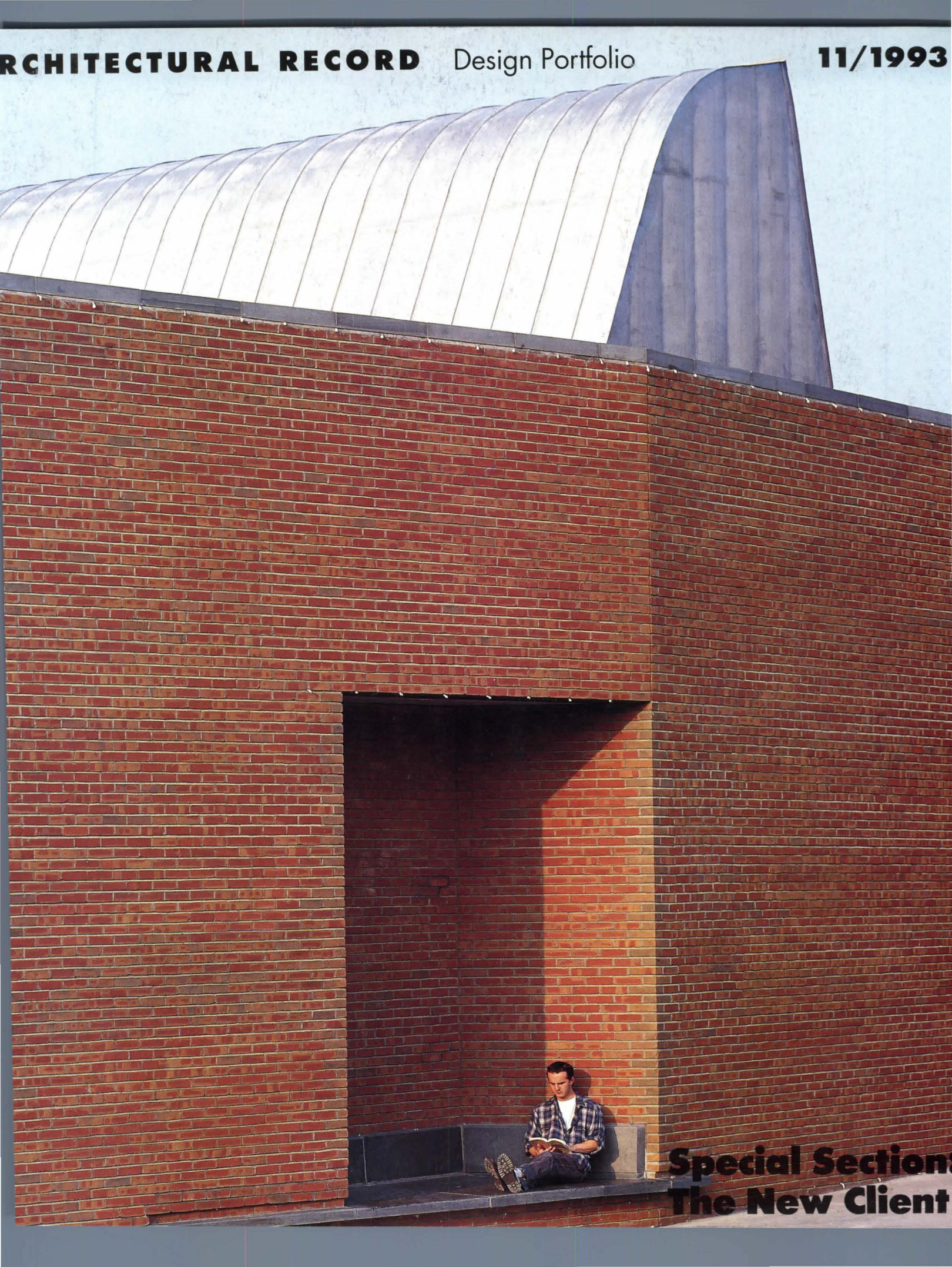

Special Section:
The New Client

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Juha Leiviskä's Männistö Church and Parish Center in Kuopio, Finland, is fully within the tradition of Finnish Modernism, integrating concern for nature and the man-made environment, use of daylight, and simple materials. Page 86.

Next month:

1994 Product Reports
RECORD's annual reports on new building products and product literature. Contains over 600 entries (many of which are available in electronic as well as printed form). Manufacturers' information is arranged within the 16-division CSI/Sweet's format.
Winners of RECORD's 1993 Product Literature Citations.
Also in December:
Recycled products: A technical survey.

Cover:
The New College, University of Virginia, Charlottesville, Virginia
Tod Williams Billie Tsien & Associates, Architect
VMDO Architects, Associate Architect
©Michael Moran photo

SUPPLEMENT ON LIGHTING IS INCLUDED WITH THIS ISSUE
(with U. S. and Canadian copies only)

Letters

Design-Build: The Bottom Line

The construction industry as a whole is changing at a profound pace. The concept of design-build has changed the equation to a point where architects are unable to comprehend the change. General contractors, developers, and project managers in the public and private sectors are almost prostituting the architects. GC's, who in the past relied on bidding jobs, are now in the forefront of selling the concept of bringing projects within cost and time parameters. Contractors are openly claiming that architect-designed projects are over budget.

Besides the onslaught from outside, there is an onslaught from within the profession. Recently a fellow professional remarked, "You architects are your worst enemies." I am a principal in a small firm. We have been in the business for the last eight years. For the last two years we have experienced extreme difficulties with professionals (architects and engineers) who are operating their businesses on a fly-by-night basis. They don't have insurance or an occupational license from the city, yet they're practicing architecture and engineering and signing and sealing architectural drawings. They can provide A/E services for fees as small as 1 percent since they have a minimum overhead. Meanwhile, small firms have to pay rent, staff salaries, insurance, licenses, etc. plus minimum wages to ourselves.

Now we are facing another challenge. Architects who have a regular position with big firms are taking away large projects ($1 million or more), again cutting fees so smaller firms can't compete. GC's take advantage of this situation, and are reluctant to pay an architect even a minimum fee.

Who is the real spokesperson of the architectural profession? Does AIA and its chapters do enough to adjust to the winds of change or is it facing the change by burying its head in the sand? If today's architectural profession is to survive, it has to look beyond the glossy pictures produced by the big-name architects and start looking out for the interests of architects working in the trenches with no glory or rewards.

Radhe S. Mittal, AIA
Jacksonville, Florida

Liberating Device

I would like to congratulate Peter Slatin on his article "Beyond Wheelchairs" [RECORD, August 1993, page 38]. It presented a balanced assessment of ADA.

My only suggestion to the author and others involves the reference to "wheelchair-bound users." Our language can present as much of a barrier to our view of disabled persons as some of our buildings. Why not simply say "wheelchair users" or "persons in wheelchairs"?

John Lee, Architect
Assistant Director, Division of Planning & Design
Kentucky Department of Parks
Frankfort, Kentucky

Correction

Am I nuts, or is the detail drawing of the stair printed upside down [RECORD, September, 1993, page 94]? It certainly makes more sense when the page is inverted, but then the photos get all screwy.

Graham C. Hunter, II
Perkinsville, Vermont

Touché!—Ed.

Calendar

November 12-13
"Building With Value '93" focuses on resource-efficient and "green" construction; Seattle. Call 206/842-8995.

November 17
BSA Unbuilt Architecture awards announcement and exhibit at Build Boston. Call 617/951-1433, ext. 221.

November 16-February 12
"Paul Rudolph: Explorations in Modern Architecture, 1976-1993" exhibition, National Institute for Architectural Education, New York City. Call 212/924-7000.

November 28-December 3
Interbuild '93, Birmingham, England. Call 301/656-2942.

To January 2
"Expressionist Utopias: Paradise, Metropolis, Architectural Fantasy" exhibit, Los Angeles Museum of Art, includes a Coop-Himmelblau installation. Call 213/857-6522.

To January 8
"Thomas Jefferson and the Design of Monticello" exhibit, The Gallery, New York City. Call 212/554-4352.

Competitions

- Learn Television is awarding $1,500 for the best "virtual building" that will be the graphic centerpiece of an interactive magazine. Deadline: December 10. Call 312/275-5444.
- Corporation for Olympic Development and the Architecture Society of Atlanta offer three cash prizes ($2,600, $1,200, $850) in a competition to create public spaces to coincide with the Summer 1996 Olympics. Winners will be invited to negotiate with CODA for design commissions. Entry deadline: December 3; submissions deadline, March 1, 1994. Call 404/723-7210.
- Sub-Zero will award $10,000 to the best kitchen design that uses any of its seven full-size units. Deadline: December 31. Call 414/227-3500.

ARCHITECTURAL RECORD

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The Client Comes of Age

This month's special feature, titled The New Client (page 25), takes up one of the great events in the modern architect's business life — the coming of age of the client as a full-fledged, tightly organized, hard-nosed partner in the architect-client relationship. The special feature, reflecting uncensored responses from dozens of clients and architects contacted by a team of editors and contributors, not only uncovers the facts but also gives practical counsel on ways to turn to advantage what most architects still see as an uncomfortable hurdle.

In the past, some clients with active, ongoing building programs did indeed establish their own facilities departments. Today, even owners doing few or more modest projects interact strongly with the architect, from selection to occupancy. That's due in part to the recession, now mercifully fading, with owners in a strong buyer's market able (and often eager) to make architects, with depleted backlogs and high overheads, jump through hoops before making their choice.

Much more to the point, and certain to outlast the recession, is the downsized client. This client has discovered that with the help of state-of-the-art manufacturing technology, smart facilities inventory procedures, the ability of some employees such as salespeople to get by with sharing a two-shift office or even to function without one, and the ability of electronics literally to do the work of several individuals, many types of clients can prosper with fewer facilities.

In other words, more and more clients are discovering that facilities are an important part of their bottom line. H. Bruce Russell, head of Kodak's real estate department, was quoted recently in a *New York Times* article as having pushed through a plan based on finding out not *how much* space each employee used but *how* the space was used. He ended up reducing Kodak's space occupancy costs by 25 percent (meantime his own department rose from two employees to 200.)

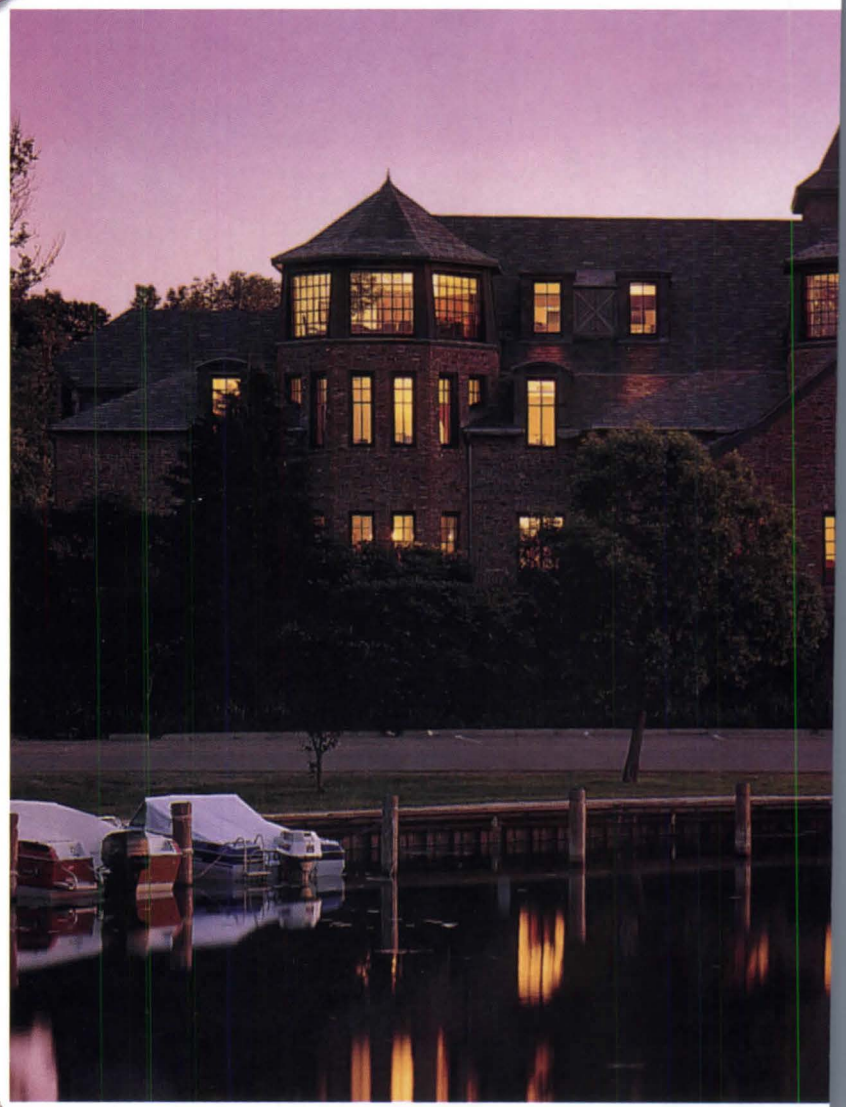
As the climate toughens, certain principles have emerged to guide the architect in dealing with clients — past, present and future:

Remember that making money for the client (or alternatively, reducing expenses) is a prime goal. For prosperous architects — from Emery Roth to Robert Stern to Michael Graves, from Morris Lapidus to HOK — the road to financial success has always been the ability to meld their client's business or institutional success into the design equation. According to a recent AIA-sponsored Roper Organization poll, clients said that when selecting architects for projects, they were looking for professionals who "listen and respond well to their needs and goals and who are able to manage the complex maze of regulations, political approvals, and zoning requirements." These criteria ranked top among the 15 tested.

Learn to speak the client's language. Most of the time this means simply sticking with plain English. At other times, understanding the technical language of health planning, education, or real estate is important. But at all costs eschew obfuscation.

Clients too have a duty when dealing with architects. It is neither fair nor sensible when selecting architects to request so much in advance by way of travel, presentations, and services that the winner's fee is scarcely enough to pay for the marketing. The selection process has seen some serious abuse, and it's neither necessary nor wise.
Stephen A. Kliment

THIS BANK SELECTED US BECAUSE WE PAID HIGHE



It looks less like a bank and more like an English country manor. But the charm of the Investors Savings Bank belies the challenges its design and construction presented. Particularly to Marvin Windows and Doors.

For one thing, fast-track construction scheduling was necessary due to constantly evolving design constraints. For another, it wasn't until thermal efficiency, condensation resistance and aesthetics were factored in that wood was chosen over aluminum. Consequently, Marvin wasn't selected for the job until construction was underway, making manufacturing and delivery deadlines extremely tight.

But Marvin's biggest challenge proved to be the building's three massive window and door assemblies, the largest of which measures 28 feet wide by 30 feet high. Using a combination of sturdy Magnum Double-Hungs and French Doors, Marvin not only built them on schedule, but also engineered them prior to delivery to guarantee they would withstand the strong, prevailing winds off the lake. And, like all 177 of the bank's other made-to-fit windows and doors, they were built with features designed specifically for the project. Features such as authentic divided lites, interior windows and doors glazed to match those on the exterior and a durable, factory applied finish in two complementary colors; Midnight Teal for the sash

The Client as Tough Customer

Caught unprepared, many architects have trouble dealing with clients who have stepped up the complexity of hiring, who interfere more during the course of the project, and who engage construction and other consultants often criticized for placing cost and schedule above design values. The phenomenon is reinforced by the recession and by corporate downsizing made possible by more efficient production and causing changing needs for facilities. The recession is fading; but the client's new way of doing business is, on the contrary, on the rise and will intensify well into the next century.

This month's special RECORD section, The New Client, tackles the topic from six angles.

• **Selecting the architect.** Nancy Levinson talked to dozens of architects and uncovered a wide range of procedures, many exploitative of the architect, some supportive.

• **Fees and agreements.** There are dozens of ways to sign an agreement and negotiate fees. Lynn Nesmith uncovers some ingenious approaches architects have worked out with their clients against the tough new backdrop of practicing architecture.

• **Managing the project.** The new climate is marked by deeper client intervention during the design and construction phases of the project. Ways in which architects can turn this to advantage are shown in Judith Davidsen's article.

• **Design-build.** Charles Hoyt describes a rising trend and shows how architects are dealing with its benefits and limitations.

• **Staffing the department.** A who's who by Joseph Wilkinson of architects working on corporate and governmental facilities staffs.

• **Profiles**. Jim Russell describes two emerging types of client organization. *S. A. K.*

ing very closely at capabilities.

"Looking closely at capabilities" is, of course, the essence of the matter. For architects, however, it can translate into selection gauntlets likely to include:

• *Shortlists that belie the name.* While a fi-

Cathy Simon, Simon Martin-Vegue Winkelstein Moris, Architect

developer's fee. His legislation would allow those buildings now funded or under construction to proceed, but prohibit any additional money to build or to lease federal buildings in the next two fiscal years.

The Clinton report also calls for breaking GSA's monopoly on building and leasing office space, so federal agencies could contract for real-estate services independently. "These proposals would hurt an already weak con-

percent from five years ago. "As a rule, architects working on the other side of the table understand the problems," says Robert Ludden. "The architect/client is also better able to communicate the problem to his colleagues."

Another potential advantage of a more sophisticated client is that the architect can negotiate a more sophisticated fee. "We have one enlightened client, who is actively

core values of the firm as do savvy business or accounting procedures. Principals may want to ask: What services does our firm provide? Which are required for a specific project and how do we precisely document them? How do we provide these services? And, most importantly, how can we create a value for which we will be fairly paid?

Having answered these questions, a firm is better positioned to determine the best ap-

THE NEW CLIENT Selecting the Architect

Marathon of Frustration

Getting the job has become an exercise in frustration for many architects as they try to land private and public projects.

THE NEW CLIENT Fees and Agreements

Wary—But Not as Scared

Recession prompts fee-cutting, but enlightened clients accept fee-setting alternatives.

By Lynn Nesmith

The current downward spiral of architectural fees, compounded by increased competition and the pressures of a flat marketplace, is getting scary. "Architects are desperate," says San Francisco architect John Field. "Survival through cut fees reduces a profession to a cutthroat business."

Architects in small and large practices around the country are calling for a fairer fee structure, lamenting that as a group

dollar figure per square foot. That was the basis for the Federal Judiciary Building in Washington, D. C., a design-build competition project developed by Boston Properties for the federal government."

"Most of our clients ask for fixed fees, with reimbursables," says Robert Ludden, of Hansen Lind Meyer Associates of Orlando, Fla. "Clients are much more receptive to paying the reimbursables as they go, because they perceive this approach as a way

pushes hard for client education at the onset of a project to make sure that everyone understands what is going to be done, what the scope is, and what the fee really represents," says Robert Ludden. "Our first preference is our HLM contract; next is the standard AIA contract; and third is the client's custom contract." That said, Ludden finds that more clients write their own agreements.

Also citing more owner-developed contracts, Chicago architect Daniel Wheeler says his

THE NEW CLIENT Managing the Project

Leaner and Meaner

Clients for the most part have reduced their facilities staffs but expanded their authority, which they have been increasingly willing to use.

By Judith Davidsen

Over the past decade, some old clients have taken on a leaner, meaner mood; many are novices who have never built anything; others are veterans building in new ways that require them to unlearn and relearn as the process develops.

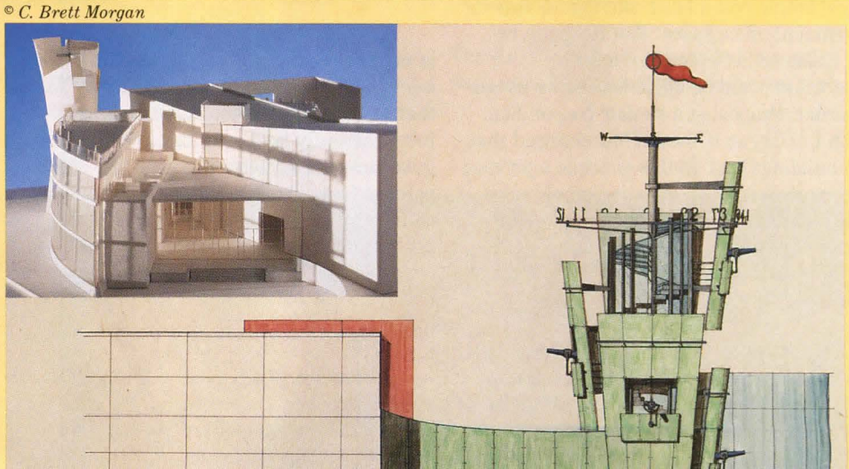
Typically, meetings with clients have become frequent and long—with fewer participants but more decision-making authority present in the conference room. CAD has gained in presentations, along with budgeting and scheduling software. Designers increasingly push for early decisions; some have begun to reassess favorably the roles of construction- and project-managers, and some are doing more tracking to make sure their invoices are paid within an acceptable number of days.

For the interpretive museums that comprise about half of the work at Lee H. Skolnick Architecture + Design Partnership, a heavy schedule of meetings and consultations from conceptual development through design has been a way of life for at least the past five years. Skolnick says some clients' learning curve is still so steep that boards of private museums keep coming back with reports that "I just saw this, I just heard that, somebody told me to watch out for the other," and there are still contractor-members who claim museums can be built for the same price as pre-fab metal warehouses. Government museums, he adds, now come with "many more sets of design standards from many more authorities, some conflicting. The strictest win." Skolnick notes an increase in phased government bidding, where, he says, "The architect doesn't get a chance to follow through." The firm still relies on manually generated drawings and models.

The Voinovich Group began in the 1980s to carve a niche in the court-ordered upgrading of county jails for clients who had not built in 100 years, and has always taken the initiative for scope and budget updates by means of regular client contacts. Electoral politics can throw the firm a curve. Edwin Williams, vice president, Voinovich Companies, recalls a jail that was ready for construction documents when a new commissioner was elected on a NIMBY platform that moved the project 45 miles away to another county with another architect; Voinovich wound up renovating the old jail at less than 15 percent of the original cost. "They had to pay us through design development and then to start programming all over again," he reports.

Saving questions for meetings

To handle the multitude of unknowns in the emerging field of "green" design, William McDonough schedules regular biweekly meetings or teleconferences, weekly during intense early and late phases. "It allows people to store questions," he claims, "and avoids frantic phone calls and the miscellania that float in and out." A typical meeting includes four people from his office, and an interior planner, construction manager, project manager, financial analyst and, most important, a chairman or CEO from the owner side. "Our instructions come from



Brookline Street Housing
Cambridge, Massachusetts
Client: Homeowners Rehab, Inc.
Design: Goody, Clancy & Associates

Public and private funding-source responses to the economy have buffeted these low/moderate/market-rate units at every stage. The community development corporation client sublet a parcel from a developer who, from schematics on, tried to triple density on a project where the city required private outdoor spaces and entrances. Then the state wanted air conditioning for the cross-ventilated design and finish changes to *guarantee* rentability of the market-rate units. Well into the project, owner financing

Some Highlights

• Construction Managers. *Well-versed CMs, brought into the process early, can help keep a project on time and on budget, but many CMs still exert a disruptive influence.*

• Dealing Directly. *Meetings are longer and more frequent but smaller, now that client downsizing has eliminated layers of hierarchy to let architects interact with decision-makers.*

the top," he explains. "Clients are asked to examine the whole process because of all the new wrinkles. They have to be comfortable and precisely informed, because it's their decision."

Attendance at Studio E meetings has decreased as client and consultant downsizing over the past two years eliminated middle-management posts, leaving the architects to deal directly with owners and executive directors. "We used to meet with the people who answered to them," principal Brad Burke reports. "It was pretty much hit-or-miss because the reps didn't have authority. Now, direction gets hammered out in schematic design, and at that point we're pretty well assured of approval. It's going to be interesting when everybody gets busy again and we find ourselves dealing with people who have to track answers back through three or four other people." On the other hand, many large clients delegate to their professional design staffs key decisions that once were made by top management, according to Hershel Post, vice president, retail design and development at Chemical Bank.

Knowing more and knowing it sooner

Alice Carey, president of Carey & Co., agrees that client downsizing, while causing temporary disruption, makes for quicker decisions. She feels tight budgets cause more client decision-making in schematics: "They understand they have to know early where the money is going or they are going to have to backtrack."

She sees more detailed programs, more in writing, "more making sure people sign off on them," and uses more CAD now that scanning can use existing drawings and photogrammetry can create elevations from a two-point photo.

Teamwork breaks down

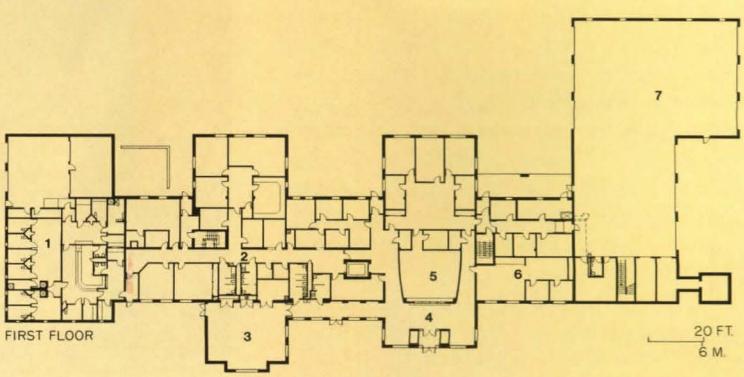
While most architects claim they keep the other disciplines and consultants under their control, Carey perceives a breakdown in teamwork as private clients increasingly hire special disciplines in-house or as consultants. After the 1989 San Francisco earthquake, when owners began hiring structural engineers to head design teams, she says, "The other specialists would be brought in after the structure was set and had to work around it." She considers split projects, where an engineer does the structural scheme and then hands off to the architect, "backward. Instead of coming on as a team, we give the client information in bits and pieces." Public clients, she reports, still prefer architect-led teams, "so they can point one finger at one person."

Presentation formats have become more sophisticated at Goody, Clancy, where two-and three-dimensional CAD is used beginning with schematics, but the greatest change has been in the affordable-housing end of the practice since Reaganomics took the federal government out of the housing business. Now, with funding dependent on a combination of state and local programs, private syndicates, linkage money from market-rate projects, and tax credits, decision-making is protracted from schematics onward—on the same project, marketing

Creative Discovery Museum, Chattanooga, Tennessee
Design: Lee H. Skolnick Architecture + Design Partnership

"The most dramatic change," says Lee Skolnick, "is that we hardly do anything that isn't translated into value engineering by a construction manager." Because private interpretive museums raise money as they go along, Skolnick encourages the inclusion of a construction manager right after schematics to "price stuff out on an ongoing basis and update the budget. They can give better support here than the architect can. Big guys like Turner (on the Discovery Museum) and Morse Diesel are increasingly willing to shepherd projects through these stages for a small fee and a shot at the construction," says Lee Skolnick, "but we can still bid it out." While all other disciplines and consultants "are in service to our design," Skolnick says a construction manager in this role should be contracted to the client, since their responsibility is not to the architect but to the budget.

1. *Jail*
2. *Police department*
3. *Community room*
4. *Lobby*
5. *Clerk*
6. *Fire department*
7. *Apparatus room*



Even the most efficient management can't stop a volatile economy and politically ambitious clients from blind-siding a project at the most inopportune moment.

qualms can cause one funding source to require sudden upgrades of systems and finishes, while another source may dry up, slashing the project scope (see case study). By contrast, the firm's college and university clients, says Clancy, "have pretty consistent] design standards, more realistic and carefully spelled out."

At Studio E, affordable housing clients can be either governments or non-profits, but the latter have to wheedle increments of financing out of government agencies based on progressively more detailed drawings. "We'll have a frantic three weeks, and then we'll sit for a month until someone takes the drawings to an agency and gets money for the next stage," says Brad Burke.

Carey reports that clients have become more knowledgeable and attentive to detailing, products, and specifications out of a concern for costs and maintenance, but the occasional problem occurs when they become "inflexible about what a friend told them." Skolnick (see case study), McDonough and Burke encourage the trend of clients' bringing in construction managers or general contractors at least by the construction document phase to, as Burke puts it, "sit down and act as cost estimators and get involved in methods of construction so the details are most up to date in method and technology." He calls them a second set of eyes, and claims that when the drawings are ready to go they are snag-free. John Clancy reports that housing consultants who package creative housing financing are increasingly adept at such issues as maintenance, but adds ruefully, "They push architects as much as contractors for cut-rate service."

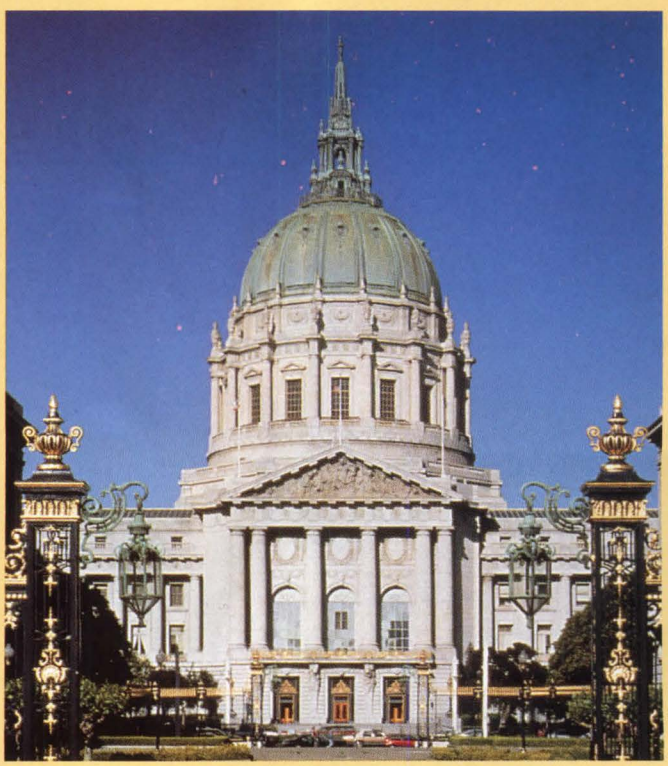
Carey's public jobs go to bid, but although insurance companies increasingly advise her against recommending contractors for private jobs, she feels she owes it to the client. "This is a real specialty," she says. "It's important to have a good Rolodex for your client." Goody, Clancy still recommend general contractors for bid invitations, but finds more projects going the guaranteed-maximum route, with clients trying to lock in recession-driven low contractor costs so early that two rounds of pricing result: once at 80-percent completion of construction documents for guaranteed-maximum contracts, and again when the documents are complete.

On interpretive museums, Skolnick says funding sources and board composition have an impact on how jobs are let out. Funds from government agencies may require preferential treatment for minorities and women, he says, and he recalls one board member with political aspirations who sought to garner local support by going to open bid on a project already finely honed by a contractor through all its stages. "You face redesign if it's bid out," Skolnick says, "and a renegotiation of compensation to redo the drawings."

Clancy finds that the increase in guaranteed-maximum price over lump-sum contracts "complicates life during construction, because it needs more auditing of costs and changes, and who initiated them." Goody, Clancy has been asking for increased fees

City Hall, San Francisco, California
Owner: City of San Francisco
Preservation Architect: Carey & Co.

The approvals process is becoming a larger part of Carey & Co. contracts—code analysis, building and planning approvals, landmarks approvals, state and local heritage groups, groups concerned with disabled access, memoranda of agreement for federal funding. "It used to be that the owner did a lot of it" she reports, "but it's become very sophisticated, and it's difficult if you haven't gone through it many times." Some teams, she reports, even have public review consultants. Although she normally feels third-party construction managers have a divisive influence on project teams, Carey admits she values the third party on San Francisco's complicated City Hall project: "The construction manager works out the complicated public review and traffic schedule to keep the project moving forward by collecting information from many, many people and getting it back to all of us in a form we can all understand and appreciate."



for the construction phases, but "not very successfully." For Carey, the problem of staying in the loop during contract administration has increased dramatically. "When construction starts,"' she says, "construction managers tend to answer questions that should be answered by the architect, sometimes without looking back at the drawings." Skolnick finds being left out of the contractor/client loop a constant frustration, but feels clients are catching on that they "lose what they originally bought if they don't have us as part of it." Williams has noted a greater tendency by third-party project or construction managers to bring more issues to the architect's attention.

Clamping down on extra services

Burke thinks payments are as timely as ever because Studio E is structured so that principal architects have direct relationships with high-ranking clients. "It's not like our bookkeeper is talking to their bookkeeper," he says. Clancy, on the other hand, points out that between the economy and increased competition among architects, clients "are clamping down on extra services, and on paying for extra services when they're due. There's more claiming of errors and omissions that architects are expected to pay for." The firm has more bills outstanding for a much longer period of time on government planning and urban development jobs.

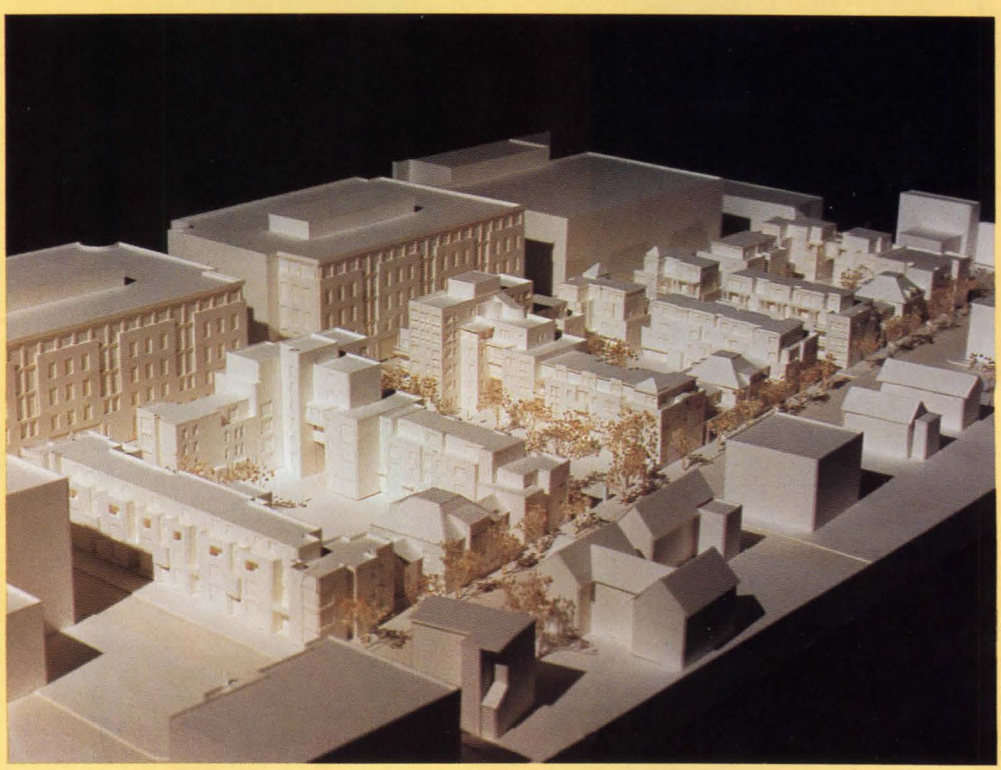
Carey says bills that used to be paid in 30 to 60 days now take 60 to 90 days. Recently denied an increased line of credit when the bank felt her invoices were too old to be considered income, she made her project managers responsible for tracking bills, which on government projects can go through six or seven hands before final approval. "Once they learn you're going to be calling, they clear it off their desks quicker," she says. Skolnick's private clients tend to pay quickly, but as government payment schedules become more protracted, he's also taken up tracking. Adding insult to injury, at least one government client, he reports, requires the architect to sign away the right to penalties for late payment.

Skolnick plans to try negotiating his liability premiums into his contracts, noting "contractors get a line item for bonds." As more clients request liability, Voinovich also is seeking compensation as part of the contract. Studio E clients accept the fact that the firm does not carry liability: "It limits the number of architects they can talk to," Burke says.

Alice Carey recalls talking the federal Department of Energy out of $5 million in coverage on the grounds it would cost more than the fee. Reactions to the idea that architects, like contractors, could negotiate overhead or benefits into a contract range from a lofty "We don't burden clients with our problems," to a hardened "My clients don't cry over my cost of doing business." ■

Safety Building, Stow, Ohio
Owner: City of Stow
Design: Myers Associates Architects
Project Manager: Voinovich Cos.

Voinovich vice president Edwin Williams says outside project managers brought in by clients "feel they are not seen as doing their jobs unless they are challenging us and putting us in the light that we don't know what the hell we are doing. It's a different relationship if they come out of architectural firms; then there's a mutual respect even when they are trying to one-up us." With a long background in correctional design, Voinovich found itself project manager for the Stow Safety Building; the firm prepared the requests for proposals and participated in the selection of Myers Associates Architects to design the combination fire department, police department and five-day jail, and the Environmental Design Group as civil engineer and landscape architect. "A jail is expensive, and they know we have design experience that can help them," says Williams.



Gabriel O. Gualteros

Package Deal

Everyone is talking about design-build. It has many permutations. It currently accounts for a small percentage of what is built. And it bears close watching.

"I've become a vocal proponent," says Easley Hamner, president of The Stubbins Associates, which put together its own team for design-build. Counters another architect, who has worked as a consultant to design-build developers: "It's a pernicious trend hitting architects left, right, and center." Together, these two architects sum up a whole range of involvment.

Knowing it when you see it

Simply put, design-build consolidates responsibility for a completed building's delivery to a client into a single contract. The concept is not new. "It started with recorded history," reminds Howard Paul, who trained as an architect, employs architects, and, as a builder/developer, has had a big hand in shaping downtown Topeka, Kansas. "It's gone on in many societies ever since."

"The most common arrangement is for the architect to be a consultant to a builder-developer, who becomes the client," says Dale Ellickson, the AIA's senior director of documents. The builder-developer is, of course, a intermediary, who has signed up to deliver a building to an end user—who once was the architect's client. Now, says Ellickson, he gets calls from harried architects in telephone booths asking what to do when the developer has ordered actions against the architect's best judgment on, for instance, code compliance. His advice: "The consultancy role [if properly structured] allows architects to walk away."

Many architects may not be that lucky. They have more binding contracts or have taken a financial interest in a project in return for their services. "The permutations of contracts are endless," says Herbert McLaughlin of Kaplan/McLaughlin/Diaz, who can identify at least 25 varieties, and *has experienced* most of them.

Why clients (and some architects) like it

- "Clients think design-build simplifies the procurement process and project reporting," says Bradford Perkins of Perkins Eastman Partners.
- "Clients think they get the project quicker and cheaper," says Ellickson.
- "Design-build is a logical outgrowth of construction management," says Hamner.
- "It's the only way to go if you're an architect," says Paul, who sees architects taking all the liability for a project and, without becoming design-builders, a small percent of the rewards.
- Government clients' "nontraditional procurement methods arise from officials' frustrations with the complexities and inefficiencies of their own traditional procurement methods," says a report from an AIA large-firm roundtable.

"We'll use design-build when and if it makes sense," responds Edward Feiner, an architect and GSA's director of facility-standards and technical division.

The AIA has had a standard design-build contract document since 1985. Its position paper on government procurement is being rewritten to delete a stated preference for traditional delivery.

Will it last?

"By the year 2000, most buildings built in the U. S. will be built by design-build," predicts a member of the Design-Build Institute of America, an organization recently formed to promote its delivery system in federal and state governments. "That's one opinion," says an architect, who notes that construction-industry organizations come and go. According to Feiner, the GSA does not have enough experience after only four year's involvment to know whether design-build works better. "The jury's still out."

Indeed, a lot could ride on the construction process that governments at every level decide to use. GSA director James Stewart has announced his agency's biggest-ever construction campaign—$6.5 billion for design, and bricks and mortar [see RECORD, September 1993, page 36]. Feiner describes the current percentage of design-build projects as "very small," and Stewart has called the process "difficult to implement." Another factor at the federal level is the way that Congress appropriates money for construction projects. It throws the logic of design-build into question. Money for design is often appropriated in a different year from money for construction, meaning that design *must* precede construction in the traditional manner. Another factor: GSA contracts are prepared with the recommendations of the regional offices that administer them. Their recommendations may well vary.

The U. S. Postal Service is going to use design-build for projects over $10 million. "It saves time and money," says John Wiernicki, manager of major facilities. But the Postal Service's construction budget of $800 million is far smaller than GSA's.

The number of domestic design-build projects of all types has doubled since 1988. But, points out *A/E Marketing Journal* editor Carolyn Kenney, design-build projects still account for only 5 percent of construction.

The professionalism question

"The problem," says Ellickson, "starts when the developer who hires the architect has different goals from the ultimate owner on, for instance, design or construction quality. Architects then have a difficult time meeting the building user's concerns. They are stuck between a rock and a hard place." The issue becomes the possible lack of ability for architects to meet their traditional fiduciary role. One large architectural firm's brochure, while offering design-build services, flatly states: "The architect does not respond to changes the owner may want after the scope of the project is agreed on without the contractor's concurrence. The architect's allegiance is to the contractor."

The brochure lists other shortcomings:

- "It is clearly inappropriate for a complex

Some highlights:
• **Keep control.** *It's essential, difficult but achievable.*
• **Contracts are key.** *Architects need access to the owner.*
• **Design-build is professional.** *That's the AIA position.*
• **Design-build may be illegal.** *That's what some states say.*

building with ill-defined or developing program requirements."

• "The owner must sign off on a final product without traditional [design] documentation."
• "The outline specifications are subject to the narrowest intrepretation."

"Still," says Perkins, "the process can work on the right type of building (one without complex design or program requirements), with the right contracts that give the architect some measure of control, and with the right developer—preferably one experienced in the process.As we shall see, Perkins has enjoyed a unique working relationship. Ellickson points to practical restrictions: "Licensing laws have branched out in different directions in each state. Some say that the architect can't work through an intermediary. Some say that the architect can't be part of a joint-venture design-build team without a high percent of ownership." These states' rationale? "Any other but the tradional owner-architect relationship muzzles an architect's responsibility for life, health, and safety."

Despite problems, the AIA recognizes design-build as a legitimate professional pursuit. It has had a standard contract form for this delivery process since 1985. According to David Johnston, director for government relations, the AIA is in the process of removing wording from its position paper on government procurement stating that tradional owner-architect contracts are the preferred means. He says that the AIA *does* have suggestions for government procurement for design-build. Among them:
• Limiting the number of teams that are picked to compete during prequalification so that a large number of unsuccessful firms will not waste their efforts.
• Clear definition of criteria for team selection.
• Adequate compensation to designers for their competition efforts.
• Assuring that the architect will have a clear communications route to the users.
Adds Johnston: "Architects must have the skill to know if design-build for a particular project has a clear advantage—for them *and* for the user."

The liability issue

One architect who is a firm principal, *and* does design-build projects on his own and with partners, says that he does not use his design firm for these projects. "If the owner is unhappy, I would have no one to sue."

The truth, according to Christopher Clark, AIA director of risk management programs, is that professional liability insurance can cover most forms of design-build architectural services, but not faults with the building caused by other factors—such as architects' performance as developers.

• Architects signing consultant contracts with contractor/developers are usually covered by their basic policies. "The contractor/developer replaces the owner for coverage purposes."
• Special riders to basic policies can cover architects who hire contractors or go into joint ventures with contractor/developers.
• Uninsurable situations occur when an architect is required to use certain products or construction systems without first evaluating them.
• "Insurance companies basically look unfavorably on situations in which the architect is unable to exercise professional judgment," sums up Clark. *Charles K. Hoyt*

"The developer who hires the architect may have different goals from the owner on design or quality. Architects then have a difficult time meeting the owners' concerns. They are stuck between a rock and a hard place."

A Few Architects' Experiences

Taking control

The Stubbins Associates put together a design-build team with a contractor to form Hyman/Stubbins, Inc. with which it has completed two houses of detention. The Suffolk County Jail [RECORD, September 1990, page 148] and the Suffolk County House of Corrections [RECORD, May 1993, page 96].
• By choosing a contractor with a good local track record as a partner, Stubbins gained clout in the competition for the projects.
• It was able to be party to contract-negotiations and defend its interests—including ongoing direct contact with the owner.
• It was flexible and inventive, developing new terms such as "working documents" to replace "contract documents," which indicated that, "in these fast-track processes, the drawings would look, and be, different."

Finessing control

Perkins Eastman Partners started out to do a design-build project for the University of Connecticut in a normal consultant's role to Atlas Construction, with which it had worked well before, so well, in fact, that the university, convinced that the two parties could work together under any circumstances, went ahead and signed a separate contract with the architects. "Find a contractor you trust," advises Bradford Perkins.

Molding new markets

Haines Lundberg Waehler has gone into the emerging mainland China developer market. Partner Robert Djerejian says the firm started by offering traditional architectural services. It found the market so unformed, however, that his firm is doing *everything* from construction management to creating subsidiaries for importing construction materials to finding project financing. The result is latitude in structuring fees. Djerejian calls HLW's role a "development arm" rather than a development partner. It *is* a partner on each project with a local "design studio," which in turn works with a contractor so that the process of producing construction documents becomes "seamless." He adds: "When you get into international markets, you find all sorts of new ways of doing things." ■

The Corporate Connection

Architects at work in the corporate world are busy handling everything from Mickey's Toontown to Big Blue real estate—and hiring outside architects to help.

By Joseph F. Wilkinson

See one corporate architecture department and you've seen one corporate architecture department.

No two departments are the same. They vary greatly in mission, organization, and size. Some are responsible for the main thrust of corporate image and others are appendages of engineering departments. Some do design in-house, although most of them assign design to outside firms.

Corporate departments of architecture are usually responsible for managing design and construction, selecting architects and other design consultants, representing the corporation on construction projects, providing in-house design, programming projects, administering contracts, and facilities management.

Architects who work for corporations and government agencies and reach management levels usually find themselves in the role of client, interviewing and engaging architects in private practice. They view this as a mutually beneficial arrangement. The architects who hire architects feel that the detailed assignments that they give to private practitioners define projects precisely and simplify their fulfillment. The corporate and government architects believe, too, that they can elicit more effective work from the architects they engage than a client without architectural training. "It's just that we are more knowledgeable when we hire them," says William Ulmer, adviser for architecture and engineering for Eli Lilly and Company. "They can't just show us pretty pictures and get away with it. They've got to have some meat in their presentations."

"Corporate employment has been an attractive career for many architects," according to Sanford R. Greenfield, a professor of architecture at New Jersey Institute of Technology. He has recently written a paper entitled "Corporate Architecture: Constraints and Opportunities for Practice in This Setting."

Among the advantages, Greenfield cites the relative stability, security, and generally higher salary and benefits when compared to employment in private practice. "Annual income for a senior corporate architect or corporate project manager is equal to or greater than that of an associate partner in a mid-sized private firm," says Greenfield. "And the income is reinforced by annual incremental growth in salary. It also avoids the typical, yet unpredictable changes of income from year to year that occur in private practice." Other advantages claimed for corporate employment over private practice have been better work environments, more reasonable work days, more paid leave, and better retirement programs.

Further attractions of corporate practice for some are the variety of projects and locations and the opportunities to work on large-scale projects and with leading architects. Of the working architects in the United States, about 14,000 work in corporations, according to the reckoning of Marc Gravallese, director for Design/Practice of the American Institute of Architects.

Although corporate and government architecture offers more secure employment than private practice, it, too, is vulnerable to a faltering economy. Most corporations today find themselves with more real estate than they need. New construction is rare and, as a result, most architectural staffs have been reduced. Even in government, just about the main source of new projects today, tax revenues are declining and architectural staffs cut back.

AIA members employed in corporations are now represented by the Corporate Architects Professional Interest Area. This 400-member group is the successor to the Architects in Industry Committee.

The variety of corporate practice is seen from these interviews with a representative group of architects employed by corporations:

Donald Brown, Architect
Process Engineering Department
Tennessee Eastman Division
Eastman Chemical Company
Kingsport, Tennessee

Eastman Chemical's Tennessee Eastman Division, a producer of chemicals, fibers, and plastics, has a construction program that runs to $300 million annually and employs an engineering and construction division of about 600 persons. The division's assignment is to provide technical assistance and support and improve existing facilities and to provide capital project management, design, and construction services for new and expanded facilities.

"My work is consultation on the technological aspects of work performed and writing standards of ways work should be done," says Donald Brown. "For example, we have a boiler that is being built and the structural steel needs fireproofing. There was a pre-award meeting with the subcontractor who will do that work and I was there to see that the subcontractor was following the proper specifications. I do the same thing with many other applications and materials for facilities, usually chemical manufacturing and service facilities. It could be a powerhouse or a cafeteria or an office building, but it is usually for manufacturing.

"Our technology changes rapidly and that is what keeps us busy. I guess about 60 percent of our work is renovation and 40 percent is new construction. We have partnerships established with large design/construct firms, such as Bechtel and Fluor Daniel, for most of the manufacturing work. If it is a commercial project, an office building, or cafeteria or change house, then we would contract that out to a conventional architect-engineer firm. Eastman's Process Engineering Department has a staff of 140 persons, two architects, about 100 engineers, mostly chemical and mechanical. The remainder are support staff."

Brown has no experience in private practice. Registered in three states, he has been with Eastman for 32 years.

Some highlights:

• **Corporate salaries.** *Annual income for a senior corporate architect is equal to or greater than an associate partner in a mid-size firm.*

• **Corporate projects.** *The variety of projects, locations, and the opportunity to work with big-name architects are some of the job attractions for corporate architects.*

Donald Cosper, Corporate Architect
Alabama Power Company
Birmingham

Donald Cosper is the chief architect of Alabama Power. His staff, half that of some years ago, consists of four registered designers, two architects, and two engineers.

"We are responsible for all of the design work throughout the company," says Cosper. "Typically, we design office buildings and warehouse-industrial type buildings. Our most recent project was a 37,000-sq-ft office building in the center of Birmingham. We designed that in-house. We do about $10-million worth of work a year, consistently."

Cosper, like the other architects on his staff, has worked in private practice, having done light commercial and residential design for five years. His first corporate experience was with Southern Company Services. Alabama Power is one of several utilities that make up Southern Company.

Richard Benedict
Architectural Design Manager
Architecture and
Design Department
Corning Incorporated
Corning, New York

Richard Benedict is the manager of the architectural design group, which reports to Sam Frank, the director of Architecture and Design. Frank is responsible for architecture, graphics, and exhibit design. This group is part of the Corporate Affairs Division of Corning. During his 20 years with Corning, Benedict has always worked in the facilities design and engineering part of the corporation.

The core of this operation has been a staff savvy in the equipment layout and installation of hot-glass kilns and glass- melting units. He sometimes works as what he calls a kind of roving guard, offering consulting services to corporate officials who initiate manufacturing projects. In addition, he works closely with those responsibile for outlying plant facilities worldwide.

The choice of architects for major buildings, such as the Decker engineering building and the more recent corporate headquarters, rests with Corning's CEO. In both cases the decision followed selection committee and design-review committee recommendation. "You do your homework right and you develop a win situation," says Benedict. More typically, the selection is made by the user/provider team from a candidate list prepared by Benedict and Frank.

Benedict's degree in architecture is from Columbia. He worked for two New York City firms for 13 years, on the Department of Housing and Urban Development Operation Breakthrough for two years, and joined Corning in 1973.

Orlando T. Maione
ADA Coordinator Building and Land
Services Department
PG&E, San Francisco

PG&E at present has a full-service Project Design and Construction section, the equivalent of an architect-engineer firm of 125 strong. Its work ranges from programming to complete building design for a corporation with buildings and power plants not unlike a small city. The unit could handle projects of up to $20 million to $30 million in construction dollars, mostly in-house. It is part of the building management group, which reports to building and land services, a unit of the corporation's general services division.

Orlando T. Maione joined PG&E eight years ago as a regional architect for an area about one-third of the system. He now handles compliance with the Americans with Disabilities Act for the entire company.

The economy has pulled back, says Maione, and this has shrunk the operation of Project Design and Construction. "We are no longer planning large service plants or large expansion projects" Maione says. "The system hasn't grown and the population hasn't spread. The company is downsizing our operation and offering retirement packages or encouraging people to find positions elsewhere. PG&E doesn't see the volume of new projects maintaining this large a group. By the end of the year, it won't be as large as it used to be."

William Ulmer
Adviser for Architecture and
Engineering
Eli Lilly and Company
Indianapolis

William Ulmer, at 56, has been with Eli Lilly and Company for 37 years. He studied architecture at the University of Cincinnati after joining the pharmaceutical company in 1957. He is at corporate level and his job is to deal with all facets of planning, design, and construction on a worldwide basis. He is an adviser for the contracts and construction division of the corporation. Over the past 10 years, Eli Lilly has averaged about $500 million per year on capital-spending projects.

"Our engineering staff has about 250 persons," says Ulmer. "Only six or seven are architects sprinkled throughout the corporation and most of the rest are engineers of various disciplines, chemical, electrical, mechanical, civil, and planners in each engineering division." Engineering divisions work with component areas, such as production, development, R & D, or office and administrative areas. Architects are assigned to all projects, even if the architecture is minimal compared with engineering services required on a project. "Lilly has always done much of its design and engineering on projects in-house. However, today the bulk of the work is done with outside consultants because of the size staff it would require to complete our workload. The bulk of our work is industrial and manufacturing projects, but with our headquarters offices, research and development buildings, and projects for our subsidiaries, we have a large variety of projects."

Continued on next page

William Sims
Senior Vice President
Walt Disney Imagineering—Florida
Glendale, California

"Our product is entertainment," says William Sims. "At Walt Disney Imagineering we do everything, from development of the original concept all the way through construction management. For instance, one attraction of our theme parks may look like a mountain, but it is really a building. It still requires working drawings, code compliance, access for the handicapped, air conditioning, everything a building requires."

Walt Disney Imagineering designs and builds the Disney theme parks worldwide. Sims directs the Florida staff that includes teams of architects, structural, mechanical, and electrical engineers, interior designers, musicians, sculptors, artists, draftsmen, financial planners, set designers, costumers.

"We just completed a project at Disneyland called Mickey's Toontown. All the buildings and facades in this new land are cartoon-scaled. There is not a straight line on any building. They are all bulbous and cartoon-looking. The architects have to be able to come up with concepts, but often our creative group, the show designers, will come up with the concept.

"We produce construction documents. We are a total architectural operation and construction manager. When it comes to construction, we use every trick in the book. There isn't a delivery process that we don't use."

In hiring architectural staff, Disney Imagineering has no rigid requirements. Architects are brought in directly from school and others from private and corporate practice. "Most of all, they have to be innovative," says Sims. "They have to understand that architecture is often—not always—the servant of the show. Sometimes it is the show." Sims, registered both as an architect and an engineer, has been with Disney for five years. He joined Disney from the Ralph M. Parsons Co., where he was principal-in-charge of Disney work. Before that, he served in the Air Force for 28 years as an architect.

Janet Marie Smith
Vice President of Planning and Development
Baltimore Orioles, Baltimore

Until this year, Janet Marie Smith has had only one project, the $105-million Baltimore Oriole Park at Camden Yards, which has no predictable completion date. She was hired by the Orioles in 1989 to represent their interests in the design and construction of the baseball park in downtown Baltimore. The park was opened in April 1992 and has two seasons of play behind it, but Smith's work goes on.

"The Orioles' mandate is that the job isn't finished just because the ribbon has been cut," says Smith. "We need to be vigilant about the way that we assess the ballpark, the way that fans use it, and the way that we go about improving it.

"We knew in 1990 that we would host the All-Star game this year and we wanted to use that as an opportunity for some significant addition, such as opening Camden Station and installing terrace-box television and extra seats and Orioles memorabilia. It is hard to know when the job is done."

The Orioles have an agreement with the Maryland Stadium Authority, the state's builder of the new ballpark, that the team would be an integral part of the design process and would be involved in all decisions related to planning that would have to do with the master plan, the esthetic and stylistic aspects of the architecture, and the functional aspects of the park. In 1988, the authority engaged Helmuth, Obata & Kassabaum to design the park. The Orioles owners hired Smith to represent them in the process [RECORD, October 1990, page 45].

Except for clerical support, Smith is a one-person department of corporate architecture. Her work meant constant liaison with Joe Spear, the HOK principal-in-charge; with the construction manager, Barton Malow Sverdrup; with the Orioles' graphic designer, David Ashton; and with Suzanne Forte, the interior-design consultant. Smith also spends time with other members of the Orioles sampling opinions of fans.

Smith received a bachelor of architecture degree from Mississippi State University in 1981 and master of urban planning degree from New York's City College in 1984. Except for summer internships, she has never practiced in a traditional way. From 1982 to 1984, she worked as coordinator of architecture and design for the $3-billion Battery Park City project in New York. From 1985 through 1988, Smith directed the program for the $15-million redevelopment in Pershing Square, in Los Angeles.

Spruille Braden, Director
Design and Engineering Consulting
Real Estate Services
International Business Machines
Stamford, Connecticut

Spruille Braden has been with IBM for 16 years and has worked only in Corporate Real Estate. In addition to bachelor and master degrees in architecture, he holds a master's in business administration.

"I went to work here because I enjoy variety in my work," says Braden. "There was less likelihood of specializing in one particular facility. For example, at IBM I might be working in the morning on a high-technology process manufacturing plant and in the afternoon on the layout of a relatively small office. The geography of the two projects could be as different as Japan and a small American town."

Since 1956, when IBM engaged Eliot Noyes to advise on design, IBM has been hiring prominent architects to fulfill the philosophy of Thomas J. Watson, Jr.: "Good design is good business."

Continued on next page

At peak, in the 1980s, the IBM Real Estate Services had 1,000 employees and was buying as much as $1-billion worth of construction annually. The staff has been reduced in parallel with IBM's overall reduction in workforce and its scale of operations. Like many large corporations today, IBM has more real estate than it needs.

Spruille Braden devotes much of his time and effort to managing the built environment. "As we go now into a different phase in the economic cycle," he says, "we find that because of technology advances or changes in the business structure, we don't need as much space as we did in the past.

"Our mission when IBM was expanding was to guide the expansion in terms of insuring that IBM had a quality product, a flexible product, and a product that would meet not only short-run needs, but long-run ones as well," says Braden. "I think that time has proven that we are able to do that." Under the guidance of Lee A. Dayton, general manager of IBM's Real Estate Services Division, the Design and Engineering function finds itself in the mode that asks: 'How do we manage our assets? How do we help the corporation in its financial goals through the management of the real-estate portfolio?'

"IBM is not in the real-estate business. We are not an independent brokerage firm or a real-estate developer. We are here to help the corporation manage its real-estate portfolio, renting excess office space. We come up with a real-estate strategy for those facilities, making sure we anticipate growth or a shift in the business, and then positioning the real-estate portfolio to match those business needs. Because we are no longer expanding, we are managing a built environment, as opposed to building that environment."

Braden heads a staff of architects and engineers, all of whom have had 10 years or more of private experience in architecture, engineering, or contracting. Braden and staff manage the design process. When IBM builds, Braden's group chooses the architect, prepares a panel of potential designers, interviews the firms on the panel, and selects the finalists.

Richard Kruter
Manager of Major Projects
Corporate Real Estate Services
Xerox Corporation
Stamford, Connecticut

The Xerox Corporate Real Estate Services Group handles three areas: major projects and project management (Richard Kruter's responsibility); lease management and analysis, and corporate services, which provides procedures, guidelines, and special programs. "We play different roles, depending on who our in-house customer is and what, if any, abilities they have to manage a project," says Kruter. "We'll either play an overall project manager role where we own the whole project or a supporting role. Typically, for manufacturing projects, the process engineering people tend to manage the overall program and we give them technical and support services and provide and work with an architect to house the manufacturing process.

"In other projects, we take the lead role and in that role we would identify the architectural and engineering firms involved and provide the quality and value engineering processes in line with the overall Xerox quality program initiated about 10 years ago. There are four things we try to track closely: quality, safety, cost, and schedule.

"My regional areas of responsibility are the Midwest to the East Coast and I am involved with our European company, Rank Xerox. We have two persons who handle the Americas operation, Canada, Mexico, and South America, and there is an international manager who is focusing on projects in China. We're involved in about $150-million worth of construction, about half of what we did five years ago. In general the company is doing about $150 million to $250 million annually in capital construction, with the focus of work outside the U. S."

Kruter worked in private practice for five years after getting a bachelor of architecture from City College of New York in 1973. He joined IBM corporate design group in 1978 and Xerox in 1988.

Travers Nelson
Director, Design and Development
PersonaCare, Baltimore

PersonaCare operates nine nursing homes and rehabilitation centers around the country and has three more in the acquisition stage. It has a three-person design staff—two architects and an interior designer—headed by Travers Nelson.

"We review design extensively and sometimes do initial programming, single-line sketches," says Nelson. "Almost all of our design is done by private practitioners, most of them local to projects. We hire the architects and negotiate contracts for construction on our own authority. Most of our construction contracts are cost-plus with or without a guaranteed maximum. We review the sub-bidding of the contractors quite extensively. We don't have a regional staff, so we travel a good bit. We rely on a maintenance supervisor or administrator in a facility to be the day-to-day point of contact with the contractor. We seldom have the luxury of building something in an unoccupied space, so a lot of coordination is required. We handle project management ourselves, providing turnkey services, complete with furniture and equipment, for operations staff use.

"The dollar volume of projects stays fairly constant. Relative to our early years, however, we are handling more but smaller projects. We are now carrying out high technology retrofits of existing nursing homes to support subacute care, rehabilitation therapy, and other specialized medical services. This is consistent with the trend in the health-care industry to find lower-cost alternatives to traditional hospital settings for non-acute care."

Nelson has been with PersonaCare for seven years and worked in private practice for 12 years before that. His assistant, Matt Mitchell, has been with the company for four years and worked in private practice for 10 years. ■

Two Owners Face New Facts of Life

Two diverse non-profit clients see big changes in the world in which they operate. Can the Philadelphia Zoo maintain its status as one of America's best zoos in the face of leadership changes and a prolonged economic slump within its community? And how will Kaiser Permanente, a health-care giant, meet the challenges of universal "managed" care?

The Philadelphia Zoo
Type: *Zoological park and garden owned by the City of Philadelphia but run by the private, nonprofit Zoological Society of Philadelphia.*
Description: *America's oldest zoo, opened in 1874. At 42 acres, it is the smallest of America's major zoos, yet houses a collection of 1,700 animals (considered among the most valuable and diverse in the U. S.) and an impressive collection of specimen plants.*
Visitors: *Over 1.2 million annually*
Annual Budget: *About $16 million*

Zoos are not usually associated with architects. But zoos are no longer museum-like warehouses for animals either. They've become more active in educating visitors by showing species in realistic settings. Architects have increasingly become part of this process, designing structures that help frame and interpret exhibits while resolving

Kaiser Permanente
Type: *A nonprofit health-maintenance organization comprising 12 regions in 15 states and the District of Columbia.*
Description: *Unlike many HMOs, which contract with medical practices and doctors, Kaiser Permanente employs its own doctors and staff, and builds and operates its own clinics and hospitals. The Northern California region, the focus of this report, has 3,446 licensed beds and 33 medical facilities (including 15 hospitals) for its 2,425,000 members. It will spend $400 million in 1994 on design, construction, property acquisition, and equipment.*
Members: *Over 6.5 million*

Depending on whom you talk to, Kaiser Permanente is "the model" for health-care reform, "perfectly positioned" to take advantage of changes making their way through Congress. Or, Kaiser is at risk: "an organization that will have to wrestle with much stiffer price competition." Until recently, health care was a good category for architects. As providers jockeyed to attract patients and meet everchanging technological needs, new facilities were added and older ones updated. Today, millions of square feet languish unbuilt while owners try to divine the consequences of proposed health-care reforms. At this writing, there is little doubt some kind of plan will come out of Congress in 1994—voter support is strong despite misgivings about cost and added layers of government. But what kind of plan, and who will benefit?

Kaiser certainly thinks it will. "We have the program that provides the kind of care Hillary Clinton and her group want to have provided," says Ed Denton, Associate Director of Design for the Northern California Region's Facilities Design and Construction Department. "Our membership may increase because people who are not now covered could get coverage, and people who are in fee-for-service programs will look to HMOs." (These cover nearly all services for a fixed fee.) According to Ken Lee, of Lee, Burkhart, Liu, Inc., a health-care oriented firm currently working with Kaiser Permanente, "It's a split decision in our office as to whether Kaiser is well-positioned or is going to be subject to further price pressure. In the past, they've had a lock on the market. Now you see big companies that are merging, making alliances [with once-independent hospitals], and offering service comparable to Kaiser. We've already seen a lot of lower-cost HMOs get into the market."

A "systems" client

Indeed, if health-care reform leads to price-cutting, Kaiser could be at risk simply because its cost-containment strategy depends on a systematic approach that is more expensive up front. "They're what we call a systems client," says Kevin Schlaht, project director at architect Anderson DeBartolo Pan. "Kaiser is very aggressive in looking at how to cut costs without cutting quality. They're trying to systematize decision-making. They're good at setting standards, implementing and upgrading them. They're good at getting a database and knowing what things cost." In Northern California alone, a 230-person facilities design and con-

the diverse and demanding needs of animals, their keepers, and visitors.

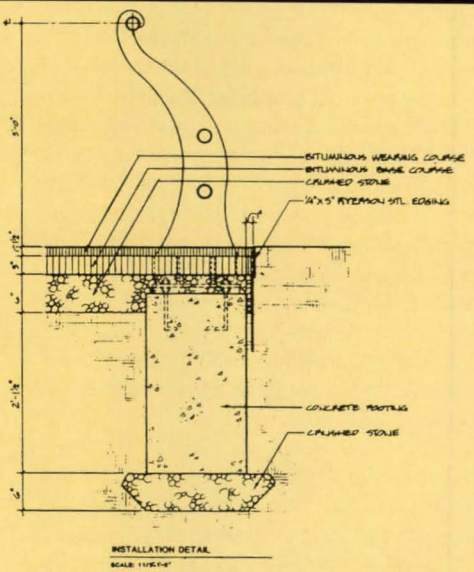
Reviving a moribund institution

Though hobbled by a small site, a neglected infrastructure, and a city that was increasingly distracted by more pressing problems, William Donaldson, a former city planner, made the Philadelphia Zoo a leader in the 1980s. Donaldson used talented local architects, not zoo experts, to reinvent what had become a moribund institution. Pete Hoskins, a new director hired this year, must maintain the Zoo's profile in a much more austere economy. This is the reality many clients face, though the Zoo is unusual not only as a type of client but in the way it sees the creativity and open-endedness of the design process as essential to its goals.

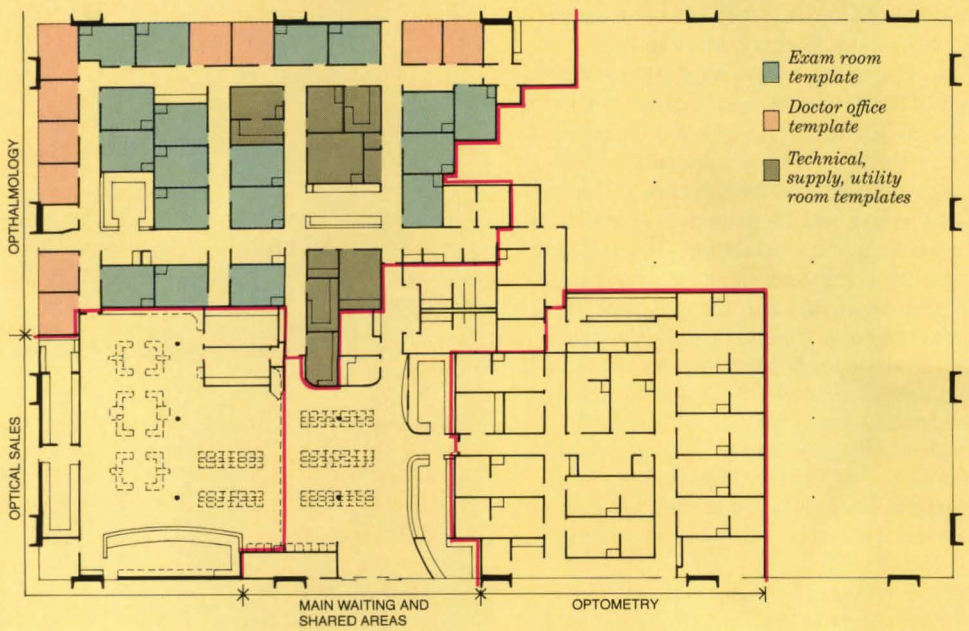
According to Charles Dagit, partner in Dagit/Saylor architects and once a Zoo board member, "Donaldson saw the Zoo

© Matt Wargo

William Donaldson saw the zoo's arboretum-like landscape and historic exhibit structures as something to build on. Venturi Rauch and Scott Brown's Treehouse



(left) was a renovation of a 19th-century antelope house. Lights (left) and railings (right) were part of Bohlin Powell Larkin Cywinski's masterplan.



Kaiser Permanente asks architects to work with its standards on fixture locations, room layouts, and even department plans. This plan of an eye clinic by ESS Architects shows spaces within the opthalmology area covered by templates.

struction staff supports this effort, an expense, however worthy, that might not be borne by more cost-driven competitors. (Not all Kaiser regions use the same techniques.)

"We have a strong standards program that includes standard specs, equipment and furniture standards, standard department and room layout templates," explains Ed Denton. "This lets us control our quality, deliver projects quickly, and assess costs in the next 10 years that are very accurate." Wayne Ruga, president and CEO of the National Symposium on Health Care Design, is skeptical. "In England they've been struggling with their planning agency's Nucleus plans, which got bad reviews from the beginning. The VA has done standards forever without great success." Kaiser's standards, though, get fairly high marks from other architects because the HMO listens to criticism and regularly updates the standards.

Kaiser is taking the systems approach further. It has made national purchase agreements, receiving volume discounts on

1993 Regional Estimates Dodge Construction Potentials

October, 1993

Construction Contract Value (millions of dollars)	1993 Preliminary	1994 Forecast	Percent Change 1994/93		1993 Preliminary	1994 Forecast	Percent Change 1994/93
Northeast							
CT, ME, MA, NH, NJ, NY, PA, RI, VT							
Nonresidential Building				**Residential Building**			
Commercial and Manufacturing	$ 6,725	$ 7,325	+ 9	Singlefamily Houses	$12,400	$13,725	+ 11
Institutional and Other	8,775	9,725	+ 11	Multifamily Houses	2,175	2,325	+ 7
Total	$15,500	$17,050	+ 10	**Total**	$14,575	$16,050	+ 10
Nonbuilding Construction	$12,600	$13,075	+ 4	**TOTAL CONSTRUCTION**	$42,675	$46,175	+ 8
North Central							
IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI							
Nonresidential Building				**Residential Building**			
Commercial and Manufacturing	$ 9,450	$10,150	+ 7	Singlefamily Houses	$23,625	$24,600	+ 4
Institutional and Other	11,200	11,775	+ 5	Multifamily Housing	2,950	3,100	+ 5
Total	$20,650	$21,925	+ 6	**Total**	$26,575	$27,700	+ 4
Nonbuilding Construction	$11,725	$13,475	+ 15	**TOTAL CONSTRUCTION**	$58,950	$63,100	+ 7
South Atlantic							
DE, DC, FL, GA, MD, NC, SC, VA, WV							
Nonresidential Building				**Residential Building**			
Commercial and Manufacturing	$ 7,375	$ 8,725	+ 18	Singlefamily Houses	$26,625	$30,800	+ 16
Institutional and Other	8,550	9,675	+ 13	Multifamily Housing	2,325	2,775	+ 19
Total	$15,925	$18,400	+ 16	**Total**	$28,950	$33,575	+ 16
Nonbuilding Construction	$10,975	$11,550	+ 5	**TOTAL CONSTRUCTION**	$55,850	$63,525	+ 14
South Central							
AL, AR, KY, LA, MS, OK, TN, TX							
Nonresidential Building				**Residential Building**			
Commercial and Manufacturing	$ 6,425	$ 7,750	+ 21	Singlefamily Houses	$17,900	$19,400	+ 8
Institutional and Other	7,250	7,975	+ 10	Multifamily Housing	1,125	1,275	+ 13
Total	$13,675	$15,725	+ 15	**Total**	$19,025	$20,675	+ 9
Nonbuilding Construction	$ 9,000	$10,050	+ 12	**TOTAL CONSTRUCTION**	$41,700	$46,450	+ 11
West							
AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY							
Nonresidential Building				**Residential Building**			
Commercial and Manufacturing	$10,225	$11,000	+ 8	Singlefamily Houses	$26,375	$27,700	+ 5
Institutional and Other	9,900	10,450	+ 6	Multifamily Housing	2,575	2,800	+ 9
Total	$20,125	$21,450	+ 7	**Total**	$28,950	$30,500	+ 5
Nonbuilding Construction	$12,875	$13,900	+ 8	**TOTAL CONSTRUCTION**	$61,950	$65,850	+ 6

Prepared by the Economics Department, Construction Information Group, McGraw-Hill Information Services Company, Robert Murray, vice president, economic affairs.

Amendments (1987), federal money was used to help establish SRFs in each state, with the states then making their own contribution. The SRF would then become the source of construction loans, or the foundation on which to base a state bond issue to fund waste treatment projects. But as a 1992 report by the EPA to Congress noted, "At this time state funding in general does not appear to be increasing sufficently to offset the phase out of federal SRF monies."

Contracting levels since 1990 relative to the second half of the 1980s seem to bear this out. The 1990-92 total for sewers was ere down 7 percent (in current dollars) from the previous three years. Current plans call for the federal government to decrease and end capitalization of state revolving-loan funds by the beginning of 1995, leaving states and localities almost completely responsible for funding. Activity for sewers in 1993 is projected to show no increase, with only a modest 2 percent gain expected in 1994. On the plus side, Congress has begun to consider legislation which would offer renewed funding during the second half of the 1990s, so the public-works emphasis could switch back to the environmental projects in a few years.

The status of water-supply construction has been less severe than that for sewers. A backlog of systems which need expansion still exists; the 1980s building boom was so extensive that some municipalities continue to add capacity to satisfy the demand created. In addition, the Safe Drinking Water Act of 1986 mandated a significant amount of construction, and Congress has recently addressed legislation which would set up SRFs for local communities to build drinking-water treatment plants or make improvements to older plants.

Overall, public-works construction is expected to post a 9-percent increase in 1993, followed by another 9-percent increase in 1994. In both years, transportation construction will lead the way with gains in excess of 10 percent. Environmental construction is expected to rise a meager one percent this year, and then show a stronger 4-percent advance in 1994. Rebuilding efforts from this summer's Midwest flood should give a push

Continued on page 120

Specification Series:Paints and Coatings

By Mark J. Kalin

Architects select coatings on the basis of color ranges available, as well as performance. Anodizing, with its limited color range, will always fight an uphill battle with other metal finishes including fluoropolymers like Kynar and Hylar that come in many bright colors. Some architects seem to be constantly seeking finishes for all types of materials that imitate metal or granite, or offer an infinite range of choices.

When architects get down to specifications, however, they have the arduous tasks of matching coating to substrate, manufacturer to coating, and volatile-organic-compound compliance to manufacturer. Few specifiers tackle this problem alone. It is important to use coating manufacturers as resources in evaluating paint perfomance, discussing current issues in coating failures, and preparing an effective short-form specification cannot be stressed enough.

There is a high possibility of a coating failing at sometime during the life of any project. "As much as 80 percent of all coating failures can be directly attributed to inadequate surface preparation that hinders coating adhesion."

Coating manufacturers

Coating formulations change with time and location. Product availability is not a constant. Several manufacturers provide charts showing those of their products that meet environmental regulations on a state-by-state basis. The practical specifier needs to use manufacturers' representatives as a resource for this type of information.

Different companies recommend different products for the same use, but there is always some consensus among them. For example, the discussion will continue for years on the merits of latex compared to alkyd finish. There *is* widespread agreement, however, that the most suitable primer for gypsum drywall is latex based.

Manufacturers have fine-tuned their formulations to the extent that a product designed for field-application and curing may fail if applied in a factory where accelerated curing conditions are used. A coating that adheres when applied immediately after galvanizing may not work after a period of time when zinc-oxide naturally forms on the galvanized surface. On such issues, manufacturers' representatives are again the best source for current information. As an example of how finishes vary with the location, California makes it illegal even to specify a coating that doesn't meet volatile-organic-compound and other environmental regulations. And it imposes stiff fines on the design professional who does so. The state has many environmental districts, and coatings allowed at the time of bidding may not be allowable a year later when the project is ready for painting. The trend towards increasingly restrictive government regulations will certainly continue.

Coating failures

According to industry sources, "as much as 80 percent of all coating failures can be directly attributed to inadequate surface preparation that hinders coating adhesion." The rest of coating failures are due to such causes as inaccurate product selection, improper application, manufacturing problems, and in-service deterioration.

If the problem is failure in adhesion, the solution can be found by examining surface preparation and testing surface compatibility with the coating. Was the shop-applied primer compatible with the field-applied top coat? In the case of wood, was it seasoned enough to allow the paint to stick? In the case of metal, the issues are following the most cost-effective SSPC (Steel Structures Painting Council) preparation method while assuring effective performance. Some painting-adhesion failures are only discovered when sealant-adhesion tests pull the coating off the substrate.

Various coating adhesion tests have been developed. They include cross-hatching and peel-off tests. For example, the thorough specifier can require coatings applied over galvanizing that will have a pull-off strength of 500 psi in an average of three tests, when tested according to ASTM D4541. However, most specifications require little testing, relying more on manufacturers' guidelines for surface preparation. Correct surface preparation is a growing issue.

Short-form specifications

Because there is a high possibility of a coating failing at some time over its life on any project, longer and longer specifications would seem to be in order. Some specifiers' typical specification for paint can be as long as 14 pages, while the painting section in AIA MasterSpec is 46 pages long. Amanufacturer's specifications can be endless depending on their product range. The one-page specification (right) would seem to fly in the face of precedent.

However, a specification similar to this can work for many projects if:

1. You consult manufacturers on each project and select specific products.
2. You make sure the drawings are clear on the surfaces to be painted.
3. You require the painting subcontractor to make specified submittals.
4. You check regularly during construction administration to assure that the installed work matches initial mock-ups.

Mr. Kalin is president of Kalin Associates, a specification-consulting firm in Newton, Massachusetts. He is author of the AIA Master Outline Specifications and is currently chairman of the AIA Masterspec Architectural Review Committee.

While specifications for paints and coatings are frequently extensive, they can, with care, be reduced to one page.

Paints and Coatings Guide Specification

PART 1. GENERAL

1.01 Summary

A. Paint unfinished interior surfaces as scheduled.
B. Paint unfinished exterior surfaces as scheduled.
C. Repaint existing surfaces in areas of remodeling.

1.02 Submittals

A. Submit schedule of coatings proposed for use. Include:
1. Name of manufacturer
2. Product data
3. Surface preparation
4. Application method
5. Dry-film thickness.
B. Submit color chips for initial selection of colors showing color and gloss.
C. Provide field-applied mock-ups of each color and finish selected.

1.03 Quality assurance

A. Comply with volatile-organic-compound and other environmental regulations.
B. Provide primer and finish coats by the same manufacturer.
C. Test sample area for adhesion for each type of paint.
D. Use experienced painters.

1.04 Delivery, storage, and handling

A. Deliver materials in labeled containers.
B. Protect materials from temperature extremes.
C. Store materials in a well-ventilated area.
D. Prevent fire hazards.

PART 2. PRODUCTS

2.01 Manufacturers:

(list them)

2.02 Materials

A. Provide top-of-line commercial-quality products for all coating systems.
B. Provide colors selected from manufacturer's full range of standard colors.
C. Match existing colors as required in areas of remodeling.

2.03 Interior-paint schedule

A. Gypsum drywall:
1. Latex primer, one coat.
2. Latex or alkyd semigloss finish, two coats.
B. Plaster:
1. Latex primer, one coat.
2. Latex or alkyd semigloss finish, two coats.
C. Wood with paint finish:
1. Interior alkyd-enamel undercoat, one coat.
2. Interior semigloss latex or alkyd-enamel finish, two coats.
D. Wood with stain finish:
1. Interior oil-base wood stain, one coat.
2. Oil-base gloss varnish primer, one coat.
3. Oil-base satin-varnish finish, one coat.
E. Concrete masonry units:
1. Latex block filler, one coat.
2. Latex or alkyd semigloss finish, two coats.
F. Concrete:
1. Latex primer, one coat.
2. Latex or alkyd semigloss finish, two coats.
G. Ferrous metals:
1. Rust-inhibiting primer, one coat.
2. Latex or alkyd semigloss enamel, two coats.

2.04 Exterior-paint schedule

A. Wood with stain finish:
1. Oil- or alkyd-resin base semi-transparent stain, two coats.
B. Wood with paint finish:
1. Exterior primer, one coat.
2. Semigloss latex or alkyd enamel finish, two coats.
C. Concrete masonry units:
1. Latex block filler, one coat.
2. Acrylic-latex semigloss finish, two coats.
D. Concrete and stucco:
1. Acrylic-latex primer, one coat.
2. Acrylic-latex semigloss finish, two coats.
E. Ferrous metal:
1. Rust-inhibiting primer, one coat.
2. Alkyd semigloss enamel, two coats.
F. Galvanized metal:
1. Galvanized-metal primer, one coat.
2. Gloss alkyd enamel, two coats.

PART 3. EXECUTION

3.01 Examination

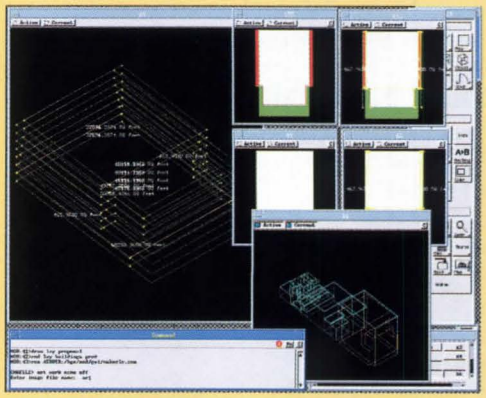
A. Inspect substrates and report unsatisfactory conditions in writing.
B. Do not proceed until unsatisfactory conditions have been corrected.

3.02 Installation

A. Comply with manufacturer's written recommendations.
B. Remove cover plates, and protect hardware and adjacent surfaces.
C. Prepare surfaces for painting, including cleaning if necessary.
D. Sand before painting until smooth and flat, and sand between coats.
E. Apply paint to dry, sound substrates only.
F. Apply paint to achieve manufacturer's recommended dry-film thicknesses.
G. Match approved mock-ups for color and gloss.
H. Recoat areas that show bleed-through or defects.
I. Clean paint spatter from adjacent surfaces.
J. Replace cover plates and remove temporary protection.
K. Touch-up damaged surfaces at completion of construction.

For manufacturers' information, see page 125

IBM Architecture & Engineering Series: A New Twist



The facilities-management module in action (the site is an I. M. Pei building occupied by IBM in Purchase, New York). Uses are color coded; the space report is also on-screen.

By Steven S. Ross

When IBM and Skidmore, Owings & Merrill collaborated on CAD back in the mid-'80s, the corporate marketers saw an irresistible image: The largest computer company and one of the largest architecture practices, knowing exactly what was good for the profession.

It didn't turn out that way.

The "profession" apparently suspected that software produced by such high-powered firms would be too high-octane for typical practices. Architects had also become leery of "proprietary" systems. IBM had, in fact, originally groomed A&ES for the RT computer, an underpowered model that was subsequently killed.

Things have changed. SOM spun off its CAD-development business to Premisys, an independent company. A&ES (IBM was planning a name change as we went to press) runs on the RISC System/6000, a successful line with many markets, and has been ported (easily) to Hewlett-Packard Apollo-derived computers. The software is now considered a moderate success but hasn't replaced the market leaders.

In the meantime, workstations capable of running A&ES have gotten much faster and much cheaper. A single seat (hardware and software) now runs about $15,000. Network configurations come in at $11,000 to $13,000 a seat. That makes A&ES roughly competitive with packages that are somewhat less capable, especially on a network.

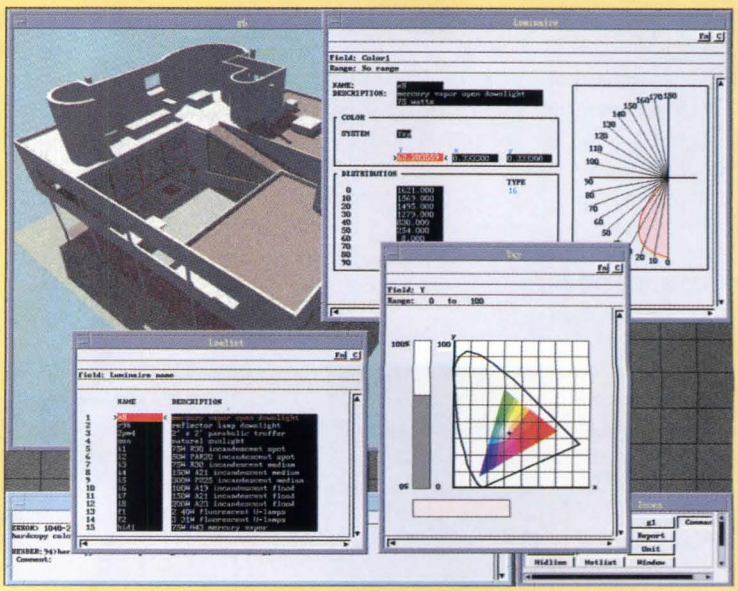
What's more, the profession's evolving needs have played to its strong points: Strong database links, good control of 3-D (everything you draw, in fact, is a 3-D entity), and built-in modeling are all in the basic "graphics" module of A&ES. You may never need anything more.

For this review, we took a good look at A&ES and at add-ons for interference detection, rendering (with textures, reflections, smooth shading, and shadows), hvac, lighting, and piping.

The graphics module is easy to draw with out of the box. Wall intersections drawn in plan clean up easily, for instance, and there's a good selection of drawing tools and entities optimized for architecture. You can easily display 3-D objects superimposed on 2-D views—to show office fittings superimposed in 3-D on a floor plan, for instance. This basic module also includes excellent database control and a good plot layout package, direct import of raster images—scanned drawings for facilities management, for instance—a text font editor, line style editor, hatch-pattern customizer, and so forth. You can even modify the interface for specific needs such as symbol control for facilities management or unusual drafting tasks.

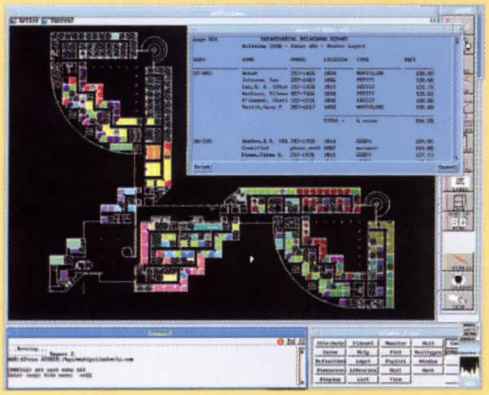
Database features include SQL access, query by example (you fill in parts of data forms and the software finds matches), duplicate-record detection, and two-way exchange with ARCINFO GIS data files. You can link many data items to one object, or many objects to the same data.

Rendered view (upper left) can be applied to a surface (lower right) in a ray-traced image from the add-on rendering module.



The lighting module in action; note the view of illumination patterns, control over colors, and database of fixtures.

Basic graphics module is used for a massing study; alternative building shapes for the constricted site can be considered in just a few minutes; even the shadows cast by the building can be shown.



You can have different tolerances in different layers, groups, and so forth. The basic graphics module comes with a library of 4,000 architectural and landscape symbols; you can view them on-screen to select. They are all 3-D, but can be viewed in 2-D (in plan or elevation). The system can handle an unlimited number of libraries of unlimited size.

The handling of symbols is amazingly flexible. You can, for instance, put any amount of text on a symbol to store data without having the data in the definition of an entity's attribute. Database links are to Oracle, Ingres, and Informix.

The add-on modules from IBM and third-party vendors include:

- *Structural.* Covers design and analysis of residential or commercial buildings, including high-rise structures.
- *Interference detection.* Includes not only "hard" interferences (pipes colliding with beams), but also soft ones—inadequate clearances for maintenance, for instance.
- *Lighting.* Meant mainly for interiors; includes links to IES (Illuminating Engineering Society) files.
- *Energy.* Links to Department of Energy public-domain energy-analysis software.
- *Hvac.* There are two sections; one handles load calculations and the other draws ducts. Walls can be given different U values for winter and summer; in fact, they can be built up of layers, each with its own thickness, U value, and other properties. You can match the data against expected weather.
- *Piping.* Includes plumbing for commercial and residential structures for 17 systems (chilled water, sanitary, and so forth).
- *Facilities management.* Remarkably flexible; it can even allow people from different departments to share one office space and keep everything tracked. Cadtech was the developer.
- *Electrical layout.* Mainly for locating service on walls, not for minimizing cable runs.
- DXF and IGES translators. A module for walkthroughs is expected as well.

We recommend plenty of fixed disk space beyond the minimum 400MB suggested by IBM. A&ES supports unlimited layers in a drawing, essentially by storing each layer in a separate file.

Corporate architects (and offices that have to deal with them for everything from tenant fitups to retail store fittings) should find A&ES particularly attractive; it handles facilities-management and other data-intensive chores well. Planners will find the GIS links useful, too. *Circle number* **300**

IBM Architecture & Engineering Series Summary

Equipment required: IBM RISC System/6000, 400MB disk space (more for a stand-alone system), 16MB random-access memory (32MB recommended), AIX (IBM's version of UNIX). Or, you can use an equivalent workstation from Hewlett-Packard. X-Windows interface and mouse strongly recommended.
Vendor: International Business Machines Corporation, 472 Wheelers Farm Rd., Milford, Conn. 06460, 800/IBM-4AES. The Graphics module licensing fee is $5,195; media are extra; includes free upgrades within version and free unlimited support. Advanced rendering is also $5,195. Other modules range in price from $1,250 to $12,000.
Manuals: We took a good look at the reference manual for the base graphics package. The giant looseleaf was well done.
Ease-of-use: Excellent on a fast machine.
Error-trapping: Excellent; the full range of UNIX data-recovery tools is available. ■

DGNLink Aids CAD File Translation

As those who have had to translate files from one CAD system to another know, the process is somewhat of a black art. In fact, high-volume translation chores are often contracted out to service bureaus. Decision Graphics, Inc. (DGI) has long had part of the solution for do-it-yourselfers: Software for importing MicroStation files directly into AutoCAD.

Now DGI has upgraded its package to work within AutoCAD Release 12 as an ADS application. And there's now a module available for exporting the file back to MicroStation (also from within AutoCAD). Finally, DGI has released a version that allows importing MicroStation DGN files into Cadvance for Windows.

The key to file translation that works for you is control over how various entities—fonts, complex curves, colors, and so forth—are translated. DGNLink allows you to set up the translation defaults, then let relatively unsophisticated users simply import (and, for AutoCAD, export) files using the CAD program's menu system.

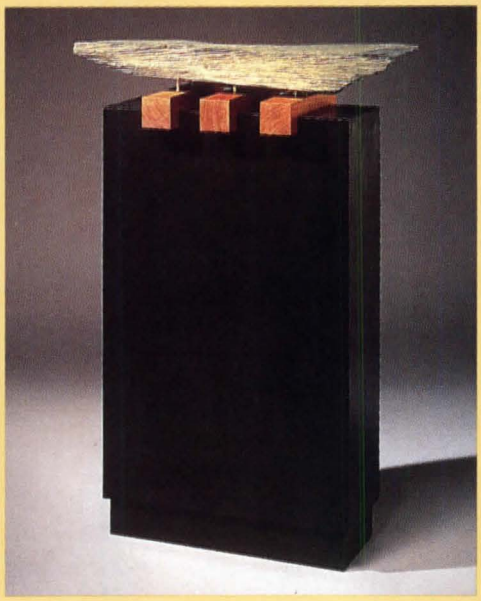
The translations can never be perfect because each system has some entity definitions the other doesn't. But they are a lot better than you'd usually get by using DXF as an intermediate file. *Circle number* **301**

DGNLink Summary

Equipment required: Any computer powerful enough to run AutoCAD Release 12 for DOS or Cadvance 5.0 for Windows.
Vendor: Decision Graphics, Inc., 210-C Exchange Place, Huntsville, Ala. 35806, 205/837-7710, 800-352-7859, fax 205/837-7712. $395 for MicroStation to AutoCAD, $395 for AutoCAD to MicroStation, $695 for both. $695 for module to import into Cadvance. Additional seats are at half price.
Manuals: Simple, straightforward for AutoCAD. We did not see a manual for the Cadvance version—and didn't need one.
Ease-of-use: Simple. Menu-driven from within AutoCAD, once you install it.
Error-trapping: It is theoretically possible but highly unlikely to overwrite an IGES DGN file with a DWG file, and vice versa, if you are using other utilities that allow mindless changing of filename extensions. ■

Adding Up

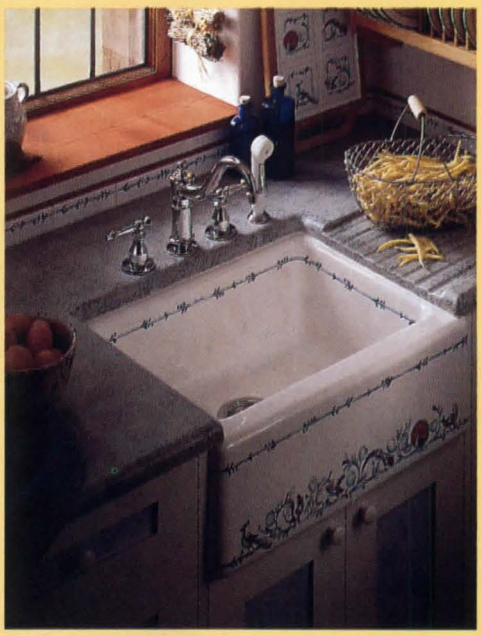
David Whitcomb photos



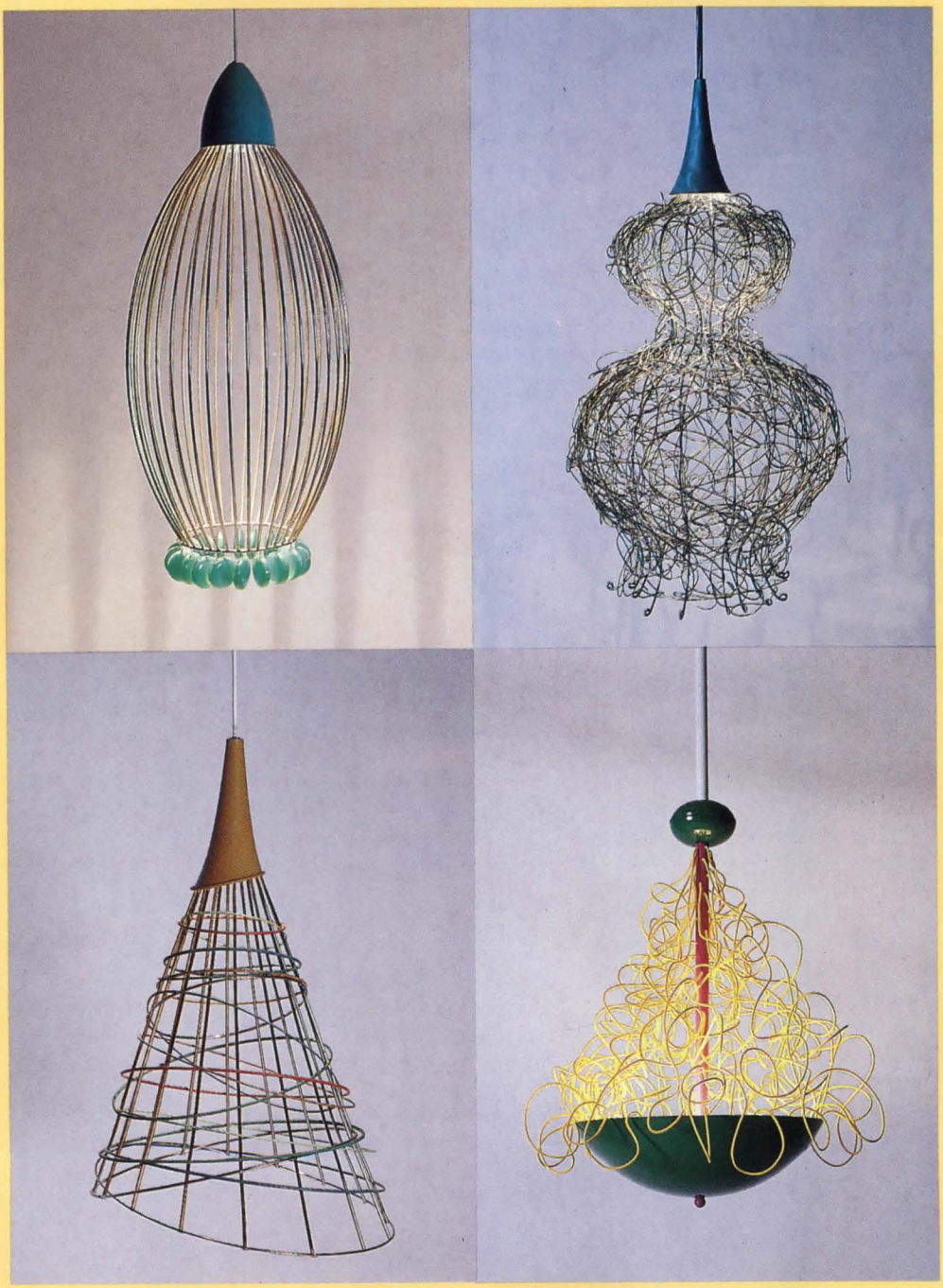
302. After Thomas Seiler returned to his native Baltimore to practice architecture, he became adept at translating specific site and client requirements into mathematically proportioned furniture. Basing his constructions on the rationality he found in a 16th-century numerical progression called the Fibonacci Series, he used this proportional relationship to determine the dimensions of an element—whether a space or a piece of furniture within it—and the number of elements making up the piece itself: how big the table should be, and how many legs it should have. He uses construction materials—metal, concrete, wood, and slate—to fashion his sculpture and tables into metaphorical buildings. A low table (top) has a black-walnut surface resting on three open boxes of ebonized plywood; mahogany drawers are accessible from two sides. Hall tables (below) stand 38-in. high; a black-walnut top rests on three precisely proportioned open boxes of hand-brushed aluminum, and a slate top sits on steel pins set in three mahogany bars within a solid volume of ebonized plywood. Thomas K. Seiler Architect, Baltimore. ■

Aproned Sinks

303. Kohler has expanded its Artist Editions line of decorated plumbingware from the bath into the kitchen with new sinks featuring an extended front apron. More-luxurious versions of the sink Mister Hudson polished silver at in *Upstairs Downstairs*, the models have a bas-relief pattern molded into the fireclay material. Aviary (below) has a Delft-like pattern of birds, leaves, and fruit in deep blue and persimmon colors; Interlace (bottom) is a floral in solid white or biscuit glaze. Matching ceramic tiles can coordinate the installation. Kohler Co., Kohler, Wis. ■



Wire Work



304. One-half of the talented designer/maker team Godley-Schwan, Lynn Godley creates lighting constructions that have progressed from small table-top lamps to generously scaled—and very decorative—pendants. Her newest pieces use a lot of colorful tinted and lacquered wire, illuminated by white light from standard-base halogen bulbs. Luminaires are about 24-in. high by 16-in. wide, and should work well in large residential spaces as well as lobbies and reception areas. Shown clockwise from top left: Birdcage, the Body Lamp, Dome, and Basket. Godley-Schwan, Brooklyn, N. Y. ■

For more Lighting products, see separate Lighting Supplement

Au Naturel

305. Made pretty much by hand in downtown Milwaukee, the La Lune Collection offers an extensive range—over 600 designs—of furniture and casegoods in a rustic, natural-wood style reminiscent of Andrew Jackson Downing. The 14-year-old firm has placed product in the homes of celebrities such as Ralph Lauren, Eddie Murphy, and George Lucas, as well as in restaurants, hotels, and stores like The Limited and Eddie Bauer. Designer Mario Costantini has a unique take on the use of wood in furniture construction, working with fast-growing, "environmentally secure" American woods like willow, white birch, and aspen and incorporating many limbs and branches cut without permanently damaging the tree itself. Materials, water-based finishes, and hand-done construction details allow many pieces to be used outdoors as well. These new chairs are representative of the curvilinear and rectilinear shapes prominent in the collection. Beds, armoires, settees, dining and side tables, and accessories are also available. Trade prices start at about $345, for the armless chair. La Lune, Milwaukee. ■

Critical Positions

ANY, *edited by Cynthia Davidson. New York: six times a year, subscription $45, single copies $10.*
Appendx, *edited by Darrell W. Fields, Kevin L. Fuller, Milton S. F. Curry. Cambridge: two times a years, subscription $28, $45 (institutions).*
Assemblage, *edited by K. Michael Hays, Catherine Ingraham, Alicia Kennedy. Cambridge: three times a year, subscription $60 (individuals), $35 (students).*

Reviewed by Scott Gutterman

Architectural journals usually try to foster criticism that is "cutting edge," a designation that too often winds up meaning convoluted and obtuse. For publications that hope to promote social change—another common aim—such twisted language is a fatal flaw. When the lofty ambitions for these journals are not borne out in their execution, they are bound to be read only in graduate-school libraries and seminar rooms—if at all.

The three journals reviewed here run the gamut from provocative and engaging to needlessly obscure. The most successful of the lot is *ANY*, the publication started by architectural gadfly Peter Eisenman and his wife Cynthia Davidson to promote discussion on, oh, any number of issues.

The July/August 1993 issue of *ANY* is entitled "Seaside and the Real World: A Debate on American Urbanism." Contrary to most events that bill themselves in this fashion, it truly does generate heated, intelligent debate. The principal architects behind the revolutionary (or is it reactionary?) Florida development, Andres Duany and Elizabeth Plater-Zyberk, staunchly defend their approach in the face of formidable opposition, including Neil Smith, Mark Linder, and most pointedly, Eisenman himself.

Everyone agrees that Seaside is a popular success, but no one can decide whether or not that is a good thing. Eisenman calls the development "a paradigm of retrenchment." The dynamic duo shoots back, "What critical effect can be attributed to the new Deconstructive buildings: the advertising agency interiors, the expensive houses, the pasta palaces?" Whichever position one embraces, this journal more than fulfills its role of provocateur by embodying a vintage Modernist principle: question everything.

Scott Gutterman is a journalist who covers art and architecture.

More problematic, though promising, is *Appendx*, a journal devoted to African-American architects and the perplexing questions they face. Here language and its usage is very much an issue under review—notably the tension between the "white" language of academic writing and "black" vernacular speech. By showing up the profound differences between the two, the editors of this journal point to the seemingly unbridgable gap between high theory and lived experience. But far too often, they fall headlong into the gap. On the one hand, it is bracing to hear Milton S. F. Curry say in his essay "Emancipation Theory," that "I found prominent black architects in particular actually mocking theory, and demarcating it as an exclusively white terrain and the site of elite rhetoric." On the other, it is disheartening to read in Kevin Fuller's essay "Negative Affirmation" a particularly turgid analysis of an eloquent passage from Ralph Ellison's *Invisible Man*. Clearly, it is beyond the scope of any journal to resolve all such disjunctions and *Appendx* should be applauded for bringing questions of race and class to bear on the field of architecture.

Of the three journals, *Assemblage* drifts the farthest into the realm of nonsensical babble. To compile issue number 20, guest editor Mark Wigley invited artists and critics to respond to the words: "VIOLENCE SPACE." For the most part, the responses he received bear little relation to architecture, to say nothing of coherent thought. Of course, these contributions (Wigley calls them "interventions") are meant to dislocate, to challenge the dominant discourse, to map alternative strategies (all favorite catch-phrases). Yet, as with the most insufferable avant-garde endeavors, they are far too smug in their insularity to alter almost anyone's thinking about anything. One contributor—make that interventionist—concludes a quasi-poem written in Scottish dialect with the line, "git a grip." Truer words were never spoken. ■

Briefly Noted

The New Finnish Architecture, *by Scott Poole. New York: Rizzoli, 1992, 224 pages, $50 (hard), $35 (paper).*
An excellent introduction to what is being designed in Finland today and why it's being done that way, this book starts with essays by Poole and Colin St. John Wilson, and then shows the work of 13 architects—including Juha Leiviskä (whose Mannisto Church is in this issue of RECORD, page 038). St. John Wilson aptly summarizes Finnish architects' special relationship with Modernism: "... for Finnish architects the Modern movement is not only an unchallengeable foundation for an evolving architecture, but has, during the last 65 years, established an ample tradition." *C. A. P.*

Calatrava Bridges, *by Kenneth Frampton, Anthony C. Webster, and Anthony Tischhauser. Zurich: Artemis, 1993, 224 pages, $95.*
Like the bridges of Santiago Calatrava, this book has a lean and elegant design that allows it to cover a lot of ground with a minimum of fuss. Each of the 16 bridges in the book is well represented in photographs, drawings, and text. Essays by Frampton and Webster help place Calatrava's bridges in context with the rest of the architect-engineer's body of work and the history of bridge building.

Design, Form, and Chaos, *by Paul Rand. New Haven: Yale, 1993, 232 pages, $45.*
From the man who gave you the IBM logo, as well as graphics for NeXT computers and The Limited, comes a strikingly designed book that looks at topics such as the values behind esthetics, the role of intuition in good design, the place of market research, and how to use computers. The book's mix of short texts and smart graphics is just right.

Michelangelo: Architect, *by Giulio Carlo Argan and Bruno Contardi. New York: Abrams, 1993, 388 pages, $125.*
Although he often complained that architecture was forced on him by wealthy patrons, Michelangelo brought the same restless spirit of innovation to buildings as he did to sculpture and painting. This book offers essays and detailed chronologies of 31 architectural projects, as well as a rich set of photographs and drawings.

In This Issue

"Perhaps the best of the group—not as a summation or stopping point, but in richness of conception and satisfying composition," writes correspondent Gerald Moorhead of Finnish architect Juha Leiviskä's most recent church (page 86). The same can be said of Becton Dickinson Building 2, the latest addition to a three-phase office park scheme by Boston firm Kallmann McKinnell & Wood (page 80). Client Becton Dickinson wanted a corporate headquarters that would meld with the rural landscape, in part so it would find acceptance in a New Jersey community hostile to commercial intrusion. The principal goal of Cannon PTN Architects in its design of St. Charles County Community College in St. Peters, Missouri (page 92), was also community-minded: to create a sense of cohesion to counteract the current notion of such institutions, which editor Cliff Pearson characterizes as "the pedagogical equivalents of strip shopping centers." For Tod Williams Billie Tsien & Associates, the challenge was to imbue a new residential college at the outskirts of the University of Virginia's now sprawling campus with its own identity, while acknowledging the clarity of vision and purpose established by University founder and original architect Thomas Jefferson (page 98). A sense of community and identity are themes familiar to Richard Dattner and Stanley Saitowitz and landscape architect Michael Van Valkenburgh, whose work is featured in Building Types Study 711 on Parks and Recreational Facilities (page 108). *K. D. S.*

Manufacturers' Sources listed on page 125

Rooms With a View

As a company, Becton Dickinson is nothing if not democratic. Blessed with a sumptuous rolling 14-acre site, the architects for this manufacturer of high-volume medical devices have succeeded in giving every worker adjacency, or at least a view of, nature. In contrast to the first Becton Dickinson building [RECORD, January 1988] located on the same site, and similar to it in superficial ways, Building 2 has no doors on any enclosed office except for a small handful of top executives, thereby opening up the view for support staff at the workstation-equipped cores of the finger plans.

Moreover, whereas Building 1 is the corporate headquarters and staffed by the suit-and-tie crowd, Building 2 serves as headquarters for an operating division, and is less encumbered by dignity. Separated from Building 1 by a sloping lush green lawn and edged by honeylocusts, Building 2 is more plebeian, livelier, freer, more open, colorful, and workmanlike. Walls bear paintings and mounted photographs in vivid colors. Niches and atria carry large figurative sculptures, and the central atrium is dominated by a 34-foot multicolor Japanese sculpture intended in part to raise consciousness about Japan as a competitor (the sculpture, not shown, is not universally liked.)

The four-level building is organized around three north-facing fingers, each with a full-height atrium that also acts as an exhaust plenum for the hvac system. The eastern-most atrium is a breakout space for surrounding classrooms, and is likewise used by large groups for special gatherings. At the same end, a health center, cafeteria, notions store, and fitness center accommodate the needs of a fairly isolated workplace. The two parking structures are designed on the basis of one space per employee.

The division is a line operation and profit center, and incorporates 100,000 square feet of laboratories. The lowest level houses the so-called pilot-line function, where engineers develop the manufacturing equipment which, in offsite plants, produces the company's products. The level also contains a computer room, building transformer, and switchgear rooms, and kitchen support spaces. On level 2, product—design labs are housed in the core of the middle finger. While the exhaust fumes are not toxic, the variable air volume hvac system provides for a 100 percent air change, with separate exhaust stacks leading from each lab, providing flexibility for any future conversion. Perimeter offices are able to keep maximum ceiling height through a system that feeds and exhausts air horizontally directly from distribution ducts in corridors.

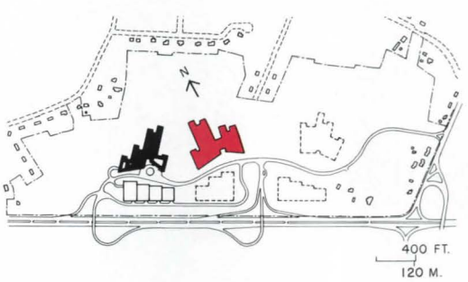
In a move that is still the exception for the delivery of buildings of this stature and scope, the owner held the contracts directly with some 40 trade subcontractors, in effect acting as its own general contractor, according to Ronald Freschi, project manager for corporate engineering and facilities planning at Becton Dickinson. An independent construction manager was hired as an extension of Freschi's staff, chiefly to provide field supervision.

Unpretentious but dignified, part of the land and not imposed upon it, and flexible to accommodate change, the Becton Dickinson buildings subscribe to no style or time, and will flourish as congenial workplaces long beyond the lifespans of their creators.
Stephen A. Kliment

Up Close

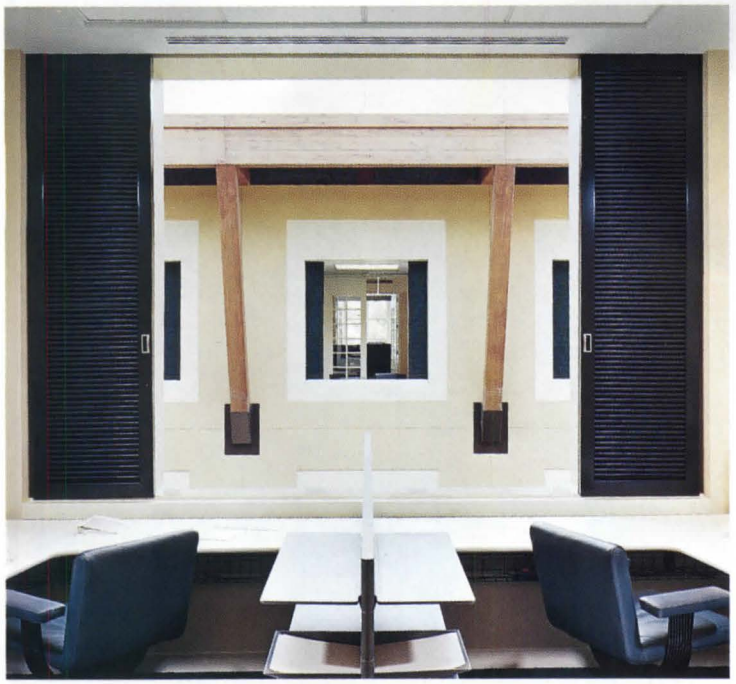
Workplace for the common man. Nothing better reflects the architects' intent than an excerpt from five-year-old Harvard Graduate School of Design lecture notes which Gerhard Kallmann and Michael McKinnell used to define their parti: "Whilst there is that thread of continuity, we have resisted the safe haven of a rigid ideological stance and have stayed away from the tides of fashion and trendiness, and have jealously guarded our freedom of action against the dogma of an avant-garde or the pundits." The simple steel framing, copper roof, cedar wood and beige brick facing, when combined with wide hallways with glazed ends, (expressed through the rounded vertical elements (opposite top) that provide daylight and views, all make for lightness and transparency. They deliver the kind of relaxed environment that was the owner's underlying goal. "We wanted a building that's handsome to walk through," McKinnell told RECORD. "We didn't want an object standing in a lovely park; we wanted the buildings to meld into the landscape."

The key shift in focus from Building 1 to Building 2 is in the added concern for employees of all ranks. No office except the top executives' has doors; instead, there's a six-foot opening to each office which reveals the view to those at the interior workstations.



Building 2 (shown above in color) was completed about five years after Building 1. Each is supported by a parking garage, designed on the basis of one space per employee. There are no present plans to erect the third building. Exterior differences between the first and second buildings are subtle, and lie mainly in the use of square limestone-trimmed windows in lieu of vertical windows. Materials are limestone and a beige brick from Ohio over a steel frame, a copper roof, and an occasional use of cedar to finish off the tops of columns and the

© *Steve Rosenthal photos*

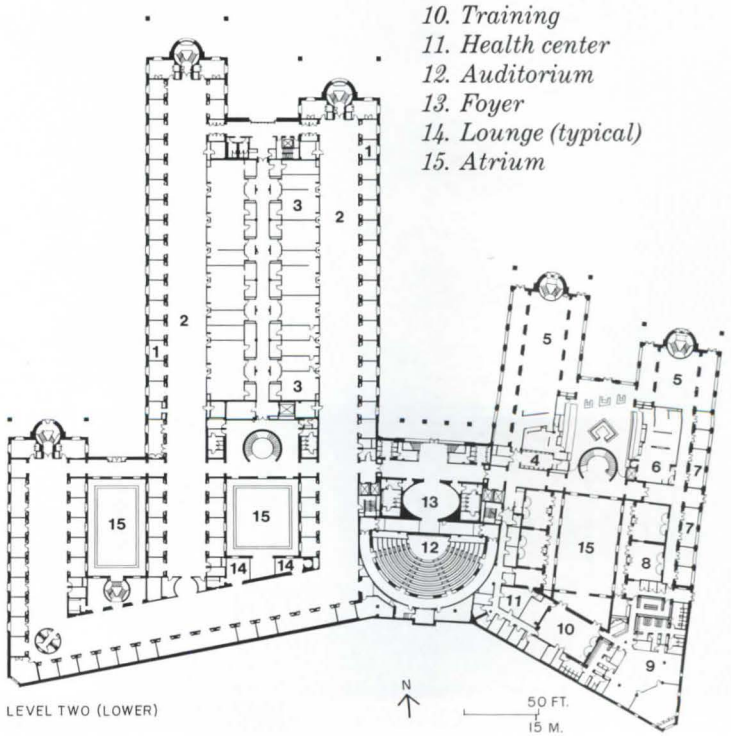


The openness of the design is evident in the view from one office across an atrium to a corresponding office on the other side (top left.) For privacy, there are a few small enclosed conference rooms; these cut off sound but don't interfere with the luminous, open quality of the building (middle left). Perched on a patterned carpet and lit by indirect ambient lighting, the center finger is given over to workstations. Each position affords a view to the outside through perimeter offices, one of which can be seen near the right edge of the picture (bottom left).

Credits

Becton Dickinson Building 2
Franklin Lakes, New Jersey
Owner: *Becton Dickinson and Company*
Architect: *Kallmann McKinnell & Wood Architects, Inc.—N. M. McKinnell, Gerhard M. Kallmann, Henry A. Wood, partners-in-charge; S. Fiske Crowell, Jr., Bruce Wood, Hans Huber, project team*
Engineers: *Zaldanstani Associates, Inc. (structural), Cosentini Associates (mechanical), Andrew Marshall, Jr. (civil)*
Consultants: *Stephanie Mallis, Inc. (interiors); Fisher Marantz Renfro Stone (lighting), Todisco Associates, Inc. (specifications)*
Landscape Architect: *Morgan Wheelock, Inc.; Landscape designer for north court: Michael Singer*
General Contractor: *Becton Dickinson Department of Corporate Engineering and Facilities Planning—Donald P. Sposato (vice president, director of operations), Ronald G. Freschi (project manager), Greg Butler (project manager, laboratories)*
Construction Manager: *Henderson Corporation*

1. *Perimeter offices*
2. *Open-plan offices*
3. *Labs*
4. *Store*
5. *Cafeteria*
6. *Kitchen*
7. *Private dining*
8. *Classroom*
9. *Fitness center*
10. *Training*
11. *Health center*
12. *Auditorium*
13. *Foyer*
14. *Lounge (typical)*
15. *Atrium*



Ethereal Light

Männistö Church and Parish Center
Kuopio, Finland
Juha Leiviskä, Pekka Kivisalo, Architects

Finnish architectural historian Juhani Pallasman has called Juha Leiviskä's churches "the finest instruments of articulating light constructed in our time." The Männistö Church, situated on the outskirts of the central Finnish town of Kuopio, is perhaps the best of the group—not as a summation or stopping point, but in richness of conception and satisfying composition. Leiviskä's architecture is an independent personal expression, fully within the tradition of Finnish Modernism as consolidated by Alvar Aalto: concern for both nature and the man-made environment; use of daylight; simple use of materials; and knowledge of the vernacular traditions of the land.

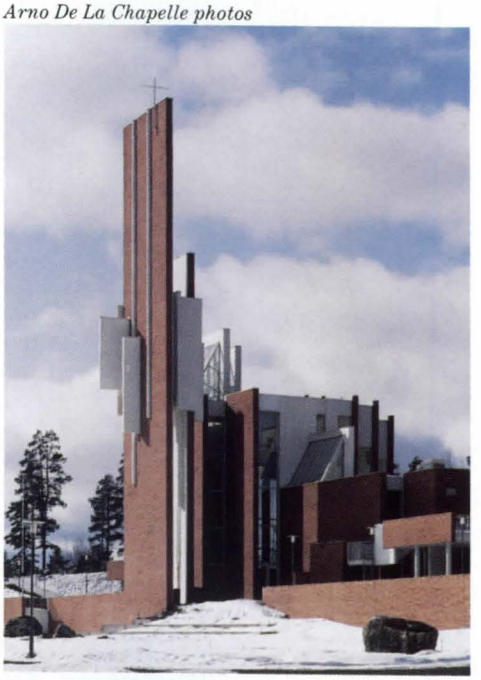
Instead of following the town plan, which indicated a church in the center of the sloping site, Leiviskä placed the church, parish facilities, and future "leisure center" on the western edge, at the highest point. The dramatic massing of the church with its freestanding bell tower is the climax of the building and site forms acting together.

The structure of the Männistö Church is composed of de Stijl-like vertical planes of concrete wrapped in brick. The positioning and spacing of the panels, seemingly random and willful, are actually cooly calculated to control the entrance of daylight into the worship space. Precious though the northern light is, it is not allowed to enter directly. The assortment of panel widths and spacings reflects diffuse light throughout the sanctuary. Nuances of intensity emphasize the chancel area. The serenity found in the interior is quite unexpected, in contrast to the animated exterior.

The church illustrates some construction technology that is different from that used in the U. S. Despite Finland's cold climate and long, dark winters, problems with thermal expansion and contraction of materials are not as important as in warmer lands. Expansion joints are few and far between and vapor barriers are little used. Walls are solid sandwiches without cavities—in the case of the church, a core of poured-in-place concrete laminated with rigid insulation and a skin of brick. The most basic concern is to keep the warmth in. Windows and skylights are triple glazed. The large sloping lanterns on the east-facing walls of Männistö Church have a top surface of double-pane insulated glass and a large ventilated air cavity with a single pane of glass below.

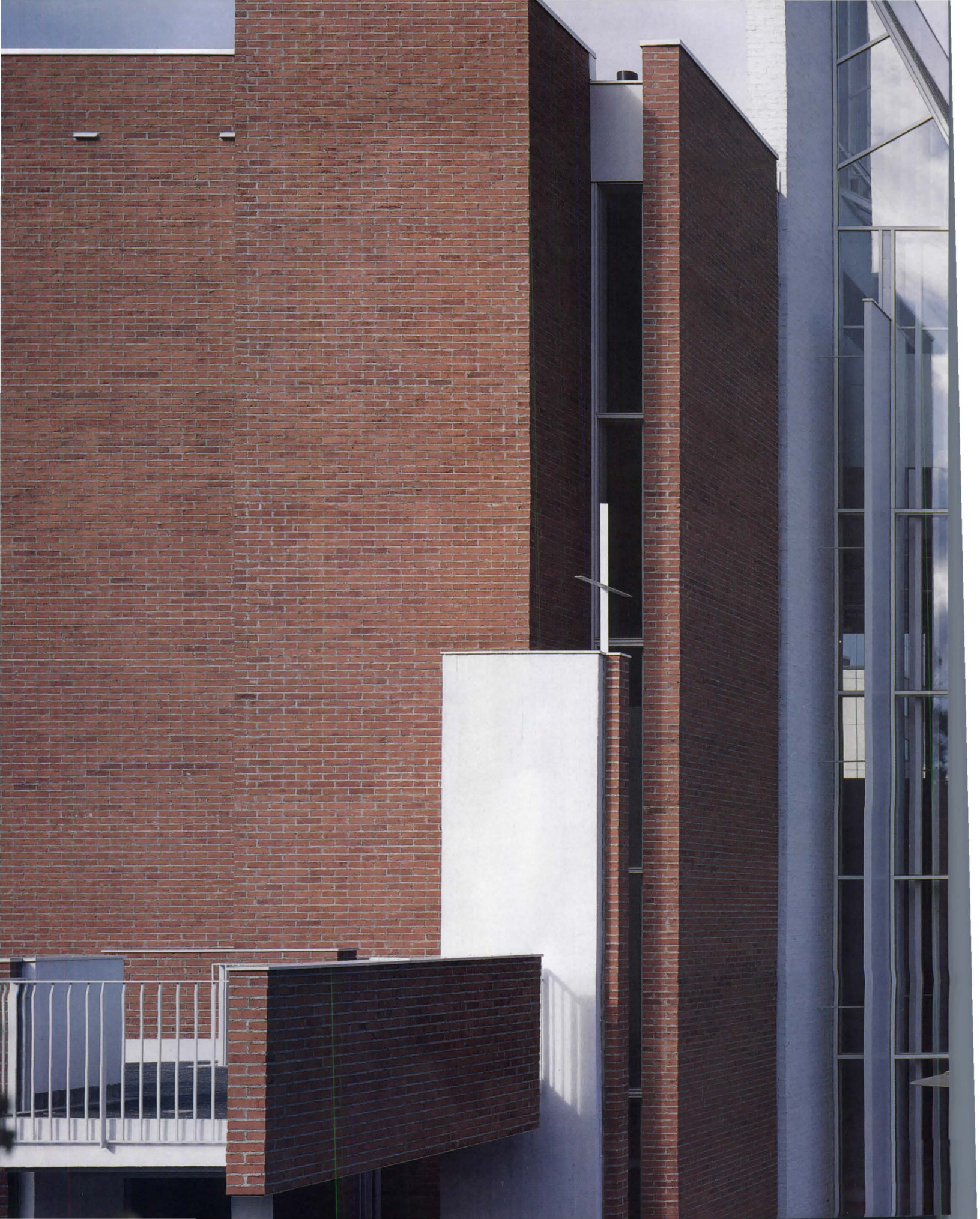
Leiviskä has added two new themes to the Männistö Church. The first is an internal skew to the pews and rear wall of the sanctuary. Breaking with his typical orthogonal order, the angled pews bring people closer to the altar for a greater sense of community, and the non-parallel walls improve the acoustics. The second new theme is color. Leiviskä's architecture is typically built with a very limited set of materials—in this case, red brick, red floor tiles, and white walls of brick and plaster. He says that "because I have aspired to a situation where light plays in every different shade, powerful color effects have not come into the question. They would mutilate the space." So, instead of applying color directly to the walls, color appears mystically as reflected light. Working with artist Markku Pääkkönen, Leiviskä placed bands of exquisite clear, pale tones on the back sides of light-reflecting panels. The effect is as ethereal and elusive as the changing light. *Gerald Moorhead*

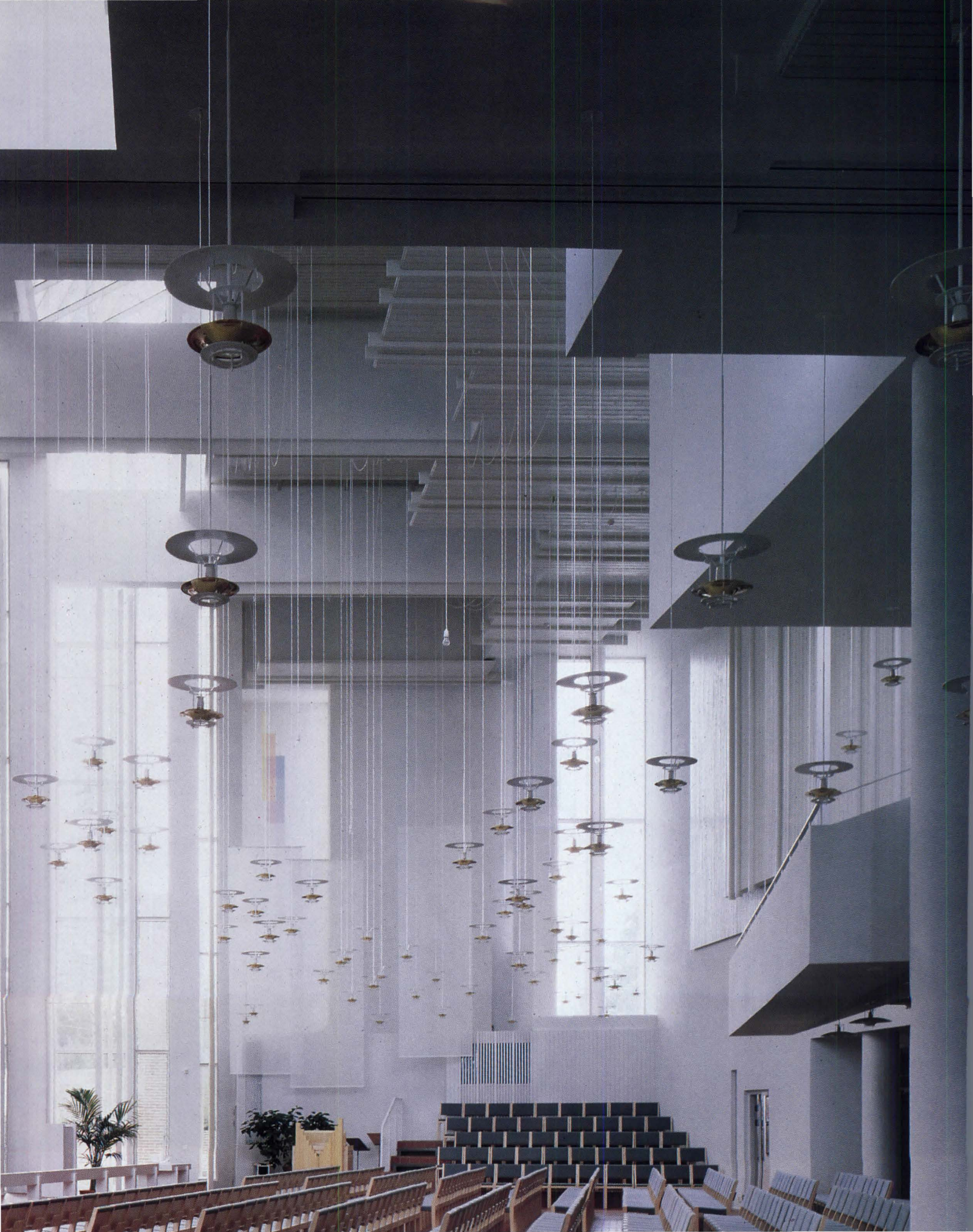
Arno De La Chapelle photos



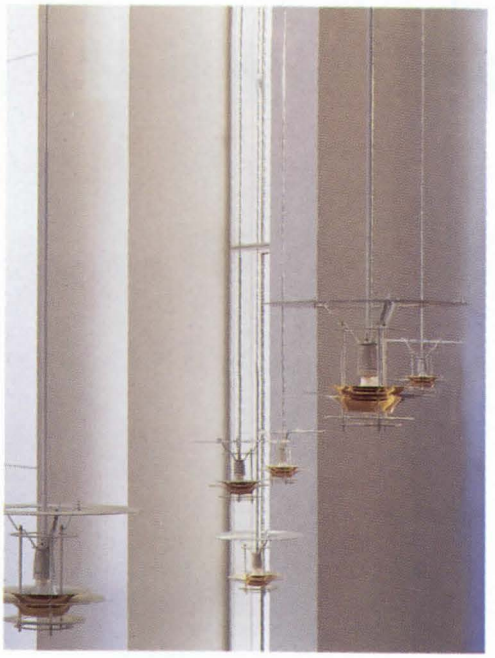
The 114-foot-high bell tower is composed of two vertically cantilevered concrete slabs. Just above mid-height, a series of horizontal and vertical planes form a box to stabilize the two primary planes. Slender white ribs projecting from the red brick stiffen the upper part of the main tower panel.

White-painted brick alternates with basic red brick to denote the sanctuary, and reflects the morning sun into the worship space through the glazing that separates the great vertical planes.

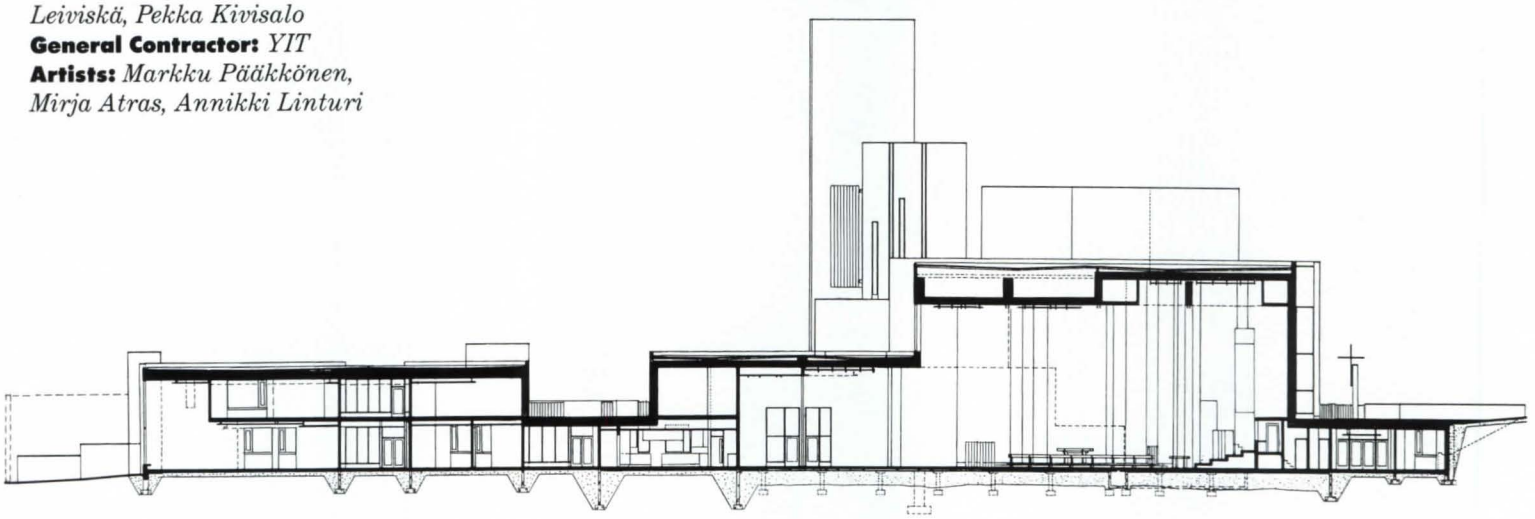




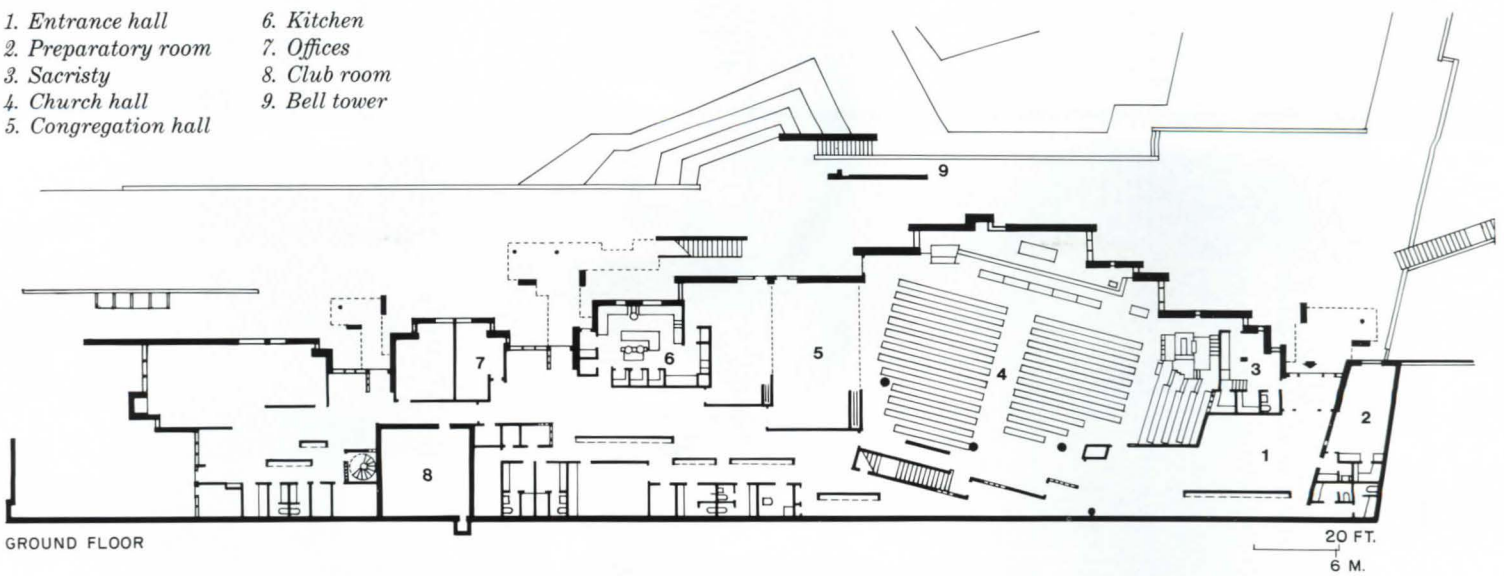
Light fixtures designed by the architect swarm through the church like hallowed angels. Leiviskä says that his "aim has been to achieve a lively dialog between large and small, open and closed, high and low, light and shade." The most important building material is daylight.



Credits
Männistö Church and Parish Center
Kuopio, Finland
Architect: *Juha Leiviskä, Pekka Kivisalo, Architects*
Engineers: *Harry Dunkel (structural); Markku Turikainen (mechanical); Erkki Pitkänen (electrical)*
Acoustics: *Alpo Halme*
Interior Design: *Juha Leiviskä, Pekka Kivisalo*
General Contractor: *YIT*
Artists: *Markku Pääkkönen, Mirja Atras, Annikki Linturi*



1. *Entrance hall*
2. *Preparatory room*
3. *Sacristy*
4. *Church hall*
5. *Congregation hall*
6. *Kitchen*
7. *Offices*
8. *Club room*
9. *Bell tower*

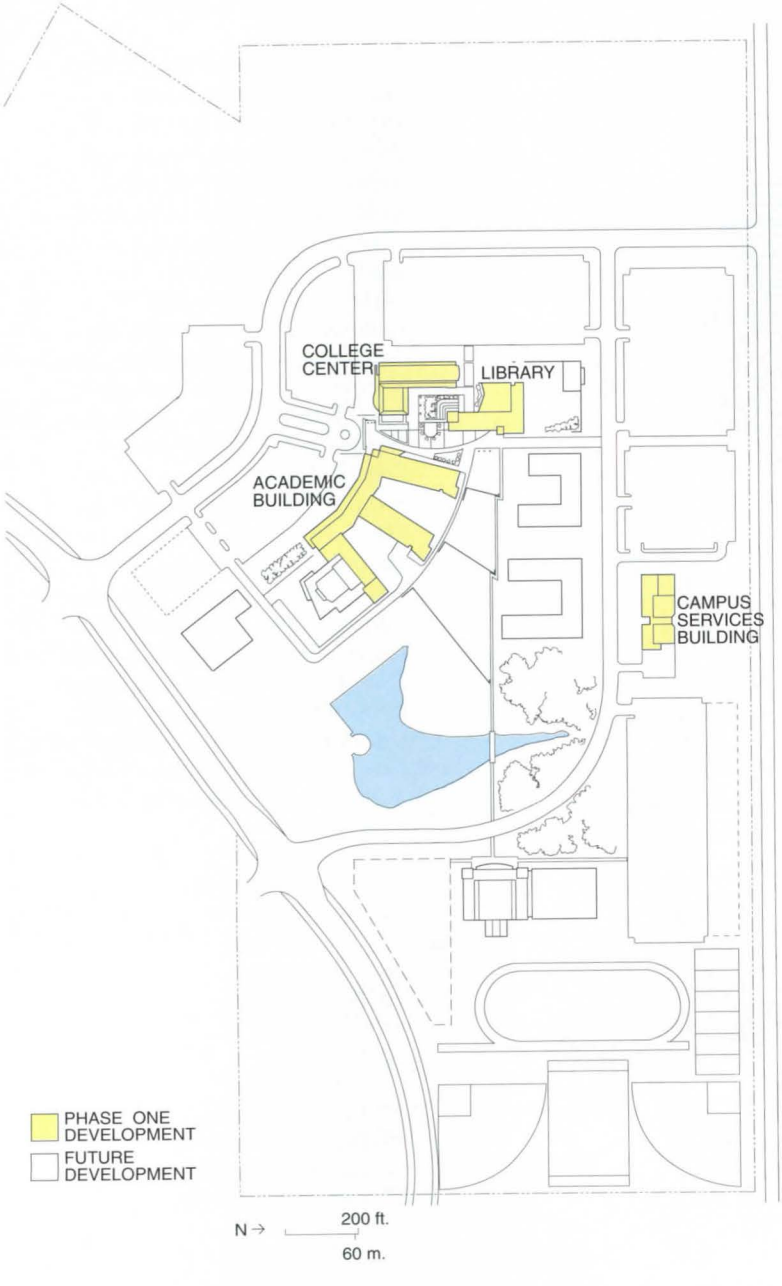


GROUND FLOOR

Community Action

St. Charles County Community College
St. Peters, Missouri
Cannon/Pearce Turner Nikolajevich, Architects

The academic building's stair tower (opposite) serves as a campus landmark. Set on 140 acres of former farmland (site plan below), the college's four buildings enclose 206,000 gross square feet of space—the academic building accounting for 112,000 square feet, the college center 37,000 square feet, the library 41,000 square feet, and the services building 16,000 square feet.



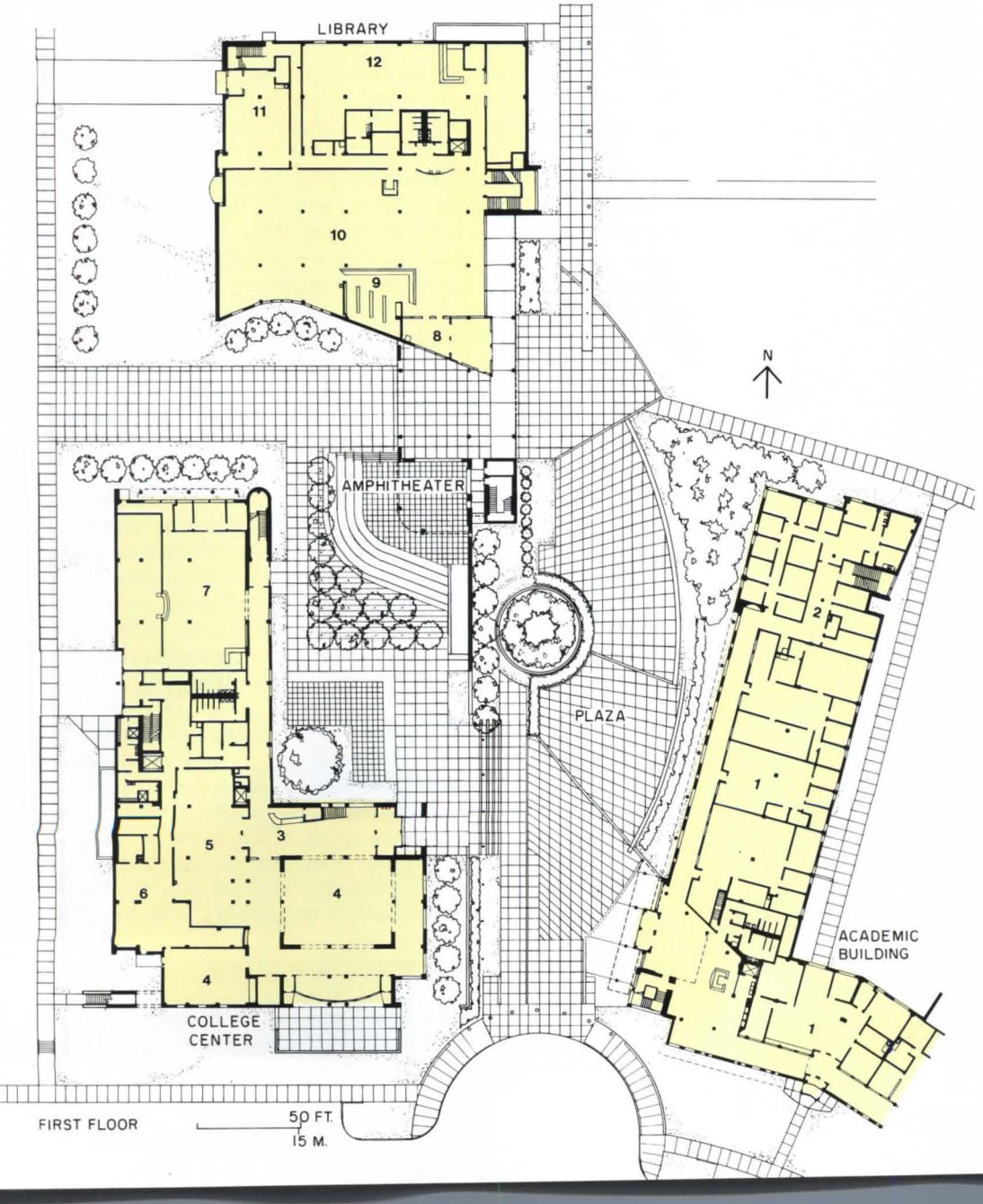
The problem with most community colleges is their remarkable lack of community. In their headlong effort to make higher education available to people with daytime jobs or other responsibilities, these institutions have become the pedagogical equivalents of strip shopping centers—emphasizing easy parking and short visits. Not surprisingly, they tend to *look* like shopping centers. St. Charles County Community College, a 4,200-student school in a rapidly growing suburban area outside of St. Louis, is a striking exception to this rule-of-thumb.

Without short-changing the special needs of students who commute (often more than once a day), Cannon/Pearce Turner Nikolajevich created a true campus out of 140 acres of farmland. One key to the school's success is its compact site plan. It clusters the first phase of buildings around a series of outdoor spaces that are more urban than rural in character. This strategy provides ample parking around the perimeter of the campus, while letting the main buildings look onto landscaped courtyards in the foreground and rolling hills beyond. "We had to create the sense of a campus with just a few buildings to start with," explains George Nikolajevich, the principal in charge of design. Packing the buildings together and consolidating many functions in a multi-fingered academic building helped form an efficient plan and prevented "the outdoor spaces from leaking out," says Nikolajevich. An admirer of Eliel Saarinen, Nikolajevich says he studied the way Saarinen manipulated spaces between buildings at Cranbrook Academy in Michigan.

Formerly located in scattered buildings in the town of St. Charles, the college now occupies three buildings on its new campus—an academic building with most classrooms and administrative offices, a college center that serves as a student union, and a library. A campus services building, just outside the campus perimeter, houses machinery that supplies power, heat, and air conditioning for the other buildings. Using steel-frame construction with brick, lightly tinted glass, and translucent wall panels, the architects designed 206,000 square feet of space within a tight construction budget of $18 million. While many other community colleges consist mainly of two-story "pancake" buildings, Nikolajevich and his associates worked hard to add height to both interiors and exteriors at St. Charles. As a result, the academic building is three stories with a skylit spine rising its full height and a stair tower anchoring one corner. The college center features a soaring dining facility with a two-story space in the middle and three-story areas on three sides. Extensive use of milky-white translucent wall panels in places such as the main stair tower and the college center brings daylight into the buildings without wreaking havoc with energy consumption; at night these panels let the buildings glow from inside.

The academic building's floor plan allows each major department to occupy a different finger, with faculty offices at the end of each double-loaded corridor. Classrooms and faculty spaces are on the first two floors, while administrative offices are on the third. Offices providing heavily used services line one edge of the main spine's ground floor, tucked behind aluminum storefronts that can slide down after hours. By bending the spine slightly, the architects helped reduce the apparent length of the corridor and introduced a welcome sense of animation. Because it faces south, the spine's glazing is limited to triangular windows, vertical strips, and clerestories.

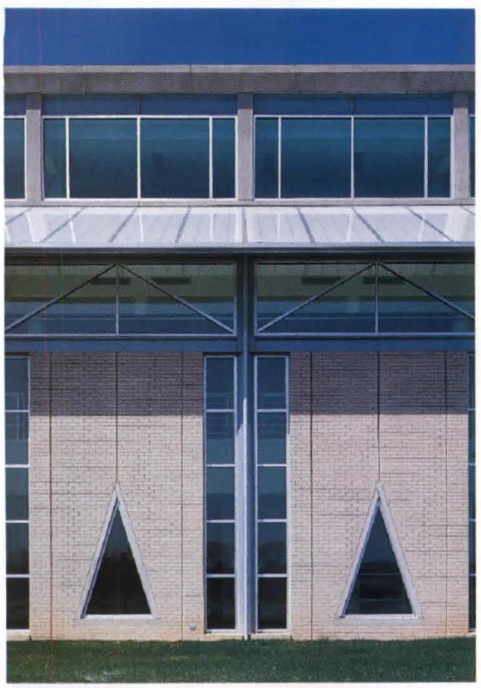
Completed before Pearce Turner Nikolajevich merged with Cannon earlier this year, the new campus has given St. Charles a higher profile that has helped attract more students. *Clifford A. Pearson*



The campus offers a variety of outdoor spaces that range from rolling hills to a paved amphitheater (left) to a covered terrace tucked underneath the second floor of the library. Understanding the importance of the relationship between outdoor and indoor spaces, Nikolajevich and his design team worked with landscape architects Austin Tao & Associates from almost the beginning of the design process. Contact between indoors and outdoors is enhanced by elements such as a terrace adjacent to the dining facility, generous glazing in circulation spaces, and carefully framed views from all buildings.

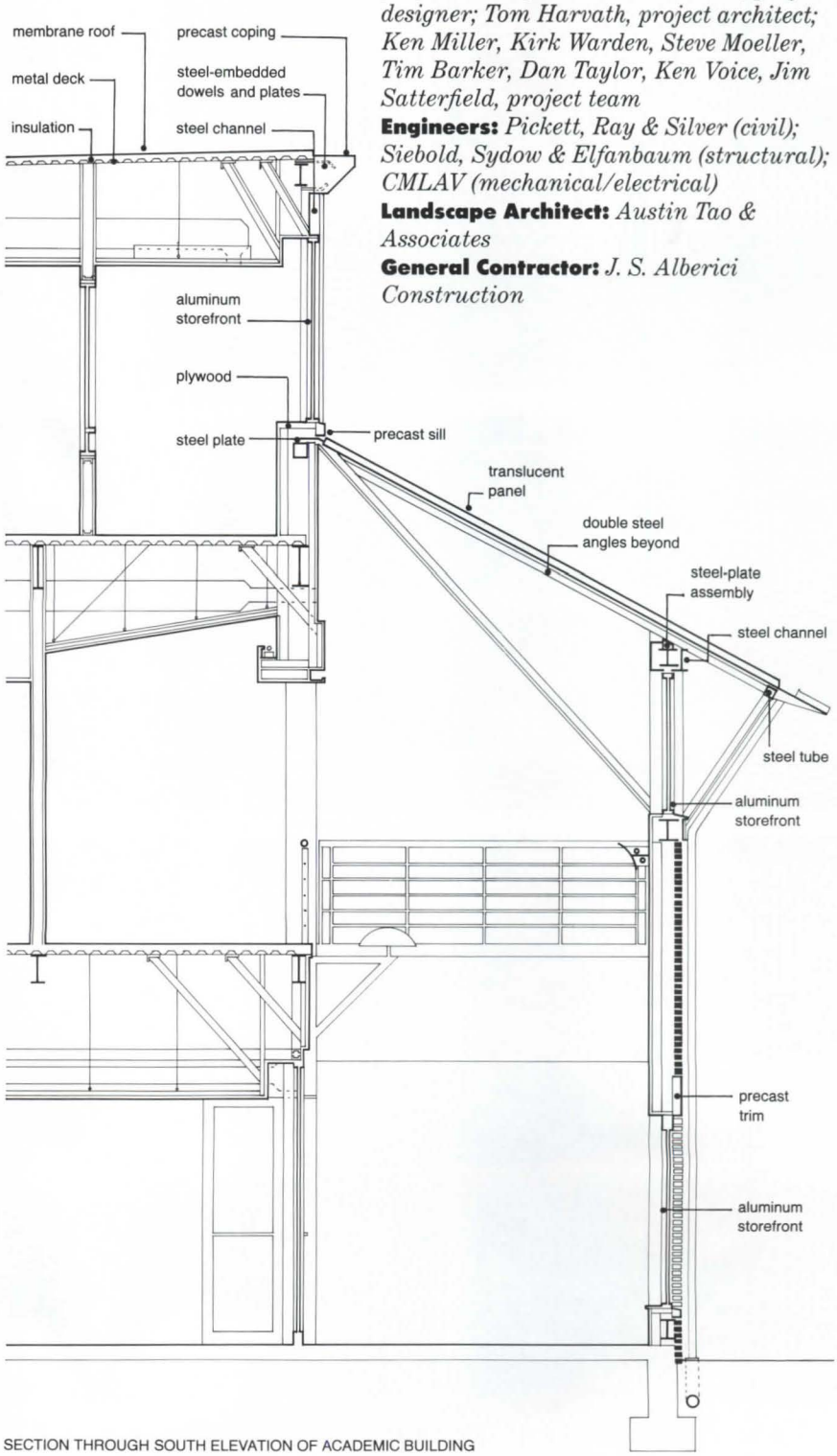
The academic building (top opposite) houses classrooms and faculty offices on its first two floors and administrative offices on the third floor. The building's three-story circulation spine faces parking on the south, making access convenient for students who commute. Double-loaded classroom corridors extending from the spine, however, look onto quiet outdoor areas. By recessing the entry to the library (middle opposite) and carving out a covered reading terrace, the architects were able to wrap the ground-floor reference room with glass on two sides and not flood the space with too much direct sunlight. The L-shaped college center (bottom opposite) serves as the student union with dining facilities and a bookstore on the ground floor and a variety of meeting rooms above.

1. *Student services*
2. *Faculty offices*
3. *Information*
4. *Dining*
5. *Food service*
6. *Kitchen*
7. *Bookstore*
8. *Security*
9. *Circulation desk*
10. *Reference/reading*
11. *Technical processing*
12. *Computer center*



The main spine of the academic building (opposite and section below) is a three-story skylit space. Classrooms and faculty offices are on the first two floors, while administrative offices are housed on the third floor.

Credits
St. Charles County Community College
St. Peters, Missouri
Owner: *St. Charles County Community College*
Architect: *Cannon/Pearce Turner Nikolajevich—George Nikolajevich, partner in charge of design; David Pearce, project manager; Mark Banholzer, project designer; Tom Harvath, project architect; Ken Miller, Kirk Warden, Steve Moeller, Tim Barker, Dan Taylor, Ken Voice, Jim Satterfield, project team*
Engineers: *Pickett, Ray & Silver (civil); Siebold, Sydow & Elfanbaum (structural); CMLAV (mechanical/electrical)*
Landscape Architect: *Austin Tao & Associates*
General Contractor: *J. S. Alberici Construction*



SECTION THROUGH SOUTH ELEVATION OF ACADEMIC BUILDING

Material concerns

"St. Charles is a brick county, and brick was the most economical way to go," says Nikolajevich, explaining his selection of building materials. But the architect didn't want the community college to look too heavy or somber. So instead of large swaths of traditional red, he and his associates specified a variety of tan, yellow, and brown brick. "Brick needs shadow, the right proportions, and complementary materials to make it work," states Nikolajevich. On the south face of the academic building (above) the architects used slender vertical reveals that add shadow and scale to the material and combined it with glass, metal, and translucent glazing. The campus services building (top) uses a few different materials—corrugated aluminum and pop-out metal panels—but to similar effect. By specifying materials with a range of transparency, translucency, and solidity, the architects helped define the character of each building.

Academic Pioneers

Tod Williams and Billie Tsien acknowledge the spirit of Thomas Jefferson's University of Virginia, but impose their own identity on a new quadrangle.

The New College
University of Virginia
Charlottesville, Virginia
Tod Williams Billie Tsien & Associates, Architect
VMDO Architects, Associate Architect

© *Michael Moran photos*

Adding to the much revered campus of the University of Virginia is a daunting assignment for any architect. New York City-based Tod Williams and Billie Tsien, who got a commission to design dormitory space for 525 students and an adjacent dining hall, respected University founder Thomas Jefferson's ideas about creating enclosed outdoor spaces and his use of materials, but imposed on the given program their own perceptions and style.

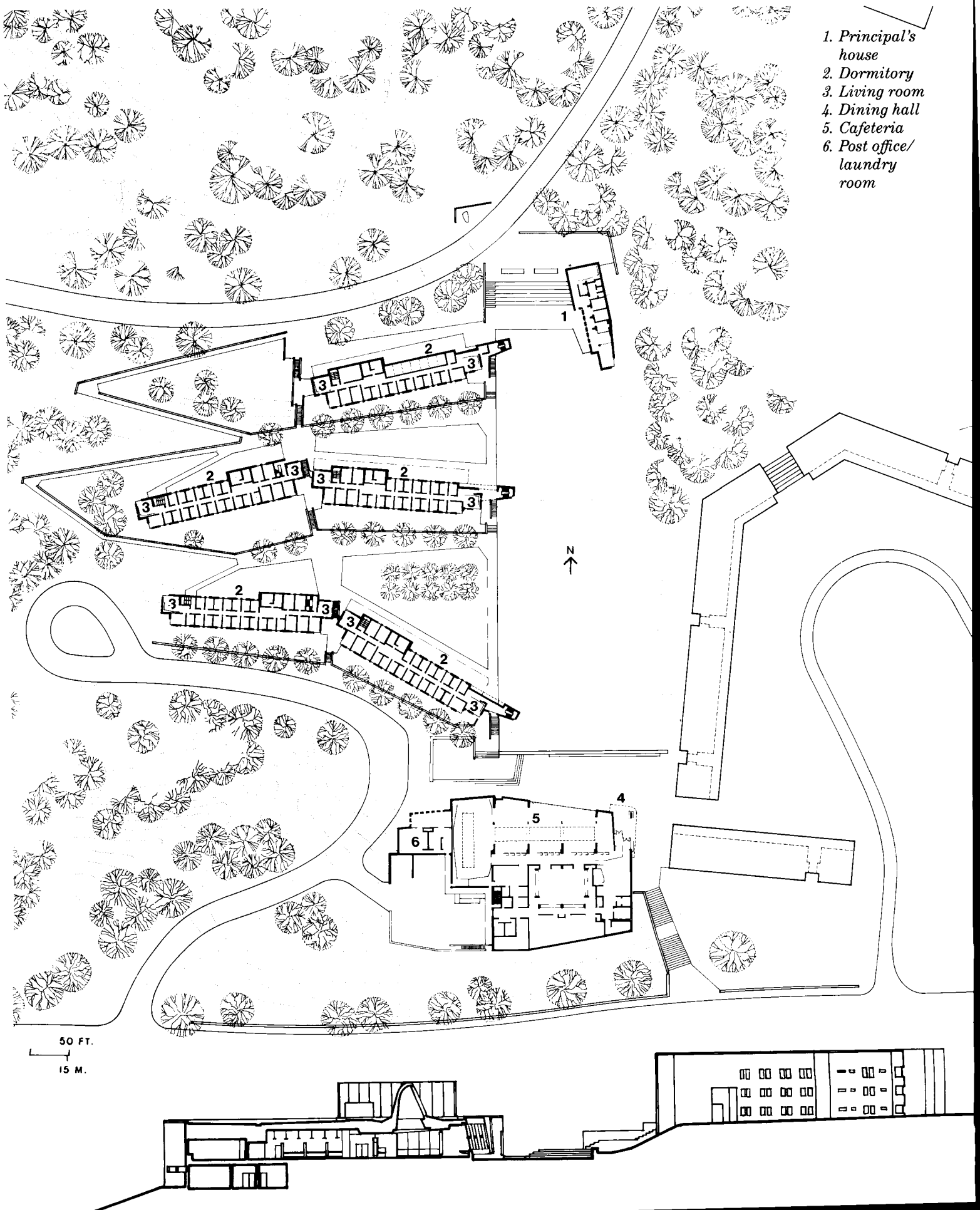
The University's planning office submitted six sites to the administration as potential homes for The New College. The last on the list—the site furthest from the famous Jefferson "Lawn"—was selected, because as local architect David Oakland of VMDO Architects explains: "It had the least potential for any other type of development." Bounded on the north and west by existing forest, to the south by single-family houses (many rented by students, the majority of whom live off-campus), and on the east by a dormitory complex built in 1985, the steeply sloping 11-acre site had few obvious charms. The architects, however, saw it as a chance to create a world of their own, a plan which coincided in part with the University's tentative foray into the "residential college" model of self-sufficient living-dining precincts that, among other alleged virtues, lessens the influence of fraternities and sororities on campus.

The architects exploited the site's distant mountain views and inherent but not obvious drama by stepping long finger-like dormitory blocks down the hill: two double-bay blocks pivot from central stair towers toward the dining hall at the bottom of the hill, while a lone half-block angles toward the principal's residence, which presides over the complex. Of the project's kinship to Jefferson, Williams and Tsien claim: "[It] shares with Jefferson's vision the desire to create a place with a strong sense of both center and edge; a contained space that feels whole . . . "

While building heights vary from 30 feet to 40 feet due to the slope of the site, the overall effect is of low-slung retaining walls set into a cascading terrain. Precast concrete floors and ceilings are framed by walls of concrete block with a ruddy brick facing. (In the Jefferson tradition, the brick was made by hand in wood molds, even though the architects thought machine-made brick to be more authentic to our time.) Flat roofs are edged by 4-inch-thick slate coping to emphasize the horizontality of the forms. Dormitories have double-loaded corridors with communal areas at each end. Rooms are primarily single-occupancy, but changes in grade provided space for some loft spaces and suites, which are used as faculty apartments.

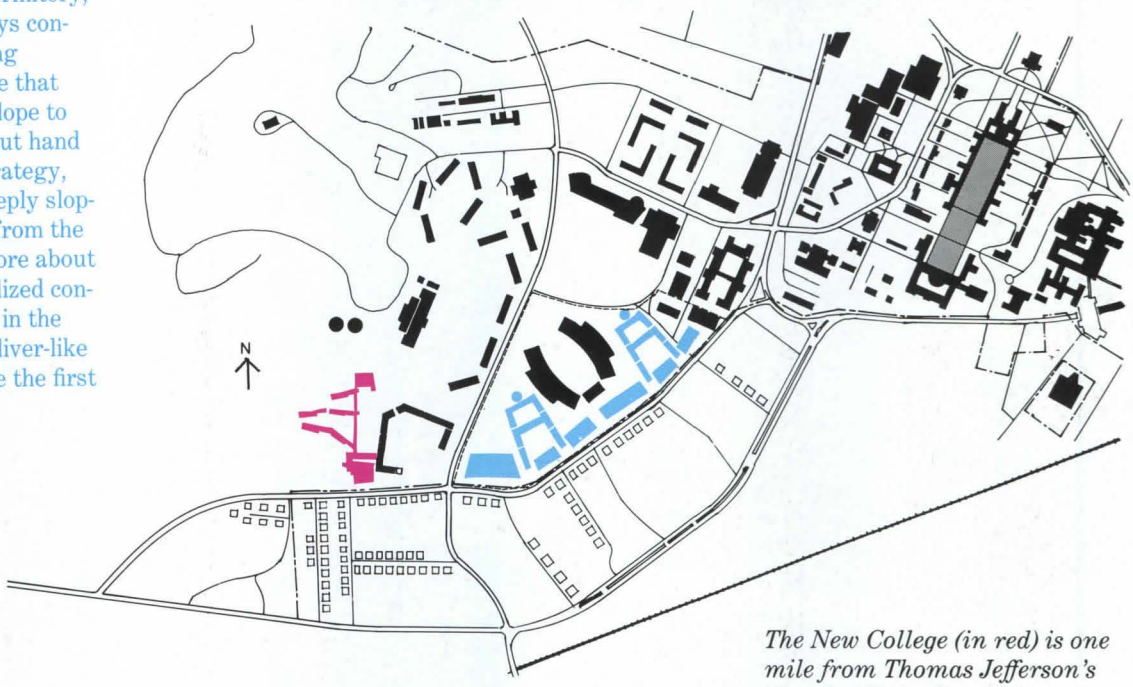
The absence of overt Jeffersonian motifs at the New College has drawn mixed reviews from students and faculty. Admired for its sculptural elegance, the complex has been criticized as too stark, too cerebral. Yet college principal Mel Cherno reports that dormitory space is oversubscribed. Adds architecture student Laurie Edwards in an article published in a University newspaper: "[The New College] is for any human being who has ever been inspired to climb a hill to enjoy a view. It is for anyone who has witnessed the changing colors of sunlight across a brick wall as the golden afternoon turns to blue twilight." Clearly the complex can be judged on its own terms, with Jefferson as a kindred but distant spirit.
Karen D. Stein

Photographed from an airplane (left), the dormitories of The New College look like fingers splayed on a tilted surface. "Knuckles" are narrow passageways between blocks. The dining hall is at the bottom of the hill (above and opposite).

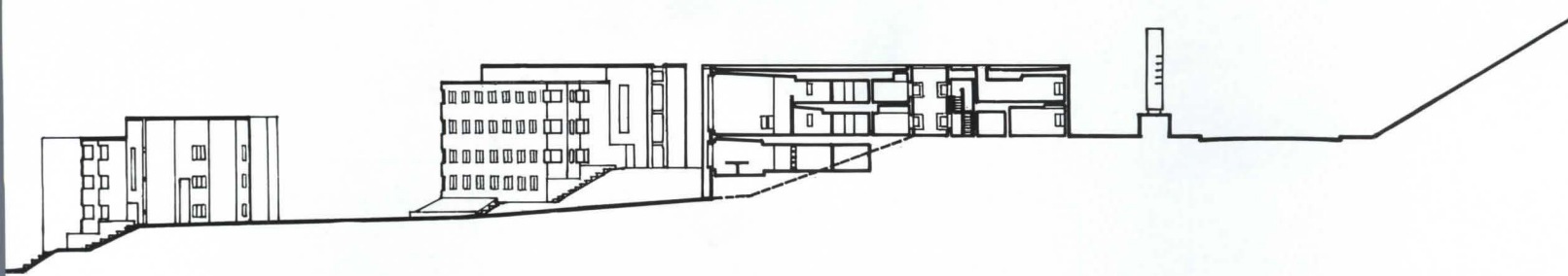

1. Principal's house
2. Dormitory
3. Living room
4. Dining hall
5. Cafeteria
6. Post office/ laundry room
N
50 FT.
15 M.

Up Close

Building a new quadrangle. The architects were able to combine the budgets and programs of two separately funded projects—dormitories and a dining hall—to create a residential college, only the second such living-dining facility at the University of Virginia. The steep slope of The New College's 11-acre site did not permit a traditional four-sided quadrangle. Instead, architects Tod Williams, Billie Tsien, and Charlottesville-based David Oakland of VMDO Architects located the dining hall at the bottom of a 60-foot drop in grade and stepped the five dormitory blocks—in two pairs and a single—up the hill, a clear departure from Thomas Jefferson's "academical village." At the top of the hill is the principal's residence, which frames the outer edge of the College's own great lawn. A plaza in front of the dining hall connects to an adjacent 1985 dormitory, which shares the cafeteria. Pathways connect dormitories, including a winding sidewalk up the west side of the site that maintains less than a five percent slope to accommodate wheelchair use without hand railings. Of the overall planning strategy, Williams and Tsien state: "This steeply sloping site is so far in time and space from the Jeffersonian lawn that it seemed more about the frontier, the edge, than the civilized containment of the terraced courtyard in the academical village. Thus the long sliver-like buildings of the dormitories are like the first walls erected by new settlers."



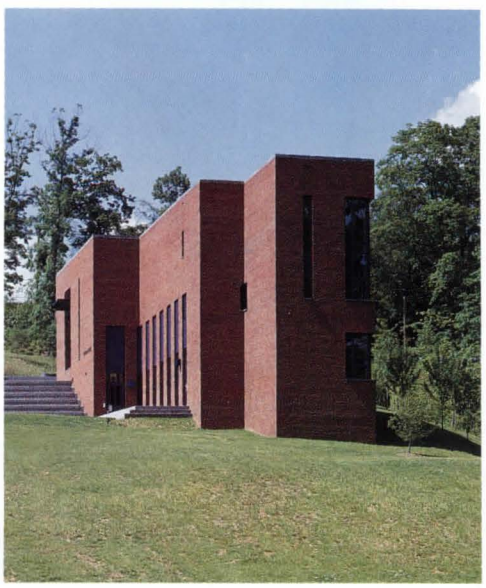
The New College (in red) is one mile from Thomas Jefferson's "academical village" (in gray). The architects also studied possible locations for future dormitory construction (in blue).



A blue-painted steel canopy with translucent panels and flat, steel columns marks the entrance to the dining hall (top right). It also screens a plaza that unites The New College, adjacent Gooch-Dillard dormitory (not shown—it shares the cafeteria), and a pedestrian thoroughfare to Stadium Road and the rest of the campus (bottom far right).

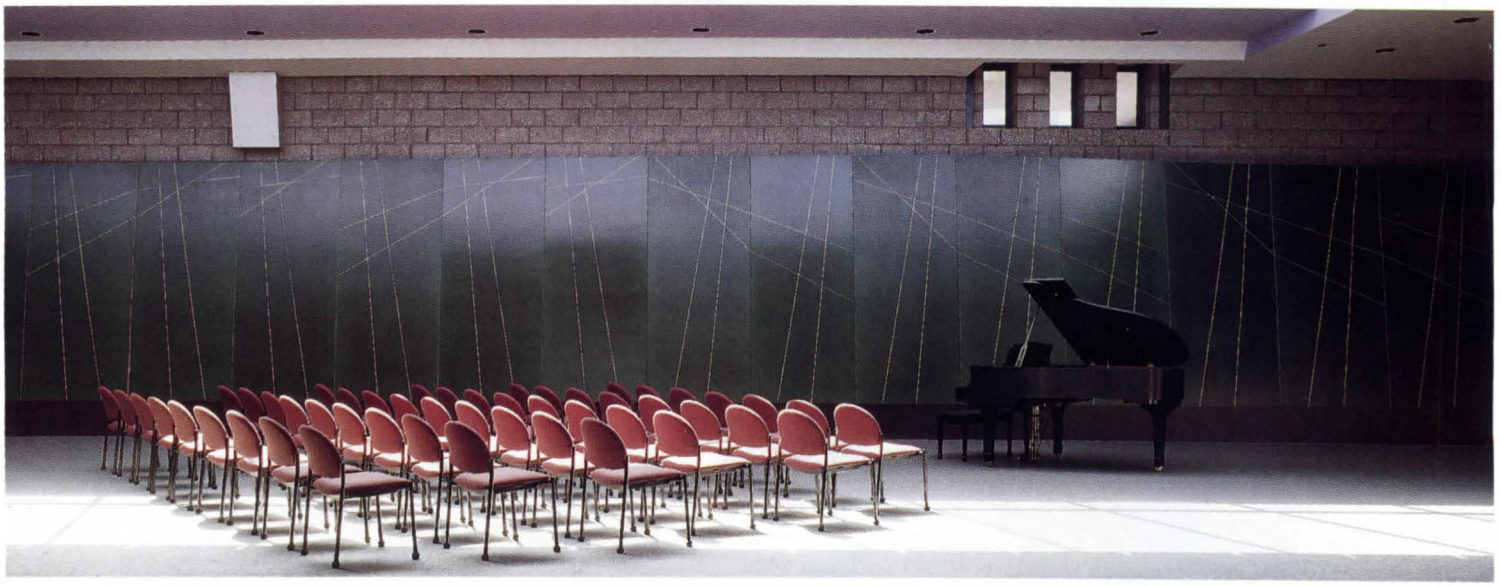
The New College dormitories are arranged in three rows set into the hillside. At the top of the hill is the principal's residence—two floors of living space with computer and study rooms for students below facing a concrete outdoor amphitheater (middle right and bottom near right). Mel and Dee Cherno, now in their second year as residential college principals, consider The New College's architecture ideally suited to its role as a living-dining facility, a new hybrid for the University.

Detailing of the structures emphasizes their dense horizontality. For example, an unusually dark mortar is used in 3/8-inch-thick horizontal joints that are raked to create a shadow line; blue-painted aluminum-frame corner windows, recessed eight inches from the face of the wall, are framed top and bottom with two-inch-thick slate that projects slightly over the brick to accentuate the horizontal (opposite).



A tight $94-per-square-foot budget did not permit use of costly materials. Inside the principal's residence (this page) and dining hall (opposite) walls are ground-face concrete block. For "decoration," the architects used colored Finnish plywood panels as red sliding doors between master bedroom and hallway (bottom left) and as an inexpensive curved and canted green "mural" in the assembly hall (grooves in the panels add texture). Fluorescent light fixtures are hidden by custom aluminum shields. Other fluorescent and incandescent fixtures are recessed or hung from soffits in the cafeteria, where north- and west-facing windows and clerestories provide daylight.

Credits
The New College
University of Virginia
Charlottesville, Virginia
Owner: *University of Virginia*
Architect: *Tod Williams Billie Tsien & Associates—Tod Williams, principal-in-charge; Brett Ettinger, Billie Tsien, Vivian Wang, Martin Finio, Rick Gooding, Annie Chu, Marwan Al-Sayed, Erika Hinrichs, David van Handel, Matthew Pickner, Kevin Chu, project team*
Associate Architect: *VMDO Architects—David Oakland, principal-in-charge; Daniel Simpson, Jr., Todd Bullard, Jeffrey Dreyfus, Brian Broadus, Karen Boyd, Terry Scott Forbes, Randy Liverman, John Kisner, Micah Rosen, project team*
Engineers: *Gloeckner & Osborne (civil); ECI Engineers (mechanical/electrical/plumbing); Dunbar, Milby & Williams (structural)*
Consultants: *Nancy Takahashi (landscape); Arthur Sisca (cost); Lynn Rush (planting)*
General Contractor: *Kjellstrom and Lee, Inc.*



Paradise Lost and Found

Parks and recreational facilities help satisfy the timeless need we have for places to play. They accommodate all sorts of escapist activities, from contemplation to competition. Thousands of U. S. parks are modeled on New York's Central Park, where Frederick Law Olmsted and Calvert Vaux constructed a pseudo-18th century English garden of vast proportions inside that 19th century city.

Today such a monumental park is an anachronism—difficult to fund and maintain in decentralized cities. Cities have turned to smaller parks spread out over a larger areas, more easily adaptable to a population's changing needs. Planners are showing ingenuity in creating parks even where land is scarce.

Parks from wasteland

In urban areas, newer but smaller parks are being built on formerly polluted toxic waste sites. Two examples are Gas Works Park in Seattle, which is considered an adaptive reuse prototype, and the brand-new Mill Race Park in Columbus, Indiana (opposite left and pages 114-117). Tiny compared to Central Park, the land is still sculpted to create environmental interest for the visitor, and to incorporate found or created structures.

Twenty-two-year-old Gas Works Park on Seattle's Lake Union was once a coal-gas extraction plant, and in the 1970s occupied the last open space on the lake. Landscape architect Richard Haag's design added sidewalks, a sundial sculpture, and cleaned up and preserved many of the old gas-plant structures, not memorializing them as monuments to industrial culture, but because they look interesting in and of themselves. The park has become an icon of both the park-as-adaptive-reuse project, as well as what can go wrong when industrial sites are reused. Despite the removal and replacement of contaminated topsoil, the park's subsoil is accused of being the source of toxic chemicals leaching into Lake Union. Still, the park is extremely popular with Seattle residents.

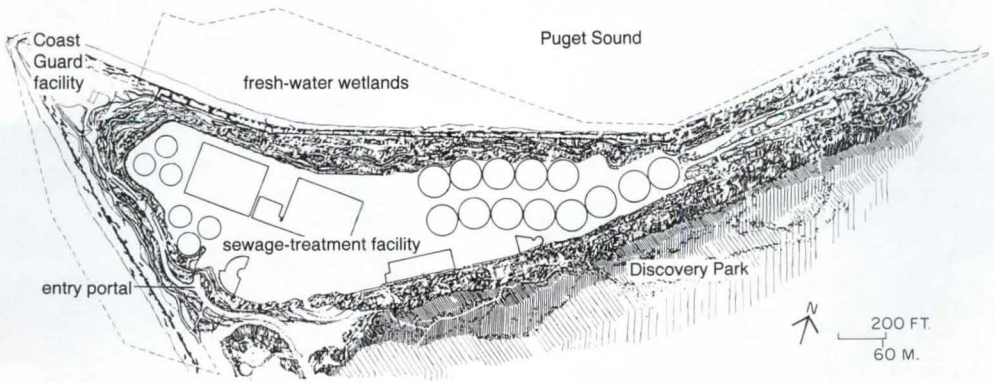
Mill Race Park, near the western edge of Columbus, Indiana, is located on an 85-acre site near the confluence of two streams that form the East Fork of the White River. This land, too, has been reclaimed—cleansed of toxic waste and pollution from a tannery. Landscape architect Michael Van Valkenburgh reused some site features, including concrete retaining walls and two existing gravel pits that were enlarged to create ponds on the site. Architect Stanley Saitowitz's follies have been carefully integrated into Van Valkenburgh's pleasing, well-ordered landscape design.

Parks over "created space"

Parks that have been built over created space are the West Point Treatment Plant [RECORD, June, 1993, pages 136-137] under construction in Seattle, and the new Riverbank State Park in New York City. Although these creative solutions still involve the same kinds of problems that challenged Olmsted, they are the result of attempts to mitigate the impacts of public infrastructure projects.

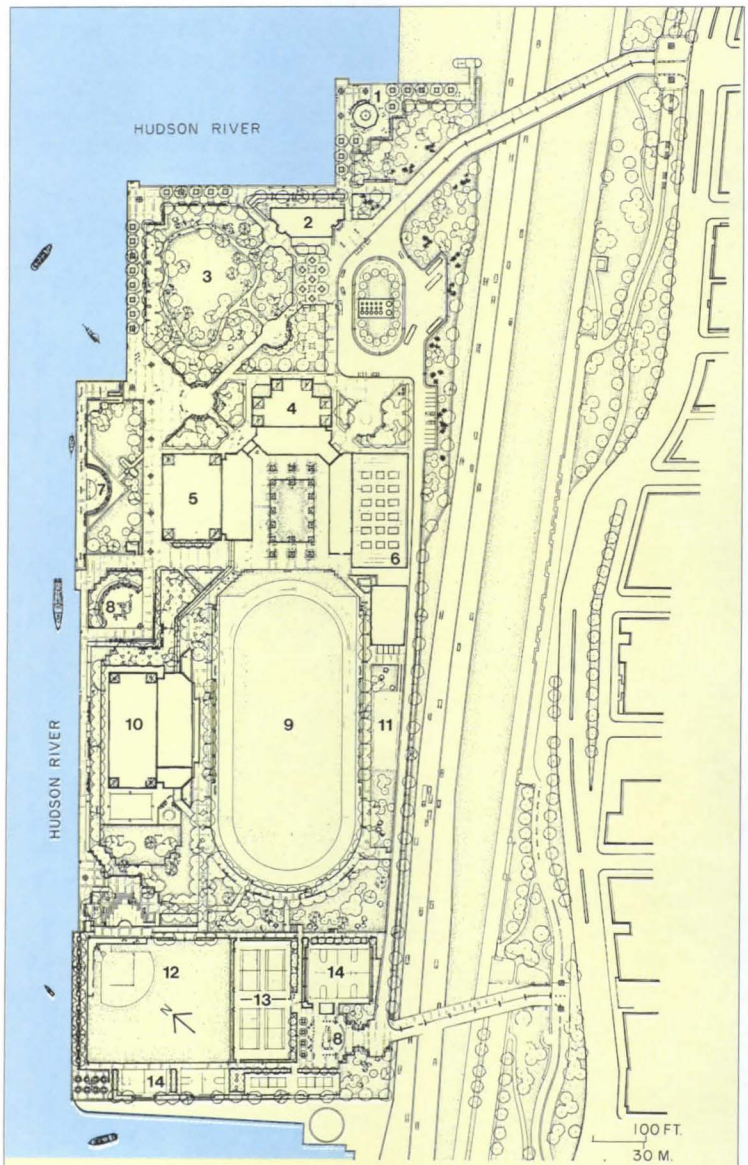
The Municipality of Metropolitan Seattle had to build the park around the West Point Treatment Plant (below) to get a shoreline use permit. It wasn't a difficult choice—locating the sewage-treatment plant elsewhere would have cost billions of dollars just to reroute sewer lines. Landscape architects Danadejieva & Koenig have designed soft earth-forms, seeded with structure-concealing native plants and grasses that will grow in over time, and nature trails. Eventually, the park will provide an additional recreation area in an increasingly crowded urban area.

The $129-million Riverbank State Park (opposite left and pages 110-113) was built on top of a sewage-treament plant occupying 28 acres. Its purpose was to soothe the negative feelings of Harlem neighbors who wished that the plant be located elsewhere. The new town-like recreation complex that architect Richard Dattner designed does not even remotely resemble Olmsted's ideal, or his design process: it evolved by involving community groups. Dozens of meetings were held stretching over several years. It is enormously popular, and is used by tens of thousands on some weekends. *Charles D. Linn*



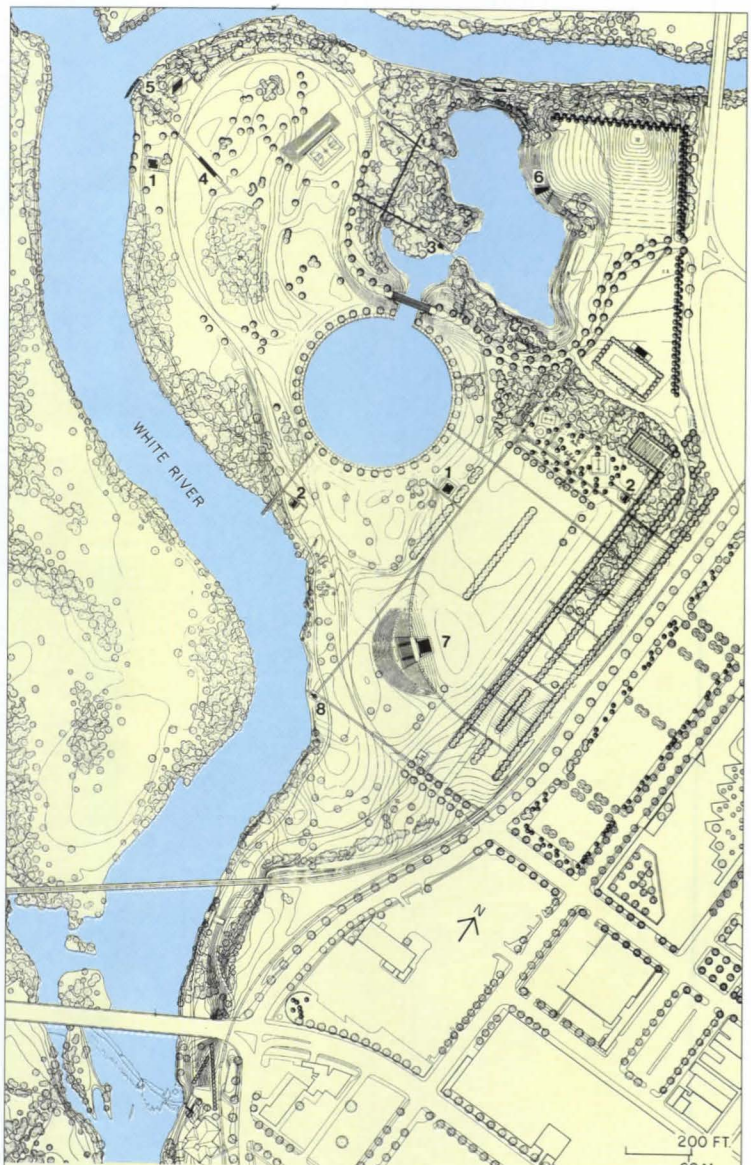
WEST POINT TREATMENT PLANT, SEATTLE, WASHINGTON

New sites for parks emerge as urban land becomes scarce and the requirements of environmental mitigation are felt.



Riverbank State Park, New York City

1. *Carousel*
2. *Restaurant*
3. *Picnic area*
4. *Cultural building*
5. *Athletic building*
6. *Skating rink*
7. *Amphitheater*
8. *Playground*
9. *Football field*
10. *Swimming pool*
11. *Community gardens*
12. *Softball fields*
13. *Tennis courts*
14. *Basketball courts*



Mill Race Park, Columbus, Indiana

1. *Restrooms*
2. *Picnic shelter*
3. *Boathouse*
4. *Arbor*
5. *River vista*
6. *Lookout*
7. *Amphitheater*
8. *The Tower*
9. *Covered bridge*

Riverbank State Park

New York City
Richard Dattner, Architect
Abel, Bainnson, Butz, Landscape Architect

Any way one looks at it, the new recreational facilities at Riverbank State Park represent a complex design challenge. Located on the Hudson River in New York City between West 138th and West 145th Streets, the $130 million park sits on top of the 28-acre roof of the North River Pollution Treatment Plant, a facility that treats most of the sewage originating from New York City's West Side.

Just the politics surrounding the park have been daunting. A Federal Court decision originally required construction of the treatment plant in 1965. In 1968, the west side of Harlem was chosen as the plant site after other West Siders successfully fought its location in their neighborhoods. The park was offered

Riverbank State Park (above) is located on the roof of a sewage-treatment plant just west of Harlem, and linked to the neighborhood by vehicular/pedestrian bridges at West 138th and West 145th Streets. A playground (right) with a spectacular river view is one of many amenities (see plan, previous page) available to visitors.

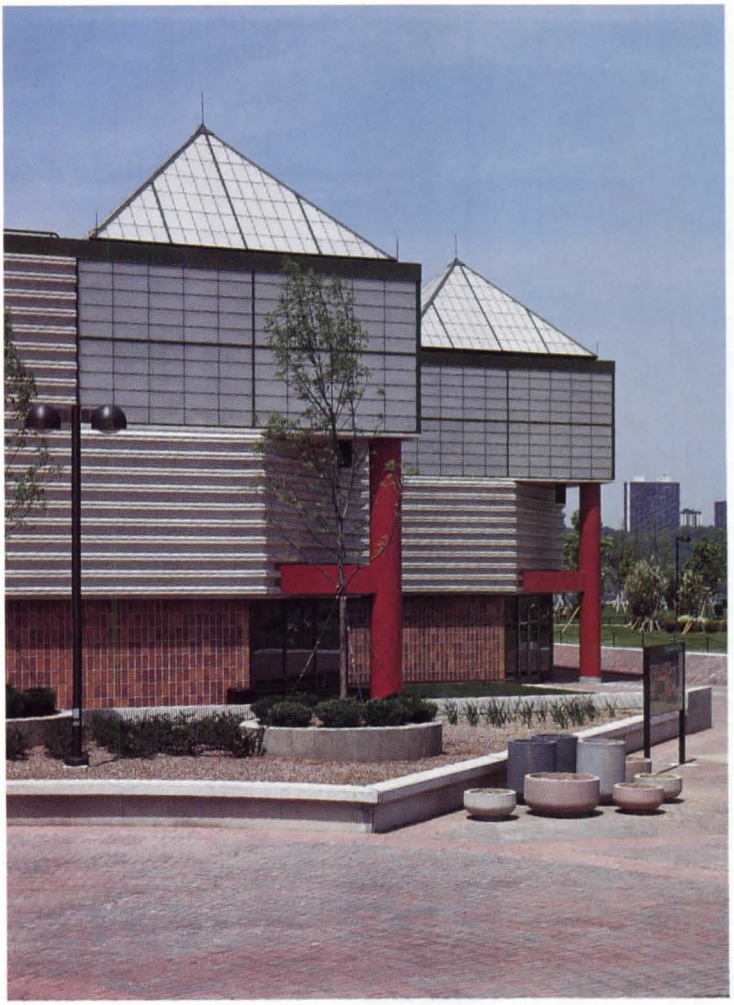
as a means of soothing angry Harlem residents who felt they didn't deserve the plant in their backyards either, and feared that odor and possibly health-threatening gases would eminate from the plant. In the ensuing 11 years, three complete designs for the park were prepared and rejected because they didn't meet community needs or were either too costly or unbuildable.

Architect Richard Dattner and his design team were selected by a committee of state officials and community representatives in 1979. Their design for the site represents almost nine years of community-based programming and design activity, document preparation, and several cycles of redesign due to value engineering. Construction finally began in 1987, nearly 20 years after the Harlem site was chosen, even as odor from the partially completed plant had begun wafting through the neighborhood, and a state budget shortfall demanded that value engineers be given another shot at the buildings. Dattner barely kept the state from taking over the design and construction of the project with its own designers, who proposed that all of the all of the landscaping be scrapped, and that metal buildings be substituted for the structures originally designed. "It would have looked like a small airport," Dattner says. Although much of the light, airy detailing of the buildings was lost, the designers kept much of the overall design intact.

Most of Riverbank State Park is 58 feet above the river. An exception is the Amphitheater and promenade (above) located only a few feet above the waterline of the Hudson. It is isolated to keep noisy events from disturbing neighbors to the east. This level is accessible via the stair/elevator tower in the center of the photo.

The layout and make-up of the overall complex, including the locations of two access bridges, was largely determined in the programming and fact-finding process. Dattner's team accepted community residents as active participants, thus easing tensions and increasing the probability that this design would ultimately be built, unlike the previous plans.

The structural system of the sewage-treatment plant itself influenced the layout of the buildings, both internally and in the context of the site as a whole. The plant rests on caissons driven through Hudson River mud to bedrock. Concentrated loads from park building columns had to rest directly on columns already supporting the floors and roof of the treatment plant—there could be no bearing walls. Thus it was necessary for the buildings' structural systems to conform to the plant's. In addition the plant itself is built of 14 independently moving sections, whose expansion joints could not be bridged by structures. As a result, lightweight metal or tile-faced panels became the building system of choice, much of it placed by helicopter before the connecting



Three views of the Cultural Building (top left and right), and the main entrance to the park. Because all building loads had to be transferred to columns that rested on columns supporting the plant, Dattner chose lightweight tile- and metal-faced panels as the primary wall system. The roof structure of the skating rink is visible to the left of the Cultural Building entrance.

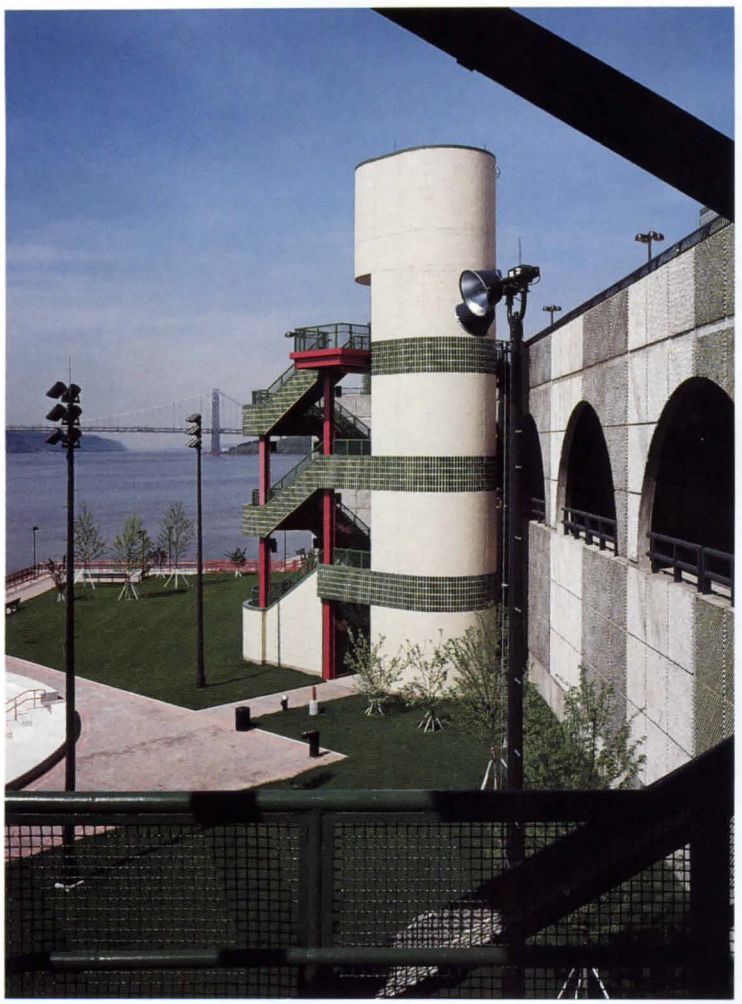
The trees and lush lawn (right) were built directly on top of the plant's precast concrete roof, where loads were limited to 400 pounds per square foot. The sod covers acres of foam panels placed in layers up to 2-ft thick used as filler to decrease the dead-load.

bridges were built.

Uniformly supported loads, such as landscaping and paving, could rest directly on the plant's six-foot deep precast concrete roof structure, but had to be limited to 400 pounds per square foot. To reduce the amount of dead- load, layers of plastic sheet foam up to two feet thick were placed beneath the earth fill.

Despite the fact that the buildings at Riverside State Park were designed over a decade before they were built, and even then endured several rounds of redesign, their age is not betrayed by layers of Postmodern frosting, a tribute to Dattner's philosophy that buildings should be timeless. The daylight admitted by the wall and roof glazing that did survive value engineering makes the facilities pleasant to be in. And despite the complexity of the site, its immediate visual contact with the river on one side and the city on the other allows visitors instantaneous orientation. The real proof that Riverbank State Park is an unequivocal success is in attendance figures: on a recent Sunday 50,000 people visited. *C. L.*

Credits
Riverbank State Park
New York City
Owner: *State of New York*
Architect: *Richard Dattner Architect*
Landscape architect: *Abel, Bainnson, Butz*
Structural engineer: *Ewell W. Finley*
Mechanical engineer: *Daniels, Barnes, Wesler & Cohen*



A view of the Hudson River, and Amphitheater stair tower (above left). The Athletic Building (left), along with most of the buildings in the park, is daylit by corner towers built of insulated fiberglass panels. Covered walkways (above) link the Swimming, Athletic and Cultural Buildings.

Mill Race Park

Columbus, Indiana
Stanley Saitowitz Office, Architect
Michael Van Valkenburgh Associates, Landscape Architect

Among architects, the small Midwestern town of Columbus, Indiana (population 32,000) is so famous that getting a commission there, no matter what size, is considered an honor. The town has a reputation as a showcase of Modern architecture, largely due to J. Irwin Miller, a local businessman and self-described "concerned citizen," who established a foundation in the 1950s to pay the fees of foundation-approved architects [RECORD, January 1990, pages 64-67].

Miller's legacy continues to grow, thanks in part to his son, Will Miller, who succeeded him upon retirement. Mill Race Park, located at the western edge of town, is the latest addition to the list of architectural attractions that includes works by Eliel and

Eero Saarinen, I. M. Pei, and Robert Venturi.

Located on a flood plain, the park occupies 85 acres where the Driftwood River and the Flatrock River meet to form the White River. Previously occupied by a tannery and a shanty town of ramshackle structures, the area was nicknamed "Death Valley" by the community. A group of local boosters calling themselves "River Rats" spearheaded the cleanup of the site. The intent, according to landscape architect Michael Van Valkenburgh, was to "create a small town equivalent of [New York City's] Central Park." Van Valkenburgh's master plan takes into account soil contamination from such tannery refuse as horse hides and hoofs: while some mature trees were removed to conform to safety codes and others were pruned to open vistas, only species able to withstand the rubble in the soil were planted. Van Valkenburgh added two 1,000-foot-long rows of Kentucky Coffee and Hackberry trees to reinforce the dominant east-west grid of Columbus. The trees are also parallel to existing tannery foundation walls, which

The amphitheater (opposite top and bottom) opens toward concrete bleachers built into the hillside and toward the great lawn below. The bleachers accommodate 1,000 spectators, while some 20,000 people can gather on the lawn for performances. The boat house (above and left) has a sloping roof atop a glass block and red-painted steel structure.

were retained as borders of a new parking lot.

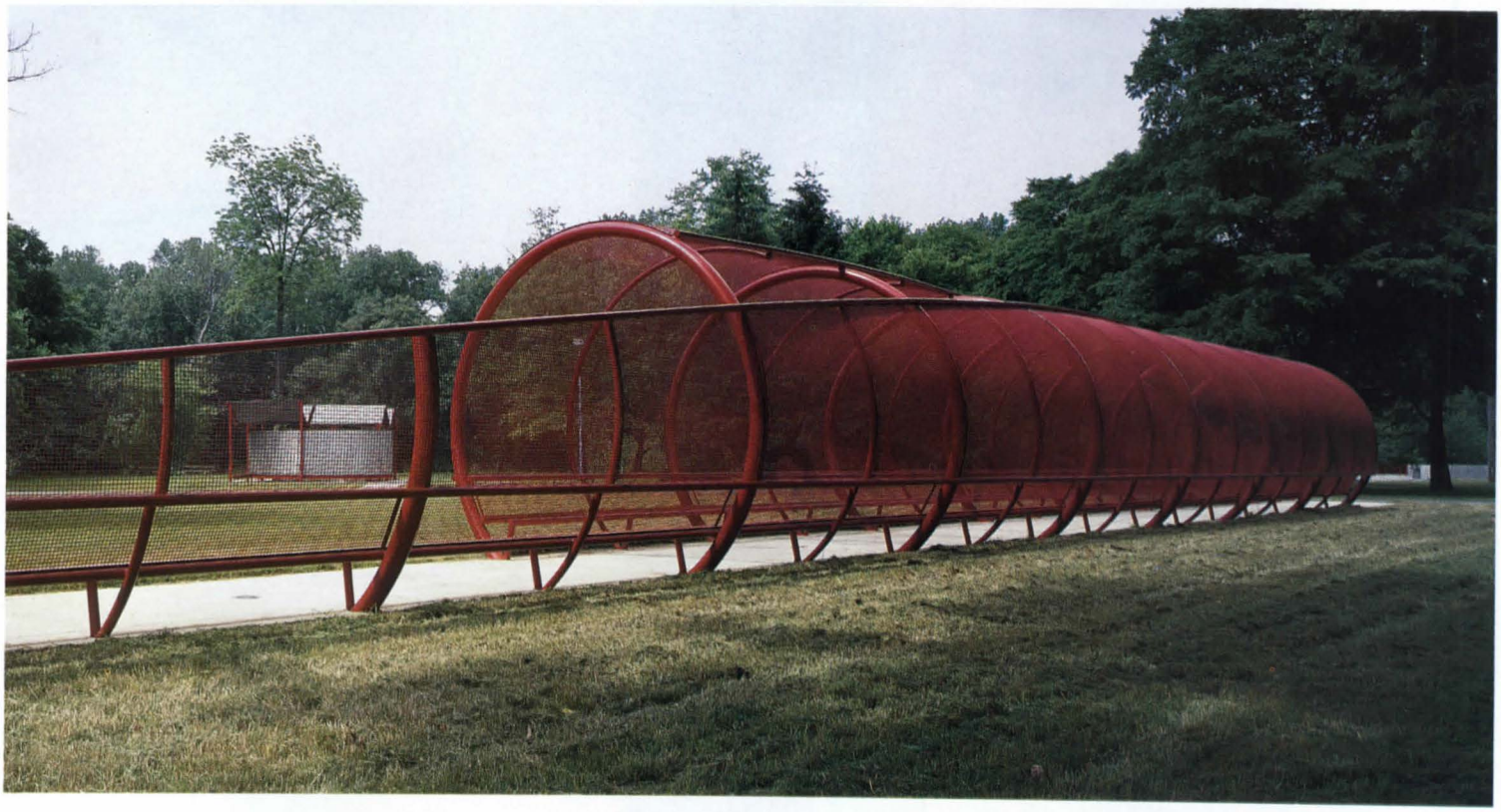
San Francisco architect Stanley Saitowitz was originally commissioned to give frank yet artful form to such utilitarian park structures as restrooms and picnic shelters. But the program grew to include an amphitheater, an observation tower, a boathouse, a fishing pier, and an "arbor," with the support of his client, the Department of Parks and Recreation, and local community groups.

An existing pond was excavated to form a 450-foot-diameter round lake ringed with cherry trees—"a symbol of democracy" says Van Valkenburgh. The dug-up earth was used as the berm of the nearby amphitheater.

Saitowitz tucked smaller structures, also of red-painted steel, among the foliage. Restrooms topped with curvy "M" and "W" letters are raised 6 inches from the ground to allow water to drain when the site floods. "The project reinterprets the idea of a folly in the park," explains Saitowitz of his Tinkertoy-like red objects dotting the landscape. "Although I had originally

planned for the steel to have a metallic silver-green finish, when the pieces were delivered with a red primer coat, the forms had greater clarity. Like the Golden Gate Bridge, they stayed red." *K. D. S.*

Credits
Mill Race Park
Columbus, Indiana
Owner: *City of Columbus, Indiana Department of Parks and Recreation*
Architect: *Stanley Saitowitz Office—Stanley Saitowitz, principal-in-charge; John Winder, Daniel Luis, John Bass, Vincent Chew, and David Lynch, project team*
Landscape Architect: *Michael Van Valkenburgh Associates—Michael Van Valkenburgh, principal-in-charge; Tobias Dayman, Laura Solano, Michael Lindenlaub; project team*
Engineer: *Santos and Urrutia (structural)*
Consultant: *S. Leonard Auerbach & Associates*
General Contractors: *W.C. Brown Welding; Dunlap; Rapp and Mundt; Taylor Brothers; Force Construction; Contractors United*



The large picnic shelter (opposite top) seats over 50 people. Restroom structures (opposite middle left and right) are 6 inches off the ground to accommodate river flooding, which occurs several times a year. A sinewy concrete wall marks the place for fishing (opposite bottom left). A tubular "arbor" spans a walkway (above), while a river overlook (far left) and an observation tower (near left) provide overall views of the park.

Kaiser Permanente Profile

Continued from page 45

too glitzy at Kaiser. "It's a balancing act," says Chester Widom, of Widom Wien Cohen architects (they're doing several projects for Kaiser). The Walnut Creek architectural review board, he says, once insisted on a granite facade, an image Widom says was "probably inappropriate for Kaiser, even if it turned out to be cheaper."

How Kaiser uses architects

Architects who work for Kaiser characterize the organization as fair but demanding. Selection is quality-based, and architects are asked to perform all of the usual design services with the exception of programming. Architects are usually responsible for shepherding projects through the state's demanding review process, but Kaiser's standards speed the reviews. A contractor is often hired during the design process to offer advice on construction techniques and estimate costs. The same contractor may or may not build the job. Kaiser negotiates much of its construction work with a selected general contractor (using a guaranteed maximum price), who bids-out the subcontracts. Denton and Bernhardt have rejected design-build as not oriented to Kaiser's long-term outlook and its need for flexibility and expansion.

As Denton admits, construction can be frustrating. "We have to build with the right amount of money and the buildings have to work. In the medical industry this can be hard to do because changing technology drives the need to change the building. We may make changes right up to the last minute, but we still want it done on time."

Wayne Ruga, who has seen facilities and met architects from all over the country, sums up the dilemma of Kaiser (and presumably the large-scale providers envisioned under the Clinton plan) thus: "They are an extremely large organization trying to provide services for a huge and very diverse population. The management problems that they're faced with in doing this are only equal to problems our government faces—agencies like the VA or the Department of Defense." How do they meet the challenge? "They've worked to understand these issues and deal with them. They are centered around prevention and education, and both aspects are very positive," Ruga responds. "When you go into a Kaiser facility, you get an immediate sense of welcome and that they want to take care of you."

James S. Russell

Construction Volume Update

Continued from page 51

to other types of public-works construction through the end of this year and into 1994.

Institutional building

The institutional-building market offered welcome support to the construction industry during the early 1990s downturn. While total construction fell 9 percent in 1990 and then 6 percent in 1991, the value of institutional starts ran counter to this trend by posting gains of 6 and 7 percent. Avoiding the boom-and-bust behavior shown by other types of construction, the slow but steady growth for institutional building has allowed it to exceed the commercial and industrial sector, from 1991 through the present.

The underlying trend for institutional building has followed the slow change of demographic developments. During the 1960s educational building was spurred by the impact of the baby-boom generation on school enrollments. More recently, the increase in births since the mid-1970s (referred to as the baby-boom echo) has supported an extended rise for school construction. Growth at the other end of the age spectrum, those 65 and over, has contributed to an increased need for health facilities. And societal changes have played a role—the tougher stance against drug-related crimes has resulted in stiffer sentences, and construction for a growing prison population.

The near-term pattern for institutional building can be shaped to some extent by the fiscal status of state and local governments, which have come under increasing stress since the recession of 1990-91. With unemployment up by 2 million persons since 1990, this has meant states have had 2 million fewer taxpayers, and 2 million more individuals receiving unemployment benefits. The National Governors Association cited state general-fund budgets as increasing just 3 percent for both fiscal 1993 and fiscal 1994, much less than the 8 percent annual growth averaged in the 1980s.

A saving grace for institutional building is that states maintain both an expense budget and a capital budget, the latter including construction projects. Fiscal stress hits the expense budget most severely, causing services to be reduced and payrolls cut. With most public projects financed by the bond market, the impact of state fiscal stress on construction is less direct. The limitations come from keeping the interest payments on debt at manageable levels, as well as the greater scrutiny given to bond issues by voters hesitant to add to the debt burden.

To the extent that institutional building experiences cyclical sensitivity, it tends to lag the business cycle—both on the way down and the way back. This occurs because much of state fiscal stress is related to the level of unemployment, which itself follows the business cycle. Once unemployment eases, income-tax revenue picks up and spending on unemployment benefits recede. Accordingly, the period of maximum stress on institutional building would be 1992 and 1993. The economic improvement expected in the latter stages of this year should aid this sector's 1994 prospects.

Activity for institutional building did stabilize in 1992 and 1993 when viewed in terms of contracting value, and in square-footage terms slipped back 7 percent from the 1991 peak. Educational building departed last year from its longstanding upward trend, but since then it has made at least a partial rebound. Offsetting this support has been temporary weakening in public buildings, specifically detention facilities, and in transportation structures such as terminals and hangars. Health facilities construction has also lost momentum from last year's heightened activity, due in part to uncertainty over

the Clinton healthcare reform proposals.

Even with this pause, institutional square footage in 1993 is estimated at 375 million square feet—still 45 percent above the early 1980s trough and much stronger than the relative status of most commercial categories.

The moderate improvement expected in 1994's economy should allow some measure of relief for state governments. The improved employment picture will expand the tax base while alleviating income maintenance payments, making possible a return to pre-recession priorities. Institutional building in 1994 is projected to climb to 395 million square feet, and post a contract value gain of 9 percent.

The one exception next year could be healthcare building, still stalled by uncertainty over the shape of the reform package. Farther out, the primary effect of the Clinton plan will be to re-emphasize the change in this market that occurred during the second half of the 1980s. That is, it will encourage the expansion of health-maintenance organizations, which deliver their services in clinic settings, probably at the expense of more costly hospitals. With expanded coverage for long-term care, nursing homes will also benefit. In general, the structural shift about to take place in this market should support generally stronger levels of building activity by mid-decade.

Income properties

This combination of multifamily housing with offices, hotels, shopping centers, and other types of commercial construction represents what has been most responsible so far for the construction industry's substandard recovery. Following a 1985 peak of $88 billion, contracting has fallen to about half that total in reaching 1992's $43 billion. In constant dollar terms, last year's income property total was more than 60 percent below its mid-1980s peak.

The boom itself dates back to the 1980 deregulation of the savings and loan industry, followed by the real-estate investment incentives contained in 1981's Economic Recovery Tax Act. Tax reform in 1986 eliminated accelerated depreciation and passive-loss provisions, and what was a workable project in 1981-86 later became a problem asset. The collapse of the savings and loan industry in 1989 and the weakened condition of commercial banks in 1990 were the end result of a decade of excess. Subsequent re-regulation brought the banking industry back to health, but it effectively removed funding available for speculative development.

Aside from these legal and financial aspects, the glut of commercial space is one essential issue to be dealt with. In the case of offices, the amount of excess space is estimated in the range of 700 to 800 million square feet—meaning if no new office space were added, it would require about three and a half years to bring supply into balance with demand.

With such an overhang of excess space, the difficulty is explaining why any new construction should take place at all. Most economic recoveries generate an increased need for space—with growing employment the excess supply retreats in at least some local and regional markets. Even with stubbornly high vacancy rates and falling real estate prices, last year witnessed an additional 85-million sq ft of new-office starts. Admittedly, the notion of a turnaround raises legitimate questions. On the demographic side, the "baby bust" group of the 1970s is reaching young adulthood at present, causing the 18- to 34-year-old cohort to shrink by five-million persons in the first half of the 1990s. This is just the group

Construction *Continued from page 121*

needed to help absorb the overbuilding of the last decade. In addition, a strong case can be made that the amount of office space needed per worker is less today than 10 years ago, given the computing and communications capabilities now possible for work at home or on the road, not to mention the increasing use of temporary workers.

Still, there are positives. The quarterly pattern for offices, warehouses, and hotels suggests that these categories have reached their "natural bottom," and the potential for change is now on the upside. As noted, a Federal Reserve survey of 60 banks points to some easing of the credit crunch. Vacancy rates, while still high, have been receding for several quarters. There is one caution in dealing with a commercial building turnaround, however: given the low starting point for these categories, the size of the percentage increase may be misleading. In all cases the absolute amount of any pickup in activity will be small by historical standards, leaving the category at a still depressed level.

Multifamily Housing—After falling to 162,000 units in 1992, the lowest level in over 30 years, multifamily housing is expected to gain some momentum during the second half of 1993. The total of 175,000 units projected for this year will be the first advance shown since 1986 for this depressed sector. Some support next year may be possible from the reinstatement of tax credits for low-income rental housing, not to mention the greater housing focus of the Clinton Administration. Activity in 1994 will rise to 190,000 units, still a very low figure.

Offices—The downward trend for offices accelerated back in the 1990-91 period, as many of the vulnerable aspects of the office market became fully realized in the midst of credit crunch and recession. The rate of decline eased in 1992 and 1993, bringing this year's total to an estimated 80 million square feet. Modest improvement was reported in mid-1993; this is expected to continue into next year resulting in a 1994 annual volume of 87-million square feet.

One point of interest for the office total—while the downturn for new construction has been severe, alteration work has been relatively stable. Accordingly, the share of office contract value devoted to alterations has increased from 20 percent in the mid-1980s to about 45 percent in 1993.

Stores and Shopping Centers—This category continues to stand apart from the other commercial structure types, since it bottomed out in 1991 at a level well above its early 1980s trough. Following last year's 6 percent gain to 184 million square feet, the upward trend will advance the store total to the 200-million square-foot level in 1993. The traditional lagged relationship of stores to one-family housing is one benefit at work here; but perhaps more important is a structural shift taking place in retailing. Large discount outlets have engaged in aggressive expansion to capture market share from high*er*-cost sellers; in this vein high vacancy rates and restrictive bank financing are not major impediments. Contracting is expected to climb further in 1994, reaching 215 million square feet.

On balance, the income-property group will stabilize in 1993 as gains for stores and multifamily housing offset the last stages of weakening from the other categories. In 1994 an 11 percent rise in contract value is expected from a very low base, which in real terms leaves the group still about 50 percent below its 1985 peak.

Manufacturing Buildings

After hovering around a level of 160 million square feet during the 1984-89 period, new

Construction *Continued from page 122*
factory construction fell sharply in sliding to 1992's 95 million square feet. This category has shown an essentially downward trend over the past two decades, corresponding to the shrinking manufacturing sector in the U. S. economy, and the tendency by producers to invest more in equipment to enhance productivity (rather than structures).

The quarterly pattern indicates strengthening occurred at mid-year 1993; this should allow an annual rise in square footage to 105 million square feet. (A sharp reduction in petrochemical work this year, however, will lead to a decline in contract value.) The pickup in the capacity utilization rate to this year's 81 percent should keep the gradual rise going; a level of 115 million square feet is anticipated for 1994. Implementation of the North American Free Trade Agreement could negatively impact this category, though its projected level is already low by historical standards.

The shape of 1994

Combining these sectors together results in a total construction gain in 1994 of 9 percent. The notable feature of this forecast is its balanced nature—growth is projected across a range of categories rather than just one or two. Housing, public works, and institutional building will advance from relative strength; meanwhile, the income properties will creep upward from a very weak position.

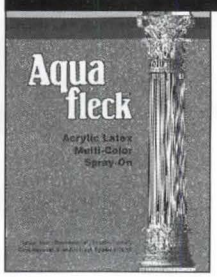
Of course, there are risks. Weak consumer confidence could derail housing, which happened in 1992 and 1993. Deficit reduction pressure at the federal level might cut back on the gain expected from the new highway legislation. Uncertainty over the healthcare reform legislation might induce a larger than expected decline in health-related construction. And, the income property group might flatten out with no upturn, despite the glimmer of an upward trend and the one pocket of strength (stores) already seen. But assuming the forecast holds, the pattern over the past two years is similar to the sequence of earlier recoveries, in that housing leads the way with support coming from other types of construction.

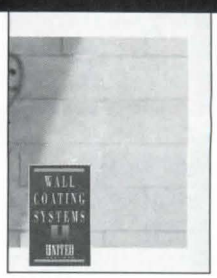
This time the recovery has a unique 1990s twist. The upturn for housing is taking place over at least three years and it is being driven almost entirely by the single-family side of the market in its early stages. For a couple of reasons, non-residential building is joining the recovery in a much more delayed and gradual fashion than in the past. Institutional building, which by its very nature avoids sharp swings, has assumed a more dominant role in the non-residential total. And the response by the commercial categories has been for the most part minimal, due to the glut of excess space, the reduced availability of funds for development, weak job growth, and corporate restructuring.

One useful piece of information for looking at the mid-1990s comes from comparing the period to the mid-1980s—regarded as the "heyday" for the industry. As taken from F. W. Dodge's Five-Year Forecast, the following points come through when looking at the 1994-98 period relative to 1984-88:

- Total construction will be close to the constant dollar total of the mid-1980s—just 2 percent behind. The composition will be substantially different, however.
- Single-family housing will show a 15 percent increase in constant dollars relative to the mid-1980s. This is due to greater numbers of units and larger house sizes.
- Public-works and institutional building are each about 25 percent greater in real terms than their mid-1980s levels.
- The income-property group, even with modest improvement, will be about 40 percent less in the five years ahead. ■

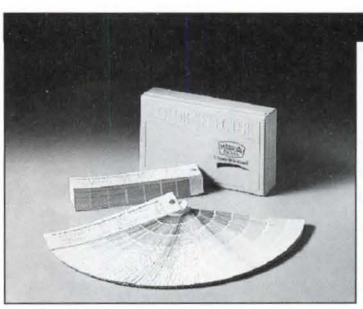
Product Literature/Paints and Coatings

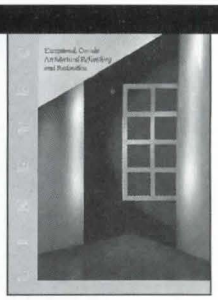




400. Latex multicolor finish
A water-based product, Aquafleck is said to offer the design and durability of alkyd multitone paints, but without odors, VOC emissions, or requiring masks during application. Non-toxic, the two-step system dries quickly and is easy to clean up. Color chart shows all base-color and fleck options. California Products Corp., Cambridge, Mass.

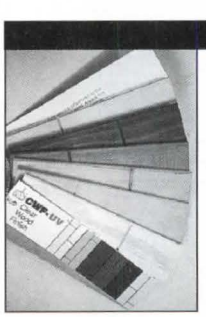
401. Surface treatments
A folder holds chips of 12 colors of high-performance architectural wall coatings. Offered in four problem- and surface-specific acrylic formulations, including Canyon Tone Stain, products are said to provide waterproofing, dampproofing, color uniformity, and graffiti resistance to virtually any exterior wall surface. United Coatings, Greenacres, Wash.

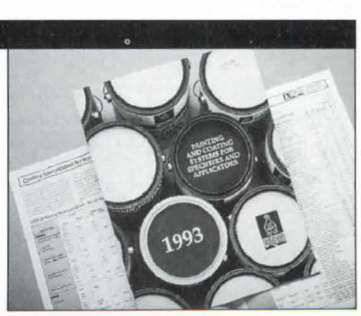




402. Historic and other paints
A new fan deck holds paint chips of over 1,850 distinct shades, including Moore-O-Matic custom colors for commercial, industrial, and residential use, as well as the 174 colors in this manufacturer's Historical Collection. Benjamin Moore & Co., Montvale, N J.

403. Field-applied coatings
A color brochure explains how this spray applicator's Field Service Division specializes in refinishing and restoring architectural finishes on column covers, cladding, curtain-wall components, and entrances made of aluminum, steel, glass, plastic, wood, masonry, brass, and bronze. Linetec, Wausau, Wis.





404. Exterior-wood toners
A fan-deck format holds sample wood strips coated with CWF-UV exterior-wood finishes in clear, cedar, redwood, mission brown, and driftwood gray, as well as an uncoated strip for comparison. Protective and decorative toners can be used on new and existing horizontal and vertical wood surfaces. The Flood Co., Hudson, Ohio.

405. Architectural paint systems
A color-coded reference guide within a 148-page catalog lists interior, exterior, and heavy-duty coating systems by VOC compliance. Other sections recommend primers and topcoats by substrate, and offer surface-preparation instructions. Complete flame-spread, performance, and other test results given. Sherwin-Williams Co., Cleveland.*

** Product Data on CAD disk*

Continued on page 129

For more information, circle item numbers on Reader Service Card.

Manufacturer Sources

Pages 80-85
Becton Dickinson Building 2
Kallman McKinnell & Wood Architects, Inc.
Brick: John Kelly, Inc. Limestone: Bergen County Cut Stone. Copper roofing: Mueller Roofing. Glass: PPG; LOF; Union County Plate Glass. Skylights: Viracon-Super Sky. Locksets: Schlage. Hinges: Stanley. Closers: LCN. Exit devices: Von Duprin. Cabinet hardware: Hafele. Acoustic tile and demountable partitions: Nasasi White. Custom woodwork: Fred Schill. Concrete finishes: Tennant. Lighting fixtures: Zumtobel. Elevators: Dover.

Pages 92-97
St. Charles County Community College
Cannon/Pearce Turner Nikolajevich, Architect
Modular brick: Acme Brick. Curtain walls: PPG. Precast concrete: Klueter Bros. Roofing: Firestone. Glass: Spectrum. Translucent glazing: Kalwall. Metal doors: Curries. Wood doors: Weyerhauser. Locksets, closers, and exit devices: Sargent. Hinges: Soss. Checks: Rixson. Suspended ceilings: Donn; USG Interiors. Paints and special coatings: Sherwin Williams. Wall coverings: Seabrook. Flooring: Fritztile. Carpet: Stratton. Indoor lighting: Sterner; Diversified. Outdoor lighting: Lumac. Hydraulic elevators: Otis.

Pages 98-107
The New College
The University of Virginia, Charlottesville
Tod Williams Billie Tsien & Associates, Architect
Wood-molded brick: Old Virginia Brick. Curtain walls and entrances: EFCO. Blue-painted steel canopy: Lynchburg Steel. Translucent cladding: General Electric (Lexan). Partition fabric: Jack Lenor Larsen. Custom woodwork: Architectural Wood products. Paneling: Fin Ply. Solid-surfacing (dining hall): Wilsonart (Gibraltar). Buckingham slate flooring: Architectural Stone Products. Outdoor lighting: BEGA. Special lighting, aluminum shields: Custom Ornamental Iron.

Pages 114-117
Mill Race Park Structures
Stanley Saitowitz Office, Architect
Glass block: Pittsburgh-Corning. Hollow-metal doors: Curries. Rolling doors: Cornell. Plumbing fixtures: Acorn. Accessories: Bobrick. Paints and stains: Tnemec. Glazed CMU: Burns & Russell (Spectra-Glaze II). Flooring: Morton (Tread-Grip); grating: IKG-Borden. Lighting fixtures: BEGA; Kim; Stonco; Hubbell; Altman Stage Lighting; Prescolite; Hydrel. Personal hoist: Gillespie Corp. Clock: Electric Time.

Correction
A report on the selection of firms to design the fine-arts facility for the University of California at Riverside [RECORD, October 1993, page 26], mentioned "invited entries by Peter Eisenman and Tod Williams/Billie Tsien, and, in earlier rounds, Steven Holl, Antoine Predock, and Michael Rotondi. . ." In fact, Steven Holl Architects was not involved; it did not submit an entry nor participate in any way. The selection process involved interviews rather than a competition.

In the same article, the firm name BOORA, one of the firms selected, was misspelled, as was Barbara Kallas' name. Frank Israel is a design consultant to BOORA.

Philadelphia Zoo Profile

Continued from page 44

be carried out. I think most architects would say that we were fairly demanding in terms of what we expected them to learn and the time we expected them to spend at the Zoo." This point of view led to unusual selection criteria. "More than anything," continues Cebul, "it came down to chemistry. Once we were convinced a firm had design and management capability, we were really looking for people with whom we thought we could share a couple of years of our lives." Zoo exhibits can be deceptively simple looking. But, says Cebul, "you've got this tremendous coming and going of humanity with all the needs to serve them with restaurants and food and trash removal. And then you've got this other world of animal needs. As an architect, you have many clients." To meet these diverse needs the Zoo often required specialists from lighting to exhibit construction. Tight budgets had to accommodate elements that could be staggeringly expensive: artificial rockwork, for example, or government-mandated air-handling requirements for off-exhibit animal-holding areas. Some projects were financed partly through city funds, which meant cumbersome procurement methods. The Zoo's management success, though, brought an offer from the State of New Jersey to help manage its new aquarium, which recently opened in Camden, near Philadelphia. The Zoo has also received an AIA Urban Design Award.

The changing of the guard

Today the Zoo faces new challenges. Donaldson died two years ago, and the search for his replacement was prolonged. Their purses tighter, the number of visitors is flat in spite of the popularity of the recently completed Carnivore Kingdom by Bohlin Cywinski Jackson. Fund-raising is harder, too, with institutions competing for fewer donor dollars.

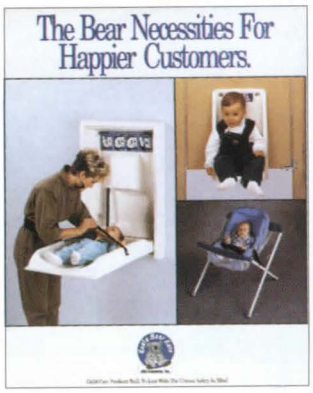
The new director, Pete Hoskins, inevitably brings a different perspective. "There's been a tremendous change in the zoo world over the last three to four years around more sophisticated notions of conservation and education," he says. "That certainly affects programming and physical plant." The Zoo is committed to an extension of the Carnivore Kingdom, called Lion's Lookout (also by Bohlin Cywinski Jackson), and a badly needed renovation of its animal hospital (Dagit/Saylor architects), and hopes to build a $10-million education center in honor of Donaldson. With these projects underway, Hoskins sees "three years plus in which to do more serious thinking about the whole Zoo." He anticipates updating the master plan and emphasizing the Zoo's education role. He expects the Zoo to be more activist in trying to turn visitors into environmentalists. In the meantime, the Zoo, says Hoskins, "is under severe economic pressure. We are almost completely dependent on dollars generated ourselves. Until 1988, the city provided $750,000 for operations. That went to zero in 1989, and we're still struggling with that loss."

Much of the staff Donaldson assembled has also moved on. Hoskins hasn't had a chance to put his own stamp on the Zoo, but Bernard Cywinski, of Bohlin Cywinski Jackson, sees him as "offering a very consistent direction so far," though possibly "less confident in the guiding of less-experienced architects." Charles Dagit, as others, suspects a somewhat more conservative regime, but says, "the [new] assemblage of creative juices there has yet to be tested."
James S. Russell

Disclosure: the author once worked as an architect on Philadelphia Zoo projects.

Product Literature Showcase

Koala Bear Kare Brochure



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Koala Corporation

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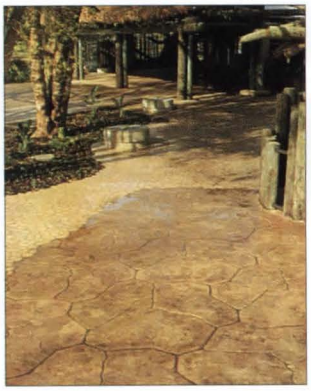

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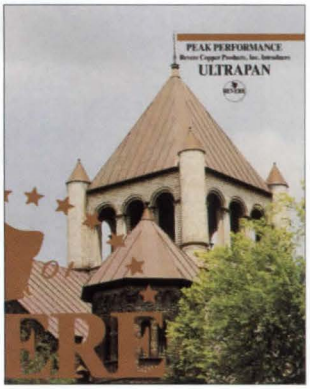

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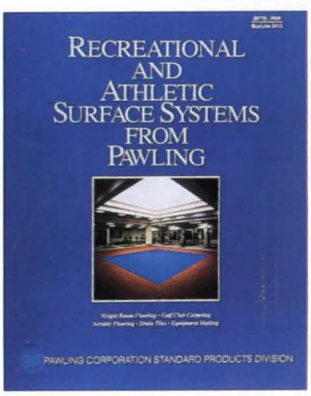

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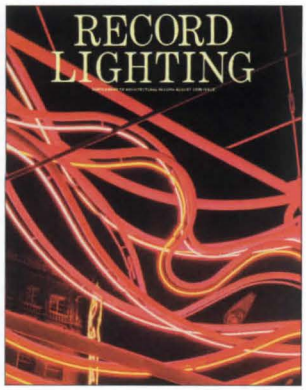

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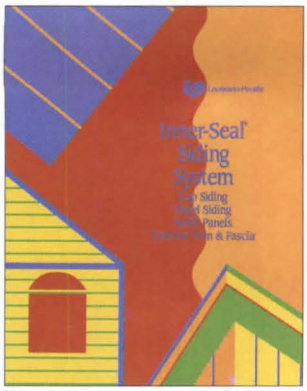

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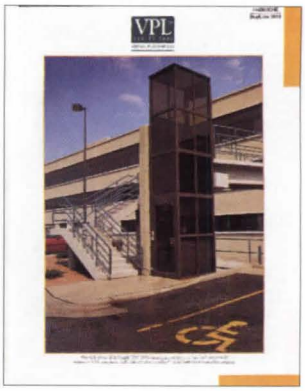

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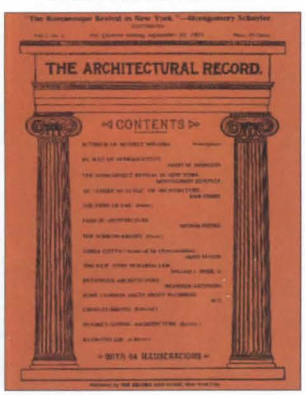

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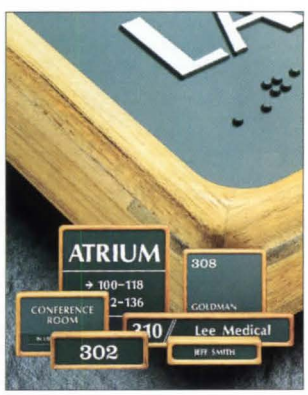

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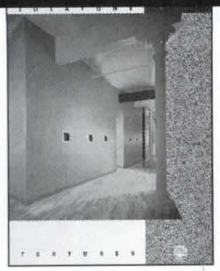
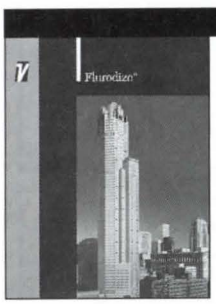
Product Literature/Paints and Coatings

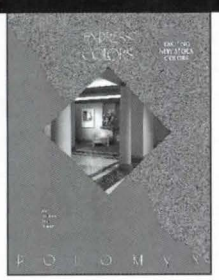
406. UV-resistant polyurethane
An illustrated case study explains how the Oriole ballpark at Camden Yards, Baltimore, obtained a high-performance, custom-color finish by coating structural steel prior to erection. The deep-green urethane chosen is said to be very resistant to ultra violet-induced fading, and can be applied by spray or brush. Miles, Inc., Pittsburgh.



407. Multicolor textures
Described as a durable, UL Class A fire-rated alternative to paint and vinyl, Zolatone multicolor wall finish comes in various degrees of texture. A specification folder holds actual samples, from marble-like creams and tans to dark granite looks. Surface Protection Industries Co., Los Angeles.



408. Curtain wall finish
"Fluorodize" coil/spray coating is said to preserve the esthetic integrity of aluminum's metallic sheen while eliminating the performance drawbacks of anodized aluminum. A brochure samples all colors and compares the finish with anodizing as to chemical-, corrosion-, and UV-resistance. The Valspar Corp., Garland, Tex.



409. Multicolor in stock
This maker's Express Colors is a selection of multicolor wall finishes—faux stones, solids, and four-color designs—grouped to harmonize across a wide color range. A fold-out chart samples all color and texture choices, available in stock. Polomyx, North Billerica, Mass.

410. High-gloss enamel
A "wet look" waterborne enamel, Mirrolac-WB is said to combine the high gloss, hardness, adhesion, flowability, and durability of alkyd enamels with the low-odor and other benefits of latex products. It can be used indoors and out on a variety of substrates, including metal. Devoe & Raynolds Co., Louisville, Ky.

411. One pass, five colors
Vitricolor, a ter-polymer, low-odor polychromatic coating system, offers a range of five distinct colors within one seamless wall texture, applied in one application. Suggested as a graffiti-resistant, cost-effective alternative to vinyl wallcoverings. Vitricon, Hauppauge, N. Y.

Continued on page 131

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University of Oregon, Department of Architecture seeks applicants for one regular faculty appointment and two visiting programs beginning fall term 1994. Design/ Technology: Asst. Prof., studio plus coursework in Structures and Construction. Frederick C. Baker Chair in Light and Lighting: Visiting Prof./Assoc. Prof., studio plus coursework related to light and lighting. Pietro Belluschi Distinguished Visiting Professor of Architectural Design: Visiting Prof./Assoc. Prof., studio plus seminar. Completed applications including application, curriculum vitae, no more than ten pages of representative research/creative practice, statement of interest and references must be received by the Faculty Search Committee, Department of Architecture, 1206 University of Oregon, Eugene, OR 97403, no later than Jan. 15, 1993. the University of Oregon is an EO/AA/ADA institution committed to cultural diversity.

Teaching Overseas The Faculty of Engineering and Architecture at the American University of Beirut (AUB) in Beirut, Lebanon has openings beginning October 1994 for teaching and research in the following fields: Urban Planning, Architecture, and Graphic Design. Applicants in Urban Planning should have a Ph.D. degree, while applicants in Architecture and Graphic Design should have at least a Master's Degree. Applicants should have a minimum of three years of professional and/or teaching experience and are expected to teach graduate courses in Urban Planning and undergraduate courses in Architecture or Graphic Design and be active in research. Salary and rank are commensurate with qualifications. Applications should include a complete resume and the names and addresses of three references. They should be sent air mail before the end of January 1994 to the Dean, Faculty of Engineering and Architecture, American University of Beirut, Beirut, Lebanon, with copy to the American Univer-sity of Beirut, 850 Third Avenue, 18th Floor, New York, New York 10022. The American University of Beirut is an Affirmative Action/ Equal Opportunity Employer. U.S. passports are presently invalid for travel to, in or through Lebanon, and for residence in Lebanon, by order of the Department of State, and therefore applications from individuals who would travel to or reside in Lebanon on a U.S. passport cannot at this time be considered.

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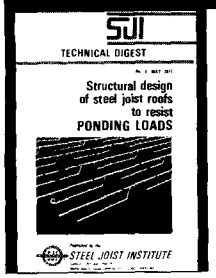
Product Literature

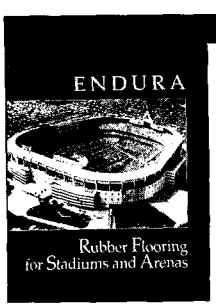


412. Steel-joist data
For $10, the Steel Joist Institute will send a 34-page technical guide to the selection of steel joists for flat roofs to resist loads resulting from accumulated water, revised to reflect current K-series joists. Data considers two framing condidions, and describes how accounting for camber and pitch reduces ponding. Steel Joist Institute, Myrtle Beach, S. C.

413. Monolithic flooring
A color brochure highlights high-performance flooring systems for many commercial and factory applications, from light-traffic areas to badly degraded floors that need resurfacing. Color options are illustrated for all flooring, including decorative quartz-aggregate materials. Tnemec Co., Inc., Kansas City, Mo.

414. Exterior restoration
A binder prepared for the architect, facility manager, and building owner covers masonry, stone, concrete, sealants, and waterproofing, as well as building cleaning and approved materials and application techniques. Cost: $49.95. Order form describes the volume in detail. The Sealant, Waterproofing & Restoration Institute, Kansas City, Mo.

415. Building-materials CAD
PC-based, AutoCAD-compatible software, USG ACTION V.2 runs under Microsoft Windows. It contains CAD and specification libraries, fire- and sound-test databases, and information on gypsum drywall systems, ceiling and floor systems, and related products, with access to on-line technical assistance. United States Gypsum Co., Chicago.



416. Rubber flooring for arenas
An application-specific brochure illustrates rubber flooring installations at large stadiums, such as the Louisiana Superdome, and racetracks, arenas, and other sports facilities around the country. Endura Flooring, Waltham, Mass.

417. Snap-together railings
A catalog on the STAR system describes aluminum fences and railings that assemble without fasteners or welding. Interchangeable parts are said to allow for unlimited fence and railing styles, from stock, in multiple color schemes. The on-site snap-together system is particularly suited to stair railings. S.T.A.R. System International, Ltd., Richmond, B. C. ■

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Publication number: 132-650

2. Date of filing—October 1, 1993.

3. Frequency of Issue—Monthly. Number of issues published annually: 12.

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5. Complete Mailing Address of Headquarters of General Business Offices of the Publisher—same as above.

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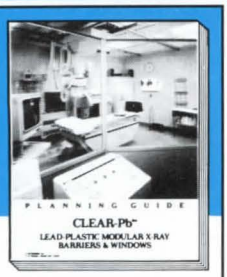

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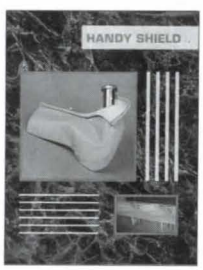

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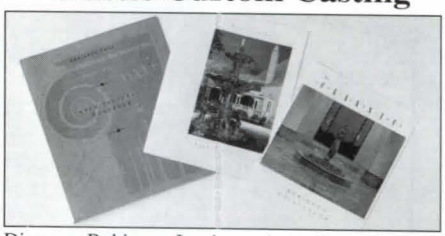

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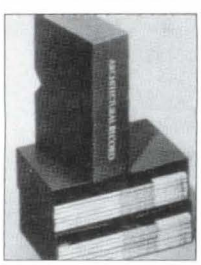

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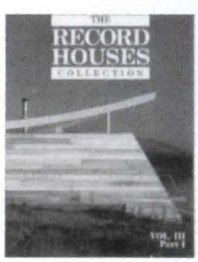

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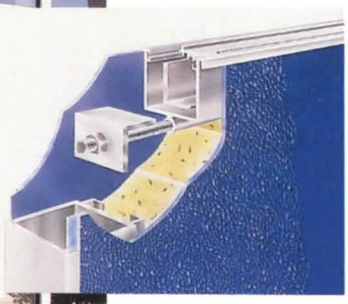

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TECHNOLOGY BROUGHT TO LIGHT

Cover:
Michigan State Capitol, Lansing, Michigan
Gary Steffy Lighting Design
©Balthazar Korab photo

California

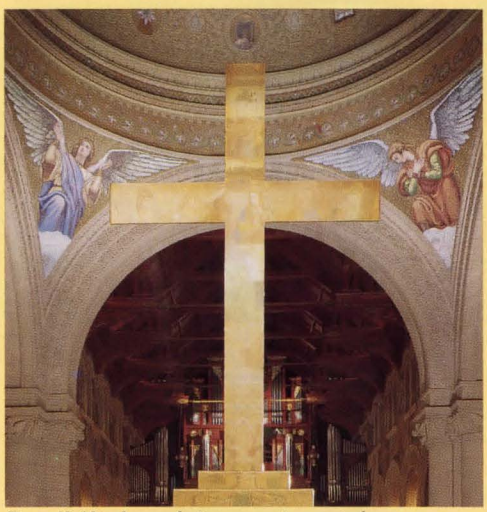
Lighting Upgrade Fits University Church For Its Multiple Missions

Stanford Church is the chapel of Stanford University, but like many of its kind, the building is sized and appointed in a way that would do honor to a bishop. It serves a variety of denominations for worship, and the entire campus for concerts, theatrical productions, assemblies, lectures, major speeches, and a continuous procession of weddings. "It is used almost every day," says Paul Helms, whose firm PHA Lighting Design collaborated with Hardy Holzman Pfeiffer on its restoration. The program began as an earthquake-driven project to cure structural problems, but well into the process it became evident that the most successful fund-raising appeals would be those that promised a significantly upgraded appearance.

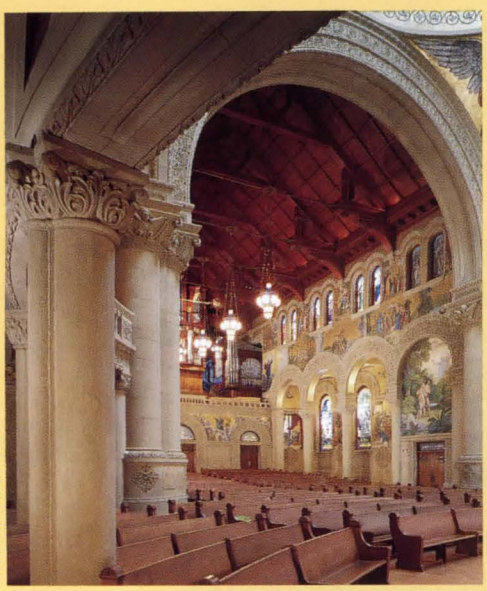
The 1913 church had been one of those vintage institutions that yielded to modernity only so far as electrifying the chandeliers; major events required temporary fixtures, wires straggling all over the floor, and generators grumbling along outside. "There was no lighting to accommodate anything but quiet, dark, private space for worship," says Helms. After jointly developing a program to capture architecture and ornament and serve widely varying events from built-in sources, HHP gave PHA a single simple directive: "Put in anything you want as long as we can't see it."

To widen the nave by visually incorporating the side arcades (bottom left), Helms used light sources on the shelves that the capitals create at the back of the columns; light bounces off the painted arcade ceilings onto both the arches and the back walls. Sources tucked into the nave cornice erase shadows that concealed the wood ceiling's color and grain. Vertical lighting booms on either side of the organ loft (bottom right) illuminate the choir and organ with angled light concealed behind the structure. Light pipes placed behind the chancel arches, and vertical booms trained on the chancel (bottom center) from left and right mezzanines, overcome shadow and limit the glare that confronts participants facing the congregation/audience, while highlighting the chancel mosaics (reflected in altar cross, top center). Quartz halogen PARs used throughout enrich the perception of warm sandstone, gold mosaics, and reddish woods.

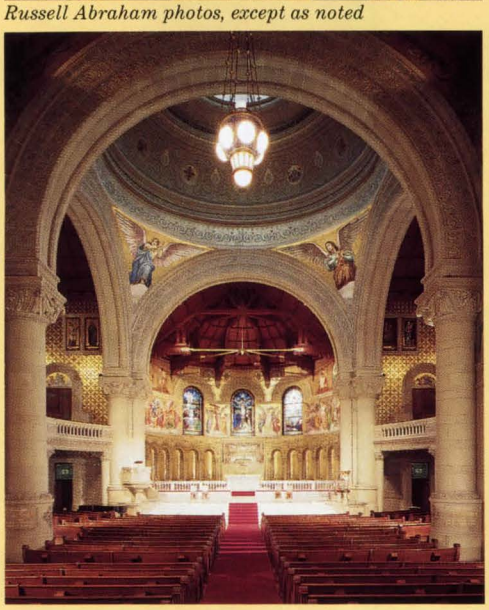
Most events need only the PARs lamps on 16-scene pre-set controls cued for intensity and instrument selection, but theatrical fixtures can be plugged in at will. Most maintenance is done from a low stepladder because, as Helms points out, "The university has one guy for many facilities." ■



Russell Abraham photos, except as noted



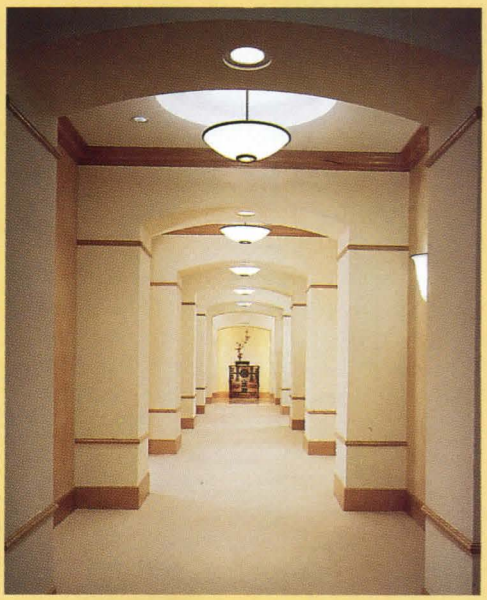
© Richard Barnes



California

An Enriched Environment for the Aging Eye

Chas McGrath photos



As health and eyesight fade, aging people begin to require more mechanical and technical support than the general population. They also have a seldom-acknowledged need for the psychological reinforcement of attractive and stimulating surroundings. At the luxury Stratford in San Mateo, which combines medical care, communal hospitality amenities, and 65 condominium apartments, Seccombe Design Associates achieved the visual contrast the aging eye requires by using warm wood finishes, a rich fabric palette, and a lighting design by firm principal Laura Seccombe, Richard Osborne then of Luminae Souter, and Naomi Johnson Miller, at the time a partner at Architectural Lighting Design and now manager of design applications at the Lighting Research Center at Rensselaer Polytechnic Institute. The goal was relatively high, glare-free, uniform light levels in all areas, with no sacrifice of visual interest. Almost all the spaces combine direct and indirect lighting to minimize extreme contrasts in the field of view, while providing high task-lighting levels and occasional highlights to avoid blandness. In the communal living room (left), the ceiling is composed of 2800K neon coves with recessed PAR30s centered in each coffer; the neon was chosen for long life, dimmability, and energy efficiency. The main floor corridor (right) uses recessed PAR30 halogen downlights, adjustable MR16 accents trained on artwork, and compact fluorescent wall sconces and pendants. PAR20 downlights built into the pendants create an even path of light on the floor, while the uplights wash out shadows on surfaces and faces. ■

Maryland

A Jukebox Serenade in Neon

The Silver Diner at Towson Town Center revives "the good old days" with a generous application of neon, incandescent downlighting, and MR16 accents reinforcing a mood created by glass-block walls, stainless-steel sunburst panels, ceramic-tile floors, and period laminates. "The intensity," says interior designer Charles Morris Mount, "comes from the reflected ceiling coves," where white and pink neon washes a vintage boomerang-pattern plastic laminate. 'Lighting is the first thing we try *not* to cut from the budget." says Mount. ■

Douglas Brown photos

Briefs

Harnessing the sun
Bradlees department store in Medford, Mass., is trying out roof-mounted solar cells to power its lights. Sourcing will switch automatically from grid to solar when the sun shines, says William Berg, who is researching the process at the University of Massachussetts at Lowell. With tax credits and utility rebates, system-supplier Osram estimates a five-year payback.

Happy ending for Chapter 11
Venture Lighting International, the Solon, Ohio, metal-halide lamp manufacturer, has restructured its debt with assistance from GE Captial, and plans to concentrate on open-fixture-rated products and retrofit kits.

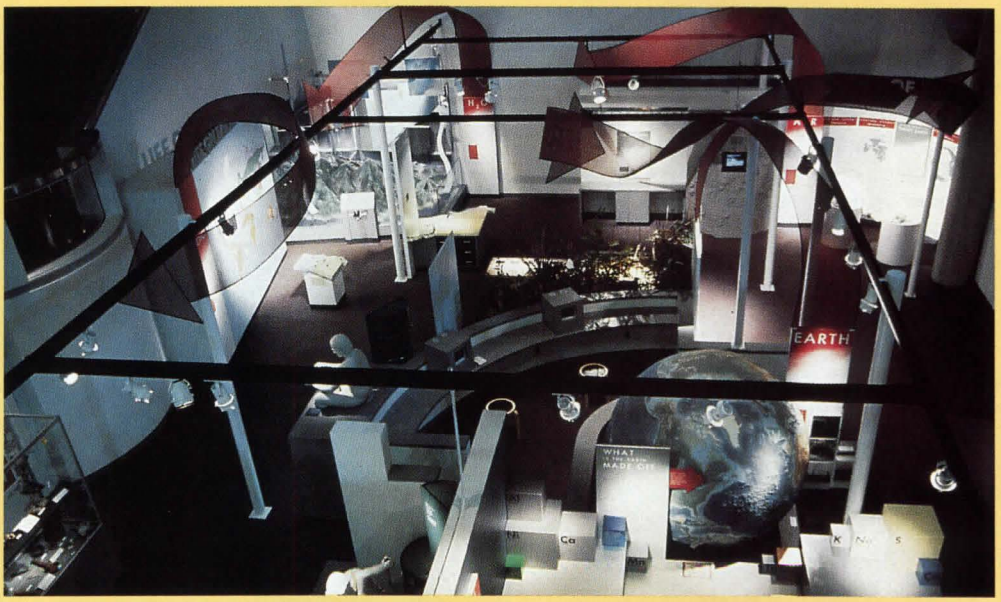
Compact standards
The Northwest Residential Efficient Appliance and Lighting Group, an association of utilities and government agencies in Idaho, Montana, Oregon, and Washington, has adopted the Green Seal environmental standard for compact fluorescent lamps, joining the Sacramento Municipal Utility District and PG&E utilities. Green Seal is a Washington, D. C., independent non-profit that sets norms for efficiency and performance, and toxics limits in production and packaging. The compact standards were developed in open review with manufacturers, consumers, environmentalists, utilities, and government agencies; Underwriters Laboratories was the primary testing contractor. Green Seal has so far approved six specific compacts—GE electronic 20W triple Biax, and 15W and 20W double Biax; and Lights of America 2020TP, 2022TP and 2030TP. Utilities, however, use the standards as manufacturer specifications for their demand-side management programs.

There will be a test
The 15-module "ED-150: Intermediate Level Lighting Course" is available from IESNA, 120 Wall Street, 17th Floor, New York, N. Y. 10005-4001, 212/248-5000. The first technical knowledge exams based on the course will be offered at 17 U. S. and Canadian sites on January 29 and July 16, 1994. Contact American College Testing, POB 168, Iowa City, Iowa 52243, 319/337-1317.

Competition
January 31, 1994 is the deadline for the IESNY Richard Kelly Grant. Contact: IES, 120 Wall Street, 17th Floor, New York, N. Y. 10005-4001, 212/248-5000. ■

Missouri

Seventeen Different Ceiling Heights Complicate Museum Lighting



The St. Louis Science Center showcases science, technology, and the environment in more than 500 distinct display elements, with contradictory lighting needs, housed in 11 galleries with 17 different ceiling/mounting height conditions ranging from 8 ft to 65 ft—as many as five different heights in a single gallery—to bedevil the lighting designer. To light the two-tier ecology and environment gallery, Katherine Abernathy of Randy Burkett Lighting Design installed low-voltage 120W PAR64s in the 4-ft stem-mounted movable track that the builder provided in continuous U-channels on the 65-ft ceiling, along with 10-ft-on-center power outlets to provide an endless variety of lighting positions. At the lower level, track-fitted pipe frame secured to the floor holds low-voltage PAR36s and line-voltage PAR38s in standard off-the-shelf fixtures. Throughout the museum, louvers, lenses, color filters, and other control accessories tailor the instruments to each display without disturbing the signature mood of each gallery, or interfering with adjacent exhibits in the same gallery. ■

Texas

Feast for the Eyes at Houston Nutrition Center

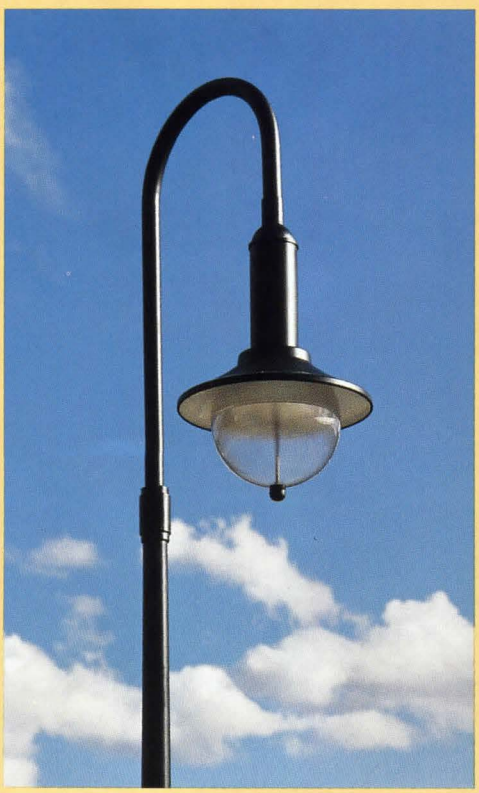
Lighting consultant Michael John Smith derived the dramatic ambience in the evaluation area at Hermann Hospital Nutrition and Human Performance Center almost exclusively from shallow-recessed MR-16 adjustable accents—the counter glow is downlight bouncing back up through the floating glass surface. Task lighting for the rear desk is 12V incandescent festoon strips hidden in the bottom of overhead cabinets. Triple MR16 pendants combine up- and downlighting, while recessed AR111 metal reflector halogens wash the metal walls. ■

Site Family

310. Staff's Architectural Outdoor Lighting (AOL) series luminaires are now made in Highland, New York, from designs developed by Se'lux in Germany and widely installed in Europe over the past few years. The landscape fixtures share a new optical technology as well as a contemporary yet user-friendly appearance. Though white-light metal-halide sources are now the most popular in both European and American applications, the AOL optical selection also includes polycarbonate ring refractors developed specifically for use with economical compact-fluorescent sources and the new, quick-start cold-weather ballasts. These refractors work like prisms, directing any given angle of light as required and diminishing the worst of the glare at critical viewing angles for each fixture. Mirror, white-finish, and molded borosilicate-glass refractors can be specified for the light-distribution requirements of other sources. AOL luminaires come in over 100 design and performance configurations, with many models (six are pictured) available in single pole-top, cluster, wall-mount, and bollard options for fixture-style uniformity throughout the site.

An unusual shape that resembles a trainman's lantern, Saturn (**1**) establishes pedestrian scale in either contemporary or more traditional landscapes. Like most of the luminaires, a self-illumination feature establishes the shape of the fixture when it is lit at night. Saturn also comes in a more hat-like shape, minus the arched "handle." Pendel (**2**) is said to provide superior light distribution; a double-lamp feature allows higher illumination during peak hours, cutting back to a one-lamp security-light level to save energy. Shown here in a wall-mount version, the MTR fixture (**3**) also comes in pole-mount and bollard versions. Globus (**4**) is two hemispheres of clear or opal-finish acrylic or polycarbonate. Series 200 Bollards (**5**) include a distinctive fluted style; all are made of an impact-resistant extruded aluminum. The exception to the small-scale AOL rule is Polygon (**6**) an aerodynamic shape with light-emitting slots that create a form-revealing glow. Suitable for large-area and roadway lighting, Polygon also offers the energy-saving two-lamp option. STAFF Lighting Corp., *Highland, N. Y.*

1



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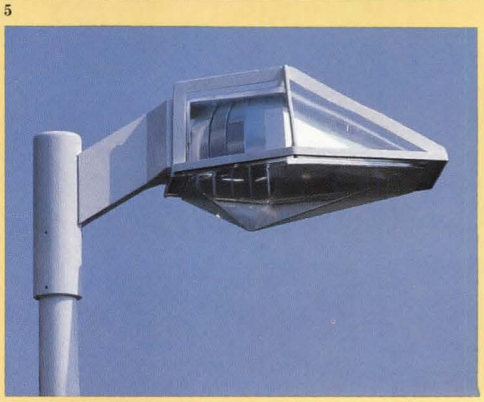
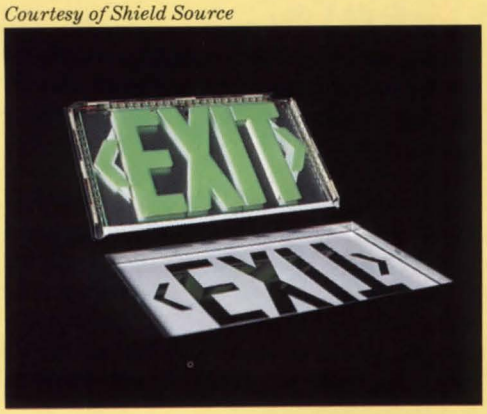


6

Exit Signs: The Best Way Out

One of the least noticed lighting fixtures might also be the one that saves your life. Edge-lit LED signs are one good solution.

Courtesy of Shield Source



By Lindsay Audin

In an emergency, an exit sign might be the only help you get in finding your way to safety. Many designers treat them as an afterthought, however, specifying the cheapest model to contain job costs. Energy contractors also are often guilty, installing retrofit kits that may save watts but could cost lives if visibility is seriously compromised. Fortunately, there are now options that provide good visibility while significantly cutting energy and maintenance costs.

What Are the Choices?

Exit signs come in six basic types:

- Incandescent (with two 25W T-lamps)
- Fluorescent (tubular and compact)
- Self-luminous (using tritium gas to excite phosphors in glass tubes)
- Electroluminescent (a dielectric surface glows when electrified)
- Photoluminescent (emitting light when excited by ambient illumination)
- Light-emitting diodes (LEDs shine out through a diffuser or else into the edge of an acrylic sheet)

Retrofit kits that convert one of the above to another are also available.

What are the issues?

While most signs work reasonably well, recent events and studies exposed some rather serious problems often not considered by lighting designers:

- Lamp maintenance
- Visibility in smoke conditions
- Energy and maintenance costs

Lindsay Audin is the energy manager for Columbia University.

Sign surveys show a percentage are dark because of lamp failure, while others provide insufficient visibility during a fire or blackout. Exit signs are also a covert guzzler of electricity because they are on 24 hours a day.

Few facilities place a priority on replacing burnouts immediately—unless expecting a visit by the fire inspector—so systems that use a replaceable lamp may be vulnerable to poor maintenance. Signs that use no lamps don't always fare much better. Electroluminescent signs are good for about eight years, and some have been prone to early failure due to intrusion of moisture into the dielectric surface. Self-luminous signs lose about half their brightness in the first six or seven years, and disposal is a problem due to their slightly radioactive content.

Some types provide much greater luminance, generally a plus during smoke conditions. Self-luminous, electroluminescent, and photoluminescent signs do not provide the brightness of incandescent, fluorescent, or LED signs. Those with stenciled lettering, instead of lettered diffusers, are more visible in smoke. Some signs do not meet 1991 NFPA Life Safety Code luminance requirements (except by special exemptions), or regulations in larger municipalities (such as New York City), even though approved by other electrical codes.

Are retrofits a good solution?

To cut the energy and maintenance costs of incandescent signs, many facility managers and energy contractors are replacing the guts of such signs with fluorescent or LED conversion kits. Available from at least a dozen vendors, they include most components, and are often a cost-effective way to extend the time between burnouts, while cutting wattage by 75 percent or more.

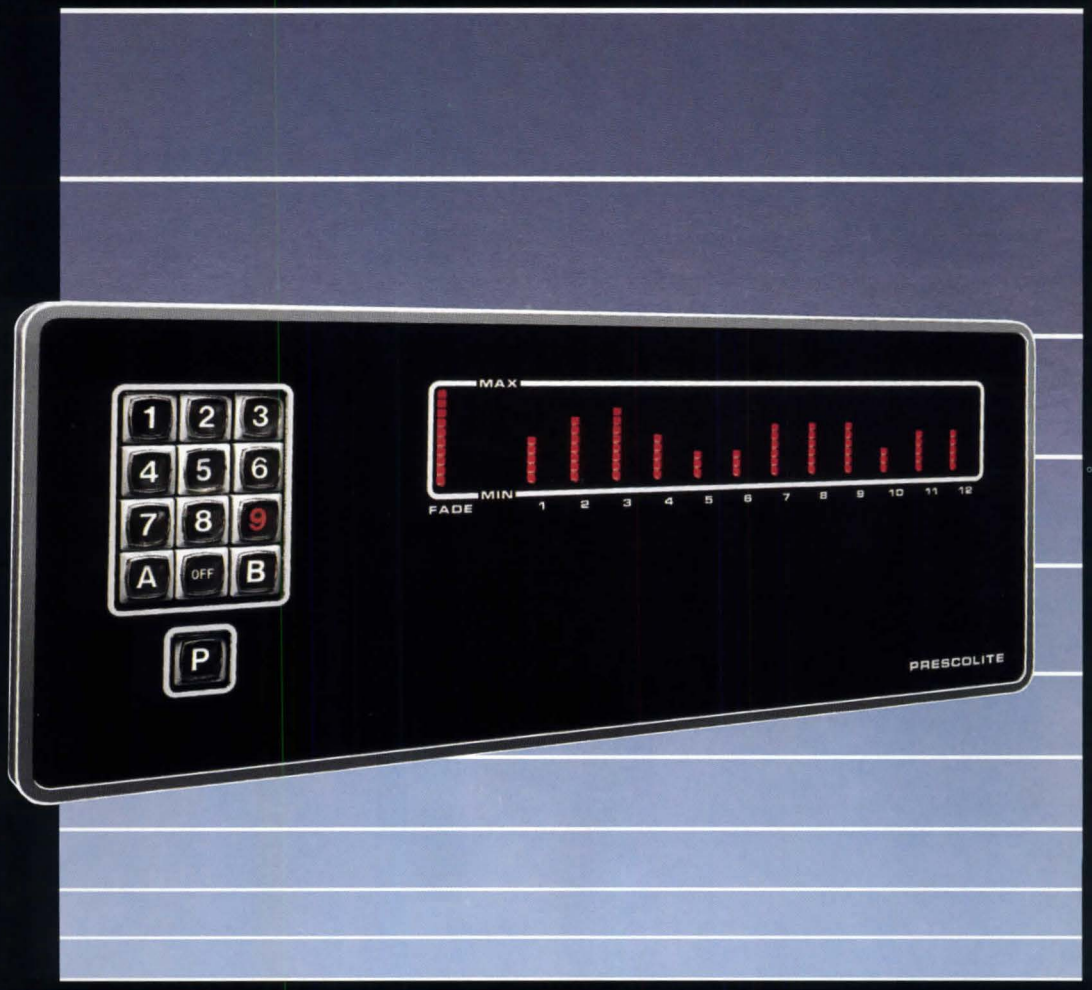
But watch out for the problems sometimes hidden in these retrofits, especially when all existing signs are not identical:

- Size. Not all kits fit all fixtures; sometimes internal obstructions or dimensions make installation difficult, if not impossible.
- When installed over a number of years, signs may have been connected to whatever circuits were most convenient. Unless sign voltage is known with certainty, specify kits with taps for both 120 and 277 volts.
- Downlighting. Some signs are designed to provide downlighting for emergency egress, so watch that the kits don't cover the lens on the fixture bottom.
- Socket compatibility. Unless all signs were installed at the same time, sockets may vary from sign to sign. Any conversion kit should contain all types required.
- Vibration sensitivity. When signs are located where vibration is common, compact-fluorescent lamps mounted diagonally may loosen in that orientation.
- Luminance in large or two-sided signs. Many conversion kits fit such signs but lack code-level luminances because they are designed for a single-sided sign with 6-in. lettering, not a two-sided one with 8-in. lettering.
- Flashing capability. Ballasts in fluorescent conversion kits are not designed to flash their lamps so, where existing, this capability may be lost as a result of retrofitting.
- Compatibility with emergency batteries. Many batteries will supply sufficient power to start a fluorescent lamp but were designed to maintain the glow of an incandescent filament, not a fluorescent lamp. So, fluorescent conversion kits may not remain lit for the 90-minute minimum required by many codes, when connected to existing batteries.

The best answer

Check out the newer, edge-lit LED signs (photo, top left) now available from two vendors. From the standpoint of luminance, life cycle, and energy costs, they really stand out, especially in the dark. While meeting most (if not all) codes, these signs are warrantied for at least 20 years, require no relamping, use little power, and are easily visible even at wide angles. Prices have come down significantly, and special options such as flashing and audible signals are available. While more expensive than others, few problems occur during installation, energy savings are maximized, visibility and esthetics are very good, sign maintenance is practically eliminated, and many utilities provide a nice rebate for the equipment. ■

Specify Performance



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Fill-Lighting Versus Installed: The Editor's Dilemma

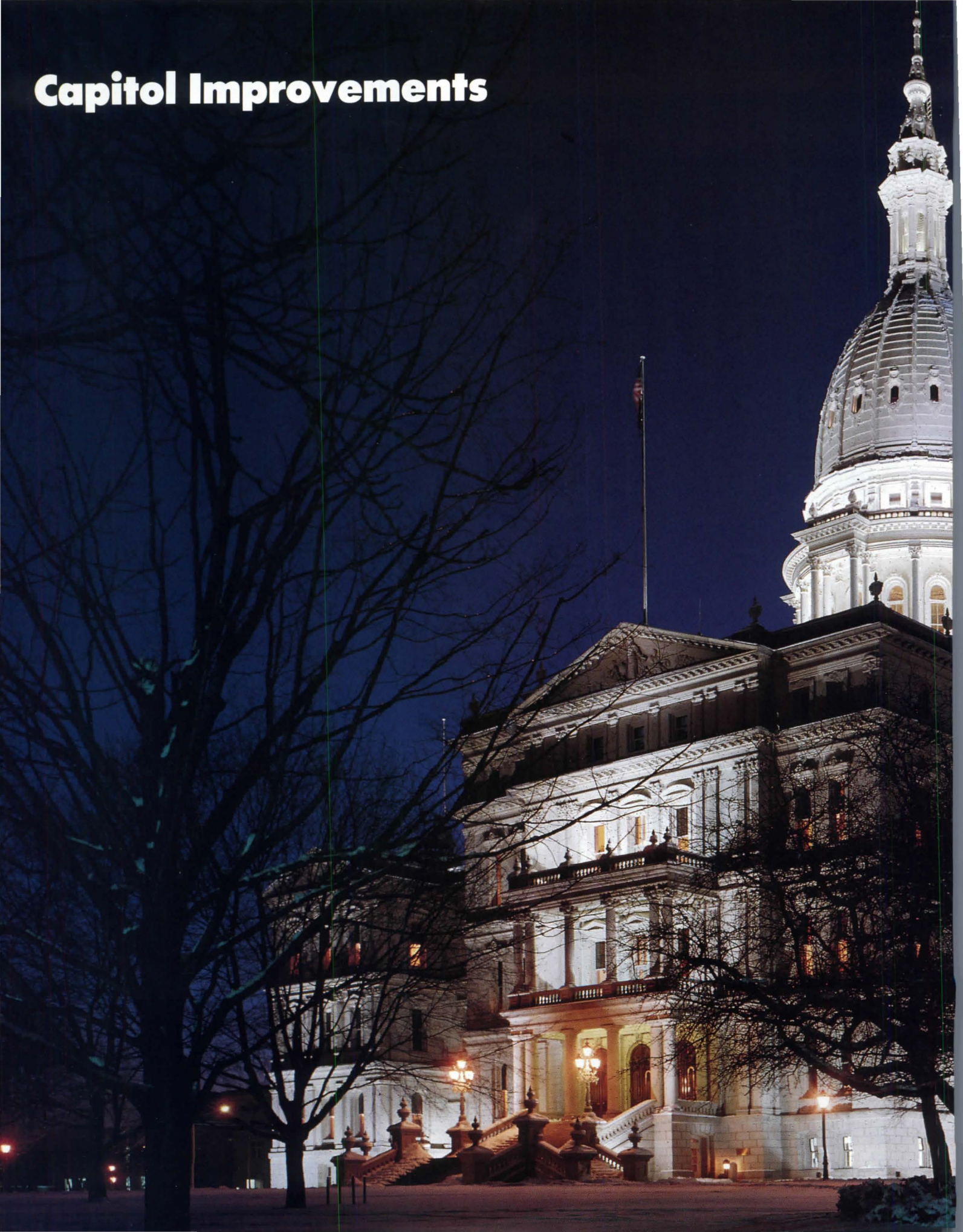
One of the great privileges editors at ARCHITECTURAL RECORD have is being able to work with some of the world's finest architectural photographers. You can probably imagine the thrill of opening a box from someone like Balthazar Korab, who took this month's RECORD LIGHTING cover photo of the rotunda of the Michigan State Capitol, and getting to see his originals with your own eyes. It's marvelous.

Taking photos for a magazine that is concerned with the illumination of space presents a unique problem for photographers, because photographic film, for all its impressive capacity for simulating reality, doesn't record light exactly as the human eye sees it. For one thing, the eye can perceive a far greater range of illuminance levels than can film under the same conditions. And the eye does a much better job of compensating for weird variations in the color spectrum from sources like fluorescent and high-pressure sodium than film, which is manufactured to see either day- or tungsten light as "normal." Photographers must use fill-light and color-correcting filters so that an environment is rendered on film as it would appear to the naked eye. It is almost impossible to photograph interiors without these aids.

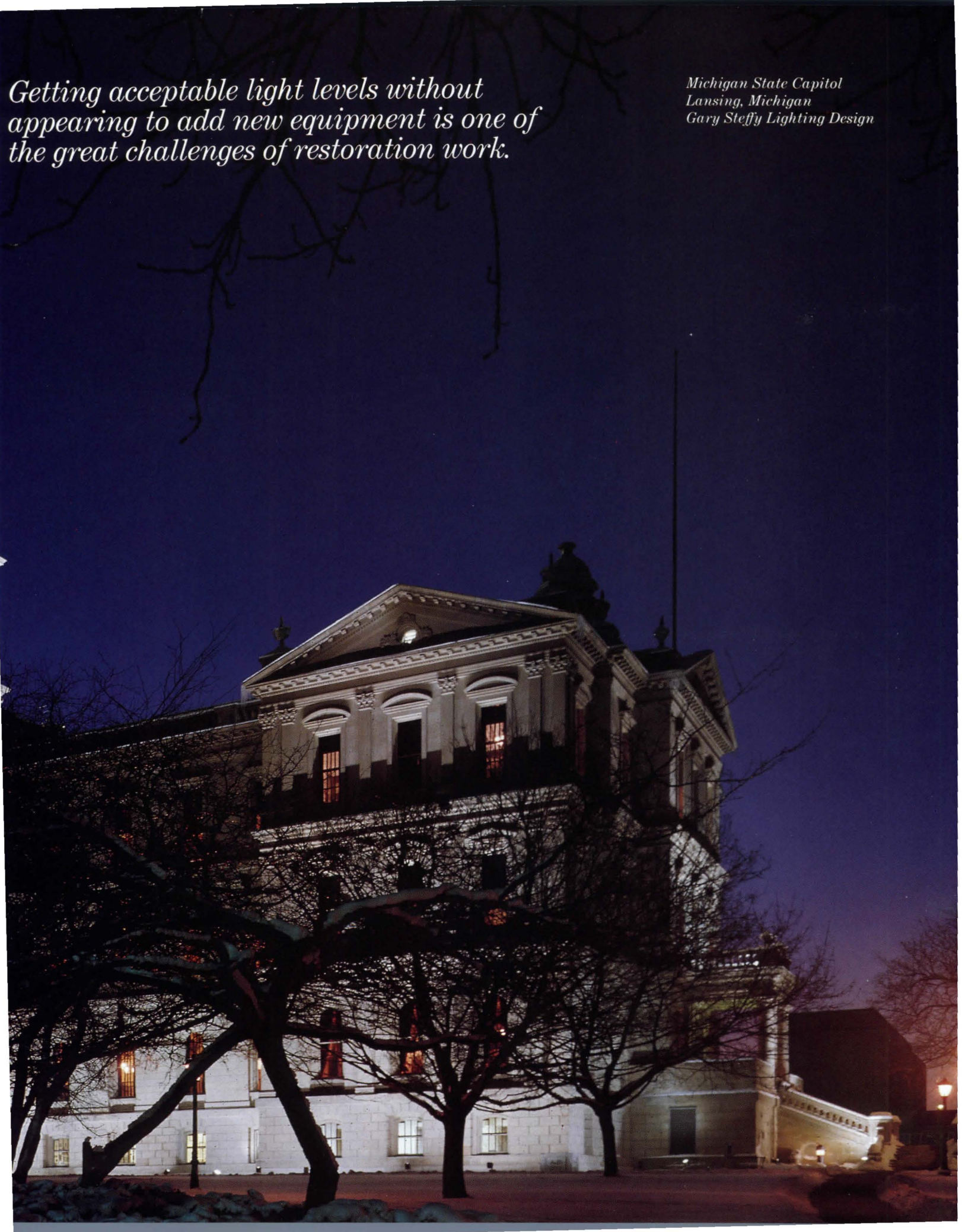
The challenge for the editors of RECORD LIGHTING is to judge when the photographer's lighting outshines the work of the lighting designer who lit the space. To decide, we examine each photo to judge if the lighting system could plausibly deliver the light captured in it. A burst of light coming from behind a sofa in an otherwise downlit room is usually a dead giveaway that lighting has been added, especially if the lighting designer didn't mention sofa-uplighting as part of the solution. Bright reflections that seem inappropriate given the light sources used, such as those on the columns on page 26, are also usually a clue that fill light is leaving an impression on film that would not be seen by one viewing the space.

Early in my career as a lighting magazine editor, I threw out a lot of projects because of their obviously fill-lit photography. Today, I feel I have to accept it as a necessary evil if the choice is either to publish a project with a fill-lit photo, with some explanation if the additional lighting is blatant, or publish nothing and deprive the reader. As always, the best way to understand how a project was lit by the designer is to visit the space. Otherwise, look at the photos and read the text to find out. Good photography reveals the lighting designer's talent, while the photographer's should go unnoticed. *Charles D. Linn*

Capitol Improvements

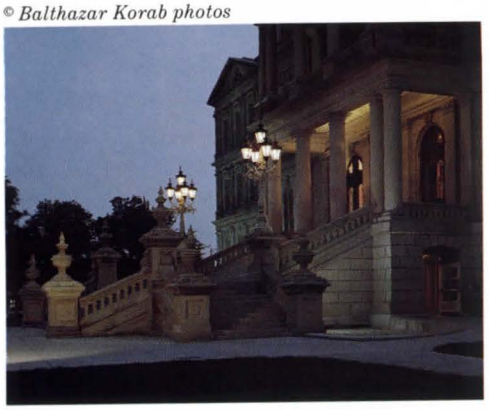


Getting acceptable light levels without appearing to add new equipment is one of the great challenges of restoration work.



Michigan State Capitol
Lansing, Michigan
Gary Steffy Lighting Design

© *Balthazar Korab photos*



Up Close

Brightnesses on walls; fill light. Lighting designer Gary Steffy notes that one of the problems with period lighting that uses globe-type diffusers—like those shown in the photo of one of the grand stairways (opposite)—is that while the light sources themselves are very bright, not much of the light they produce actually reaches architectural surfaces in the field of view. However, walls and ceilings usually seem brighter after a restoration is complete, because renewed finishes are more reflective than before, even when they start out relatively dark, like the blue ceiling in the photo. Some fill light has been added by the photographer to approximate what a person would see if they visited the building. Except for the very bright reflections at the base of the columns and balustrade, the brightnesses of the walls and ceiling as photographed are rendered accurately, according to Steffy.

The Michigan State Capitol started out like most restoration projects: a beloved edifice gone bad from decades of neglect, low-bid improvements, and insensitive modernizations. Starting in 1979, architect Richard Frank was largely responsible for developing the restoration plan, and Gary Steffy's office was called upon to redesign the lighting of the rotunda, upper corridors, and exterior.

"The Michigan State Capitol opened in 1879, nine months before Edison invented the electric lamp," says Steffy, "and the building was illuminated by 1,700 gas burners—replaced in 1901 with electric-light fixtures. By the mid-1960s the Capitol had fallen into complete disrepair, with intermediate floors added into office areas, lay-in ceilings, and a lot of the architectural character getting thrown out or covered up with plasterboard and paint.

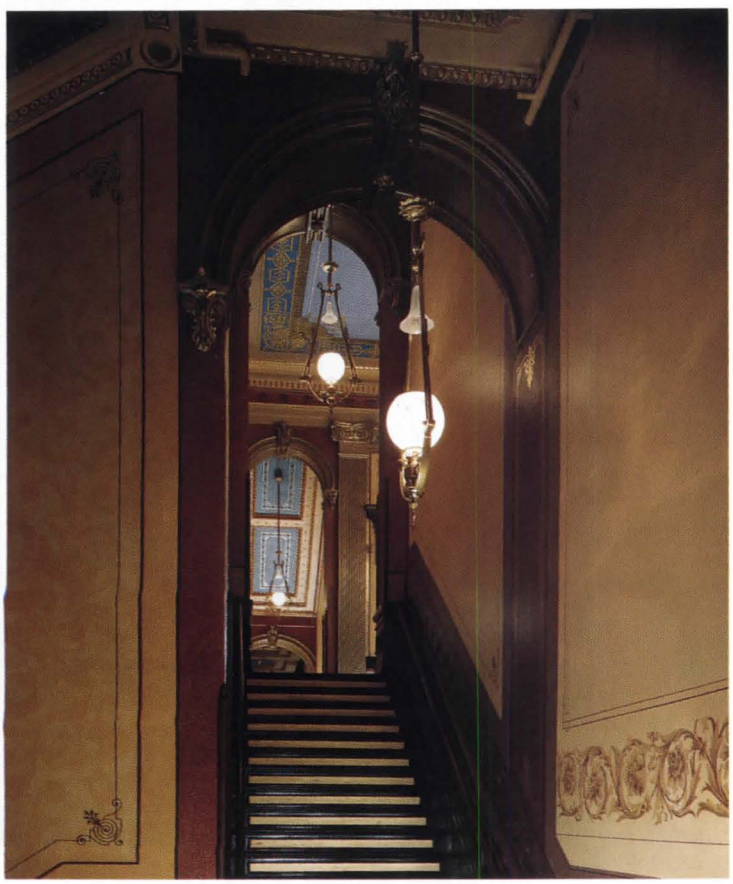
"But for the lighting, there was a lot of good stuff," Steffy continues, "some of the original luminaires were still around, and could easily be replicated. But people were very concerned that when the Capitol reopened in 1992, the space not look like the dingy half-foot-candle-dark space it was in 1979. We couldn't just go in and replace everything as it had been in 1901 with Edison's lamps. And energy efficiency was not as important as retaining the character of the building, so frankly there were some areas where it worked out best to go with some relatively inefficient incandescent sources."

In the upper lobbies and corridors, original incandescent chandeliers and harps were reused, along with new sconces that imitated what period originals might have looked like if they had existed. All were lamped with clear, 8,000-hour traffic lamps which, like Edison's originals, have exposed filaments.

It was in the rotunda that the challenge of adding light without adding obvious fixtures was greatest. Light at the first level is bolstered by lighting through the glass floor, and from flag cases. On the second floor, incandescent-fluorescent lamps were installed in new portrait lights, and existing architectural brackets were restored. 75W PAR30 uplights were recessed into the rotunda floors at various levels to wash wall surfaces, pilasters, and the undersides of balconies. Further up in the rotunda, balconies are inaccessible to the public, so 75W PAR30s in lampholders were used. Here, they are aimed upward to wash the dome, and through balustrades toward paintings on the opposite walls. A ring of blue-filtered metal-halide fixtures lights the oculus at the top of the dome. A preset lighting-control system sets appropriate lighting levels based on exterior conditions.

The exterior lighting (previous pages, this page top) was only a restoration in that some of the five-headed lanterns originally installed on poles on the building's porticos were recreated, and compatible site-lighting was installed next to sidewalks around the grounds. Although some facade lighting existed, Steffy started over.

His approach was to highlight the architectural detailing of the building. "That meant building tiers of accent light from the ground up, highlighting the pediments of the building. From there we work up to the colonnade under the dome itself, putting some bright backlighting behind the columns, as well as front-lighting them. The large upper dome just has a soft wash fading off toward the brighter cupola." For most of the facade lighting, Steffy used warm, 3000K 100W metal-halide floods and spots mounted fairly close to the building. Narrow spots mounted in pits on the ground are used to illuminate pediments. The dome and cupola are lighted using similar roof-mounted equipment. *Charles Linn*



The lower rotunda (upper left) is illuminated by uplighting through the glass floor, new PAR30 uplights recessed into the floor, existing architectural brackets, and spill from the flag cases and portrait lighting. The upper rotunda (above) is washed by concealed PAR30s and metal-halide spots. The restored architectural wall brackets and floor uplighting wash the walls on the second floor of the rotunda. Existing harps (lower left) light a stairway.

Credits
Michigan State Capitol
Lansing, Michigan
Owner: *State of Michigan*
Restoration Architect: *Richard Frank*
Implementing Architects: *Architects Four; Quinn Evans/ Architects; Wigen Tincknell Meyer & Associates*
Lighting Designers: *Gary Steffy Lighting Design—Gary Steffy, principal; Gary Woodall, Jeff Brown, associates*
Engineers: *Shreve Weber Stellwagen (mechanical/ electrical); Robert Darvas & Associates (structural)*
Consultants: *Detroit Institute of Art (art conservation); Norman Weiss (stone conservator); Washington University Tech Associates (dome); Darla Olson (painting conservator); William Johnson & Associates (landscaping)*
Electrical Contractors: *F. D. Hayes Electric Co.; Quality Electrical, Inc.*
Construction Manager: *The Christman Company*

Come Rain or Shine

Freer Gallery of Art
Washington, D. C.
Cole and Denny/BVH, Architect
Richard Skinner, Freer Design Department, Lighting Designer

Charles Lang Freer was convinced the only way to view art was under daylight conditions, but in the teens of this century, when he and architect Charles A. Platt were planning the Washington, D. C. museum that bears Freer's name—and holds his American and Asian collections—few were aware its ultraviolet rays can damage fragile artifacts.

The completely renovated Freer that reopened last May remains true to its founder: daylight still pours into the galleries through 13 skylights and 21 laylights. However, the museum's design department has taken subtle steps to bring combined day- and electric lighting up to conservation standards.

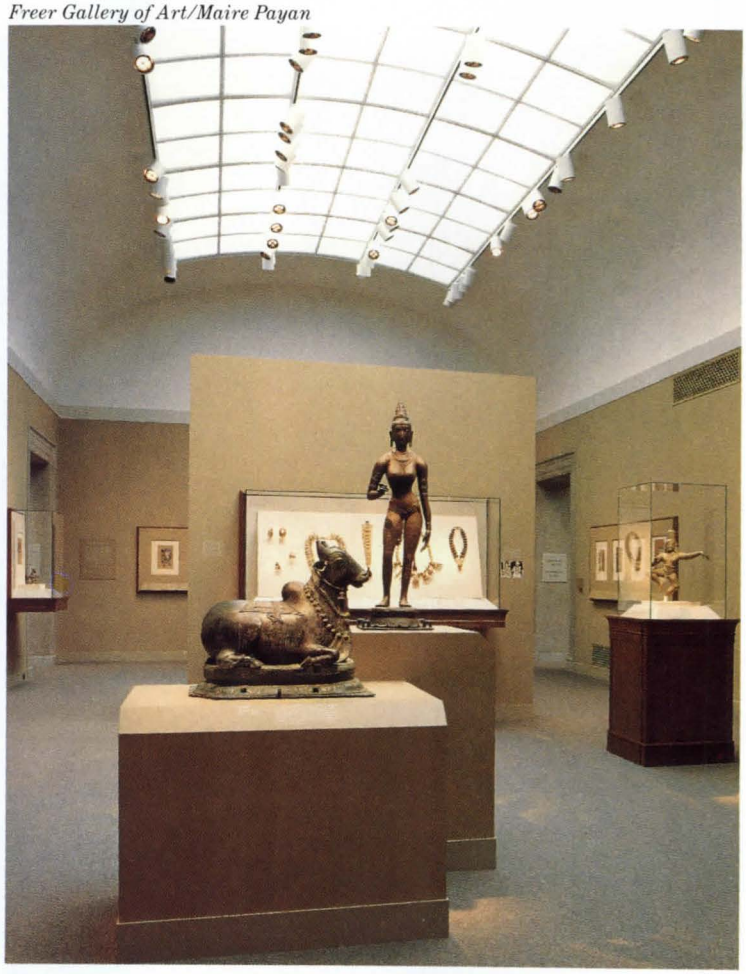
The 70-year-old laylights of ribbed, sandblasted, single-layer glass have been replaced by laminated safety glass that conforms to safety codes and contains a clear UV-filtering polyvinylbutyral interlayer. A light-diffusing two-coat ceramic frit fired onto the room side of the glass duplicates the appearance of the original and helps further reduce light levels. Above the laylights, newly angled skylight glazing permits more light to enter from the north than from the south to minimize seasonal light changes in the galleries. Five different striped patterns on the insulated glass exterior cut down light penetration.

Cotton-mesh scrim stretched across the attics between skylight and laylight gives added protection to the galleries that contain the most light-sensitive artifacts, and brings those that have the largest glass expanses into conformity with all the others. Seasonal adjustments are made by adding or subtracting scrim. Some 80 percent of the cool-white fluorescents in the attic spaces have been removed and the remainder rewired on electronic ballasts; they are turned on and off manually depending on the weather and the scheduling of evening events. The reliance on manual adjustments in the age of sensors is a deliberate part of a year-long experiment involving thrice daily light readings on all walls and a gallery-by-gallery continual recording of the complete range of brightness all day long. "We're still learning the relationships of skylights, laylights, and the arrangement of artifacts," says Freer lighting designer Richard Skinner.

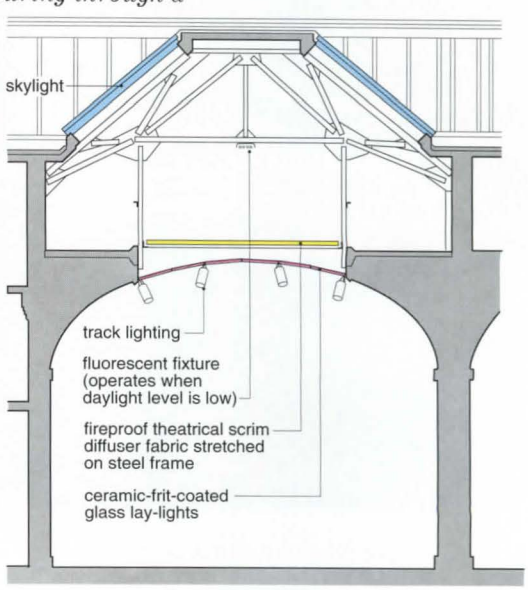
Eleven of the 19 galleries depend totally on ambient daylight and incandescent spots focused on individual objects. Track-mounted wallwashers light the walls in the eight galleries with the most sensitive objects and therefore the lowest ambient daylight levels, so that on gray days the spaces will not appear dark and dismal when entered from areas receiving greater amounts of daylight. "We've tuned the light according to the placement of the glass and the location of the rooms so that all the rooms appear similarly lit," Skinner says. Gallery track lighting combines halogen PAR36s and PAR38s in fixtures painted a "shadow white" to create the least obtrusive effect against the laylights. Halogen sconces are used in the main circulation corridors.

The one space that doesn't follow the Freer's lighting concepts—that is, in fact, a flamboyant surprise amid the serene galleries and corridors—is James McNeill Whistler's 1877 *Peacock Room*, covered by the artist with highly varnished verdigris green, Prussian blue, and a wealth of metal leaf. The original glass pendants were cleaned and rewired at the museum, and two of them fitted with fiber-optic spots trained on the painting for which Whistler conceived the entire room as a frame. *Judith Davidsen*

Freer Gallery of Art/Maire Payan



The walls in the Southeast Asia gallery (above) are very slightly washed with electric light to compensate for less light on cloudy days; a scrim behind the laylight protects light-sensitive artifacts. Focused spots and daylight pouring through a scrimless laylight constitute the illumination in one of the American painting galleries (opposite). The drawing (below) shows the relationship of skylight, scrim, and laylight.



SECTION THROUGH RENOVATED GALLERIES 3 ft. 1 m.

Freer Gallery of Art/Robb Harrell

Freer Gallery of Art/Maire Payan

Daylight and electric light combine in a corridor (top left) facing the courtyard, where heavily tinted neutral-density film in the glazing protects sensitive art. For a uniform appearance on both bright and dark days, the museum design staff retired "not terribly attractive" ER sources at the points of the groin arches, and designed both new uplight sconces and adjustable recessed fixtures that accommodate up to three MR16 sources behind a 2- by 6-in. aperture.

In one of the more daylight-accessible areas (bottom left), attic-level scrim provides an extra filter to protect sensitive artifacts (the door at left has since been veiled). Spots surrounding the laylight bring out images and sparkle on the gold leaf. Dust-proof display cases have an anti-reflective coating.

Charles Lang Freer purchased a London dining room (opposite) whose owner had returned from a trip to find James McNeill Whistler had decorated and varnished every surface. "The glare," says Freer lighting designer Richard Skinner, "was intended by the artist." Lighting assistant Michael Edson placed fiber-optic spots in the perforations of two original pendants to light The Princess from the Land of Porcelain.

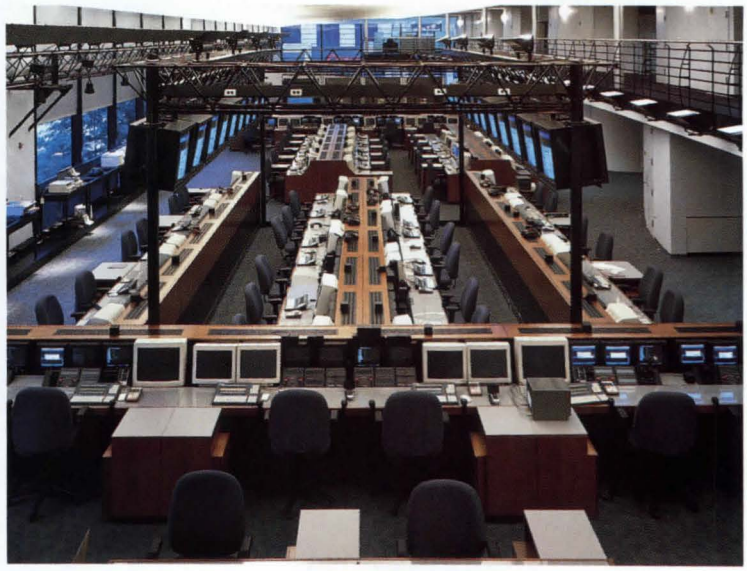
Credits
Freer Gallery of Art, Washington D. C.
Owner: *Smithsonian Institution*
Architect: *Cole and Denny/BVH*
Lighting Designer: *Richard Skinner, Freer Design Department; Michael Edson, assistant lighting designer; Patrick Sears, project manager; Claude Engle, skylight consultant.*
Electrical Engineer: *Cad-Con*
General Contractor: *Associated Builders; Wm. V. Walsh Construction (skylight and roof)*

Freer Gallery of Art/John Tsanes and Jeffrey Crespi

Trading Up

Credit Suisse Trading Room
New York City
Janko Rasic Associates Architects
Imero Fiorentino Associates
Lighting Designer

© *Norman McGrath photos*



The halogen uplights are a type usually used outdoors. Project architect John Kinnear designed baffling for the tops of fixtures to conceal the intensely bright lamps from the view of persons standing on the mezzanine. A slanted, smaller-scale baffle was used to shield fixtures mounted on the window wall. Does daylight present a screen-glare problem? The room faces north and the gray solar glazing is 1/2-in.-thick. If all else fails, there are shades. A fiber-optic strip behind the edge of the ceiling cove makes it appear to float.

"Technology is part of the design," says architect Janko Rasic. He likens this new block-long trading room of the Credit Suisse Bank in Lower Manhattan, with its sweeping curves and elegantly utilitarian detailing, to an ocean liner. A freestanding steel-truss system supports some of the uplights illuminating the space, as well as banks of computer screens in the constant sight of some 100 traders. These screens display vital, constantly changing information on trends in the money market and are supplied by some 120 reporting organizations. Credit Suisse's Thomas Denis not only manages such day-to-day operations as coordinating these organizations, but also was the architects' client contact. He took an active role in maintaining the 18-month design and construction schedule.

Flexibility was one of Denis's primary goals, including the ability to quickly replace computer equipment in pace with rapid technological advances, and to rearrange furniture to meet the traders' needs. Five-foot modular desks designed by the architects for the space are currently arranged in long rows. Their design allows them to be rearranged in U-shape or square configurations for groups of traders working together on future projects. One of the logistical problems the architects had to solve was how to support the mezzanine that overlooks the trading floor. The trading-floor structure itself could not be braced because it is above the building's public lobby. Instead, the mezzanine was built with edge beams up to 50-feet long, and supported by rod hangers attached to the beefed-up ceiling structure above. A second logistical challenge was the need to keep operations running during business hours around the world—that is, 24 hours a day. Ease of equipment maintenance was assured by keeping all cabling and mechanical lines out of the ceiling and walls, running them instead under a raised concrete floor for unobtrusive access.

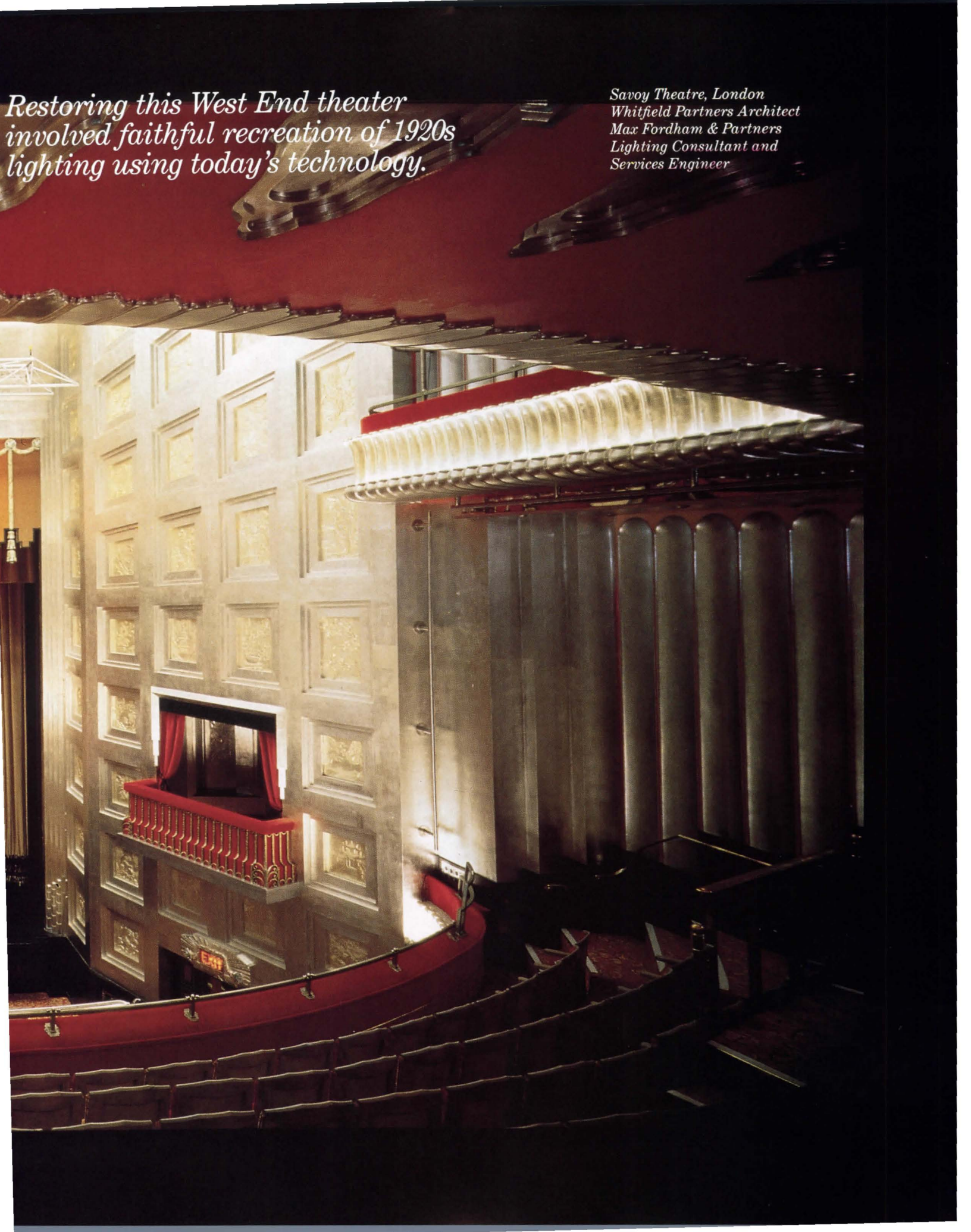
Architect-in-charge John Kinnear conceived the idea of bouncing light off the cove-shaped ceiling to reduce glare on computer screens and to accommodate changing furniture arrangements. The diffused lighting gives a high visual-comfort level, and the ability to quickly replace lamps also lives up to the easy maintenance requirements, meeting two more client goals. According to Kinnear, his original idea of using theatrical lighting would not have worked. Lighting consultant Frank Kelly pointed out that the short-lived lamps would require constant replacement. Instead, he recommended halogen fixtures with parabolic reflectors to eliminate hot spots and used computer modeling to test their effectiveness. Meanwhile, the architects built a 1/4-scale model first, and then a full-size section of the room. They found what they expected. The ceiling shape, which worked so well for bouncing light, was a poor shape for acoustics. Spray-on acoustical insulation corrected the problem.
Charles K. Hoyt

Credits: *Credit Suisse Trading Room, New York City*
Architect: *Janko Rasic Associates Architects—John Kinnear, architect-in-charge*
Lighting Designer: *Imero Fiorentino Associates—Frank Kelly, project designer*
Electrical Engineer: *Jaros Baum Bolles*
General Contractor: *Meli Borrelli Associates*

House Lights Up

Restoring this West End theater involved faithful recreation of 1920s lighting using today's technology.

Savoy Theatre, London
Whitfield Partners Architect
Max Fordham & Partners
Lighting Consultant and
Services Engineer



London's 1881 Savoy Theatre was the first theater totally lit by electric light. Rebuilt in 1929 by architect Basil Ionides in an idiosyncratic blend of oriental and Art Deco styles, the theater was badly damaged by fire in 1990. The aim of the $18-million restoration, completed in the summer of 1993, was to recreate the splendid interior using modern technologies and materials. The Savoy is listed on the British equivalent of the National Register of Historic Places, which meant that the completed restoration had to resemble the 1929 version as closely as possible.

An essential component of this task was the restoration of the archaic front-of-house lighting, using identical luminaires fitted with modern light sources. "Energy-saving was one consideration," explains project engineer Nicholas Wedgewood of Max Fordham & Partners, project engineers, "but low maintenance was also a major issue, as many of the luminaires are quite inaccessible." This is particularly true at the upper levels of the theater, where a new plant room and health club have been built above the present structure—the swimming pool sits right over the stage.

Many of the 1,137-seat auditorium's sculpted surfaces are covered in glittering aluminum leaf, which makes great play of the lighting, provided by four main groups of luminaires. These are all dimmable, and controlled by one dimming system. Most notable are the 32 "skylight" boxes in the ceiling above the proscenium, each containing three 100W long-life tungsten lamps concealed above a diffusing panel. These reflect down and off the elaborate coffered Chinese walls and their richly engraved center panels, which arch over the front of the stage.

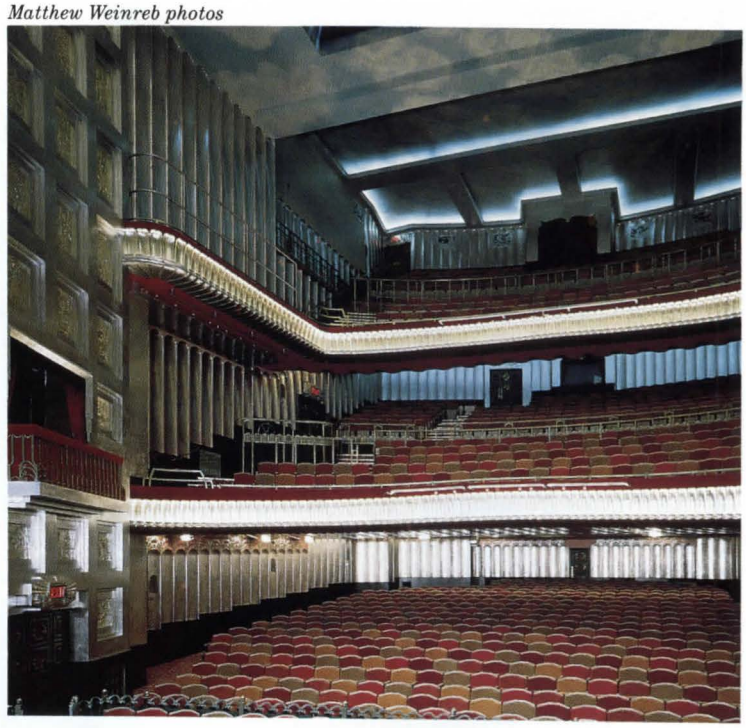
At the back of the upper balcony, concealed cold cathode, life-rated at 60,000 hours, adds a mysterious, glowing edge to the ceiling, painted to resemble sky. A similar hidden source is used to provide gentle uplighting to the bulkheads in the intermediate balcony. The silvered, scalloped balcony fronts at both levels are demarcated by a row of 40W tungsten lamps, hidden behind diffusers that resemble sea shells. "We wanted to use low-voltage tungsten halogen, for extra sparkle, but there was no room for the transformers," Wedgewood says.

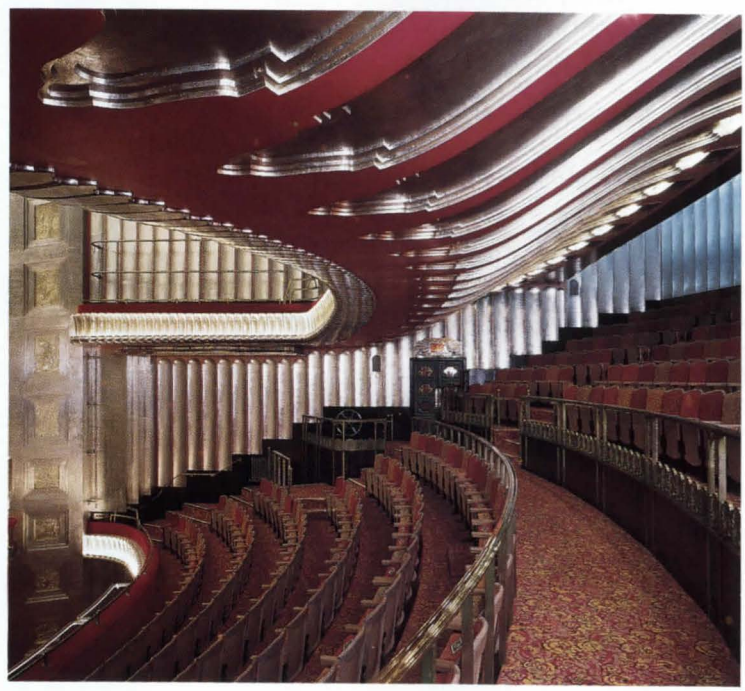
The most difficult luminaires to recreate were the decorative "V"-fixtures—named for their shape—which occur under the balconies and elsewhere in the theater. These comprise 75W tungsten lamps diffused by delicately hand-blown, white-etched glass, which were custom-made to match the original. The same glass was used on special linear tungsten luminaires incorporated into the backs of the brand-new air-conditioning vents in the upper balcony. At all levels, secondary emergency lighting is provided by fiber optics.

In the bars, lobbies, and circulation areas, with their emerald green walls and huge "balloon" motifs, dimming was not a major consideration. Here compact-fluorescent replaced the inefficent tungsten as the preferred source—the "V"-lamps, for example, are equipped with an 11W compact fluorescent lamp. What was more problematic was the reconstruction of fixtures for easy maintenance. Some ceiling-mounted fixtures that originally came apart in many pieces were made less complicated, making their new fluorescent lamps and ballasts easy to replace. *Carl Gardner*

Carl Gardner is a London-based freelance writer specializing in interior and lighting design, and co-author of Lighting Design: An Introductory Guide for Professionals.

Matthew Weinreb photos





Dramatic lighting makes full play of the Savoy's aluminum-leaf decoration. Long-life tungsten lamps are used in the ornate ceiling coffers over the stage and along the balcony fronts, while cold cathode gently highlights the edges of the balcony ceilings. All the house lighting is controlled by a single dimming system.

Credits
Savoy Theatre, London
Owner: *The Savoy Theatre Ltd.*
Original design 1929: *Basil Ionides*
Restoration Architects: *Whitfield Partners*
Consulting Engineers (including lighting): *Max Fordham & Partners*
Theater Consultants: *Julian Courtenay and Theatre Projects*

Technology Focus

Two Studies in Gothic

The strongest common denominator between Patrick Keeley's 1888 French Gothic revival church, St. Peter's Cathedral in Erie, Pennsylvania, and Bertram Goodhue's 1928 English Gothic revival Christ Church, in Cranbrook, Michigan, is their soaring, uplifting height, strengthened by their vertical architectural elements, columns, pilasters, and tracery, especially the long mullions. Both spaces are filled with beautiful Gothic detail and ornamental architectural art.

But the differences begin with their sizes. St. Peter's has more than twice the cubage and seating as Christ Church, and has a much more open plan, with a great long nave and deep sanctuary. Both congregations expressed a desire for a flexible, dimmable, system that would increase light levels, which were as low as one-to-two footcandles in many parts of their naves. At Christ Church no architectural changes were made during the relighting; at St. Peter's the sanctuary was brought forward, partly into the transept, and a post-Vatican II arrangement created.

Decorative lighting

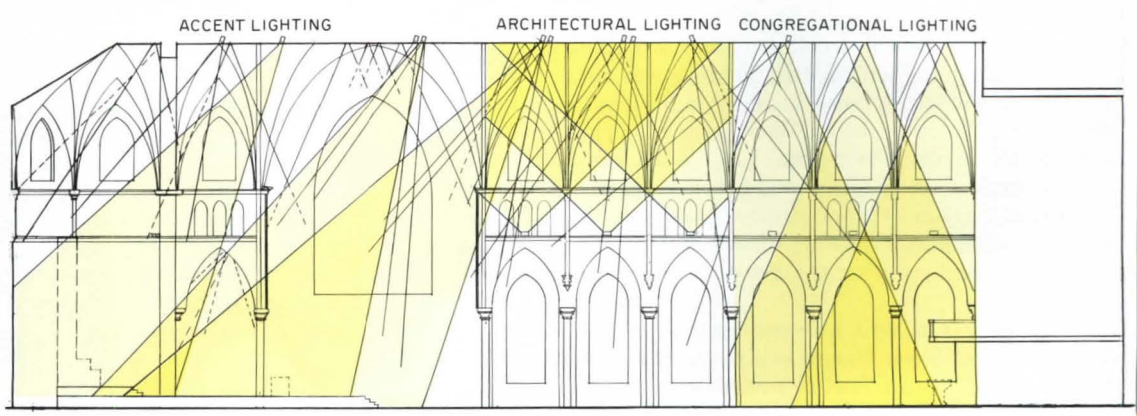
When the work began, both churches still had their original pendant lighting systems. Christ Church's filigree units, made by Caldwell and Company in 1928, recently had their lower-lamp output increased. When their bottom glass plates were removed, severe glare was created. The levels of light expected in a sanctuary today would require a sea of lanterns, even in their present glaring condition. The solution was to reuse the lanterns, restoring them to their original lamping and appearance, but to use new equipment elsewhere to provide the majority of the illumination required.

At St. Peter's, the 32 original "plumb bobs," repousséd in copper by Rambusch Lighting in 1921, were hanging two per bay, but had been supplemented by downlight from the attic in 1951. To open up the interior, the pendants hanging in the nave space were removed. Ten were saved and hung within the side aisles, giving warm light in that secondary space.

Congregational lighting

In both churches it was decided that the congregational, or "reading" light, should come from high, deeply baffled ellipsoidal reflector downlights, with high bay pinhole apertures. In both cases there was considerable overlapping of beams, so that at any point at reading height, light is contributed from at least four lamps, giving soft, shadow-free illumination.

Christ Church has a lower light level, up to 17 footcandles as compared to St. Peter's 24 footcandles. Lighting systems in both churches are on dimmers, limited to 90 percent of full voltage. This extends lamp life, but yields a warmer light at less than full lumen output. Christ Church had no recessing space—rather a truss-supported timber ceiling—so two 500W downlights per bay were bracket-mounted to the nave side of each truss. These were attached to a device that lowers the fixtures to the floor for easy relamping.



St. Peter's Cathedral. *This section illustrates the basic locations and beam patterns of the new lighting. For purposes of illustration, the lighting systems have been shown separately.*

The relighting of two classic American churches reveals the subtleties of the English and French Gothic Revival styles.

St. Peter's had ample accessible recessing space, so four 400W downlight units in each bay were placed to the right and left of a catwalk above the groin vaulted ceiling. These were installed in the openings left by the original fixtures using special adapters, avoiding the need for new apertures.

Architectural lighting

The main nave ceiling in both churches was illuminated as part of the relighting. Christ Church has no triforium, so uplighting was concealed on the deeply-set clerestory window ledges. This location was logical because it was from here that the architect had originally admitted daylight into the building. When the units were turned on, the gilding and polychroming of the beams became visible for the first time. The side-aisle walls were washed with miniature 150W quartz wallwashers so the rhythm of the arches and columns would read in silhouette. The magnificent fresco on the chancel walls received its own wash of light.

At St. Peter's, uplights were placed in the center panel of each blind triforia. Small hatches were made so that each 500W quartz uplight could be relamped from the large shed space over the side aisle ceilings. Recessed accent fixtures were used to graze the 14 Stations of the Cross located between the stained-glass windows in each bay.

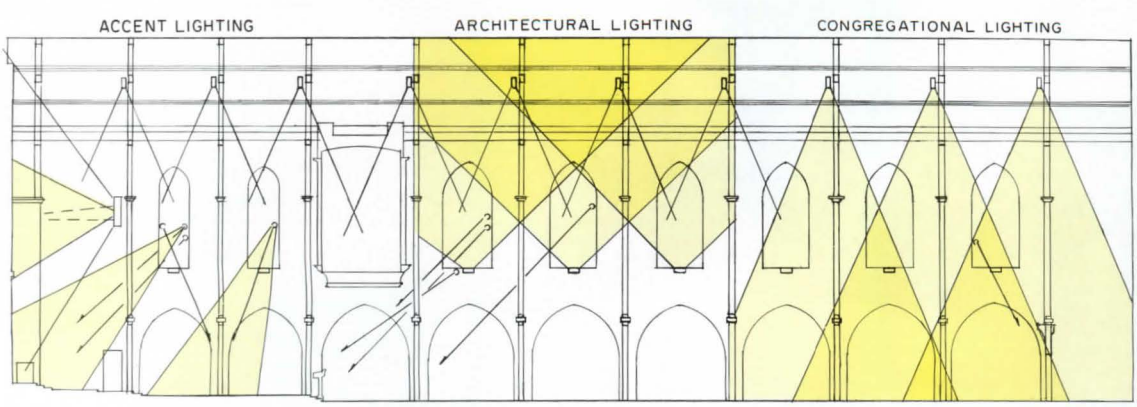
Accent lighting

At Christ Church, accent lighting was tucked into the deep reveal of the windowsills. Surface-mounted fixtures with deep, dark-painted hoods and an internal yoke were selected to minimize glare. These were placed on the far side of the reveals to conceal them from the congregation. At St. Peter's recessed 60-degree adjustable 300W and 500W units were selected, since the enormous throw would negate the effect of smaller 150W and 250W units. Many of the vault surfaces had compound curves, so maximum adjustment in the recessed downlight units was essential.

Dimming systems

Dimming systems control the lighting at both churches. At each church, the four different lighting types (decorative, congregational, architectural, and accent) have been separated into individual zones, each activated by a pre-set button. Christ Church has eight light level presets controlling 18 channels, and St. Peter's has 16 presets controlling 34 channels. In both churches there were presets for visiting hours, pre- and post-service, the Liturgy of the Word, and the Liturgy of the Eucharist. During services, the devotional lighting at St. Peter's is dimmed way down or turned off; at Christ Church, the great chancel fresco is only slightly dimmed.

Although originally vastly different in execution, these two interiors have been retrofitted with similar flexible lighting systems that can easily be used by officiating ministers or their assistants to create a wide range of effects. Only music can make a greater contribution to the liturgy. *Viggo Bech Rambusch*



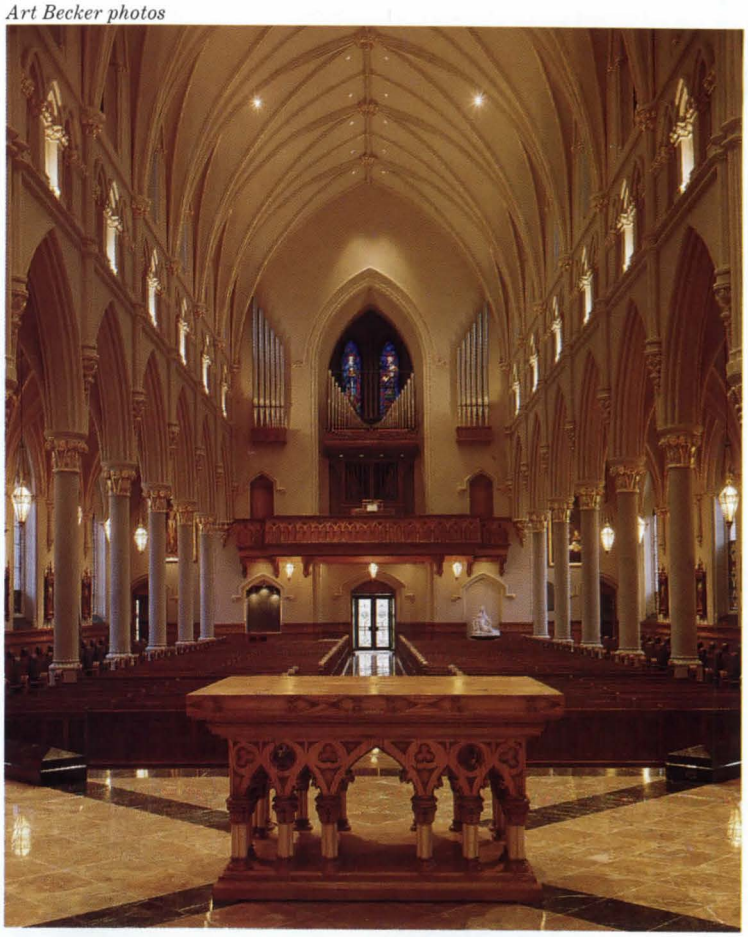
Christ Church. *This section shows the locations and beam patterns of new lighting. Christ Church had no attic space for recessing fixtures, so new fixtures were surface-mounted as subtly as possible.*

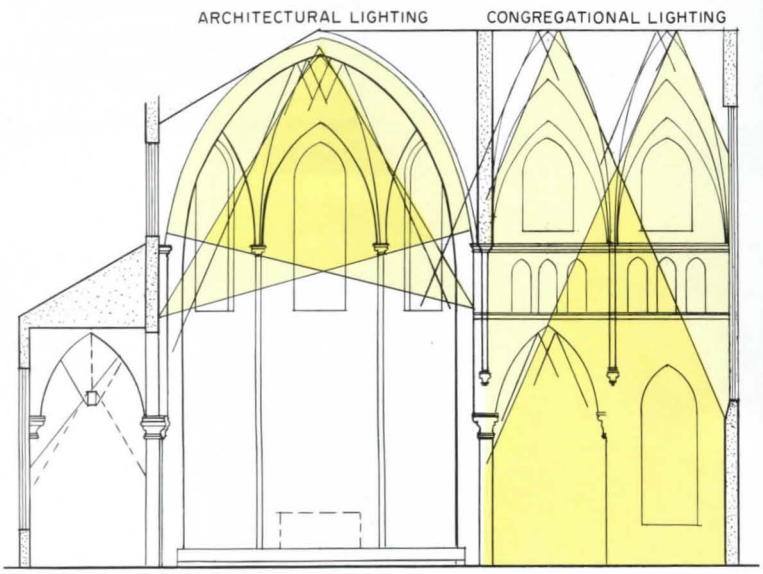
St. Peter's Cathedral
This church is a classic example of French Gothic revival. The original pendant lighting system has been removed to open up the space, and new recessed quartz downlights and accent lighting installed in the vaulted ceiling (opposite and section below). A wash of light is thrown onto the ceiling from quartz floodlights mounted on the sill beneath the blind triforia.

The lighting is controlled by a preset dimming system, with preset scenes (upper right) for different liturgical occasions. The Chapel of the Reservation of the Eucharist (below right) received a soft, mysterious wash of light.

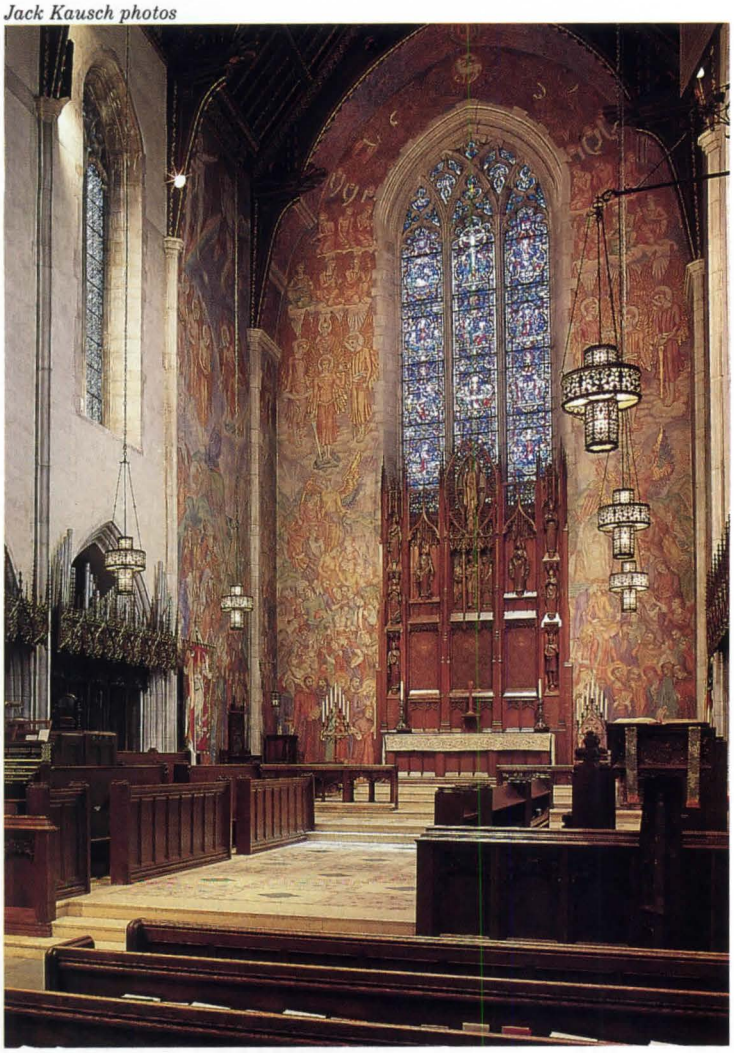
Credits
St. Peter's Cathedral
Erie, Pennsylvania
Architect: *Weibel Ryzewski & Shuster—Richard Weibel, cathedral architect*
Lighting Designer: *Rambusch Decorating Company—Viggo Bech Rambusch*
Liturgical Designer: *Rolf Rohn & Associates*

Art Becker photos



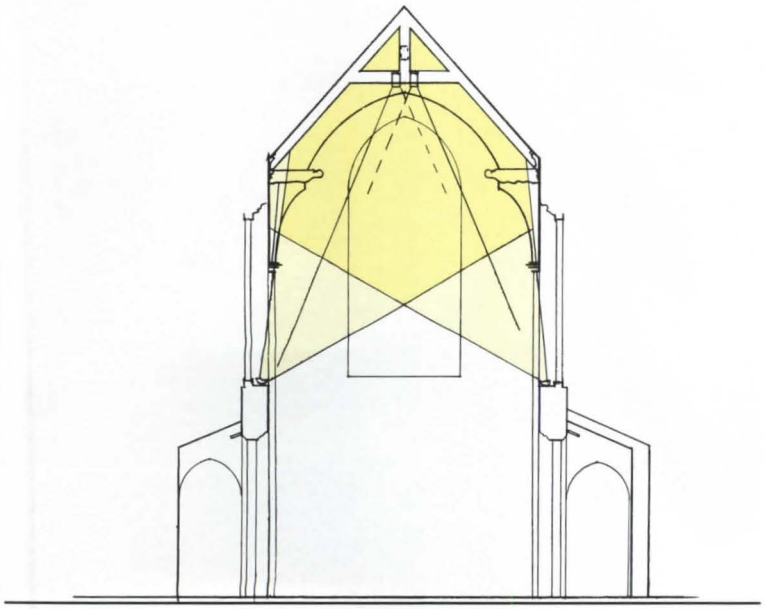


Jack Kausch photos



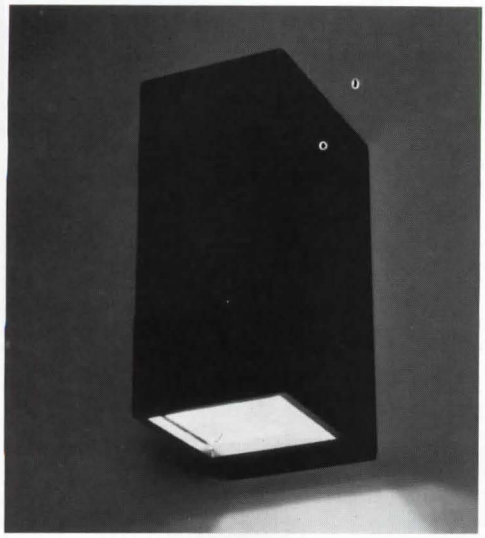
Christ Church
Before Christ Church, an example of English Gothic Revival, was relit, most of the richly detailed ceiling and trusswork simply disappeared into darkness. The new architectural lighting system uses quartz uplights concealed on the clerestory window ledges (section below and photo opposite) to reveal the gilded and polychromed beams for the first time. Because there is insufficient space in the ceiling for recessing downlights, exposed downlights have been mounted on the nave side of the trusses. The fresco on the chancel wall (left) received its own wash of light.

Credits
Christ Church
Cranbrook, Michigan
Architect: *Jickling Lymon Powell Associates—John Jickling, project architect*
Lighting Designer: *Rambusch Decorating Company—Viggo Bech Rambusch*
Project Coordinator: *Charles Raines*



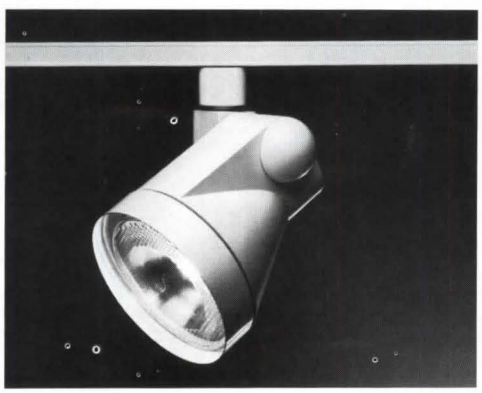
ARCHITECTURAL LIGHTING

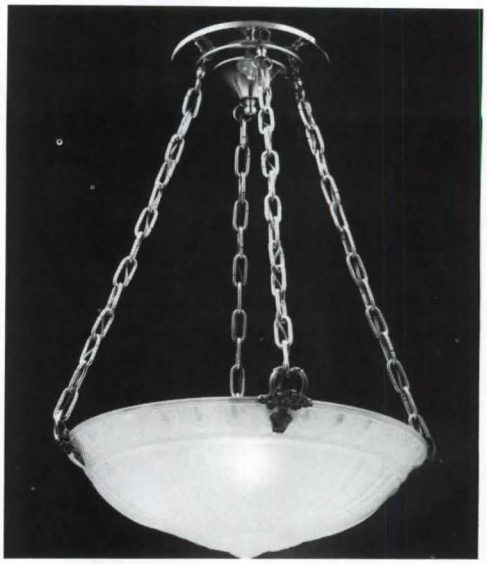
New Products *continued from page 12*



311. Versatile downlights
Described as vandal- and weather-resistant, rectangular Pragmatic fixtures are suggested for walls and ceilings indoors and out. The low-profile aluminum housings can be specified for any of seven different lamp types. Standard finish is black enamel; match-color option available. The 10-in.-deep vertically oriented design is pictured above. Voigt Lighting Industries, Inc., Leonia, N. J.

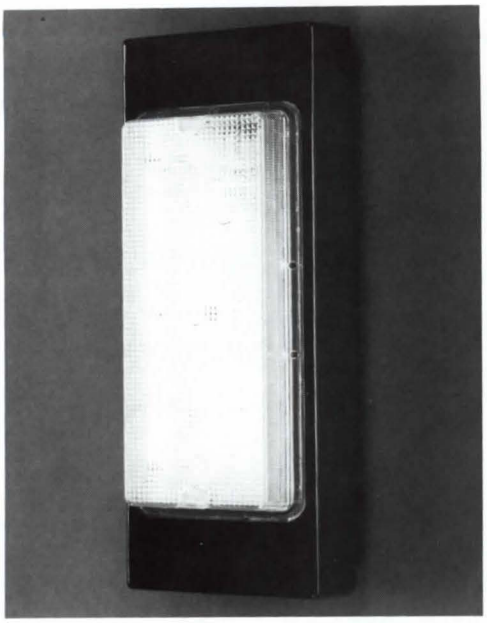
312. Track fixture for low-watt PARs
The new KT858 lampholder has been designed specifically for GE's highly efficient PAR38IR lamp, as well as the PAR38 lamp in sizes from 45 to 250 watts. The fixture resembles the KT855 unit, and echos the lines of the maker's other cone-shaped track designs for MR11, MR16, T4, PAR30, and other sources. The new fixture is recommended as display and accent lighting where specifications call for energy-saving track installations. Capri Lighting, Div. Thomas Industries, Los Angeles.



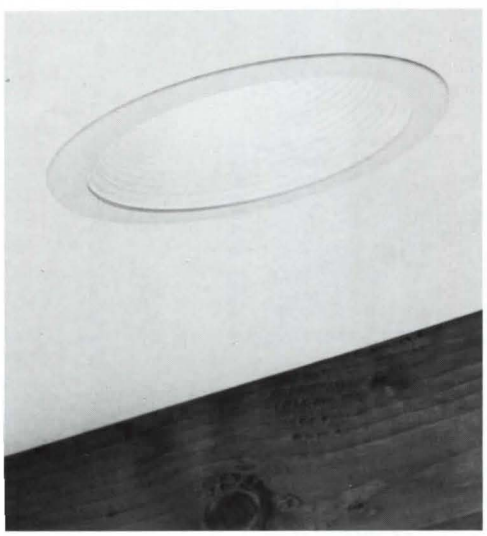


313. Turn of the (last) century
A large-scale (23 in. in diameter) chandelier offered by a Portland firm specializing in authentic reproduction lighting, the Ainsworth luminaire has a pressed-glass bowl made from the original, Edwardian-era mold. A colorful catalog illustrates over 240 other fixtures in Victorian, Arts & Crafts, and Art Deco styles. Rejuvenation Lamp & Fixture Co., Portland, Ore.

For more information, circle item numbers on Reader Service Cards.

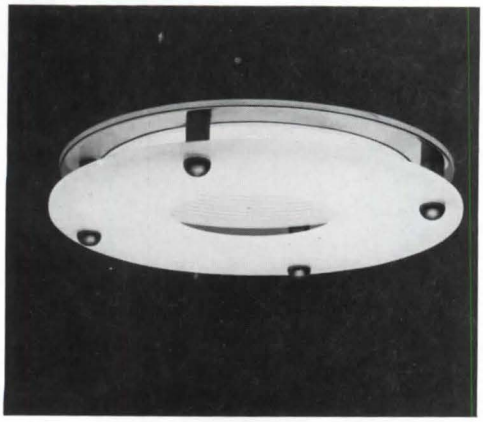


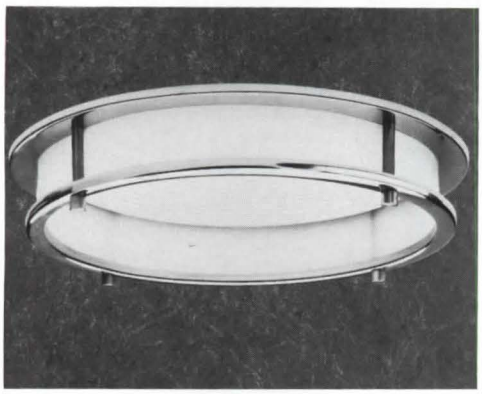
314. Low-profile utility light
The Mini Wall Pack comes ready to surface-mount at vandal-prone entrances, garages and stairways, and in recreational areas. Listed for wet and damp locations, the one-piece housing is available for vertical-, horizontal-, and overhead-mount installation. Diffuser can be specified in prismatic polycarbonate or smooth white acrylic. Thomas & Betts Corp., Memphis, Tenn.



315. White trim for standard housings
All-white recessed trims—cones and baffles—as well as clear, gold, and black Alzak reflectors fit into standard Lite Box insulated-ceiling housings, including those for sloped ceilings, as shown here. Trims accept most lamps. Prescolite, San Leandro, Calif.
Continued on page 48

New Products *continued from page 47*

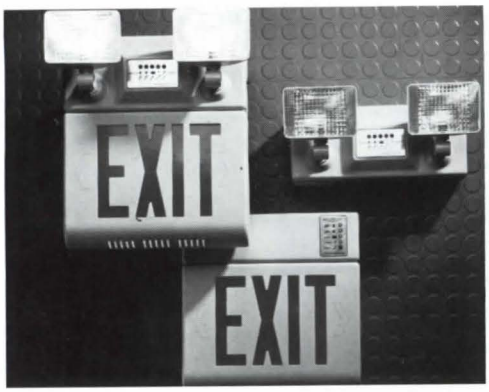




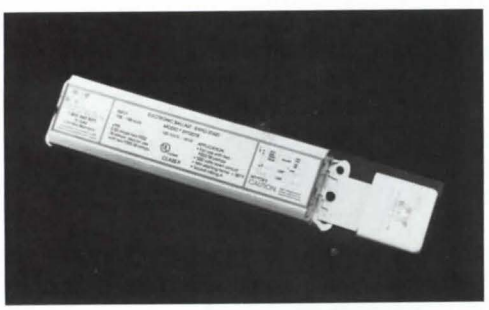
316. Renovating domestic downlights
A new line, Accents trims add decorative options to standard residential recessed downlights, matching the ceiling or soffit light to a traditional wood bookcase, for example, or picking up the bright brass of cabinet knobs. Below white stepped baffles, translucent collars and discs bounce some light onto the surrounding ceiling for a brighter effect (left). Other Accents accessories are marbleized or etched-glass-look covers that conceal the bulb and distribute light more widely. All trims can be retrofitted to existing Juno 4- and 6-in.-wide recessed fixtures.

A new remodel housing makes it easy to install recessed downlights into an existing ceiling (right). A supplied template guides sawing a hole in the drywall, then the power supply is pulled through the hole and wired to the fixture (top). The entire housing fits into the opening and is held by special remodel clips, and a trim ring covers hole edges and housing (bottom).
Juno Lighting, Inc., Des Plaines, Ill.

For more information, circle item numbers on Reader Service Cards.



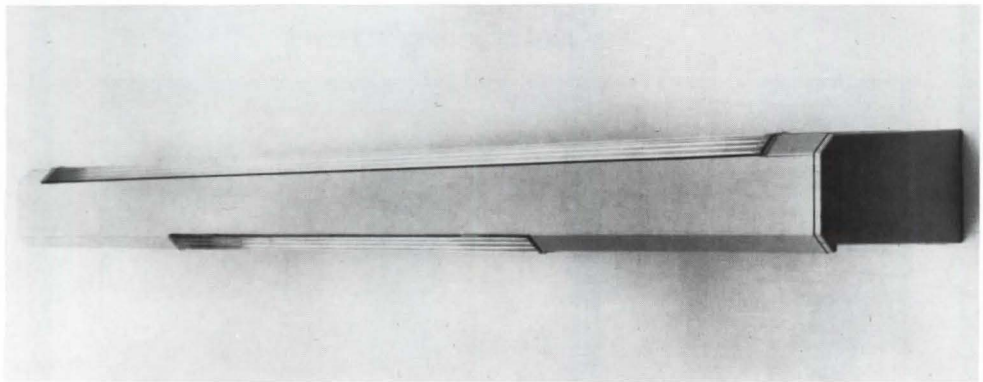
317. Emergency diagnostic monitor
The new Factor product is a self-diagnostics system that constantly monitors the status of the lamps, batteries, and chargers of this maker's emergency exit and lighting equipment, and automatically tests the unit every 28 days to ensure code compliance. Hubbell Lighting, Inc., Christiansburg, Va.



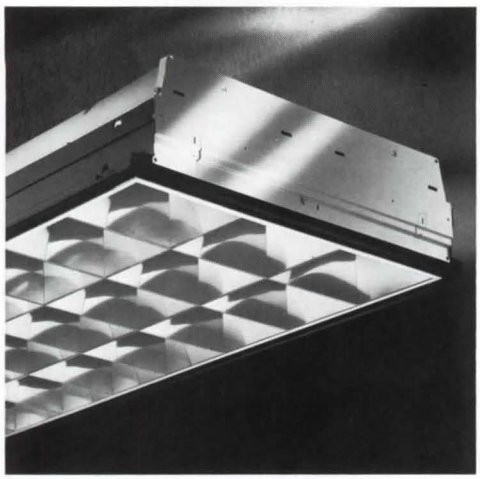
318. Fluorescent dimmer
Said to exceed requirements for utility rebate programs, the Dimwatt dims smoothly down to 10 percent of full intensity. Compatible with incandescent controls and occupancy- and ambient-light sensors, dimmer comes in electronic and linear-ballast forms. Stocker & Yale, Beverly, Mass.

319. White-trim downlights
High-reflectance matte-white paint finish is said to provide a clean, seamless look that blends well with any interior. Housings are approved for use with energy-efficient halogen PAR and compact-fluorescent lamps. Hubbell Lighting, Inc., Christiansburg, Va.
Continued on page 50

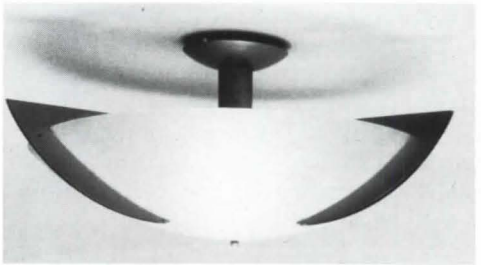
New Products *continued from page 49*



321. Patient-room lighting
A wall-mount direct/indirect bed light for use in medical facilities, the VE-H contains two T8 fluorescent-lamp uplights, and one 40W CFL downlight that can be switched separately. The extruded-aluminum housing comes in 4- and 5-ft-long units; lamps and ballast are attached to an internal gear tray. The fixture is leveled by means of a concentric washer. Standard finish is white powder coat; custom colors available. Zumtobel Lighting, Inc., Garfield, N.J.

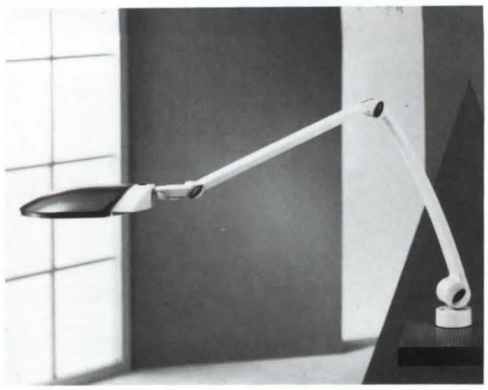


320. VDT-glare eliminator
The Precision Cut-Off Parabolic (PC 2) lighting system (left) is said to completely eliminate VDT glare by suppressing high-angle brightness. The specular, low-iridescent aluminum louver incorporates compound parabolic profiles in both lengthwise and crosswise planes. Developed by the Metalux division, the luminaire "bends" light effectively enough to exceed the light control standards recommended by the Illuminating Engineering Society. Cooper Lighting, Elk Grove Village, Ill.



322. Sand-glass ceiling light
Timete, designed by David Palterer, has a cast-aluminum body and steel struts supporting a large (23- or 26-in.-wide) diffuser of molded sanded glass. Artemide, Inc., Farmingdale, N. Y.

For more information, circle item numbers on Reader Service Cards.



323. Task light for the office
The latest in a Euro-styled line, Valencia has a sculpted, tiltable lamphead with two 9W compact-fluorescent lamps. Standard bulbs have a color temperature of 4100K, and a CRI of 82. Lamphead comes in matte black, light gray, teal green, and burgundy. Waldmann Lighting, Wheeling, Ill. ■

Manufacturer Sources

For your convenience in locating fixtures and other products shown in feature articles, RECORD has asked the architects and lighting designers to identify their sources.

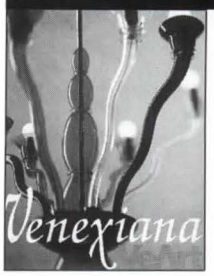
Pages 24-29
Michigan State Capitol
Gary Steffy Lighting Design
Exterior spots: Arc Sales. Lamps: General Electric. Floor-mount uplights: Hydrel. Historic replicas: Jefferson Art Lighting. UV-blocking lenses: KSH. Theatrical accents: Litelab. Striplights: Lithonia. Lighting energy controls: Lutron. Louvers: Norton. Exterior cove uplighting: Peerless. Sconces: St. Louis Antique Lighting. Exterior bollards and gelled uplights: Sterner. Exerior floodlighting and lamps: GTE Sylvania. Ceiling-mount globes: Urban Archaeology. Repair and restoration of site lighting: Washington University Technology Associates. Site-lighting poles: Western Lighting Standards.

Pages 30-33
Freer Art Gallery
Richard Skinner, lighting designer
Light track, modified track-mounted fixtures: Edison Price. Freer-designed corridor uplight sconces, adjustable recessed MR16 downlights: NULUX. Laylight glass: PPG. Exterior skylight glass: Alpen. Fiber-optic illuminator, cables: Optical Display Lighting. Historical fixture restoration: Rambusch.

Pages 34-35
Credit Suisse
Janko Rasic, Architect
Quartz uplights: Elliptipar. Theatrical projectors: Altman Stage Lighting. Track lighting: Lightolier. Quartz cove-lighting strips: Starfire. Wall sconces: Artemide. Lighting controls: Macro Electronics Corp. Fiber-optic accent lighting: Lumenyte, Int.

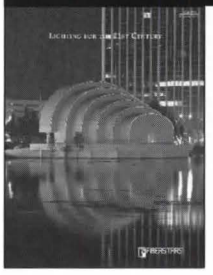
Pages 40-45
Christ Church and St. Peter's Church
Viggo Bech Rambusch, lighting designer
Quartz downlights, uplights, accent lights: The Rambusch Company. Lighting-control systems: Lutron (St. Peter's); Lehigh (Christ Church). ■

Product Literature/Lighting

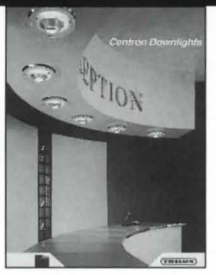


418. Decorative Italian fixtures
VeArt's 1994 catalog includes dramatic color photographs of the Venexiana Collection of Murano glass luminaires, as well as full dimensional and lamping information. The high-style line features single, double, and triple-light sconces and multiple-light chandeliers. Artemide, Inc., Farmingdale, N. Y.

419. Direct/indirect pendant
Lunos provides direct downlight through straight-blade or parabolic baffles, and luminous indirect ambient light through translucent faux alabaster diffusers. Lamping options include two or four 40W twin-tubes and 31W Octron fluorescent. Luminaire is said to be lightweight, and to minimize ceiling/fixture contrast. Excelite, Inc., Altoona, Pa.

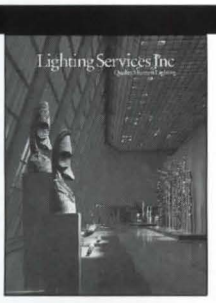


420. Architectural fiber optics
Fiberstars fiber-optic lighting systems are said to offer a colorful, more economical alternative to conventional electric strips in applications from pathway and safety lighting to building and bridge outlining. An eight-page design guide illustrates lighting effects and details mounting options. Fiberstars, Inc., Fremont, Calif.



421. Adjustable downlights
The Centron compact-fluorescent downlight offers a post-anodized faceted reflector that can be adjusted for wide or narrow beam-spread in the field. An optional water-white-glass lens reflects light onto the surrounding ceiling. A brochure includes photometric, lamping, and other data. Litecontrol, Inc., Hanson, Mass.

422. Self-ballasted fluorescents
Binder insert on Dulux EL electronic compact-fluorescent lamps shows how they reduce energy costs by as much as 75 percent and last up to 13 times as long as comparable-light incandescent sources. Screw-base bulbs can directly replace incandescents in many downlight, track, and decorative-lamp applications. Osram Sylvania, Inc., Danvers, Mass.

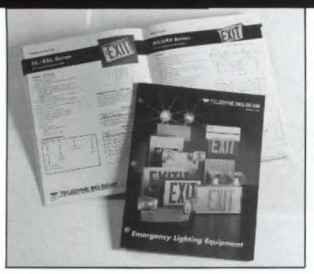


423. Museum lighting
A design portfolio includes full-page color photos of specific gallery installations, describing the illumination program and detailing the fixtures that met the lighting designer's requirements for both conservation and display of artwork and exhibits. Lighting Services, Inc., Stony Point, N. Y.

For more information, circle item numbers on Reader Service Card.

Product Literature/Lighting

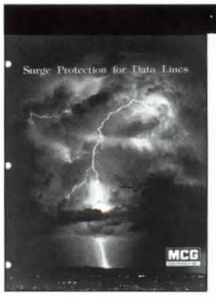
424. Outdoor lighting
A 14-page brochure describes the Curvilinear Cutoff line of high cut-off, post-top and arm-mounted exterior luminaires. Four different light distributions, three housing sizes, and numerous finish options are available. Fixtures using HID lamps ranging in size from 70W to 1000W may be specified. Kim Lighting, City of Industry, Calif.



425. Emergency lighting
A 64-page catalog outlines a comprehensive line of emergency-lighting equipment. Commercial and industrial lighting units, emergency-power systems, exit signs, and central inverter systems are among the products featured. References from the National Electrical Code and Life Safety Code are included. Teledyne Big Beam, Crystal Lake, Ill.

426. Lighting-control videos
A videotape demonstrating Luméa lighting controls, and the LuMaster central lighting-control system is available. The control systems provide central monitoring and convenience, according to the manufacturer, and are available in 14 colors. A second tape describes how both controls are installed. Lutron, Coopersburg, Pa.

427. Indirect fixtures
The Ensconce Series of interior lighting fixtures uses an adjustable, asymmetric reflector to spread light evenly across the ceiling plane and wall surfaces. Many Ensconce styles are available, including wall-mounted and torchère models. Sources include tungsten, metal halide, and high-pressure sodium. Elliptipar, Inc., West Orange, Conn.



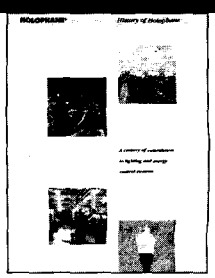
428. Surge-protection catalog
A 20-page catalog allows selection of an AC power-line surge suppressor for almost any application. Surge suppressors featured range from wall outlet plug-in types to those capable of protecting an entire facility, as well as protectors for data-line carriers and video and computer networks. MCG Electronics, Deer Park, N. Y.

429. Boom-proof fixtures
The Guardtite series of U. L.-listed explosion- and vapor-proof lighting fixtures have epoxy-coated aluminum housings, guards to protect globes, and lamp compartments isolated from the wiring chamber. A brochure lists photometric data, dimensions, lamping, and mounting options. Guth Lighting, St. Louis.
Continued on page 54

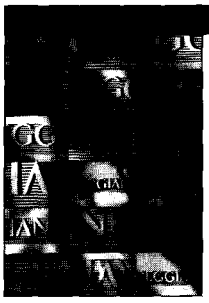
For more information, circle item numbers on Reader Service Card.

Product Literature/Lighting

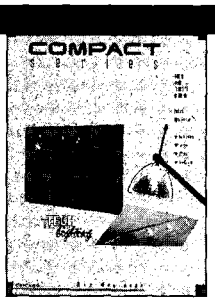
430. Open-conductor track
The Basis Line is an open-conductor track system capable of supporting up to 40 amps of low-voltage track lighting. The elegant track can be factory bent to a radius as little as 2 ft. and can easily be mounted into truss or space-frame systems. All components are either U. L. or E. T. L. listed. Translite Systems, Redwood City, Calif.



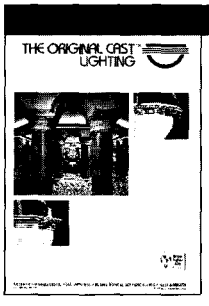
431. Prismatic-lighting brochure
The history of the development and use of prismatic refractors, reflectors, and lenses is detailed in a 12-page color brochure. Other lighting achievements presented include the discovery of the first scientific method for measuring light intensity, glare, and distribution, the first heat-sink ballasts, and other innovations. Holophane, Newark, Ohio.



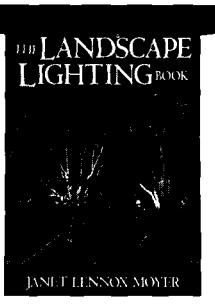
432. Complete fixture catalog
A 48-page color catalog illustrates a complete line of lighting fixtures, including track, recessed, pendant-, and surface-mounted equipment for accent and ambient lighting. Fixtures are available in a full range of incandescent, fluorescent, and HID sources, and in a wide variety of styles and finishes. Regianni U. S. A., Inc., New York City.



433. Portable display lights
The CP Series of low-voltage display fixtures have telescoping arms, a concealed, integral transformer, and come either with a ceiling-canopy mount or a mobile clamp-mount. A five-fixture set with carrying case can be purchased. The fixtures use a tiny MR16 lamp, available in three beam spreads. Tech Lighting, Inc., Chicago.



434. Energy-efficient fixtures
A 28-page catalog illustrates a wide assortment of classic pendants, sconces, and flush-mounted fixtures that come with either energy-efficient compact-fluorescent or HID lamps. The manufacturer also specializes in creating custom light fixtures and in restoring existing antique fixtures. The Original Cast Lighting, St. Louis.



435. Landscape lighting book
Lighting designer and author Jan Moyer's *Landscape Lighting Book* shows lighting and landscape designers how to achieve beautiful interior or exterior landscape lighting. The book covers lighting drawings, gives fixture and control-systems specifications, maintenance, lighting levels, and more. John Wiley & Sons, Inc., New York City. ■

For more information, circle item numbers on Reader Service Card.

Product & Literature Spotlight

Cast Aluminum Lighting

Sun Valley Lighting manufactures an extensive line of Standard & Custom cast aluminum lighting poles & fixtures in all period styles. Our 50 years of design & manufacturing experience provides you with unexcelled product quality. Our staff of designers, engineers, & tool makers are here to assist you. Our in-house foundry assures quality & prompt delivery at competitive costs.

Sun Valley Lighting

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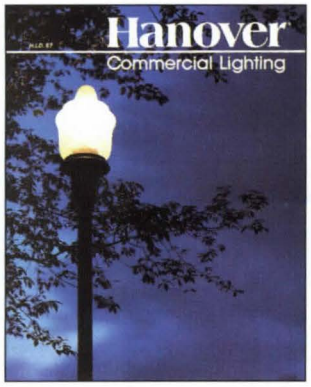
Hanover Lantern Commercial Lighting



Hanover Lantern designs & manufactures high quality heavy duty cast titanium/aluminum commercial grade decorative lighting fixtures, poles & accessories. A selection of design styles, light source options, light distribution systems, mounting options, computer generated photometric data plus a custom design service are available to the architect or engineer. 470 High St., Hanover PA 173331. Phone (717) 632-6464, fax (717) 632-5039

Hanover Lantern

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Custom is spelled E-R-I-C

For nearly 25 years, Eric Industries has been serving the needs of architects and designers by producing only the finest in custom lighting and decorative metals. Our reputation for quality and attention to detail has led to high profile projects across the US and around the world. Let us turn your custom design into reality. (818)-814-2381.

Eric Industries, Inc.

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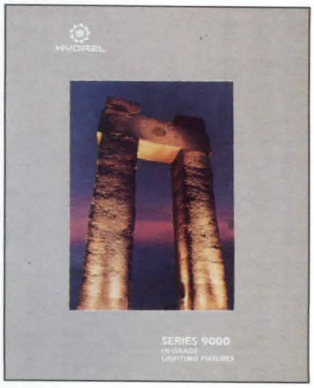
In Grade Up Lights

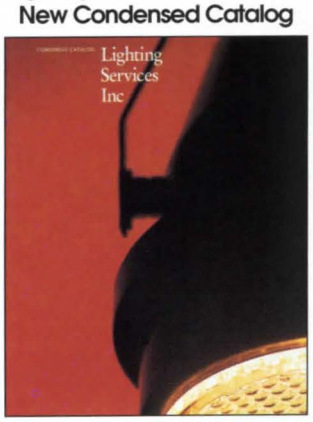


This 36 page catalog covers the new, innovative 9000 Series Ingrade Lighting fixtures. See how modular design makes a difference in performance, installation, maintenance, and durability. Available in a variety of configurations, this series accepts lamps to 175W HID, 250W incandescent. Architectural and landscape illustrations include recommendations for the most common applications. Hydrel, Sylmar, California.

Hydrel

Circle 109 on Inquiry card

Lighting Services Introduces New Condensed Catalog

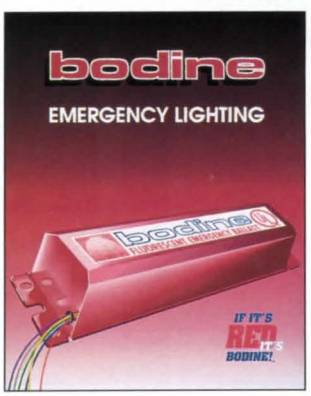


New 16-page condensed catalog features an overview of LSI's extensive line of track, lighting fixtures & accessories. The catalog illustrates vibrant color photos of the company's most popular fixtures including the Spotlight, Low Voltage & Compact Fluorescent Series as well as CAD drawings of LSI Track & mounting devices. There is also a preview of LSI's newest fixtures, the QM200/QM500 Series, wall wash units & the FO70/FO150 Series, Fiber Optic Systems.

Lighting Services, Inc.

Circle 110 on Inquiry card

Fluorescent Emergency Lighting



Bodine emergency ballast convert a fluorescent fixture into an emergency light by installation inside or near the fixture. Designed to operate any type of fluorescent lamp. Compatible with ELECTRONIC AC ballasts. Meets state and local fire/safety codes. Independent operation of each fixture during emergency. Quality products for over 30 years. For more information, call Bodine 800-223-5728.

Bodine Company

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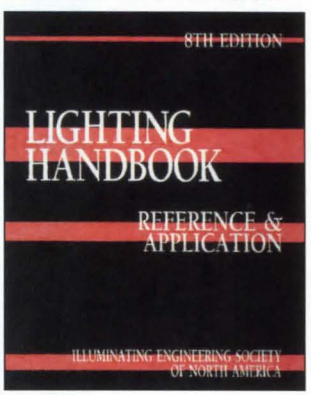
IES LIGHTING HANDBOOK



Lighting Handbooks, published by the Illuminating Engineering Society of No. America, are acknowledged as the standard lighting guide. New 8 Edition contains the latest technology, terminology, & acceptable lighting standards & applications in today's energy efficient environment. Highlights include the '93 codes & regulations, elements of design & the design process, illuminance selection procedures, & software for use with lighting economic calculations! Expected Pub. Date is 7/93.

Illuminating Engineering Society

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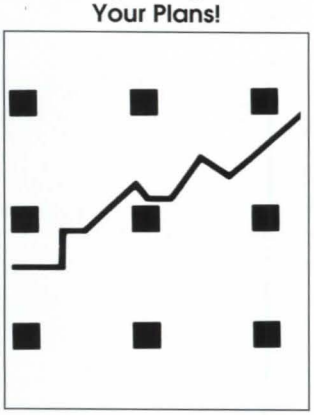
Keep Dodge in Your Plans!



Don't forget to provide your local Dodge Reporter with the details and plans for your next job. You don't want them to miss out on the best bid for your next job. Contractors can't bid on jobs they don't know about. Thank you for your input. We appreciate your cooperation. F.W. Dodge, McGraw-Hill Construction Information Group.

F.W. Dodge

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For detailed data, prefiled catalogs of the manufacturers listed below are available in your 1993 Sweet's Catalog File as follows:

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(E) Engineering & Retrofit
(I) Industrial Construction & Renovation
(L) Homebuilding & Remodeling
(D) Contract Interiors

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Sales Offices

Main Office

Mc Graw-Hill, Inc.
1221 Avenue of the Americas
New York, NY 10020

Publisher
Roscoe C. Smith III (212) 512-2841

Administrative Assistant
Anne Mullen (212) 512-4686

Director of Business and Production
Joseph R. Wunk (212) 512-2793
Fax: (212) 512-4256

Assistant Promotion Manager
Sheryl Berger (212) 512-2234

Classified Advertising
(801) 972-4400

Editorial
(212) 512-2594

District Offices

Atlanta
4170 Ashford-Dunwoody Road
Atlanta, GA 30319
Ollie Bieniemy
(404) 843-4781
Fax: (404) 252-4056

Chicago / Dallas / Houston
2 Prudential Plaza
180 North Stetson Avenue
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Philadelphia / Pittsburgh / Cleveland
1700 Market Street
Suite 1520
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Fax: (215) 496-3828

Arizona
Media Sales Associates
7119 East Shea Blvd., Suite 106-28
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New England / New York
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New York, NY 10020
Louis Kutscher
(212) 512-2814
Fax: (212) 512-4256

New York
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New York, NY 10020
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(212) 512-3603
Fax: (212) 512-4256

San Francisco / Seattle
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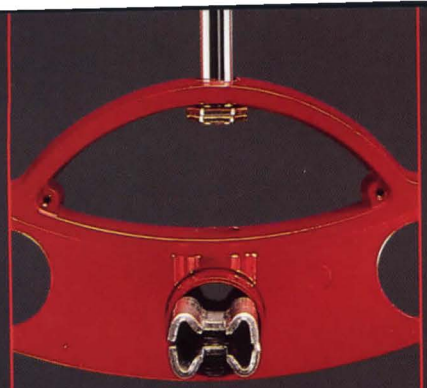


lightruss

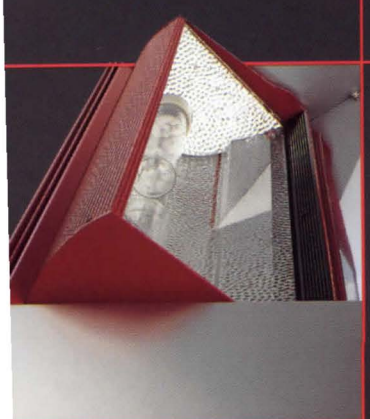
A modular indirect lighting structure for large, open spaces. Configure to include horizontal or vertical runs, gentle curves, multiple angles of any radius or even changes in elevation.

Choose from a palette of reflector designs and light sources that are uniquely packaged to conveniently drop into the system.

Flexible, lightweight components are constructed of die-cast, extruded aluminum anodized and powder coated to withstand corrosive environments.

For optimum illumination that goes the distance the choice is **lightruss** - from **SPI**.

SPI



SPI Lighting Inc.
10400 North Enterprise Drive
Mequon, WI 53092

414-242-1420
414-242-6414 FAX

Circle 114 on inquiry card

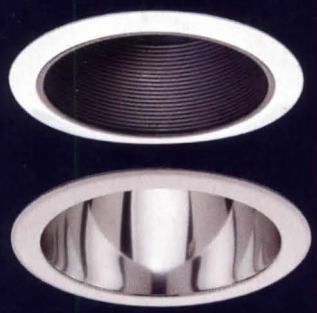
2D DIRECTIONS

Alta boldly goes where no lighting manufacturer has gone before with the creation of these decorative luminaires featuring the 2D lamp source.

Alta Illuminations Mfg. offers a new direction in energy saving lighting with their innovative series of luminaires, utilizing GE's revolutionary 2D compact fluorescent lamp.

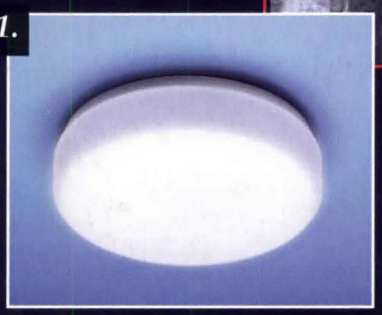
Spanning environments both commercial and residential, this collection premieres the next generation of energy saving lighting technology.

Alta Illumination Mfg. and General Electric - in partnership for an energy conscious tomorrow.



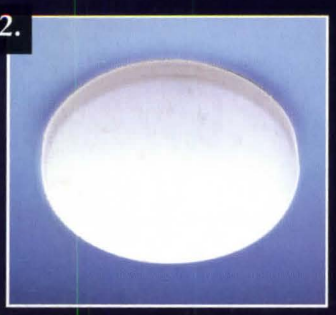
Above: Recessed fixtures utilizing either regressed black baffle, or specular reflector.

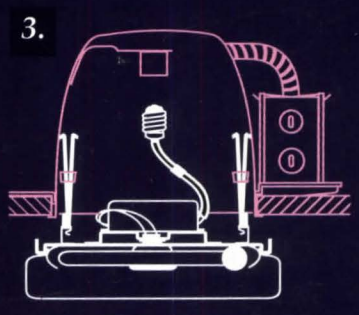
Right: Dramatic suspended 2D lighting

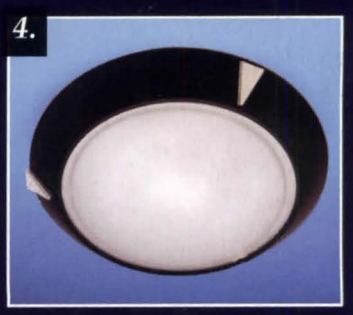


Surface mounted 2D lighting:

1. 28 or 38 watt 2D (lumen output of 200W incandescent).
2. Shallow depth diffuser (3"), 28 or 38 watt.
3. Retrofit 2D, retrofits an existing recessed incandescent housing in seconds (hardwire option available).
4. Decorative surface mount, available in a variety of colors and finishes.







ALTA™

ALTA ILLUMINATION MFG

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27615 Avenue Hopkins, Valencia, CA 91355 • Telephone: (805) 257-6897 • FAX: (805) 257-1554

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