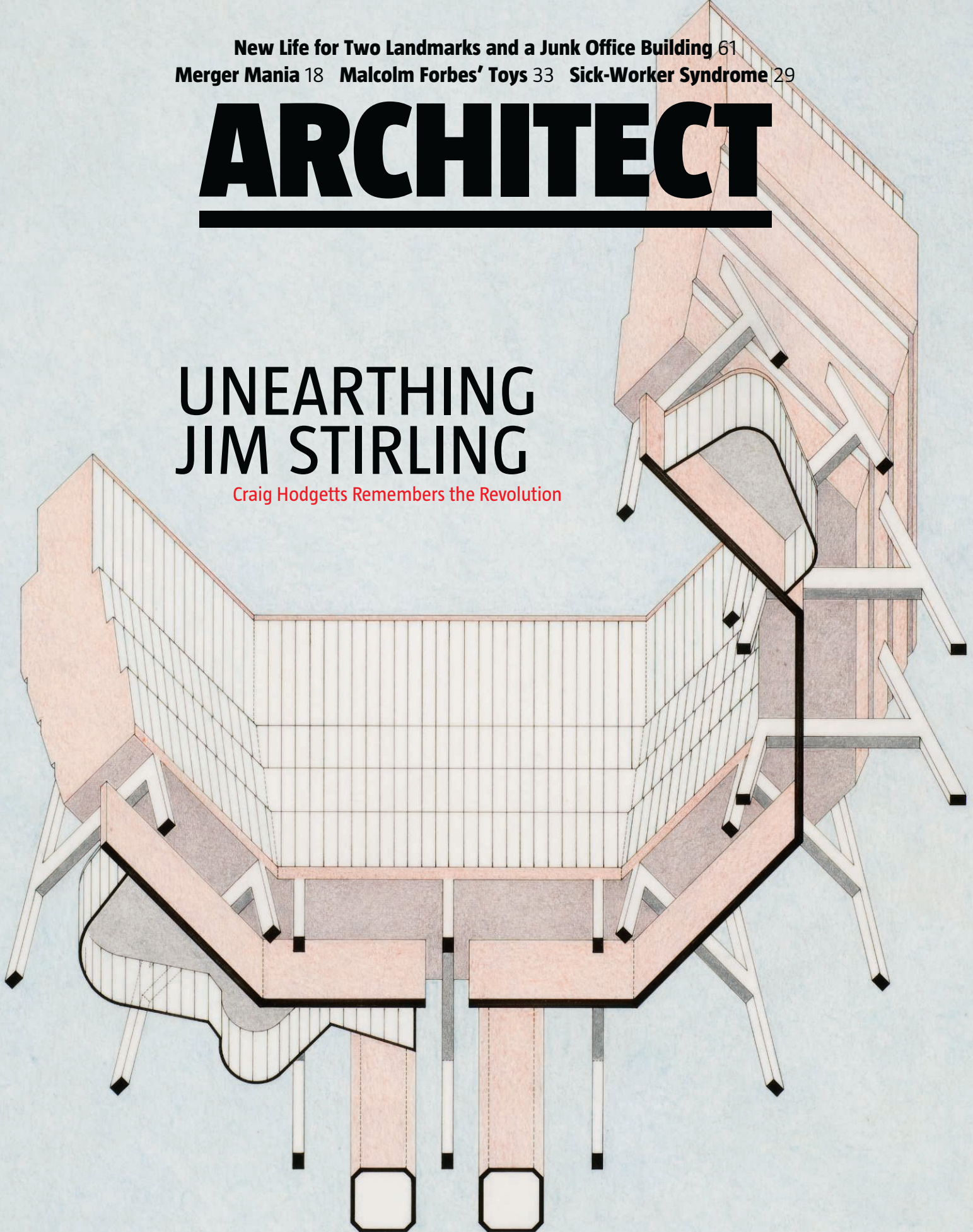


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Craig Hodgetts Remembers the Revolution



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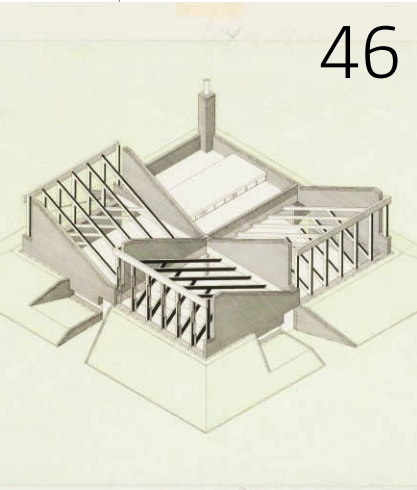
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### James Frazer Stirling

With Yale University hosting two exhibitions on the British architect, who died in 1992, it's time to reconsider the life and work of a brilliant, yet complex and laconic, master. Inside our 14-page feature:

- **Drawings** from Stirling's archive.
- A **timeline** of Stirling's life and work.
- An essay by **Craig Hodgetts**, once a student of Stirling's, on the tangled legacy of his late mentor.
- **Hugh Pearman** examines the demise of Stirling's ambitious Southgate housing project in Runcorn in northeast England.

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### Morgan Library McKim Building

Financier Pierpont Morgan's private library, designed by McKim, Mead & White, had not undergone a comprehensive interior restoration in its 100-year history. Beyer Blinder Belle Architects & Planners assembled a team of lighting designers, artisans, and conservationists to give new life, and light, to the museum. **SARA HART**

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### Uniqlo Shanghai Flagship Store

Architect Peter Bohlin called upon his special blend of retail design alchemy, seen in Apple stores worldwide, and his personal history of spelunking to convert a stripped-down spec office building into one of the hottest new shopping spots in Shanghai. **MIMI ZEIGER**



### Hugh Pearman

"Georgian Precedents, Modern Realities," page 54

Hugh Pearman is editor of the *RIBA Journal*, the magazine of the Royal Institute of British Architects, and architecture critic for *The Sunday Times*, London. He helped establish the Stirling Prize for Architecture, named for James Stirling, in 1996. He is also the author of several books, including *Contemporary World Architecture*, published by Phaidon.

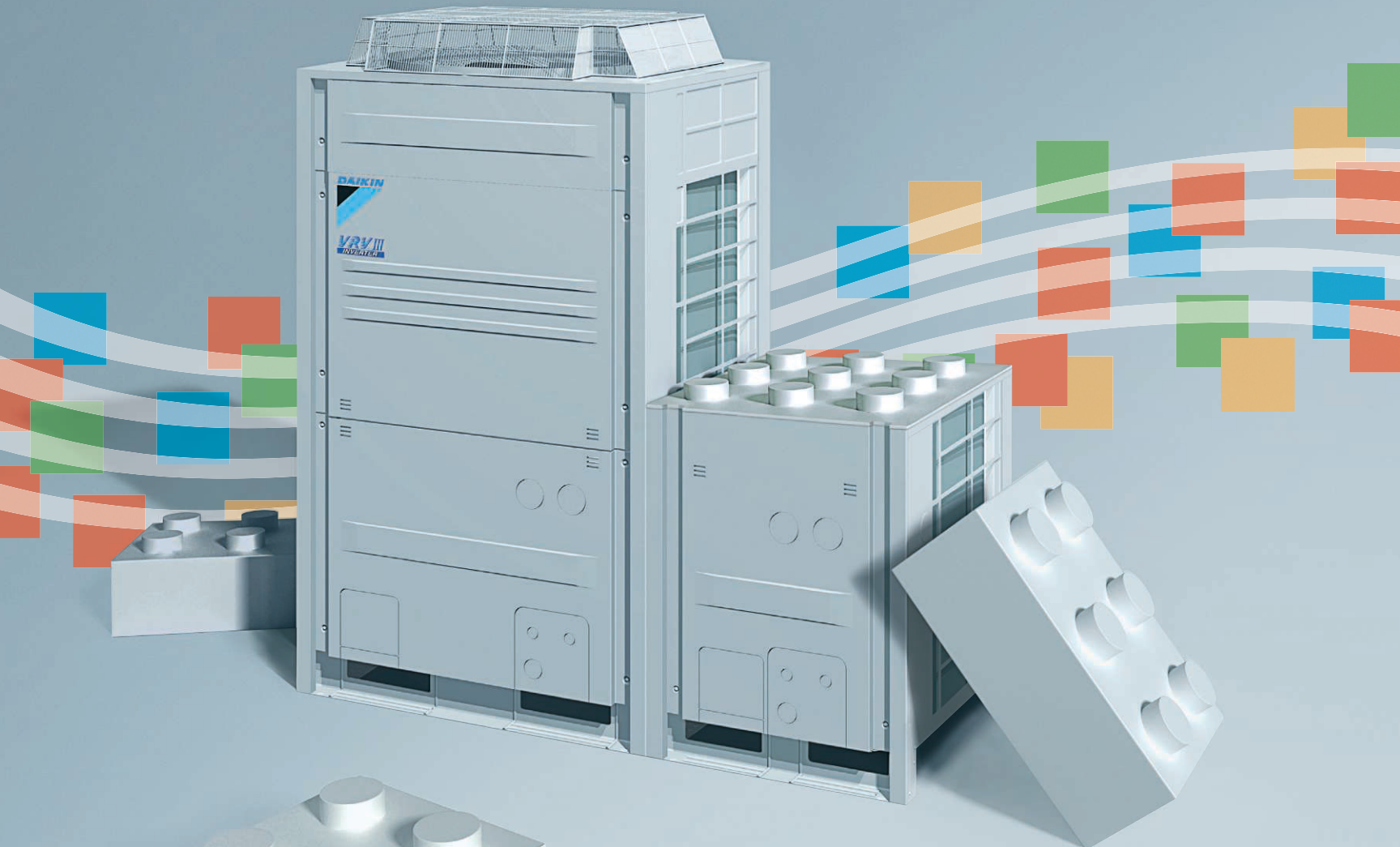
ON THE COVER  
JAMES STIRLING'S FLOREY BUILDING.  
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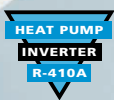
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PETER ARKLE



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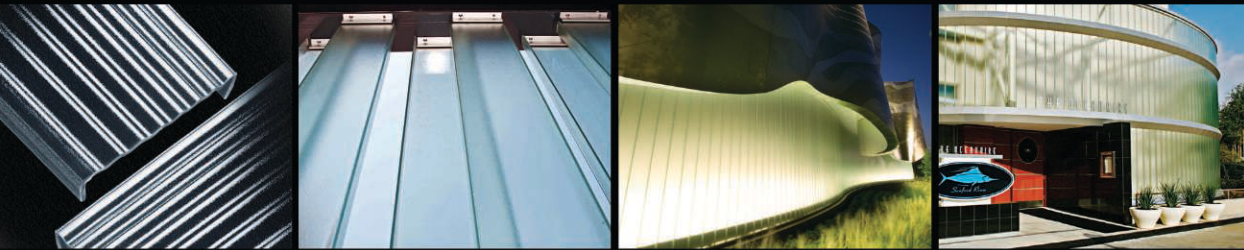
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# OUR ROI WORLD

**AUSTERITY'S JUST DANDY**—for the other guy.

While U.S. politicians quarrel ad nauseam over fiscal policy, Britain's coalition government went ahead and swung the axe. On Oct. 20, Chancellor of the Exchequer George Osborne announced a plan to reduce government spending by roughly \$130 billion over the next four years. Osborne intends the British deficit to dive accordingly, from its current level, 11.5 percent of GDP, to 1.1 percent of GDP in 2016. That's big savings.

So what must the British people sacrifice in exchange for a cleaner balance sheet? Design, for one thing. The Commission for Architecture and the Built Environment (CABE), a government-chartered group that provides guidance on building design and urban planning, has lost all of its government funding, which last year accounted for 40 percent of its operating expenses. Now CABE's very existence is in question.

The annual savings on CABE will amount to roughly \$1.5 million. In light of other measures, such as the elimination of nearly 500,000 public-sector jobs and a hike in the retirement age from 65 to 66, the CABE cuts may seem like the least of Britain's worries. The flurry of objections in the nation's design press could easily be dismissed as special-interest griping.

Yet CABE's accomplishments are major, and I suspect the British people will come to regret its loss should the government cuts prove to be crippling or fatal to the group. CABE has conducted 3,000 design reviews in its 10-year history, on every conceivable building type: offices, housing, hospitals, schools, and parks, to name a few. And CABE-guided projects have raked in the design awards, which demonstrates that the architecture community, at least, approves of the group's work.

Unfortunately, most design awards are an insider's game, with limited effect on popular opinion and zero grounding in quantifiable metrics. In evaluating each other's work, awards jurors typically are asked to define quality according to the vaguest of criteria: aesthetics. While aesthetics matter tremendously to architects and provide real benefit to the public, "beautiful" simply doesn't compute in the mind of a government accountant.

The seemingly casual elimination of CABE's \$1.5 million is symptomatic of a larger problem for architects. The profession does many things very, very well. But demonstrating the value of architecture in the context of a devastated global economy historically hasn't been one of them.

Joe and Jane Six-Pack (or Joe and Jane Six-Pint, if you're British) probably perceive design as a luxury good, a Louis Vuitton splurge when times are good. The powers that be obviously feel much the same way, despite a zillion *Fast Company* arguments for design's potential contribution to the bottom line. Like it or

not, we're living in a nickel-and-dime world now, and I fear architecture isn't coming across as a sound investment—not only in the U.K., but in the U.S. as well.

Stateside, the AIA helps with aggressive lobbying and promotional campaigns. But the AIA can't go it alone. The real burden of proof—proof of the tremendous return on investment in design—sits squarely on the shoulders of the individual architect.

Don't feel overwhelmed. The solution is already out there. Architecture firms and their clients increasingly are documenting building performance. There's a growing industrywide effort to monitor buildings' energy and water consumption. These efforts are important and should become standard practice. And such practices can go even further, to encompass the effects of design on a company's core business.

Gensler, a business-savvy practice if there ever was one, has its own in-house research department, which generates post-occupancy reports on its office projects, proving hard benefits of design such as increases in staff retention and declines in employee absenteeism. A law firm loves to hear that its paralegals took fewer sick days because their new workspace cubicles have better access to daylight. That's value.

Not every client is willing to pay for post-occupancy research, but there's always the possibility of gathering the data, ostensibly on the client's behalf, as a value-added service. The value will accrue to both client and architect. Research findings will guide architects' design decisions in the future and help them justify those ideas to the next client.

If the profession as a whole gathers enough findings and broadcasts them effectively, programs such as CABE would fall into the category of essentials, and architecture would transcend its perception as a luxury trade. I wish good design could speak for itself, but occasionally the designers themselves need to speak up. There's value in that.

*Reel Crane*

## Corrections

In the November 2010 issue, the photo of the Design Research store in the Culture section should be credited to Ezra Stoller ©Esto. And November's "Welcome to Canada!" misreported the number of licensed architects in the United States. There are 105,312, according to the National Council of Architectural Registration Boards.



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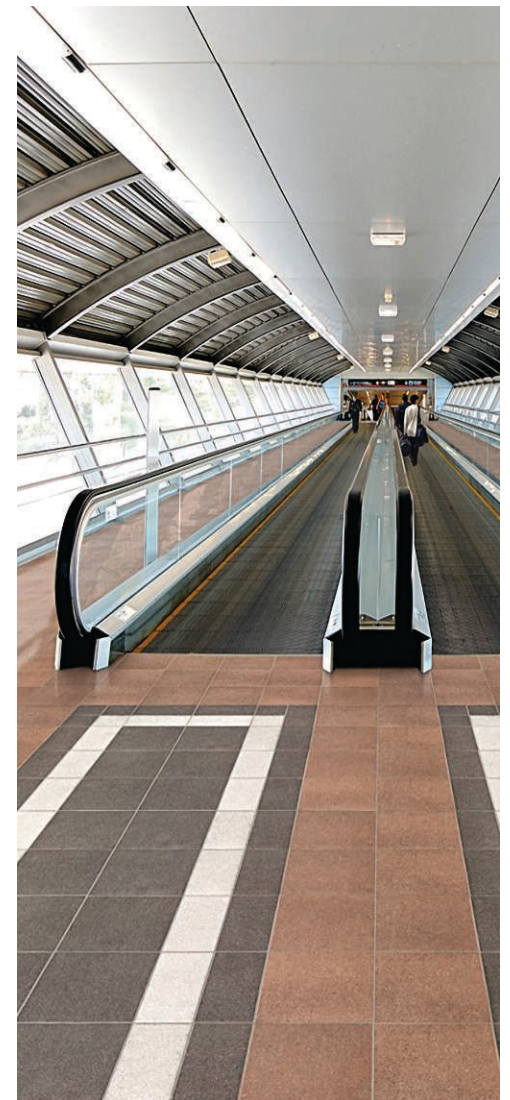
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## NEWSWIRE

COMPILED BY EDWARD KEEGAN



### HERALD (SCOTLAND)

#### Modern "ruin" may be preserved

Scotland's St. Peter's Seminary (1966), by Gillespie, Kidd & Coia, was abandoned in 1980. Glasgow-based arts group NVA has offered plans that "accept the building in its current" state.



### ECO-STRUCTURE

#### USGBC seeks comments for next LEED

The first round of public comments will close on Dec. 31, with a second round occurring sometime in 2011. Proposed changes stress performance-based metrics for LEED credits.



### THE DAILY REPORTER (MILWAUKEE)

#### High-performance prototype

The Weidt Group and HOK unveiled the Net Zero Co<sub>2</sub>urt prototype, which achieves 80 percent efficiency via design. PV panels and solar thermal tubes get the building to net-zero status.

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SOURCE: AIA

# Construction Specifications Institute Acquires Software Developer BSD

**MERGERS CONTINUE TO** propagate in the industry, but one of the latest transactions is not between two firms; rather, it's the acquisition of software developer Building Systems Design (BSD) by the Construction Specifications Institute (CSI). The nonprofit professional organization will maintain Atlanta-based BSD as "a separate, for-profit enterprise," according to a press release.

The CSI has long been the industry leader in establishing the ubiquitous standards for construction specifications, including MasterFormat, SectionFormat, UniFormat, and OmniClass. BSD publishes SpecLink-E and the new LinkMan-E, which connects SpecLink with Autodesk's Revit. "CSI needs to be involved in the creation of standards that enable greater efficiency in information transfer, data interoperability and improved construction documentation," CSI executive director and CEO Walter Marlowe says. "CSI also must provide better access for our members to software that utilizes those standards."

BSD president and chief operating officer Robert Paul Dean says, "This will create more business for us and generate increased membership for CSI." In the short term,

through a limited offer, it will be less expensive to join CSI and purchase BSD products than to buy the software alone.

It remains to be seen what effect the CSI-BSD partnership will have on the competition. MasterSpec and its associated SpecWare software are developed and published by ARCOM (Architectural Computer Services) for the AIA. The relationship between the AIA and MasterSpec is somewhat analogous to the new relationship between CSI and BSD—"but with a significant difference," BSD's Dean notes. "The AIA owns MasterSpec, but outsources the management of the product to ARCOM." ARCOM is BSD's largest competitor. "We're a cornerstone partner of the AIA," Dean says, which creates a similarly odd relationship between a major industry nonprofit professional organization and a competitor to one of its revenue-producing products.

Specifications specialist Andrew Wilson of AWC West raises an interesting point. He sees the CSI-BSD link committing the organization that has traditionally created the most commonly used specifying standards to a single protocol: data-based specifying. "They could lose their objectivity," Wilson says. EDWARD KEEGAN

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# BUSINESS



INTERVIEW BY EDWARD KEEGAN  
PHOTO BY MIKE MORGAN

→ BEST PRACTICES

## All for One (Usually)

EGOS, GENERATIONAL DIFFERENCES, CAREER GOALS ... THERE ARE MANY REASONS TEAM MEMBERS MIGHT NOT SEE EYE-TO-EYE.

SmithGroup workplace practice leader **Angie Lee** says that parenthood has been one of the best ways she's learned how to deal with staff conflicts. "You love them all the same way," Lee notes, "but sometimes, you have to play referee."

**NO ONE GOES TO WORK** with the intention of causing chaos, but it's inevitable that, for one reason or another, people will allow something to disrupt team—or even office—harmony. What then? Angie Lee is the workplace practice leader for SmithGroup. Based in Washington, D.C., her reach within the 11-office firm is national. Part of Lee's portfolio is dealing with SmithGroup's own work environment—and managing the complex interactions that occur within a national firm. "It's like herding cats to some degree," she says. And Lee's 25-plus years of experience have seen her herd a lot of cats.

**What's the most common conflict, and how do you handle it?**

People don't see eye-to-eye. Deal with it right away. I want to talk about things if they're not going well. The more you talk, the more you understand the other person's point of view.

**What's the key?**

We're in a relationship business. Eighty percent of





leading a successful project is working together. When things go well, you don't notice it. When things are not going well, you need to put on your psychologist hat. You have to develop personal relationships with the people on your team. As a leader, my job is to understand people's agendas and career aspirations so that I can help them succeed in their respective roles. Empathy is important.

#### How do you build these connections?

We get together organizationally three times a year at what we call national practice conferences. We have biweekly meetings via video. It's not perfect, but it is face-to-face. We talk about opportunities, issues, and topics. The best way to get to know people is on projects.

#### How has this changed over the past 20 years?

I don't see a lot of differences. People argue about the same things they argued about 20 years ago. Often, it's petty stuff that gets blown up into a big issue.

#### Do generational differences cause problems?

Our principals are now migrating us to open-plan offices, but we are not 100 percent bought into the concept. The boomers are used to having a private office with a door. Twenty-somethings don't care if you stick them in the corner, if they have the coolest tools. Give them an iPhone or an iPad, and they're happy as clams.

#### How do you deal with deep-seated personal issues?

You have to understand personalities. People are motivated differently. I don't like to have people come to me to talk about another person. That's a pet peeve. I get that a lot: People come to me, take me aside, and complain about somebody else. I always try to get everybody together, get away from the office, and hash it out.

#### And that solves the problem?

Sometimes it doesn't work because certain individuals just don't get along—and there's not a lot you can do about it. They still have to work together, but you hope that because we're all professionals, they can put aside their differences and focus on the work. I can think of only one example in my career where we had to let somebody go. They were like a cancer in the department.

#### What's your final advice?

Don't get sucked into office politics. Come to work with a clear mind and do the best work. Communicate, communicate, communicate. Make sure people understand where you're going. By doing the best work and bringing your colleagues along with you, it's a much more enjoyable place to be. When you have bad circumstances in terms of environment, it takes a lot of energy to deal with it. And then your energy is not put towards the work itself. □

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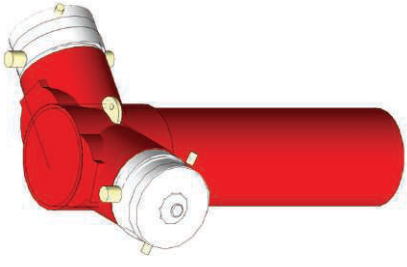
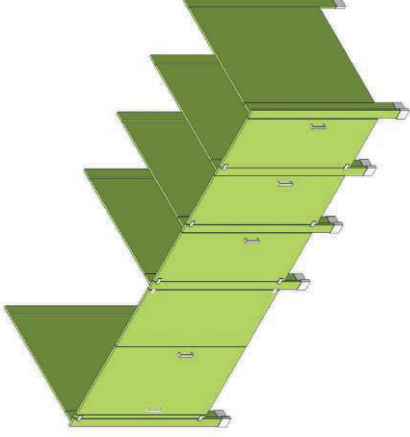
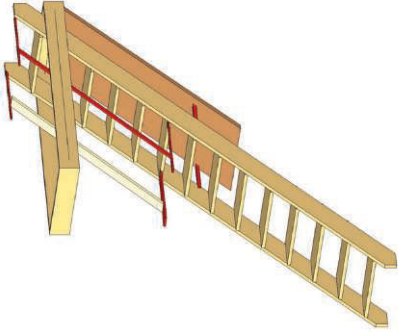
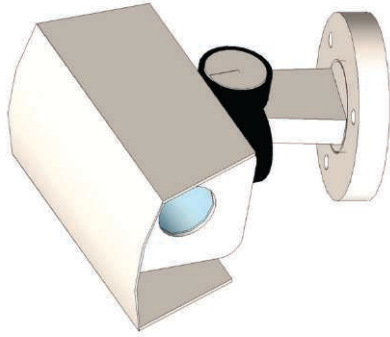
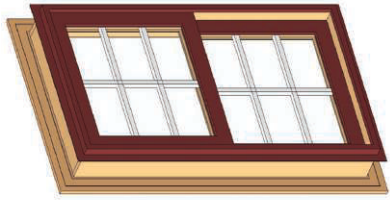
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→ MERGERS &amp; ACQUISITIONS

# Shopping Spree

THE PAST YEAR HAS SEEN AN UPTICK IN A/E M&A ACTIVITY. WE LOOK AT THREE TRANSACTIONS TO LEARN WHAT MOTIVATED EACH SIDE TO AGREE TO A UNION.



TEXT BY ERNEST BECK  
ILLUSTRATION BY MCKIBILLO

**NOW THAT THE LONG**, troubling recession is winding down—or so the experts say—consolidation in the A/E industry is heating up.

Fueled in part by the economic downturn, the pace of mergers and acquisitions (M&A) accelerated in the past year as large, multidisciplinary firms cherry-picked small, medium, and even big firms at advantageous prices. Eager to fill in geographic gaps in their service coverage, enter new markets, and deepen expertise in various sectors, these firms are taking advantage of an industry in flux and the many victims of the recession who are uncertain about their firms' future prospects. "It has been a rough two years for many architecture firms, so everything is on the table now, from considering mergers to acquisitions and closely evaluating a firm's strategic goals," says Steve Gido, a principal at A/E consultancy Rusk O'Brien Gido + Partners.

Indeed, deals have been popping up everywhere. And three of them, in particular, reflected the broader forces reshaping the industry.

RTKL Associates bolstered its presence in China by adding AHS International, a prominent healthcare

design firm in Beijing. Seattle-based NBBJ, a multioffice firm that previously had grown organically, went outside the box and acquired Chan Krieger Sieniewicz (CKS), a highly regarded Boston boutique. And Canada's Stantec, already one of the world's largest design and engineering firms, continued an aggressive acquisition strategy by taking over the 600-person staff at Burt Hill, adding that firm's 13 offices in the U.S. and abroad. Terms of the deals, which were structured as mergers or asset and stock buyouts, have not been disclosed.

Besides the slack economy, which made financing cheaper for those on the prowl and softened the hearts of some initially unwilling brides, a number of other factors have helped propel the buying binge.

One is expanding global markets, especially in emerging economies in the Middle East and Asia, which will become a new source of business and require a local presence. Another is the need to fill in services at the growing number of one-stop-shop firms, which seek to offer a client everything under one roof. And, finally,

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specialization is gaining ground as a major marketing driver. "Clients want to know that you've done a project like theirs not just once but a dozen times before, and if you don't have these skills, it's difficult to start on your own," notes Lance Josal, RTKL's CEO and president.

The desire to expand its China presence is what led RTKL to purchase the assets of AHS, which had built a thriving business in Beijing and Shanghai servicing

a burgeoning healthcare sector with a staff of 43. RTKL had a Shanghai office, but it also wanted a presence in the nation's capital, where it has good government connections. As with the other deals this year, the firms involved had already worked together. Mostly, however, the deal provides RTKL with a readymade operation and clients in a fast-growing market. "You buy a portfolio and contacts and hit the ground running. It pays for itself," Josal says about such acquisitions, noting that starting an office from scratch is often costly and time-consuming.

In a similar way, Edmonton, Alberta-based Stantec was on the prowl for new acquisitions, and Burt Hill, with its strong, decentralized East Coast and overseas presence and client base, as well as its expertise in science and technology, was "on our radar screen as a firm that would be compatible," recalls Stantec's president and CEO, Bob Gomes. This partner needed some wooing, however. "We were not looking for anything of the sort," insists Peter Moriarty, Burt Hill's president and CEO—the kind of pushback that made Stantec try even harder. "They tried to recruit one of our people, but he said no, and then they wanted to talk to me, and I said no, and then I decided to listen, and suddenly bells went off," Moriarty recalls.

For its part, Burt Hill found itself in a difficult situation. "We were playing in the big leagues against the behemoths of the industry," Moriarty explains, and the firm needed a new strategic direction. At the same time, its Pittsburgh and Dubai, United Arab Emirates, offices had been hit hard by the real estate and construction crash in the United Arab Emirates, prompting layoffs (although Moriarty says the firm remained profitable). The acquisition gives Burt Hill the heft it needs to be a big player, through Stantec's resources, as well as continued control of its territory, the executives point out.

NBBJ's acquisition of CKS, a 38-person office that specializes in urban design and always valued its independence and collegial, familylike work environment, was more of a long, slow courtship between two wary partners.

The two firms were working together on a big project at Massachusetts General Hospital when NBBJ first suggested getting together about three years ago. The idea was rejected. "We all agreed we didn't want to work for someone else," says principal Tom Sieniewicz. But in 2009, buffeted by the recession and seeking stability and future growth possibilities, it was CKS that raised the issue again. "We called them and said, 'Remember our first date?'" Sieniewicz recalls.

At this point, it was acquisition-shy NBBJ that was reluctant but then agreed to talk. "We felt an office in Boston was a strategic advantage for us and our clients, and we had no presence there," Scott Wyatt, NBBJ's managing partner, says, noting that his firm wanted to beef up its urban design expertise on the East Coast. One selling point for CKS, Sieniewicz says, was an NBBJ commitment to remain "relatively autonomous and small" within the NBBJ network, while also gaining access to the firm's large client portfolio and "a chance to build more buildings," Sieniewicz adds.

Inevitably, however, mergers and acquisitions often mean a loss of identity and a brand name. Chan Krieger

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Sieniewicz is now Chan Krieger NBBJ, a moniker that will eventually fade away as the outpost becomes NBBJ's Boston office, according to Wyatt. Burt Hill will keep its name until the deal closes, after which it will "morph into Stantec," Moriarty says. And you can expect AHS to be "absorbed" into RTKL eventually.

Another issue, analysts say, is that it's unclear what these mergers and the growing power of one-stop, "super mall" firms will mean for design and the acquired firms' design sensibility, despite the usual assurances that the individual corporate cultures are compatible. "There will be a lot of work in the future for the large firms, and they will do it all, but how creative they will be is another question," suggests Hugh Hochberg, a principal at design consultancy Coxe Group.

With the economy slowly recovering but still in the doldrums, expect the M&A mania to continue as the industry adjusts to a new, tougher business reality and

further segments into giants and smaller players, architects and experts predict. "Larger firms will continue to find someone who is hurting and take a shortcut to get 10 top professionals for a particular market, at prices cheaper than they were a few years ago," concludes Jack Reigle, president of Sparks: The Center for Strategic Planning, a marketing and business adviser for design firms. □

BESIDES THE SLACK ECONOMY, WHICH MADE FINANCING CHEAPER FOR THOSE ON THE PROWL AND SOFTENED THE HEARTS OF SOME INITIALLY UNWILLING BRIDES, A NUMBER OF OTHER FACTORS HELPED PROPEL THE BUYING BINGE. ONE IS EXPANDING GLOBAL MARKETS, ESPECIALLY IN EMERGING ECONOMIES IN THE MIDDLE EAST AND ASIA, WHICH WILL BECOME A NEW SOURCE OF BUSINESS AND REQUIRE A LOCAL PRESENCE. ANOTHER IS THE NEED TO FILL IN SERVICES AT THE GROWING NUMBER OF ONE-STOP-SHOP FIRMS, WHICH SEEK TO OFFER A CLIENT EVERYTHING UNDER ONE ROOF. AND, FINALLY, SPECIALIZATION IS GAINING GROUND AS A MAJOR MARKETING DRIVER.



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→ LOCAL MARKET

# Cheyenne, Wyo.

TEXT BY MARGOT CARMICHAEL LESTER AND CLAIRE PARKER



**CHEYENNE, WYO.**, is the northern anchor of the Front Range Urban Corridor, a stretch of busy municipalities that originates in Pueblo, Colo., and runs through Denver along Interstate 25. But despite being Wyoming's capital and a federal government stronghold (F.E. Warren Air Force Base is here, along with several other agencies), Cheyenne feels more like a small town than a growing urban area, say locals. After all, it is best known as the home of the nation's largest outdoor rodeo.

"The biggest thing is government," says local architect Mike Potter, a principal with Potter Architecture and the president of AIA Wyoming. "They tend to be the ones that do the major building." All three levels of government have been busy building in Cheyenne—even during the recession.

This steady government work has helped create a stable local economy. "We don't suffer the dramatic ups and downs of the rest of Wyoming's mineral-extraction-dependent economy, nor are we strongly influenced by the down cycles of the [nearby] Denver economy," explains Randy Byers, principal of local architecture firm Design Studio. New development is anticipated from spinoffs related to a new National Center for Atmospheric Research (NCAR) facility (see No. 2) and the potential of the Niobrara oil play, a recently discovered geological formation that could bring natural gas—and oil-extraction business to the area.

"Cheyenne should be positioned for several years of positive growth," predicts Dale Steenbergen, president and CEO of the Greater Cheyenne Chamber of Commerce. Between government expansion, the recent energy discoveries, and renewed growth up and down the Front Range, it's no wonder locals are so bullish on the Magic City of the Plains. □

**1. Cheyenne Botanic Gardens, Paul Smith Children's Village, and Lowe's Discovery Lab**  
**ARCHITECT:** Design Studio, Cheyenne, Wyo. **COMPLETION:** 2009. **BRIEF:** \$1.3 million LEED Platinum project incorporates two WPA-era buildings.

**2. National Center for Atmospheric Research—Wyoming Supercomputer Center**  
**ARCHITECT:** H+L Architecture, Denver. **COMPLETION:** 2011. **BRIEF:** \$70 million facility will house one of the world's fastest supercomputers; LEED Gold expected.

**3. Southeast Wyoming Welcome Center**  
**ARCHITECT:** Anderson Mason Dale Architects, Denver. **COMPLETION:** 2012. **BRIEF:** \$11 million center will have a green roof, a rammed-earth Trombe wall, wind turbines, and PV panels.

**4. Triumph High School**  
**ARCHITECT:** Design Studio, with RB+B Architects, Fort Collins, Colo. **COMPLETION:** 2008. **BRIEF:** \$13.5 million facility designed to LEED Silver but not certified.

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- Growth challenging current infrastructure
- Economic reliance on government entities
- Downtown in need of revitalization

**FORECAST**  
"Cheyenne will see steady growth over the next 10 years. The city, county, and economic development agencies have had some success in bringing businesses ... that help diversify the economy," says local architect Randy Byers. "There is great hope that the NCAR facility will spawn other high-tech businesses. I also think Cheyenne's perspective regarding design and development has matured."





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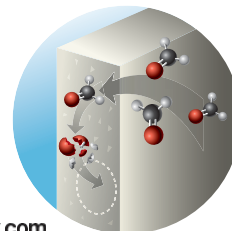


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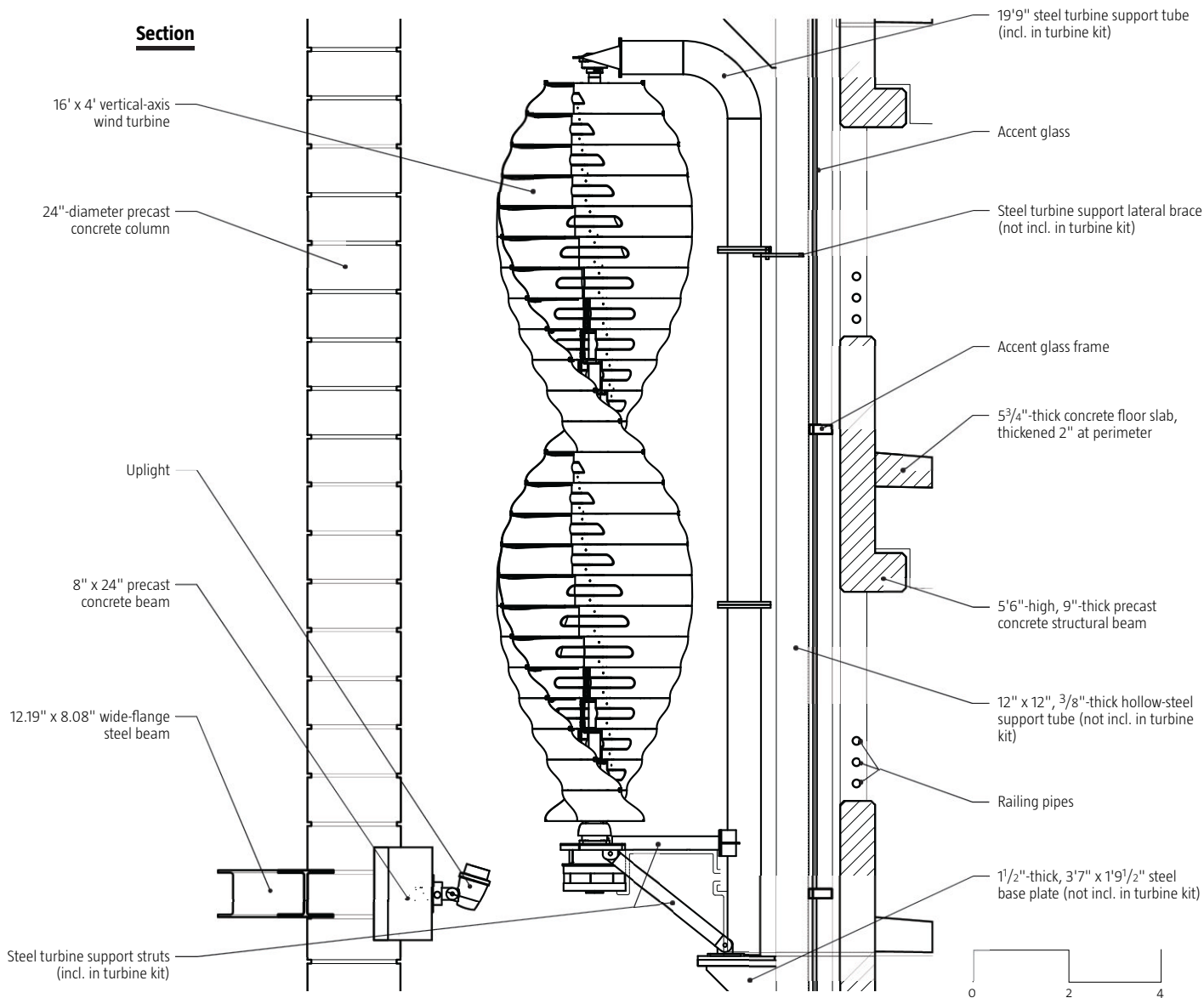
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# TECHNOLOGY



→ **DETAIL**

# Integrated Wind Turbine

**Project:** Greenway Self Park  
**Architect:** HOK  
**Location:** Chicago

TEXT BY GIDEON FINK SHAPIRO





**DESPITE THEIR HIGH-TECH** appearances and promise of free energy, building-integrated wind turbines have been criticized as ineffective, noisy, and incompatible with cities' unpredictable wind patterns. One recent project that may prove more successful in matching wind energy with architecture is the Greenway Self Park, a partially self-powered, 11-story parking garage in downtown Chicago designed by HOK. The building's dozen vertical-axis wind turbines, which are stacked in two double-helical columns along the southwest corner, have a specific, finite objective: Generate enough power to cover the cost of lighting the building exterior at night, including the elegant turbine system itself.

The benefit of vertical-axis wind turbines, such as those in Chicago's Greenway Self Park (above), is that they make use of breezes coming from any direction, and at a variety of speeds. By chamfering the parking garage corner where the 12 turbines are, HOK increased the turbines' exposure to Second City winds.

The design makes intelligent use of passive as well as active technologies for harnessing natural energy flows. Ventilation, for example, is accomplished without a mechanical plant because the garage's porous skin—a tapestry of vertical cast-glass planks spaced at varying widths and overlaps—is at least 20 percent open on every level, meeting local code requirements. The client, Friedman Properties, saved several hundred thousand dollars on air handlers and ducts, according to HOK, and will also see savings on monthly utility costs. Interior light fixtures are conventionally powered, but shut off automatically in response to ambient daylight.

The 12 self-starting, lightweight aluminum S594 turbines, manufactured by Helix Wind, were selected for the relatively low wind velocity (11.1 mph) at which they start producing usable electricity, explains Todd Halamka, director of design for HOK's Chicago office. Vertical-axis turbines can exploit wind from any direction at a wide range of velocities, a strong bonus for harnessing the fickle breezes of urban microenvironments. The more familiar horizontal-axis turbines—which resemble propellers—produce energy more efficiently, but they take up more space and are harder to integrate architecturally.

Each turbine rotates independently and is capable of producing up to 4.5kW of power. The Greenway Self Park's two-way power meter allows the garage to give and take, redirecting electricity back to the Chicago utility grid whenever there is more energy produced than consumed. Although the turbines became fully operational last May, it will take two to three more years before their energy-performance data can be meaningfully assessed, Halamka says.

As is always the case with prefabricated or off-the-shelf components, the architect's handling and presentation of these elements in context are integral to the project's public character. HOK does well to give the turbines a prominent yet well-ordered presence by positioning them as two continuous vertical stacks against a chamfered corner facing the intersection of West Kinzie and North Clarke streets. The chamfer not only increases the turbines' wind exposure, it also enables them to visually anchor and define the corner. Each modular unit, measuring 16 feet high and 4 feet in diameter, is clipped in to a dedicated support column, or "spine tube," which transfers the turbine's weight to the garage's precast concrete structure. Uplights are mounted to the inside surface of the exposed façade beams. In this dynamic "hot corner," as Halamka calls it, the turbines rotate like a "kinetic sculpture" in front of a bright-yellow glass backdrop.

Because the most efficient layout of parking spaces in a rectangular structure means no spaces in garage corners, the chamfer causes no loss of usable square footage. Similarly, the Greenway Self Park's other three corners are put to work, containing stairs, elevators, and electrical hardware and transferring rainwater harvested from the building's green roof down to street-level trees. And in a final nod to sustainability, the garage is also equipped with a dozen charging stations for electric cars. □

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The Flat Ledge Quarry in Massachusetts produced Cape Ann granite from the mid 1850s to 1930. Cape Ann granite was prized for its firm texture, high crushing test and freedom from pyrites and other impurities, making it most desirable for paving blocks, building and monumental purposes. The quarry was filled with water soon after operations ceased and is currently under the stewardship of the state's Department of Environmental Management as part of Halibut Point State Park. Today the reservoir is one of Rockport's two main water supplies, holding 85 million gallons. The park is a hot bed for rock climbing and hiking. Public can explore and enjoy the park's trails and tide pools, picnic on its rocky ledges, enjoy its sweeping views, cross country ski, fish and learn about Cape Ann's historic granite industry.

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→ ECO

# Truly Universal Design

ACCESSIBLE DESIGN SHOULD INCLUDE BOTH MOBILITY AND CHEMISTRY.



TEXT BY LANCE HOSEY  
ILLUSTRATION BY PETER ARKLE

**TWO DECADES OLD** this year, the Americans With Disabilities Act (ADA) has transformed the built environment by requiring “barrier-free” spaces across the country. On the other hand, the ADA’s language potentially alienates anyone not defined as “able.” According to the act, a disability refers to any “physical or mental impairment that substantially limits one or more major life activities.”

Many prefer more positive-sounding terms such as “universal design” and “design for all.” While words *are* important, the topic nevertheless suffers from a narrow focus on mobility. There is another, increasingly important aspect of “designing for all”: environmental health.

According to the U.S. Census, out of 54 million Americans who identify some type of “disability,” about 3 million use wheelchairs. But the number of those who suffer from chemical or respiratory ailments is dramatically higher. As much as 10.5 percent of the population (some 30.2 million people) suffers from asthma, says the National Heart, Lung, and Blood Institute—and indoor environments riddled with dust, mold, and allergens only exacerbate the problem. Studies conducted by the California and New Mexico state health departments found that 16 percent of respondents reported an “unusual sensitivity” to the chemicals common in

everyday products, and that 2 to 6 percent had been diagnosed with multiple chemical sensitivity (MCS), a potentially debilitating condition that stems from contact with low levels of toxins.

Putting healthier materials in buildings can make a big difference. For example, MCS sufferer and Oberlin College graduate James McConaghie gets sick if exposed to any of the standard chemicals found in new carpets, paints, and adhesives. Built using materials screened for certain toxins, the Adam Joseph Lewis Center for Environmental Studies was the only campus building where McConaghie could study safely while he was at Oberlin.

Yet LEED has only one credit related to material health: low-VOC products. Fortunately, there are better alternatives. The Healthy Building Network’s Pharos Project offers a comprehensive guide to smart materials selection. Its filters include the Living Building Challenge’s Red List, which prohibits the use of 14 classes of chemicals, and the U.S. Environmental Protection Agency’s five Chemicals of Concern categories. Perhaps the most rigorous standard available, little-known among architects, is Clean Production Action’s Green Screen for Safer Chemicals. Any of these guides can expand the concept of “barrier-free” to include “toxin-free” and help create truly universal design. □

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→ PRODUCTS

# Finishes

TEXT BY LAURIE GRANT



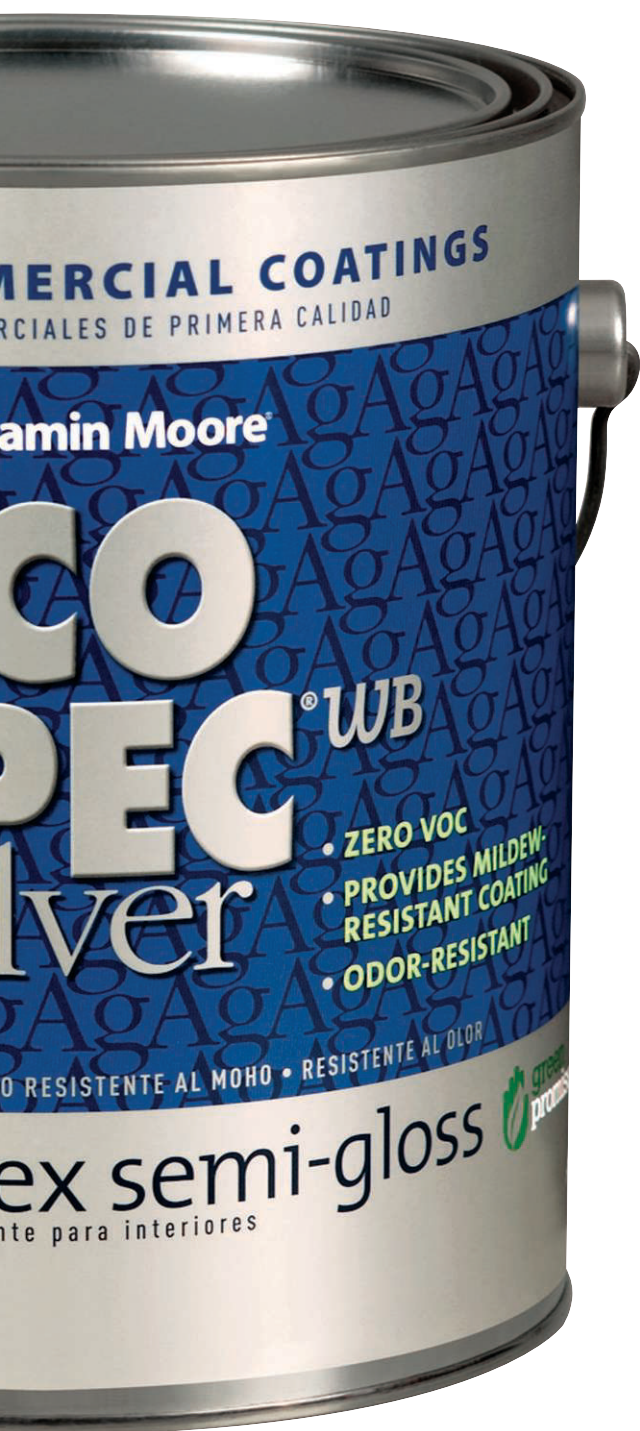
The **Campione Collection** from **DesignTex** has three new multiscaled patterns: Corda features a slightly irregular stripe, Ondina (shown) is inspired by the ripple effect created by water droplets, and Stampato plays on positive and negative space on variegated ground. Corda is available in 18 colorways, Ondina in 16, and Stampato in 13. The wallcovering contains 30% recycled content—20% post-consumer recycled polyester and 10% pre-consumer recycled vinyl—and is applied with the company's Recore Recycled Wall Technology backing. • [designtex.com](http://designtex.com) • Circle 100



**Green Blade** from **FibandCo** is a natural, handmade veneer composed of banana fibers. The banana plants are grown in Martinique and, after the fruit is harvested, the trunklike stalks (which must be cut down for the plant to regrow and produce more fruit) are turned into fibrous veneers. Available in four colors—Bahamas, Havana, Aruba, and Saint-Barth—the veneers are available in four thicknesses ranging from 0.004" to 0.014". Green Blade is suitable for use in interior fittings and furniture. • [fibandco.com](http://fibandco.com) • Circle 101







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# CULTURE



## → OBJECT

Malcolm Forbes, the publisher of *Forbes* magazine, liked to live large. Over the course of his life (he died in 1990, at age 70), Forbes amassed the typical appurtenances of great wealth: yachts, a French château, a palace in Morocco, a Boeing 727 called the *Capitalist Tool*. He and his sons also amassed superb collections of Americana, Victorian art, Fabergé *objets*, and toys. Yes, toys. On Dec. 17, Sotheby's will offer 237 lots from **Forbes' toy trove**, including a 1912 electric-powered model of the *Lusitania* (estimate: \$10,000–\$20,000)—made in Germany, ironically—and this 1910 pastel-colored, steam-powered lighthouse (estimate \$10,000–\$15,000). Every magnate, it seems, has a Rosebud. • [sothebys.com](http://sothebys.com)

→ PUBLICATION

Have you ever considered the architecture favored by movie villains? Yale graphic design student Benjamin Critton has. In his newsprint publication **Evil People in Modernist Homes in Popular Films**, Critton explores one of filmdom's curious coincidences: Bad guys often reside in modernist structures.

(That's Ernst Stavro Blofeld at right, holing up in a John Lautner-designed house in the 1971 James Bond film *Diamonds Are Forever*.) Critton's treatise-of-sorts is strengthened by essays from Joseph Rosa, director of the University of Michigan Museum of Art; *Guardian* journalist Steve Rose; and Jon Yoder, a scholar of modern architecture. It's a cheeky take on an amusing coincidence, but Critton's publication also raises a trenchant question: How do we *really* feel about modern architecture, if that's where we *really* put the evildoers?

• \$10 at [printedmatter.org](http://printedmatter.org)



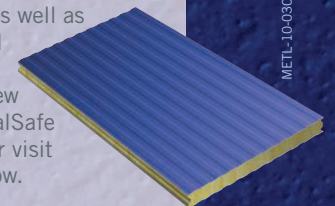
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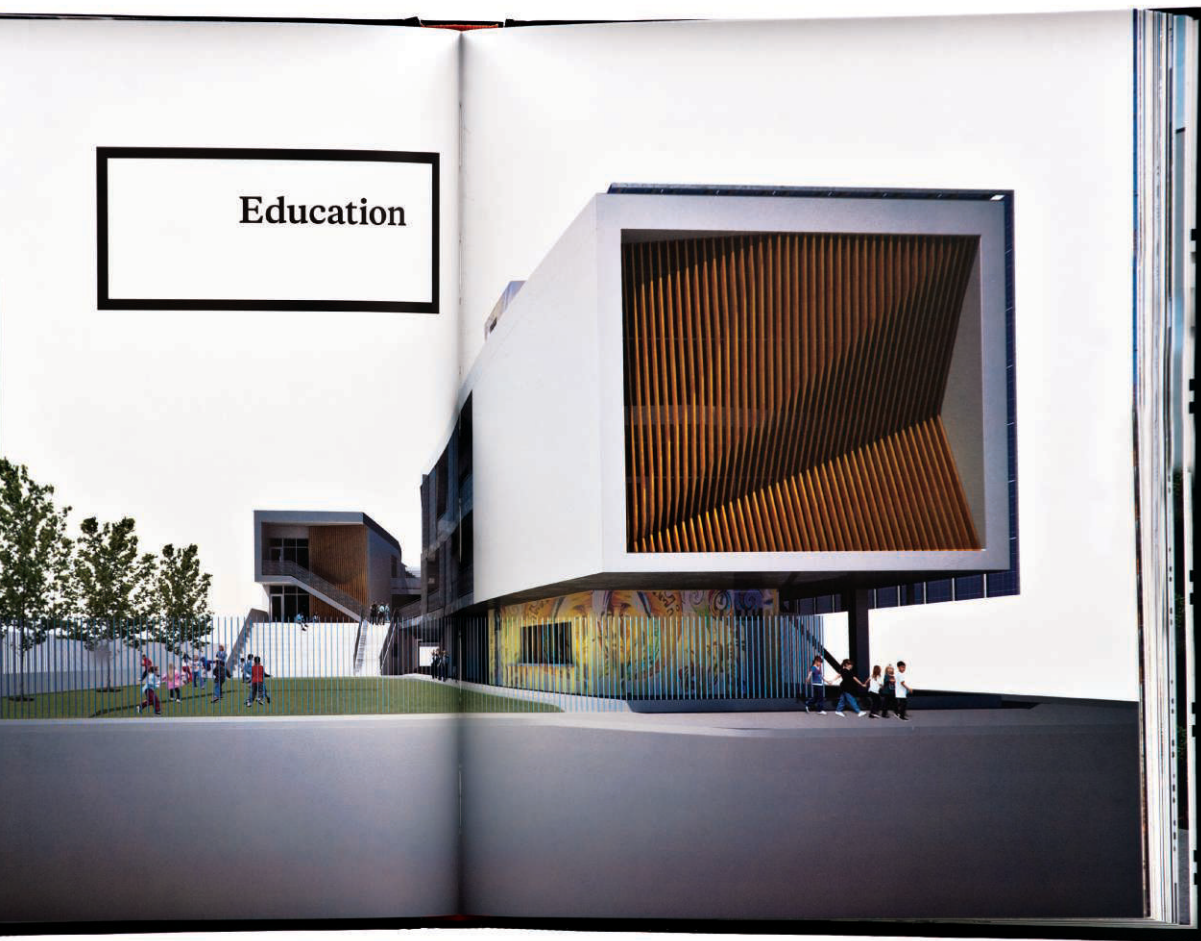
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## Education



### →BOOK

"Pro bono" is short for *pro bono publico*, a Latin phrase often taken to mean "for free," but which, in fact, means "for the public good." That distinction is important to John Cary, who, with the nonprofit group Public Architecture, edited **The Power of Pro Bono: 40 Stories About Design for the Public Good by Architects and Their Clients.** Yes, the architects of the collected projects—ranging from shipping-container eco-cabins for a Boy Scouts camp in California to a food-bank warehouse in Boston—donated design services, sometimes to the tune of hundreds of thousands of dollars, so that their service-minded clients could achieve their goals. But what's more important is that they were determined to create lively, dignified spaces that, in Cary's words, "reflect and bolster the spirits of those who frequent them." • \$40; Metropolis Books

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LEFT: BENJAMIN CRITTON; RIGHT: MIKE MORGAN

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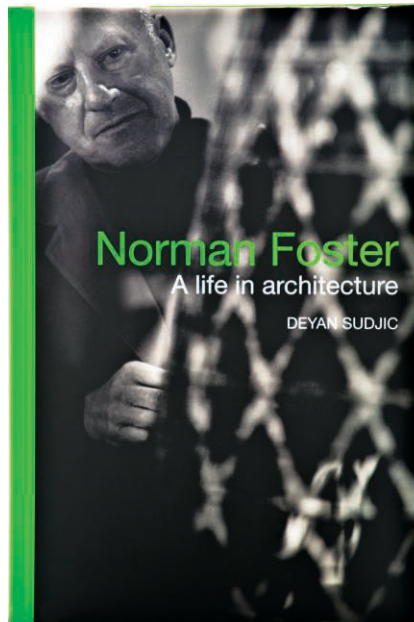
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→ CRIT

# A Life Less Ordinary



A NEW BIOGRAPHY CHARTS **NORMAN FOSTER'S RISE** FROM THE STREETS OF MANCHESTER TO THE TOP OF THE DESIGN WORLD.

**IT'S ASTONISHING HOW LITTLE** we know about the lives of architects. This is the era of the starchitect, after all, the celebrity architect, but our biographical sense of even such luminaries as Frank Gehry or Zaha Hadid is Wikipedia-thin. The deficiency is especially glaring in comparison with other creative professionals—actors, artists, musicians, writers—with whom we seem to be familiar on an almost intimate basis. We see their work as a form of personal expression, so the better we know them, or think we know them, as individuals, the more resonant their work becomes. A song about a heartbreak seems more meaningful if we know about the singer's last romantic flameout. Architecture, on the other hand, is an inherently abstract medium; an architect's divorce isn't going to offer much insight into the folded planes of his or her latest project, let alone its circulation plan.

There are those who will tell you that it's a good thing we're not interested in architectural biography, that the "great man theory" it implies is not reflective of collaborative practice and otherwise suggests an unfashionable model for interpreting history. I find something distasteful and dangerously wrong in these attitudes. What is lost is a sense of human agency and its consequences. Architecture is more than entertainment;

it orders our lives and shapes our cities. Understanding the men and women who create it—their intellectual roots and the experiences from which they draw—would seem to be a reasonable imperative, now more than ever.

*Norman Foster: A Life in Architecture*, by Deyan Sudjic, director of London's Design Museum, is a welcome addition to the architectural biography field, even if it is of the authorized variety. You will not find here, for instance, any discussion of the British tabloid controversy over Foster's tax status (and the subsequent calls for him to renounce his lordship). Sudjic is no lapdog, though, and while his admiration for Foster weighs heavily throughout the book—as you read, it's hard not to share his conviction—he generally steers clear of sycophancy.

Sudjic gives an evocative description of Foster's decidedly wrong-side-of-the-tracks youth in working-class postwar Manchester: crummy floral wallpaper, the nearest phone a five-minute walk. (The architect, even in his 70s, has the look of a heavy in a Guy Ritchie film.) His parents, hard-working strivers themselves, wanted him only to land a safe government job, and when he did and then left it, they were mortified. That Foster made his way to architecture was a prodigious feat of self-invention. After a stint in the military, he discovered his

TEXT BY MARK LAMSTER



Mark Lamster is at work on a biography of Philip Johnson.

BOOK PHOTO BY MIKE MORGAN

interest in design and took a job as an office boy in an architecture firm. He gained admission to study the subject at university by plagiarizing the firm's presentation drawings for his portfolio. He worked his way through school on the strength of his gift as a draftsman, his restless creativity, and his seemingly unending capacity for work. Eventually, Foster won a scholarship for graduate study at Yale University, where he befriended Richard Rogers, studied under Paul Rudolph, and was inspired by the techno-utopian ideas of R. Buckminster Fuller.

The book's strength is its first half, in which Sudjic deftly narrates Foster's improbable rise. There is a natural tension here: Will Foster succeed in lifting himself from his humble beginnings? Can he establish his own progressive practice, when others might settle in comfortably at a larger firm, their futures secured? A good biography is generally inspiring—that's part of why we read them, to feel better about our own prospects—and over its first 150 pages, Foster's story fits the bill. It's hard not to cheer such early successes as the Willis Faber & Dumas headquarters in Ipswich (see "Big Jim," page 46) and the Sainsbury Centre in Norwich, which clearly establish the signature of Foster's work to come: cutting-edge technology paired with programmatic innovation.

Sudjic's narrative inevitably flags as Foster's office becomes the well-financed, corporate juggernaut that it is today, with hundreds of employees and projects around the globe. "Now that there are so many new designs coming from the office, it is impossible to regard them in the same way that they once might have been," Sudjic writes. The sheer output of Foster's office over the past four decades is, indeed, staggering. The laundry list of highlights includes skyscrapers for HSBC, Commerzbank, Swiss Re, Hearst; the Nimes Médiathèque and the courtyard of the British Museum; the Reichstag and the London City Hall; airports for London, Hong Kong, and Beijing; the Millennium Bridge and the stupendous Millau Viaduct. Sudjic artfully describes these works and manages to inject a good bit of drama into their making, but it is, unavoidably, something of a litany.

Sudjic is frank about what might be the most controversial aspect of Foster's practice: his willingness to take on clients regardless of their political baggage. "[H]is approach to politics is more concerned with the tactics of building in a complex world," Sudjic writes. This philosophy is neatly illustrated in the opening pages of the book, in which Sudjic visits Masdar, Foster's "carbon neutral" educational city in the desert outside of Abu Dhabi, United Arab Emirates, which seems at once a realization of Fuller's futuristic fantasies and a segregated community in a nation without free elections. By any measure, it is a long way from the back alleys of Manchester. But whatever one thinks of Foster's decisions, simply by presenting them for discussion, Sudjic does the profession a service, at the same time demonstrating why biography is such a useful art in its own right. □



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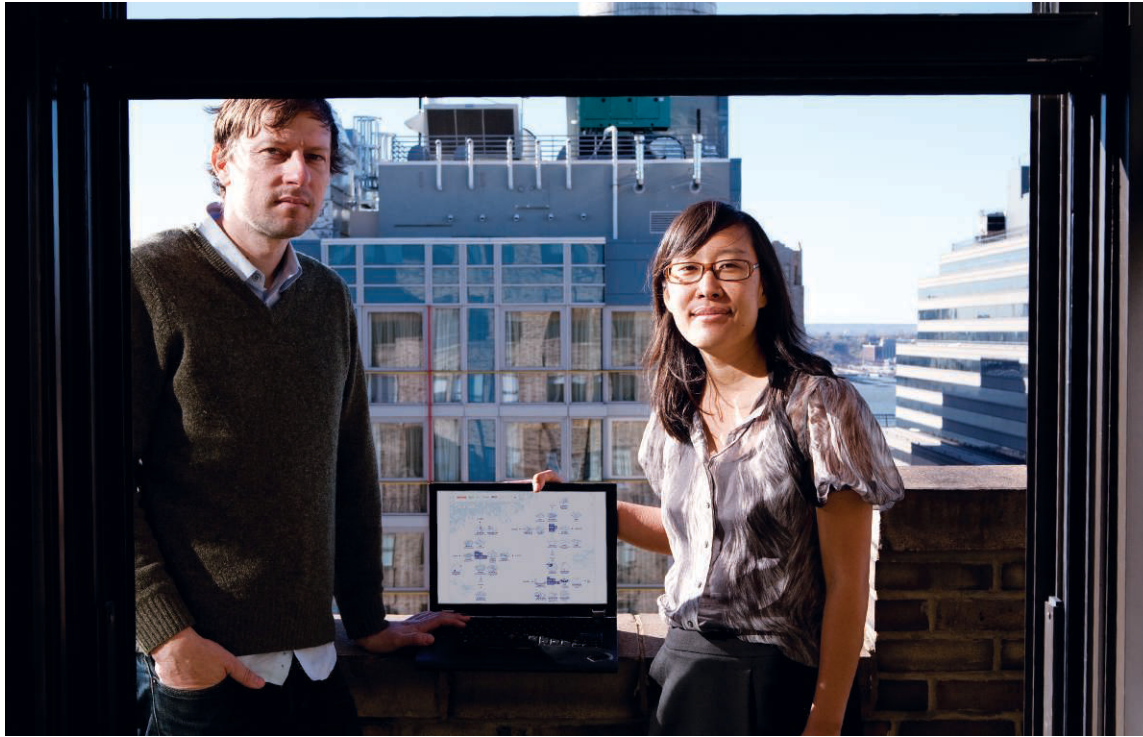
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# theunderdome.net

DESIGN IS ONLY ONE PART OF THE CONVERSATION ABOUT ENERGY CONSUMPTION.



TEXT BY BRAULIO AGNESE  
PHOTO BY SIOUX NESI

Underdome creators **Erik Carver** and **Janette Kim** hope to provoke their fellow architects into thinking broadly about energy use and considering the political and societal factors, not just those related to design. Architects, Kim says, “have a tendency to understand efficiency gains [only] on the scale of a building.”

**THERE HAVE ALWAYS BEEN** considerations within the architectural community about the future of the city, but when it comes to energy consumption, designers frequently narrow their vision, focusing on the building itself. But if architects want to be leaders, not just service providers, as society heads haltingly into a greener future, they must understand how to navigate issues of power (both government and corporate) and lifestyle (how do people actually want to live in a sustainable world?). Enter Underdome, a website designed to help architects get started on this path.

Janette Kim and Erik Carver, friends since their days earning M.Arch.'s at Princeton University, describe Underdome as a “voter’s guide” to energy efficiency. The site, launched in October and still very much a work in progress, begins with the idea that there are many approaches to a sustainable world, and each has validity. “Our idea is to show as broad a spectrum of ideas as we can,” says Kim, a principal at the design and research firm All of the Above and a professor at Columbia University’s Graduate School of Architecture, Planning and Preservation, “to see where possibilities arise and where problems arise.”

The site’s structure is divided into four categories—Power, Lifestyle, Territory, and Risk—and taps into the knowledge and resources of historians, politicians, engineers, and people from other disciplines. “We’re mixing interviews and textual resources,” says Carver, an independent designer and professor at Rensselaer Polytechnic Institute. As Underdome grows more robust through the posting of further interviews and research, Kim and Carver expect to convene a series of multidisciplinary panel discussions—architects included. They’re also planning a design competition.

Underdome was inspired in part by “Dome Over Manhattan,” R. Buckminster Fuller and Shoji Sadao’s 1960 proposal for a two-mile-diameter structure that, feasibility aside, would have offered real environmental design benefits for the metropolis. But the name is also a sly pop-culture reference to the 1985 movie *Mad Max Beyond Thunderdome*, whose storyline centers on Bartertown, a ragtag, postapocalyptic community powered by pig waste. If architects can better influence energy use as it relates to the future shape of society as a whole, perhaps it won’t take a disaster to make the decision for us. □

## LINKS

### [www.kajima.co.jp](http://www.kajima.co.jp)

Deconstructing a building doesn’t have to be a noisy, messy explosion and collapse or a top-down, piecemeal project that puts workers at risk. The Kajima Corp. has developed the “Cut and Take Down Method,” which erases a building floor by floor, but at the ground level. This page on Kajima’s site explains how the process works and delineates its benefits: [bit.ly/kajimacut](http://bit.ly/kajimacut).

### [www.english-heritage.org.uk](http://www.english-heritage.org.uk)

Eric de Maré (1910–2002) served as the editor of *The Architects’ Journal*, but he is best known as a photographer and writer. The Historic Building and Monuments Commission for England (aka English Heritage) has a trove of 2,860 of his photographs, all available for viewing online; go to [bit.ly/demare](http://bit.ly/demare). “The photographer is perhaps the best architectural critic,” wrote de Maré in 1972, describing his aesthetic, “for by felicitous framing and selection he can communicate direct and powerful comments both in praise and protest. He can also ... reveal architecture where none was intended by creating abstract compositions of an architectural quality.”

### [infrastructureusa.org](http://infrastructureusa.org)

A project of the Open Space Institute, InfrastructureUSA combines a blog, videos, polls, expert information, and more in an effort to engage Americans in a discussion about the nation’s infrastructure.

### [yarnbombing.com](http://yarnbombing.com)

Paint and chalk aren’t the only ways to secretly place art in the urban landscape; cotton and wool work, too. Yarn bombing—also called guerilla knitting—helps provide color and warmth to city spaces. This blog keeps tabs on the playfully subversive practice.

### [urbncal.com](http://urbncal.com)

In the hunt for a 2011 calendar that’s not run-of-the-mill? Swedish designers Esa and Lisa Tantt have created urbncal. Each day is a photograph of a Copenhagen building’s address number, and each month covers a different neighborhood of the Danish capital. \$30 at [etsy.com](http://etsy.com).



# ARCHITECT

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## Living Off-Grid:

### Power Generation and Storage Basics



*This home in Buffalo, WY is completely off-grid. Instead of power-lines, the homeowner's chose to power their home with a propane-fueled generator.*

Understand how an off-grid power system works, the key components, and the advantages of using a propane generator to ensure a comfortable home and reliable energy source.

Living off the grid—independent of power utilities—has become increasingly popular over the past decade. Getting rid of power poles and natural gas lines has become an attractive notion to many homeowners whether they have a second home designed to be a summer or winter retreat, want a permanent outpost far from the madding crowds, or simply desire to become energy independent. While the basic challenges of living off-grid haven't changed, solutions to these challenges have made the idea of getting away from it all much easier.

But what exactly does living off the grid mean? Simply put, living off the grid means having a dwelling that does not require a constant supply of energy from off-site sources (usually electricity or natural gas). There are many reasons why someone might choose to live off-grid, but one of the most common is driven by financial decisions. Rural power companies can charge more than \$6 per foot of electrical line, a fee that has to be covered by the homeowner. That means it can cost more than \$60,000 to be linked to the power grid if you live just two miles off the beaten path. In some cases, rough terrain makes running power lines impossible. When faced with the prospect of spending tens of thousands of dollars to be connected to a power utility or installing an off-grid system for considerably less, most homeowners who opt to live in undeveloped areas easily choose an off-grid power system.

Until recently, being independent of traditional utilities meant sacrificing many



**CONTINUING  
EDUCATION**

Use the learning objectives to the right to focus your study as you read *Living Off-Grid: Power Generation and Storage Basics*

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### LEARNING OBJECTIVES

After reading this article, you should be able to:

- Describe economic and environmental reasons why off-grid living is starting to become more appealing.
- List or describe the technology and components required to generate and store power in an off-grid home.
- Describe the functional, practical and sizing differences between portable, stand by and off-grid generators.
- Compare the energy and environmental advantages and disadvantages of diesel fuel and propane for off-grid use.



*The propane generator used at the Herkimer lodge (small box to the left of tree) was specifically designed and built for off-grid applications. It is quieter than most generators and allows for 500 hours between servicing.*

of the creature comforts we've grown fond of in modern society. A past example of living off-grid might have been a hunting cabin deep in the woods with an oil lamp, hand-powered well pump, and a wood-burning stove. But with new battery technologies, energy-saving appliances, and the increased acceptance of renewable energy sources, living off-grid can be as comfortable and common as life in any modern suburban home. Today, with a little education and a considerable amount of thoughtful planning, all the modern conveniences of city life can be taken into the wilderness where power lines simply can't follow.

#### ON-SITE POWER GENERATION

In order to successfully, and comfortably, live off-grid, the home must have a reliable source of electricity. While off-grid living requires certain lifestyle sacrifices to reduce the amount of electricity or "load" needed in a home, almost all home appliances require some amount

of electricity to function. Generating electricity on site allows the homeowner to enjoy many of the benefits of modern living, but it requires the right system to capture and store power. A standard off-grid power generation and storage system includes a renewable energy generator such as a windmill or solar photovoltaic (PV) panel or array (a set of connected PV panels), a battery bank to store the electricity, an inverter to convert the direct current (DC) electricity to alternative current (AC), and a mechanical electrical power generator. Each one of these links in the chain to energy independence must closely be examined in order to create the most affordable, reliable, and practical system for off-grid living.

An often-used analogy with off-grid living is to think of electrical storage capacity like a barrel of water. If you have a 10-gallon barrel of water and are draining it at a rate of two gallons per hour, in five hours the barrel will be empty. However, if you are adding one gallon

an hour, the barrel will take 10 hours to empty. To successfully manage your water supply you can either increase the amount of water you are adding, decrease the amount flowing out, or get a bigger barrel to extend the amount of time until the barrel is empty. When applying this analogy to off-grid living and energy use in a home, the barrel is the battery pack, the flow out is the amount of electricity used to operate the home, and the flow into the barrel is the electricity generated by a solar, wind, or hydropower generation system. Every so often, when the barrel runs dry, it will need to be filled to the top again, which is where a generator comes in. The electrical generator acts as a buffer to ensure that all year, in any situation, the home never runs short of electricity.

#### RENEWABLE ENERGY

Renewable energy sources such as PV solar panels and windmills have increased in popularity and use over the past few years thanks to a general acceptance of the technology and generous tax credits. Qualified installers of PV panels, micro-hydro turbines, and windmills are now common nationwide. As more manufacturers enter the market, the price of PV panels and windmills is going down while the power generation systems continue to improve in quality, output, and durability. The federal government has offered tax credits of up to 30%, and state governments and local utilities also offer financial incentives for purchasing and installing renewable energy systems. The entire renewable energy system including solar PV arrays, inverters, batteries, and generators can qualify for rebates. In the case of federal tax incentives, the tax credits for on-site electrical power generation can apply to both traditional and off-grid living as long as the dwelling is a primary residence. This can make the investment in solar panels or a windmill

much more affordable for off-grid living situations.

Unfortunately, renewable energy generation sources such as solar panels and windmills rarely provide enough consistent and reliable electricity to keep a home operating comfortably. Ideally, the renewable energy generation system installed would be robust enough to constantly keep the barrel full, but this is seldom the case. Most off-grid renewable energy systems supply 2 to 4kW of energy through a solar PV array, windmill generator, or a combination of both. In southern climates with ample sunlight and low energy loads, most solar PV arrays can sustain the electrical needs of a home for about nine months of the year, but have reduced electrical output during the winter months. In northern climates with shorter days, consistent power generation is only viable for six months of the year. Many renewable energy technologies available today cannot provide 100 percent of the demanded energy load for a traditional home. Renewable energy systems often require a back-up energy source to provide supplemental energy when the renewable source does not produce the demanded load. For example, solar arrays and windmills will not always produce energy; during extended periods of cloudy or very calm days these systems will produce very little energy.

#### STORING ENERGY IN BATTERIES

The next part of the off-grid power system is the energy storage unit or battery pack. Individual batteries are linked together and recharged while the solar PV array or windmill is generating electricity. Battery technology has greatly improved in the past decade and has allowed off-grid living to become more practical. The first batteries used for off-grid living were standard lead, acid-based car batteries, larger deep cell "marine" batteries, or golf cart batteries, which are larger still and



*The 600-square-foot, two-bedroom lodge at Herkimer Diamond was designed and built to promote resource conservation and energy independence. It was built with 80-percent recycled products and furnished with recycled glass dinnerware, reclaimed wood furniture, and Eco Pure pillows made from recycled plastic bottles.*

have a greater storage capacity. While these types of batteries are still popular, new technology such as deep-cycle sealed gel batteries are becoming more common. Designed specifically for renewable energy chargers such as solar PV arrays and wind turbines, sealed gel batteries have the potential to require less maintenance than traditional batteries and have a much greater storage capacity. These new batteries are considerably more expensive than traditional batteries, sometimes double in price, which often puts them out of reach for many off-grid homeowners.

Battery banks in off-grid living are usually sized to provide three to four days of power for the home before recharging, but every so often they need a deep charge or "equalizing" that requires a significant amount of energy. Acid lead batteries need to be overcharged or equalized several times each year in order to extend their service life and performance. To do this

the battery must be fully charged, and then an additional boost of electricity is added to battery for about three hours. The overcharging helps optimize battery performance and requires more electricity than most renewable energy generators can provide. An off-grid mechanical generator is often necessary to provide the additional energy needed to equalize the batteries.

#### THE NEED FOR INVERTERS

Once the energy is stored in batteries, it is not yet ready for home use. Solar PV arrays and windmills generate electricity in direct current (DC), while home appliances operate on alternate current (AC). An inverter is needed to transform the electricity into stable, usable energy for the home. An inverter is a device that converts DC power to AC power. Most modern inverters create standard 120-volt AC power, although some models have a built-in capacity to handle both 120- and 240-volt loads. The extra load capacity can be



*The Herkimer solar-powered lodge's heating system, refrigerator, and domestic hot water system all run off propane, as does the generator. During peak demand the lodge uses about 16 amps, the equivalent of two toasters.*

important to power some off-grid devices, such as deep-well submersible pumps that require 240 volts. The inverter is an important link in the chain because it not only converts the energy from the batteries to the home, but also works as the charger for the battery, feeding power from the renewable energy source into the batteries and also acting as a gateway between the mechanical generator and the batteries.

The inverter also works as a monitor of battery level and health. The inverter, when configured properly, will automatically start the generator to either charge batteries or deliver additional electricity to the home. Inverters can be purchased in modules of 2kW increments and then linked together, or as one large unit. The benefit of taking a modular approach with inverters is that the size of the system can be expanded if the homeowner wants to increase battery capacity or link on a few more solar PV panels to increase energy generation.

#### GENERATORS

To take full advantage of off-grid living, on-site electrical generators are a must. The generator has three primary tasks in off-grid living: charge the batteries when the renewable energy sources can't keep up with the home's demand; equalize the batteries to extend their life and provide optimum storage capacity; and provide additional energy to the home for specific tasks or during times of high demand. Without a mechanical generator acting as a safety net for the home and providing additional electricity when needed, off-grid living would be far more rustic, and in many climates, simply not possible.

Sizing of the generator is important, but bigger is not always better when living off-grid. Smaller generators use less fuel, are quieter, and have a smaller footprint. Because the primary function of an off-grid generator is to recharge batteries, the

generator only has to be big enough to successfully complete this task in a timely and economical manner. Batteries can be damaged if recharged too quickly. The inverter will limit the amount of amps fed to the battery bank from the generator to keep from damaging the batteries based on the bank's C-rate.

The C-rate is the rate of charge or discharge in relation to the battery's size and capacity. The faster the battery can safely discharge its energy, the faster it can be recharged. Lead acid batteries, especially deep cell marine or golf cart batteries, are designed to slowly discharge their power, so they have a high C-rate, usually around C/20. To determine how much energy can be fed to batteries during recharging, simply divide the battery pack amps by the recommended C-rating. For example, to safely recharge a 220-amp battery pack with a C/20 rating, the maximum amount of amps that should be used during recharging is about 11 amps or roughly 1,300 watts with a 120-volt system. This means that if the home has a 10,000-watt generator, only a percentage of the energy generated will actually be used for charging the batteries. The rest of the energy can either be used by the home while the generator is running or it is wasted. Because charging batteries cannot be rushed, it may take a few hours to completely fill the battery bank, which will result in a lot of wasted fuel for the generator if it is oversized for the recharging task.

Besides selecting the right size generator, choosing the right style is critical. There are three main styles of electrical generators available today: portable, standby, and off-grid.

A portable generator is usually a smaller, gasoline-fueled generator that is primarily designed for use on construction sites, during weekend camping trips, or for short-term

specific tasks. There are many reasons why a portable generator will not be a successful choice for off-grid living. First, portable generators require manual operation, which means they must be physically started every time before use. This can be inconvenient in an off-grid living situation where battery banks may need to be charged at night or during bad weather. Also, gasoline is a poor choice for fuel when it comes to generators because without treatment, gasoline can expire. When gasoline “goes bad” it can oxidize, lose volatility, and varnish fuel-intake valves. Portable generators also have smaller fuel tanks, which means they simply may not run long enough to recharge the battery bank before refueling is needed. The more times the homeowner has to refuel a portable generator the greater the chance of fuel spillage, combustion, or ground contamination.

For most on-grid living applications, generally a standby-style generator is most appropriate. For generators the term “standby” applies to permanently mounted units that are meant to provide electricity to grid-fed houses during power outages. As any homeowner knows, the electrical power grid can be disrupted for any number of reasons. Severe weather events such as hurricanes, ice storms, and wind storms, mechanical failure due to an aging and stressed power grid, even increased demand from heat waves can knock out power and leave millions of people in the dark, literally. A standby generator is tied into the home’s electrical system through a transfer switch that will activate the generator and restore power to the home within 10 to 30 seconds of a power outage.

While there are similarities between standby and off-grid applications, the differences in the systems are important to understand. Unlike an off-grid application, standby power systems do



*The solar-powered lodge at Herkimer Diamond is proof positive that sustainable living doesn't have to be Spartan. The lodge even boasts chic bamboo flooring and two LCD televisions.*

not have batteries but are designed to independently supply the home with all the electricity it needs during an outage. Also, because a standby generator is used to completely power the home, the units are generally larger than off-grid generators. For a modern home in a cooling climate where air conditioning is needed to maintain comfort and reduce the chance of mold growth from high humidity, a generator may need to provide more than 25,000 kW of power in order to keep the home comfortable, safe, and secure. By comparison, even the most expansive off-grid homes can get by with a much smaller generator because, again, the off-grid generator’s main task is to recharge the battery bank.

The ideal generator choice for off-grid living would be more like a standby than a portable, but one specifically designed for the rigors of off-grid living. Compared to standard standby generators the off-grid generator should have a longer service life, require less maintenance, be

quieter than a traditional generator, and be able to adapt to any kind of renewable energy system.

#### FUEL TYPES FOR GENERATORS

Generators in off-grid applications will be either diesel- or propane-powered. While each has its place in the market, there are significant issues with using diesel to fuel generators. Diesel fuel will oxidize over time and must be treated with stabilizers to ensure the fuel doesn’t go bad before use. Also, diesel is highly susceptible to condensation in the tank. When water is introduced to diesel it can quickly promote the growth of microbes and organic compounds. These pollutants can degrade the fuel and produce clogging materials that can reduce performance and eventually ruin the engine. A problem that is unique to diesel is that the colder it gets, the thicker it becomes. Diesel generators must be equipped with heat plugs that have to warm before the generator can be started. In extreme cold

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climates, diesel may gel to the point that it can create real challenges for generator fuel pumps. Diesel can also be an environmental hazard if spilled and can quickly foul drinking water if it seeps into wells.

As an energy source, propane has many advantages over diesel. While diesel fuel needs periodic conditioning to prevent spoilage, propane does not degrade over time nor does it promote the growth of microbes. Propane does not oxidize nor lose its volatility, so there are never any fuel maintenance issues with propane. The natural temperature of propane in its condensed liquid form is minus 44 degrees Fahrenheit, which means that even during the coldest of winters propane will not thicken or gel like diesel. Also, transporting and storing propane is safer than diesel. A propane tank is 20 times more puncture resistant than a typical diesel tank.

Propane is an environmentally friendly, clean fuel when compared to

diesel. At the point of use, propane emits fewer greenhouse gases than almost every other fuel type available including gasoline, diesel, heavy fuel oil, or E85 ethanol per unit of energy. Propane generators produce half of the ozone-forming emissions and produce none of the evaporative emissions of other fuel type generators. Electric generators powered with propane also require less maintenance than diesel models, and need fewer oil changes and less cleaning.

For fuel storage, propane tanks can be either above ground or below ground, which can further protect them from the elements. There are more than 56,000 miles of propane pipeline in the United States today that supply more than 6,000 propane retailer locations. Propane distributors deliver the fuel to the home in bulk filling trucks called "bobtails" and refill permanently installed tanks that are either leased or purchased by the homeowner. One attractive

idea taking hold for off-grid "clusters," where several homes are built in relative close proximity, is to have a large community propane tank that all homes share. This approach provides the advantage of a much greater supply of propane available to the small community, potential savings on the energy source through large, bulk purchase, and is possible only by using propane-powered generators.

GO ONLINE TO READ MORE. VISIT [PROPANETRAININGACADEMY.COM](http://PROPANETRAININGACADEMY.COM) TO FINISH READING THIS ARTICLE AND TO TAKE THE QUIZ.

**SUMMARY & RESOURCES**

Information on propane safety can be found at [propanesafety.com](http://propanesafety.com).

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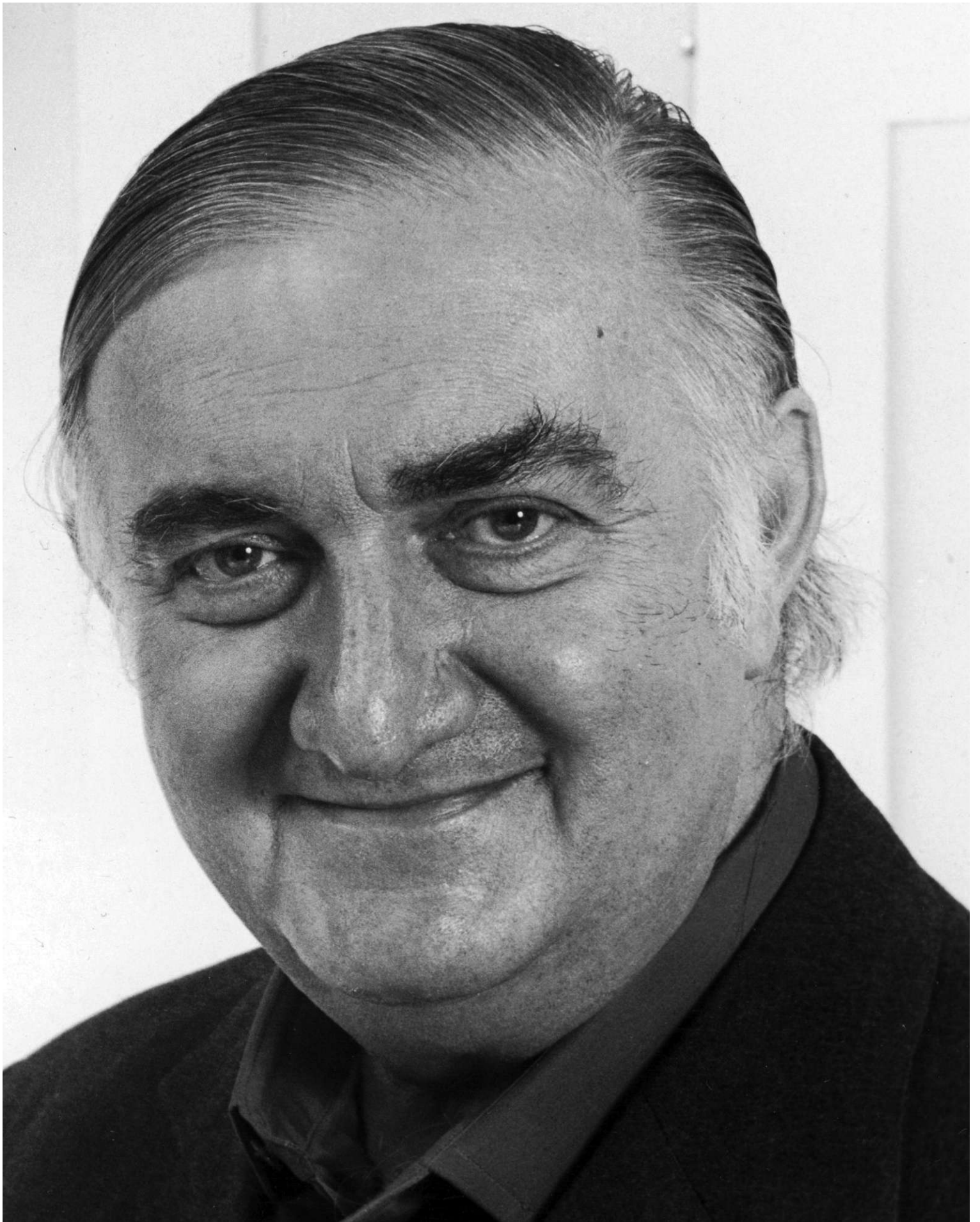
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→ The drawings in this article are from the collections of the Canadian Centre for Architecture. They appear as part of the exhibition “Notes From the Archive: James Frazer Stirling, Architect and Teacher” at the Yale Center for British Art (through Jan. 2). A companion exhibition, “An Architect’s Legacy: James Stirling’s Students at Yale, 1959–1983,” is on display at the Yale School of Architecture (through Jan. 28).

# BIG JIM

FUNCTIONALIST, BRUTALIST, POSTMODERNIST: WHO EXACTLY WAS **JAMES FRAZER STIRLING**? WITH YALE UNIVERSITY HOSTING TWO EXHIBITIONS ON THE BRITISH ARCHITECT, A REVIVAL SEEMS IMMINENT. **CRAIG HODGETTS**, ONCE A STUDENT OF STIRLING’S, CONSIDERS THE LEGACY OF HIS TIGHT-LIPPED MENTOR.

**HERE’S THE RUB.** Big Jim, aka James Stirling, went at architecture the way a heavyweight on the way up goes after a doll.

*No. Scrub that.*

Here’s the incongruity: Sir James Frazer Stirling addressed the profession of architecture in a manner that reflected his humble origins, but along the way ...

*No, no. Way off. He was no social climber.*

Okay. This is the real deal: Stirling’s blunt, intensely personal, confrontational, even hyperfunctional style was something he wore as naturally as his fluorescent-green stockings and cadmium-blue dress shirts.

*Too many words.*

Sir Jim said very little about his work, sticking to very disciplined (never flowery) descriptions that were absolutely devoid of jargon. In fact, one might infer that he was dismissive of the “elevated” discourse some think is appropriate when talking about architecture.

It’s one of the conundrums of his legacy, because there is so much to chew on. A review of his built and unbuilt projects over a mere 40 years is startling, not only for its sheer quantity, but for the consistently challenging concepts which he regularly launched from his crowded atelier. In the beginning, one waited in line for a fresh cut from the Beatles, wore the latest thing from Mary Quant—and watched for a salvo from Big Jim.

Ham Common was Aalto redux. Preston was more of the same, but better. Leicester was Aalto *delicto*, and from there on, it was time to call in the bomb squad, or the morals police, or the guardians of British culture—whoever could get there first. Remarkably, at least for a while, the commissions kept rolling in, from prestigious universities and planning councils and industrial titans who (one must assume) were advised to catch him quick, while he was on the way up.

Sir Jim’s delight was to join the puzzle pieces of a program into an assemblage that was barely reined in by structure and weatherproofing. This teetered on the edge of a critical precipice, which, of course, is what engendered such a babble of commentary. With his champions—the critics Reyner Banham and Colin

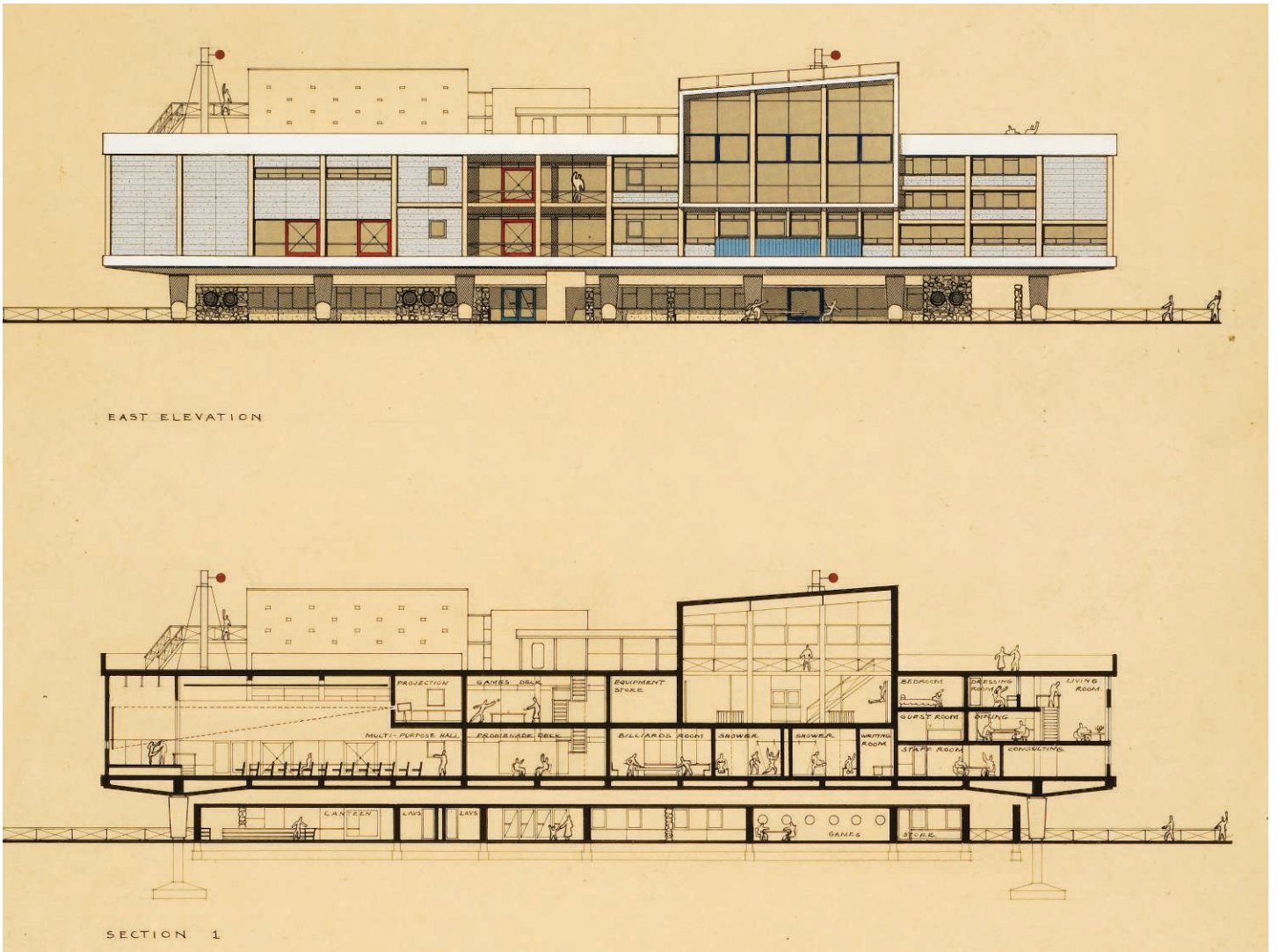
## A JIM STIRLING TIMELINE

1926

James Frazer Stirling is born on April 22 in Glasgow, Scotland, the son of a ship’s engineer and a schoolteacher.



**1. HOUSE FOR THE ARCHITECT: MODEL.** STIRLING WAS A FOURTH-YEAR STUDENT AT LIVERPOOL, ON A WORKING SCHOLARSHIP IN NEW YORK CITY, WHEN HE PRODUCED THIS BREUER- AND GROPIUS-INSPIRED DESIGN.



**2. COMMUNITY CENTRE, NEWTON AYCLIFFE.** FOR HIS UNIVERSITY THESIS, STIRLING PLANNED A NEW TOWN IN NORTHEAST ENGLAND WITH A COMMUNITY CENTER AT ITS HEART. THE BUILDING, WITH ITS PILOTS, EVINCES STIRLING'S STUDENT INTEREST IN THE WORK OF LE CORBUSIER, WHILE THE SMOKESTACKS WITH RED WEATHER VANES HINT AT STIRLING'S MATURE STYLE.

1925–26

Walter Gropius,  
Bauhaus building,  
Dessau, Germany



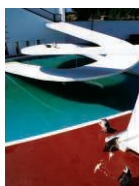
1912–31

Sir Edwin Lutyens,  
Viceroy's House  
(Rashtrapati Bhavan),  
New Delhi



1933

Berthold Lubetkin and  
Ove Arup, Penguin Pool,  
London Zoo, London



1941–42

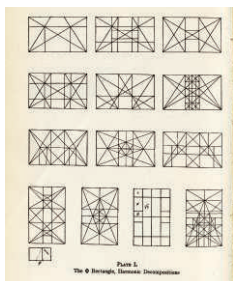
Stirling enrolls at the  
Liverpool College of Art.

1942–45

Stirling serves in the British  
army during World War II.

1946

Stirling enrolls in the  
architecture program  
at the University of  
Liverpool.



1947

Stirling's teacher, Colin  
Rowe publishes the essay  
"Mathematics of the  
Ideal Villa."

1949

Stirling spends fall  
semester working at an  
architecture firm in the  
United States.

2 1950

Stirling graduates from  
Liverpool, moves to  
London, and enrolls in the  
School of Town Planning  
and Regional Research.

1952

Stirling leaves the School  
of Town Planning and  
Regional Research.

1953

Stirling begins working as a  
senior assistant with Lyons,  
Israel & Ellis.

1954

Stirling visits Le Corbusier's  
Maisons Jaoul (1954–56),  
under construction in  
the Paris suburb of  
Neuilly-sur-Seine.



Rowe—leading the incursion, architects around the world were alerted to an aesthetic so fundamentally removed from their own that only a brave few would sign up for it. After all, who among them had ever imagined that brightly colored air extractors might stand in for the "plop art" with which they adorned their windswept plazas; or that one might manage airflow with cleverly placed inverted vents, rather than a ducted system? The forthright, often scatological functions which Stirling celebrated sometimes made an assault on the senses. At his Leicester University Engineering Building, the infamous vent at the prow of the terrace wafted the olfactory delights of the restroom below.

At that time, in the late '50s and early '60s, artists such as Charles Mingus, Allen Ginsberg, and Francis Bacon were producing work that drew on the same strain of radical reconception that provided the DNA for Stirling's early buildings. In marked contrast to his contemporaries, Stirling seems to have been less preoccupied with the (narrowly defined) "culture of architecture" and far more engaged with broad cultural tremors which he could not ignore. An *ack-ack* of unprecedented built and unbuilt projects underscored his willingness to risk all in the search for a matching paradigm: raw concrete and brightly colored molded fiberglass at Runcorn; more extremely molded fiberglass for Olivetti; a ribbed, precast concrete system for university housing at St. Andrews; an unbuilt proposal featuring gigantic rotating sunscreens for Siemens.

With each jab of his famous stub of a pencil, he pushed both aesthetic and technological boundaries further into an unknowable future. And yet, later, the punctuation often took the form of veiled historical references, such as the concave cornices on the Siemens design, and the depressed Piranesian footprint that gave his competition entry for the Wallraf-Richartz Museum an epic, even elegiac, quality.

This tendency—to oscillate between a functional, programmatically driven parti and a visual narrative blending episodes old and new—endowed his projects with something like the "nose" extolled by wine connoisseurs. It was a melding of influences, overtones, and subtle references that never approached the banal cynicism of Philip Johnson's Chippendale pediment.

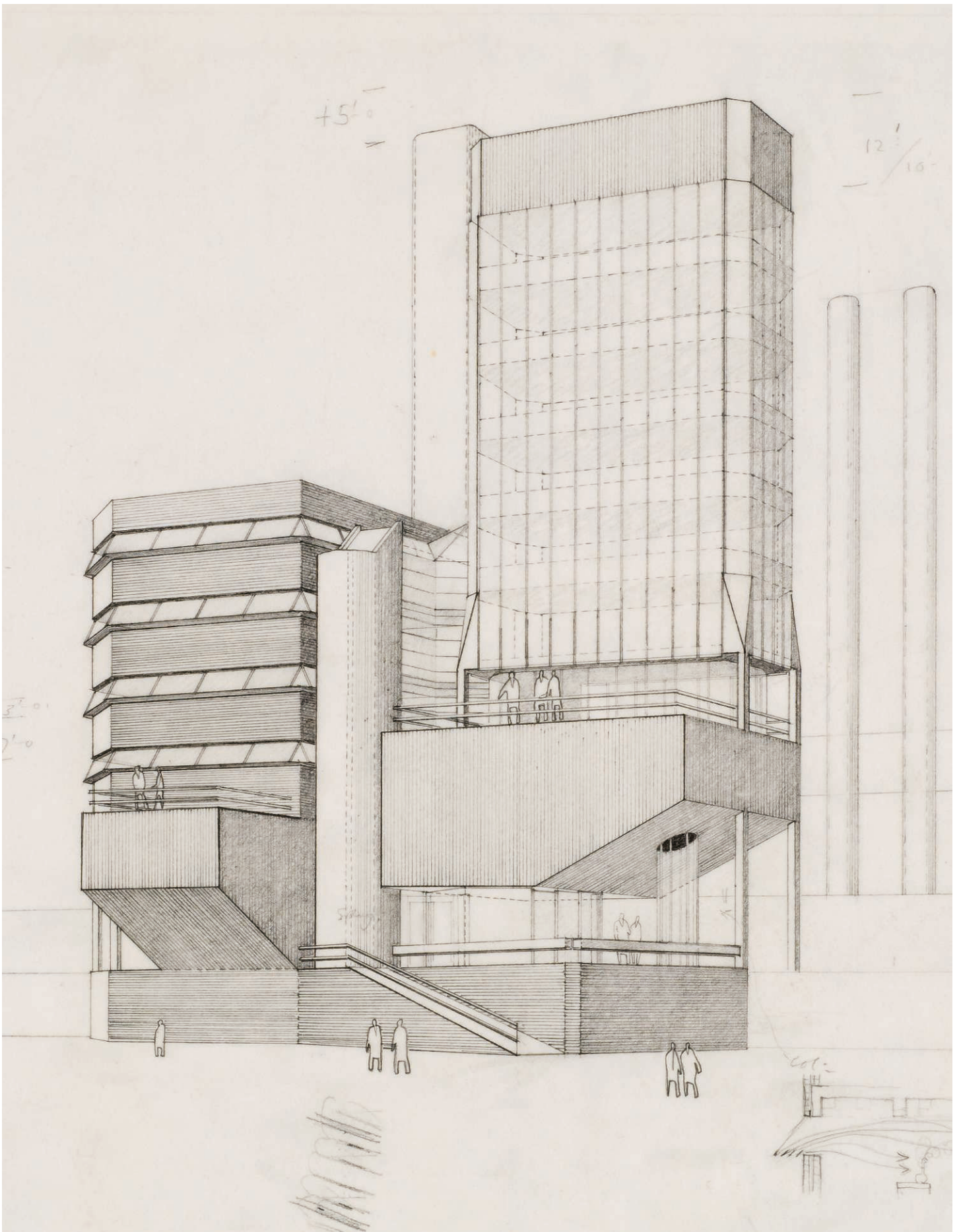
In the states, Peter Eisenman, Richard Meier, and Jaquelin Robertson circled his camp, as each was carving his own place in architectural history; House X and the High Museum were *in vitro* experiments during the period of Stirling's greatest influence among the avant-garde, as was Paul Rudolph's nearly simultaneous Yale School of Art and Architecture, and Robert Venturi's Guild House. Wildly divergent styles marked the break with classical Modernism, mirroring challenges to the social and political order of the culture as a whole. Yet only Meier and Venturi found acolytes to carry on their principles: Eisenman's celebrated match-up with Jacques Derrida led to a wider breach between theory and practice, while Sir Jim's forthright diagrams caught flak from an establishment committed to the status quo, and above all, in thrall to its conservative, corporate clientele. Stirling's complex design rhetoric, difficult for critics and architects alike, seemed to sow only confusion among even his most ardent followers.

A less adventurous Stirling emerged in the late '70s, "curated" by Léon Krier. He left behind agitprop to create a series of projects which, while still idiosyncratic, cloaked functional flourishes—such as the monumental exhaust stacks framing the entrance to the Fogg Museum—with thin, often disingenuous disguises. This work, embraced by many of his students at Yale, extended the premise of the Staatsgalerie by relying on a material gravitas (mostly absent earlier) that was supplemented by an assemblage of primary geometries in order to convey a sense of civic authority.

This turn of events mortified many of his admirers, while inspiring a kind of hybridized postmodern affectation that quickly became the hallmark of innumerable schools, libraries, and courthouses. Possibly the most-often quoted project of this period is the theater arts project at Cornell University, which features a slender bell tower, an Italianate arcade, and a hilltop village layout. Devoid of the somewhat pompous air which found its way into many of Sir Jim's later projects (the No.1 Poultry building in London comes to mind), Cornell pulls off a kind of pleasant, synthetic vernacular. But it is difficult to reconcile its placid countenance with the ferocious originality which brought him to the attention of the architectural world.

American disciples are thin on the ground, but echoes of the first (the "good") Stirling can be found in Frank Gehry's early projects, and one thinks of Marion Weiss and Eric Owen Moss. Then there's our own studio, a throttled-down, road-going version of the ATV screamer that Jim was piloting.

Retrospectively, his influence seems as fleeting as that of Ledoux and Boullée, even though, within 20th-century architectural history, the sheer brilliance of his work has no equal. While such a quick fade from memory may be due in large part to his reluctance to theorize, it's meant that just "getting the job done"—as Sir Jim liked to say—has given way to the unbridled rush to get to the head of the line. □



3. LEICESTER UNIVERSITY ENGINEERING BUILDING: PERSPECTIVE. STIRLING'S FUNCTIONALLY EXPRESSIVE BREAKTHROUGH PROJECT DREW EQUALLY UPON RUSSIAN CONSTRUCTIVISM AND THE INDUSTRIAL VOCABULARY OF VICTORIAN BRITAIN. THE SYNTHESIS, THE ARCHITECT HOPED, WOULD BE A NEW "TYPE FORM" FOR UNIVERSITY LABS.

1955

Stirling begins teaching at the Architectural Association in London.

1956

Stirling and his colleague **James Gowan** leave Lyons, Israel & Ellis to found their own firm.

1957–59

Infill Housing, Preston, Lancashire, England

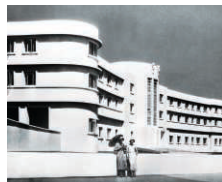


1959

**Frank Lloyd Wright**, Guggenheim Museum, New York



**Ludwig Mies van der Rohe**, Crown Hall, Illinois Institute of Technology, Chicago

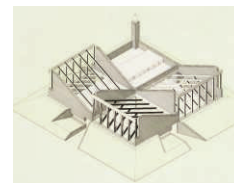


1960

**Reyner Banham**, *Theory and Design in the First Machine Age*

1958–61

School Assembly Hall, Brunswick Park Primary School, Camberwell, London



3 1959–63

Leicester University Engineering Building, Leicester, England

1963

Stirling and Gowan split; Stirling establishes his own practice with office assistant **Michael Wilford**.

1964

**Archigram**, *Plug-In City* and *The Walking City*



1966

**Robert Venturi**, *Complexity and Contradiction in Architecture*

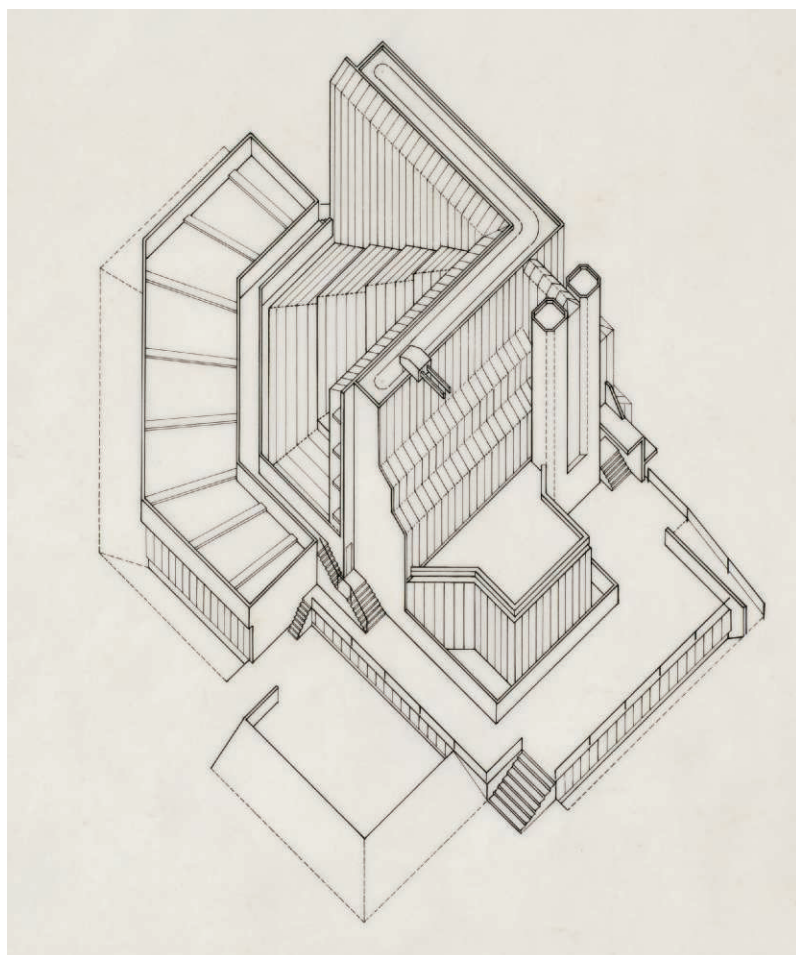


1963–67 4

History Faculty Building, University of Cambridge, England

1967

Stirling serves as Davenport Visiting Professor of Design at Yale, a post he holds until 1984.



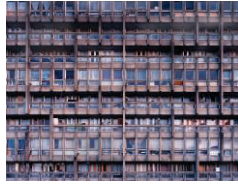
4. HISTORY FACULTY BUILDING, UNIVERSITY OF CAMBRIDGE, ENGLAND: AXONOMETRIC. STIRLING JOINED AN L-SHAPED OFFICE TOWER TO A GLAZED PENTAGONAL VOLUME HOUSING RADIAL BOOK STACKS.

“HE WAS TOTALLY DEMANDING ABOUT DRAWINGS ... THOSE FAMOUS AXONOMETRICS YOU KNOW FROM HIS OWN WORK, HE DEMANDED OF HIS STUDENTS.”

—ROBERT A.M. STERN,  
DEAN, YALE SCHOOL OF ARCHITECTURE

1972

Alison and Peter Smithson,  
Robin Hood Gardens,  
London



1969–72

Olivetti Training School,  
Haslemere, Surrey, England



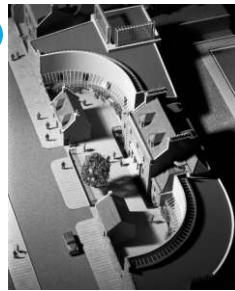
1971

Olivetti Headquarters,  
Milton Keynes,  
Buckinghamshire, England

Stirling forms partnership  
with Michael Wilford

1971–74 6

Arts Centre, University of  
St. Andrews, Scotland

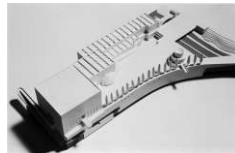


1975

Nordrhein-Westfalen  
Museum, Dusseldorf,  
Germany



Wallraf-Richartz  
Museum, Cologne,  
Germany



1976

Regional Center,  
Florence, Italy



Government Center,  
Doha, Qatar

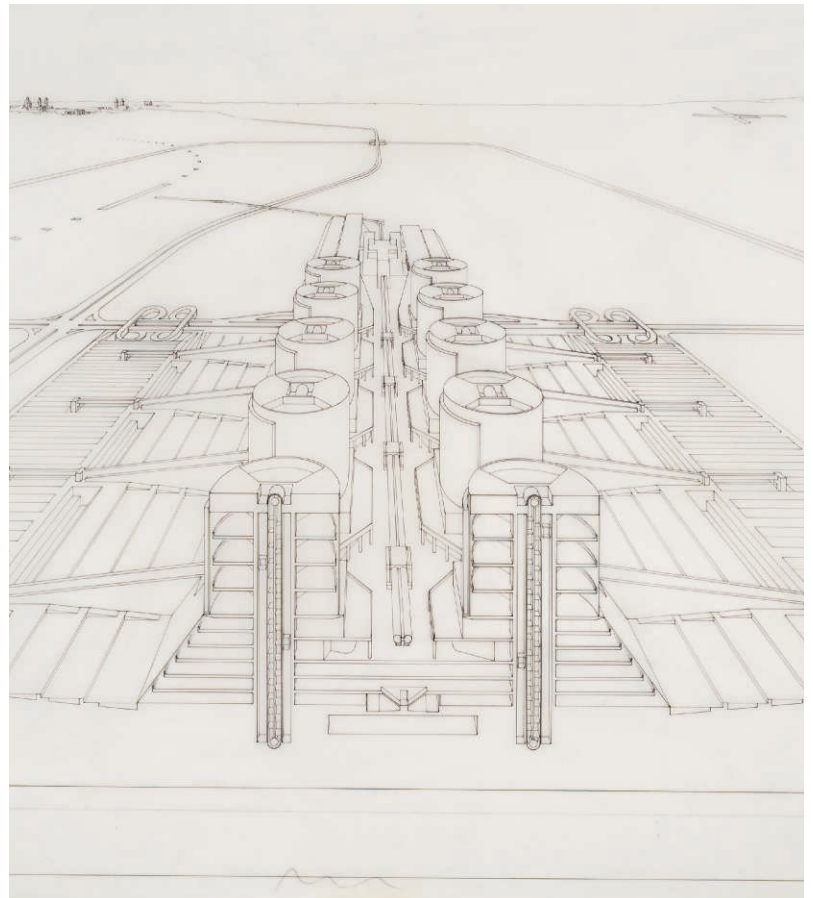


Meineke Strasse,  
Berlin



**“WITH THE ARCHIVE OPENED UP ... IT’S NOW  
BECOME POSSIBLE TO STEP BACK FROM THE  
DEBATES THAT SURROUNDED HIS WORK  
AT THE TIME, AND MADE HIM BOTH LOVED  
AND SCORNE, AND ... LOOK AT THE WORK  
A LITTLE MORE DISPASSIONATELY.”**

— ANTHONY VIDLER, CO-CURATOR, “NOTES FROM THE  
ARCHIVE: JAMES FRAZER STIRLING, ARCHITECT AND  
TEACHER,” YALE CENTER FOR BRITISH ART

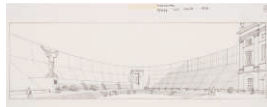


**5. SIEMENS AG HEADQUARTERS, MUNICH: AERIAL PERSPECTIVE.** DESIGNED WITH LÉON KRIER, THE SUBURBAN COMPLEX FEATURES 10 MASSIVE, CYLINDRICAL OFFICE AND LAB TOWERS WITH COMPUTERIZED REVOLVING SUNSCREENS. “THE METAPHORS ARE PATENTLY INDUSTRIAL,” KENNETH FRAMPTON WROTE.

1966–71

Florey Building, the Queen's  
College, Oxford, England

1970

Derby Town Centre,  
Derby, England

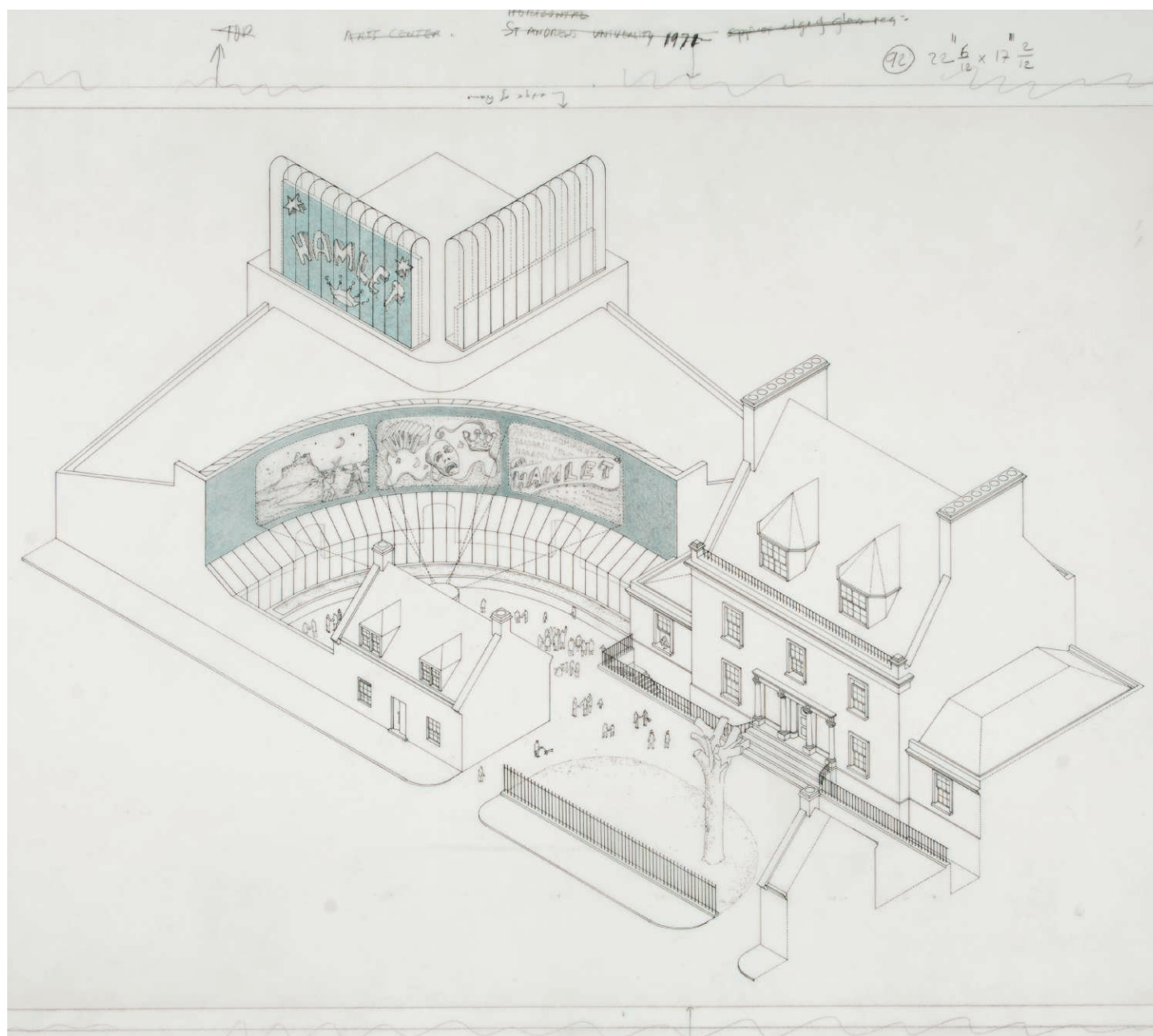
1969–70

Siemens AG Headquarters,  
Munich, Germany

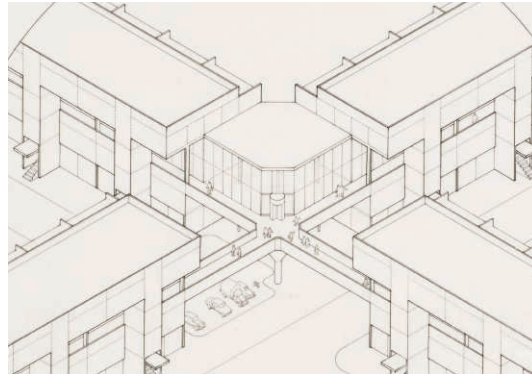
1963–68

Students' residence,  
University of St.  
Andrews, Scotland

5



6. ARTS CENTRE, UNIVERSITY OF ST. ANDREWS: AXONOMETRIC. STIRLING ADDED CURVED ARCADES TO AN 18TH-CENTURY TOWNHOUSE, IN A MASH-UP OF ITS OWN PALLADIAN ANTECEDENTS AND THE INDUSTRIAL GLASS-AND-METAL STRUCTURE OF JOSEPH PAXTON'S VICTORIAN CRYSTAL PALACE.

1967–76 **7**Southgate Housing,  
Phases I and IA,  
Runcorn, England

**7. SOUTHGATE HOUSING, PHASES I AND IA, RUNCORN.** TOP TO BOTTOM: AXONOMETRIC; PERSPECTIVE; ONE OF THE GEORGIAN-STYLE SQUARES; A COLONNADE AND RAISED WALKWAYS

## GEORGIAN PRECEDENTS, MODERN REALITIES

Or, What Went Wrong at Runcorn?

TEXT BY HUGH PEARMAN

**IN JULY 1981**, in the offices of the British architecture newspaper *Building Design*, I received a letter from James Stirling. It enclosed a clipping from the *Runcorn Daily News*, a local newspaper in the northwest of England. “I hope your readers are as amused by it as we are,” Jim remarked drily. I unfolded the clipping. The headline read: “Police Girl saw ‘God-like Pose’ of Nude Man.”

The story concerned a court case. A Mr. Dutch—a 36-year-old, married father of two and a resident of Stirling’s Southgate housing project in Runcorn New Town—had repeatedly been seen disporting himself naked in one of the two large porthole windows of his apartment, coincidentally at the very time each morning when a busload of hospital nurses was going past.

Tiring of this after a while, the nurses alerted the police, who with fine judgment sent along a plainclothes female officer to check up. “He appeared, nude, waved at me and smiled,” she told the court. Nurse Elizabeth Dolman added that he sometimes stood in the window with his arms and legs outstretched. “He just looked like God,” she said. It was, as we say in England, a fair cop. Despite the smile, the wave, and the Godlike pose, Mr. Dutch was found guilty of “indecently and lewdly exposing himself.”

Jim probably chuckled to himself that it wasn’t God that Nurse Dolman was thinking of, but Leonardo da Vinci’s Vitruvian Man—the famous drawing of a naked man superimposed on a circle and a square, an early proportioning system. Since classical proportioning drove the design of the Southgate project, it is not impossible that Vitruvian Man influenced the design of the circular windows. So Jim would have laughed out loud at the defense offered in vain by Mr. Dutch’s attorney, who blamed the architect. The porthole windows, he said, “seem to have been designed specifically to bring such cases as this to court.”

Of course we ran a front-page story on this little absurdist drama in *Building Design*. But Mr. Dutch’s Renaissance-induced exposure was not the only problem faced by this 1,500-unit, 6,000-resident housing project (called an “estate” in England), which although first commissioned in 1967, had only finally been completed in its final phase in 1976. It went downhill fast from then on, and in 1989 was slated for rapid demolition. What on earth went wrong?

Its proportions, its sequence of squares, and its abstracted-colonnade main façades were based on the Georgian precedents of the cities of Bath and Edinburgh. Runcorn offered a high-density, low-rise (five-story) solution to the national housing problem at a time when Victorian “slums” in nearby Liverpool were being demolished in swaths, and when many public housing authorities were still moving their tenants into new high-rises which were moving to prove troublesome.

Southgate was part of Runcorn New Town, which was intended to mop up overspill from Liverpool and



Manchester in much the same way as the more famous New Town of Milton Keynes took its population from both London and Birmingham. The Southgate estate formed the residential center of the new town—hence the high density. It was very unlike an earlier, smaller social housing scheme in the northwest by Stirling with James Gowan, the redbrick Preston infill housing of 1957–59 (also now demolished), except in one regard: Both schemes involved a “sandwich” of apartment types and a raised access deck.

Southgate was intended to be built rapidly so that its residents would use a new privately developed shopping mall the estate was linked to. The construction method was largely dictated by the client, but Stirling and his partner in charge of the project, Michael Wilford, worked hard to provide architectural interest in the repetitive elements, as the Georgians did. The first phases of Southgate combined in situ and precast concrete construction with the colorful GRP (glass-reinforced plastic) panels beloved of the nascent high-tech tendency in British architecture. Stirling used such plastic panels elsewhere; for instance, on his training center for Olivetti in Surrey, in southern England. In the final phase of Southgate, he abandoned concrete entirely in favor of GRP-clad timber frame.

Southgate was, then, a project on the cusp of different approaches—stylistically anticipating the postmodernism of the Italian school while incorporating high-tech elements, and constructionally combining heavyweight and lightweight techniques.

When first built, Southgate was generally well received by the international critics. “Jim the Great,” gushed Giovanni K. Koenig in the Italian magazine *Casabella* in 1975. In *Progressive Architecture* a year later, Sharon Lee Ryder praised “A refreshing bit of urbanity in a type of situation which so typically has tended towards a dispersed suburban plan,” while noting, “The bureaucracy maintains tight control over the cost. For this reason, an industrialized building method was used ...”

The British were much harder on Stirling. “It is difficult to know whether the system details took over or whether one’s expectations are overheated by the ... façades ... but round the back on staircases and along the pedestrian street, there is a great deal that is awkwardly joined and put together and skimpy,” wrote Sutherland Lyall in *Building Design* in 1977, though he added: “Everybody is settling into their great squares with a remarkable degree of satisfaction.”

*The Architectural Review (AR)* did not mince its words, calling the project “below par.” It quoted a community worker at Southgate who, though largely upbeat in his or her assessment, issued what turned out to be a prescient warning. “Great skill and understanding of young people will have to be shown if their growing numbers on the estate are to be catered for. Bored and unoccupied, they could cause huge problems on an estate designed in the way Southgate is.” With a raised street to make mischief in, in other words.

The huge problems duly arrived. As in parts of American cities, large social-housing projects in Britain—particularly those of raised-walkway industrialized construction—became a byword for poor management. The Southgate estate rapidly became socially unstable, families moved out, homes fell empty, its oil-fired centralized heating system (specified by the client, not the

architects) proved far too costly for paying tenants after the oil crisis of the early 1970s, and so the project became a dumping ground for society’s undesirables—housing’s last resort. Drug use and associated criminality soared. By the mid-1980s, the place was a mess.

With hindsight, it is clear that all this could have been put right with better management and judicious alteration. For instance, it quickly became apparent that the central band of duplexes in the sandwich, lacking their own yards and somewhat overshadowed by the projecting apartments above, were unpopular. Accordingly, Stirling and Wilford changed the design significantly for the final phase, reverting to homes with gardens at ground level. But revising the earlier phases was a course of action that seems scarcely to have been considered. The architects were not consulted on what to do. Instead, in 1989, the commissioning client, the Warrington and Runcorn Development Corp., decided to demolish it totally. The corporation was about to be wound up, its assets disposed of. Clearing the land was politically more acceptable than a problem housing estate which, according to estimates at the time, could have cost £20 million (\$32 million) to repair and maintain over the following 15 years.

The corporation was duly dissolved by the end of 1989, demolition of the estate began in 1990, and it had vanished entirely by 1992, to be replaced by brick-and-tile low-density suburban housing. A residents’ campaign to save and upgrade it failed. Even the architects of the replacement housing lamented that at least one square of Stirling’s composition could not have been saved.

At the time its doom was pronounced, Britain’s *Architects’ Journal* declared it “Britain’s Pruitt-Igoe,” in reference to the 1950s Minoru Yamasaki housing project in St. Louis, dynamited in the 1970s, that the critic Charles Jencks saw as the end of the line for old-school Modernism. In *Blueprint* magazine, Brian Hatton concluded that it was in the wrong place—an unnecessary new town—and that “It wasn’t loved because it didn’t offer enough beauty to support its density.”

Stirling himself pointed out, rightly, that the most problematic aspects of the design were those dictated by the client, including the social mix, the density, insulation standards, and the use of a raised-walkway heavy concrete prefab system. You might say: He could have refused the commission, then. But it was a challenge, and remember that in the late 1960s, the widespread problems that came to be associated with such estates were all in the future. It was a new world, an experiment.

“It was a national scandal,” remarks Michael Wilford of its destruction today. “We only knew about it once the decision had been taken. As taxpayers, we are probably still paying for it. The cost of even radical alterations would have been nothing compared to demolition and replacement.” However, he does not excuse his involvement with what turned out to be, on a national level, a deeply flawed system of low-cost social housing procurement. “One worked fairly readily within the constraints,” he concedes, unprompted.

And indeed, to my eyes it is clear that Stirling and Wilford produced better architecture out of those constraints than most other architects at the time working with industrialized systems. It was brave of them to attempt mass-production housing at all. I have no doubt that, had Southgate survived and been upgraded, it would have a very different reputation today. □

1976

Norman Foster,  
Willis Faber & Dumas  
Building, Ipswich,  
England

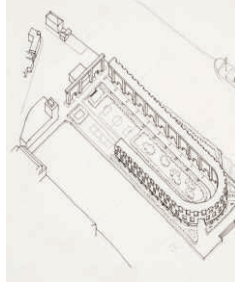


1977

Dresdner Bank,  
Marburg, Germany



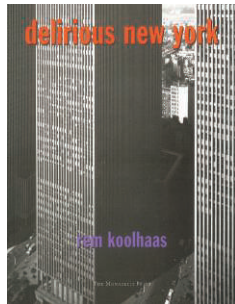
Housing Study for  
Muller Pier, Rotterdam,  
Netherlands



1978 8

"Roma Interrotta"

Rem Koolhaas,  
*Delirious New York*



1980

Stirling receives Gold  
Medal of the Royal  
Institute of British  
Architects.



Chemistry Department  
Extension, Columbia  
University, New York

1981

Stirling receives the  
Pritzker Prize.

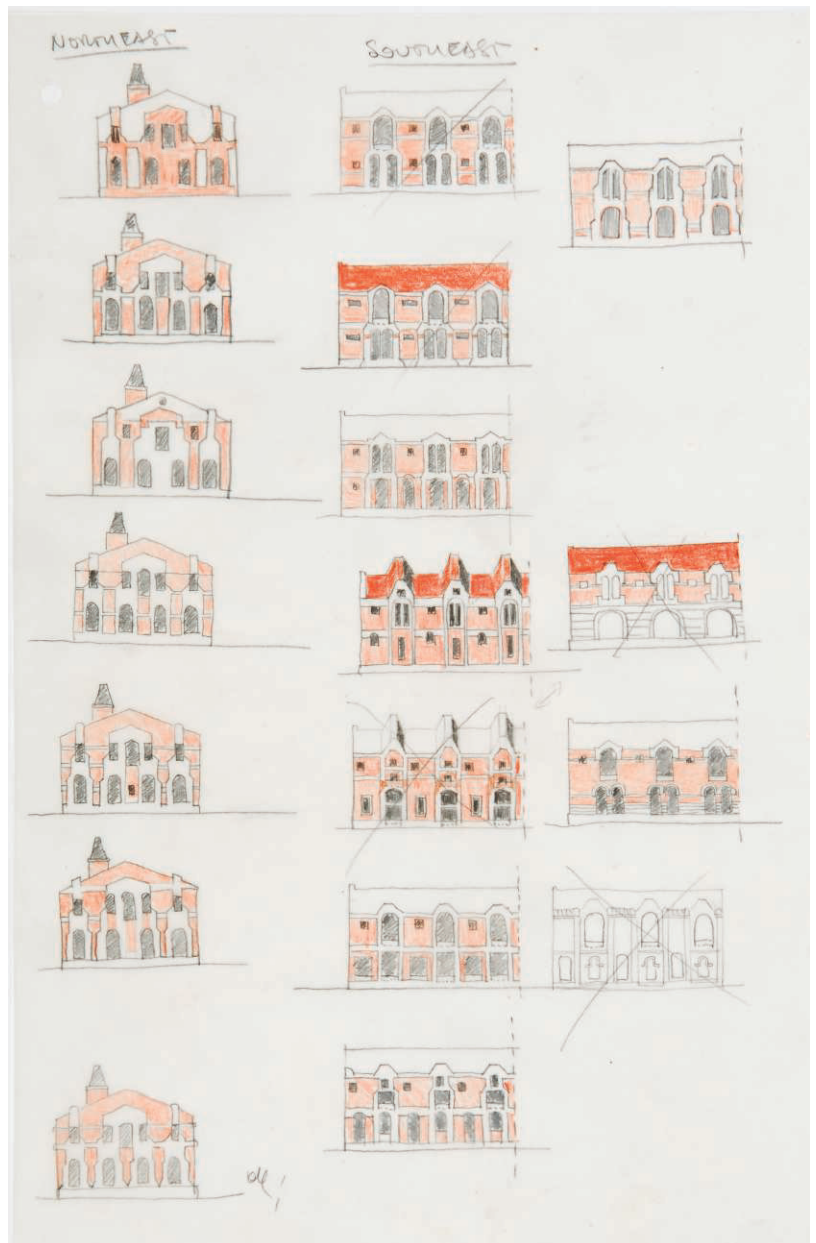
1979–81 9

School of Architecture  
Addition, Rice University,  
Houston



"HIS BUILDINGS WERE ALWAYS CONCEIVED NOT AS ONE-OFF MONUMENTS—THROWING EVERYTHING ELSE INTO QUESTION— BUT WERE DEEPLY LINKED INTO A PARTICULAR EXISTING URBAN CONTEXT, OR IN SOME CASES, WOULD BE THE SEED OF AN EVOLVING URBANISM."

—ANTHONY VIDLER



9. SCHOOL OF ARCHITECTURE ADDITION, RICE UNIVERSITY, HOUSTON: ELEVATION STUDIES. WITH THESE STUDIES, STIRLING SEARCHES FOR AN OUTWARD STYLE FOR THE BUILDING IN KEEPING WITH ITS CONTEXT, THE NEO-BYZANTINE RICE CAMPUS ORIGINALLY DESIGNED BY RALPH ADAMS CRAM.

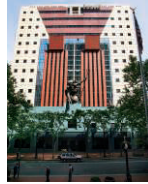


8. "ROMA INTERROTTA" FINAL DRAWING. FOR THIS LANDMARK EXHIBITION IN THE RUINS OF TRAJAN'S MARKET IN ROME, 12 ARCHITECTS WERE INVITED TO RIFF ON GIOVANNI BATTISTA NOLLI'S 1748 PLAN OF ROME. STIRLING UPDATED THE PLAN WITH DOZENS OF HIS OWN BUILT AND UNBUILT PROJECTS, INCLUDING THE SIEMENS AG HEADQUARTERS AS A BRIDGE ACROSS THE TIBER.

TIMELINE IN ORDER OF APPEARANCE: RIBA LIBRARY PHOTOGRAPHS COLLECTION; CORBIS; POCO A POCO; NICK DAWE/ARCAIDIMAGES.COM; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; MARIANA POPA / ARTIFICE IMAGES; MARCUS BLEYL/ARCAIDIMAGES.COM; RIBA LIBRARY PHOTOGRAPHS COLLECTION; RICHARD BRYANT/ARCAIDIMAGES.COM; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; PRINCETON ARCHITECTURAL PRESS; COURTESY MOMA; RICHARD EINZIG/ARCAIDIMAGES.COM; JOHN DONAT / RIBA LIBRARY PHOTOGRAPHS COLLECTION; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; RICHARD EINZIG/ARCAIDIMAGES.COM; SARAH J. DUNCAN/ARCAIDIMAGES.COM; JOHN DONAT / RIBA LIBRARY PHOTOGRAPHS COLLECTION; JOHN DONAT / RIBA LIBRARY PHOTOGRAPHS COLLECTION; JOHN DONAT / RIBA LIBRARY PHOTOGRAPHS COLLECTION; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; RIBA LIBRARY PHOTOGRAPHS COLLECTION; RICHARD EINZIG/ARCAIDIMAGES.COM; RICHARD BRYANT/ARCAIDIMAGES.COM; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; OMA PUBLICATIONS; COURTESY CANADIAN CENTRE FOR ARCHITECTURE; PAUL HESTER; RICHARD BRYANT/ARCAIDIMAGES.COM; CORBIS; RICHARD BRYANT/ARCAIDIMAGES.COM; RICHARD BRYANT/ARCAIDIMAGES.COM; RICHARD BRYANT/ARCAIDIMAGES.COM; ANDREW GILLIS/CASCADILLA PHOTOGRAPHY; CORBIS; © TIM GRIFFITH / ESTO; RICHARD BRYANT/ARCAIDIMAGES.COM; RICHARD BRYANT/ARCAIDIMAGES.COM; RICHARD BRYANT/ARCAIDIMAGES.COM

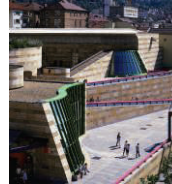
1982

Michael Graves, Portland Building, Portland, Ore.



1977–83

Staatsgalerie, Stuttgart, Germany

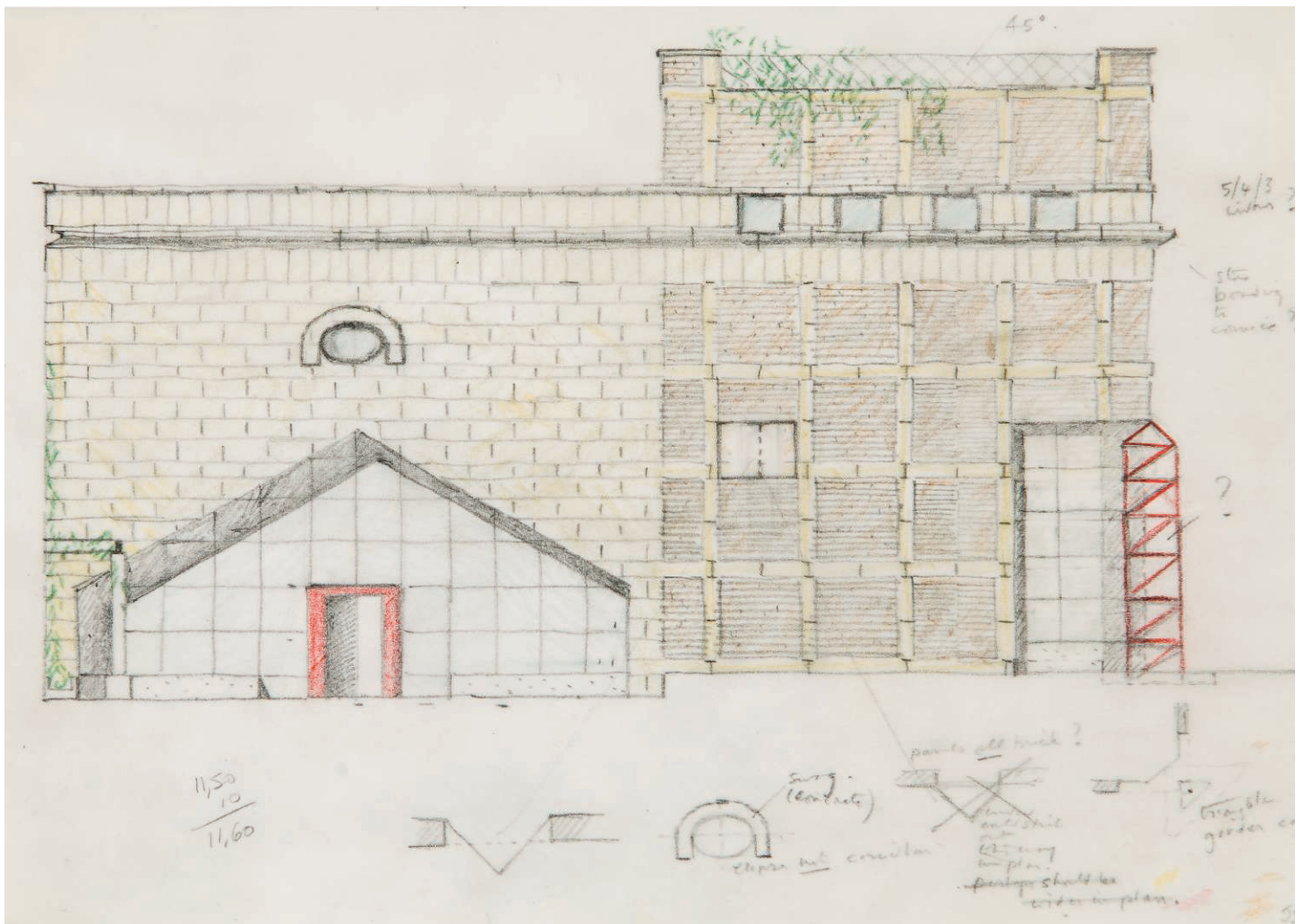


1979–84

Fogg Museum, Harvard University, Cambridge, Mass.



“STIRLING HAD US [HIS STUDENTS] REACH A LEVEL OF RESOLUTION THAT BROUGHT US TO THE POINT OF CRISIS ... THEN HE'D BE QUICK TO TAKE A BIG FAT PENCIL AND ... DRAW CIRCLES AROUND A CERTAIN INTERSECTION, AND SAY, 'IT LOOKS AS THOUGH YOUR PROBLEM IS RIGHT HERE.'” —MARION WEISS, PARTNER, WEISS/MANFREDI



10. CLORE GALLERY, TATE, LONDON: ELEVATION AND SKETCHES. STIRLING'S OFFICE CONSIDERED HUNDREDS OF OPTIONS FOR THIS COMMISSION, A GALLERY EXTENSION TO HOUSE PAINTINGS BY J.M.W. TURNER. THE CONSTRUCTIVIST-RED CORNER TRUSS STRUCTURE (AT RIGHT) WAS LATER ABANDONED IN FAVOR OF A CURVED WINDOW WITH ACID-GREEN MULLIONS.

1978–87

Clare Gallery, Tate, London

10



1979–87

Wissenschaftszentrum,  
Berlin

11



1982–89

Center for the Performing  
Arts, Cornell University,  
Ithaca, N.Y.

1989

Peter Eisenman, Wexner  
Center for the Arts,  
Ohio State University,  
Columbus, OhioTadao Ando, Church of  
the Light, Ibaraki, Japan

1992

Stirling is knighted; he  
dies on June 25 at age 66.

1988–94

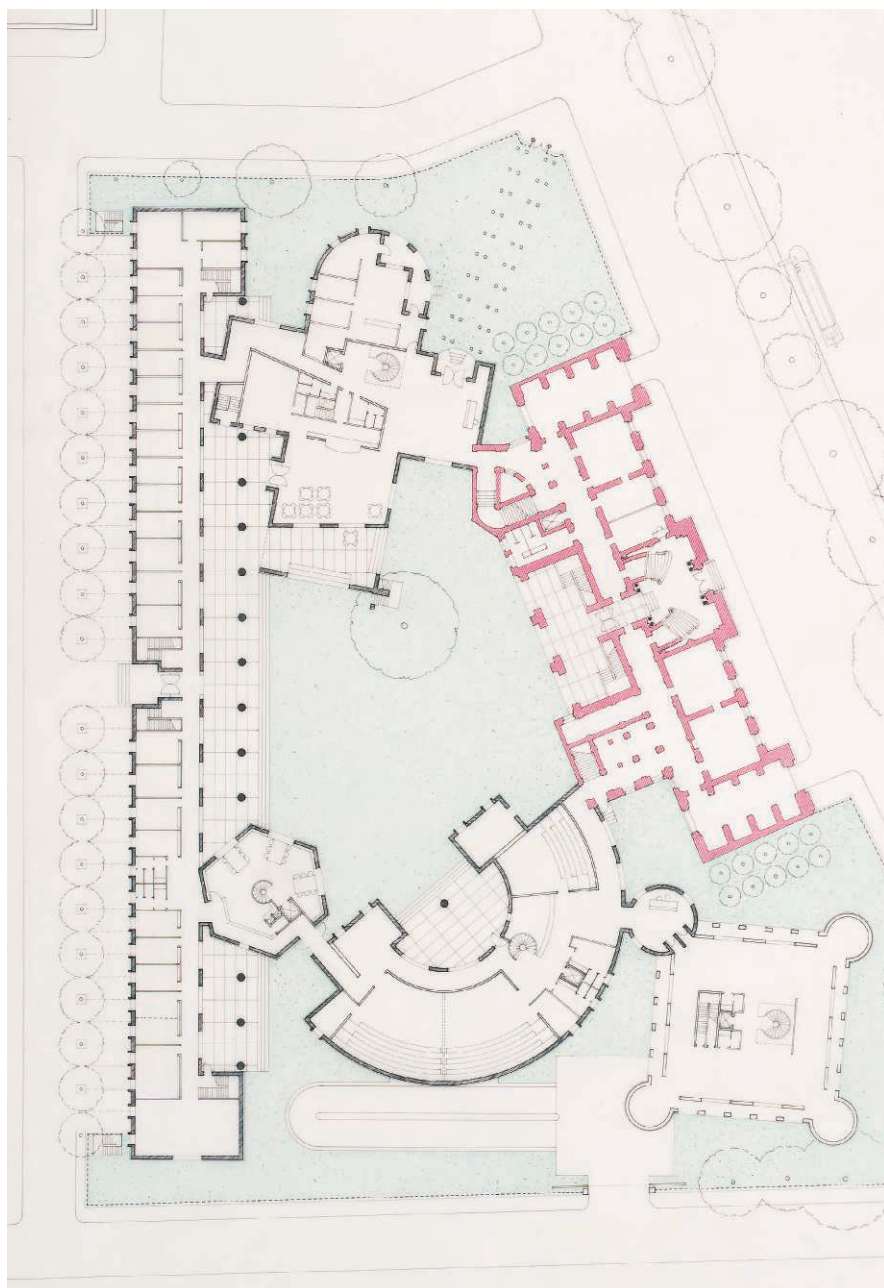
Science Library, University  
of California at Irvine

1986–98

No. 1 Poultry, London



1986–2002

Braun AG Headquarters  
Expansion, Melsungen,  
Germany, with  
Walter Nageli

11. WISSENSCHAFTSZENTRUM, BERLIN: SITE PLAN. IN PLAN, THE SCIENCE CENTER'S PAVILIONS CORRESPOND TO HISTORIC BUILDING TYPES SUCH AS A MEDIEVAL CASTLE AND ROMAN THEATER.

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WITH FIBER CEMENT  
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Carlisle	Feeney Architectural Products	Marvin Windows and Doors	Quality Edge Building Products	Trespa
CertainTeed	Fypon	Master Lock	Rheem Water Heating	USG
Contact Industries	Grohe	MonierLifetile	S-5!	VT Industries
CREE	Hardwood Council	MTI Whirlpools	Sherwin-Williams	Weather Shield Windows and Doors
Delta Faucets	Insight Lighting	Nichiha USA, Inc.	Sika Sarnafil	White River Hardwoods
DORMA	invelope	PEERLESS	Simpson Door Company	Wolf
Duradek	James Hardie	Pella		Woodharbor Doors & Cabinetry
	Kleer	Plastpro Inc.		

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# → BUILDING

① 2 3



TEXT BY KATIE GERFEN  
PHOTOS BY BRIAN ROSE  
(EXCEPT WHERE NOTED)

## TRENTON BATH HOUSE AND DAY CAMP RESTORATION

EWING TOWNSHIP, N.J.  
FAREWELL MILLS GATSCH ARCHITECTS

**THE PRESERVATION OF MIDCENTURY MODERNISM** has been a heated topic of discussion since the 1980s. Hampered by their relative youth and therefore by the impossibility of obtaining landmark status, many midcentury buildings have been lost, torn down to make room for new developments and new aesthetics. When the decision is made to actually restore a midcentury modern project, the question arises: To what preservation standards do you hold the restoration of a building with materials not all that different from today's? In the case of Louis Kahn's iconic Trenton Bath House, Princeton, N.J.-based Farewell Mills Gatsch Architects (FMG) answered without hesitation: the highest.

Kahn designed the facility, a pool, and a day camp in 1952 for the Jewish Community Center (JCC) of Ewing Township, four miles outside of Trenton, N.J. The bath house itself makes a Greek cross in plan, with four cubic pavilions (an entrance, men's and women's changing rooms, and clothes storage) each flanking one side of a square courtyard. The pavilions' walls were constructed of unfinished CMUs, with a pyramidal, timber-framed roof floating over each. Kahn's less-well-known pavilions for the day camp, slightly north and to the west on the site, were influenced by classical temple plans, with two open and two semi-enclosed structures. Here, Kahn used terra-cotta sewer pipe filled with concrete to form supports for precast deck roofs.

Fast-forward 50 years, and the structures were in "pretty rough shape," says FMG preservation partner Michael





Mills. “That had to do with the materials that were used, and the fact that some of the construction details were a little less than you would hope for.” But part of the problem, he says, “had to do with the poetry of the building. Kahn intended the water to run over the masonry surfaces. Unfortunately, in New Jersey with freeze and thaw, it also had a bad effect.”

Two of the day camp pavilions were on the verge of collapse, and the JCC wanted to tear them down entirely. But they were dissuaded by the county and others. The JCC retained FMG, with grants from the New Jersey Historic Trust, to conduct a preservation study—a job that both Mills and design partner Michael Farewell leapt at; both had visited the center as architecture students.

During the course of the study, it became clear that repairs were going to be costly, so the JCC decided to sell the property. Which is when Mercer County—which has supported several preservation projects within its borders—stepped in. “We knew we had an opportunity for open space, and we knew we had important architecture in the building,” says Mercer County executive Brian Hughes. The county bought the property from the JCC and transferred ownership to Ewing Township. With further grants, this time for capital improvements, FMG was hired to reevaluate the plan and to proceed with the restoration.

By this point, the floor slabs and several walls of the bath house were heaved and cracked. And there was the question of what to do about a snack stand that had been added unsympathetically to the west side of the bath house shortly after its opening in 1955. FMG tore down the snack stand, repaired the walls using authentic concrete block (see toolbox, page 69), repoured the floor slabs, and shored up the roof structure (“which was in remarkably good condition,” Mills says).

FMG retained Kahn’s original structural engineer, Nicholas Gianopulos, as a consultant, and used his firm on the project. At the beginning of the process, when things looked bleak, Mills recalls him saying, “Louis would understand if you had to take them down and rebuild them, or did something different.” The intention was to save everything if at all possible, but Mills recalls that “it was very helpful to hear that. We ended up in the middle—trying to do something longer-lasting that would help preserve the design.”

FMG created a new snack bar in a vocabulary related to Kahn’s and on the same grid. Farewell, who takes pride in the firm being able to “relate new architecture to existing architecture,” is quick to point out that the new construction is “deferential, because the real iconic monument here is Kahn’s work.”

The bath house and day camp are open again, but FMG already has its sights set on the next step: the parking lot. Kahn drew up plans for a bosque of trees that would both reinforce the geometries of the site and determine view lines, but his vision for the landscape was never realized, and parking was installed instead. FMG has developed an implementation plan, currently under review, to replace the existing paved plot. Here’s hoping that last step doesn’t take another 50 years.



Bath House circa 1955



Bath House circa February 2010

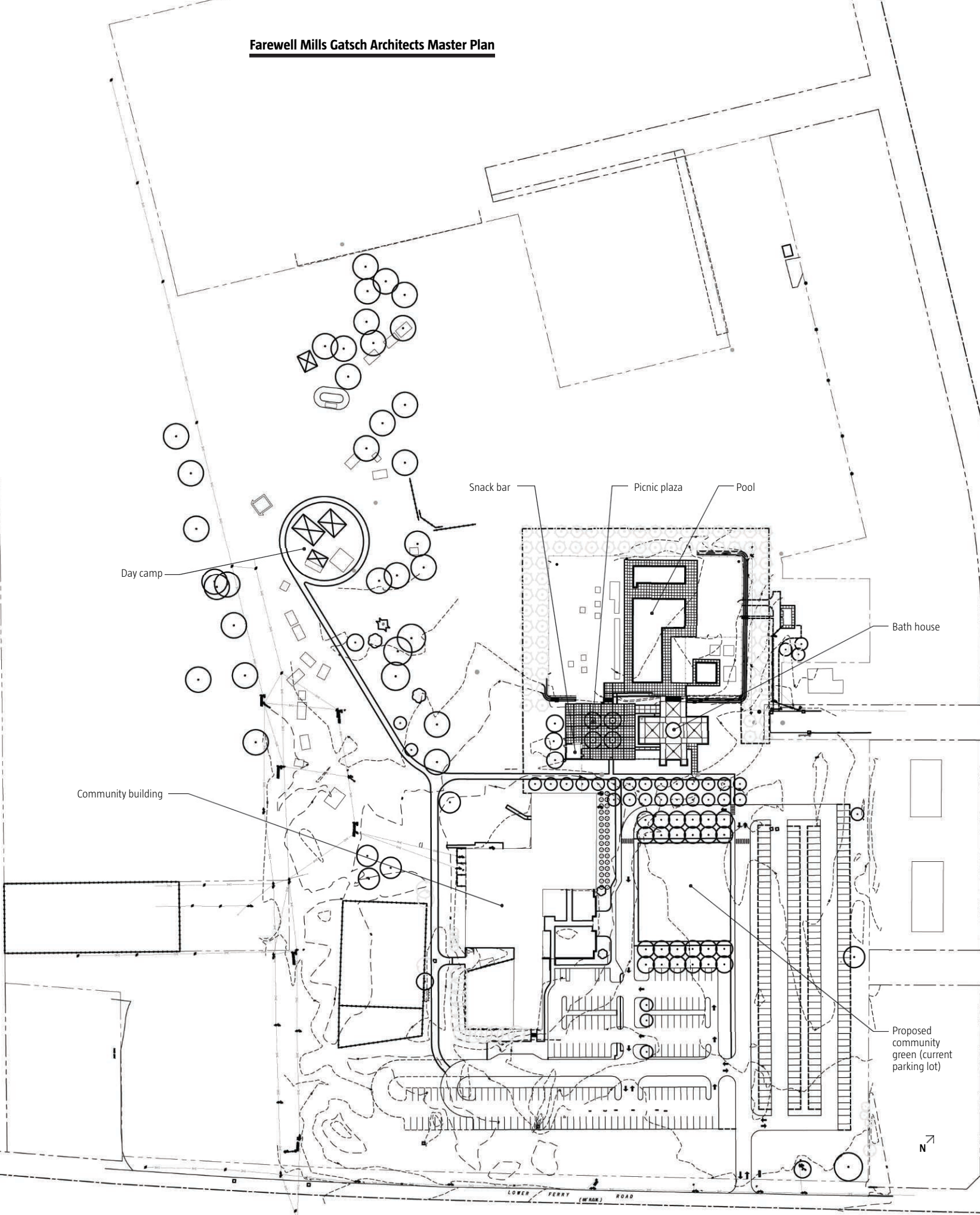




When the bath house was completed in 1955, the central plaza around which the four-pavilion complex is oriented was inscribed with an inset circle, filled with gravel. Meant to mimic a fountain, at least in prominence, and to serve as a focal point for the complex, the circle was filled in with concrete over time to comply with ADA codes for universal access. The circle was not the only thing to change over the half century. Large cracks formed in some of the concrete walls, especially at the points directly under the drip line of the roof. The concrete block discolored, and the floor slabs heaved and buckled over time.

TOP PHOTO COURTESY LOUIS I. KAHN COLLECTION, UNIVERSITY OF PENNSYLVANIA AND THE PENNSYLVANIA HISTORICAL MUSEUM COMMISSION

**Farewell Mills Gatsch Architects Master Plan**



Day camp

Snack bar

Picnic plaza

Pool

Bath house

Community building

Proposed community green (current parking lot)

LOWER FERRY ROAD (W. HAN) ROAD

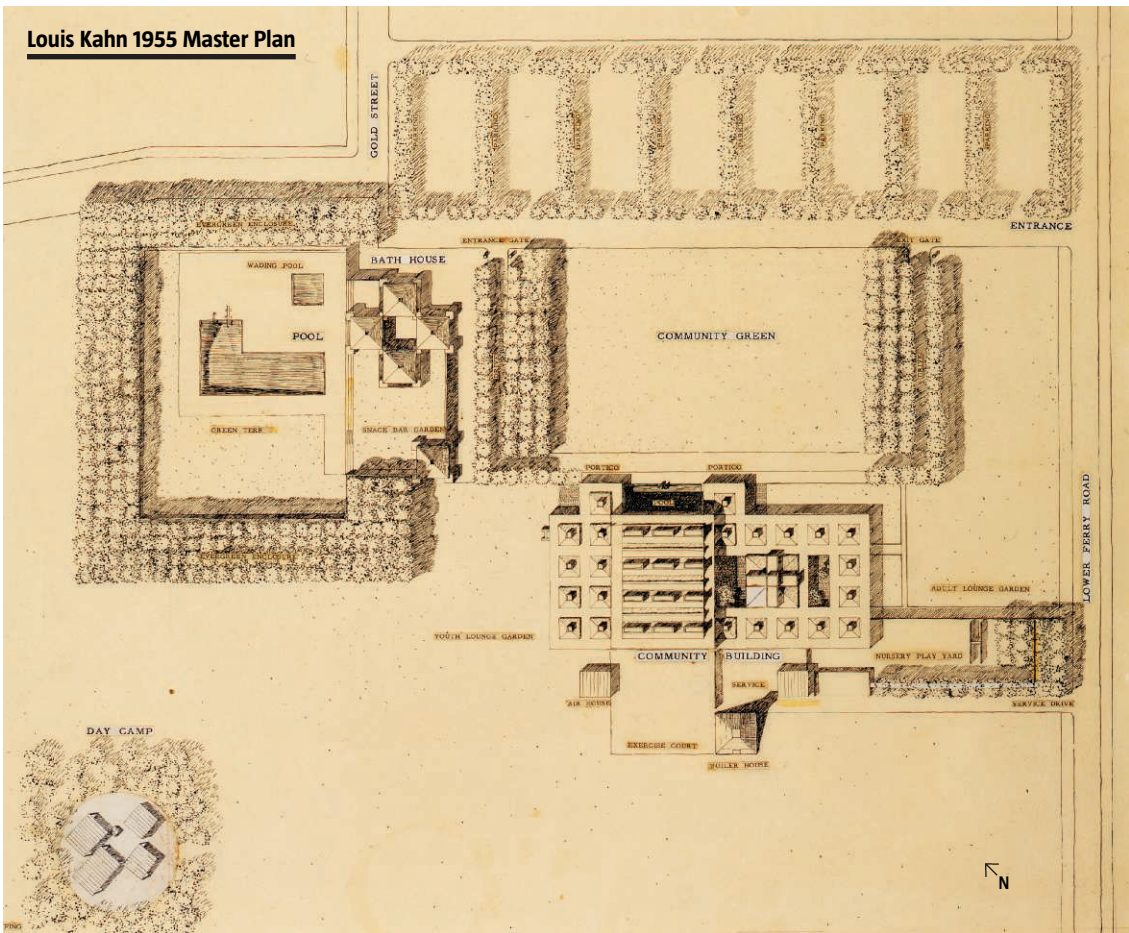
N

The full design team, which included Farewell Mills Gatsch (FMG) and Heritage Landscapes, carefully studied Kahn's 1955 plan (left) for the bath house, pool, and day camp, as well as an extensive landscape scheme that was never completed.

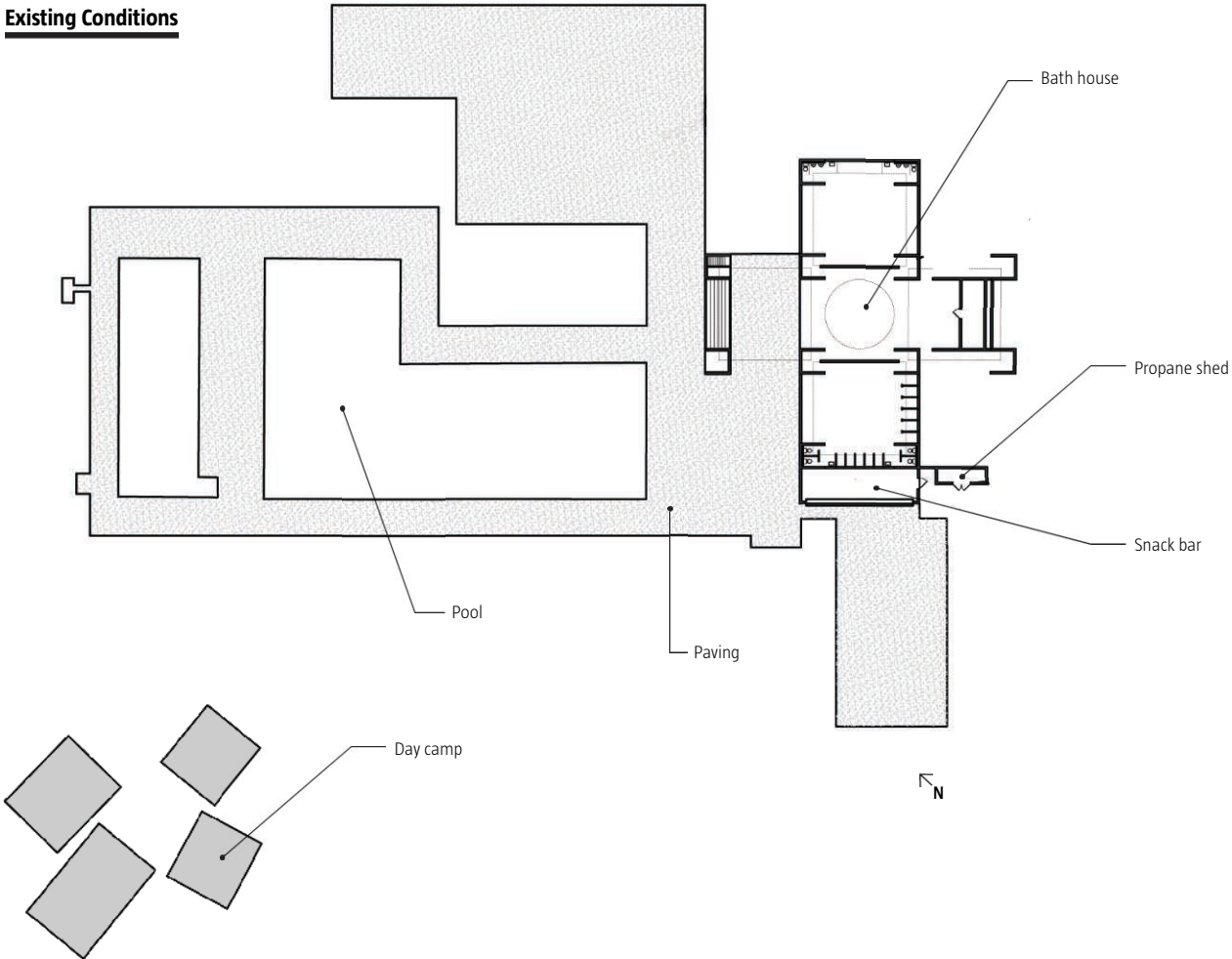
When FMG studied the existing campus (below left), they learned about many changes that had occurred over time: Two day camp pavilions were nearing collapse, and a snack bar and propane shack had been tacked onto the side of the western bath house pavilion.

FMG's final restoration plan (opposite) called for the rehabilitation of Kahn's structures and the removal of the myriad small interventions on the site. Work on the buildings themselves is complete, but the landscape plan is still under consideration.

COURTESY LOUIS I. KAHN COLLECTION, UNIVERSITY OF PENNSYLVANIA AND THE PENNSYLVANIA HISTORICAL MUSEUM COMMISSION



**Existing Conditions**



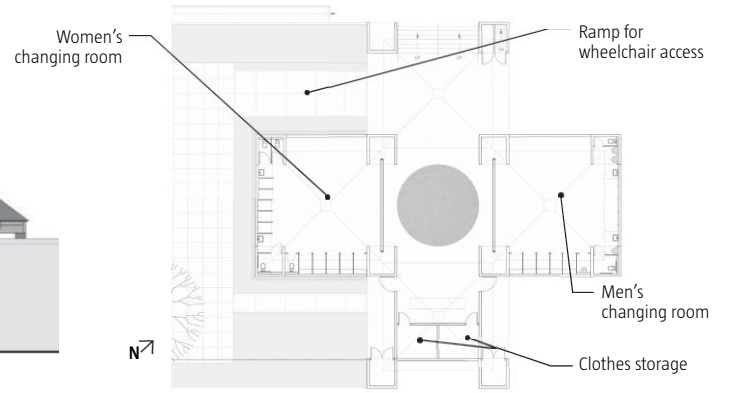
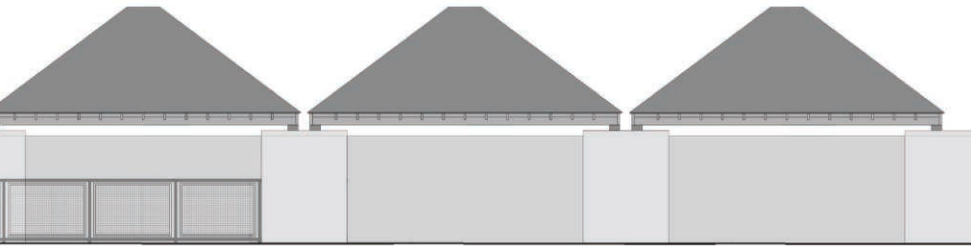
As part of its restoration plan, FMG removed a ramshackle snack bar and replaced it with a new one more sympathetic to Kahn's aesthetic. Located along what was Kahn's planned-but-never-built perimeter wall for the complex, this new pavilion sits within the grid established by the bath house. "The idea is not to in any way upstage it [the bath house] or call undue attention to the new piece," says FMG design partner Michael Farewell.

The design for the new snack pavilion was the result of an in-house competition at FMG. Built of concrete block, the structure is the physical inverse of Kahn's bath house pavilions: The butterfly roof form resembles Kahn's pyramidal roof, but flipped upside down. The clerestories are there, but instead of being open to the elements, they are enclosed in glass. And instead of being completely monolithic, the side where food is served is permeated by windows.



Restored Bath House

### Restored Bath House Floor Plan



## Restored Bath House

Now completed, the central courtyard of the bath house features both cleaned and new concrete block, and a darker exposed-aggregate concrete in place of the formerly inset gravel circle (right). The roofs were restored to their original dark tab shingles. The partitions and plumbing were updated to current standards, while trying to stay as close to Kahn's plan as feasible (below left). And the day camp pavilions (below right) were restored or rebuilt according to Kahn's plan, with some structural improvements.

---

**Project Credits**

**Project** The Trenton Bath House and Day Camp, Ewing Township, N.J.

**Client** Ewing Township, N.J.; Mercer County, N.J.

**Architect** Farewell Mills Gatsch Architects, Princeton, N.J.—Michael J. Mills (preservation partner); Michael Farewell (design partner); Anne E. Weber (project manager); Paul P. Buda, Andrew P. Burian (project architects); Meredith Arms Bzdak (architectural historian); Christa J. Gaffigan (preservation architect); Heli Ojamaa, Denim Weaver (architectural interns)

**Mechanical Engineer** Joseph R. Loring & Associates

**Structural Engineer** Keast & Hood Co.

**Electrical Engineer** Joseph R. Loring & Associates

**Civil Engineer** RBA Group

**General Contractor** Wu & Associates (bath house and day camp); De Sapia Construction (snack bar)

**Landscape Architect** Heritage Landscapes

**Size** Existing 32,980 square feet (restoration); 8,565 square feet (new construction)

**Cost** \$1,598,936 (restoration contract); \$552,213 (new design)

---

**Materials and Sources**

**Coatings** Andek Corp. [andek.com](http://andek.com); Minwax Co. [minwax.com](http://minwax.com); Dow Corning [dowcorning.com](http://dowcorning.com)

**Concrete** Mid-State Filigree Systems [filigreeinc.com](http://filigreeinc.com)

**Glass** Velux [veluxusa.com](http://veluxusa.com)

**Lighting** Kenall Manufacturing Co. [kenall.com](http://kenall.com); Bega [bega-us.com](http://bega-us.com);

Kirlin Co. [kirlinlighting.com](http://kirlinlighting.com);

Devine Lighting [devine-ltg.com](http://devine-ltg.com);

Emergi-Lite [emergi-lite.com](http://emergi-lite.com)

**Masonry** Waylite block

**Metal** J.S. Welding [jsweldingllc.com](http://jsweldingllc.com)

**Paints** Sherwin-Williams

[sherwin-williams.com](http://sherwin-williams.com)

**Roofing** Versico [versico.com](http://versico.com);

GAF Materials Corp. [gaf.com](http://gaf.com)

**Structural System** Mid-State Filigree Systems [filigreeinc.com](http://filigreeinc.com)

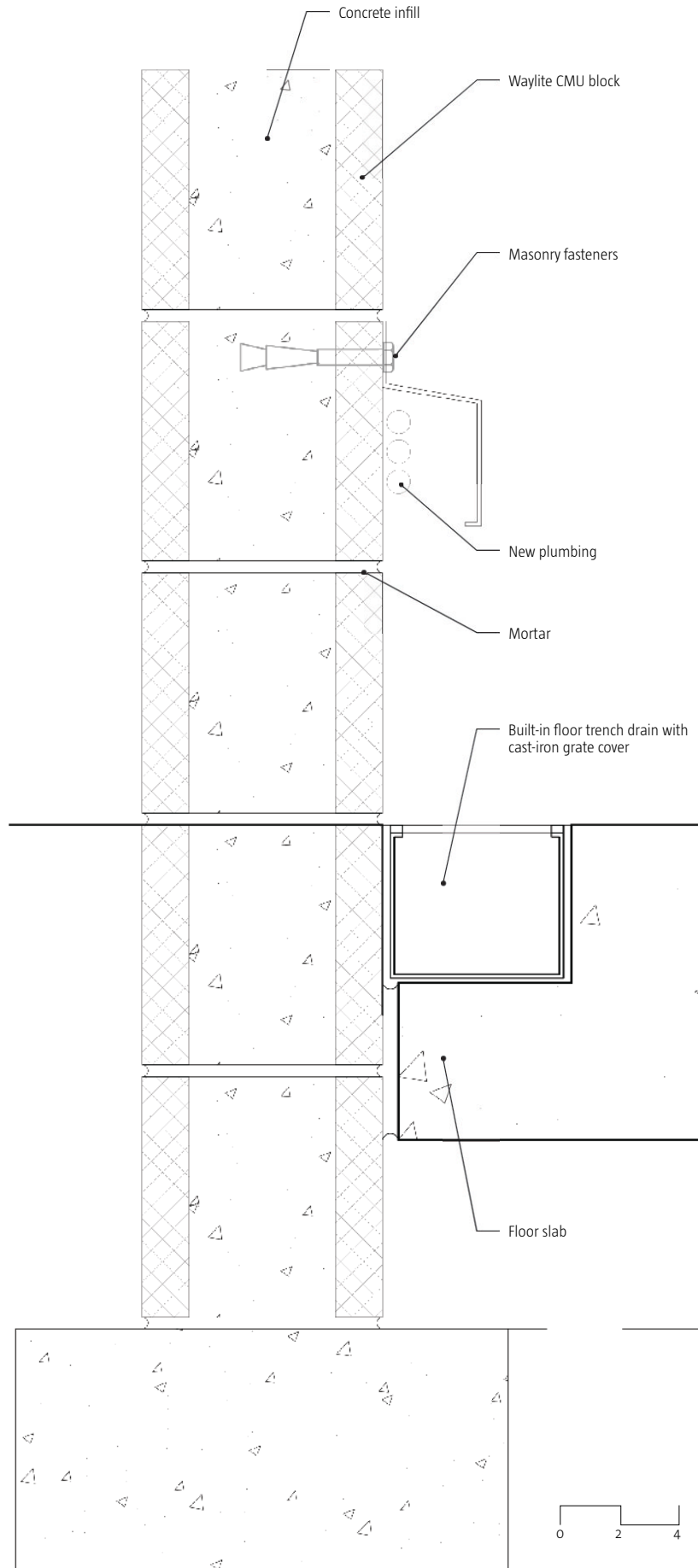
**Windows, Curtain Walls, Doors**

Kawneer [kawneer.com](http://kawneer.com)





## Bath House Wall Section



## TOOLBOX

### Concrete Block

When asked about the process of choosing concrete block for the restoration, FMG preservation partner Michael Mills laughingly calls it “Boring. Very boring.” But dig a little deeper, and he describes a compelling tale of material science. “It was a process of trial and error,” he says. “And we tried everything.”

While all of the walls of the bath house were still standing, the walls separating the men’s and women’s dressing rooms needed to be replaced, and large cracks had formed in others after years of exposure to water and freeze-thaw cycles. The broken blocks could be removed and replaced, but CMUs have come a long way, and the materials commonly used today were not a good substitute. Kahn’s original specifications yielded the texture and color, but the aggregate remained elusive. Conservation analysis identified crushed stone from the Delaware River and the presence of sand from southern New Jersey.

The team’s first thought: Alter modern CMUs to achieve the appearance of the original. In testing, two rounds of samples made using sandblasting and power-washing techniques approximated the texture, but it was unclear how the new blocks would weather.

In his notes, Kahn described the original blocks as “Waylite” blocks, a form of CMU introduced in the 1930s. “It’s a low-strength block,” Mills says. “It’s only a 3,000 psi block, whereas most modern block is 5,000 psi.” The architects found a manufacturer still producing Waylite blocks in New Jersey, and the texture of the block itself required little tweaking. The color, however, was another matter. Twelve samples were produced before the right color was achieved: a warm tan with blue and light orange aggregate. “We have all the samples,” Mills says. “I think the county’s going to keep them to show how difficult it was to match.”

Once the new block was installed, the masons filled in the voids in the block and added a thin mortar wash to seal the entire assembly. Then they added a thermoplastic resin to inhibit water intrusion, which will hopefully stave off the next restoration by a bit longer than 50 years.

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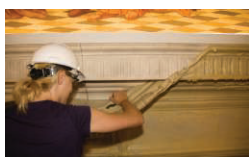




TEXT BY SARA HART

# MORGAN LIBRARY & MUSEUM MCKIM BUILDING

NEW YORK  
BEYER BLINDER BELLE ARCHITECTS & PLANNERS



The rotunda is composed of marbles in various shades, which appeared dingy after accumulating 100 years of dirt and grime (top) and were obscured by dim lighting and weakly filtered daylight. "Originally, natural light entered the rotunda through the skylight," explains Beyer Blinder Belle project architect Cleary Larkin. "For curatorial reasons, we closed it off from daylight and added a new lens and electric light source to a roof-mounted enclosure." The marble surfaces were cleaned (above)—though one patch was left dingy to highlight the difference. These improvements, combined with the new simulated daylight and retrofitted fixtures, allow visitors to fully appreciate the rotunda's mosaic panels and lapis lazuli columns (opposite).

**EVEN IN A CITY** chock-full of world-class cultural institutions, the Morgan Library & Museum stands out as an encyclopedic repository of art and artifacts. Its core holdings were amassed by financier John Pierpont Morgan, who collected so many manuscripts, old master drawings, and early printed books that in 1902, construction began on a private library designed by Charles Follen McKim of McKim, Mead & White. In 1924, Morgan's son turned the collection into a public museum that has expanded steadily over the decades, with several additions to accommodate the ever-growing holdings.

The Morgan's quiet evolution got noisy in 2006, with the unveiling of a 75,000-square-foot expansion designed by Renzo Piano, in collaboration with Beyer Blinder Belle Architects & Planners (BBB). Three new pavilions rendered in steel and glass integrate the Morgan's three existing landmark buildings. But as the applause died down, the museum eyed McKim's Italianate marble palazzo: "Mr. Morgan's Library" had not benefited from a full interior restoration in its 100-year existence.

Construction began in June (after two years of meticulous planning) on the rotunda, library, study, and librarian's office. The project included a new lighting strategy; restoration of period furniture, fixtures, applied ornamentation, and murals; new casework for revolving exhibitions; and electrical and mechanical upgrades.

BBB helped determine the scope of work and the process for implementation. The firm's oversight and

design role were key to getting the project reviewed by the city's Landmarks Preservation Commission. Structural intervention was limited to the rotunda's oculus, but BBB also oversaw the reinstallation of original chandeliers, which had been in storage for decades.

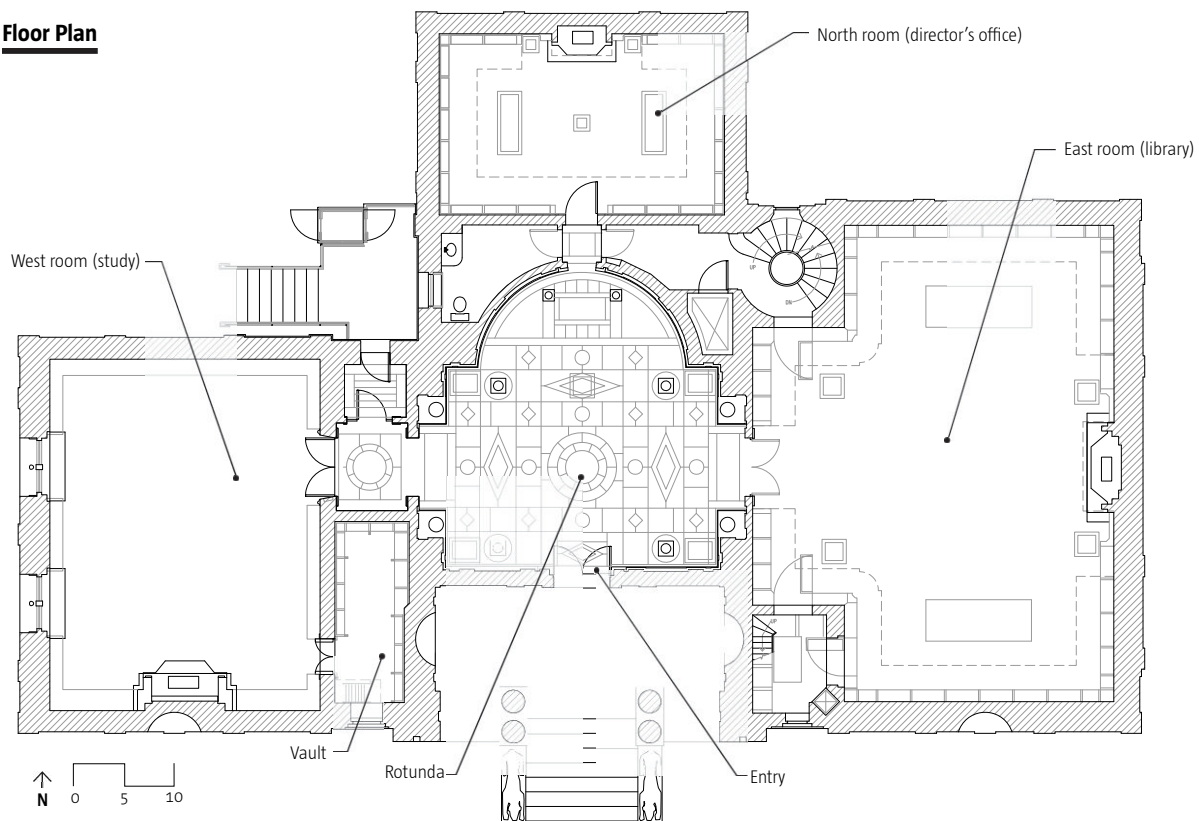
One thing those chandeliers didn't need was a retrofit from gas to electric power. Morgan was a patron of Thomas Edison and an early adopter of electric lighting; his home and library used the then-new technology. So it is only fitting that lighting was critical to the centennial restoration. "The goal was to dramatize the architectural features and artwork without being theatrical," explains museum deputy director Brian Regan. "We were intent on creating a nuanced visual experience in which the artifacts resonate."

Designed by the Renfro Design Group, a local lighting design firm with specialized knowledge in restoration projects for museums and libraries, the scheme uses incandescents, fiber optics, halogens, fluorescents, and LEDs. Radiosity and ray-tracing techniques were used to calculate and diagram various scenarios, but in the end, physical mock-ups were key to selecting the best solution. Sections of rooms were evaluated with input from the curators, who paid special attention to materials vulnerable to high levels of damaging rays.

Now complete, the restoration showcases the original craftsmanship: details lost to grime and shadow again appear in sharp relief. Mr. Morgan would be pleased.



**Floor Plan**





In the West room, which served as J.P. Morgan's private study, time had taken its toll, fading the red wallcoverings and furniture and dulling the finishes (right top and bottom). Restoration work included cleaning the surface ornamentation (including restoration work on the wallpaper) and a new lighting strategy. New bases were created for some of the sculptures, the books in the perimeter cases were removed and cleaned (top), and art was carefully returned to its original location on the walls after work was completed (above). The result (opposite) is a much softer lighting scheme, which allows the again-vibrant reds to glow in the space.



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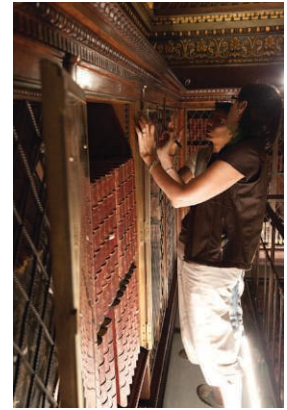
**Project Credits**

**Project** Morgan Library & Museum  
McKim Building, New York  
**Client** Morgan Library & Museum—  
William M. Griswold (director); Brian  
Regan (deputy director); Jennifer  
Tonkovich (curator, drawings and  
prints); Thomas Shannon (director of  
facilities)  
**Architect** Beyer Blinder Belle Architects  
& Planners—Frank Prial, Cleary Larkin  
**Structural Engineer** Robert Silman  
Associates  
**Electrical Engineer** JFK&M Consulting  
Group  
**Electrical Contractor** E-J Electric  
Installation Co.  
**Lighting Designer** Richard Renfro,  
Renfro Design Group  
**Exhibition Designer** Stephen Saitas,  
Stephen Saitas Designs  
**Size** 14,700 square feet  
**Cost** \$4.5 million

**Materials and Sources**

**Carpet** Nazmiyal nazmiyalantiquerugs  
.com; Costikyan costikyan.com  
**Ceilings** Rustin Levenson Art  
Conservation Associates (North room  
ceiling restoration) artcarenyc.com  
**Exhibition Cases** Case[werks]  
casewerks.com  
**Flooring** Haywood Berk Floor Co.  
haywoodberk.com  
**Furniture** Judy Cormier Interiors  
(restoration) judycormier.com  
**Glass** Grewe Plastics greweco.com  
**Lighting Control Systems** Lutron  
Electronics Co. lutron.com  
**Lighting** Visual Lighting Technologies  
(LED) visual-lighting.com; The Lighting  
Quotient (Elliptipar fluorescent fixtures)  
thelightingquotient.com; Edison Price  
Lighting epl.com; Nulux nulux.com  
**Lighting Fixture Restoration** Aurora  
Lampworks auroralampworks.com  
**Masonry and Stone** Integrated  
Conservation Resources icri-icc.com;  
Remco Maintenance myremco.com;  
Platinum Maintenance platinum  
maintenance.com  
**Metal** Competition Architectural  
Metals; Les Métalliers Champenois  
l-m-c.com  
**Plumbing and Water System** American  
Contracting  
**Roofing** Patti Roofing pattiroofing.com  
**Windows, Curtainwalls, Doors** Merrick  
Industries (doors)





An outdated lighting system combined with reflective acrylic panels in the bookcases made the East room, or library, seem dim, and did not show off the massive collection of rare volumes (top left). Each case was cleaned and the existing acrylic panels were swapped for a new nonreflective acrylic material (top). The cases were then shrouded in plastic to protect the collection as the floor, ceilings, and other surfaces were restored (above). Over the entry door, the team restored and reinstalled the original chandelier (which had been in storage since the 1940s), and they laid a newly acquired antique carpet, similar to what would have been in place originally (left). New custom casework was installed to showcase individual volumes on the ground level, and a new lighting system (which more evenly distributed light throughout the space) was installed to highlight the artwork and now more-visible shelved volumes (opposite).

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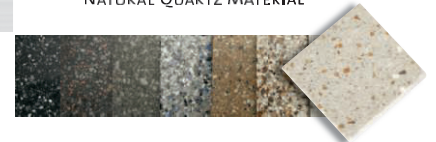


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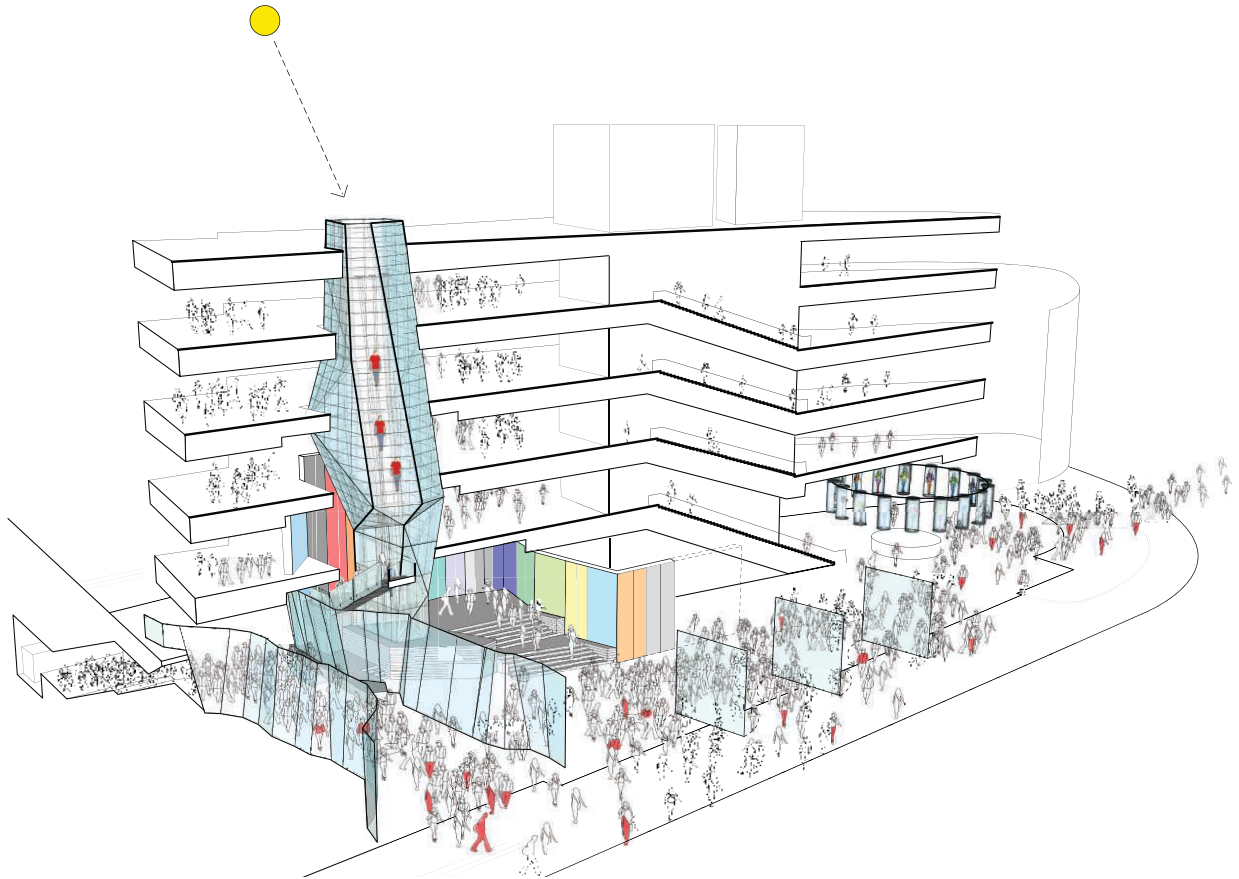


# UNIQLO SHANGHAI FLAGSHIP STORE

SHANGHAI, CHINA  
BOHLIN CYWINSKI JACKSON

TEXT BY MIMI ZEIGER  
PHOTOS BY NIC LEHOUX

## Section Diagram



Inside the “shard”—the atrium that connects all five floors of retail space—mannequins, dressed by company stylists, fly up and down on theatrical rigging designed by Louisville, Ky.-based “flying effects” company ZFX. “We wanted to draw on the shoppers’ innate sense of discovery as you move through the store,” explains Bohlin Cywinski Jackson principal-in-charge Robert Miller.

**ON ITS OPENING** day in May, some 75,000 people passed through the oversized glass doors of the Uniqlo flagship store in Shanghai, filling every inch of the 38,751-square-foot emporium. Booming Shanghai has a population of over 19 million, so architects Bohlin Cywinski Jackson (BCJ), while not expecting quite such a turnout, knew the store would be busy. And for principal Peter Bohlin, despite all the complexities to consider in the design—including an unforgiving project schedule of three months from start to finish—the locals drove the scheme. Bohlin, known for engaging retail environments, wanted to create a sense of activity and wonder for shoppers.

When the architects first arrived at the site, wonder was in short supply. The location was good—an intersection at the edge of Shanghai’s main shopping district. But the vibe was strictly negative when it came to the shabby, vacant shell of an office building on the site, which the architects had no choice but to reuse.

BCJ partnered with Shanghai-based Jiang’s Architects & Engineers, the building’s original designers, to get a handle on its tectonics. Code negotiations, on the other hand, proved thorny, and the woolliest regulations governed the building envelope. BCJ wanted to unify the façade—a jumble of openings and setbacks—but city officials kept reducing the space with which they had to work. The architects were left a zone less than 1 foot deep in which to construct a new skin.

Ultimately, the architects transformed the exterior by wrapping it with a shallow light box. Fluorescent fixtures backlight a metal skin, which is perforated in a pattern that resembles draped fabric. “Our goal was to create

an icon,” explains BCJ principal-in-charge Robert Miller. “We masked the structure with a translucent veil slipped over the existing façade. It didn’t change the thermal envelope, and we got an even glow across the skin of the building.”

Conditions provided challenges, but also creative opportunities: The top of a ramp leading to below-grade parking projected into the ground-floor shopping area, so BCJ integrated it into a topographic stairway leading to the upper levels. And rather than disguise a subway entrance hidden at the rear of the building, the architects opened up the station corridor with a glass wall, allowing commuters to see into the dramatic Uniqlo atrium.

“We asked ourselves, ‘How do you get people to go upstairs?’” says Bohlin of the five-story store. “In my early years I did a good deal of cave exploring—spelunking—and for a young architect it was an object lesson: I learned about titillation and about how to draw people into a space.” Bohlin’s cave analogy is closer to the truth than you might expect: A 67-foot-tall atrium, called “the shard,” sculpturally cuts through the floor plates of the existing structure, bringing in daylight and luring people upstairs. Its geometry is not unlike Bohlin’s cave, but made out of steel gravity tubes and glass panels.

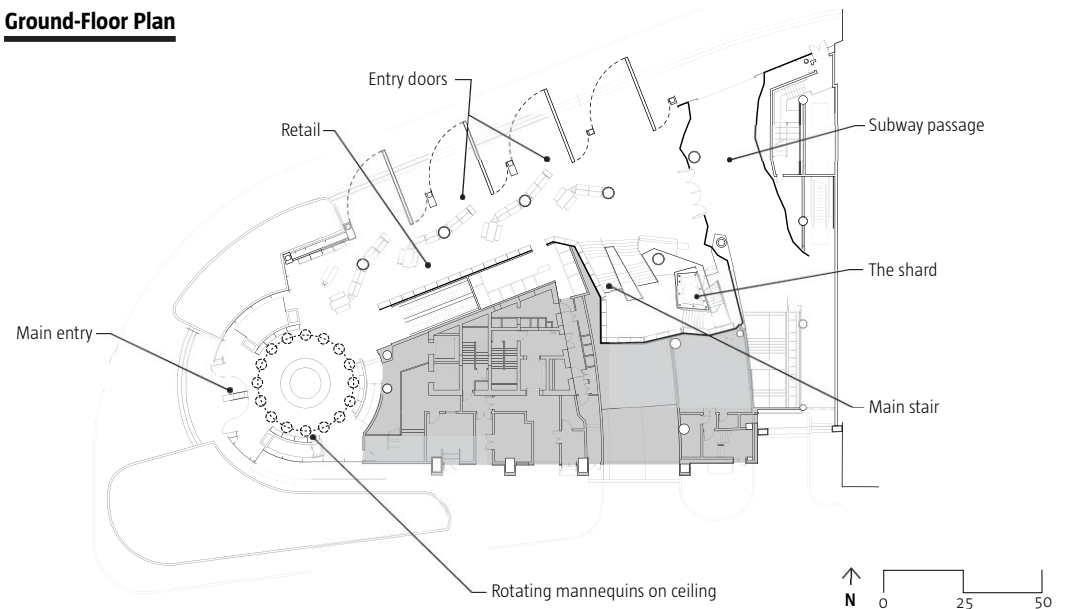
On the ground floor, mannequins—in futuristic acrylic capsules that move along a circular track—ring the bull-nosed front of the store. Robotic lighting tracks both the mannequins and customers, putting everyone on display. Ultimately, in a space packed with as many challenges as the shelves are with colorful products, the architects orchestrated a playful experience.





Uniqlo is known for making clothing in a whole spectrum of colors, so the inventory in the store actually becomes part of the design. Here, in the bull-nosed portion of the ground-floor retail space, shoppers are enticed by mannequins in capsules that rotate overhead on a track mounted on the ceiling. Throughout the store, mannequins showcasing the brand's wares are mounted near ceiling height—on ledges ringing the structural columns or on top of shelving—so that customers can see the clothes even from inside a throng of other shoppers.

### Ground-Floor Plan





#### Project Credits

**Project** Uniqlo Shanghai

**Client** Fast Retailing (Parent Company of Uniqlo)

**Architect** Bohlin Cywinski Jackson—Peter Q. Bohlin (principal for design); Robert Miller (principal-in-charge); Chris Evans (project manager); Mark Adams, Campie Ellis, Nguyen Ha, Michael Hatcher, Nick Hons, Matt Wittman

**Local Architect of Record** Jiang's Architects & Engineers

**General Contractor** Tanseisha Co.

**Lighting Designer** Candela

**Local Structural Engineer** Jiang's Architects & Engineers

**Consultant** PCS Structural Solutions

**Façade Consultant** Axis Façades

**Rotating and Flying Mannequin Consultant** ZFX

**Translator** Turid Gronning

**Size** 38,751 square feet

**Cost** Withheld

#### Materials and Sources

**Casework** Tanseisha Co.

[www.tanseisha.co.jp/en/company](http://www.tanseisha.co.jp/en/company)

**Lighting Fixtures** Koizumi Lighting

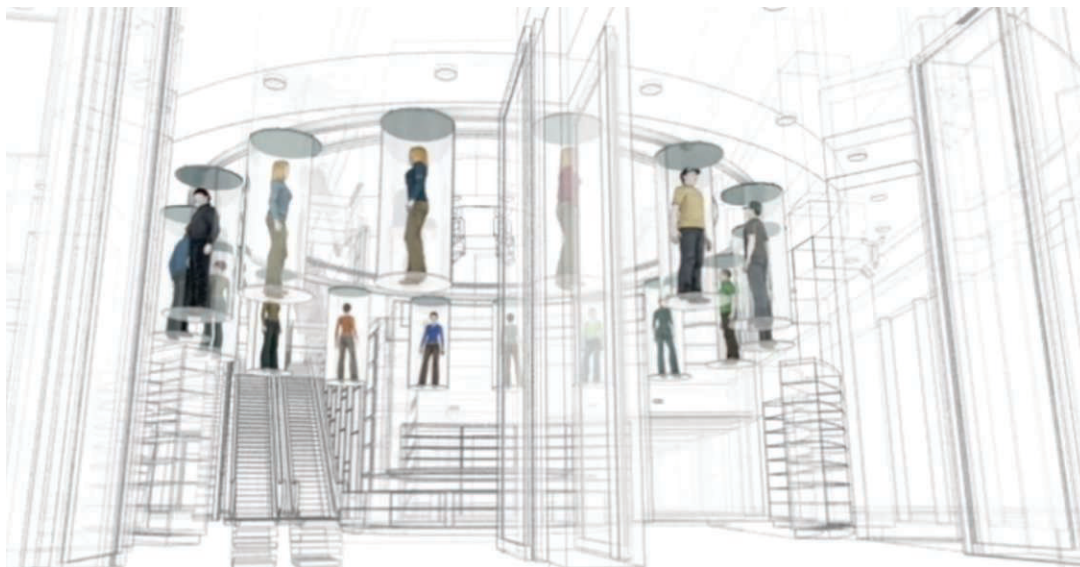
[Technology Corp. koizumi-lt.co.jp/](http://Technology Corp. koizumi-lt.co.jp/)

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**Mannequin Equipment** ZFX

[zfxflying.com](http://zfxflying.com)

#### Rotating Mannequin Diagram



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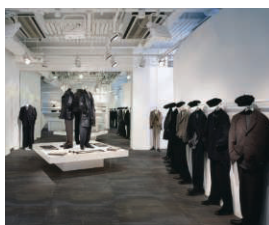
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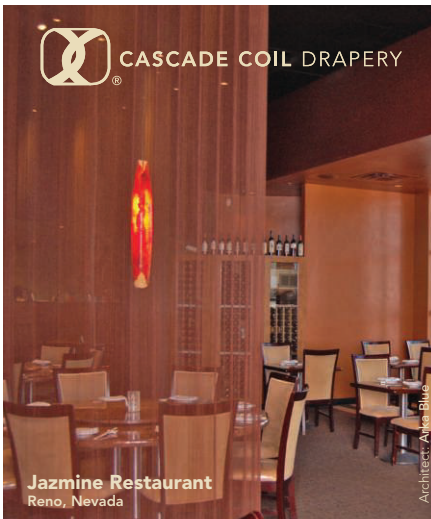


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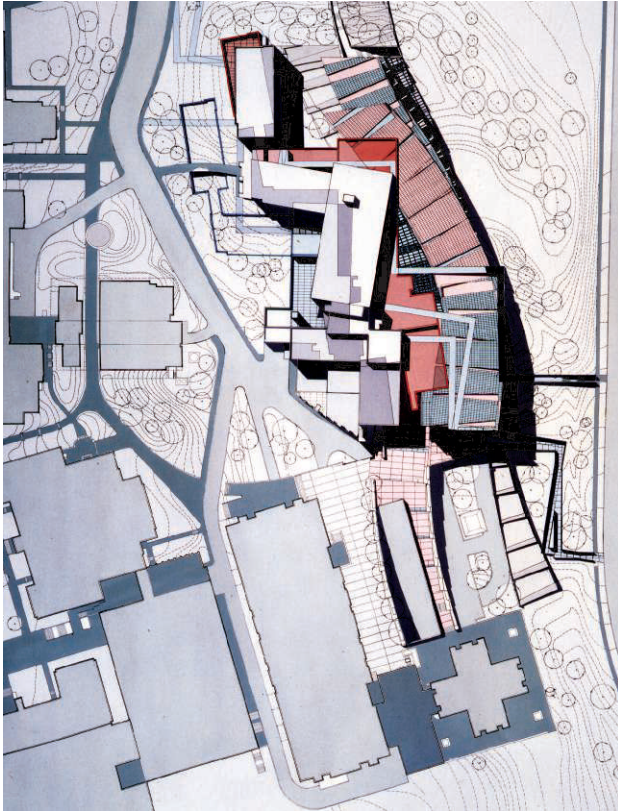
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TEXT BY THOMAS FISHER

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Nor has the building fared well since its completion in 1996. A recent article in *The Chronicle of Higher Education* recounts why the building's EIFS cladding (chosen over the original tile finish for budget reasons) already needs replacement. Post-occupancy evaluations of the building have also revealed significant lighting,

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Nevertheless, the building stands as a landmark in design and construction technology. Over the project's seven-year gestation, computer-aided-design software shifted from being a drawing to a form-making tool, enabling architects to create (and engineers to calculate) far more complicated structures than ever before. And the building's complex spaces demanded that the contractors use lasers to locate points in the middle of the volume, a technique that has since become common in construction.

Eisenman will long be remembered for his contributions to architectural theory. But his long-term contribution to architecture may rest less with the forms of his buildings and more with the methods developed to make those forms. Deconstruction, it turns out, may have been about construction after all. □



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