

## WATEREUSE ASSOCIATION NORCAL CHAPTER MEETING

February 23, 2018



San Francisco | New York | urbanfabrick.com

## **FIRM OVERVIEW**



# Urban Fabrick connects policy, practice and design through the power of collaboration, sustainability and storytelling.

POLICY



Our services bridge many of the professional knowledge gaps that exist between today's business-as-usual design practices and those required to successfully realize high-performance outcomes. We apply our knowledge of green building, adaptive design and resilience planning to help our clients make smarter decisions.

At Urban Fabrick, our mission is to make sustainability accessible and engaging to all. We work with our clients to build

better buildings and create more livable, walkable urban neighborhoods. We deliver sustainable, cost-effective building outcomes by synthesizing research, policies and technology. We guide the progress of green building certifications, net-

PRACTICE

We're committed to spreading our expertise to wider professional and general audiences. We provide engaging, professional educational programming on sustainability and collaborative design. Our outreach, messaging and training services weave narrative and visual storytelling techniques into immersive educational content. Through research-based publications, interactive installations, audio tutorials and more, we engage clients and stake-holders in meaningful conversations about our changing built environment.



DESIGN

#### **AFFILIATIONS & CERTIFICATIONS**

· Certified micro local business enterprise (LBE/OBE) in San Francisco

zero energy design and climate positive development at any scale.

- · United State Green Building Council Member
- · Carbon Leadership Forum Sponsor
- · Certified LGBT Business Enterprise
- · International Partnering Institute Member



## SERVICES



Transbay Block 9

### STRATEGY PLANNING

- Scenario Planning, Vision & Strategy
- Climate Action Plans
- · Resilience & Adaptation Planning
- · Zero-Net Energy
- · On-Site Water Reuse

### BUILDING & DISTRICT CERTIFICATIONS

- · Feasibility Studies
- Team & Process Administration
- Support Documentation & Analysis

### **PROJECT MANAGEMENT**

- Construction Project
   Management
- Owner's Representation & Advisory
- Project Management Support Services

### **ANALYSIS & EVALUATION**

- · Energy Modeling/Analysis
- · Daylighting
- · Life Cycle Assessment
- Water Budgets
  - · Sustainable / Healthy Materials

### **CODES & POLICY**

- · Building & Energy Codes
- · Local Green Building Ordinances
- · Incentives Programs
- · Water Reuse Policy

### **EDUCATION & COMMUNICATION**

- Professional Education Development
- · Visual Media & Infographics
- · Workshops
- Publications
- · Practice Guide Development



## **SELECTED PROJECTS**

#### **AEC DAILY WATER REUSE**



Urban Fabrick developed an online educational course on water reuse for AEC Daily, a continuing education provider. This 30-minute course introduces listeners to look beyond low flow to investigate the energywater nexus. Examples of completed and under construction projects in San Francisco are used to illustrate these ideas.

Objectives of the course include: describe public water supply systems and sources, assess your local systems, explain why water is an invaluable resource, describe the water-energy nexus, summarize water conservation, and explain the benefits of Integrative Design.

### **SF GREEN BUILDING CODE UPDATES**



As part of our Joint Venture with Atelier Ten to serve as green building consultants for the City and County of San Francisco, Urban Fabrick created a suite of informational handouts to communicate updates in the city and county's green building code. Handouts include information on:

- Water reuse
- Materials selection
- Construction waste and management
- Low-flow water fixtures and admissible flow rates

## **SELECTED PROJECTS**

#### UNIVERSITY OF THE PACIFIC CLIMATE ACTION PLAN



Urban Fabrick is creating a CAP as the sustainability roadmap for Pacific, emphasizing sustainable energy, energy & water efficiency, digitizing records to diminish printing needs, and efficient and alternative transportation options. Services include:

- Greenhouse gas emissions and analysis
- Community engagement strategy
- Resilience assessments and scenario planning
- Defining systems of criteria and metrics for CAP implementation

#### **1500 MISSION STREET, SAN FRANCISCO**



Urban Fabrick is the green building consultant on this large redevelopment project, which includes an office tower (500k sf) and residential tower (700k sf), each with a greywater treatment system. The office tower will house SFDPW, SFDBI and the SF Permit Center.

- Targeting LEED 2009 Gold and Silver certification, respectively
- Office and residential towers
- Graywater treatment
- Healthy indoor environmental quality



## **SELECTED PROJECTS**

#### **181 FREMONT STREET, SAN FRANCISCO**



Urban Fabrick provides green building consulting services for this 800 ft mixed-use iconic addition to San Francisco's skyline. Working with Jay Paul Company, the design team, Aquacell and Urban Fabrick integrated a graywater reuse system into the design, reducing the tower's potable water use by 40%.

- Targeting LEED 2009 Core & Shell Platinum certification
- High-performance curtainwall
- Direct connection to Transbay Terminal Park
- Retail & commercial office floors & condominiums
- Residential amenity floor with exterior terrace

#### **SFO TERMINAL 1, SAN FRANCISCO**



Urban Fabrick is engaged as green building consultant and LCA provider for this Gensler-designed redevelopment of Terminal 1 at SFO. Following SFO's ambitious sustainability guidelines, the design team is focused on creating a highly efficient building that will have a low EUI and reduced embodied carbon impact.

- Targeting minimum LEED v4 NC Platinum certification
- Targeting lowest EUI of any U.S. airport terminal
- Dynamic (self-tinting) glazing to mitigate glare
- Advanced, energy efficient baggage handling system

Rybczynski and de Monchaux on Piano's Kimbell Pavilion 118 Com to Concrete 56 The Next Jeanne Gang? 78 Channeling Gaudí 86



THE MAGAZINE OF THE AMERICAN INSTITUTE OF ARCHITECTS





Bill Worthen FAIA, LEED Fellow, GPR

## The Future of Designing (with) Water

WHAT ARCHITECTS NEED TO KNOW ABOUT WATER USE AND REUSE



San Diego Convention Center Topunsion. The design team of Proteins Architects, Critica Landscope Architects and Fase Casek is waiter problem. The convention center has to gay the local utility to centervally pamp this waiter dencity into the San Diago sever system. The wave nod Top park waite Blanker self membres designed to TBB the content Architects and Fase Casek is waiter dencity into the San Diago sever system. The wave nod Top park waite San Blanker self membres designed to TBB the content of the solid possible of the San Diago bearement www.idsg. At a minimum, the constructed workands will bearme a unique technicare feature on the nod float self-possible and the Walance and Launa. Ared if all goes as planned the weakness will not be water so it can be used for integration and other uses. Severue: Features Architects and Costas Landscope Architects and Hana Creek Living Architectures.

By Bill Worthen, FAIA, LEED AP BD+C, Founding Principal, Urban Fabrick, Inc.



- List three ways to integrate water as a design topic in your project work.
- Explain how on-site alternative water sources including gray and blackwater technology work.
- Identify what a design professional can do to address water conservation, use and reuse.
- Describe the challenges of water scarcity and the water-energy nexus.

#### CONTINUING EDUCATION



Use the learning objectives above to focus your study as you read this article.

To earn credit and obtain a certificate of completion, visit http://po.lww.net/AND144Courset and complete the corresponding quiz. If you are new to ArchitectCEUnivenity, create a free learner account; returning uses log in as usual.





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# WATER REUSE WORKING GROUP

## WATER REUSE PRACTICE GUIDE WORKING GROUP MEMBERS

- Gunnar Baldwin, TOTO America
- Barbara Bradley PE, Advanced Onsite Water
- Clark Brockman AIA, LEED Fellow/AP, SERA Design
- Josiah Cain ASLA, Sherwood Engineers
- Steve Castellanos FAIA
- William Cesanek AICP, CDM Smith
- Joel Cesare LEED AP BD+C, LFA, City of Santa Monica
- Michael Conciatore, Aquacell
- Madeleine Craig, Sherwood Engineers
- Linda Derivi AIA, American Institute of Architects California Council
- Ashley Francis PE, CFM, Sustainable Infrastructure Solutions
- Susan Freed, County of San Diego
- Mark Gangi, AIA, Gangi Architects
- Matt Jones PE, LEED AP BD+C, Magnusson Klemencic Associates
- Paula Kehoe, San Francisco Public Utilities Commission

- Avery Kintner, The William J. Worthen Foundation
- Katy Lackey, Water Environment & Reuse Foundation
- Alexandra Lichtenberg MSc, MBA, Same Drop
- Eric Lohan, GrayWorks
- Nate Nickerson, GrayWorks
- Scott Shumaker, SERA Design
- Kathleen Smith LEED Fellow, International Living Future Institute
- Alice Sung AIA, LEED AP BD+C, ISSP-SA, Greenbank Associates
- Aaron Tartakovsky, Epic CleanTec
- Adam Tartakovsky, Crescent Heights
- Rives Taylor AIA, LEED AP BD+C, Gensler
- Bill Worthen FAIA, LEED Fellow, Principal Investigator

#### **PROJECT MANAGER**

• Brett Rosenberg LEED BD+C, Treeline Strategy, The William J. Worthen Foundation

#### **GRAPHIC DESIGN**

• Stoller Design Group



NON-POTABLE WATER REUSE OPPORTUNITIES

# **TYPICAL DEMANDS**

## Up To 50% of Demands are Non-Potable in Multi-family Residential Buildings

## Up to 95% of Demands are Non-Potable in Commercial Buildings





# IS NON-POTABLE WATER REUSE RIGHT FOR YOUR PROJECT?

# SITE FACTORS

## WATER SUPPLY SUSTAINABILITY INDEX (2050)



## Considerations:

- Current water stress
- Projected water stress with and without climate change
- How governing agencies
   managing water stress
- Current utility rate infrastructure
- Existing infrastructure capacity and projected population growth vs. cost of water purchase agreements

# WATER-RELATED SUSTAINABILITY CREDITS





# FIT FOR PURPOSE – THE RIGHT WATER FOR THE RIGHT JOB

# AVAILABLE WATER SOURCES



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# HOW TO TALK ABOUT WATER REUSE

# **STAKEHOLDER MOTIVATION**

Internal Stakeholders		
ŝ	Developer/Owner	<ul> <li>Cost efficiency</li> <li>Regulatory compliance</li> <li>Brand enhancement</li> </ul>
12	Design Team/Builder	<ul> <li>Positive industry reputation</li> <li>New expertise</li> </ul>
(îĵ)	Occupants	<ul> <li>Ease of use</li> <li>Control over rate increases</li> </ul>
٩̈́	Facility Manager	· Seamless, cost effective, reliable operations
External Stakeholders		
	Regulators	<ul> <li>Protect public health and water quality</li> <li>Conserve scarce resource</li> <li>Enforce code compliance</li> </ul>
ĨÅ.	Utilities	<ul> <li>Guarantee water supply</li> <li>Maintain revenue</li> </ul>
	Financial Institutions	<ul> <li>Avoid risk</li> <li>Maintain long-term value of investment</li> </ul>





# HOW DOES NON-POTABLE WATER REUSE IMPACT THE DESIGN PROCESS

# **THE DESIGN PROCESS**





# CAN I GET THIS THING PERMITTED?

# **CITY AND COUNTY OF SAN FRANCISCO**





BUILD & OPERATE A SYSTEM

# **GENERAL TREATMENT STEPS IN AN MBR**

## GENERAL TREATMENT STEPS IN A MEMBRANE BIOREACTOR WASTEWATER REUSE SYSTEM





# **OPERATIONS & MAINTENCE**

### **ROAD MAP FOR WASTEWATER REUSE**



Depicts general water reuse applications and treatment requirements.

## Water Reuse Operations

- Visual Inspection
- Water Quality Testing
- Servicing Instrumentation
- Replenishing Consumables
- Preventative Maintenance
- Emergency Maintenance

## Equipment Replacement

- Filter/Membranes
- Mechanical Components

## Waste Removal

- Fats, Oils, and Grease (FOG)
- Sludge

## Know your Costs!

- Energy Use Variable among system types
- Pumps
- Treatment
- Disinfection
- Monitoring Equipment





# **THANK YOU!**



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