WATEREUSE ASSOCIATION NORCAL CHAPTER MEETING

February 23, 2018
Urban Fabrick connects policy, practice and design through the power of collaboration, sustainability and storytelling.

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-zero energy design and climate positive development at any scale.

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.

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 stakeholders in meaningful conversations about our changing built environment.

AFFILIATIONS & CERTIFICATIONS

- Certified micro local business enterprise (LBE/OBE) in San Francisco
- United State Green Building Council Member
- Carbon Leadership Forum - Sponsor
- Certified LGBT Business Enterprise
- International Partnering Institute Member
SERVICES

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

ANALYSIS & EVALUATION
- Energy Modeling/Analysis
- Daylighting
- Life Cycle Assessment
- Water Budgets
- Sustainable / Healthy Materials

BUILDING & DISTRICT CERTIFICATIONS
- Feasibility Studies
- Team & Process Administration
- Support Documentation & Analysis

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

PROJECT MANAGEMENT
- Construction Project Management
- Owner’s Representation & Advisory
- Project Management Support Services

EDUCATION & COMMUNICATION
- Professional Education Development
- Visual Media & Infographics
- Workshops
- Publications
- Practice Guide Development
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 energy-water 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.

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 SFPDW, SFDBI and the SF Permit Center.

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

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
Bill Worthen FAIA, LEED Fellow, GPR

The Future of Designing (with) Water

What architects need to know about water use and reuse

Learning Objectives

- List three ways to integrate water into a design
- Identify three alternative water sources
- Give three ways a design professional can use rainwater
- Describe the challenge of water scarcity in urban areas

Continuing Education

Credit: AIA 1 H.U.

Use the learning objectives above to focus your study or prepare for this article.

To earn credit and obtain a certificate of completion, visit https://www.architectmagazine.com and complete the corresponding quiz. If you are not a member or AIA Associates, create an AIA members account, returning each log-in as usual.

Sponsored by:

Advocate Water

By Bill Worthen, FAIA, LEED AP BD+C, Founding Principal, Urban Fabrick, Inc.
ONSITE NON-POTABLE WATER REUSE
PRACTICE GUIDE

BLACKWATER

GRAYWATER

RAINWATER

STORMWATER

FOUNDATION DRAINAGE

Free Download at CollaborativeDesign.org
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


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

Multi-family Residential Water Use:
- Irrigation
- Toilet
- Clothes Washer
- Shower/Bath
- Faucet
- Dishwasher
- Leaks
- Miscellaneous

Office Water Use:
- Sanitary
- Cooling Tower Make-up
- Irrigation
- Single-Pass Cooling
- Kitchen
- Miscellaneous

SOURCE: ADAPTED FROM ALLIANCE FOR WATER EFFICIENCY
SOURCE: ADAPTED FROM USEPA
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

LIVING BUILDING CHALLENGE PETALS

- Water
- Site
- Materials
- Energy
- Indoor Quality
- Beauty & Inspiration
FIT FOR PURPOSE –
THE RIGHT WATER FOR THE
RIGHT JOB
AVAILABLE WATER SOURCES

Blackwater
Wastewater from toilets, dishwashers, kitchen sinks and utility sinks (can include graywater)

Graywater
Wastewater from clothes washers, bathtubs, showers and bathroom sinks

Condensate
Condensed water from air conditioning equipment

Foundation Drainage
Nuisance groundwater that infiltrates foundation

Rainwater
Precipitation collected from roofs and above-grade surfaces

Evaporative Cooling
Or “blow down water,” is the water that is drained from cooling towers and is heavy with mineral content

Stormwater
Surface water that results from rainfall and snowmelt
HOW TO TALK ABOUT WATER REUSE
# Stakeholder Motivation

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<th>Internal Stakeholders</th>
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<td><strong>Developer/Owner</strong></td>
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<td>Cost efficiency</td>
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<td>Regulatory compliance</td>
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<td>Brand enhancement</td>
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<td><strong>Design Team/Builder</strong></td>
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<td>Positive industry reputation</td>
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<td>New expertise</td>
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<td><strong>Occupants</strong></td>
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<td>Ease of use</td>
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<td>Control over rate increases</td>
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<td><strong>Facility Manager</strong></td>
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<td>Seamless, cost effective, reliable operations</td>
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<th>External Stakeholders</th>
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<td><strong>Regulators</strong></td>
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<tr>
<td>Protect public health and water quality</td>
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<td>Conserve scarce resource</td>
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<td>Enforce code compliance</td>
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<td><strong>Utilities</strong></td>
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<td>Guarantee water supply</td>
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<td>Maintain revenue</td>
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<td><strong>Financial Institutions</strong></td>
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<tr>
<td>Avoid risk</td>
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<td>Maintain long-term value of investment</td>
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![Diagram showing environmental concern, water security, and long-term costs](image-url)
HOW DOES NON-POTABLE WATER REUSE IMPACT THE DESIGN PROCESS
THE DESIGN PROCESS
CAN I GET THIS THING PERMITTED?
BUILD & OPERATE A SYSTEM
GENERAL TREATMENT STEPS IN AN MBR

GENERAL TREATMENT STEPS IN A MEMBRANE BIOREACTOR WASTEWATER REUSE SYSTEM

1. Primary treatment
2. Secondary treatment
3. Tertiary treatment
OPERATIONS & MAINTENANCE

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!

kyle@urbanfabrick.com

piper@urbanfabrick.com