

The Architect's Newspaper

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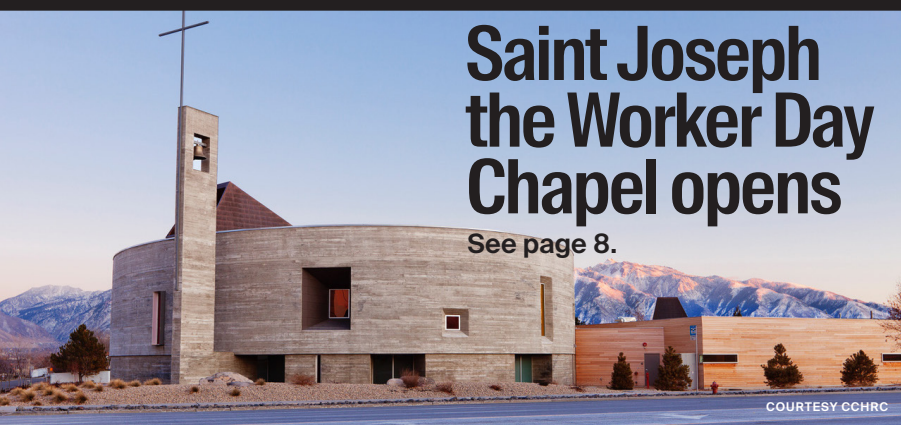
Art on the Range

Tippet Rise continues to bring art and music to south-central Montana.



There is nothing unintentional about Tippet Rise Art Center in Fishtail, Montana. Spread out over 12,000 acres of pastures in the foothills of the Beartooth Mountains, the venue is the brainchild of philanthropists and art collectors Cathy and Peter Halstead. The center is home to a handful of monumental art pieces, whose placement and approaches are carefully curated and calibrated to fit the site, with some pieces visible from vast distances and others seemingly hiding, nestled into small canyons. With a world-class concert hall and a growing collection of architectural pavilions, the

campus is a cultural tour de force in an unexpected but sublime place. While the Halsteads often point to the influence of New York's 500-acre Storm King Art Center on their decision to found Tippet Rise, their vision goes beyond a conventional outdoor art venue. For the past four years the center has played host to renowned musicians from around the world; the resulting concert series is open to the public at a nominal cost, with wildly popular tickets available through a lottery. For composers, the property provides a dramatic backdrop **continued on page 12**



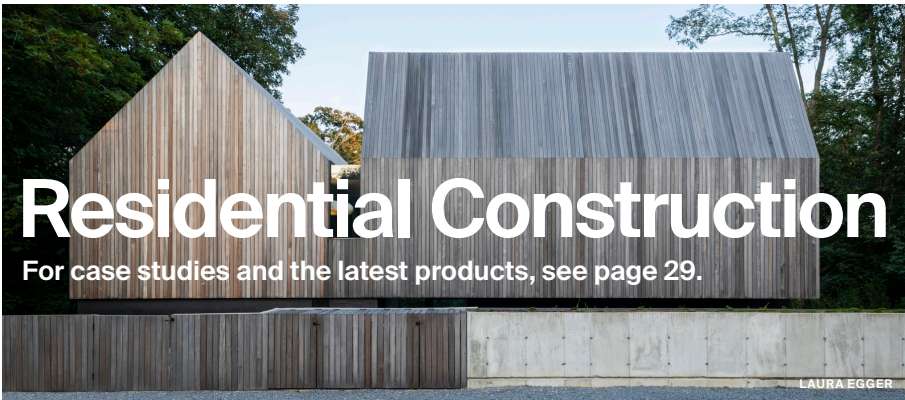
Activating the Urbane Village

A utopian mountain community in Utah is designed by an impressive list of architects and designers. What is the end game? See page 14.



Decolonizing Alaska's northern housing

The Cold Climate Housing Research Center is on the frontlines where retrofitting and prototyping new housing is crucial. See page 19.



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-Scott Rappe, AIA, LEED AP, Principal, Kuklinski+Rappe Architects

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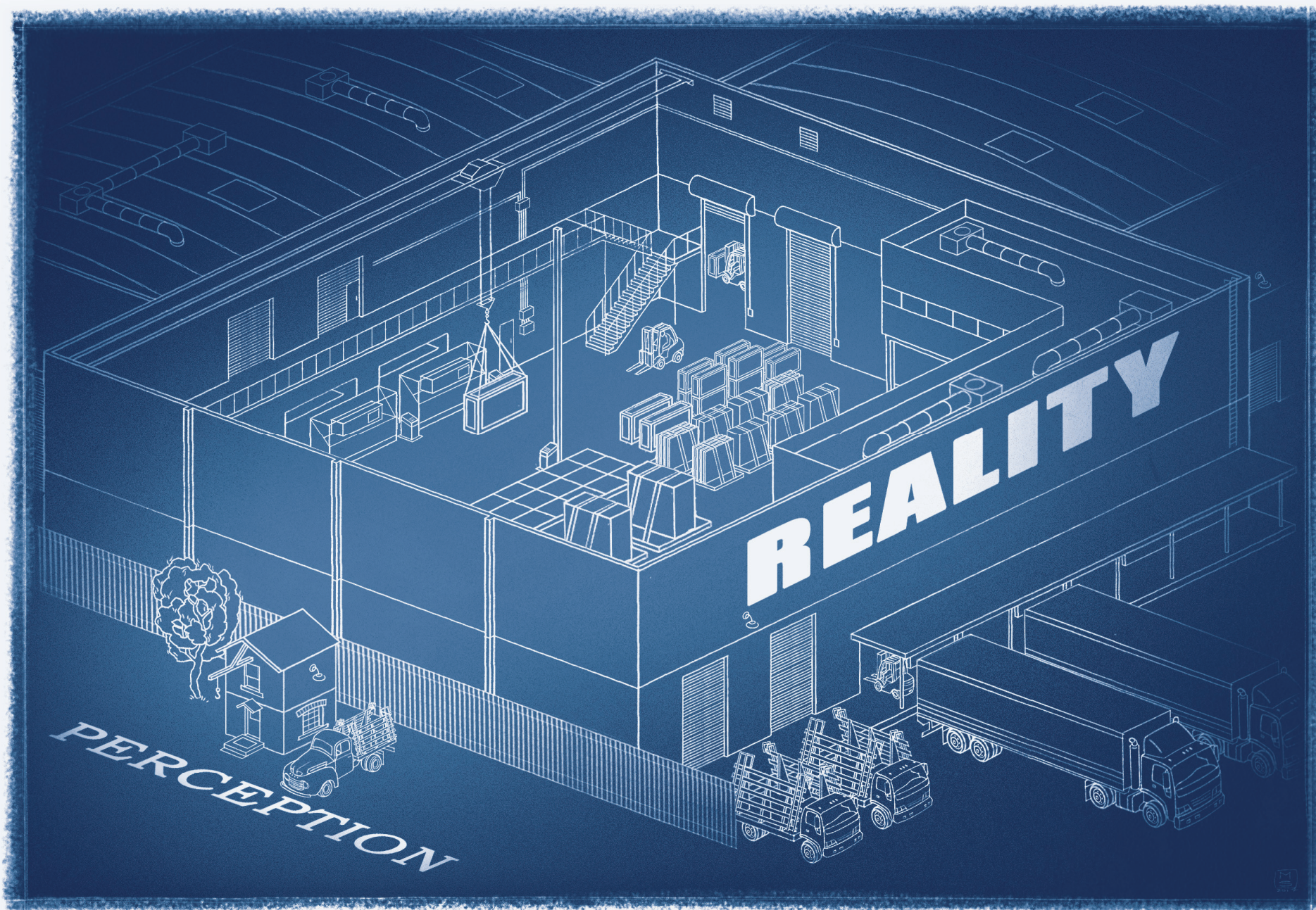
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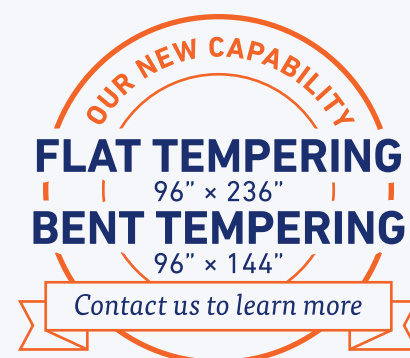


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Los Angeles is at a crossroads—don’t let it become New York.

With the 2028 Olympics approaching, Los Angeles is at a crossroads, on a path to become a different place in the next decade. But with the city already at the forefront of global media culture (*The Kardashians*, Moon Juice, *Goop*, etc.), it doesn’t need global architecture to maintain its position as a worldwide force. How it defines itself as a physical place is still up for grabs, and it should learn lessons from other hyper-globalized cities, namely New York.

Tomorrow’s Los Angeles is one of layers. Moving on from its days as a bastion of mythological American modernism centered around mobility (cars), individuality (single-family homes), and triumph over nature (lawns), it will add fresh collectivities onto itself. These layers will arise from the constant flux of the new: Emerging technologies and social patterns meld nicely into the loose, still-codifying culture and its corresponding urban forms. It is the flickering of current, communal, car-free, publicly subsidized lifestyles against the old, car-centric, low-density, low-regulation, “libertarian” bones of the urban landscape that make it such an interesting place for urbanism today. The oft-banded-about claim that the city is libertarian is also not entirely accurate, as California is a sea of regulation and red tape, continually votes to raise its already high taxes, and both California and Los Angeles are leading on climate action.

The city is quietly building public infrastructure at a rate that outpaces New York. New York’s Second Avenue subway line took somewhere between ten and 100 years to complete three stations, and the next phase will be three stops and will be completed by 2029 at the earliest. Meanwhile, Los Angeles is (optimistically) on course to build 28 new *lines* by 2028. This includes an airport-connection that will allow a direct link from LAX to the city. Obversely, New York’s MTA is in an ever worsening crisis.

New transit networks in Los Angeles, both public and private, along with lower parking requirements for new construction, will profoundly impact development and housing typologies in the future. But it is no secret that the city is careening toward a New York-like affordability crisis (if it isn’t there already) that goes hand-in-hand with the urban whitewash of global capital. Homelessness is at record levels and only getting worse. In response, architects are working to develop new housing typologies, from affordable prototypes and accessory dwelling units to larger, multi-family schemes that continue to evolve with new regulations and design challenges. The Los Angeles River and the Los Angeles River Greenway in the San Fernando Valley are also emerging sites of urban experimentation and reclamation/rehabilitation of greenspace.

Los Angeles has a unique architectural culture and urban fabric, but red flags are emerging. First, Bjarke Ingels Group and Herzog & de Meuron, international firms that are very popular with the New York development community, have projects downtown. Related has moved in and is developing a large Frank Gehry project across from Gehry’s own Disney Concert Hall. It perfectly illustrates the lower design quality of developer-led construction and echoes The Related Companies’ other project, Hudson Yards: “The project is anchored by a central plaza wrapped with shopping areas and public art.”

The biggest red flag might be the La Brea Tar Pits project. In Miracle Mile’s Museum Row, a neighborhood that already has

been marred by architectural globalists—once by KPF and twice by Renzo Piano—the shortlist for the La Brea master plan is New York establishment firm WEISS/MAN-FREDI, which beat out fellow New Yorkers Diller Scofidio + Renfro, along with Danish firm Dorte Mandrup. It is a truly odd and troubling list. All three are talented firms, but their selection signals the wind turning toward a placeless architecture where, in California terms, “there is no there there,” reflecting classic donor-class aesthetics. Don’t even get me started on what Michael Govan and the LACMA board are doing to push through their new Zumthor building. Joseph Giovannini said it best in the *Los Angeles Review of Books*: “Had he even made it into a normal architect selection process, the jury might have concluded that he was mismatched and dangerously under-equipped for the commission.”

Los Angeles doesn’t need the continental, polite, same-as-everywhere architecture that plagues institutions around the world. The architecture scene has always valued experimentation and allowed younger, more avant-garde approaches and diverse practices to gain ground, outside of the institutional weight that plagues places like the East Coast.

It is not “provincial”—as some claim—to want to preserve this well-established local flavor while moving forward. In fact, what would be provincial is thinking that it is necessary to look outward for world-class architecture, or that a mythical global culture needs to be imported for the city to become a world-class place. Nothing defines the periphery like the center, and nothing makes a place more provincial than defining itself against New York. Of course, outside architects can come in and add to the culture; it just takes a bit of judgment. For instance, Spanish firm SelgasCano’s bright, breezy, kit-of-parts style seems to fit with L.A.’s pop modernist aesthetic, and Arata Isozaki’s MOCA has also become an iconic part of L.A. architecture.

So, let Los Angeles be regional and different. Don’t let it succumb to the pressures of global capital and “global architecture.” Don’t let Boyle Heights—a strong Latino neighborhood under development pressure, with several buildings already being renovated—become Hudson Yards. New York has been ruined by capital, as developers like Donald Trump and The Related Companies, along with their elected enablers such as former mayors Bloomberg and Guiliani, have shared class interests that threaten the small-scale, local, and regional urban landscapes where artists, immigrants, and the working class foment culture.

How can Los Angeles be a laboratory for resisting the entropic, hegemonic cancer that is global capital, the global donor class, and the donor-class aesthetic?

Los Angeles in many ways is the logical conclusion of the myth of the American West. Several time zones and thousands of miles from New York and other global cities, it has historically been connected to global culture through mass media, not physical space. This isolation has left it to its own devices as an urban place. This doesn’t need to change as it grows into more of a global force. New forms and ways of living can be cultivated without abandoning what makes it a special place: its resistance to the forces of the outside. In the 2020s, defining a new localism would be quite an amazing achievement. **Matt Shaw**

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The views of our reviewers and columnists do not necessarily reflect those of the staff or advisers of The Architect’s Newspaper.

Corrections

In the 2019 *AN* Best of Design Awards, *Walking Assembly* by Matter Design received an Honorable Mention for New Materials and should have been listed.

901 East Sixth and Avenue C Multi-Family, which received honorable mentions in Commercial – Office and Restoration & Preservation, respectively, should be credited to Thoughtbarn and Delineate Studio.

Malibu Overlook, which won in Landscape – Residential, should be credited to architect Michael Goorevich and landscape architect Stephen Billings.

“Lighting: Up and Down” in the outdoor products special section of the October/November 2019 issue included a product on page 38 incorrectly listed as Generation 50 Bench. The product is Clessidra Outdoor, and it is available from FLOS.

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We corralled the top architecture and design stories buzzing about the internet this month.

MoMA reopens with a \$450 million mega-expansion and slick renovation

Designed by Diller Scofidio + Renfro in collaboration with Gensler, the multiphased renovation and expansion adds one-third more gallery space to the institution's 80-year-old complex on West 53rd Street. A new lobby with a cantilevered entrance awning, a sunken gift shop, and free public galleries at street level round out the immense undertaking.

Kengo Kuma's National Stadium in Tokyo is complete

Japan celebrated the opening of its National Stadium ahead of this summer's 2020 Tokyo Olympic and Paralympic Games. The Japan Sport Council has deemed construction complete on the 68,000-seat arena designed by Kengo Kuma and Azusa Sekkei; the stadium was inaugurated on New Year's Day with the Emperor's Cup soccer tournament final.



Francisco Javier Rodríguez-Suárez named new director of University of Illinois at Urbana-Champaign's School of Architecture

Things are shaking up at the University of Illinois at Urbana-Champaign. After almost three years without a permanent director—a span that included the tenure of an interim director from the English department—the university's College of Fine and Applied Arts announced Francisco Javier Rodríguez-Suárez as the new head of the School of Architecture.

World's largest Starbucks opens on downtown Chicago's Magnificent Mile

The Seattle-based coffee giant's largest flagship is now located on Chicago's Magnificent Mile. The five-story, 35,000-square-foot Starbucks Reserve Roastery fills every inch of a former Crate & Barrel built in 1990 and was designed by an in-house team with help from Perkins+Will.

MU Architecture designs a "paleo-futuristic" tower for remote Canadian forest

Montreal-based MU Architecture has unveiled its design for a luxury retreat set in the middle of a Canadian forest. Reaching 670 feet above the hilly landscape of western Quebec, PEKULIARI is meant to oscillate between looking like a totemic relic from the past and embodying the architecture of the near future.

LEGO opens its block-inspired CF Møller campus in Denmark

The new building, which features a decorative, LEGO-themed concrete facade, is the first phase of a CF Møller-designed campus project that will wrap up in 2021. The completed project will create 580,000 square feet of space and serve over 2,000 of the company's employees in Billund, a small town in Denmark's Jutland region.

Indianapolis's Gold Building will be stripped of its iconic facade

The infamous Gold Building in downtown Indianapolis is set to lose its luster. After purchasing the 20-story office tower earlier last this year, local developers Gershman Partners and Citimark announced they would modernize the facade with an all-glass curtain wall, effectively stripping the 44-year-old building of its longtime identity.

Olson Kundig designs world's first human composting facility in Seattle

Seattle-based Olson Kundig has revealed renderings of an 18,500-square-foot facility for Recompose, a company that offers composting as a "gentle" alternative to cremation and burial. The center will be rife with biophilic touches and is currently slated for completion in early 2021 in Seattle's SoDo neighborhood.

University of Michigan, Bedrock, and Related team up for a Detroit innovation center

The site of an abandoned Wayne County Jail in Detroit will become the new home of the 14-acre Detroit Center for Innovation, anchored by a swooping Kohn Pedersen Fox-designed research and graduate education center for the University of Michigan. The \$300 million, 190,000-square-foot building is only the first piece of an ambitious campus plan.

Ohio's Big Basket building may become a luxury hotel

Ohio developer Steve Coon announced that the former Newark, Ohio, headquarters of the Longaberger basket company—which is shaped like a giant picnic basket and covered with fake basket-weave siding—will be converted into a luxury hotel, and that its exterior will remain intact if his team can secure historic tax credits to help finance the project.



7 In Case You Missed It...

For more information and images for all of these stories, visit archpaper.com/ICYMI

Updated visuals revealed for Chicago’s Obama Presidential Center

The Obama Foundation released the third round of renderings for the Obama Presidential Center, the 20-acre complex coming to historic Jackson Park, on Chicago’s South Side. One of the most notable updates to the Tod Williams Billie Tsien Architects–designed tower is a slender, 88-foot-tall cutout that reveals activity inside.

Patrik Schumacher draws fire for claiming limiting work hours could paralyze offices

During a panel at Dezeen Day in London, the principal of Zaha Hadid Architects clashed with the Pratt Institute School of Architecture’s new dean, Harriet Harriss, claiming that measures to limit the exploitation of employees could lead to the “paralyzing” of firms like ZHA and create a slippery slope into a “socialist world of stagnation.”

New Jersey megamall opens after more than 20 years in development

The American Dream mall in East Rutherford, New Jersey, offers 4.5 million square feet of retail, dining, and entertainment, and the attractions are beyond what you might expect: Its Nickelodeon Universe theme park features more than 35 rides and rollercoasters, while the NHL-regulation-size skating rink offers space for hockey games and figure skating.

Guitar-shaped Hard Rock Hotel opens in Hollywood, Florida

The world’s first guitar-shaped hotel has officially opened for business. Standing 450 feet tall is the new face of the Seminole Hard Rock Hotel & Casino in Hollywood, Florida. The curvaceous building is part of a \$1.5 billion expansion of the existing entertainment complex.

Jean Nouvel sues Philharmonie de Paris over €170.6 million fine

The Philharmonie de Paris was over budget and two years behind schedule when it opened in January 2015. In 2017, the Philharmonie issued a €170million fine to Jean Nouvel for failing to deliver the project on time and on budget. Now, Nouvel is suing his former client, claiming the fines were “unprecedented in the world of architecture.”

Coldefy & Associates and RDAI win design competition for the National Pulse Memorial & Museum

French firms Coldefy & Associates and RDAI with the Orlando-based HHCP have won the international competition to design the National Pulse Memorial & Museum in Florida. The design beat out the other five shortlisted entries from heavy-hitting global firms, including MVRDV, MASS Design Group, and Diller Scofidio + Renfro.

Zaha Hadid Architects completes twisting tower with world’s tallest atrium

The designation of world’s tallest atrium has jumped from a building in Dubai to a new tower in Beijing. The recently opened, 45-story Leeza SOHO by Zaha Hadid Architects boasts a 623-foot-tall twisting, open-air interior with four sky bridges that beats out the Burj Al Arab hotel’s atrium by 23 feet.

World’s largest tree house burns down in minutes

It took just 15 minutes for a fire to reduce a ten-story tree house to ashes. Following what he described as a vision from God, minister Horace Burgess began to build the 97-foot-tall complex in Crossville, Tennessee, in 1993; others soon contributed scrap lumber to erect the elaborate structure, which sat atop an 80-foot-tall oak tree. All of it is gone now.



COURTESY COLDEFY & ASSOCIÉS WITH RDAI/ONEPULSE FOUNDATION

Frank Lloyd Wright’s Ennis House finds a high-flying buyer

The Ennis House, tucked into the hills of Los Feliz in Los Angeles, has traded hands more times than one can count. After coming on the market for \$23 million in June 2018, the home has been sold for \$18 million to Cindy Capobianco and Robert Rosenheck, founders of the CBD-infused beauty product company Lord Jones.

Snøhetta reveals its \$100 million Charlotte, North Carolina, library

Civic leaders in Charlotte, North Carolina, unveiled renderings for a \$100 million, five-story, 115,000-square-foot library designed by Snøhetta and partners, which is intended to be an anchor for revitalization efforts in the city’s Uptown area. The building’s most distinctive feature is a curving setback that frames the main entrance.



COURTESY DCL

West

Tillamook Creamery



In the summer of 2018, Olson Kundig unveiled a sleek, 42,800-square-foot home for the Tillamook Creamery’s visitor center, an attraction that hosts up to 10,000 visitors per day. Part museum, part food hall, the new space celebrates the agricultural heritage of the area, along with the farmers and products of the dairy co-op. The building’s palette of pale wood and dark steel was an abstracted, contemporary interpretation of traditional barn architecture. “We designed the opportunity for visitors to make a connection between the food on their plates and the story behind

it,” said Olson Kundig principal Alan Maskin. **Emily Conklin**

4165 North Highway 101
Tillamook, Oregon

Architect: Olson Kundig

Southwest

Owe’neh Bupingeh



Thirty miles north of Santa Fe, New Mexico, Owe’neh Bupingeh, the central village of Ohkay Owingeh, has been the home of one of the 19 federally recognized Pueblo tribes in New Mexico for over 700 years. The village is organized around a series of plazas where hundreds of homes once stood. Although Owe’neh Bupingeh remains a vital cultural center of the Ohkay Owingeh tribe, only a small fraction of these homes survive today. A plan by Philadelphia and Santa Fe–based Atkin Olshin Schade Architects simultaneously restores the area to its original form while providing quality housing within existing and

new buildings. Based on the preservation values of the Ohkay Owingeh tribe, the plan was developed in close collaboration with tribal elders—oral histories played a major role in conceiving the future of the space. Thirty-four homes have been renewed so far as part the ongoing project. **Shawn Simmons**

Ohkay Owingeh,
New Mexico

Architect: Atkin Olshin Schade Architects

West

Saint Joseph the Worker Day Chapel



West Jordan, a suburb of Salt Lake City, is the home of Saint Joseph the Worker parish, a Catholic community that commissioned Salt Lake City– and Los Angeles–based architecture firm Sparano + Mooney to design an intimate chapel to accompany the church that the designers finished in 2012. The materials of the new building, which opened in the summer of 2019, express the historic trades practiced by the local immigrant community that founded the church, as in the copper cladding, a nod to the nearby Kennecott copper mine. The design is

meant to sit lightly on its natural environs—the thermally isolated chapel is passively heated and cooled—while daylight filtered through a rectilinear opening in the roof reestablishes a connection to the world outside. **Emily Conklin**

7405 South Redwood Road
West Jordan, Utah

Architect: Sparano + Mooney Architecture

West

Quick Turn-Around Facility



Jackson Hole, Wyoming–based firm CLB Architects has designed what may be the world’s most pleasant car wash experience among the picturesque mountain ranges of Grand Teton National Park. Located in the Jackson Hole Airport, the only airport in the United States inside a national park, the Quick Turn-Around Facility (QTA) is a car-rental company car wash—also the only facility of its kind in a U.S. National Park. The QTA replaced a car wash that suffered damage from freezing temperatures and ice during the winter months. CLB’s design focused on weather protection for workers from three rental com-

panies who perform fueling, washing, and detailing duties. The materials—rusted metal, exposed steel, and precast concrete—echo those of the nearby airport terminal, but the new building’s translucent cladding gives it a distinct identity. **Emma Natanzon**

1250 East Airport Road
Jackson, Wyoming

Architect: CLB Architects

No mo' MoMA PS1 YAP?



Less than a month after MoMA finished the \$450 million expansion of its home in New York City, rumors began circulating about the potential cancellation of MoMA PS1's Young Architecture Program (YAP). The annual installation kicked off in 1999 as the first collaboration between the merged institutions (the P.S.1 Contemporary Art Center had operated independently since the '70s). Philip Johnson celebrated his 93rd birthday that summer with a DJ booth commemorating the disco era, spinning Frank Sinatra's "My Way" as the program's initial gesture. For the next 20 years, the jury of PS1 and MoMA directors and curators asked deans, critics, and editors to nominate 30 young firms to compete each year, selecting five of them to develop concepts for the annual outdoor pavilion in the PS1's courtyard, which has housed the Warm Up music series.

When contacted for comment, MoMA PS1 provided *AN* with a statement announcing a one-year hiatus to reevaluate the program. We spoke to P.S.1 founder Alanna Heiss about YAP's origins and asked past winners and curators to comment on its value and suggest possible future directions.

"The two most open departments to collaboration from day one of the announcement [of the PS1–MoMA merger] were film and architecture," said Heiss. "We had a gigantic space that had been used for large-scale installations of sculpture and big outdoor performance programs. We'd done, a summer before, a kind of trial Warm Up, which had been more successful than, shall we say, we wanted it to be—i.e., we had crowds and crowds of people that we had

to devise systems to control for safety. But to merge architecture with the beginning of Warm Up was just a dream."

YAP became an influential model around the world: MoMA developed partnerships that led to pavilions at MAXXI, the National Museum of 21st Century Arts, in Rome; with CONSTRUCTO in Santiago, Chile; at Istanbul Modern; and at the National Museum of Modern and Contemporary Art, Korea, in Seoul.

Former MoMA architecture and design curator Terence Riley credited the program's format and SHoP's 2000 *Dunescape* project for setting a high standard for others to follow. "The fact that [the installation] has a use was critical in the sense that it wasn't just architects scribbling and coming up with seductive forms, although they often did, but they did often have a focus and guidelines," Riley said. "That gave it some rigor and also some humor. This was for a DJ event. It was about fun; it was about enjoyment. It had its own character, which was really great."

Asked about its value and whether the program should continue, many past YAP winners strongly affirmed both. "This program was an incredibly important platform for SHoP and other young firms," said Gregg Pasquarelli, SHoP founding principal. "*Dunescape* was one of the first projects that put SHoP on the map....It showed us the tremendous R&D value of designing and constructing exhibitions and temporary pavilions and informs the way that we work to this day....[It] enabled us to conceptualize a new way of working that we are hopeful will revolutionize the entire architecture and

construction industry."

Florian Idenburg, principal and co-founder of SO – IL, which designed the 2010 pavilion, agreed that the program was invaluable and should continue. "For SO – IL, our installation, *Pole Dance*, was career-defining. We cannot recognize enough the importance that the program has had on a generation of architects. This potential is something MoMA should not underestimate and should try to maintain as it finds its new form."

Former MoMA architecture and design curator Pedro Gadanho condemned the idea of ending YAP. "In a context in which debt-ridden young architects probably have to enter corporate offices just to survive, YAP provided one of the few design opportunities in the U.S. in which a smaller scale, more experimental studio could try out architectural ideas outside the market. And with MoMA's renown behind it, winning it surely provided a boost in visibility at an international level. In these senses, after such a history has been made, scrapping it sounds profoundly unfortunate for the architectural field in the States, as well as for MoMA's role within it."

Several architects attested to the need to revise the minimal budgets and supplemental insurance liability coverage, however, and suggested expanding the time frame to design and build. Jenny Sabin of Jenny Sabin Studio, 2017 YAP winner for *Lumen*, pointed to "labor, budget, waste and sustainable materials, liability, context, and program" as constraints and parameters to be reconsidered.

MoMA has already organized a discus-

sion of YAP winners, which Tobias Armbrorst of Interboro Partners, designer of the 2011 pavilion, participated in. "I came away from it thinking that in spite of the changing context, YAP still kind of works as a stage for young architects to present ideas," he said. But one of the takeaways for him was that the budget question is a big deal. "It seems like the program is still based on an outdated idea of self-exploitation on the part of architects, and the expectation of a lot of free labor on the part of students, volunteers, etc."

Idenburg added that more updates to the program may be called for, such as partnering with city agencies or nonprofits to work on longer-term projects that have lasting benefit for residents and communities. "One can imagine projects that last over multiple years and are developed collectively," he said, "possibly using PS1 as a space for debate, work, and communication."

Among those we polled, Pablo Castro and Jennifer Lee of OBRA Architects, designer of the 2006 pavilion *BEATFUSE!* (above), had perhaps the most ambitious and critical recommendations: "[We] daydreamed that YAP could have evolved at some point to become the vehicle for putting forward a more considered project for the future of architecture and the city, using its public platform to publicize and disseminate a more progressive vision of the future of the built environment," the pair said. "Perhaps something other than urbanism via real estate speculation and architecture via marketing spectacle? Who knows?"

Stephen Zacks

Latter Day Paints

The Salt Lake Temple's four-year renovation is on.

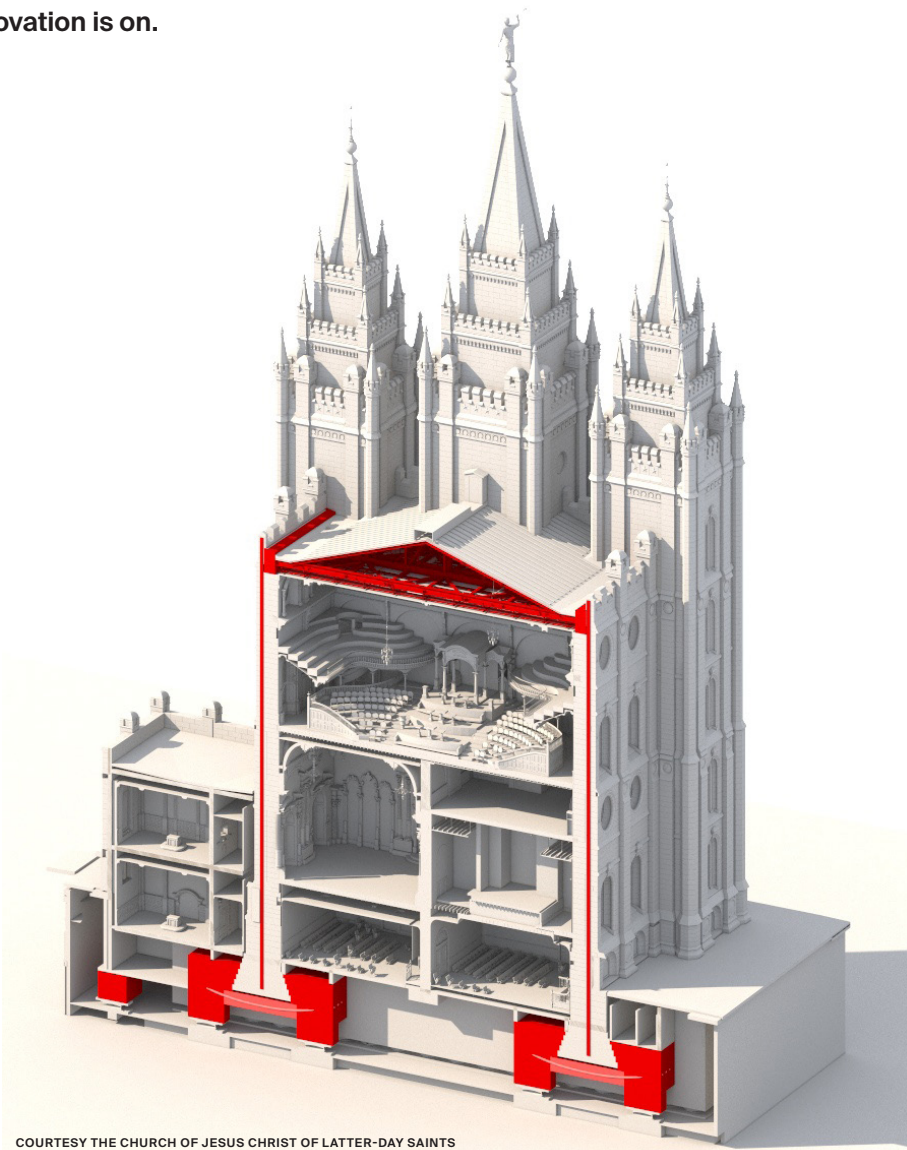
"To some extent, buildings are like people," said Russell M. Nelson, the 17th and current president of The Church of Jesus Christ of Latter-day Saints (LDS). "Not only is the aging process inevitable, but it can [also] be unkind." Nelson offered the comparison in April 2019 during an announcement that the Salt Lake Temple, the largest LDS temple in the world, and the 10-acre Temple Square that surrounds it would be closed to the public starting December 29, 2019, to undergo a four-year restoration and a series of upgrades that will make the site more accessible to the 3 million to 5 million visitors it receives annually. "This project will enhance, refresh, and beautify the temple and its surrounding grounds," said Nelson. "Obsolete systems within the building will be replaced. Safety and seismic concerns will be addressed. Accessibility will be enhanced so that members with limited mobility can be better accommodated."

The church called upon FFKR Architects, the largest architecture firm in Utah, not only to provide solutions to the temple's structural issues, but to envision a combination of preservation, restoration, renovation, demolition, and new construction, to be executed by local company Jacobsen Construction. At the formal temple entry point, for instance, the architects are adding skylights that will provide sweeping views of the temple's spires from the interior, and are creating a new tunnel to connect the nearby conference center's parking area with the temple's grand hall.

Though smaller existing buildings on the site will be demolished to make way for several new features—including multiple temple entry pavilions, two visitor centers, and updated hardscaping and landscaping—the church has stated that all of the changes will be made with only the square's original purposes in mind. "Efforts will be made to preserve the unique historicity... wherever possible, preserving the inspiring beauty and unique craftsmanship of generations long since passed," said Nelson when talking about a broader effort to renovate not only the Salt Lake Temple but also several others across Utah. To achieve a high level of fidelity in the preservation efforts, members of the Church History Department researched the Salt Lake Temple's original paintwork, murals, millwork, and furniture.

Plans for the renovation began after it was recently discovered that the 253,000-square-foot temple, which was designed by Thomas O. Angell and completed in 1893, sits on earthquake-prone land and is in dire need of seismic and structural renovations. The last renovation, which took place in 1962 and 1963, included the demolition of the original annex; the installation of new mechanical systems, plumbing, wiring, carpeting, and light fixtures; and the redecoration of the entire building. In 1964, Temple Square and its buildings, including the Salt Lake Temple, were designated a National Historic Landmark.

The current renovation includes the replacement of the temple's aging mechanical, electrical, and plumbing systems and a significant seismic upgrade using a base isolation system that will take approximately a year to install. According to Brent Roberts, the church's managing director of special projects, this will require placing



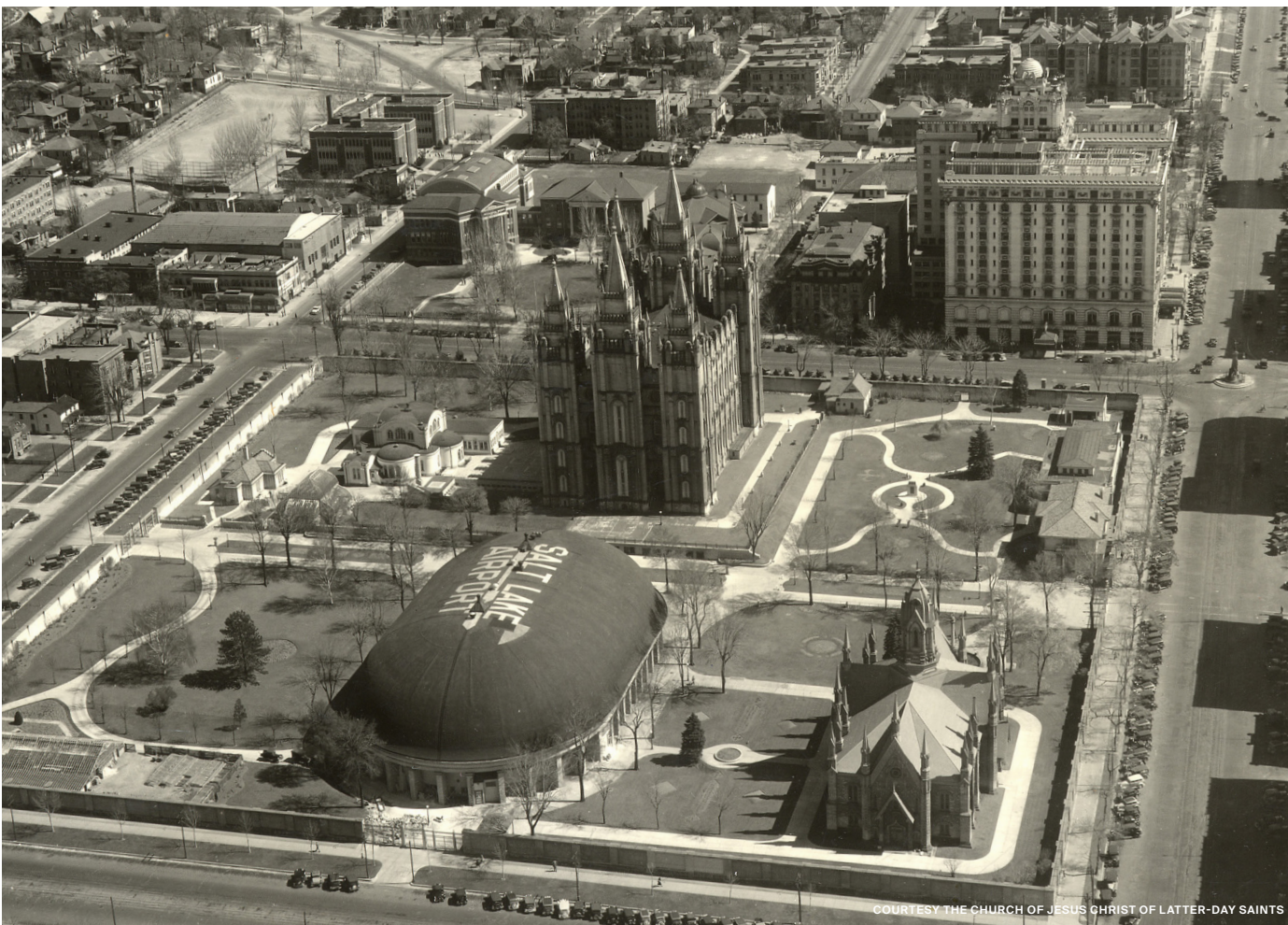
COURTESY THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS

hundreds of shock absorbers beneath the building's footings and foundations. "[The base isolators] actually will now be the foundation of the temple, so when the earth moves, the base isolation system takes all that movement," Roberts explained in the *Deseret News*.

Base isolators have proved to be an effective safeguard system for historic buildings and have been used in other historic buildings in the area, including the Salt Lake City and County Building, completed in 1894. "The base isolators take a lot of the energy out of a 7.3 magnitude earthquake," said David Hart, the former executive director of Utah's Capitol Preservation Board, in the *Deseret News*. "It's a really, really efficient way of reducing the force elements that are predicted to hit the building in a major earthquake." As an extra precaution in the event of natural disaster, the temple's iconic stone spires and walls will be strengthened while maintaining their original aesthetic character.

Though the Salt Lake Temple won't open its doors to the public again until 2024, far-reaching efforts were made to make sure the construction process will not interrupt the regular functions of surrounding facilities. The church will ensure that there will be no street closures or impediments to pedestrian and vehicle traffic during construction, while the North Visitors' Center and Salt Lake Tabernacle, a historic meeting hall on the western edge of Temple Square, will remain open for events.

Shane Reiner-Roth



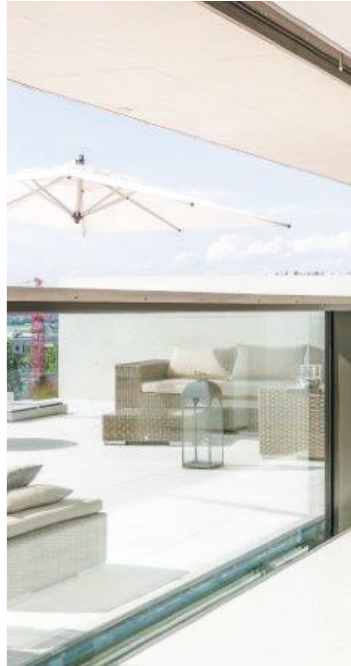
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Top: Hundreds of shock absorbers will be placed beneath the building's footings and foundations to ensure the temple can withstand future earthquakes. **Above:** The 253,000-square-foot temple was designed by Thomas O. Angell and completed in 1893.

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Cover and top: Alexander Calder's *Two Discs*. **Top:** Tippet Rise nestles art and design in the Montana landscape.

Above left: Inside Francis Kéré's *Xylem*. **Above right:** Ensemble's *Inverted Portal*.

Art on the Range continued from front page for writing and recording facilities.

"This past season, while Stephen Hough was playing Liszt, lightning flashed dramatically through the window on stage in the Olivier Music Barn, matching the tone of the music and providing dramatic synergy between the land and the performance," said Peter Halstead, recalling a mid-July concert by Hough, a classical pianist and composer. "It was a really special moment for us and the rest of the audience."

Over the past few years, the center's collection has grown methodically through acquisitions and commissions. Sculptures by Madrid-based design firm Ensemble Studio touched down in 2015, while a massive wood-and-steel piece by New York-based artist Stephen Talasnik was erected in 2016. The latest series of projects took on even more spatial considerations with the Arup-designed Tiara Acoustic Shell and *Xylem*, a pavilion by Francis Kéré.

Peter Halstead envisioned the Tiara as a rough scaffold of old doors before Arup's sound and structural engineers got their hands on it. Though still a rustic arrange-

ment of lines and planes, the finished space functions as an acoustically sophisticated outdoor concert hall. Guests and musicians sit with nearly unobstructed views of the landscape, while strategically placed panels reflect sound just as well as a highly controlled interior environment. Ensemble Studio's *Domo* produces a similar effect. The massive vault of concrete directs sound and frames views for both musicians playing beneath it and their audience—that is, if the woodwind musicians can catch their breath at an elevation of nearly 5,000 feet.

Kéré's *Xylem* is the latest arrival to the campus. Nestled in a grove of the few cottonwood trees on the property, it is composed of lodgepole and ponderosa pines, many of which were harvested already dead, victims of the insidious mountain pine beetle.

"[*Xylem*] provides a pastoral, quiet space for reflection with the calming sound of the brook babbling nearby," explained Halstead. "We experimented with short 'pop-up' concerts in the beautiful new pavilion to informally activate the serene space."

All of this is happening on an active ranch, as Tippet Rise is grazing pasture for

hundreds of cattle and over a thousand sheep. The center's ecological aspirations are as great as its artistic ambitions. Through careful, scientific animal and water management, the land is returning to a wilder state, with fewer invasive plant species and more opportunities for domestic and wild animals to prosper. Just as the public is ushered off the land at the end of the season, the cattle are moved to make way for elk and deer that descend from the nearby range to winter on the land.

Typically mum about the center's future plans, no doubt to add to the drama of the unveiling, the Halsteads have indicated that they have acquired another large-scale art piece to be installed by next year's season. As with past additions, the piece's orchestration runs through everything that happens at Tippet Rise. The complex rotation of sustainably ranched livestock, the choreographed paths across the land from sculpture to sculpture: Together, the center's activities manifest an intense attention to detail that yields a serene experience for people and animals alike.

Matthew Messner

Church in the Wild

Kanye West shoots a video inside James Turrell's *Roden Crater*.

Though rapper Kanye West has pushed his art into visual fields in recent years, fans were still surprised last January to learn that he donated \$10 million toward the completion of James Turrell's *Roden Crater*, a series of tunnels and experiential spaces burrowed into a dormant volcano in the Painted Desert of northern Arizona. Turrell began the project in 1977; it has been in the works for so long that "Sooner or later...Roden Crater" was once its unofficial tagline.

Though *Roden Crater* is not complete (due to a lack of funding), West produced a film within the hollowed volcano last summer that was recently released through a collaboration with IMAX. Titled *Jesus Is King*, the film documents one of West's "Sunday Service" gospel performances set to the music of his latest album, also called *Jesus Is King*, which was released in October. A poster for the movie features Alpha (East) Tunnel, one of the "light tunnels" within *Roden Crater*.

A poster for West's IMAX film *Jesus Is King* draws out the spiritual dimensions of *Roden Crater*.

On top of the \$10 million he provided, West partnered with Arizona State University to work toward gathering \$200 million for *Roden Crater's* completion within the next five years. When the work is finished, visitors will be able to explore the 3-mile-wide site's 21 viewing spaces and six tunnels, all designed to align with celestial phenomena, and for which Turrell consulted a number of noted astronomers—including E. C. Krupp, the current director of the Griffith Observatory in Los Angeles, as well as the late Richard Walker, an astronomer based in the nearby town of Flagstaff.

Unfortunately, because the crater is unfinished, public access is restricted and will likely remain so until the project is complete. Until then, West's film provides some of the most substantial footage of the art bunker's interiors. **Shane Reiner-Roth**

See more images at archpaper.com.



Warehouse Wins

LTL blends past, present, and future in the Telluride Center for the Arts.



The Telluride Center for the Arts will offer four stories of publicly accessible spaces for exhibitions, screenings, and performances.

When New York firm LTL (Lewis.Tsurumaki.Lewis) won the bid to convert Colorado's Telluride Transfer Warehouse into the Telluride Center for the Arts in the spring of 2017, the community embraced the step for the thriving local arts scene. The forthcoming state-of-the-art venue will host a wide range of cultural and artistic programming in the ski town. In addition to two stories of flexible exhibition space, the center will have a 100-seat media room for screenings and live broadcasts on a basement level, and a rooftop bar and cafe will take advantage of the building's panoramic views of the San Juan Mountains.

Built over a century ago during a mining boom, the original two-story structure housed offices and livestock for the Telluride Transfer Company, which transported mining goods in and out of the town, before it became a gas station and storage facility. The warehouse ceased to operate after a buildup of snow caused its roof to collapse in 1979, and for the next 40 years it remained a roofless ruin, a sandstone skeleton of four walls and boarded-up windows with a cottonwood tree growing through its floor.

LTL's design for the renovation pays homage to the warehouse's decay, setting a multilayered timber structure within the original stone walls. Just beyond the entrance, a great hall will feature a retractable skylight with a tree growing beneath it in homage to the warehouse's former derelict state. The new building will use the original windows and a glass ceiling to preserve the feeling of the open-air ruin.

"The Transfer Warehouse transforms the space through a creative engagement between old and new, past, present, and future, between flexible and highly calibrated spaces," said LTL partner David Lewis in a statement. "Overall, the project aims to amplify the future of Telluride by cultivating a dynamic relationship to its past and sup-

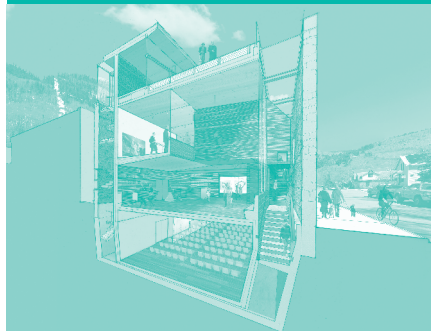
porting its present, evolving needs."

The finished arts center will be free to enter and open to the public daily. While construction is not slated to begin until 2021, some public programs have already been held in the existing warehouse, a testament to this tiny mountain town's dedication to making engaging and accessible art a priority.

In the meantime, Telluride Arts, the nonprofit behind the project, has gained control of the site from the city and a developer. The organization also had to go through a review by a historic arts commission. Both the approval of the design and the necessary transfer rights have been granted, and Telluride Arts will undertake a capital campaign to realize the project.

Shawn Simmons

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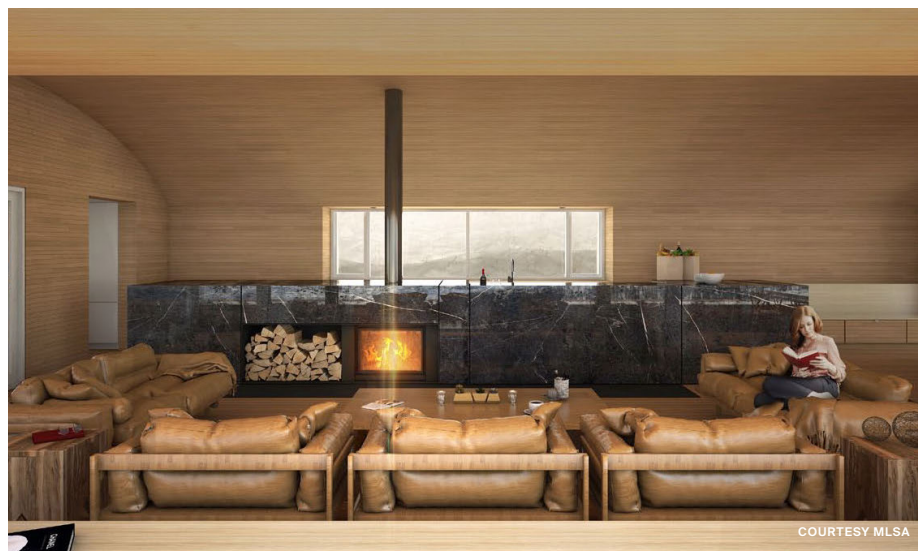
A group of architects and designers are redefining what we mean by ski town in a tech-utopian community in rural Utah.



COURTESY OFFICEUNTTLED



COURTESY TWA



COURTESY MLSA

How do you translate a “TED meets Burning Man” vibe into the design of a year-round property—as the investors behind Utah’s ski slope-adjacent Summit Powder Mountain are attempting to do in their 10,000-acre, billionaire-friendly planned mountain community? Summit, a company that organizes meetings, talks, and events with innovators and entrepreneurs, is discovering the difference between putting on a weekend conference and opening a permanent settlement: The latter requires a balancing act between vision, pragmatics, and the somewhat unpredictable dynamics between the individuals who choose to settle in such a place. The trick is to create a population density that can support amenities like restaurants, grocery stores, and public gathering areas. But what comes first, these amenities or homes for people to use them?

According to Benjamin Anderson of OFFICEUNTTLED, the architecture firm that finished the design of the development’s 2017 master plan and some of its buildings, the community has greatly benefitted from the addition of both 60 micro-condos in the village’s heart from millennial hospitality experts Selina and a ring of larger homes sited around the urban periphery. In keeping with Powder Mountain’s investors’ desire to escape a “whatever you build, I can build something bigger” mentality, owners of the larger homes are allowed up to 5,000 square feet each. While 5,000 square feet would feel enormous to most people, for billionaires, the limitation might require Spartan restraint—yet on average, homeowners usually choose floor plans of ap-

proximately 2,000 square feet. Combining a more rural sense of space around the larger homes and a more urban, closely packed experience facilitated by the micro-condos will, the planners hope, create enough density for year-round inhabitants to successfully activate the village. MacKay-Lyons Sweetapple Architects, Olson Kundig, Marmol Radziner, Studio Ma, JVA Arkitekter, and Tom Wiscombe Architecture are among the architects who have signed on to design some of Summit’s buildings.

The developers behind Summit Powder Mountain wanted to include “as broad a sociodemographic spread as possible,” Anderson said. However, Selina’s 250-to-300-square-foot micro-condos, which were initially envisaged as lower-income housing on the mountain, have a starting price of \$300,000, according to the *Wall Street Journal*. This disparity between vision and execution may make it impossible for the micro-condos to find their intended owners.

“Like a lot of master plans, it’s a bit of a living, breathing thing. We had to build in a tremendous amount of flexibility in each parcel,” Anderson said. “The last two years have been focused on developing that community and periphery inside and outside of the core that facilitates the development of the larger buildings.”

In an attempt to create dynamic urban density, the micro-condos are sited very close to Summit Institute, which hosts several winter events for year-round residents and serves as the organizational hub of the broader Summit community. It is here that events such as “Open Source Weekend” and



PAUL BUNDY

Cover: A skier walks to one of the Horizon cabins, designed by MacKay-Lyons Sweetapple Architects (MSLA), outside the Village at Summit Powder Mountain.

Top: Rendering of OFFICEUNTTLED’s plan for the Village at Summit Powder Mountain.

Middle left: Tom Wiscombe Architecture’s Dark Chalet.

Middle right: The Barrel Home by MSLA.

Above: Copper Crest East by Studio Ma with JVA Arkitekter, Oslo.

“Winter Jam,” which features talks by some of the industry leaders who own property within the community, are held. The cost per adult for the three-day Winter Jam is \$1,395, not including lodging.

The recent addition of housing is meant to meet the development’s goal to have at least 50 permanent, year-round residents, with a constant influx of visitors from the nearest town, Eden, as well as points be-

yond. Luckily, public transit options are available: There is currently bus service from several points on the mountain into Eden, as well as a connector line from Eden to a train in Odgen, which links to Salt Lake City. The intellectually curious and the luxury-ski-inclined alike can enjoy the evolving urbanism of this experimental mountain village. **Julia Ingalls**

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Snow Business

Snowmaking signals mastery and avarice in a warming world.



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The airless snow gun propels water high in the air, allowing it to freeze before it lands.

The artificial production of snow can be riveting, yet alarming, to witness: It demonstrates humanity's mastery of its surroundings, but also manifests our anxious desire to manufacture forms of nature that have begun to fade in the face of climate change.

Around the world, ski resorts report that they can no longer rely on natural weather cycles to produce the snow they need. "If [they] relied only on natural snow," said meteorologist Joel Gratz, "some resorts wouldn't be able to open at all, and others wouldn't be able to run their base areas."

The tools for snowmaking were developed in 1950 by engineers Art Hunt, Dave Richey, and Wayne Pierce, who attached a garden hose to a 10-horsepower compressor and spray-gun nozzle to create the first snow cannon. From modest beginnings came sophisticated, large-scale instruments that since the 1970s, when the tools became more widespread, have helped businesses that rely on snow to stay open more days per year. The components sited on the edges of ski paths are known as snow guns, which shoot tiny water droplets into the air that freeze before they hit the ground. One version of the snow gun combines water and compressed air to split the water into droplets, which are sprayed far and wide from a slender tower, while the more expensive version, known as an airless snow gun, propels water using only a powerful internal fan within a cannon-like form.

As simple as snow guns may sound, the hidden infrastructure and software required to sustain them are modern marvels of engineering. Some are able to transport as much as 12,000 gallons of water per minute uphill, and resorts work year-round to service and stock the water reserves embedded within the slopes. Because employees of a

resort frequently cannot monitor all of the varying atmospheric conditions of extensive properties on foot, snowmaking systems are often equipped with computerized sensors that collect hyper-localized weather data to determine optimal times for activating the snow guns. These sensors can not only reduce labor costs by up to 30 percent, but can also significantly lessen the amount of water expelled over the course of the winter season. Given that some of the largest North American resorts can spend as much as \$2 million on snowmaking each winter, the sensors provide a much-needed strategy for cost and material efficiency.

Snowmaking techniques have evolved so dramatically in the last 40 years that some resorts in warmer parts of the world can rely entirely on the technology. There are now indoor ski resorts in Saudi Arabia, Indonesia, and other countries with little or no natural snow. Ski Dubai, completed in 2005 by local company Majid Al Futtaim, is in a 240,000-square-foot building raised just above the scorching desert ground, and its interior is snow-kissed every day of the year; visitors ski under a low-slung painting of a foggy blue sky. Even when temperatures outside exceed 106 degrees Fahrenheit, the interior of the park remains within an optimal wet-bulb temperature range thanks to a series of overhead air conditioners that allow the snow guns attached to the perimeter structure to do their magic whenever a bald patch emerges on the slopes. Majid Al Futtaim is currently developing Wintastar

Shanghai, which will become the world's largest indoor ski resort, covering a one-million-square-foot site, while the first indoor ski resort in North America, at the American Dream mall in New Jersey, required 5,500 tons of snow when it opened in December.

The water supply required for snowmaking, however, cannot easily keep pace with the development of ski resorts around the world. While climates that have naturally supported skiing conditions, such as the Swiss Alps and parts of the American Northeast, are typically near copious water reserves that support snowmaking when necessary, the more recently developed ski resorts often have to go to much further lengths to keep their businesses afloat. And given that it can take up to 14 kilowatt-hours of energy to produce a single cubic meter of snow, the process of snowmaking for even a modestly sized resort is far from energy efficient.

As naturally occurring snow becomes an even rarer commodity in the near future, the global competition among resorts for optimal skiing conditions by artificial means will no doubt continue. With time, however, more sustainable methods of snowmaking may come to light.

Shane Reiner-Roth

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Hacking the West Coast

Hacker Architects marries contextualism with material efficiency.

The origins and guiding principles of Portland-based Hacker Architects stem from the six years founder Thomas Hacker spent working for Louis Kahn, an architect who knew how to match dramatic siting with phenomenal material palettes. Hacker has since retired, but the firm has expanded to a staff of over 60

people and continues to treat each project as an opportunity to mix contextualism with the latest in efficiency and sustainability. The firm is known for its innovative uses of cross-laminated timber, a favorite because of the material's quick renewability and capacity to function as a carbon sink; the firm also employs a wide

range of locally sourced materials to reduce waste and incorporates passive heating and cooling methods whenever possible.

Hacker Architects' leaders feel they are in service to the public and have become specialists in the design of libraries, museums, and other cultural institutions. The handful of

private buildings they've designed, however, are no less representative of the firm's dual interests in siting and materiality. Inspired by local history, natural scenery, and the imperative to reduce our carbon footprint, Hacker Architects sets examples for the industry with every project. **Shane Reiner-Roth**



COURTESY HACKER ARCHITECTS/JEREMY BITTERMANN, JBSA



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COURTESY HACKER ARCHITECTS/JEREMY BITTERMANN, JBSA

1 Lakeside at Black Butte Ranch

Surrounded by the scenic Cascade mountain range and the Deschutes National Forest in Central Oregon, Lakeside adds a sprawling recreational and dining complex to the rustic-modernist resort atmosphere of Black Butte Ranch. The project used a \$11.5 million budget to replace an aging pool facility with a 15,000-square-foot design that heightens the experience of transitioning from the rugged outdoor landscape to the calming resort.

Douglas fir is the primary structural component for the project, while the interior and exterior are almost entirely clad in locally sourced cedar wood, a material in common use in the Pacific Northwest because of how it gracefully weathers. The firm envisioned the building as an "aperture for the site," framing views that might strengthen connections between the ranch and the vast landscape beyond.

2 Bayview/Linda Brooks-Burton Library

Replacing a branch library dating from 1969 in the historically underserved neighborhood of Bayview in the southeastern portion of San Francisco, the Bayview/Linda Brooks-Burton Library was completed in 2013 and designed to be an open and inviting space for the community it serves. Many of the library's design gestures are a nod to the neighborhood's African and African American past, including the street-level window walls adorned with illustrations of the area's history, the kente cloth-inspired exterior paneling, and the space allotted throughout the library for works by local artist Ron Moultrie Saunders.

The firm designed the library to look inward, with a courtyard at the center large enough to host events; thanks to the floor-to-ceiling windows that surround it, the courtyard provides generous natural light and views throughout the interior spaces. The library contains several environmentally efficient features that helped it achieve LEED Gold status, including passive ventilation and air-filtration systems in the exterior walls, embedded photovoltaic arrays, and a green rooftop that filters stormwater runoff using native grasses and perennials.

3 Berwick Hall

When tasked with creating a permanent home for the Oregon Bach Festival, an annual event in Eugene, Oregon, that celebrates the works of Johann Sebastian Bach, Hacker Architects combined an office space with a double-height rehearsal room acoustically designed to function like the musical instruments that it contains. A wood panel system made of tongue-and-groove Accoya boards allows the tops of two of the rehearsal space's walls to bend in a way that provides abundant natural light from above while also preventing excessive audial buildup in the lower portion of the room.

Visually distinct from the cubic rehearsal space is the office bar, a lower-slung, redbrick building designed to match the older buildings on the University of Oregon campus. Many of its windows are operable, permitting natural ventilation while reducing the demand on the building's active heating and cooling systems.

4 Sunshine Canyon Residence

One of Hacker Architects' few residential projects—as well as one of the firm's smallest, at 2,200 square feet—Sunshine Canyon Residence was built in the hills outside Boulder, Colorado, to replace its client's previous home, lost in the Fourmile Canyon Fire near the site in 2010. To preserve the landscape, the majority of the house is supported by narrow steel columns that minimized the amount of construction work on the site. Given that the house is in a cold climate that receives an abundance of annual sunlight, its windows face south to maximize solar gain and reduce the need for active heating.

The materiality and formal simplicity of the home were inspired by the abandoned mine shafts, rusted steel mining structures, and naturally occurring granite bordering the site that resurfaced after the fire. The majority of the exterior is clad with corrugated steel and untreated lpe, both of which are designed to patina over time, like the nearby mining equipment. The interior is lined with clear vertical-grain fir that recalls the trees on the site while subtly changing in shifting daylight.

Ice Cold

Alaska's Cold Climate Housing Research Center is rethinking how the Circumpolar North builds.





Previous page: An Alaskan winter scene.

Left: Aaron Cooke, architect and program manager of the Cold Climate Housing Research Center.

The Cold Climate Housing Research Center (CCHRC) describes itself as “an industry-based, nonprofit corporation created to facilitate the development, use, and testing of energy-efficient, durable, healthy, and cost-effective building technologies for people living in circumpolar regions around the globe.”

Aaron Cooke, the architect who leads the Sustainable Northern Communities Program at the CCHRC in Fairbanks, Alaska, is at the front lines of helping northern communities in developing solutions for homes in extreme cold climates. Cooke spoke to Matt Shaw, *AN*'s executive editor, and Stephen Zacks, *AN* contributor, about technologies and prototypes being developed to conserve energy, recycle heat, rethink building envelope systems, stabilize homes situated on melting permafrost, and ensure supplies of fresh air. As the communities of the Circumpolar North adapt to climate change, their solutions hold lessons for carbon-neutral designs in the temperate zone while providing a pointed message about post-colonial regional design.

The Architect's Newspaper: What are the main areas of research for the CCHRC?

Aaron Cooke: Our largest program is the Building Science Research program, which deals with testing and researching the suitability of different techniques and products for the physical environment and cultural environment of circumpolar peoples. We also have a design program, the Sustainable Northern Communities program, that aims to take some of the building research and find real-world or holistic building applications. We design prototype homes that we test with occupants living in them for various periods of time.

Then we have a smaller program called Policy Research, which aims to aid policy makers and governmental entities but also looks at the code amendments that northern communities need to consider. Most northern places have small populations, so they don't have their own building code; they'll take a building code from the temperate region and add amendments specific to the physical environment in Alaska and the Circumpolar North.

Between those three programs, we try and stay at the forefront of regional design for the Arctic and subarctic climates.

AM: Can you talk about the challenges of the extreme terrain and cold weather in the north?

AC: The north has two primary challenges that it has to face constantly. We have an antagonistic physical environment that is very hard on buildings. Oversights in detailing or failures to plan small appropriate details in construction do not fail small in the Arctic: They always fail big, because it's a zero-forgiveness environment.

But in addition to our physical environment, the north has always faced a postcolonial problem. Every Arctic country in the world is governed by a capital city that is not in the Arctic—and that goes for Russia, Canada, Alaska, everywhere. So, there's underrepresentation in the design field, and in policy and building code. Importing technologies, assumptions, and best practices from the temperate zone without thorough vetting causes us as many problems as our physical environment does.

The idea of what a home—or a public building or a school—looks like and how it should behave is often based on temperate models, and we then have to retroactively make them Arctic. There have been famous attempts to make an architecture *for* the north, but there's been very little impetus to create an Arctic architecture *from* the north. It generally comes at us from the south, and we have to manage it somehow.

AM: Are there things that you're learning from traditional methods of conserving heat that go into your research, or is the group mainly developing new technologies?

AC: It's generally developing new technologies, but it's also giving a platform for traditional wisdom, because people have lived here for a very, very long time and have come up with innovative ways of building in the north. You're trying to make traditional communities aware of new technologies applicable in a harsh physical environment, and then you're also trying to be receptive and a good listener when people are saying what has worked or hasn't worked in the past.

As an example, we did an eight-sided house for a community in the Yukon-Kuskokwim Delta of Alaska called Quinhagak. It was a very windy place: Although it only got about 24 inches of snow a year, the snow would drift in houses to the point where you couldn't get out of the windows or in the door.

We did some pretty complex wind drift studies, and we

came up with this eight-sided house. We went out to the community to see if they were interested in building a prototype there to test it, and they were. We gave an analysis of winds, vector diagrams of how we thought the snow would self-scour away from the house, and I remember being in the community building and saying, “This is the shape I think that would be best for this region.” Someone stands up and said, “We used to make our houses that shape, we used to know that. It's only in the last 50 years that we've started making square boxes, and [snowbanks] started drifting in.” Some things we're discovering, and some things we're remembering, I guess.

AM: What are some of the new technologies you're developing or working with? Are they materials-based or are they wall sections?

AC: I'd say a very large bulk of our work could be divided into three fields. One is envelope design: We need warmer envelopes, and we need materials that go together in wall design differently. Arctic villages often don't have heavy equipment, so you're trying to find materials that can be constructed without cranes or trucks, or any of the things that we assume are going to be on job site. We also are looking at how things are transported when we choose our construction materials. When I was in architecture school, I never once had a class on sourcing materials. We assumed that the materials are going to show up at site; we'd choose them based on how they perform once they're assembled.

In our region, about 40 percent of overall construction costs are in shipping. But we don't take a course on how to choose materials based on how they ship, and the shipping companies are smart: The barge season is short, the air strips are short, and if something's heavier than it is big, they charge you by weight. If something's bigger than it's heavy, they charge you by volume. If the barge gets delayed, you don't build next month, you build next year. Most of our economics can be boiled down to how we get our materials to site and how we select them based on their appropriateness for shipping. In envelope design, a big part is to create a materials package that can be shipped and easily brought to a very remote location.

Besides envelope design, we work quite a bit with foundation design. The Arctic is one of the fastest changing regions in the world. There are a million models, and they all contradict each other, but one thing is for sure: We



Left: An assembly prototype being developed in the research center in Fairbanks.

Above: Adjusting a foundation in the village of Atmautluak.

have a lot less sea ice than we used to, and that is creating unprecedented coastal erosion that is forcing our communities to relocate. Land that has been permanently frozen since the last ice age is melting in very unpredictable ways and causing massive foundation failures. It's not hypothetically happening sometime in the future, it's happening to us *now*. Those are very expensive problems, so foundation design is something that we've been working quite hard on. One of the easiest things to get funding for is how to design foundations for the degradation of permafrost.

The third tier of what we research is mechanical systems: how to provide heat. We're always looking for heat that is more efficient, heat that is more clean and reliable. That'll never go away, no matter how much global warming occurs. The Arctic will always be one of the colder places on the earth, and we'll always have a winter in which we need heat somehow.

AN: Are there solutions that you've come up with, or ideal systems that you've developed?

AC: A paradigm shift has happened in foundation design in the Arctic during my short career. When I was studying to be a specialist in northern design, the basic rules for permafrost foundation design were if the ground's frozen, keep it frozen, and if it's thawed, keep it thawed—that's foundation design in the Arctic. In the 1960s and '70s and '80s, when they were putting more modern and larger buildings in the Arctic, as we were urbanizing, most of the building failures were because the building was leaking heat into the ground around the base of the foundation and melting the permafrost, creating a sinkhole. The building then had this foundation failure, and that was why most of the emphasis was on keeping the ground frozen through installation.

But now the permafrost is melting even if we do everything right. Even if we perfectly thermally isolate our building from the thermal regime of the soil, it's still melting out from under us in many circumstances, and the circumstances aren't something that we're able to easily predict. Since the research center is focused mostly around housing, we want adjustable foundations that the occupant can adjust without specialized knowledge—very simple mechanical foundations that can be leveled as the ground drops away or floods or heaves.

AN: What does that look like?

AC: It can be as complex as a kind of a Buckminster Fuller-style space frame, where you've got triangulated points that can be hand ratcheted, or it can be as simple as car jacks on top of columns that are pounded into the ground. We've tested no fewer than a dozen types of adjustable foundations. We're mostly looking at threaded rod and things that can be jacked with a cheater bar in a circular motion or with what's basically a glorified wrench.

We haven't given up on trying to keep the ground frozen. For larger buildings, we're still using thermosiphons and technology that takes advantage of state change and chemicals that have a boiling point around 32 degrees Fahrenheit so that they can move heat away from the ground. We're also looking at ground source heat pumps—or geothermal, as it's commonly called in the Lower 48—to move heat from the ground to the house for cooling in the summer and heating in the winter.

AN: What does field work look like? Is it mostly working with communities, or testing experiments?

AC: It's both. Almost every year we're building a prototype home somewhere with a local construction force. We train the local carpenters on new construction techniques. Living in an experimental house means there needs to be quite a bit of follow-up. We try to make a good, close relationship with the occupants so when there are problems with technology, they can call us, and we can get on a plane and head out there. I always require a resident of the experimental home to be on the crew, so that they fully understand the systems that are different than the rest of the houses in the village. That way, we have an above-average success rate with new technology acceptance and more pride in the construction. It's like Habitat for Humanity for building scientists.

AN: What are the main differences between the prototypes and traditional buildings?

AC: The prototypes always have an envelope that we're testing that's different than a two-by-six wall or a structural insulated panel, which are the two most common types of walls out there already. They always have a foundation type that we're trying to test, whenever we know that the ground is going to be volatile. We're also looking for new

mechanical systems, because rural Alaska is by and large an economically depressed region. There are large rates of poverty and overcrowding. We're always trying to lower the heating bill and create efficient mechanical systems and healthy indoor air quality, while lowering the amount people have to pay for fuel.

AN: Are you going out to sites and living in extreme conditions yourself?

AC: Oftentimes when we're building a house in the summer season, and we're in a village that's small enough that there's no real lodging, we're just sleeping on the gym floor at the school while school is out and building with the local crew. This summer, we oversaw the building of 13 homes for a community that's relocating entirely because their original community site's falling into the ocean now that there's no sea ice anymore. The fall storms have been eating about 80 feet of shoreline a year, and they're being forced to relocate the entire community. In that case, when we were building the first prototype home over there at the new community site, there was nothing there. We were just basically camping and getting our water and dealing with our own waste, and trying to stay warm through the season. Sometimes it's a very remote field camp, and then other times it's just hanging out at the school at night.

AN: Is there an ideal wall section that you've developed at this point—or if not, what are a few examples of improvements?

AC: One thing that almost all Arctic and northern walls need to have in common that makes construction more challenging is you absolutely need a complete thermal break in the walls. That flies in the face of every stud wall we've ever built.

Generally, a stud wall has a structured component, and then in between the structural components is insulation. But that means, of course, that the structure is leaking heat. At the inside, the two-by-fours are in the warm; at the outside, the two-by-fours are in the cold. That might get you through the winter in the temperate zone, but it absolutely doesn't work in the Arctic. We're always trying to make sure that nothing that touches the inside of the thermal envelope is also touching the outside of the thermal envelope.

We've done walls where we've used two-by-four studs



A house in Anaktuvuk Pass, Alaska, where unexpanded spray-foam was flown in and used to create an “inside-out” wall assembly system with metal studs covered in the foam insulation. It was designed with material transport costs as a driving force.

and then had a gusset plate made of something like PVC or OSB that holds the cladding up, and then we fill it with something so that the stud doesn’t reach all the way through the thick wall. We were looking at spray-applied polyurethane for a while; you can spray past the stud and make this adobe kind of shape as a way to avoid thermal bridging of materials. The double wall that could all go up at once added efficiencies to the framing of thick-walled structures. We’ve also looked at an older Canadian technique, recently updated, which involves reframing a two-by-four wall, sheeting the entire outside of the wall in rigid installation, and lapping the joints, not allowing any of the framing to touch the outside of the wall. This is called the REMOTE wall technique, and it would be a good fit for temperate regions with hard winters too.

- AN:

What are the main challenges to energy-efficient retrofits of existing buildings?
- AC:

The retrofits are a large part of our work. When you create a giant impermeable coat over your old building, the first thing that almost always happens is your indoor air quality suffers. When we do retrofits today, we’re always trying to approach indoor air environment and thermal comfort at the same time, because the understanding now is that a lot of times when you add R-value to a wall, you’re tightening the house, and you’re going to have to come up with a mechanical solution to address ventilation and fresh air.
- AN:

Are heat-recovery ventilation technologies a method for bringing in fresh air and ventilating moisture without losing heat in the process?
- AC:

Certainly there should be no such thing as waste heat in a place this cold, and heat recovery ventilators have been one of the technologies that have made the most progress in the last ten or 15 years.
- AN:

What is a heat-recovery ventilator, exactly?
- AC:

It is a method of solving the problem of fresh air being colder. You’re in a house, it’s very cold outside—say it’s 30 degrees below zero outside—and you don’t want to open your windows. You want to keep all the heat that you possibly can in your building. What that means is the carbon dioxide goes up, and anything your furniture is off-gassing becomes more concentrated. You’re not getting the air

- changes that you need to be a healthy human when you’re scared of the cold air coming into the house.
- There’s a branch of mechanical engineering that is concerned with taking your wonderfully warm but dangerously dirty indoor air and allowing the wonderfully clean but dangerously cold outdoor air to rob the heat from it without mixing with it. That’s the question: How do we steal heat from our used air and then get it out of the house so that we can get fresh, clean air inside, but have it be warm enough that people will use that system?
- AN:

The prototype in Anaktuvuk Pass looks strikingly different than other approaches. Is there a break from the past that you’re exploring, or is there a radically new wall section that you’re trying out there?
- AC:

It was a wall section that we had not tried before. Anaktuvuk Pass is fly-in only. They have no roads or barge delivery. Construction costs are extremely, prohibitively expensive there. We had been working with a spray-applied polyurethane applicator to see if we could create a wall that was a two-by-four steel structure that would be built inside out. We put the interior sheeting on the stud, and then we’d spray foam out and keep spraying past the foam to create that thermal break. The look that you see there—they’re a kind of dumpling, adobe look—is all based on the thermal requirements. It’s pretty far north.
- The other thing is that the residents there wanted to try a building where the foundation was on the ground. We use that polyurethane foam to create a raft, and the raft basically floats on the permafrost and bridges it if any movement occurs. The spray foam comes in barrels and expands to 30 times its size when it comes out of the gun. We can fit the barrels on the plane, and we can fit a lot more R-value per cubic foot on that plane because it’s going to expand once it gets to the site.
- AN:

Can you talk about any problems that you might anticipate in the crafting of a policy around the Green New Deal mandates meant for temperate regions that could have a potentially harmful effect on you?
- AC:

Ten or 15 years ago, there were a lot of adaptations that needed to be made for, say, a LEED system when it finally came north. The research center tries to incorporate environmentally conscious building practices into everything we do—we’re the farthest north LEED Platinum

- building in the world. There are certainly things that don’t apply: There was a time when permafrost was considered a wetland by professionals from the temperate zone, and in the south, you can’t build on a wetland. Here that would mean you couldn’t build on 70 percent of Alaskan soils—think about a land area bigger than the state of Texas that you’re not allowed to build anything in. Simple things like that. The other thing is the passive house ideal: Getting to 90 percent off fossil fuels in the Arctic is possible, but for the last 10 percent, the returns are just not there. Ninety percent has to be good enough, and then we have to realize that sometimes our heating is going to have to come from somewhere else.
- For all the theories of architecture and design, and all the isms out there—Classicism and deconstructionism, and all the isms that exist—I believe in regionalism in architecture because I live in a place where it’s necessary. Regionalist architecture manifests itself when and where it’s most necessary. It’s no mistake that it tends to be in places like deserts and the Arctic, places where if you ignore regional inputs to design, you ignore them at your peril. Your building will fail.
- AN:

In your collaboration with the Royal Danish Academy, how did their experience in extreme environments and yours overlap or inform each other?
- AC:

I try to work in a pan-Arctic sense, because we are all trying to solve similar, difficult design problems, but we’re doing it alone because the polar region is spread-out with a lot of different governments involved. The centers of design learning are also very far from us. There is no accredited degree in architecture north of 60 degrees latitude in North America. You’ve got to go south to get your degree, and then come north and unlearn quite a bit of what you learned in school. The Royal Danish Academy’s Architecture and Extreme Environments program recognizes this, and it does a very good job of engaging underrepresented regions in design discourse.
- I can remember taking my first construction methodology course while I was getting a master’s degree in Ohio, and we were talking about foundation design, and the professor—who was a very good professor, a good architect—was teaching us about how to get our foundations below the frost line. It was my first year of school, and I asked, “What do we do when we can’t get below the frost line?” He said, “Well, don’t build there. That’s a bad site.”



COURTESY CCHRC

The new Mertarvik village, seen here, was one of the first to be relocated in the face of coastal climate adaptation.

So, we have this familiar problem. We want to engage universities in our design growth. We want young, smart people to care about this place and move here or return here and practice architecture here. But again: Every university that is interested in saving the Arctic is located outside the Arctic, and this is a textbook postcolonial problem, right? We get approached by universities all the time; it's very in vogue right now to save the Arctic. The ice caps are melting, polar bears are going extinct—there are plenty of reasons that Lower-48 universities are suddenly interested in us, and we need them. We need the attention of the young designers who want to solve some of the difficult problems we have. But the question is always, are you willing to *send* your studio here, or are you going to try and solve the problem from South Florida?

University architecture programs, from our small rural perspective, bring a lot of resources. The unspoken worry in Alaska is that we are very far from the rest of the world. A lot of disaster relief funding is federal. It's been undeniably challenging that we're the first part of the world to be dealing with these massive community shifts due to climate change, but it's also good to be at the beginning of the process. The instant the rest of the population has to deal with it, too, there's not going to be any money left to move tiny little Alaskan villages. Once New Orleans and San Francisco and Manhattan have a climate change problem, that's the end of our help. We're trying to figure out how to handle these moves now, and what we're going to do when the resources to handle them get diverted to larger population centers. That's the Arctic problem.



COURTESY CCHRC

Cooke looking out over the village of Anaktuvuk Pass in northern Alaska.

West by Northwest: Oregon Ways

The more Oregon changes, the more it stays the same. How do the mythologies of Oregon's utopian seekers inform its design and architecture today?

Olson Kundig's human composting center.



COURTESY OLSON KUNDIG



Portland's Asian Health & Services Center, by Holst Architecture.

A few months back, while casually scrolling through some feed or another, I was struck by a series of images for a Portland-based boot company, Danner. Kicking up a faint cloud of dust with measured, deliberate steps, a lone photovoltaic maintenance worker moves across the image between parallel sets of solar trackers in a 64-acre facility in the high desert landscape just outside of Bend, Oregon. Emblazoned in bold over the image, the word “STRONGHOLD” conjured the workboot family and the attitude of the region from which it springs. In what could pass for a Green New Deal campaign lifted from only the most heroic of WPA posters, other images from the commercial shoot evoke the photovoltaic maintenance process—a delicate operation involving technical expertise, careful stewardship, the right boots “built for comfort and stability,” and a Dodge Ram with plates reading “1932,” Danner’s date of establishment prior to relocating to Portland, where it would supply loggers with caulked boots during the Depression. From those origins spring the current slate of boot categories: work, hike, lifestyle, hunt, military, and law enforcement, producing an uneasy space where aesthetic cohesion and mythologizing coagulate in an open wound of mixed messaging between bright green and militarized versions of the future. The Danner website declares: “The Future Is Strong.”

Scenes like the above are a renewable resource in the Pacific Northwest, underwritten by a low-key utopian sense that’s as much about a “way” of doing things as it is about place. Oregon is of the American West, but not exactly the center of its mythos. In the estimation of the 1940 Federal Writers’ Project guide to the state, Oregon’s position at the “end of the trail” leveraged terminus into an exceptional charge that “inspire[d] not provincial patriotism, but affection”: “The newcomer at first may smile at the attitude of Oregonians towards their scenery and their climate. But soon he will begin to refer to Mt. Hood as ‘our mountain.’” Here, the “dismal skies” and rains of winter were merely the “annual tax” one paid for the privilege of inhabiting a state of “eternal verdure”—a cozy picture that excludes the desert land east of the Cascades mountain range and a whole host of volcanic and seismic activity lying in wait and prone to violent outbursts.

For its part, the city of Bend has recently been deemed a commuter town for Silicon Valley and is an increasingly expensive playground where brewpubs, rec centers, inner tube flotillas on the Deschutes River, and extensive parkland make their own kind of lively stronghold at the base of the Three Sisters Mountains. As in Portland just on the other side of the Cascades, there’s a rolling collision between earlier imported and newly imported visions of an affluent good life in

nature that are just complementary enough to exist in tenuous détente while other narratives vie for recognition.

Upon arriving in Portland by way of a westward drive through the Columbia River Gorge, it was hard for me to escape the impression that this working landscape had been staged as an advertisement for the achievement of a kind of augmented reality just removed from the usual roiling of time. The B Reactor at Hanford, Washington, and the still-toxic ghosts of the Manhattan Project were out there somewhere, as was a Lamb Weston facility that processes 600 million pounds of frozen potato products annually, but here in this gash through the Cascades was a vision of forward movement in balance. Flanked by wind turbines running along the hill crests and with Hood’s emblematic peak directly ahead, rail and moss-lined roadways delivered a parade of works and features, from dams, locks, and spillways to waterfalls and elevated viewpoints. Some of these projects, like the Bonneville Dam, have been held up as pivotal but imperfect New Deal-era models of public hydropower administration, while The Dalles Dam is known more for its erasure of Celilo Falls, once a critical center of indigenous cultural and economic life. Such erasure and fragmentation, however, are far from the exception, as white nationalists have also long found refuge in Cascadia’s crevices and realty boards since the state’s founding in black exclusion. Here, too, the American Redoubt and various Cascadian secession movements pick up where Ernest Callenbach’s more countercultural 1975 novel *Ecotopia* left off with utopian search/seeking, be it for an ecotopia or a white nationalist stronghold.

As a perverse addendum to the theme of exclusion, however, Oregon’s urban growth boundaries have made for a compelling regional planning model, containing sprawl to preserve the “natural” playground and its biodiversity. In all things a kind of balance. Runaway utopian-as-utilitarian dreaming was, after all, the villain of California-born author Ursula K. Le Guin’s 1971 novel, *The Lathe of Heaven*, a fable of Portland’s exceptionalist attitude and the relative wealth of its natural inheritance. In this corner of the country, there was the possibility, for some, of a more comfortable—or less uncomfortable—future. Still, the novel’s status as a critique of progress or a privileged and resigned version of the same remains difficult to discern.

Storied weirdness aside, Portland is one of several metropolitan centers with the self-designation, “the city that works.” And it does, though critiques of the “sustainable city” are rolling in from those willing to cast a more critical eye toward the externalities and displacements produced through progress of this sort. Persistent NIMBY-ism and the ongoing

battle over a proposed I-5 expansion amid new reports that Portland’s carbon emissions reduction progress has flatlined since 2012 suggest that the city’s climate policies are still far from where they need to be. On a more positive note, Oregon HB 2001’s move to effectively dissolve single-family zoning was the kind of course correction one would come to expect in the wake of new evidence of housing need. As with other improvements over its history—UGBs, public ownership of the coast, mass timber innovation by firms like LEVER and Hacker, ecodistricts, hydropower, cycling culture, and transit-oriented development—in paving the way for a proliferation of duplexes, triplexes, and fourplexes, Oregon again models a quietly progressive version of a future.

Exemplary care-oriented building projects also come to mind, like the Seven Corners Collaborative in Southeast Portland, where Waterleaf designed a new, fully accessible colocation center for local nonprofits that provide support services for people with disabilities, along with an assistive technology lab for trainings, consultation, and public interface. Elsewhere, in the Lents neighborhood, a shelter in the repurposed shell of an old church forms the heart of a new “family village” campus by Jessica Helgeson Interior Design, Carleton Hart Architecture, and Corlett Landscape Architecture that’s furthering the use of trauma-informed design and concentrated service delivery for families experiencing homelessness. Also in Lents, the new Asian Health & Service Center by Holst provides a venue not only for much-needed affordable healthcare services for the area, but also a well-appointed infrastructure for community social events, all granted a generous view of Mt. Hood from the top floor. SCOTT | EDWARDS ARCHITECTURE’S Portland Mercado fulfills a similar social function for Portland’s Latinx community through a modest adaptive reuse and landscape strategy that ties an existing structure together with a series of food carts, covered outdoor space, and copious seating. Led in part by the efforts of the latter two firms along with Ankrom Moisan and organizations such as Home Forward and Central City Concern, recent supportive housing projects in the city, such as Bud Clark Commons, the Beech Street Apartments, Garlington Place, and the Blackburn Center, are also demonstrating how architecture can operate and innovate through a lens of care and playfulness rather than singular virtuosity or brute force.

This ethos also comes out in Portland’s new and renovated green spaces, such as the collaboration by 2.ink Studio and Skylab on Luuwit View Park in East Portland. The park stands as a microcosm of the city’s celebrated urban landscape innovations, complete with community gardens, dog park, skate



Top: The Bonneville Dam Spillway on the Columbia River, which runs along the Oregon-Washington state border.

Above: Portland Mercado is a public market that supports over 40 local businesses from the Latinx community.



The Dee Wright Observatory in the Willamette National Forest outside Bend.

park, event shelter, public art, stormwater treatment area, and bilingual signage to acknowledge and accommodate the diversity of new residents in the neighborhood, as well as trails aligned with distant landmarks like Mt. St. Helens, or “Luuwit,” as named in the Cowlitz language. Likewise, with Cully Park in Northeast Portland, 2.ink explored similar design elements on the site of a former landfill in an underserved neighborhood, including significant habitat restoration, a fitness course, and the city’s first Native gathering garden. Developed by the community nonprofit Verde in partnership with the city, the project engaged neighborhood residents throughout the process with outreach, employment, and education programs.

More broadly, a host of design and planning-based initiatives work to translate reparative sociopolitical agendas into spatial terms, such as the Portland African American Leadership Forum’s 2017 *People’s Plan* and the more recent Portland Bureau of Planning and Sustainability publication on the *Historical Context of Racist Planning* in the city. Blocking pipeline projects and filling streets in the name of climate action, Sunrise, XR, and 350PDX also stake active claims on the city and its future, while newly constructed works like FLOAT’s Portals in Southern Oregon stage direct action pipeline resistance, countering fossil fuel extraction logics with an expansive meditation on architecture’s capacity to support multispecies reciprocity. Further, initiatives and organizations throughout the region like Columbia Riverkeeper, Sightline, Wisdom of the Elders, the High Desert Partnership, and the Ashland Forest Resiliency Stewardship Project engage in environmental care and land management through advocacy and cross-scalar collaborations, while efforts by the Friends of Trees and the city’s Green Street Steward Program involve volunteers in urban greening and bioswale maintenance. On the academic front, Portland State University’s Center for Public Interest Design was founded in 2013 to respond to the needs of underserved communities in the city and abroad and has since paired design-build work with robust community engagement processes, while the University of Oregon has launched a multidisciplinary fellowship initiative in Design for Spatial Justice, which mobilizes theory and practice in foregrounding narratives, experiences, and modes of design, political action, and biodiversity conservation long marginalized or excluded by fields responsible for the built environment.

How this expanding constellation of projects and practices might fare in an escalating climate struggle is a crucial question. With even cursory estimates of climate-induced in-migration to the region due to sea level rise alone projecting numbers in the hundreds of thousands over the next few decades, the chal-

lenge for utopia would initially seem to be one of scale. The war footing rhetoric of the GND, like that of the New Deal before it, anticipates such scales of action in the work of justice and infrastructural investment. A war footing for scaling care, however, is perhaps a more fraught and paradoxical charge, particularly as the goal would be to move beyond a narrow definition of relief as improvised response toward the construction of more durable and equitable systems merging care with justice.

In a dysfunctional climate regime, what does it mean to position oneself as a stronghold or a refuge, or a model city? When PG&E issued its now infamous directive to its California customers to “use your own resources to relocate” when the utility company unilaterally shut off power to nearly a million people back in October, it signaled that climate change survival would become a matter of self-reliance if left in the hands of those with no obligation for care. Against this backdrop, even a modicum of external accountability would come to appear as care and competency. As Holly Jean Buck writes, “There are plenty of scenarios where we deal with climate change in a middling way that preserves the existing unequal arrangements... [where] even muddling through looks like an amazing social feat, an orchestration so elaborate and requiring so much luck that people may find it a fantastic utopian dream.” In a global theater of sociopolitical and ecological degradation, it becomes difficult to assess the utopian potential of projects that work well within familiar registers, leading in some cases to a privileging of expediency and the reenactment of functioning models.

But, even with the relative risk aversion, what bridges the perceived cultural gulf between the measured and occasionally errant strands of progressivism in the Pacific Northwest and the most fanciful Silicon Valley fever dreams is the recurring belief in some level of remove as a precondition for positive transformation and mastery. The right person in the right boots in the right geography, and a comfortable future is assured. The inclusion of photovoltaics in that picture is a welcome addition, but what is the future of an image like this in a present where what’s demanded is both a dissolution of the concept of human mastery over the environment and a dramatic mobilization, reorientation, and upscaling of progressive instruments closely aligned with the tools, attitudes, and systems that delivered the environment to the brink of collapse in the first place? Its violence veiled as much as romanticized, the story of a pioneer harnessing the productive power of a landscape was one promise of “the West.” As many of Oregon’s latest projects begin to suggest, there are and should be others, and the next steps are critical in defining the kind of refuge the region will become. **Justin Fowler**

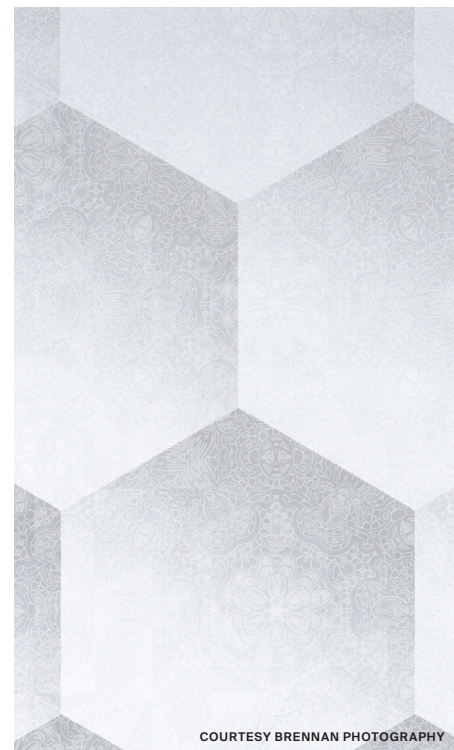
Optical Illusions

Marcel Wanders's metal skins play with perspective.

Dutch designer Marcel Wanders teamed up with the architectural metal walls design studio Pure + FreeForm on a collection of metal panels whose appearance change with the light.

Aptly dubbed, the Chameleon collection comprises designs for eight metallic sheets adorned with various nature-inspired motifs. Like some sort of ephemeral performance, these panels seem to shape-shift in response to their surroundings. Different light refractions at various times of the day alter the appearance of the metal sheets. At different angles, the surface visually transforms, showing different colors and textures.

The collection demonstrates Pure + FreeForm's technical abilities while exploring the limitations of metal as a material and surface. In a dialogue between the mise en scène and the enveloping metal skins, nonspecific design is upstaged by dynamic visual ephemera. Wanders said: "Directed by the intensity of the sun, the movement of the clouds, the density of urban humidity and the dance of its reflections, our Pure + FreeForm skins present an endless symphony of voices, creating an infinite architectural opera that makes us experience our cities every day anew. Architectural subtlety like never before." **The Editors**



Lace features a latticework of nature-inspired designs overlaid on shaded hexagons.



The metal Chameleon collection is suitable for interior wall paneling as well as for exterior cladding.

Domestic Details

For our first-ever special section on residential construction, step into case studies that explore the makings of domestic-scale buildings from inside out. These include origami-like townhouses in Portland; an Oza Sabbeth house in Sag Harbor, New York; and a Long Island passive house. The product pages survey the latest smart home devices, kitchen and bathroom fittings, weather and air barriers, and more. By Gabrielle Golenda



Greenport Passive House

Architect: Wayne Turett
Location: Greenport, New York

Contractor: The Turett Collaborative
Plumbing: Duravit, Hansgrohe Axor
Exterior siding: Fabricated by Vector East
Flooring: Heart Pine with Woca White Pigment Oil
Hardware: Kenwa, Ranpo, Kwikset
HVAC: Mitsubishi
Roofing: Atas Aluminum Standing Seam
Windows: Bildau & Bussmann by Eco Supply

The Greenport Passive House is an energy-efficient project in the harbor town of

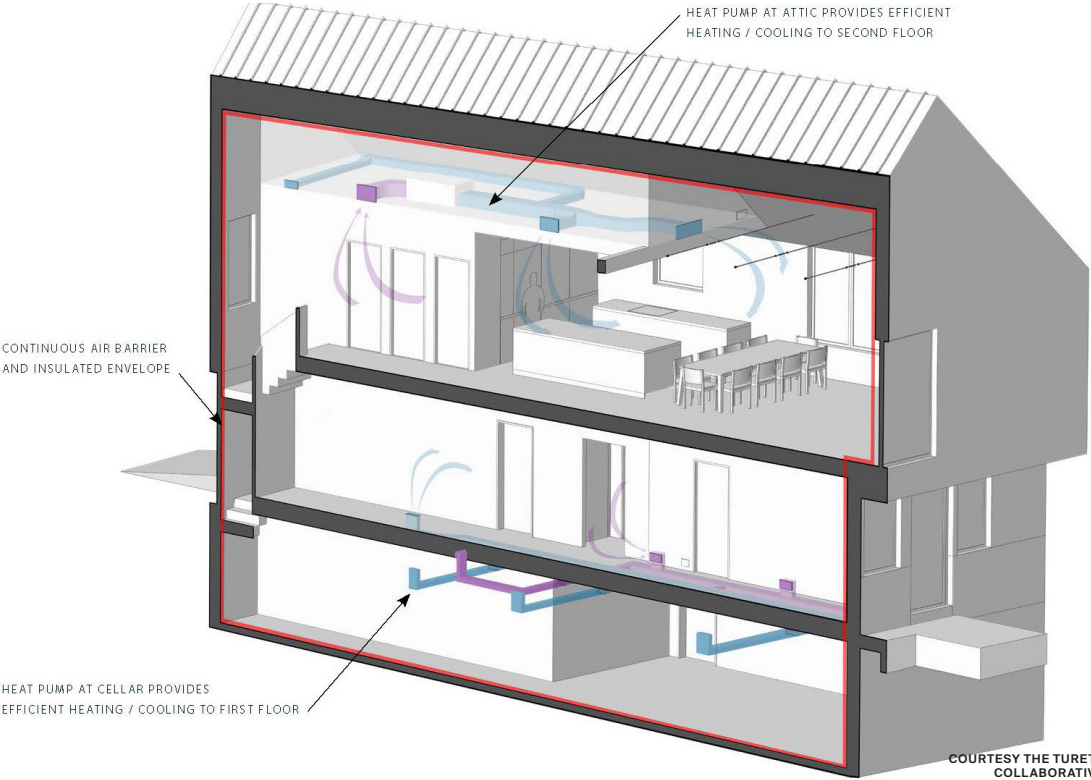
Greenport, New York, on the North Fork of Long Island. Architect Wayne Turett designed the residence as his own home. Drawing inspiration from the local barn vernacular, the carbon-neutral project was made to show how designers can address the climate crisis without sacrificing contemporary expectations of comfort and style.

Turett considered three key elements in the design of the Passive House: “First, the building envelope, which had to be completely sealed so that there was no leakage of air; then the insulation, to ensure that heat would not escape or cold air enter; and finally, the added elements like roof overhangs that

protect the house from receiving too much sunlight in the summer,” he said. As a result of these decisions, the Greenport Passive House consumes nearly 90 percent less heating energy than existing homes and 75 percent less energy than average new construction. The home also benefits from triple-glazed windows and energy-recovery ventilation, which brings in and takes out air.

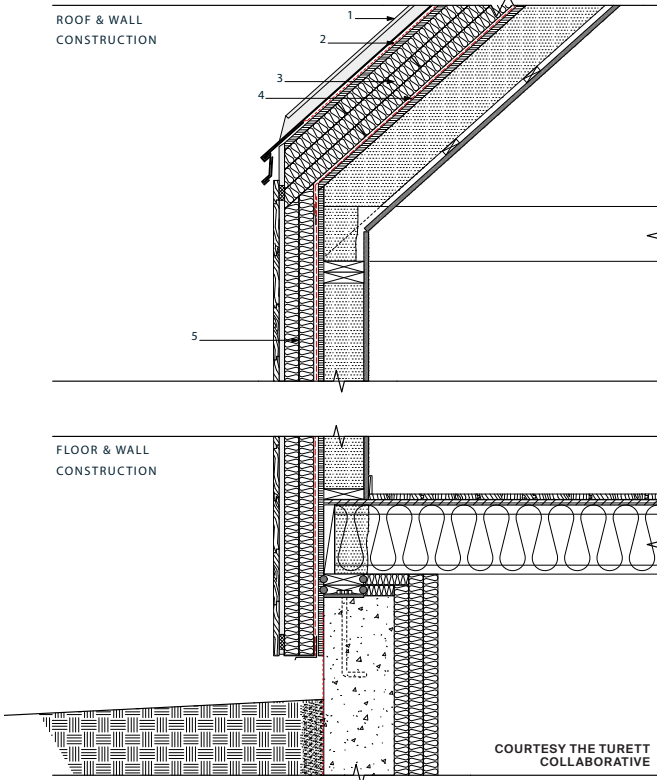
The home’s exterior is shiplap gray cedar and cement with an aluminum roof. The insulation works in combination with a proprietary sheathing taped to form the air barrier, allowing for an airtight building envelope. The all-electric home is heated and cooled with a

duct mini-split system aided by an ERV. Inside, a neutral color scheme and light wood materials along with white walls and upholstery create a bright, airy aesthetic. A combined kitchen, dining, living room, and porch were intentionally programmed on the second level with views to the water. Below, bedrooms and bathrooms are accessed via an outdoor shower to smooth the transition from the site’s sandy shores. As an integrated project, the home fuses Turett’s modern aesthetic with a performative building envelope. **Eric Baldwin**



Top: In the living areas, operable glass walls can provide ventilation in warm weather.

Above left: An airtight thermal envelope and heat pumps keep the house conditioned.



Above right: Beneath a standing seam metal roof (1), an adhered ice and water shield (2), six inches of poly-iso insulation (3), weather and air

barrier (4) cover the structure. Four inches of poly-iso insulation (5) fill the exterior walls.

Connected Kitchens

From a wireless charging surface to a touchless faucet, these devices feature technologies that make cooking and entertaining easy.

Sensate Kohler

This voice-activated kitchen faucet is truly hands-free. Commands include turning the water on and off, dispensing measured amounts of water, and touchless motion-based interactions. Via the KOHLER Konnect app, users can track water usage and detect leaks.

us.kohler.com



Dual Fuel Range, 48 inches, 4 Burners, 4 Zones Fisher & Paykel

Featuring dual cooking areas—four gas burners and four induction zones—this integrated range is equipped with a high-resolution touch screen interface. Besides controlling obvious functions, like the precise temperature of the oven, the platform gives users access to recipes and information about ideal settings for different kinds of cooking.

fisherpaykel.com



400 series wine storage Gaggenau

This wine climate cabinet features a TFT touch display that controls three different temperature zones. To hide or display up to 99 bottles, the units come with glass-framed or stainless steel doors in 18- and 24-inch widths.

gaggenau.com



GENNY Watergen USA

This standing water filter actually makes water from air—up to 8 gallons per day. Originally designed for communities without access to clean water, the technology requires only an electric power source to deliver a renewable supply of H₂O.

watergenusa.com



DUO Carafe Heatworks

With two spouts—one red, one blue—this carafe instantly heats and cools water to a temperature within 1 degree Fahrenheit of the set point. Powered by batteries wirelessly charged on the magnetic port, the heating and cooling elements are not compromised by exposure to water and air (and don't leave a strange taste in the filtered water).

myheatworks.com



Intentek Wireless Charging Surface Formica

Forget the phone charger—Formica has installed wireless charging technology directly within a laminate surface. Integrated coils wirelessly charge Qi certified devices simply placed on top. Durable and easy to clean, the surface is offered in a range of colors and textures.

formica.com



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Origami



Architect: Waechter Architecture
Location: Portland, Oregon

Contractor: Yorke & Curtis
Structural engineer: Grummel Engineering
Civil engineer: KPFF
Landscape: Lango Hansen
Rainscreen: James Hardie
Concrete block: Mutual Materials
Windows: VPI Quality Windows
Doors: Andersen, VPI Quality Windows
Cabinetwork: Euro-American Design
Paint: Miller Paint
Solid surfaces: Caesarstone
Floor and wall tiles: Emser Tile

Lighting: Kuzco Lighting, RP Lighting + Fans
Plumbing: Duravit sinks, bathtubs, toilets, and faucets

Origami is a new residential development by Waechter Architecture in Portland's Piedmont neighborhood. As an urban gesture, the project occupies a full city block with twelve wood-framed townhouses. The buildings' footprint surrounds a shared internal court at the back, where each residence has private space for gardens and parking. Exterior wall surfaces allow each unit to retain its own character.

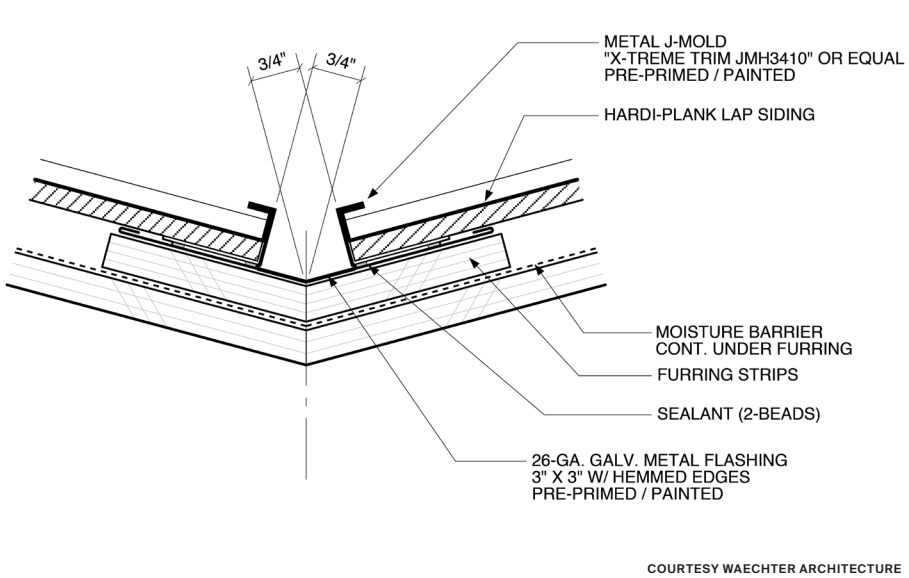
The design takes inspiration from origami, the Japanese process of folding paper to cre-

ate complex forms. In a play of light and shadow, the team used the concept of "the fold" to shape a roofscape that connects the gabled facades of each unit. Waechter decided to use Hardie siding and asphalt shingles to bring together the exterior walls and roof surface. To enhance the desired qualities of shadow relief and texture, the designers went beyond cladding with several techniques, including a flashing detail and window placement.

Principal Ben Waechter explained the approach, noting, "At a building scale, we folded the facade, and at each of the folds there is a special detail that visually gives the impression that the facade plane has been scored

and folded. This three-piece flashing detail allows the fold to bend at a concave or convex angle. All the windows are recessed into the wall cavity rather than attached directly to the outside face of the sheathing. With the windows recessed, the trim is able to be applied perpendicular to the facade, giving it more visual depth than what is typically achieved with standard flat trim."

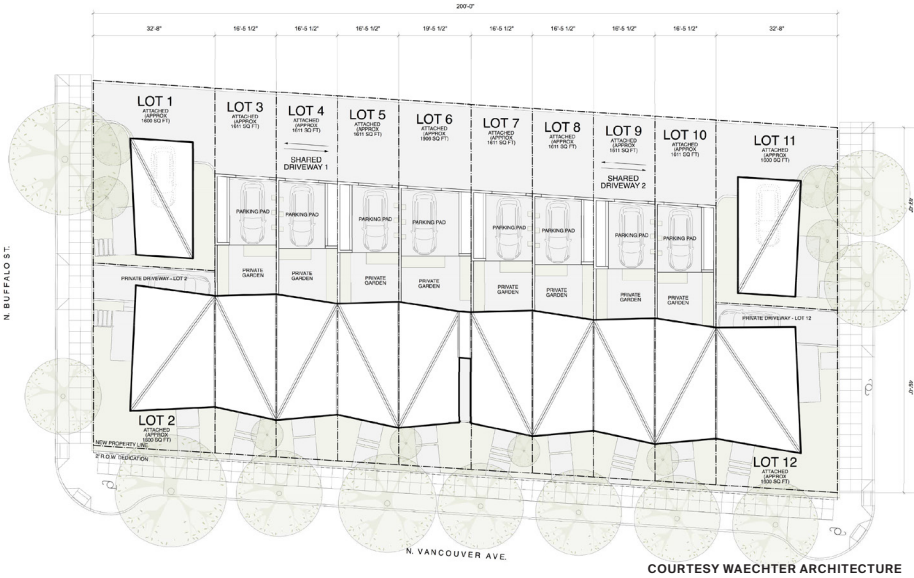
Origami is a study in scale and balance for new multifamily housing. The project's concept provided individual articulations of each unit while maintaining the sculptural impact of the whole, and in turn, created a subtle identity for the development. **Eric Baldwin**



Top: The gabled roofs and walls take cues from origami, the Japanese art of folding paper.

Above left: A wall detail shows how metal flashing and channels meet the James Hardie siding at corners.

Above right: The folds of the massing articulate the development's twelve lots.



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ST. CHARLES NEW YORK • SUB-ZERO | WOLF | COVE • THERMADOR
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Weather and Air Barriers

These insulating layers keep the rain out without compromising air circulation. Made specifically for residential construction, the following barriers provide the best coverage for home-size projects.

C3 Engineered Wall System MgO Systems

Combining fireboard with structurally insulated panels, this barrier solution provides thermal and acoustic insulation. In addition to being resilient to fires, the prefabricated system reduces installation time and construction waste.

mgosystems.com



LP WeatherLogic Water Screen LP Building Solutions

The latest update to LP's weather membrane includes a synthetic polymer-based screen that maximizes ventilation and increases drainage. The lightweight system is designed to pair well with LP's other residential construction products, such as siding and trim.

lpcorp.com



Effisus Breather FR System Effisus

This weatherproofing system envelops structures in a water- and wind-tight membrane. The integrated solution is ideal for various residential applications, including curtain walls, rainscreen cladding, and projects requiring maximum fire resistance.

effisus.com



HP+ Wall System BASF

This wall system brings together two technologies: Walltite, a high-performance air and water barrier, and Neopor, a graphite-strengthened rigid thermal foam insulation. Available in multiple assembly configurations for different climates, it is designed to be combined with BASF's construction products.

basf.com



CertaWrap CertainTeed

Add a layer of protection to block out moisture and provide ventilation with CertaWrap's Premium Weather Resistant Barrier or Standard Housewrap. Both applications come in a variety of roll sizes and widths to accommodate a range of residential types.

certainteed.com



DELTA-FASSADE SA Dörken Systems

Designed specifically for insulating projects with an open-joint cladding system, this weather and air barrier is highly resistant to UV exposure. The membrane is fashioned in a three-layer polypropylene substrate complete with a UV-resistant acrylic coating.

dorken.com



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Touchless Bathroom

These bathroom products turn on and off via automated commands. Other enhancing features include thermal disinfection, scald protection, hygienic flush, and more.

Viu/XViu Duravit

This ceramic bathroom furniture collection features a smart mirror vanity with touchless icons to control ambient lighting and myriad other functions. When paired with Duravit’s electronic facet, D.1e, the unit displays water temperature via the color of the light on the handle, from a cold blue to a hot red.

duravit.us



RP WASHLET+ RX Wall-Hung Toilet TOTO

This high-tech potty is outfitted with a concealed connection that can support up to 880 pounds. Spalike functions include an automatic air deodorizer, a warm air dryer, and a heated seat with temperature control (and, obviously, auto flush).

totousa.com



KOVA Select KOVA

Vertically integrated company Kattera recently launched KOVA, a division of modular appliances, plumbing, and lighting to outfit entire projects. The KOVA Select Plumbing System encapsulates the scope of products needed for any bathroom (and kitchen), including faucets, shower mixers, diverter valves, and more.

kovaproducts.com



Hi-Tech Bluetooth Mirror Strasser Woodenworks

This fully automated mirror with perfect LED lighting for makeup application also features Bluetooth-enabled sound, defogging heat, and touch controls. It is offered in three sizes: 24 by 36 inches, 36 by 36 inches, and 48 by 36 inches.

strasserwood.com



TapeMat Kit with SunStat Connect Wi-Fi Thermostat SunTouch

The newest addition to this family of electric floor heating products is a programmable, touch-screen thermostat control, the SunStat Connect Wi-Fi. The kit comes complete with everything needed for assembly, including peel-and-stick tape for easy and quick installation. The 2-foot-wide TapeMat is available in various lengths.

suntouch.com



Water Leak & Freeze Detector Roost

Detect leaks and frozen pipes with this sensor that sends alerts via the Roost app. Place it anywhere where a potential threat exists: underneath a sink, near toilets, or by pipes that could freeze.

getroost.com



Smart Homes

Automated via voice control or smart apps, the latest devices are connected to a central hub to optimize energy usage and minimize consumption levels.

Decora Smart Voice Dimmer Leviton

This dimmer, available in early 2020, enables users to fully automate lighting via voice control or remotely with the Leviton app. Features include dimming, preset schedules, custom “scenes,” vacation mode, and more. And because it is equipped with Amazon Alexa, many other “smart” functions like music streaming and news updates are available.

leviton.com



Laser Egg+ CO2 Kaiterra

Using cloud-based calibration, this device’s sensors accurately detect levels of carbon dioxide, air quality, temperature, and humidity. Users can monitor the device remotely via the Kaiterra app, which allows them to see shifts in air quality in real time, understand trends, and set alerts that notify them when measurements exceed preselected levels.

kaiterra.com



PowerView Motorization Hunter Douglas

Tired of turning the blinds down? Cover all windows at the touch of a button. PowerView Motorization is designed for use with the Hunter Douglas app, but it is also compatible with Alexa, Google, Apple Home Kit, and other smart home platforms. It is available with over 20 shade styles that are customizable by color, size, and fabric.

hunterdouglas.com



Line Voltage Doorbell NuTone

For quick installation, this doorbell kit comes with a built-in transformer and a wireless, battery-free push button. It allows users to choose one of eight electric chime tones.

nutone.com



Buoy Whole Home Water Controller Buoy Labs

Installed directly in the main water line, Buoy shuts off the water supply when a leak is detected. Users can track water usage in real time and chart trends via the Buoy app.

buoy.ai



Smart Home Starter Kit Aqara

Aqara’s kit includes a central hub to manage a full range of wireless smart home automation, including lighting, security, and surveillance. Users can activate their devices—from window and door sensors to a smart plug that can turn on the coffee maker every morning—via voice commands or remotely with Apple Home or the Aqara Home app.

aqara.com



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East End House

Architect: Oza Sabbeth Architects
Location: Sag Harbor, New York

Engineer: CRAFT | Engineering Studio
Contractor: Modern Green Home
Facade: Mahogany decking over Pro Clima weather resistant membrane; EPDM over plywood sheathing
Roof: Mahogany decking over EPDM
Aluminum doors: Arcadia
Aluminum windows: Gerkin Windows and Doors

Located on the edge of Long Island in Sag Harbor, New York, the East End House by Oza Sabbeth Architects takes cues from the surrounding landscape. Sag Harbor developed as a working port on Gardiner’s Bay and was designated as the first port of entry to the United States. Today, the village is home to a range of vernacular structures associated with whaling. Inspired by this context and the densely vegetated pond on-site, the East End House reinterprets both regional forms and materials.

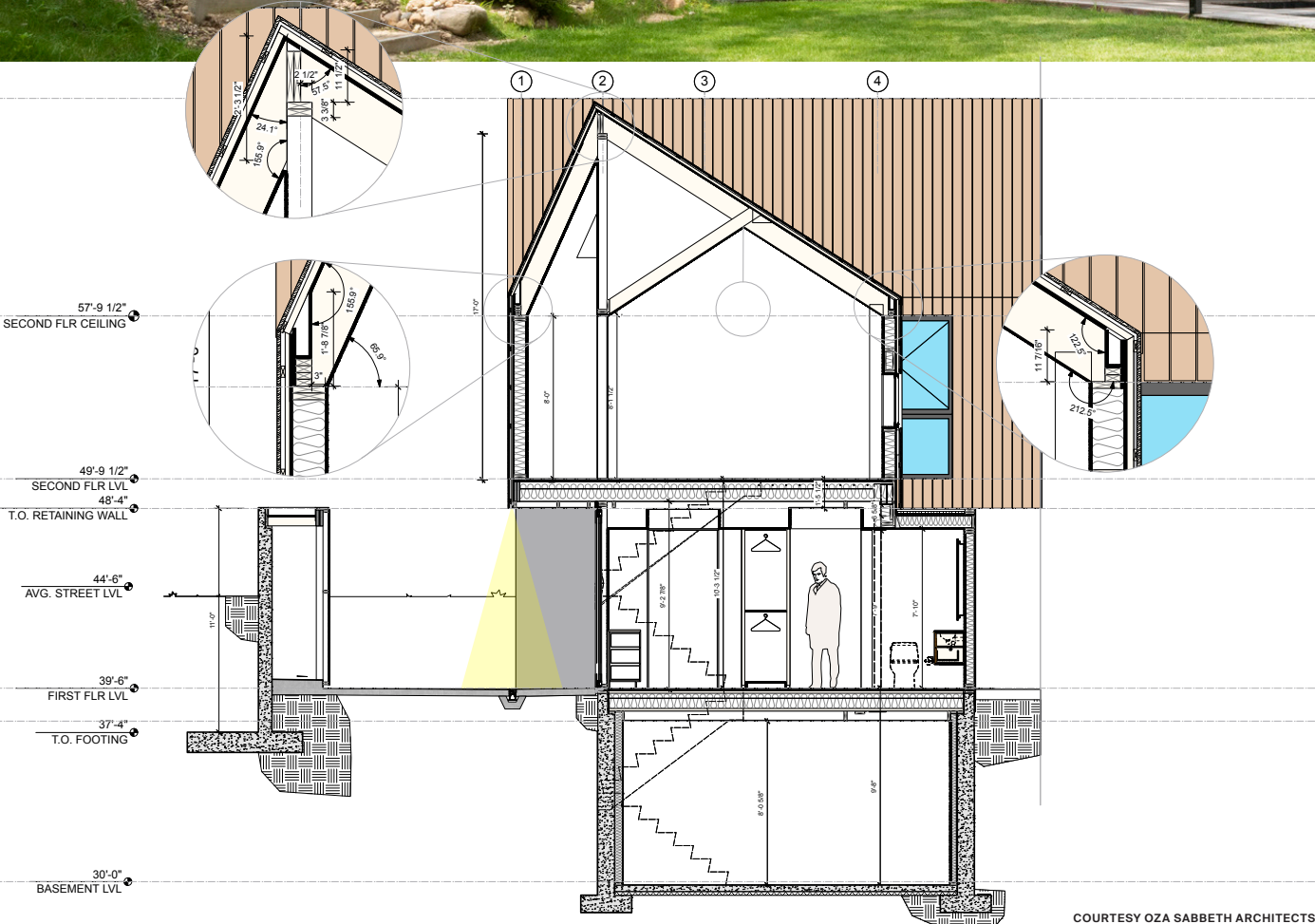
The project is bookended by the pond and a busy turnpike. To create a tranquil sense of

place, the home’s form turns away from the sights and sounds of street traffic and toward the pond and forest. The building features a sequence of moments that showcase its layout and materials. The entry is composed of a dense bulwark of concrete and wood, as well as an intimate forecourt. From there, an entrance foyer opens up to the landscape and pond. The organization in plan generated a private front and an accessible backyard with multiseasonal outdoor spaces on the lowest level.

Oza Sabbeth experimented with using substrates as finish materials for the home. The

roof and walls are designed as a rainscreen assembly of exposed rubber (EPDM) and mahogany decking material. “The substrate, EPDM in this case, is revealed in instances and slips behind the mahogany shell where needed,” said Oza Sabbeth principal Nilay Oza. The flooring is a poured self-leveling concrete, typically used as a substrate for tile. For the millwork and wall panels, the team used a Baltic birch platform as a base upon which more expensive finish veneers were applied.

Eric Baldwin



Above: The exterior is clad in mahogany, birch, and EPDM rubber, each material covering a separate floor.

Left: The building’s multiple cladding materials required a range of section and corner details.

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RIEDER

Ashley Avenue II

Architecture and interior design: TaC studios, Cara Cummins, AIA
Location: Atlanta

Cabinetry: Design, TaC studios; fabrication, Gatto Kitchen Systems
Countertops: Neolith Calacatta
Appliances: Miele
Flooring: Ceramic tile, Imola Concrete Project 48x48
Pendant lighting: SONNEMAN
Custom table and buffet: Design, TaC studios; fabrication, McMeubel

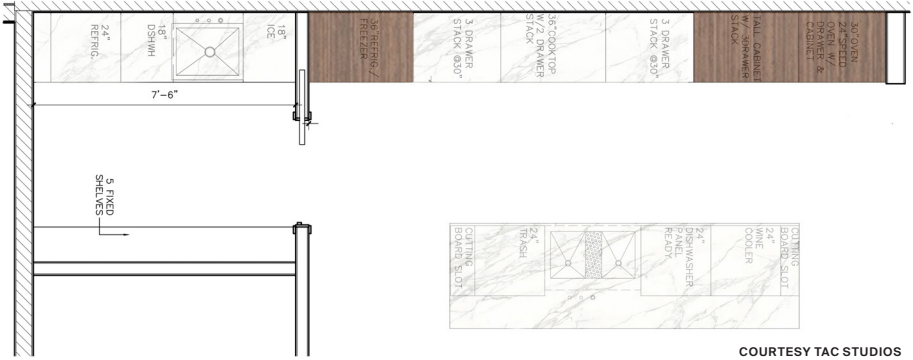
Located one block from the Atlanta BeltLine, this residence by Atlanta-based TaC studios was inspired by nature. Built for jewelry designers, the home features handcrafted and custom components, and the subdued interior’s rich woods and locally crafted furniture provide warmth and clear functionality. The house is 35 feet wide—creating a challenge to maintain connections between living spaces and the exterior courtyard, garden, and pool—and the spacious kitchen ties the house together at its heart. It showcases a stripped-down aesthetic and embodies an approach that blends the modern with the elemental.

A pocket door divides the kitchen and a pantry, which accommodates extensive shelving, an extra refrigerator, a prep area, and a dishwasher. The kitchen’s central waterfall Neolith Calacatta countertop continues into the pantry, which unifies the two spaces. “The clients are great entertainers who wanted to be able to expand the gathering area on short notice to have everyone in the kitchen,” architect Cara Cummins said.

The kitchen’s details come together in an interplay between interior and exterior spaces. Large 12-foot sliding doors open from the kitchen to the terrace, which can be enclosed by retractable screens. Inside, opposite the kitchen, a white oak stair on a custom steel stringer rises to the roof level with detailing that allows for illuminated art displays. Custom millwork throughout the home was designed by TaC studios and built locally by McMeubel.

The architects selected materials with an eye toward their longevity: Brick, cementitious stucco, cement board, and ceramic roof pavers all emphasize life-cycle durability. The home features LED lighting throughout, lighting system controls, foam insulation, and high-performance windows. Outside, a bronzed screen blocks the setting sun and was made as a nod to the historic city blocks of the Old Fourth Ward.

Eric Baldwin



Top left: The open kitchen connects to an outdoor patio and the indoor living and dining areas.

Top right: The kitchen features an island with a Neolith waterfall countertop.

Above: The countertop continues in the adjacent pantry.

Right: The kitchen is outfitted with Miele appliances.



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usa.sika.com

ZIP System Liquid Flash Huber Engineered Woods

This liquid flashing mixture is immediately resistant to water and cures in only 20 to 40 minutes. It adheres to a wide array of building surfaces, including concrete, masonry, wood, glass, metal, PVC, and EPDM.

zipliquidflash.com

Titebond Roof Plus Sealant Franklin International

Made from a solvent-based elastomeric rubber, this sealant is inherently water-resistant. It is designed for typical roofing applications as well as specified uses, including solar roof systems and architectural metals.

titebond.com



Drywall Advanced LIQUID NAILS

Drywall Advanced is a liquid-applied technology that reduces nail pops in interior drywall installations. Correcting small irregularities, it also reduces fastener use and adds acoustic performance.

liquidnails.com

MAPEFLEX PU40 MAPEI

This polyurethane solution was developed specifically for sealing expansion and contraction joints in both horizontal and vertical applications. Ideal for facades and industrial floors, it automatically hardens in reaction to the humidity in the surrounding air.

mapei.com

Wood-Tack Bostik

Quickly install wood flooring materials—solid, engineered, and select bamboos—with this rapidly air-curing adhesive. Perfect for use in residential, office, and light commercial applications, it contains low VOCs and no solvents or heavy metals.

bostik.com



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Heating, Ventilation, and Cooling

The latest HVAC systems for single-family homes, apartments, and other residential applications provide plentiful ventilation along with efficient cooling and heating at the touch of a button.

BreezElite Ventilation Fan Delta

This bathroom exhaust fan allows for hands-free operation with a built-in humidity sensor. Its special mounting-bracket system simplifies installation, maintenance, and renovation.

deltabreez.com



MM14CHCS Portable Air Conditioner Honeywell

Set on rolling wheels, this portable indoor system houses four features within one unit: heating, cooling, airflow, and dehumidification. Ideal for single rooms (or New York studios), the MM14CHCS has three fan speeds, a 24-hour energy savings timer, light-touch digital buttons, and a remote control.

honeywellstore.com



Art Cool Mirror LG

Aptly named, this wall-hung HVAC unit features an opulent mirrored chassis. Offering superior energy efficiency with real-time feedback, the duct-free inverter technology is equipped with built-in Wi-Fi for touchless operation.

lghvac.com



SLZ-KF Four-way Ceiling Cassette Mitsubishi Electric

Featuring multiple-way vane controls, this ceiling-mounted ductless unit allows users to select up to four airflow patterns. When paired with the 3D i-see Sensor, it automatically detects room capacity to adjust temperature, airspeed, and other qualities for optimal comfort.

metahvac.com



nanoe X Panasonic

The main feature of this ductless heat pump unit, available in early 2020, is a built-in air and surface purification system that penetrates deep into carpet and furniture fibers. With nearly whispering airflow, the technology dispenses nanoscale OH radicals to reduce odors and pollutants.

aircon.panasonic.com



YHG YORK

The newest release within the LX series features a compact body to fit in tight spaces. Users can connect remotely via Alexa or YORK's Affinity Hx3 thermostat to monitor energy usage in real time.

york.com



Resources

Kitchen and Bathroom

American Standard
americanstandard-us.com

Amuneal
amuneal.com

California Faucets
calfaucets.com

Cosentino
cosentino.com

Dacor
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Kingspan Light + Air
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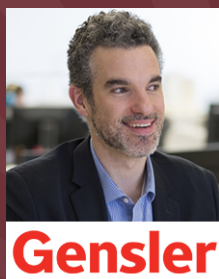
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49 Highlights

West

Survival Architecture and the Art of Resilience

Museum of Craft and Design Through May 3, 2020
2569 Third Street
San Francisco



This exhibition at San Francisco's Museum of Craft and Design showcases visionary solutions for emergency shelters in the wake of natural disasters. Curated by Randy Jayne Rosenberg of Art Works for Change, an organization that produces exhibitions that relate to social and environmental issues, *Survival Architecture and the Art of Resilience* imagines the future of a climate-constrained world by addressing the need for adaptable housing for vulnerable populations.

One proposal, *Cardborigami*, by Tina Hovsepian, is a compact and foldable cardboard structure suitable for two people to sleep in.

Mary Mattingly's *Desert Deployment 2* (top) evokes military camouflage in the covering of a tentlike shelter. *Cricket Shelter: A Modular Insect Farm*, by Mitchell Joachim (above), imagines the future of food with a 21st century twist on a chicken coop. Other projects by over 20 artists and studios illustrate radical approaches for navigating extreme weather. Organized into four themes—Circular, Portable, Visionary, and Resilient—the works ask viewers to envision how the built environment can be designed flexibly in a time when change is the only constant. **Leilah Stone**

East

Designs for Different Futures

Philadelphia Museum of Art Through March 8, 2020
2600 Benjamin Franklin Parkway
Philadelphia



The Philadelphia Museum of Art presents alternately cautionary and hopeful visions for the human experience in *Designs for Different Futures*. The exhibition features 80 pieces looking at the future of a range of topics, including food and clothing, intimacy and child rearing, and extraterrestrial communication and cities. “We often think of art museums as places that foster a dialogue between the past and the present, but they also can and should be places that inspire us to think about the future,” said Timothy Rub, the museum’s director and chief executive officer. In textiles, architecture, typogra-

phy, prosthetics, film, and other media, the designers featured in the show anticipate the challenges and opportunities their fields will face in the future. After closing in Philadelphia, *Designs for Different Futures* will move to the Walker Art Center in Minneapolis and the Art Institute of Chicago, the co-organizers of the exhibition. **Emma Natanzon**

Midwest

Props

Contemporary Arts Center Through March 1, 2020
44 East 6th Street
Cincinnati



The first Zaha Hadid–designed building in the United States is presenting an exhibition that pays homage to the architect’s complex geometric forms. *Props*, a series of eight sculptures by mixed-media artist and trained architect Lauren Henkin, dances with Hadid’s architecture at the Contemporary Arts Center in Cincinnati, which opened in 2003.

Since graduating from Washington University in St. Louis, Henkin has produced work that frequently examines the built environment’s relationship to nature.

Henkin’s work occupies more than 3,300 cubic feet of “unintended” exhibition space,

engaging with architectural elements in areas of the museum that have not previously displayed artwork. Along with the unconventional use of space, Henkin makes it clear that the sculptures are not the main attraction—rather than to evoke beauty, they are meant to serve as catalysts to get viewers thinking about Hadid’s building and one’s place within it. **Shawn Simmons**

The 2019 Oslo Architecture Triennale: *Enough: The Architecture of Degrowth*

September 26 to November 24, 2019

The Oslo Architecture Triennale, now through its seventh iteration, has made a name for itself under the directorship of Hanna Dencik Petersson as one of the most prescient and timely showcases in the relentless stream of -iennales, those beloved recurring art and design festivals where dreams are made. After a successful 2016 exhibition focusing on migration and identity in the face of hyperglobalization, the program returned in 2019 to examine climate change, resource allocation, and economic systems around the theme of “degrowth,” with the title *Enough: The Architecture of Degrowth*. Curated by Maria Smith and Matthew Dalziel of London-based architecture and engineering firm Interrobang, designer and critic Phineas Harper, and researcher Cecilie Sachs Olsen, the exhibition offered a fresh take on ecology, introducing the ideology of degrowth into architecture discourse and exploring how it would help realize a more ecologically oriented human civilization.

Degrowth has recently gotten attention as a new paradigm for understanding a post-consumerist future where resource extraction and economic growth are decelerated, giving way to new social, political, and economic systems that are more in accord with the earth's finite resources. For an exhibition, this is fertile intellectual territory to speculate on the ways in which we build, and how they can evolve in alternative worlds. It is a refreshingly positive take on politics today, as much of our discourse, in architecture and beyond, is overwhelmingly negative and aims to discount or problematize—“cancel”—rather than propose new ideas or provoke other ways of thinking.

The main festival exhibition, titled *The Library*, was conceptualized as a “spatial infrastructure for sharing knowledge” and organized as a series of four rooms, or “collections,” that featured works in multiple formats and scales, from material samples and books to analyses of languages and economic systems. The range and breadth of types of thought experiments presented a holistic and clear vision—almost a manifesto—of what degrowth might look like as an architectural philosophy. It was not a set of solutions, but rather speculative, positive provocations on what this new area of discourse might entail.

The Library's first collection, “The Subjective,” examined personal identities and rituals. How would life change in a degrowth world? How would we live, laugh, and love? The *Aerocene* backpack by Aerocene, an artist group, is a personal, solar-powered balloon imagined as an alternative to carbon-intensive jet air travel. Helen Stratford's *Organisational Diagrams for Everyday Life* is a set of schematic diagrams that redraw the rituals of a daily schedule to visualize new routines outside of the pressures of work and productivity metrics that define us today.

Perhaps the most traditionally eco-friendly collection is “The Objective,” which addresses materials and building techniques. Like the rest of the triennale, it attempts to take decades-old ideas around sustainability and push them into new places. *Another Column*, by Canadian firm



Society under Construction (State 2) by Rimini Protokoll.

YYYY-MM-DD, is a textile column that can be filled with sand or aggregate and deployed as a site-specific architecture to replace concrete. *Multiplo*, by GUSTO, is a simple brise-soleil made of discarded fan covers from an abandoned army base in northern Italy. A host of other newly deployed materials gave a glimpse into how the extraction of resources like fossil fuels could be replaced by small-scale reuse and bioengineering to promote architectural degrowth.

In “The Collective” and “The Systemic” lie the questions that both define a possible architecture of degrowth and are also impossible to answer now. How new collectivities and systems would be constructed is not clear in degrowth discourse at the moment, but the ideology is ripe for speculating on how we might live in a post-consumerist, post-growth society. Collective projects include *Visual Ecolophonic*, by INDA and Animal Domestic, which examines and visualizes the Sami language of northern Finland, which the designers describe as being more in harmony with nature than most languages. *ARPA*, by (ab)Normal, is a theoretical world where artificial intelligence replaces market forces as an organizing principle. The works demonstrate that questions about power structures and humanity's proclivity for violence have to be taken into consideration when thinking about the future.

The biggest questions are raised in “The Systemic,” where entire social and political systems, networks, and environments are rethought at both local and global scales.

According to the curators, this is where degrowth departs from previous environmental movements. MassBespoke, a timber housing system, displayed a flexible system where mass housing can be personalized like custom homes. *Intentional Estates Agency*, designed by Jesse LeCavalier, Tei Carpenter, Dan Taeyoung, and Chris Woebken, is a set of real and imagined real estate models both new and old—from 19th-century utopias to seasteading—that speculate on alternatives to our current metrics.

In addition to the main exhibition, more than 100 events and other programming added to the degrowth chorus. Standouts included a workshop to make new tote bags from ones recycled after previous events, as well as a spectacular, interactive performance by Rimini Protokoll that made the audience unwilling participants in the complexities and absurdities of our growth-fueled construction industry: politicians engaging in corruption, financiers gambling, and precarious workers struggling.

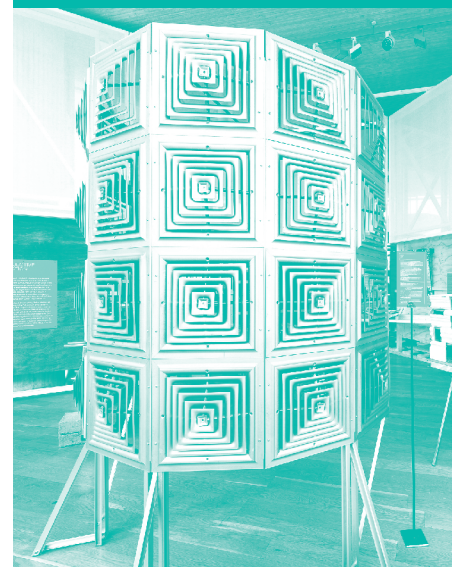
Beyond the questions raised through these interventions and proposals, then, are even more interesting questions: How is degrowth a helpful ideology for architecture? Can it provoke new ways of building at the individual level that can become communal and then translate into change at the systemic scale? What power structures are most susceptible to degrowth in architecture? How can the real estate industry be convinced to participate in this? How do democracy and degrowth interact? What would happen if the right were to take degrowth and use it as an excuse to enable

eco-fascism? Conversely, what does a green, socialist utopia look like? Can every aspect of our lives be redesigned through the lens of degrowth?

The answers don't matter right now; it is the questions that offer promise and should echo through architecture at this most critical time.

Matt Shaw is the executive editor of *The Architect's Newspaper*.

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Modernism's Visible Hand: Architecture and Regulation in America

By Michael Osman | University of Minnesota Press | \$30.00

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Thermostats, refrigerators, dioramas, slide rules, organizational charts, paperwork—these are some of the elements Michael Osman scrutinizes in his book *Modernism's Visible Hand: Architecture and Regulation in America*, which examines the “crossing points among architectural design, management, and environmental control” to reconstruct the regulatory apparatus of American architecture between the Civil War and World War I. Osman is part of the architecture history collective Aggregate, whose 2012 book, *Governing by Design*, significantly reconfigured the field by asserting a “shared conviction that agency is complex; that authorship of the built environment is dispersed across multiple registers comprising not only architects and designers but also many other kinds of producers and consumers, along with a multitude of associations, institutions, and bureaucracies.” Osman’s latest book takes up a similar approach to explore the ways in which an emerging regulatory imagination at the turn of the 20th century shaped the built environment at a range of scales and levels: domestic interiors, industrial warehouses, natural history museums, laboratories, factory floors, and finally the architectural office itself. Osman animates this material to dazzling effect, showing how management of the built environment enrolled people, commodities, nature, time, labor, and design in regulatory regimes, often by transforming them into legible and fungible eco-

nomic units.

The first two chapters consider how new technologies of environmental regulation affected built forms and the ways in which those forms were made available for regulation. “The Thermostatic Interior and Household Management” traces the development of conditioning systems to show how the regulation of the domestic interior was fundamental to the constitution of social roles. These systems create an interior environment independent from its surroundings and therefore stable, regardless of fluctuating exterior conditions. The impact of this ability becomes more extreme in “Cold Storage and the Speculative Market of Preserved Assets.” By examining the development of cold storage warehouses, Osman argues that the buildings were instrumental in transforming perishable goods into reliable economic elements, effectively slowing down time through an architectural response and creating a futures market in the process.

Chapters three and four turn to modes of visualizing regulatory systems. “Representing Regulation in Nature’s Economy” considers two modes of scientific inquiry—fieldwork and laboratory work—to argue for connections between ways of representing ecological data and a corresponding regulatory imagination. By making links between the shared linguistic root of *economy* and *ecology*, Osman shows how nature itself became likewise imagined (incorrectly) as a

self-regulating system whose discrete components could be disaggregated and subject to rationalized scrutiny. Representation of managerial work is the focus of the chapter “Imaging Brainwork,” in which the book considers how the “indirect” labor of management was visualized in order to justify its existences and solidify its power. The tools of regulation in this chapter are the managers who sit between the “controllable” conditions of the factory inside (labor is, of course, one abstraction among many from their perspective) and the unpredictable conditions of the market outside.

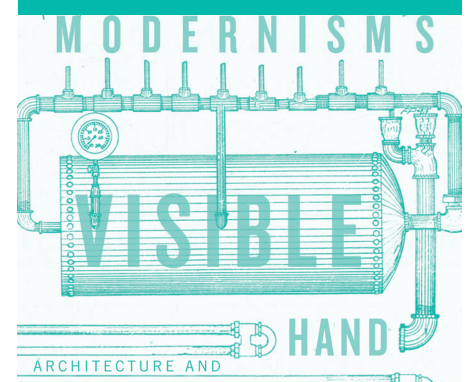
The final chapter, “Regulation Through Paperwork in Architectural Practice,” uses the office of architect Albert Kahn to argue that bureaucratic techniques emerging from scientific management theory were essential to shaping modern architecture. A template for the contemporary office, Kahn’s was organized around principles of industrial work that subdivided architectural projects into discrete sets of tasks. This was “premised on the extraction of data from the firm’s daily operations” so that managers could then make decisions about where to direct resources based on cost and efficiency. Architectural design was thus increasingly cast as a service that represented clients’ financial interests as well as their artistic ones. Though Kahn’s office was organized to appear similar to a machine shop, it was the technologies of management—including paperwork, circuitry, and tele-

phones—that allowed the company to remain profitable in the face of unpredictable exterior circumstances.

Throughout the book, “dynamic infrastructures” mediate between intensely managed interiors and volatile exteriors to support regimes of control and together constitute the “visible hand” of the book’s title. Osman makes a clear case that what is at stake is more than the apparent stability of the “interior,” but the ways in which managerial abstraction creates conditions of risk and then presents itself as the inevitable solution. These systems rely on data to mitigate risk through a suite of technologies and techniques. Of the book’s many contributions, the relationship it articulates between regulation, data, and the built environment stands out as especially relevant in our current political and technological moment. The data of Osman’s case studies are generated from discrete, observable, and recordable actions or conditions (temperature, time, piece work, etc.), which then inform managerial action. The input of an external stress (e.g., a surfeit of a commodity) can then be adjusted for—often with the support of the built environment—to maintain equilibrium (or at least the image of it). One century later we find ourselves in a world in which data, risk, and control have come to be defining features of contemporary life, only now, data is not recorded by a diligent supervisor—it is automatically generated with our every click, keystroke, and glance. The world has become data-driven and our gestures, habits, and impulses become justification for a host of decisions made by “managers” interested in minimizing risk, often at the urban level. *Modernism’s Visible Hand*, beyond offering a brilliant reassessment of the emergence of modern architecture, also, like the best history, illuminates our contemporary condition. Osman reminds us that none of the systems he analyzes were “assumed to be part of an inescapable future.” As our own managers and regulators are increasingly invisible, increasingly automated, and increasingly manipulating “data” to their ends, we would do well to remember that *these* systems are likewise not inescapable.

Jesse LeCavalier conducts research and design at LeCAVALIER R + D and is an associate professor at the Daniels Faculty of Architecture at the University of Toronto.

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Set in Stone

An interview with archaeoacoustician Steven J. Waller.

Steven J. Waller practices archaeoacoustics, an emergent subdiscipline of archaeology that studies the sonic dimension of archaeological sites, including a location's capacity to produce resonance. Waller's research focuses on rock art. He was the first to theorize that echo, when interpreted by ancient people as spirit beings living in rock, was a motivational factor in rock art image placement. In preceding a science of acoustics, rock art, in Waller's conception, begins to function as a tool for phonetic transcription or proto-recording, pointing toward the ability of materials to talk back to us—if only we listen.

Emma McCormick-Goodhart: What are the prevalent architectonic and sonic characteristics of rock art sites in the American Southwest?

Steven J. Waller: Much of the rock art in the Southwest is sited in canyons and on cliff faces, rather than in deep caves. A canyon is almost like a cave without a roof on it. Sound still bounces around; it's just that in deep caves, it's much more reverberant or resonant. Reverberation is like a thunderous sound, whereas in shallow shelters—canyons or cliff faces—it's more like a distinct echo that speaks back to you, sometimes with multiple repeats. Shelters are interesting, because they can act like a parabolic reflector, just as antennae dishes focus sound and help to magnify it. There's a place in Chaco Canyon [in northwestern New Mexico] called Tse'Biinaholts'a Yalti (Curved Rock That Speaks). An artificial mound was built at the focal point of this curved cliff face, and you can actually get an echo that's louder than the original sound, because it focuses it. There's a legend associated with a spirit being that's in the rock.

In fact, there's a whole mythology about portals that open up into a spirit world. Sound reflection helps to give that illusion. It's like when you look in the mirror, you look *in* the mirror—and sound reflection gives that same illusion of depth. Even though you can see the rock-face, what you're hearing is depth, as if there's something beyond there: a chamber or something, where spirits are living. It's an interesting illusion of space. In the Great Gallery at Horseshoe Canyon [in northern Utah], for instance, it's like the paintings speak back to you.

Sound reflection, as a general phenomenon, would have been inexplicable to ancient people—whether it was a distinct repeat, or a reverberation that blurs together like thunder—because they didn't know about sound waves. Instead, they had a supernatural explanation for this phenomenon. Hearing it as communication with the spirit world, they sought these spirits deep in caves or way up on cliffs, where sound appears to come from.

EMG: How did you “hear your way” into this theory?



Steven J. Waller on-site.

SJW: I don't think that it was a Flintstone kind of sound system for their music; I think that it was spiritual. I made my discovery, by accident, at the cave of Bédouillac, in France. I was standing outside of the cave, waiting for my wife to get a sweater from the car, and I asked myself, if I were a cave-man, why would I go deep inside the cave? Why would I only decorate certain chambers? Why would I only depict certain things—and what was taking her so long? I yelled, “Hey, Pat,” and the cave spoke back. My subconscious heard that echo not as an echo, but as a voice speaking back—and I instantly remembered learning about the legends of echo spirits that live in the rock. My subconscious realized ancient people would've heard it like an echo spirit calling back to them, calling them into the cave. That was in 1986, and I've been going to as many caves and canyons as I can ever since to test my hypothesis about the correspondence of sound and rock art. The more places I go to, the more I hear it.

EMG: You argue for the preservation of soundscapes at sites of rock art. Can you elaborate what's at stake in facsimile production?

SJW: It's a natural offshoot of my theory: the realization that a rock art site is not simply the panel of images, but also the experience of the sound environment around it, which is, I think, what inspired the rock art. There's effort dedicated to documenting and

“preserving” rock art, which to me means keeping the original, but to a lot of people means making copies. They'll spend months recording every stroke, yet they make no effort to document or study the sound. I think that if they're making a facsimile or replica and they want people to have a realistic experience, it has to include sound—it has to be audiovisual—or it's going to be misleading. Lascaux II is completely misleading—it might as well be your living room. The sound is dead. They gave no thought to acoustics at all, even though millions were spent reproducing the shape of the cave to the centimeter, and art to the brushstroke. It also doesn't necessarily have to be a physical replica of the cave; this can be accomplished with virtual reality.

EMG: What might explain this recurring sonic omission?

SJW: I think that it's twofold, at least. One is that we, as modern people, know about sound waves and reflections. We know what an echo is, so it's trivialized. It's such a contrast to how echoes were viewed in the past as spiritual phenomena, revered to the point of worship. There are legends around seeking echo, like the Acoma migration story. They would go to places and test for echo, and if the echo was no good, then they would move on. The legend describes a place just to the east of Acoma, where they found the perfect echo. The land area of the Acoma tribe has the

Petroglyph National Monument [outside Albuquerque, New Mexico] at its eastern boundary, and it is one of the strongest echoes I've ever recorded. There's also another myth: “The white man calls it an echo; these are witches that live in snakeskin and inhabit sheep. That's where the echo spirit lives.” Some legends don't call it an echo, but a “talking rock.”

The other thing is that the very name of the thing that we're studying is rock art, so the attention is focused on the “art,” or the visual. I think it's more interactive and audiovisual, because of the evidence I've collected showing the correspondence between locations that were selected and their sound reflective intensity—so it seems like they purposely chose places with the best echo and reverberation. I don't think that the art was an afterthought, but an auxiliary part of the ritual.

EMG: You've written about the percussivity of stone tool production as another source for interpretative “mishearing.”

SJW: When you're flint knapping and making stone tools, those percussion noises—when they echo back—sound like hoofbeats. That's why certain engravings are of hooved animals. They might've even purposefully chosen places like that to make their stone tools, thinking that it might endow tools with magical qualities reinforced by spirits. You could also speculate that that's how they discovered making tools; that they were banging rocks together to make echoes, and some of them happened to break. Some people have been looking at the tonal quality of some of these blades. It makes you wonder how much sound impact was important for stone toolmaking.

EMG: Sound is still physically measurable in rock art sites. Sound doesn't fossilize, per se, but might it be useful to think of sound as a living fossil layer—a form of what UNESCO would term “intangible heritage”?

SJW: That's an interesting way of looking at it, because it's not that the sound itself can still be heard, but that the structure of the place—the characteristics of the rock, and the shape—still produces the same phenomenon as it did then. Any effects of erosion add statistical noise or statistical uncertainty, but I think that most of these places are spatially similar enough now to how they were in the past that you can figure the sound is going to be quite similar. You're not hearing the same airwaves as our ancestors, but the same acoustic response. I try to apply my scientific methodology and hypothesis testing as a basis for arguing for the conservation of soundscapes in order to study rock art not just with our eyes, but with our ears, too.

Emma McCormick-Goodhart



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