

arcca

architecture california
the journal of the american institute of architects
california council

Stormwater Pumpstation No. 6
Mission Bay, San Francisco
Tom Eliot Fisch

infra
structure

Infrastructure: Need and Opportunity / Central Plants: from Back of House to Center Stage / Rising Tides /
Infrastructure at Mission Bay / The L.A. River / AIACC Disaster Preparedness / Off-Grid Competition /

Content

Design in the Public Realm	9	→ Donlyn Lyndon, FAIA
Infrastructure: Need and Opportunity	10	→ Thomas W. Bishop
Changing Practice in Civil Engineering An Interview with S. Bry Sarté, P.E.	13	
The L.A. River: Plain Drain No More	19	→ John Chase, Assoc. AIA
Rising Tides Competition	22	→ David Meckel, FAIA
Central Plants: from Back of House to Center Stage	31	→ Michael Franklin Ross, FAIA
Infrastructure at Mission Bay: a Conversation	37	→ Amy Eliot, AIA, Amy Neches, and Tim Beedle
Book Review: <i>Everyday Urbanism/ The Infrastructural City</i>	40	→ Steven Flusty
AIACC Disaster Preparedness	45	→ Lori Reed
Off-Grid Competition	48	
	05	Comment
	07	Contributors
	55	... and Counting
	56	Coda

arcCA, the journal of the American Institute of Architects California Council, is dedicated to exploring ideas, issues, and projects relevant to the practice of architecture in California. arcCA focuses quarterly editions on professional practice, the architect in the community, the AIACC Design Awards, and works/sectors.

arcCA

09.4

Editor	Tim Culvahouse, FAIA Culvahouse Consulting Group, Inc.
Editorial Board	Paul Halajian, AIA, Chair John Leighton Chase, Assoc. AIA Peter Dodge, FAIA Annie Chu, AIA Wendy Kohn Eric Naslund, FAIA Stephen Slaughter, AIA Kelly Walker Nicholas D. Docous, AIA
Design	Bob Aufuldish Aufuldish & Warinner Ragina Johnson
Production Manager Production	Jeffrey Kruger Lorraine Sacca
Publisher	Kathy Varney California Regional Publisher McGraw-Hill Construction
AIACC	Lori Reed Director of Marketing and Communications

arcCA is published quarterly and distributed to AIACC members as part of their membership dues. In addition, single copies and subscriptions are available at the following rates:

Single copies: \$6 AIA members; \$9 non-members.

Subscriptions (four issues per year): \$24 AIA members;

\$15 students; \$34 non-members, U.S.; \$38 Canada; \$42 foreign.

Subscriptions: arcCA, c/o AIACC, 1303 J Street, Suite 200, Sacramento, CA 95814, www.aiacc.org

Advertising: 877.887.7175.

Inquiries and submissions: Tim Culvahouse, Editor: tim@culvahouse.net; c/o AIACC, 1303 J Street, Suite 200, Sacramento, CA 95814; 916.448.9082; fax 916.442.5346. Bob Aufuldish, Aufuldish & Warinner: bob@aufwar.com.

Copyright and reprinting: © 2009 by AIACC. All rights reserved. Reproduction in whole or in part without permission is prohibited. Permission is granted through the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. arcCA is a trademark of AIACC.

arcCA (ISSN 0738-1132) is published by The McGraw-Hill Companies on behalf of The American Institute of Architects, California Council. McGraw-Hill and AIACC are not responsible for statements or opinions expressed in arcCA, nor do such statements or opinions necessarily express the views of AIACC or its committees. Contributors are responsible for credits and copyright permissions. Third class postage paid at Lebanon Junction, Kentucky. Printed by Publishers Press.

Dodge
Sweets
McGraw Hill
CONSTRUCTION
Architectural Record
ENR
Regional Publications

To purchase display advertising
in upcoming issues of arcCA,
please contact your

Account Representative today:

Maggie Hartley

maggie_hartley@mcgraw-hill.com

Dawn Hicks

dawn_hicks@mcgraw-hill.com

Call early to receive your
special discount rates.

AIACC
The American Institute
of Architects, California Council
1303 J Street, Suite 200
Sacramento, CA 95814
916.448.9082 p 916.442.5346 f
www.aiacc.org

2009 Executive Committee
AIACC President
John P. Grounds, AIA
**First Vice President/
President-Elect**
Nicholas D. Doucous, AIA
Treasurer/Secretary
Frank O. Bostrom, AIA
**Vice President Legislative
Affairs**
David L. Phillips, AIA
**Vice President Communications/
Public Affairs**
Michael Malinowski, AIA
**Vice President Professional
Practice**
Michael D. Chambers, FAIA
Vice President Regulatory Affairs
Paul E. Schroeder, AIA
**Vice President of
California CACE**
Nicola Solomons, Hon. AIACC

Vice President of AEP
Jason D. Pierce, Assoc. AIA

2009 Board of Directors
Regional Directors
Jeffrey T. Gill, AIA
Anne Laird-Blanton, AIA
R. Kent Mather, AIA
Pamela M. Touschner, FAIA
Regional Associate Director
Jill C. Finn, Assoc. AIA
AIA San Francisco
Associate Director, North
Gray Dougherty, Assoc. AIA
AIA East Bay
Associate Director, South
Lucas W. Reames, Assoc. AIA
AIA Los Angeles
Student-Director
Stephonie Nash, AIAS
AIA California Central Coast
Lauren L. Luker, AIA
AIA California Desert
Lance C. O'Donnell, AIA
AIA Central Valley
Cynthia Easton, AIA
Carl C. Lubawy, AIA
Matthew Shighihara, AIA
AIA East Bay
Timothy L. Craig, AIA
Philip A. Erickson, AIA

AIA Golden Empire
Bruce M. Biggar, AIA, PE
AIA Inland California
Pasqual V. Gutierrez, AIA
Dennis T. Tanida, AIA
AIA Long Beach
Peter K. Phinney, AIA
AIA Los Angeles
Paul A. Danna, AIA
Michael A. Enomoto, FAIA
Hsin-Ming Fung, AIA
John E. Kaliski, AIA
Stuart C. Magruder, AIA
Katherine J. Spitz, AIA
AIA Monterey Bay
Daniel Fletcher, AIA
AIA Orange County
Jason Briscoe, AIA
J. Schroder, AIA
Michael P. Porter, AIA
AIA Palomar
Greg K. Izor, AIA
AIA Pasadena & Foothill
Richard F. McCann, AIA
Alek Zarifian, AIA
AIA Redwood Empire
Alima Silverman, AIA
AIA San Diego
Linda Glaze, AIA
R. Kirk O'Brien, AIA
Kevin P. Pollem, AIA

AIA San Fernando Valley
Richard Gemigniani, AIA
AIA San Francisco
Michael S. Bernard, AIA
Charles Chase, AIA
Jennifer K. Devilin, AIA
Karin L. Payson, AIA
Zigmund Rubel, AIA
Bryan R. Shiles, AIA
AIA San Joaquin
William E. Patnaude, AIA
AIA San Mateo county
Dianne R. Whitaker, AIA
AIA Santa Barbara
Rosa E. Alvarado, AIA
AIA Santa Clara Valley
Sapna Marfatia, AIA
Hari Sripadanna, AIA
AIA Sierra Valley
Robert T. DeGrasse, AIA
AIA Ventura County
Richard N. McKenzie, AIA

AIACC Staff
Executive Vice President
Paul W. Welch, Jr., Hon. AIA
**Director of Marketing
and Communications**
Lori Reed

In this issue of **arcCA**, a look at Infrastructure—much in the news, where the attention has been on “shovel-ready” projects, not perhaps the best place to look for coherent opportunities to ennoble the public environment. We have taken the opportunity to be a bit more reflective and forward-looking.

As always, we performe omit far more than we include. Key example: the WPA 2.0 Competition, sponsored by city-LAB at UCLA, which sought “innovative, implementable proposals to place infrastructure at the heart of rebuilding our cities.” Learn about it at <http://wpa2.aud.ucla.edu>. You might also look for the lucid new *Street Design Manual* of the City of New York, available at <http://www.nyc.gov/html/dot/html/about/streetsdesignmanual.shtml>; and *The Tennessee Valley Authority: Design and Persuasion*, a volume I edited on the early design work of the TVA; it is available at www.smartfurniture.com/tva, as a benefit for the Tennessee Architectural Foundation.

Following up . . .

. . . on **arcCA** 09.3, “Beyond LEED,” Rocky Mountain Institute has unveiled Green Footstep, a free, online carbon calculator for reducing carbon emissions in building construction and retrofit projects from pre-design through occupancy. It’s also an educational tool that helps users understand a building’s life cycle carbon footprint. For more information about Green Footstep, including a free user account, check out www.greenfootstep.org.

2010 Editorial Calendar

In 2010, our first quarter, “professional practice” issue will look at two movements driven by new digital tools: the emergence of Integrated Project Delivery (IPD) in mainstream practice, and the use of parametric modeling in schools of architecture and some highly exploratory practices. Where and how do these methodologies meet? What are the hurdles to be faced by each and by the two together? What opportunities do they present?

In response to **arcCA** 09.3, “Beyond LEED,” reader Yvonne Vail asks, “Why does no one mention anything related to population increase and how it will affect buildings and infrastructure?” It is a question we will ask in the second quarter of 2010, when the theme of our “architect in the community” issue will be “The Future of California.” We will look at a handful of big issues—population, water, governance, climate change, and others—and ask how they may affect architectural practice over the coming years, and how architectural practice can affect them.

For the third quarter, “AIACC Design Awards” issue, we will be looking at architecture education—not only how our schools of architecture are responding to a changing world, but also how an understanding of architecture might be shared more broadly in our society.

In the fourth quarter, our “works/sectors” issue, we will feature buildings that deal with questions of faith and loss.

Except for the first quarter issue, which is fully assigned, we welcome suggestions for articles.



Tim Culvahouse, FAIA
Editor



Correction

Those who were fortunate enough to attend this fall’s Monterey Design Conference will recall a moment during the awards presentation when, for the AIACC Merit Award for the Portola Valley Town Center (above), the recipients were introduced as “Henry Siegel and Larry Strain . . . and some other guy.” The other guy was Jim Goring, of Goring & Straja Architects, who share credit for this extraordinary project with Siegel & Strain Architects. We left them out of the credits in the Design Awards issue of **arcCA** 09.3, “Beyond Leed,” too. Our apologies.

Contributors



Thomas W. Bishop holds dual positions with URS Corporation. As Senior Vice President, he is responsible for overseeing the URS Division's operations in the Western United States, as well as in Europe, the Middle East, and China. He also directs URS' construction services group, which provides construction management, program management, and construction services to clients throughout the United States. As Vice President of Strategic Development, he directs the company's business forecasting and budgeting, risk management, and strategic initiatives.



John Chase, Assoc. AIA, is Urban Designer for the City of West Hollywood and is Chair of the **arcCA** Editorial Board. He co-edited, along with Margaret Crawford and John Kaliski, *Everyday Urbanism*, reviewed in this issue. He may be reached at Jchase@weho.org.



Amy Eliot, AIA, LEED AP, is a principal with the firm of Tom Eliot Fisch, a San Francisco based architecture and interior design practice focused on creating community serving environments characterized by attention to material and craft.



Steven Flusty is an L.A. geographer temporarily exiled to the Provinces, where he serves as an Associate Professor of York University. His primary obsession is the everyday practices of global formation, a topic he has interrogated most ruthlessly in *De-Coca-Colonization: Making the Globe from the Inside Out* (Routledge, 2004). His work has appeared in assorted electronic media and academic, professional, and popular journals of varying degrees of repute. He may be reached at sflusty@yorku.ca.

Peter Hasselman, FAIA, is an Orinda architect and veteran of many urban design studies for the Urban Land Institute and the AIA. He may be reached at hassel2@comcast.net.



Donlyn Lyndon, FAIA, is Eva Li Professor of Architecture and Urban Design, Emeritus, at UC Berkeley and one of the founding editors of *PLACES, Forum of Design for the Public Realm*, which can now be read online at <http://places.design-observer.com/>. He is a recipient of the AIA/ACSA Topaz award and the AIACC Lifetime Achievement Award. Lyndon's writings, buildings, and teaching have explored ways that architecture can relate to the places of which it is a part and enhance the lives of those who live there. He may be reached at dlyndon@berkeley.edu.



David Meckel, FAIA, is Director of Research & Planning for the California College of the Arts (CCA) in San Francisco. He may be reached at dmeckel@cca.edu.



Lori Reed is Director of Marketing and Communications at the AIA California Council. She may be reached at lreed@aiacc.org.



Michael Franklin Ross, FAIA, is a principal with HGA Architects and Engineers in Los Angeles. He was 2007 Chair of the AIA Committee on Design and 2006 Chair of the AIACC Design Awards Jury. The author of *Beyond Metabolism: The New Japanese Architecture*, he has contributed over 80 articles to the architectural press, including *Architectural Record*, *Progressive Architecture*, *A+U Architecture & Urbanism*, *LA Architect* (now known as *FORM*), *Places* and **arcCA**. He has been on the faculty of Tokyo University, UCLA and SCI-Arc. He may be reached at mross@hga.com.



Design in the Public Realm

Donlyn Lyndon, FAIA

From Places, vol. 9, no. 2, places.designobserver.com, by permission.

The urban services that we so often take for granted comprise the most ubiquitous of design challenges. They form, in large part, the basis for the public realm, the place of our encounter with each other, with our predecessors and with the collective values and aspirations of society. The streets, bridges, transit systems, service centers and institutions that are created in the public interest by government action and regulation set the terms within which our individual creative action and experience take place.

The realm of public design can be a forum for leadership at all levels of government, from federal programs to local, neighborhood organizations. In many great periods it has been. Much of the history of monumental architecture is written about buildings of the public realm, and the history of the vernacular environment is suffused with the underlying structures of public rights-of-way and services.

Facilities created for the public can and should embody qualities of concern for human experience and for the equitable and purposeful use of resources. If well designed, they can set standards for private enterprise, and the infrastructure created by roads, services and regulation

can evoke the creative involvement of entrepreneurs and engineers in shaping the environment we share.

We should come to think of all design projects as infrastructure—setting the stage for use and elaboration by others. It is not just the shape of what is built that matters, but what it can make possible in use and in subsequent attraction and adjustments.

This is especially true for the design of the public realm, which is made palpable not only with grand projects but also with every step underfoot, with the organization of paving and planting of rights of way; the curbs, sidewalks, roadways, trees, tree gratings, drainage systems, signage and lighting. All these are often relegated to the realm of public works engineering and discarded from conscious design thought. They form, though, the substructure for our actions, they determine how smoothly we move on foot or in vehicles, how easily we exchange with our neighbors or gather in public assembly, how gracefully the forms of our surroundings are fit together and how they reflect our values.

Architecture in the public realm spans across a range of scales, from the shape and material of a curb to soaring structures that shelter places of public assembly; from objects and spaces that are everywhere in our lives to great monuments that mark moments of collective memory. Both the fine-grained and the colossal present opportunities for caring to get it right—to show that shrewd and persistent imagining, when coupled with attention to the multiple interest, can make places that carry our interests, hopes and pleasures into an evolving future. ●



Infrastructure: Need and Opportunity

Thomas W. Bishop, Senior Vice President, URS Corporation

URS Corporation is a leading provider of engineering, construction and technical services for public agencies and private sector companies around the world, with more than 45,000 employees in a network of offices in more than thirty countries. A URS joint venture is providing planning and engineering services for one third of the proposed 800-mile, high-speed rail system from San Francisco and Sacramento to San Diego; URS also leads the multidisciplinary project management team for San Francisco's TransBay Terminal. Other transit projects in California include San Diego's Mission Valley Light Rail Transit, Santa Clara Valley's Measure A/B Rail Expansion Program, and BART San Francisco Airport Extension Stations and Parking Structures.

When the American Society of Civil Engineers (ASCE) Report Card gave California's infrastructure a "C-" grade, it noted that the state's annual investment needs are \$37 billion, just to bring the existing infrastructure up to par. Just consider our roadways as one example of how our state's infrastructure already is stressed to inadequacy. In Los Angeles, the most congested region in the country, the average commuter spends 70 hours a year sitting in traffic. This translates to billions of dollars in lost productivity and unnecessarily contributes millions of tons of greenhouse gasses into the environment. And with California's population projected to increase from 38 million to 48 million people by 2025, we not only need to address the immediate funding challenges, but we also must make long-term investments in our public infrastructure.

This critical need to upgrade California's infrastructure is presenting opportunities for architects and engineers to design the next generation of public facilities and shape the way millions of Californians live for years to come. The good news is that elected officials have recognized this problem and have begun to identify solutions that will provide much-needed funding for modernizing the state's infrastructure, as well as enacted new laws that will help California better plan for its growth.

On the funding side, the federal stimulus package is providing new prospects for architects and engineers to showcase their talents. In California, the state is competing for a portion of the \$8 billion in stimulus grants earmarked for high-speed rail projects. This money will support the engineering, design and construction of the state's proposed high-



Opposite: Image of high speed rail running along Union Pacific Rail Road lines through Central California. Above: San Francisco's TransBay Terminal. Both images courtesy NC3D. More images of the California High Speed Rail project are available at <http://www.nc3d.com/projects/california-high-speed-rail-2.html>.

speed rail system, including the stations and other facilities that architects will have a hand in designing.

In recent years, California voters also have passed a number of ballot initiatives and dedicated tax measures to fund a variety of public infrastructure projects, including the construction of new rail and transit lines, water projects and education and health care facilities—all of which require the work of architects.

In addition, Assembly Bill 32 (California Global Warming Solutions Act of 2006; see <http://www.arb.ca.gov/cc/factsheets/ab32factsheet.pdf>) will have tremendous implications for what architects will design, how they will design it, and how they will work with engineers to create aesthetically pleasing solutions.

As an engineer, I have tremendous respect for the architectural profession. Architecture has a dimension of art; it brings an aesthetic dimension that helps take the hard edge off engineering solutions. An engineer may look at the task of designing a transportation center in technical terms, whereas an architect complements this view by looking at it in a way that *invites* people to use the facility and helps it blend in with the surrounding environment.

If we are going to successfully meet the challenges of designing California's future, architects and engineers must continue to develop long-term, integrated solutions. This means fulfilling technical expectations in a way that supports the larger needs of the community—promoting resource conservation, infill, and urban centers, while providing

visually appealing solutions.

Through their designs, architects can help a project capture the hearts and minds of its stakeholders. At San Francisco's TransBay Terminal, the public is the largest stakeholder, and we are working to design a facility that will serve as a major transit hub, as well as be the architectural centerpiece of an urban renewal. Regardless of the size of the project, architects can shape public perception and help their clients achieve their goals.

If you've flown into the new Hong Kong airport, you will know what I mean. The original design, by the Hong Kong Airport Authority, was a boxy, functional building. A very clever architect—Sir Norman Foster—submitted a design to fulfill the same requirements, but said that for the same price he could design a terminal reminiscent of a beautiful bird. This is an example of how architects can work with engineers to design public facilities that will be a source of pride and admiration. One only needs to look back to the work of the Depression-era construction projects, such as Boulder Dam (built by URS, along with Bechtel and Kaiser), which continue to serve as national treasures.

Just as our predecessors defined California through the design of our modern infrastructure, we will have the opportunity to shape the future through many of the projects we will be working on. The architect who can develop aesthetically pleasing solutions within the scope of the project's priorities and limitations does a service not only to the owner, but also to society.☉



Changing Practice in Civil Engineering



An Interview with Bry Sarté, Sherwood Design Engineers

What is the current state of sustainable practice in civil engineering?

Sustainable infrastructure is still evolving, both as a definition and a practice. At this point, nearly every civil engineering firm has a sustainability menu among its offerings, but, I would argue, these offerings are often not integrated with the overall practice.

Storm water management and water resources are among the most forward thinking areas of civil engineering—states and municipalities are beginning to make changes in this regard, with some states now requiring rainwater harvesting. There is also tremendous will to change the energy system with smart grids, wind farms, biofuels, and pilot projects for other innovative advances. But change needs to happen first at the regulatory and code level. Without new codes in place, many sustainable systems cannot easily become widespread.

How have you been involved in this process?

By tackling the regulatory hurdles head on. One of our clients, a retreat center, was recently interested in closing the water loop on its property. Their water rights had been challenged by the state, and their building permits were stalled until they could resolve the issue. They were considering drilling seven, 5500-foot deep wells to tap the aquifer, but we were able to demonstrate—both to the client and to the state—that, through a combination of new technologies, incorporating rainwater harvesting and graywater recycling, we could get to a net-zero, balanced water condition. This immediately released the project to move forward with construction and elevated the regulatory support for our overall efforts.

Following from that success, we organized a symposium with representatives from several counties—designers and developers—to think about how to deal with innovative water systems and the related code hurdles. Out of that symposium came a working group focused on state issues that has been active for the past eighteen months.



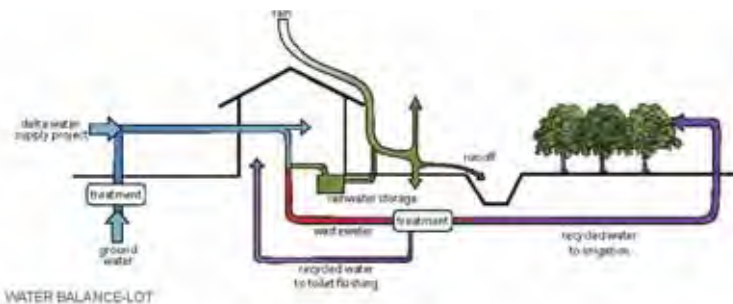
What is the largest scale at which you've worked?

Our work oscillates between the city, neighborhood, and building scale. We are currently involved with a massive brownfield redevelopment project with SOM San Francisco and Hargreaves Associates in China, with a projected population of 800,000. The site is at the intersection of two megacities that have just physically merged—Guangzhou and Foshan. They are moving heavy industry out, service industry in. We're helping to develop respiratory and ecological open space to resuscitate this part of the city, comprising 36 square kilometers, redeveloped with 50% open space.

What do you mean by "respiratory open space"?

We've been thinking about these spaces as the green lungs of the city. Working there for the past year, we've never seen a blue sky in Guangzhou; every hotel room has two oxygen masks. Yet, what's amazing, for all the China-bashing in the US for their apparent lack of regard for the environment, culturally there's a deeper appreciation for ecological issues and a stronger emotional investment in ecological systems than in the West. It's something I've observed with everyone we've talked to there. Wetland parks are one of the prime attractions in southern China, where people go to look at herons and reeds and walk on the boardwalks. I believe we're going to see those values reapplied in a much more genuine way than we see here in the US and in Europe. "Integration" is an overarching driver in Guangzhou today—with ecosystems, waterways, air quality. As much as they look to us for expertise today, we'll be looking to them for models, ten and fifty years from now, as these integrated systems bring their cities into balance.

In San Francisco, we are working on a number of facets of a city-wide management plan—taking a watershed approach to storm water management. The challenge we have is that eight to ten times a year, the combined storm water/wastewater system overwhelms the city's infrastructure and sends untreated sewage into the Bay, occasionally flooding low-lying, poor, minority areas along the way. One potential response that's been considered for decades by the PUC (San Francisco Public Utilities Commission) is to drill a tunnel across San Francisco, to put all that excess water directly into the ocean—potentially a \$1 billion construction project. The community has pressured the PUC for years to consider, instead, an integrated approach. Water runs off the city so fast, and it gets to the edges and has no place to go. So, we are advancing and building a number of projects trying to slow down the water higher up in the watershed. Think of a project like the California Academy of Sciences, which captures 90-98% of the rain that falls on its roof—an estimated 2 million gallons a year. But for us to comprehensively embrace such solutions at an agency level and to implement them in a highly integrated way is challenging. It's hard to look a hundred years forward in our society.



Opposite: Pearl River Tower, Ghangzhou, China, image © Skidmore, Owings & Merrill LLP, 2009. All rights reserved. Top and center: Old Mint Plaza, San Francisco, CMG Landscape Architecture, photos courtesy Sherwood Design Engineers. Bottom: Central Valley development, water loop diagram, courtesy Sherwood Design Engineers.

How does the civil engineering industry handle the change from huge networks of pipes to scattered elements like pervious pavement?

This is the core of many of our designs: balancing between centralized and decentralized infrastructure. There can be great benefits to each. Often the best solution is not one or the other, but a combination. And, in many instances, the centralized infrastructure is already in place and provides a lot of value, since the investment has been paid for.

What are some examples of effective decentralized infrastructure?

In the project in China I mentioned earlier, we discovered that, by instituting simple efficiency measures into individual buildings in our project area, the city could forego construction of a 500-megawatt power plant, which would have cost between \$100 million and \$600 million, depending on whether it was conventional or nuclear. This is a tremendous cost savings, which means the city can decrease developer fees or provide other incentives. Conceiving infrastructure as a series of smaller, energy efficient projects allows you to look at the overall system.

Take, for example, the Pearl River Tower, by SOM, with mechanical systems designed by Roger Frechette, their Director of MEP and Sustainable Engineering. Ghangzhou has subsidized its construction to help encourage developers to think of buildings as energy generators. Because it's a highly efficient building, mechanical floors are more efficient, and the void spaces in them are now being dedicated to turbines. The wind accelerates through openings in the building and turns these vertical turbines. The system decreases wind shear on the building while generating power. If you combine that with the high performance building skin, radiant cooling system, and other innovations, the building is driving towards net-zero energy, while it simultaneously becomes a part of the city's generating system. Planning for hundreds of high-performance buildings in the city district over the next few decades will allow them to avoid building another power plant. So, the buildings are a part of the city's infrastructure.

The same analogy applies to storm water management. You have a network of pipes in place; they typically lead to end-of-pipe treatment facilities. These systems, especially when combined with wastewater systems, require considerable energy and resources to move and treat the water. Over time, through watershed planning, we can distribute water treatment into the landscape—minimizing the use of water treatment facilities—and use systems funding for multiple benefit solutions that include cleaning water and landscaping the city. As we get those sorts of requirements in place, we are effectively changing all the branches of the collection network. Each building's selection of a tree or shrub or landscape strip is becoming a part of the city's infrastructure.

One might suppose that denser development and smaller-scale, distributed infrastructure would be less costly for developers. Is that in fact the case?

Often large-scale infrastructure cost is externalized through bond funding or other public monies. When we make the case for distributed

infrastructure, we must develop the argument in the context of first costs, operations, and externalities. Externalities, such as sunken costs in decentralized infrastructure, have a role to play, as do greenhouse gas emissions and other variables. We have the tools to make that argument.

And there are regulatory tools, as well. In the Central Valley, Attorney General Jerry Brown is working with municipalities to put responsible growth plans in place to minimize development of agricultural lands and growth without concern for greenhouse gas emissions. In a recent project example, a large developer in California had proposed a conventional development on a large parcel of rural land. The combination of the state's pressure and a Sierra Club lawsuit requires them to adopt sustainable design principles in a comprehensive way and to look at the implications of this development as it relates to California's growth plans. As a result, we've been working on a master plan to integrate transit and maximize open space, to close the water loop, and to find ways to move toward net zero carbon at a scale that's replicable for other developers. If it's successful as a model, maybe there is some hope for the future of development in California's Central Valley.

What counsel would you give to architects who want to be more fully engaged in infrastructural issues?

There's a tremendous opportunity to think about how systems are integrated into the planning process and new construction. Think about allocating space for natural processes to be introduced. Look for overlapping functions, the integration of open space and performative systems. Identify ways to create closed (or nearly closed) loop systems.

Trying to balance water flows into and out of a site is a significant sustainable design objective; tying that principle to specific building scale interventions and technologies opens the possibilities for new design ideas. Thinking about the role of the building as a part of the infrastructure can inspire new directions in architecture; at the most conceptual level, looking for cues in the infrastructure and the form that infrastructure would like to follow can optimize the building design or master plan. Building forms that respond to those decisions can optimize the efficiency of integrated infrastructure. Establishing or reestablishing site systems that respond to nature, perhaps following a dendritic form—like the pattern of a tree's root system—can complement urban form. Integration of infrastructure can be a springboard for design.

Finally, what advice can you give an architect in selecting a civil engineer who's clued in to sustainability?

Look for openness to new ideas, especially potential synergies between infrastructure and building systems, and look for experience implementing those ideas. Additionally, see if you can find a willingness to investigate alternative funding sources and to research new ideas that might fit the site. A good civil engineer can show leadership in connecting the dots on the funding side and mustering agency support, rather than running up against agency barriers. ●

USC Greenvisions Habitat & Linkages Study Species



SANTA SUSANA MOUNTAINS

SAN GABRIEL MOUNTAINS

SIMI HILLS

VERDUGO MOUNTAINS

SANTA MONICA MOUNTAINS

SAN RAFAEL HILLS

MT. WASHINGTON

MONTECITO HEIGHTS

LINCOLN HEIGHTS

MONTEREY PARK

WHITTIER NARROWS



The L.A. River:

Plain Drain No More

John Leighton Chase, Assoc. AIA,
Interviews Deborah Weintraub, AIA, and
Carol Armstrong



Opposite: LA River Revitalization Plan, Habitat Connectivity Map. Above: the LA River, from Canoga Park to its outlet in Long Beach. All images courtesy of the City of Los Angeles.

The Los Angeles River is a seasonal stream that runs from Canoga Park in the San Fernando Valley, east and southward through Los Angeles and Burbank and Glendale in its northern reaches, and then heads southward, flowing through Vernon, Commerce, Maywood, Bell, Bell Gardens, South Gate, Lynwood, and finally into the harbor at Long Beach. By the time the City finished confining it to a concrete straightjacket in the 1930s, it almost squeezed the life—and especially the wildlife—out of the river. But in an age of heightened green awareness, L.A. is now counting on the River to revitalize the city. Signs of hope are hard for Californians to find in the recession new year of 2010. But the Los Angeles River restoration effort and its Revitalization Master Plan are proof that legacy projects can persevere. The River was rediscovered as a potential ecosystem and recreational resource by the poet Lewis MacAdams and the Friends of the L.A. River (FOLAR) in the 1980s. Today, the Los Angeles River has become a touchstone for creative urban design and the inspiration for a more sustainable Los Angeles. The L.A. River Master Plan, adopted in 2007, takes full advantage of the River's potential to supply greater open space and recreation opportunities, bring communities together, and upgrade the ecological integrity of the River Basin.

The L.A. River Master Plan proposes an entirely new system of governance, under a new super agency, the Los Angeles River Authority; a new level of entrepreneurial leadership under the Los Angeles River Revitalization Commission; and a new standard of river oriented philanthropy in the form of a Los Angeles River Foundation. The Plan allows for measures that will lessen peak storm flow, allowing for some greening of the concrete river channel itself. As Burnham's plan was to Chicago in its scope and vision, so is the L.A. River plan to Los Angeles.

arcCA Editorial Board Chair John Leighton Chase interviewed Los Angeles Chief Deputy City Engineer Deborah Weintraub, AIA, LEED AP, and Carol S. Armstrong, PhD, Project Manager for the Los Angeles River Revitalization Master Plan, at their downtown Los Angeles office.

John Chase: Is the most important aspect of the L.A. River effort more open space, is it improve-



LA River Revitalization Plan, Reach 2: Sepulveda Dam to Tujunga Wash

ments in the ecology of the river basin? Better storm water management? Is it greater recreational opportunity, or is it giving people a more palpable connection to nature?

Deborah Weintraub: There are near- and long-term goals. The long-term goal is to bring back ecological value to the River. That's a more challenging goal because of storm water. Near-term, it's a 32-mile linear park in the heart of the city—something we can implement that will make a huge difference in the life of the city.

Chase: How do you restore a system that originally involved lots of open space but is now confined to a fraction of its former area?

Weintraub: We are not going to be able to restore the L.A. River flood plain to its original state. People live in it!

Carol Armstrong: We are not restoring an ecological system, we are restoring ecological value to the post-industrial landscape. If we can do it here in L.A., it's also important to many other urban places, particularly in the developing world, that are urbanizing rapidly.

Weintraub: I want to emphasize that nothing we are talking about doing along the river will jeopardize flood protection. When people say just rip out all the concrete, the answer is, well, that's not possible, but it is possible to take it out in selected areas. It is possible to do some armored channel bottoms with plants that might get scraped out when we have floods. We are essentially still going to need an armored river, because the river has been reduced to this narrow channel only one sixth as wide as it once was. The speed with which the water goes through there is now much greater. It's devastating to plant and animal life. If we were just to unpave the river, nothing would survive.

Chase: Is the L.A. River a single project undertaken by a single entity, or is it a family of overlapping projects undertaken by multiple entities?

Weintraub: It's definitely a family, because of the overlapping responsibilities among the different agencies—the City, the Corps of Engineers, the Water Board, Flood Control, and others. And that is its strength, because it is a cooperative effort. We have been working with the

County, with the DWP (Department of Water and Power), because they are also interested in water recycling and cleaning more water sources locally. If we can attenuate some of that storm flow, capture it, and use some of it for water supply, it helps those agencies accomplish their goals, and it also helps the River.

Chase: Do you ever see a downtown Los Angeles with rail tracks underground and open space immediately along the river? Is it possible that the banks of the L.A. River east of downtown might one day be the same kind of living room for the city, heart of the city, that Central Park is for Manhattan?

Weintraub: Generally speaking, the master plan says we want to move rail, consolidate it on one side of the park, and cover it where possible.

Chase: If you came to Los Angeles on a typical October day a hundred of years ago, would there have been cracked earth, or would there have been swampy areas?

Weintraub: The Glendale narrows, north of downtown, probably always had water. So did the Sepulveda basin. But there probably was very lit-



L.A. River Revitalization Plan, Reach 4: Cornfields-Chinatown area to 1st Street

tle flow in the river at this time of the year. Now that we have a steady flow—because of year round urban irrigation runoff—there is a lot of discussion about preserving it, because it does provide habitat, particularly for shore birds.

Armstrong: Councilman Reyes and the national League of Cities have been working with the people in Washington, who are starting to understand that Southwestern rivers are different: the L.A. River shouldn't be held to the same standards for clean water as Eastern rivers, because it is an ephemeral stream. It can be dry most of the year, and then torrents come down. As the Army Corps has reminded us, we accomplish the same slope from our mountains to the sea that the Mississippi River accomplishes in 2200 miles.

Chase: What do you say to the classic doubters who don't believe the river can be transformed?

Armstrong: One thing we do is show them examples of other cities that have done remarkable things.

Weintraub: We have some sister city rivers in other communities. One of them is the Cheong-

gyechon River in Seoul, Korea. They had encased a stream; they had built a freeway over it. They went back and opened it up. They revitalized their entire downtown, totally changed it.

Chase: How much fear is there of the change along the River, of bringing in the public, who may not be used to seeing the River as a public place?

Armstrong: A lot. It's been a forbidden place. However, in the places where they have already started to construct linear greenways and parks, the communities—even the ones that were hesitant—come to realize that it can be a great thing. I am thinking, for example, of the Tujunga Wash greenway project. A lot of the residents in that area did not want the project. But, now that it is there, they love it.

One of our greatest challenges is working with the County and the Corps in developing a way of patrolling the rivers that is more legible and understandable to the general public, because right now it's quite confusing—which areas are forbidden and which ones are not. So, we are working on a River Master Use Agreement between the City, L.A. County Flood Control, and the Corps of Engineers.

Weintraub: That Master Use Agreement is revolutionary. It seems like a small thing, but our goal is a single organization that you can pick up the phone and call, which is responsible for maintaining all the greenways on the river. Probably within a year we will be able to have that agreement.

Chase: What is the realistic expectation of returning wildlife, birds, fish, and animals to the city along the river?

Armstrong: It's only going to get better. They are already here. There are fish in the L.A. River now—and people who fish in the L.A. River—but the fish are non-native species. The steelhead trout is a native species that is an indicator species; a lot of people think that the river will have been truly revitalized if they reappear. Again, we are not going to be able to restore the ecosystem of the L.A. River, but we will be able to restore ecological value. ●

Learn more at the L.A. River Revitalization website, <http://www.lariver.org>, and at Friends of the L.A. River (FOLAR), www.folar.org.



An International Competition

David Meckel, FAIA

BCDC, the San Francisco based Bay Conservation and Development Commission, is a state agency created by the California legislature in 1965. Their web site (www.bcdc.ca.gov) has all the exciting content of a typical state bureaucracy. Headings include “Dredging and Sediment Management,” “Permits,” “Enforcement,” “Regulations,” and “Policies.” How is it, then, that BCDC has sponsored an international ideas competition seeking strategies for dealing with rising sea level? And in the middle of a budget crisis?

The answer, of course, is that even bureaucratic state agencies are staffed by individuals—in this case remarkable individuals. Executive Director Will Travis and his team, led by Brad McCrea, decided that they were in a unique position to pose important questions and share the responses with others around the country and the world. With a federal (not state) grant from the National Oceanic and Atmospheric Administration, they hired a competition advisor (the author) to help them launch and run “Rising Tides.”

The first step was to forge key alliances, the most important of which was with the AIA San Francisco chapter, to handle registration and payment. Graphic designer Kelly Macy (www.kellymacy.com) built a beautifully simple site that wasn’t suffocated by the state’s web site

standards. Although the focus was San Francisco Bay, rising sea level is an issue for coastal environments worldwide, so the jury would need to be a blend of local and global expertise. Three Americans—architect and writer Michael Sorkin; Bay Area landscape architect Walter Hood; and New Orleans based estuary expert Denise Reed—were complemented by two experts from abroad, Dutch coastal geomorphologist Marcel Stive from Delft and cultural landscape journalist Tracy Metz from Amsterdam. Over 135 entries were received; there were six winning ideas and seven honorable mentions.

The six winners suggest three distinct approaches. Two are about communicating the immensity and physical complexity of the challenges to come. *RAYdike* uses laser beams to mark future sea level at its projected height at full scale all around the Bay, while *The Hundred Year Plan* proposes a toolkit for the larger water issues tied to rising sea level. Another two suggest incremental approaches. *Topological Shifts* allows the Bay to infiltrate the urban fabric over time, creating a new kind of green city condition. *Evolutionary Recovery* prepares low lying communities to abandon unsustainable positions and move to higher ground. The last two winners push the boundaries of hybrid solutions that blend ecology and technology. *BayARC* suggests an operable tidal curtain right at the Golden Gate, while *Folding Water* regulates water levels at points around the Bay where an intervention could prevent flooding. ●

You can visit the competition web site at www.risingtidescompetition.com.



Topological Shifts

Wright Huachi Yang and Lee Stickles, SWA Group

TEAM CREDITS:

Wright Huaiche Yang + J. Lee Stickles

San Francisco, California

Special Thanks to: SWA Group

In San Francisco, . . . the area most affected by sea level rise is the industrial eastern waterfront If sea level rise were to take a natural course over the next 100 years, much of this edge would be at the elevation of tidal wetlands. However, sea level rise will constantly be in flux as it adjusts and shifts over time, and any intervention should be capable to alter with it. The complicated edge of the industrial landscape of San Francisco calls for various interventions that recognize the need for change over time and adjustment for the future. The idea of this proposal is to strengthen and extend upon already proposed development ideas to reach a realistic proposal for sea level rise. For our generation, we must decide which areas are crucial to protect and which areas can take a natural course of change, and shift and adjust as we negotiate with the sea. The intention of this proposal is to set up a framework and strategy for future generations, one that is conscious of a larger context [and] that is adaptable for change over time, as the next generation will likely view this edge differently.



100 YEAR PLAN RISING TIDES ARE A CATALYST TO SOLVE WATER CRISIS

RE-LOCALIZE WATERSHEDS



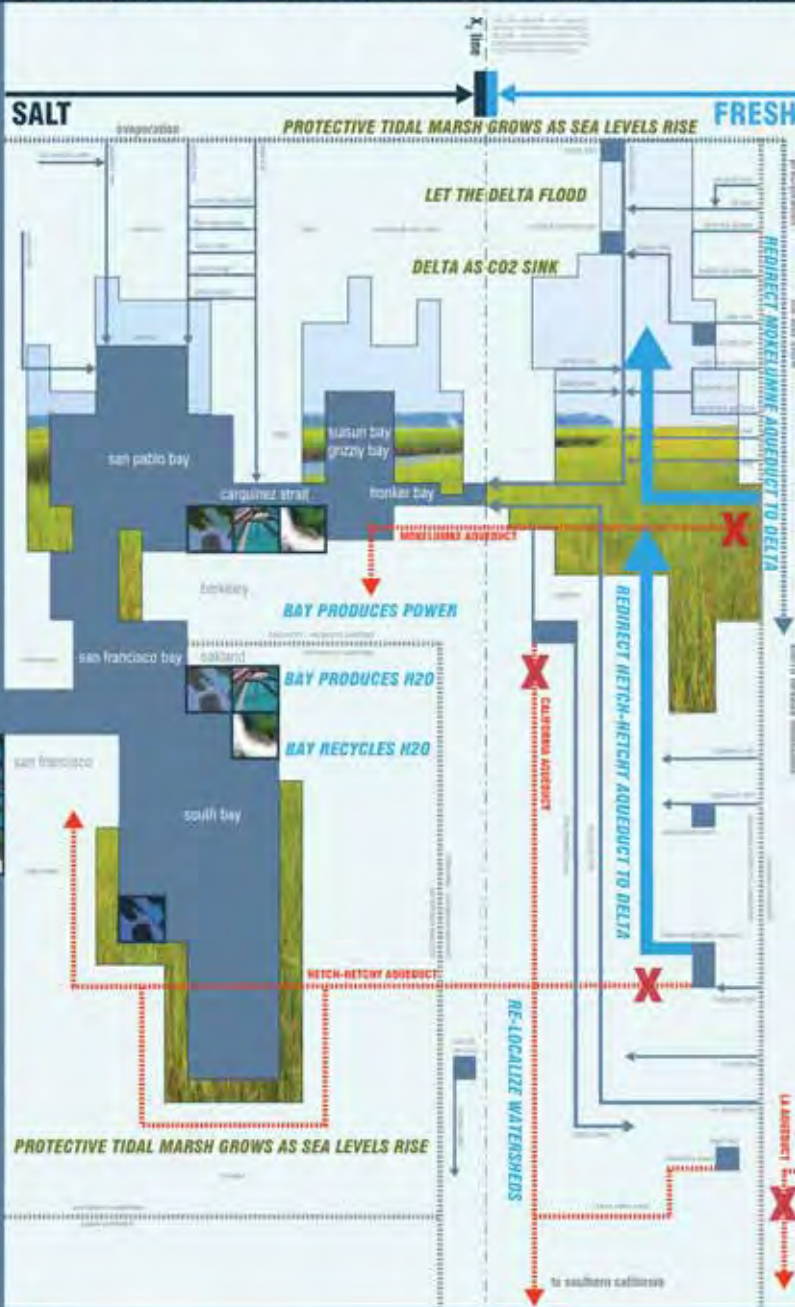
RE-PLENISH FRESH WATER

RE-POWER WITH TIDES

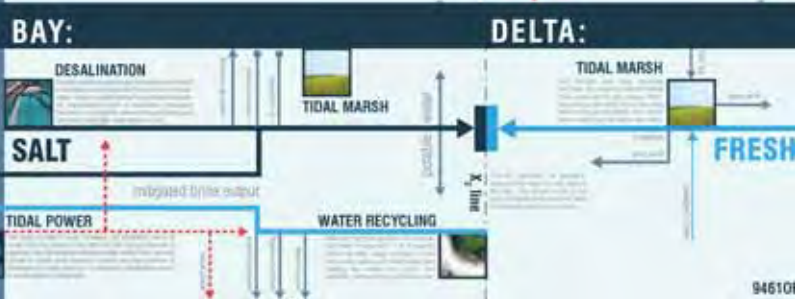
RE-GROW THE LAND

It is naive to focus on **RISING TIDES** as the most significant outcome of climate change. Rising tides are merely one symptom of a more daunting **WATER CRISIS**. The threat of rising tides can provide a catalyst which leads us to comprehensively **RE-BALANCE** the water system in **CALIFORNIA AND BEYOND**.

Our **100 YEAR PLAN** is political first and foremost. It advocates for an ambitious policy-based **TOOLKIT** that trades the "watershed hopping" method of massive water transport (which is energy intensive and environmentally destructive) for a more localized approach. We propose fresh water via sustainable desalination and water recycling programs along with tidal marsh regeneration, powered and protected by **RISING TIDES** over the course of the next 100 years.



TOOLKIT



The Hundred Year Plan Derek Hoeflerlin

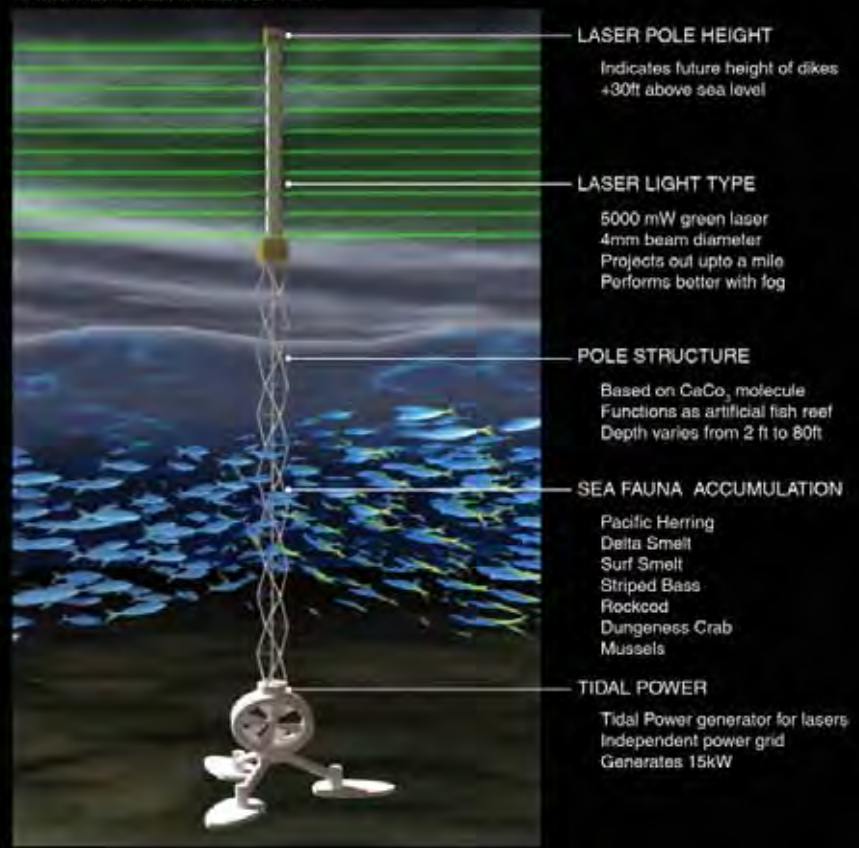
TEAM CREDITS:
 Derek James Hoeflerlin, Architect (co-lead, design + production)
 Ian Caine (co-lead, design + production)
 Michael Heller (research assistant)
 St. Louis, Missouri

It is naive to focus on rising tides as the most significant outcome of climate change. Rising tides are merely one symptom of a more daunting water crisis. The threat of rising tides can provide a catalyst which leads us to comprehensively re-balance the water system in California and beyond.

Our 100 Year Plan is political first and foremost. It advocates for an ambitious policy-based Toolkit that trades the "watershed hopping" method of massive water transport (which is energy intensive and environmentally destructive) for a more localized approach. We propose fresh water via sustainable desalination and water recycling programs along with tidal marsh regeneration, powered and protected by rising tides over the course of the next 100 years.



RAYdike EMITTER NODE SECTION



RAYdike

Thom Faulders

TEAM CREDITS:

Thom Faulders

Faulders Studio

Berkeley

Thom Faulders, Jang Hyung Lee, Sean McGuire, Devin Rutz

Night Photography: Jeremy Chang

RAYdike is a temporary laser light marker system that accurately maps a hypothetical barrier network required to protect Bay Area cities from rising water caused by climate change .

By mapping **directly upon the bay** how a large, standard earthen dike system lining the coast would appear, complete with accurate elevation heights and geographic locations, RAYdike is a real-time knowledge and awareness system. Additionally, once deployed, its presence could begin to stem the flow of new urban development into affected low-lying areas and would initiate the process for tidal zone land reclamation.



PROTECTION

SFO



Protect Shoreline Infrastructure

- Protect major shoreline infrastructure - Airports / Ports / Highways / Utilities
- **Physical Barrier + Wetland** = Double shoreline protection



OPERATION

Foster City



Operate Low-Grounds / Landfill Development

- **Retreat**: Existing development susceptible to future inundation
- **Relocate**: Creating **New High-ground** for Relocation
- **Recreate**: **New High-density development**



ADAPTATION

South Bay



Adapt Existing Wetlands / Salt Ponds

- Tidal wetlands function as natural buffers against flood events. They adapt to sea level rise by gathering sediments and growing vegetation accelerated with carefully **prescribed dredging and deposition** accompanied with **wetland planting**
- Salt ponds will be released as dredge materials and sediment washes into newly opened salt ponds



EVOLUTIONARY RECOVERY



Evolutionary Recovery

Yumi Lee

TEAM CREDITS:

Yumi Lee + Yeon Tae Kim, LANDplus Design

Special Thanks to: EPRI, Giyoung Park / Architect

San Francisco Bay is one living organism. It breathes, circulates and transforms over time. During the past century, San Francisco Bay has suffered from a tremendous loss of its body—more than 40% due to the heavy shoreline development.

The global warming phenomenon calls for both challenges and opportunities for San Francisco Bay. If continuous climate change is anticipated, the sea level at the Bay is projected to be 4.5 feet higher in 2100. This will result in massive inundation of the San Francisco Bay shoreline. Ironically, the sea level rise will bring back the Bay to the size that it was a century ago.

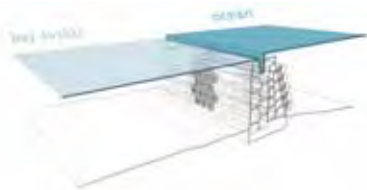
Evolutionary Recovery begins. There is no one magical solution for this recovery process. Some wounds have stitches to heal, while some need simple clean-ups. Others require major surgery. This design proposal defines the Bay's Evolutionary Recovery process and identifies three recovery zones: Protection. Operation. Adaptation.



FOLDING WATER: A VENTILATED LEVEE FOR A LIVING ESTUARY



FOLDING WATER is a new “ventilated” levee that protects shorelines by regulating both sides—rising sea levels and the delta and bay waters—mechanically managing tides to create micro-bay estuaries for the shoreline of San Francisco and other key areas within the Bay. Responding to dramatic global and climatic transformations, this *dynamic* levee system meets specific shoreline conditions to preserve waterfront property, activities such as recreation and tourism, and the estuarine ecology dependent on tidal action. It departs from the conventional, static levee—or dam—by exchanging waters through a perforated pump wall to artificially manage tides and to create micro-bay estuaries. These BAY AVATARS essentially maintain the current estuary’s levels, activity, and ecology, sustaining the relationship between the estuary and its inhabitants. This mega-scaled civic project provides a vital portal for the cultural and environmental future of the region in the form of a monumental FOLD of water.



Folding Water Kuth Ranieri Architects

TEAM CREDITS:

Elizabeth Ranieri + Byron Kuth

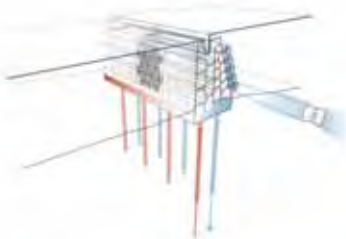
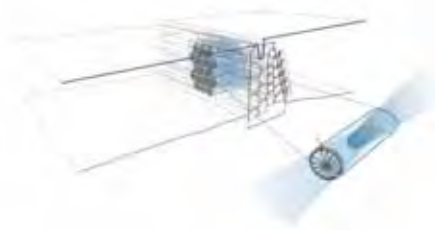
Kuth Ranieri Architects

San Francisco, California

Byron Kuth, FAIA, LEED AP, Elizabeth Ranieri, AIA, LEED AP,

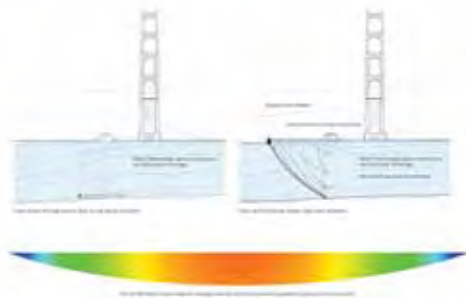
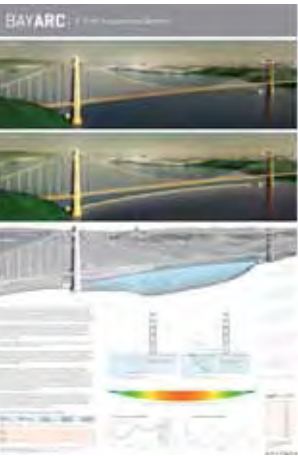
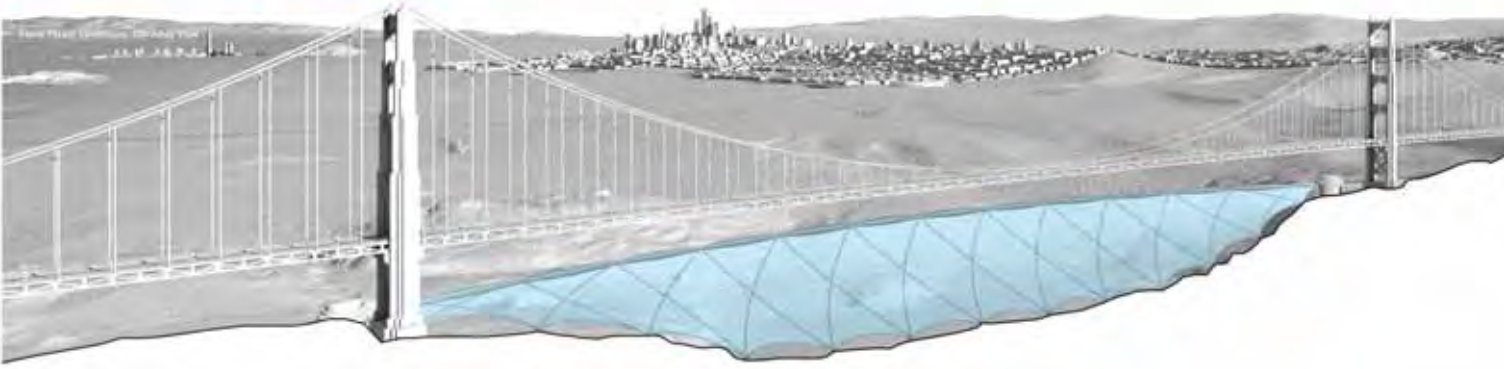
Steve Const, LEED AP, Gretta Tritch, Matt Hutchinson

Mark Stacy, Professor in Civil and Environmental Engineering,
UC Berkeley



Folding Water is a levee mitigation system that maintains water elevations for existing shorelines that are susceptible to flooding and manages rising ocean waters through the design of a *bifurcated* water surface strategy. This stealth infrastructural system manages water—and is made of water—artistically preserving the interface of culture and ecology by reforming the bay surface. Without a divisive barrier, it extends the natural ecology of the bay and maintains vistas and visual connections that characterize its unique estuarine beauty.

Tidal cycles are artificially managed through a perforated wall of pump “ventilators,” located at key sections along its full height, to allow the transport of the entire water column between the shoreline and ocean waters, creating Bay Avatars. By ventilating the regulated body of water, it *recreates* the ecological exchanges of sediment, salinity, and biota promoted by the tides . . . [It] can be specifically/locally tuned to accommodate the variety of shoreline conditions of its estuary.



BayArc
SOM San Francisco

TEAM CREDITS:
SOM

San Francisco
Craig Hartman

Design Team: Mark Schwettmann, Leo Chow, Geoffrey Brunn,
Alex Cruz, Ross Findly

Structural Engineering Concept: SOM, Mark Sarkisian,
Eric Long, David Shook

Marine Engineering Concept: Moffatt & Nichol Marine
Engineering, Dilip Trivedi, Richard Dornhelm

Graphic Design: SOM, Lonny Israel, Alexander Ng

... [T]he principle threat of flooding in the next century is not from the rise in the sea level itself, but from the increase in extremes during high tides, which create breaches of existing flood defenses for relatively brief periods.

The objective of the BayArc is to prevent the peak of extreme tide events while maintaining a natural tidal exchange between the ocean and the bay.

The BayArc consists of a submerged, cable-reinforced membrane anchored to the seabed that utilizes a bladder embedded in a tensile leading edge fastened to structural pylons at the water's edge. When deployed, the BayArc floats to the surface and its tensile membrane creates a barrier stretching from the water's edge to the sea floor. When it is not needed, the bladder is deflated, the BayArc sinks and rests on the sea floor.

When the peak tide is projected to rise above a threat level, the BayArc is deployed. It remains deployed only until the high-tide peak has passed, "shaving off" the peak into the bay ... [P]rojections for sea level rise by 2050 would require deployment for only a few hours per day and only a few times per year.



Central Plants:

From Back of House to Center Stage

Michael Franklin Ross, FAIA

In the not too distant past, if architects were asked to master plan a campus, images of Thomas Jefferson's University of Virginia and its elegant academic quad framed by well-proportioned classical façades would quickly drift into our minds. The infrastructure necessary to power the buildings was invisible, hidden somewhere out of sight. Central plant facilities were considered the ugly ducklings that nobody talked about. Of course, the cost of energy in the 19th century wasn't the major consideration that it has become in the 21st century.

When the University of California made the decision to build its tenth campus near the rural city of Merced in the Central Valley, energy conservation was a prime consideration. The site was in the middle of nowhere; the intention was to make somewhere special out of nowhere.

Skidmore, Owings & Merrill, LLP (SOM) was selected to develop the master plan. From the beginning, the goals for the campus were lofty and aggressive. Carol Tomlinson-Keasy, the UC Merced Chancellor at the time, framed the goals as setting "a new standard for energy efficiency, water conservation, utilization of recycled materials, and protection of air quality." The core objective was "to utilize all possible efforts to conserve and preserve natural resources."

With these criteria in mind, John Kriken and the SOM team developed a master plan that integrated nature into the campus, while making a gesture toward Jefferson's mall at UVA. SOM, with ARUP Engineers, was then asked to design the new central plant. They decided to celebrate it, not hide it in the backyard, so they put together a forward-thinking team that included Lynn Simon, FAIA, of Simon & Associates, as the sustainable design consultant. Simon, one of the founders of the United States Green Building Council (USGBC), has created a firm solely focused on energy-efficiency and green building. Together, the design team set a goal of surpassing the Leadership in Energy and Environmental Design (LEED) Silver target established by UC.

"One of the parameters for the design team was that the UC Merced campus had to be 20 percent lower in energy consumption than any of the other UC campuses," recalled Keith



Opposite, top: UC Merced Central Plant, SOM, photo by Tim Griffith; bottom: UC Merced master plan, Skidmore, Owings & Merrill, LLP. Above: County of Orange Central Plant, HGA Architects & Engineers, Syska Hennessy Group.



Above: University of Pennsylvania Modular VII Chiller Plant, Philadelphia, Leers Weinzapfel, photo by Peter Aaron/Esto.

Boswell, a director at SOM. “Energy performance was high on the list not only for the campus infrastructure, but for all components of the buildings.”

Completed in 2007, the UC Merced central plant achieved LEED Gold. Enclosed in perforated metal and channel glass, the building incorporates materials fabricated in the Central Valley. The building is comprised of three components: a three-story block that houses the power and infrastructure operations, a telecommunications building, and a two-million-gallon water storage tank. It provides 30 to 50 percent energy savings per year. Mark Maxwell, LEED coordinator for the campus, noted that “exceeding the standard on our first attempt reaffirms our commitment to environmental leadership and illustrates the dramatic progress we’re beginning to see in the design and construction of ‘green’ buildings.”

Yet the Central Plant is not only about energy savings; it is an architecture that stimulates a discussion of sustainable design and climate change. To facilitate this, SOM peeled

back the exterior wrapper to reveal the inner workings of the plant. “We worked with ARUP to compose the building around the operating equipment and pull those elements forward in its architectural form,” explained Boswell. “The Central Plant is located in the heart of the campus master plan. The idea was to make the facility very visible and very prominent. It should not only speak to what it does, but also promote sustainability.”

The national AIA award winner has become a prominent symbol of UC Merced’s academic mission and legacy of sustainability. “The declarative, iconic form of the Central Plant acts as a symbol of the importance the campus places on its sustainability objectives and the central role integrated infrastructure plays in achieving them,” said Tom Lollini, Associate Vice Chancellor of Design and Construction at UC Merced. “UC Merced has led the UC system in demonstrating what is achievable within constrained budgets. The campus has become a model of how sustainability as an aesthetic driver can create a

unique, modern identity that is derived from the history and the specific environmental challenges of the region.”

Elevating the central plant to this prominence hadn’t happened since Leers Weinzapfel won a national AIA award for the University of Pennsylvania’s Modular VII Chiller Plant, in 2001. At the time, *Architectural Record* reported, “The plant has become an elegant urban gateway for an increasingly busy side of the campus.” In a similar fashion, the UC Merced Central Plant has become the new front door to this emerging academic Mecca.

Changing the Energy Landscape

Every airport, academic campus, and large healthcare complex has the need to operate more efficiently, whether adding new buildings or upgrading existing facilities. To help clients meet these energy and infrastructure needs, HGA Architects and Engineers has teamed with Syska Hennessy Group in California to master plan and design multiple Central Utility Plants (CUPs) around the state. From San



Above: Children's Hospital & Health Center of San Diego, Syska/HGA, photo by David Noferi.

Diego to Orange County and from the Inland Empire to Sacramento, the Syska/HGA team has been developing energy simulation models to optimize operations for energy savings while visually enhancing the physical environment.

At Children's Hospital & Health Center of San Diego, Syska/HGA designed an expanded plant that would withstand a significant seismic event. The plant enables the hospital to operate independently from the power grid and to return additional power to the grid for distribution to others. Designed to seamlessly fit in with the existing campus architecture, the plant massing is shaped to be a good neighbor. Screens, walls, louvers, and openings are designed to allow the equipment to breathe, while concealing mechanical equipment and piping from public view.

Similarly, the County of Orange adopted a resolution to upgrade the central plant functions in the heart of the Santa Ana Civic Center to reduce its reliance on the grid. Syska/HGA teamed up to design a new 10.4-megawatt cogeneration facility that met the energy sav-

ing goals while being visually appropriate. The mass of the facility was broken into smaller scale components to allow the large mechanical equipment to fit within the Civic Center. It operates like a Transformer toy: a mechanical robot morphs into an Orange County businessman. The \$33.4 million facility is scheduled for completion in November 2009.

The State of the State

In response to Gov. Schwarzenegger's 2004 Executive Order that directed the "greening" of state buildings, the California Department of General Services (DGS) commissioned a team to design and build one of the most energy-efficient central plants in the country, the State Central Utility Plant. Completed in July 2009, the plant provides the steam and chilled water to heat and cool more than 5.5 million square feet of office space in 23 state-owned buildings. This heroic task was completed in just 21 months, with anticipated LEED Gold certification from the USGBC.

"California continues to lead the nation in

fighting climate change, and this new central plant is leading by example to reduce our state's carbon footprint," said Gov. Schwarzenegger at the time the plant opened. "It is very exciting that this new facility is being built to the Gold standard, and our state will save energy and reduce resource use while protecting the environment."

The initial design team included Capitol Engineering Consultants with Simon & Associates for sustainability, Lionakis Beaumont Design Group, and Jacobs Engineering. Subsequently, DGS commissioned a design-build team led by Skanska USA Building, Inc. with Nacht and Lewis Architects and Flack+Kurtz as major consultants.

"For projects as complex as the State Central Utility Plant, the design-build process enables us to get the job done quickly and lends itself to strong collaboration between the design team and the contractor," said Joel Griffith, project director for DGS. "Using the design-build model, we were able to select from teams that had a proven track record



State of California Central Utility Plant, rendering courtesy of Nacht & Lewis.

for energy-efficiency. The firms with the most points for sustainability and other design criteria, at lowest cost, won the job.”

The new plant incorporates the latest advances in technology, reducing water usage by over 95 percent compared to the old plant, and the facility can operate off the electric grid during an emergency. A subsequent phase of the plant will include a 140-foot tall, 4.25 million gallon, thermal energy storage tank to store reserves of chilled water produced during off-peak hours for use during the heat of the day. Photovoltaic panels will power the energy needs of the offices within.

“How do you hide an elephant in a cherry tree?” asks Lowell Shields, Principal with Capitol Engineering. “You paint its toenails red.” The design team has done that and more for this impressive yet imposing facility built in the heart of downtown Sacramento. By creating a composition of well-articulated forms stepping back from the street, culminating in the 140-foot tower, the team has developed a hierarchy of smaller scaled elements that build up to a facility

that feels at home adjacent to the 15-story State Office Buildings 8 and 9 next door.

Center Stage

Energy and infrastructure have always been essential components of civic and campus context. With greater awareness of climate change and an elevated dialogue about energy efficiency, central plants are gaining presence, and architects are discovering another point on their palette. The central plant has moved from the back of house to center stage. ●



Infrastructure

at Mission Bay:

a Conversation

Amy Eliot, AIA, Amy Neches,
and Tim Beedle

Mission Bay, San Francisco's newest neighborhood and the largest development in the city's history, was once 303 acres of former rail yards along the Bay. In the late 1990s, owner Catellus Development Corporation (now held by FOCIL-MB LLC) partnered with the San Francisco Redevelopment Agency to create a flexible plan for a mixed-use, transit-oriented development. Master-planned by Johnson Fain of Los Angeles, the project incorporates up to 6,000 housing units—28 percent of which are affordable—as well as 4.4 million square feet of office/life science/biotechnology commercial space; a new campus for the University of California, San Francisco; 500,000 square feet of retail; a hotel; community facilities such as a new public school, public library, and fire and police stations; and 41 acres of new public open space. About half of the housing had been constructed as of September 2009, as well as more than 11 acres of new parks and open space and significant elements of the other components.

A number of landscape and architecture firms have worked on Mission Bay's infrastructure, including EDAW (now AECOM), The Office of Cheryl Barton, Cliff Lowe Associates, Hargreaves Associates, Marta Fry Landscape Associates, WRT, MKThink, and Tom Eliot Fisch. Tom Eliot Fisch designed a number of the park structures and pump buildings. We asked principal Amy Eliot, AIA to talk about her firm's approach to infrastructure in the new neighborhood, in conversation with Tim Beedle and Amy Neches. Beedle is Vice President, Planning and Development, for Mission Bay Development Group LLC, which is responsible for building the neighborhood's infrastructure. Neches is Manager of Project Area Planning and Redevelopment for the San Francisco Redevelopment Agency.

Opposite, top: Stormwater Pumpstation No. 6, Tom Eliot Fisch, photo by David Wakely; bottom: base site plan of Mission Bay by AECOM.

Amy Eliot: How did you approach integrating the early elements, such as the urban design, park planning, and infrastructure?



Left: Mission Creek Sports Park Maintenance Pavilion, MK Think, photo by Jacob Elliott;
right, Kayak Hut, MK Think, photo by Steven Kelley.

Amy Neches: It is important to understand that the “Design for Development” document was not prescriptive. We didn’t try to prescribe style, because we knew things would happen over time.

Eliot: But was there a significant milestone in setting the tone?

Neches: Doing the streetscape master plan was important, because we did feel that the public realm needed to have some consistency, or it wouldn’t be a true public realm. The risk was that every developer was going to put in his or her own street trees and sidewalks, and the result would be chaos. The work on the streetscape took a long time to get right.

With an open space system, even though it is being built incrementally, you can’t design each piece independently as you go—it’s not like the buildings. So we came up with an agreement that the concept plan for each major park had to be done at once. Ultimately, even though a major public space may be built over time, the pieces will feel like one large park, and will make sense together.

Tim Beedle: The concept plan provides a good framework and general sense of continuity to the public spaces. Also, given both the scale and duration of this project, we had the opportunity to learn from experience through the construction and maintenance of completed parks and infrastructure projects. Those lessons are now applied as we move from the concept plan to construction documents.

Eliot: Let’s talk about the philosophy of infrastructure.

Neches: It’s important to step back from the implementation and understand infrastructure as a manifestation of place. The public realm is the armature that we have created in these 303 acres, and it is expressed in all kinds of ways. The various infrastructure buildings are vertical elements of the public realm.

You can see that public realm expressed in the street grid, which is meant to be as urban as possible. It’s divided into small, walkable blocks laid out in a linear fashion that reflects the grid and urbanity of San Francisco’s street plan.

Infrastructure buildings are an expression of the way cities really work, and of course they

are part of that larger comprehensive design.

Eliot: Can you talk about the context for the architecture at Mission Bay?

Neches: There wasn’t anything here. If you look at what’s been built, everything relates to a certain warm, modernist vocabulary. All of these pieces are designed individually, but they are part of an overall design palette that was meant to make Mission Bay feel like a part of San Francisco, while still reflecting the time in which it is built.

Beedle: Early on, we realized that the infrastructure and related buildings can’t be separated from these design principles. Take, for example, storm drainage management and its supporting infrastructure: there are five stormwater pump station buildings required throughout the project. They’re a major part of the urban environment, and, instead of trying to hide them, we made a decision to place these pump stations within the public parks. Their prominent locations in the public realm and the building architecture make them not remote from the public but rather architectural



Left: Park 15 trellis overlooking water feature, Tom Eliot Fisch; right: Stormwater Pumpstation No. 6, view west toward condominiums, Tom Eliot Fisch, photo by David Wakely.

elements within the park design.

Eliot: We were all pushed by the city’s Arts Commission, which has jurisdiction over the design of these structures, to design pump stations that celebrated a 21st-century vocabulary and were not hidden.

Neches: They really helped push us to reach a higher level of design. It took a few cycles of review.

Eliot: While most of our infrastructure buildings share a common architectural language of channel glass, exposed structural steel, and Heath tile, and are designed to have a lantern-like quality at night, you didn’t prescribe how other infrastructure buildings should look?

Neches: As with the development buildings, we want each one to be as good as it can be. There are the two buildings that MKThink did, the kayak hut and the maintenance building. We didn’t ask them to design a building like yours. We want the best of each architect involved.

Beedle: And yet they are compatible, because

their design expresses the function of the buildings as they relate to the public needs.

Eliot: What about earlier efforts?

Neches: We did have a MUNI power station that was built a number of years ago, and we have struggled a bit with that. The first one had a very “designed” look, but we didn’t like it. We didn’t have enough of a sense of what the place was going to feel like. We asked the architect at the city to give us a basic cinderblock building, and we would set aside resources to clad the building later. We didn’t even have the streetscape plan at that point.

Beedle: That raises an interesting point—how should the architect design the building without any context for the future?

Neches: In the beginning, they wanted to do something that referred to the industrial surroundings. We would tell them that those buildings were going to go away and wouldn’t make sense once everything around them was built up.

Eliot: There is a way to extend an industrial aesthetic that doesn’t seem falsely referential.

Beedle: We’re trying to maintain a consistent architectural language with the design of the public building in the plans for the future linear parks along Mission Bay Boulevard. In this park, the restroom, kiosks, and pergola shade structure incorporate similar architectural elements used in the pump station buildings at other locations. Other future parks, such as a children’s park and an active recreation park, have been designed to incorporate features which borrow—literally—from prior architectural elements found at Mission Bay; for example, using large steel I-beams recycled from the warehouses structures.

Eliot: What has the public response been?

Neches: Most people really love the infrastructure buildings, but some people really don’t. It’s the same with the other buildings in Mission Bay. But that happens in any city. ☺

THE INFRASTRUCTURAL CITY

NETWORKED ECOLOGIES
IN LOS ANGELES

Edited by Kazys Varnelis



Book Review

Everyday Urbanism. John Leighton Chase, Margaret Crawford, and John Kaliski, editors. New York: The Monacelli Press. 2008 (1999). 224 pp., illustrations, diagrams, and notes.

The Infrastructural City: Networked Ecologies in Los Angeles. Kazys Varnelis, editor. Barcelona and New York: Actar; Los Angeles: The Los Angeles Forum for Architecture and Urban Design; New York: The Network Architecture Lab, Graduate School of Architecture, Planning and Preservation, Columbia University. 2008. 251 pp., illustrations, diagrams, and notes.

Steven Flusty

Looking down on empty streets, all she can see
Are the dreams all made solid
Are the dreams all made real
All of the buildings, all of those cars
Were once just a dream
In somebody's head
—Peter Gabriel, “Mercy Street”

The strange and unexpected forms our cities take as they transit from imaginings to realization and back again have given rise to a vast toolkit for apprehending such metamorphoses. Jonathan Raban's soft cities within the hard, where bricks and mortar are psychically remolded by those who move among them; Henri Lefebvre's spatial triad of perceived, conceived, and lived spaces continually reproducing and elaborating one another; Michel de Certeau's restless, transformative practices of everyday life.

Ultimately, though, these constructs are high abstractions, and must be grounded in the pragmatics of nuts, bolts, and human hands if they are to be of use in understanding the making of real cities. The recent release of two edited volumes, *The Infrastructural City* and *Everyday Urbanism*, provide just such concrete grounding.

The Infrastructural City is comprised of illuminating—and even delightful—chapters on the evolution of assorted infrastructures thought of as idiosyncratically contingent histories of personal and insti-

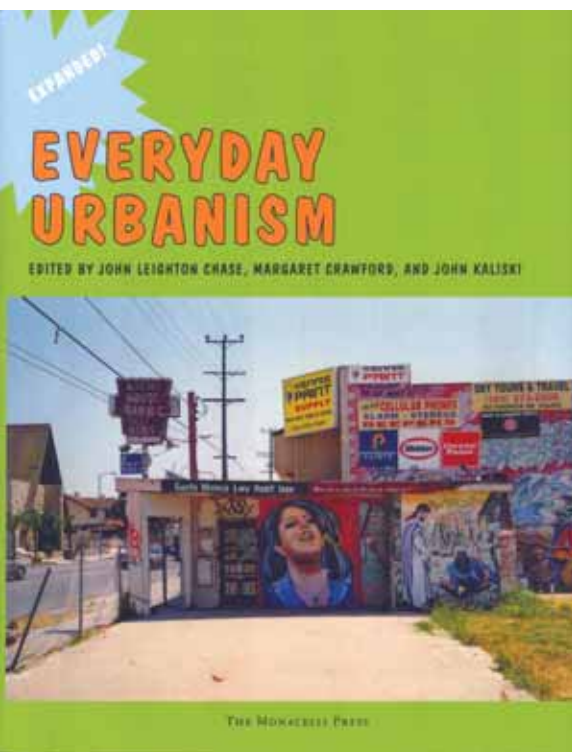
tutional practices. By way of example, in a handful of pages, one chapter deconstructs the very notion of traffic, while providing an overview of the development of traffic control from a policeman at every intersection to remotely sensing control rooms buried deep beneath our city halls. Another standout is an account of pavement—and of gravel in particular—focused as much upon the voided pits its mining leaves behind as its redistribution to form our hardscapes. And anyone who has marveled at how L.A.’s streets are simultaneously *de facto* research stations for botanical exotics will find much to absorb here, in the immigration histories and likely futures of eucalyptus and palm trees (both the vegetal and the telephonically cellular variety).

At the same time, there are chapters that, while exploring novel and unfamiliar infrastructures, are weakened by insufficient sourcing and by polemical criticism of our more destructive habits. Such criticisms at times appear as opaquely phrased moral pontificating that blunts both their impact and the accounts of the infrastructure to which they are saddled—as in an otherwise perversely fascinating depiction of the super-distribution centers for retail giants like Ikea and WalMart scattered about L.A.’s furthest nether-regions.

Nonetheless, the volume’s repeated observations that our infrastructures are reaching their limits, or are well past them, are well-taken and provide something of a unifying theme. This cautionary—at times verging on apocalyptic (we Angelenos, it seems, are never truly satisfied until we’re seeing our own city fall catastrophically in upon itself)—thread runs through most of the essays: the city’s infrastructure is devouring itself and everything around it, including the urbane lifeways it is intended to enable. An important theme, to be sure, although many of the authors are so intent upon telling the tales of their chosen piece of the infrastructural puzzle, and telling them well, that they seem to run out of space for this message. In the process, it frequently feels tacked on, sometimes only in chapter conclusions that are themselves little more than afterthoughts.

While the essays in this volume concur on the larger picture, they often vary widely not just in character but also in analyses that become, at times, glaringly dissonant. For instance, is the grade-separated Alameda Rail Corridor, recently created to carry high volumes of containerized traffic unimpeded from the Ports of Long Beach and Los Angeles, a new economic lifeline for L.A.? Or was it obsolete as soon as it was completed? There seem to be as many opinions as there are authors addressing it. Such disagreement underscores both the diversity of perspectives and the larger point that even the most Pharaonically planned and constructed infrastructure yields uncertain outcomes. So it is that *The Infrastructural City* injects us from many points into the kluged-together organs and systems comprising the Frankensteinian body of the L.A. hyper-region, its ever-lengthening tentacles stretching the city’s paved plains and crumbling hillsides into distant lakes and deserts.

Everyday Urbanism, a decade-old book now augmented with updated material, is a collection of two sorts of essays. First, it is a compendium of thoroughly illustrated cases wherein the varied conditions and responses of everyday life have remade the city adaptively, contingently, and messily. Such cases span a wide range of scales, from the signage on a chainlink fence and the social ecology of a single alley to a typology of ever-metastasizing pod-malls. And, second, these cases are conjoined to cautiously formulated and thoughtfully presented heuristics (never algorithms or prescriptions) for how to work with such everyday dynamics. These heuristics are consistently given concrete illustration, by such potential (and, in a few instances, realized) projects as street vendors’ furniture, pocket parks that harmoniously accommodate existing neighborhood constituents regardless of their officially sanctioned “desirability,” and retrofits of entire urban districts sensitive to their initial conditions. *Everyday Urbanism* is thus a detailed recognition of everyday lives as the vectors along which city planning and urban design should proceed; simultaneously,



it is an idea book for the objects and spaces such planning and design can create.

What *Everyday Urbanism* is not, *contra* some earlier critics, is anti-planning. Rather, it is critical of a particular, dominant kind of planning, whether in its High Modernist slash-and-burn or kinder, gentler, New Urbanist manifestation. Everyday urbanism objects to any planning that regards *what is* as a blight better replaced with a new, tidy, and commonly air-dropped master alternative—an alternative, it must be added, that is almost invariably exclusive in its realization. As such, while this volume is not committed to a countervailing planning solely for the poor and disenfranchised, it does give their concerns and practices at least equal weight. All urbanites, after all, are creators of everyday urbanisms.

These strengths, however, apply nearly as well to the original edition of the book as to the current version. More space given over to updated material, especially in the form of current commentaries on the older chapters, would greatly enhance this re-issue. Now that many of the realized everyday urbanist projects, new at the time of the original publication, have been in use for as long as a decade, it would be invaluable to revisit those projects and see how they have fared, lived up to expectations or not, and been transformed through their daily inhabitation. That, after all, is what an everyday urbanism is all about, and we can only hope we will not have to wait for a third edition in another ten years to find out.

If there is one overarching theme to *Infrastructural City*, it is that everything from watersheds to cellular phone towers have arrived at their ultimate dispositions through processes of everyday use and incremental transformation. This even in the presence of intensive, technocratic administration and despite planners' constant efforts—and all the more now that so much infrastructural production and maintenance is left in the unsteady, invisible hands of the market. Given which, it is long past time we accepted *Everyday Urbanism's* admonition that messiness, happenstance, and the unintended consequences of history accreted upon our streets are not aberrant blights to be extirpated, but inevitable givens and even opportunities to revel in and build upon.

Further, while these volumes focus on Los Angeles, they are at heart books about the urban, broadly understood. Circumstances conspired to ensure that I carried them with me through roughly half a dozen cities over the past couple of months, reading all the way. In the process, it became evident that, while L.A. may be exemplary of the dynamics presented across these pages, it is in no way exceptional. Rather, the analyses and analects to be drawn from these books are no less applicable to London, Tokyo, and a host of cities in between. As such, these volumes yield inclusive and flexible ways of looking at, and grappling with, our densely packed and over-stretched cities in general. Perhaps most importantly, they remind us of a vital truth too often lost amidst our naturalized urban environments and their domesticated technologies: infrastructure is people. ●



The AIACC

and Disaster Preparedness

Lori Reed

The American Institute of Architects, California Council, (AIACC) has long been a supporter of disaster assistance to California citizens, aiding disaster victims with recovery and rebuilding. In conjunction with assisting disaster survivors, the AIACC is involved in disaster preparedness, as well. The first AIACC *Disaster Preparedness Handbook* originated in 1984. It was updated in 2005, with the goal of including many of the agencies and organizations that typically respond to disaster survivors. Focus groups were held with many of the entities that regularly work with disaster victims, and representatives from the following organizations were involved in the creation of the *Handbook*:

U. S. Geological Survey
California State Architect
California State Building Standards Commission
Governor's Office of Emergency Services
Earthquake Research Institute
Sandia Laboratories
Aediface Architecture
Degenkolb Engineers
Haviland Associates
Muller & Caulfield Architects
Perkins & Will
WWCOT

Olive View Hospital following the San Fernando Valley Earthquake, 1971. Photo courtesy of the National Oceanic and Atmospheric Administration's Historic Coast & Geodetic Survey (C&GS) Collection.

The purpose of collaborating was to join efforts, rather than work independently, and to work together when disaster strikes. The focus groups provided information that was formatted to cre-

The first truth about disaster preparedness
is that nothing prevents a disaster.

ate a handbook for those interested in establishing a preparedness plan—AIACC members, its chapters, and the public at large.

The *Disaster Preparedness Handbook* presents in simple terms the best plan for each individual to be prepared for a disaster. The easy-to-follow system aids in alleviating some of the chaos and confusion that occur during a disaster.

“The first truth about disaster preparedness,” as the *Handbook* emphasizes, “is that nothing prevents a disaster.” In California, wildfires, floods, and earthquakes are natural hazards that can and do result in disaster. Unfortunately, the worldwide threat of terrorism must also now be added to the list. In the aftermath of disasters, safety evaluation, damage assessment, and recovery all depend on the unique skills and expertise of architects. As advocates for public safety, architects are involved in the local, state, and federal activities that affect the public’s health and safety through the built environment.

A disaster is unsettling and can be overwhelming. The AIACC *Disaster Preparedness Handbook* includes an updated list of emergency service contacts, providing victims with the information they need regarding whom to call for what, available at their fingertips. In addition, an emergency card is included to help guide disaster victims about what to do in the event of a particular disaster. A “Decision Checklist” provides individuals a sequence of steps to take when a disaster occurs and to check off as they are completed.

The AIACC is actively involved in assistance to those affected by disasters in Califor-

nia. It works with counties and other agencies to expedite the turn-around time for the issuing of building permits, in addition to working with representatives from most insurance companies, as well as local political figures, conducting workshops for disaster victims to help them through the recovery and rebuilding process. The AIACC has also developed comprehensive fire resources, providing guidance to fire victims in their rebuilding efforts.

At the time a disaster hits, the AIACC immediately launches into disaster assistance mode, quickly issuing press releases and public service announcements to educate and alert the public to possible fraudulent products or claims—in damage assessment, debris removal and demolition, the process of financing, and rebuilding. The AIACC and local California chapters advise victims on rebuilding options, what to look for in deciding what kinds of professionals they will need, and how best to select the professional who is right for them.

The AIACC provides a toll free phone number for victims to speak directly to an architect regarding the rebuilding process and works closely with the Office of Emergency Services to provide disaster certified architects to the regions affected by a disaster. Comprised of twenty-two chapters throughout California, the AIACC also works closely with each chapter affected to provide assistance to disaster victims in their respective areas.

John Grounds, AIACC 2009 president, states, “We have learned from past disasters that this is not the time to make hasty decisions. Residents should educate themselves

about the rebuilding process and their options. It can take two to three months for disaster survivors to make informed decisions about the long-term impact of rebuilding their communities, and it is incumbent upon architects to help them make the best choice for themselves and the environment. The AIACC conducts workshops regarding the design, permitting, and construction process and how to work with city and county agencies to expedite permitting, allowing residents to get back into their homes as quickly as possible.”

With the input of architects, the state Office of Emergency Services, and the AIACC, protocols have been developed enabling certified AIACC volunteers to assist in the safety assessment and inspection of residential and commercial buildings.

Architects are concerned with the sustainability of all buildings and the use of materials to make rebuilt structures as environmentally responsible and energy efficient as possible. But sustainable design also means that homes be rebuilt to enhance their capacity for survivability in future disasters. Architects’ expertise is key in defining what the best rebuilding approach is for each area in California.

Disaster preparedness and assistance are among the many effective and impactful programs the AIACC offers its members and California citizens. For more information on these and other programs, please contact Lori Reed, Director of Marketing and Communications at lreed@aiacc.org, or visit AIACC.org, where all disaster preparedness resources are available free of charge. ●



Off the Grid 2.0

“Healing the Damaged Edge”

Horseshoe Cove at Fort Baker Ideas Competition for Restorative Design

The California Architectural Foundation, through the William Turnbull, Jr., Environmental Education program, furthers the general public’s understanding about the synergistic relationship between the built and natural environments in California. The Off-Grid Ideas competition involves finding sustainable solutions for urban infill projects with a zero carbon footprint. These solutions do not necessarily require a built solution; concepts may include innovative community development strategies, development of sustainable public policies, infill development concepts, natural resource conservation, multicultural issues, and creation of new materials or systems.

Competition Brief

In 1972, the Golden Gate National Recreation Area was created, encompassing much of the military land in and around the Golden Gate, including Fort Baker and the Marin Headlands. The site has been transformed from military use to public recreation under the guidance of the National Park Service. Today, Fort Baker is home to the Bay Discovery Museum and the Cavallo Point Resort and Conference Center. The site also continues as a thriving wildlife habitat and spawning ground for many species of bird, butterfly, and marine life. Numerous infrastructure improvements have been completed to better accommodate visitors.

In the midst of these improvements, a significant plot at the water’s edge along Horseshoe Cove remains vacant, damaged, and undefined. The water’s edge is marked by a deteriorating sea wall that blocks access to the water. The site has stunning views of the Golden Gate Bridge, the Bay, and San Francisco. This cove on the San Francisco Bay has seen many different uses come and go. Some of the past uses and users include:

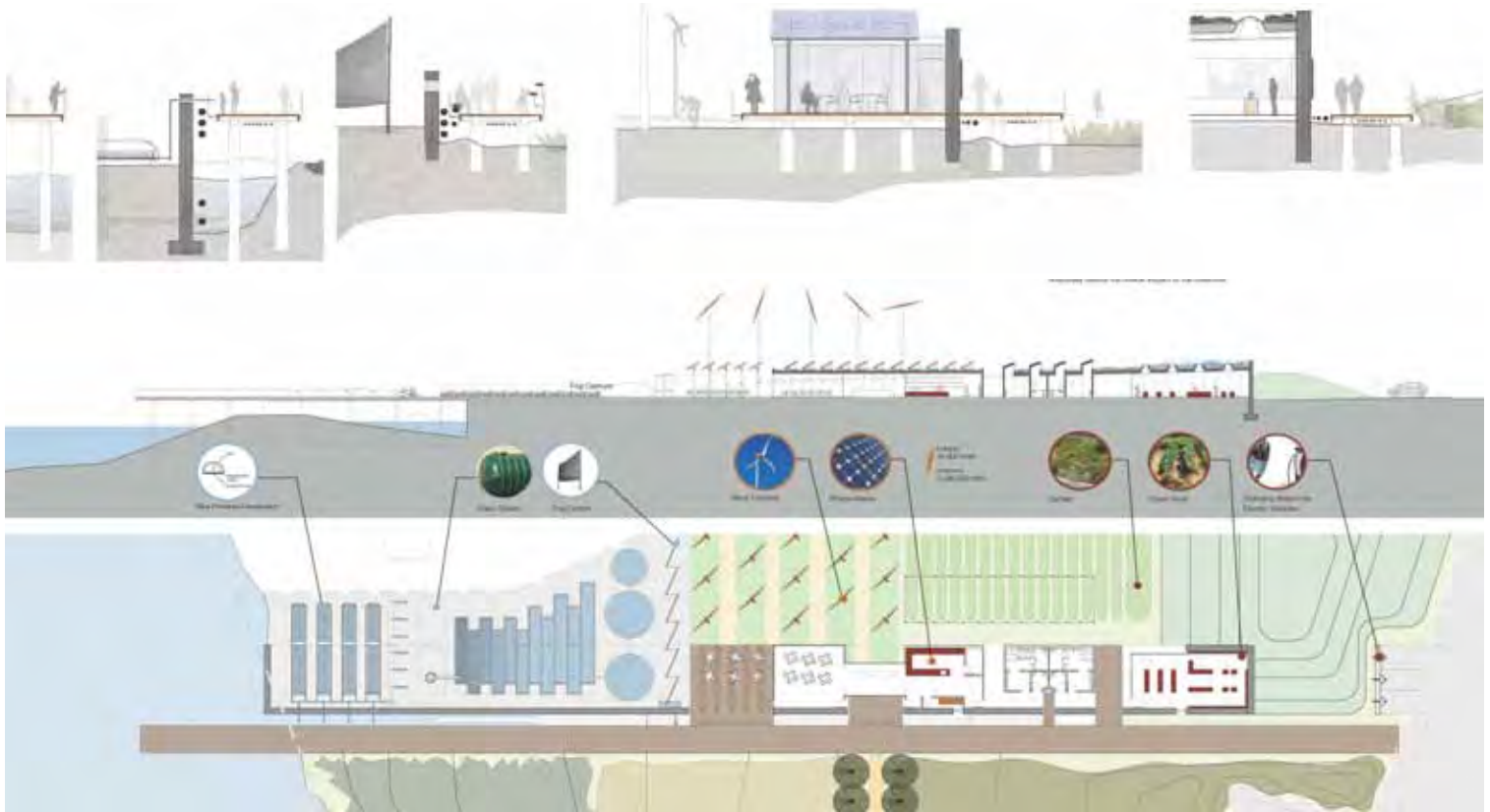
Indigenous—Miwok native hunting & fishing ground, pre-1775
Explorers—Spanish conquistador encampments, 1775-1840s
Historic—US Army fort & battery, 1850s-2002
Industrial—construction yard for the Golden Gate Bridge, 1930s
Recreational—yacht club, kayaking, fishing pier, present day

This waterfront site offers a design opportunity to enhance the visitor’s experience of the San Francisco Bay. From casual bikers and hikers, to attendees at the Cavallo Conference Center, to the school children and families visiting the Bay Area Discovery Museum, a wide cross-section of the public is drawn to this location. A sensitive infill project that provides improved access to the water will only increase the appeal of Horseshoe Cove. At 6.3 acres, this is a small site bounded on all sides by established functions. The competition sought ideas for public use structure(s) and spaces that achieve a balance between natural ecology and urbanity within very finite constraints.

Competition Jury

Hsin-Ming Fung, AIA—Hodgetts & Fung Design and Architecture
Mary E. Griffin, FAIA—Turnbull Griffin Haesloop Architects
Peter M. Saucerman, AIA—Dreyfuss & Blackford Architects
Mark W. Steele, FAIA, AICP—M.W. Steele Group, Inc.

More information available at www.caf-e.org.



Professional Honor Award and Top Award Winner

EHDD Architecture: Phoebe Schenker, AIA,
Emily Bello, and Janika McFeely
"Collected Infrastructure"



Our proposal retains a band of the existing site—including the current condition at the water's edge—anchored at one end by building and populated with renewable infrastructure. The remainder of the site is returned to its natural condition, sloping to the water and with native ecologies restored. Mediating between these two extremes—the natural and the built—is a wooden pier, which sits lightly on the site without conforming to the topography. This pier provides a means of understanding both the built band and the natural expanse while providing a third means of experiencing the water's edge, by bridging it and allowing occupation of the water's surface beyond.

The built bar contains three sections—consumption, energy, and water—which together produce an "off-the-grid" building. The necessary infrastructure runs between retaining wall and pier making it easily accessible and visible to the public. Each built section correlates to a band in the landscape that performs the same function in the natural world. As you walk along the pier towards the water, the restored

landscape to your left slopes naturally down to the water's edge, while the constructed landscape to your right is put to work, producing energy and water for our consumption.

This basic spine and banding could be implemented on various sites, as narrow as 80' across and as wide as imaginable. Because the proposal operates as a catalyst for the surrounding buildings, the expansive possibilities of a small intervention are magnified.

Jury Comments: *"The jury was won over by the very simple and strong gesture of the boardwalk separating the highly structured man-made facilities to the West from the natural, non-structured wetlands to the East. The graphic organization was very elegant, starting with a clear concept in simple diagram that is consistently developed throughout."*



Professional Merit Award

Yevgeniy Ossipov,
Anderson Anderson Architecture
"Poppy Beach"



As your ship sails in beneath the Golden Gate Bridge, off the port bow lies a sweeping golden crescent appearing like giant floppy fabric poppy flowers strung along the shore and twisting upward into a spiral tower lei jutting from the tiny peninsula cupping Horse Shoe Cove. At first glance no more than a joyful celebration of this most incredible place, closer inspection confirms the suspicion that so large a construction must have compelling economic purpose undergirding its dazzling orange gold persimmon beauty, like the Golden Gate bridge itself arcing overhead.

Of course, the form and color are borrowed, appropriately enough, from the simple California Poppy flower. Much of the function is borrowed as well: the blossoms capturing fresh water from rain and condensed fog, while the brilliantly reflective interior flash of the petals unfolds to focus solar energy onto pistil-positioned PV cells. The water-swollen petals filter and store moisture transported into twining, tuberous roots becoming a supple, wave absorbing breakwater protecting and

nurturing renewed natural shore life previously disrupted by the hard, man-made edges of the cove. Just as the natural flora and fauna revive, so too will human recreation in this more sheltering beach of sun-warmed softness filled with life, nakedness, and kayaks reflecting dazzling golden light through the moistening fog.

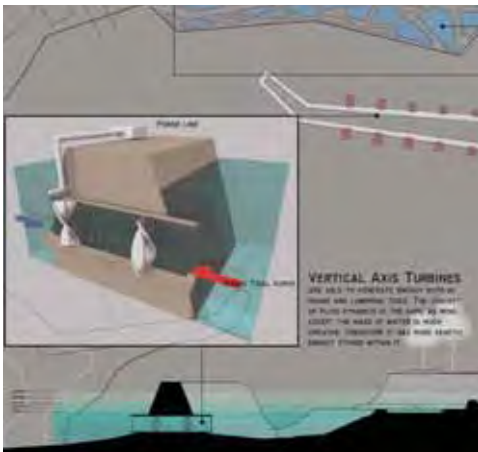
Jury Comments: *"'Poppy Beach' presented a dramatic and whimsical sculptural statement with two recurring elements. Though not fully resolved, it presented the freshest ideas with a light touch. The illustrations and the mating of natural forms with high-tech function was compelling. The jury was romanced by the poetry of this entry."*





Student Honor Award

Garrett Van Leeuwen, Cal Poly Pomona
 “Eco-mimetic: Synthesized Design
 Strategies to Mimic and Regenerate
 Disturbed Ecosystems”



This design for the 6.3 acre site on the water’s edge at horseshoe cove is an attempt to synthesize the existing natural and man made elements of this unique place, while restoring the ecosystem in the tidal zone. Using regenerative design principles, habitats of multiple functions were created for marine life, birds, and humans.

The tides are in constant shift, and thus the design takes advantage of the different levels of water throughout the day by having a system of terracing tide pools. To take advantage of the energy stored within the rising and lowering tides of the ocean, a new appendage was added to the cove to house turbines for tidal energy capture. This new walkable “arm” also protects the tide pools from strong surges and creates a smaller “sub-cove” with direct beach access.

Constructed wetlands were created to treat grey water before it reaches the ocean. The café is to have a primary treatment system to separate solids and pump grey water to the top of the mimicked estuary. These ponds use microbial activity to separate nutrients from the

water, thus cleaning the water while providing habitat for migrating birds and creating fresh water features for the park. The constructed wetlands, as well as the tide pools, are meant to serve as demonstrational elements of ecosystem restoration.

The Café itself takes a very passive approach, being nestled against an existing slope and modestly sized, so as to bring out the natural qualities of the site design. Like many creatures that live in the tidal zone, the building is well protected, with a small opening to use when the opportunity strikes. The architecture and landscape are meant to be one, cohesive whole.

Jury Comments: *“This entry took visual and structural cues from the Golden Gate Bridge, which dominates the vista from the site. The jury admired the dynamic forms and rugged materials fitted to the site, both recalling the iconic bridge’s construction and suggesting gently decaying ruins in the restored wetlands of the site. One of the most contextual entries, with sure-handed execution.”*



Student Merit Award

Katinka Suedkamp and Laura Duhacek,
NewSchool of Art and Architecture
“Cohesion”



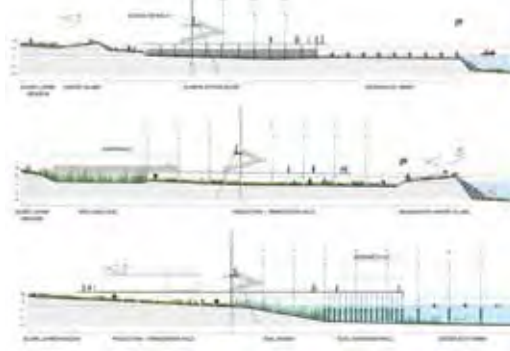
Vortex Induced Vibrations Aquatic Clean Energy (VIVACE): tidal currents flow around small, cylindrical devices, creating vertical whirlpools, which push and pull the cylinders, generating electricity.

The redevelopment of the Horseshoe Cove site brings a vital opportunity to the Golden Gate National Recreation Area to become a compelling destination and a sustainable learning resource center. The master plan developed from the idea of restoring the site back to its more natural state, while creating a fine balance of sustainable development and enrichment-based recreation at the site. Blurring the edge between development and nature at the site leads the way to designing a place that encourages the interaction of the visitor with the site and the surrounding ecosystem. The sustainable features become demonstrations for the visitor but also provide the energy and resources needed to keep the site off the grid.

Redevelopment issues of tying into, improving, or adding to existing functions in and around the site were carefully considered. The main focus was generating enough energy, in new or unconventional ways, to sustain these functions. The energy is generated not only by tidal currents and the strong wind, but also by the users that partake in the

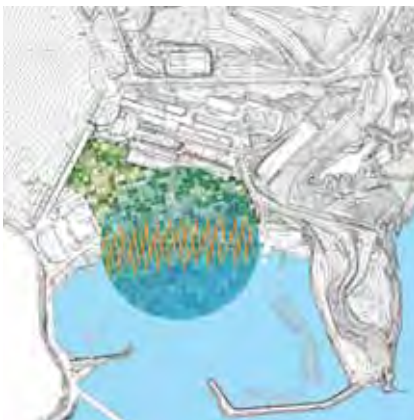
recreational modes of transportation provided on site. Each system is part of a cycle, and each cycle is part of the larger whole, as in a natural ecosystem. The improved water’s edge, restored to a natural shoreline, leads the way to the blurring of site and water and inspired the ideas for the new on-site building. The building provides the functions needed by visitors but also expands the learning opportunities for sustainable design.

Jury Comments: “*This entry presented broad-spectrum ideas for a range of issues—transportation, tidal currents, wind, water, recycling, and education. The majority of the site is given over to a wetlands, and the building is minimized. The jury was impressed that the team thought of everything related to site and systems and took the time to research and provide substance to the many ideas proposed.*”



Special Jury Commendation

Interstice Architects:
 Andrew Dunbar, AIA, Zoe Astrachan,
 Arjun Bhat, Jon Ganey, James Munden,
 Darren Perry, and Amy Wolff
 "Agri-Structure-Eco-Structure"



Inspired by the dynamic ecological potential of Horseshoe Cove, we propose a highly visible public infrastructure that sustains stewardship. By re-distributing the sea wall boundary, the site is transformed into a blurred tidal edge. Water/land ecologies evolve as we re-appropriate vernacular agricultural systems to create self-generating ecological structures. In shifting the context of these processes, we will also engender a transition from a culture of consumption to a culture of stewardship. To this end, we propose a series of simple performance typologies to create a sustaining landscape.

The site is organized and "grown" through the implementation of both Eco-structures and Agri-structures, which create a highly concentrated wetland ecotone. These structures include redistributed landform, low-impact access catwalks, and distribution networks, which together generate a site-wide "Plot" nursery for desperately needed habitats and endangered native species. The Plots are the biomass products of emergent wetland ecologies. The surplus production of the Plots is

exported to other sites as they become available due to rising sea levels.

The simple flexible armatures, in turn, create program opportunities within the Plot nursery. The initial infrastructure recedes over time as proactive ecologies succeed. The Agri-structures remain and are slowly reclaimed by the rising sea, eventually establishing a thriving marine estuary to become a destination for scientists, eco-tourists, and local residents alike.

Jury Comments: *"This was a very ambitious entry that explored teaching opportunities to a high degree. The project's relation to the Discovery Museum is admirable; it is a nice complement to the museum. The jury was somewhat concerned by the array of tall wind turbines dominating the site and view of the bay. This solution is highly engaged in activities that support environmental learning."* ©

3 recent books on infrastructure

Ambiguous Spaces, by Nannette Jackowski,
Princeton Architectural Press 2008
The Infrastructural City, edited by Kazys Varnelis,
Actar 2009
Advanced Public Design, edited by Pyo Mi Young,
DAMDI 2009
<http://library.cca.edu/>

The largest California infrastructure projects in planning

700 mile-long bullet train rail system
\$25-\$33 billion dollar project
Richard D. Chong & Associates
HNTB
DMJM
Parsons Transportation Group
In planning schematics
San Francisco Central Subway
\$1,290,000,000.
DMJM and others
In planning schematics
BART Extension, Pittsburg Bay Point to Antioch
\$500,000,000.
In pre-design
Bridge Replacement in Los Angeles County
\$400,000,000.
URS Corporation
In schematics
www.mcgraw-hill.com

Projected spending related to California's 800-mile high-speed rail system

\$ 980 million for San Francisco to San Jose
\$ 466 million for Merced to Fresno
\$ 819 million for Fresno to Bakersfield
\$ 2.187 billion for Los Angeles to Anaheim
\$ 276 million for preliminary engineering and environmental work
www.cahighspeedrail.ca.gov

The winning ideas from the recent WPA 2.0 design competition

Professional category
"Carbon T.A.P./ Tunnel Algae Park," PORT architects Andrew Moddrell and Christopher Marcinkowski of Chicago and New York.
Student category
"R_Ignite," Peter Millar, Jamie Potter, Andy Wilde, and Stuart Wheeler, Manchester School of Architecture; and "Aquaculture Canal_New Orleans," Fadi Masoud, University of Toronto.

The 4 largest California airport design and construction projects underway

SMF \$380,000,000.
Corgan Associates and others
2012 completion
SFO \$250,000,000.
Gensler and others
Ongoing
SJC \$241,000,000.
Gensler and others
Just completed
LAX \$500,000,000.
Gensler and others
2010 completion
www.mcgraw-hill.com

America under construction

A site launched to track the debate over the use of the stimulus funds.
www.infrastructurist.com

Number of smart meters PG&E plans to install in California

10,000,000 by 2012—the largest such program in the nation; they are currently deploying more than 12,000 a day.
www.pge.com

David Meckel, FAIA

The largest California bridge and tunnel projects underway

Bay Bridge	Alameda County Self-anchored suspension section only \$1,434,000,000. 2014 completion
Bridge & Roadway	San Diego County \$407,000,000. Underway
Six Bridges	Orange County \$193,000,000. Underway
Bay Bridge	Alameda County Touchdown element only \$177,000,000. Underway
Bridge	San Bernardino County \$172,000,000. Underway
Railroad Tunnel	Alameda County \$137,000,000. Underway

www.mcgraw-hill.com

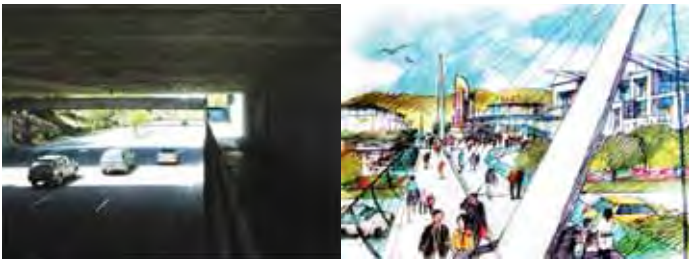
Some AIACC members with infrastructural names

Bonnie Bridges, AIA, San Francisco
Jay Bond, AIA, Fullerton
George Crane, AIA, Glendale
David J. Flood, FAIA, Manhattan Beach
Roland Foreman, AIA, Corona Del Mar
Lisa Landworth, AIA, Los Angeles
Lesley Miles, AIA, Morgan Hill
Steven Rivers, AIA, Los Angeles
Mark Steele, FAIA, San Diego
Tracy Stone, AIA, Los Angeles
Terry Tarr, AIA, Sacramento
Kevin Waters, AIA, Orange
John Woodbridge, FAIA, Sonoma
www.aiacc.org



An Urban Design Vision for Orinda, California

Peter Hasselman, FAIA



Top: aerial view of Orinda. Middle: Orinda Theater and proposed plaza. Bottom: existing and proposed pedestrian connections. Drawings by the author.

Orinda is a suburb of 17,000 people, 15 miles east of San Francisco, noted for its weather, topography, and schools. Its linear central business district was long ago bisected by a freeway and rapid transit line (BART), and the BART station's massive surface parking lot. The resulting dual business areas are vacuous, inactive, and disconnected, and their low density has created a mediocre sense of place. (For example, the entrance view of the CBD when exiting the freeway is a liquor store parking lot.) The town's single iconic building, an Art Deco movie theater with elegant marquee fin, anchors a semi-vacant retail complex. Although the city's professed desire is to be "pedestrianized," there is little to encourage walking, since the CBD is 80% pavement and has few focal points of interest.

A grassroots planning effort has reviewed precedents from similar U.S. cities and pedestrian friendly cities in Europe. The study proposes to reconnect the dual CBDs by way of state-of-the-art pedestrian bridges that span the freeway and a mid-rise, mixed-use development above the BART parking lot. The BART station itself would become an enhanced transportation center serving trains to the city and airport, bus routes, taxis, bicycles, and car rentals for residents and office workers whose proximity to BART makes automobile ownership unnecessary. A large, sun-lit plaza will serve as the entrance image for the town, and an existing library plaza and fountain system will connect 900' of pedestrian-worthy focal points with the existing civic center and library. ●