



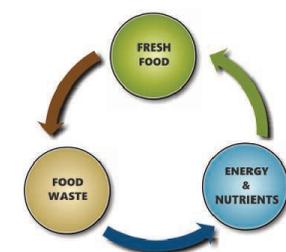
Mark Buehrer, PE, Director, Principal

Mark is the founder and director of 2020 ENGINEERING and is a recognized authority on Sustainable Water Resource Management and Low Impact Development (LID) techniques. He is a registered professional civil engineer, author, and inventor with broad experience in engineering design, construction and project management. Since 1995, 2020 ENGINEERING has been dedicated to providing simple and innovative solutions for the long-term economic and environmental sustainability of local, national and international communities.

Mark conceived and developed the concept of WHOLISTIC ENGINEERING, which provides an integrated “problem solving” approach that considers all issues and possible conditions related to the development of a project, such as: laws & regulations, social concerns, politics, special interests, economic & environmental issues, technology, and resources. 2020’s sustainable and low impact designs include porous pavements and raingardens, rainwater harvesting systems, vacuum flush toilet and greywater systems, nature-based wastewater treatment & water reuse systems (i.e. Living Machines® and constructed wetlands), algae microfarms, aquaculture, aquaponics, as well as material recycling and composting facilities.



Mark has provided master planning, engineering design and/or construction management assistance on hundreds of LID, LEED, Net Zero, Living Building and other sustainable type projects in many parts of the USA, Canada, and other parts of the world. He has also been actively involved with providing review and comments to codes and standards for low impact development and sustainable building practices, including green building and plumbing codes for rainwater harvesting, greywater, and reclaimed water reuse. He has developed urban agriculture methods based on a “closed-loop” food production system and has been a featured speaker on this topic at a number of international conferences and summits, including the 1st Annual NASA – 100 year Starship Symposium, Orlando, Florida, October 2011.



CLOSED-LOOP NUTRIENT DESIGN

Mark is a frequent speaker at various sustainable and LID conferences and workshops. He presented at the 2019, 2015 and 2013 Living Future Conferences in Seattle, 2019 EcoDistrict Summit in Pittsburgh, 2019 Localizing California Waters Conference, Yosemite, 2016 Net Impact Workshop at Western Washington University, 2011 EcoDistrict Summit in Portland, OR, 2011 Living Future Conference in Vancouver, BC, 2010 Water Law In Washington conference in Seattle, WA, and the 2008 American Rainwater Catchment Systems Association (ARCSA) in Santa Monica, CA. His solid waste & recycling conference presentations include the 1996 Washington State Recycling Association Annual Conference, and the 1995 International Symposium of Public Works & The Human Environment, “Trash To Treasures: New Trends in Waste Reduction”. He has over 38 years of civil engineering experience.

REGISTRATIONS

Registered Professional Civil Engineer
WA, OR, AK, HI, MO, Belize

EDUCATION

Ohio Northern University
B.S. Civil Engineering, 1982

COMMUNITY

Low Impact Development, Workshop Advisory Committee (2012 Manual Update)

Greywater Reuse Workshop Advisory Committee (2011 WSDOH Rule and Design Guide)

Water Reuse Planning for the State of Washington (2003 Working Group)

NET ZERO STUDIES

Feasibility; Treatment Options; Life Cycle Assessment, Life Cycle Analysis-Cost of Ownership (10 studies)

NET ZERO PROJECTS

Washington, Oregon, Michigan, Utah, Pennsylvania, California, British Columbia, New Zealand, Belize (30+ projects)

BOARDS

International Living Future Institute (ILFI)
Founding Board Member

Cascadia Green Building Council
Past Board Member

Transportation Commission
Bellingham, Board Member

Lake Whatcom Watershed
Advisory Board, Past Member



Mark Buehrer, PE, Director

[Transforming Urban Food Deserts to Food Oases: Community-Scale Aquaponics \(Aquaculture + Hydroponics\)](#). Living Future 2019 – Collaboration + Abundance, Seattle, WA - May 2019 and EcoDistricts Summit 10 Year Anniversary, Pittsburgh, PA – November, 2019

[WHOLISTIC ENGINEERING: Applied to Net Positive Water + Urban Agriculture](#). 2019 Localizing California Waters Conference, Yosemite, CA

[Net Zero Water: Closed-Loop Water & Nutrient Systems](#). 2016 Net Impact Workshop, Western Washington University, Bellingham, WA

[Smart Microfarms provide Life-support for the 100-year Starship Expedition \[Sustainable food, feed, oxygen, and other forms of energy while recycling waste and regenerating life support systems\]](#). 1st Annual - NASA 100 Year Starship Symposium, Orlando, FL, October 2011

[Resilient Community Food Production Algae Microfarms: Water & Nutrient Recycling](#). Living Future 2013 - Resilience and Regeneration, Seattle, WA May 2013

[Phosphorus, Food, and Our Future](#). Coauthor, Chapter 6, Phosphorus Recovery and Reuse, to be published by Oxford University Press in 2013

[Toward Net Zero Water: Advancing District Scale Water Systems](#). Closed Loop Food and Water. The EcoDistricts Summit, Portland, OR, Oct. 2011

[The Living Phase of the Living Building: Planting Seeds in the Garden](#). Living Future 2011- Our Children's Cities: Visualizing a Restorative Civilization, Vancouver, BC, April 22-29 2011.

[Rainwater Harvesting and the Role of Water Supply/Runoff in Green Building Design and Sustainable Development](#). Water Law in Washington Conference 2010, New regulatory, legislative, and case law developments, Seattle, WA, June 3 and 4, 2010

[Net Zero Impervious Design](#). Arcade Magazine -Water 2.0: Aquatic Dysfunctions, Winter 2009

[WHOLISTIC ENGINEERING: Applied to a Living Building Water System](#). Living Future 2008 - From Living Buildings to Living Communities: The unConference for Deep Green Professionals, Vancouver, BC, Canada April 2008

[Managing Shoreline Drainage for Slope Stability, Habitat and Water Quality- Low Impact Development Techniques and Sustainable Infrastructure Strategies](#). Northwest Stream Center, Everett, WA, May, 2008

[WHOLISTIC ENGINEERING: Applied to a Living Building Water System](#). Green Building Conference, Bellingham, WA, October, 2008

[WHOLISTIC ENGINEERING: Applied to LID, LEED, & Living Buildings](#). San Juan Community Home Trust and Department of Ecology Eco-charette: Designing a New Neighborhood on the Buck Property, Friday Harbor, WA, July, 2008

[WHOLISTIC ENGINEERING: Applied to a Living Building Water System- Deep Green](#). Northwest Eco Building Guild, Port Orchard, WA, October, 2008

[LID in the Puget Sound](#). 2008 International Low Impact Development Conference-LID for Urban Ecosystem and Habitat Protection, The Environment and Water Resources Institute of American Society of Civil Engineers, Seattle, WA, November, 2008

[Low Impact Development \(LID\) Techniques-Sustainable Infrastructure Strategies](#). Sustainable Communities, APWA 2007 Spring Conference, Everett, WA, April, 2007

[WHOLISTIC ENGINEERING: Applied to a Living Building Water Systems](#). GTZ-Ecosan Program, Eschborn, Germany, May 2007

[WHOLISTIC ENGINEERING: Applied to LID, LEED & Living Buildings](#). Hawaii Congress of Planning Officials Mixed Plate: Local

[Low Impact Development Techniques Sustainable Infrastructure Strategies](#). Washington State Department of Ecology, Shoreline Workshop, Padilla Bay, WA, 2006

[Sustainable Infrastructure Strategies Including Low Impact Development \(LID\) Techniques](#). LID Workshop, Kitsap County, WA, May, 2006

[Sustainable Infrastructure Strategies Including Low Impact Development \(LID\) Techniques](#). Kingston, 2005

[WHOLISTIC ENGINEERING: Applied to Water Conservation](#) Green Building Conference and Tradeshow, 2005 Rainwater Harvesting, Seattle Rainwater Harvesting Conference, American Rainwater Catchment Association, September, 2004

[New Strategies in Stormwater Management Using Permeable Interlocking Concrete Pavements and Other Permeable Pavements](#). Mutual Materials Workshop, Key Note, Seattle, WA 2004

[WHOLISTIC ENGINEERING: Seeking Sustainable Solutions](#). Seattle Daily Journal of Commerce, Seattle, WA, 2002

[WHOLISTIC ENGINEERING: Applied to Sustainable Site Design and Water Resource Management](#). LEED Workshop, Bainbridge Island, WA, 2002

[Sustainability-Low Impact Development Towards a Healthier Future](#). ASLA Conference, Seattle, WA, 2002

[Low Impact Development Example Applications in the Pacific Northwest](#). LID Workshop, 2002

[LID Techniques: Porous Pavements, Bioretention \(Rain Gardens\), Eco Roofs, Rainwater Collection & Reuse, and Soil Amendments](#). Low Impact Development in Puget Sound - a workshop sponsored by the Puget Sound Water Quality Action Team, May, 2002

[WHOLISTIC ENGINEERING: Applied to Alternative Parking Lot Design](#). Bellingham, WA, 2001

[WHOLISTIC ENGINEERING: Applied to Sustainable Site Design](#). Ford Motors, Detroit, MI, 2001

[WHOLISTIC ENGINEERING: Applied to: Fish Friendly Development and Building Practices](#). AIA, Washington, 2000

[Tapping Natures' Purest Water Source - "End of pipe: rain supplies their water"](#) (Seattle Daily Journal of Commerce), 1999, (water resources)

[Innovative Water Reuse Options](#) ("Water Reuse and Appropriate Technology", A forum sponsored by The South Puget Environmental Education Clearinghouse (SPEECH)), Seattle, WA, 1999, (water resources)

[WHOLISTIC ENGINEERING: Applied to Recycling and Composting "20/20 Vision: Creating Recycling's Future"](#). Washington State Recycling Association 16th Annual Conference & Trade Show, 1996, (Recycling & solid waste management)

[WHOLISTIC ENGINEERING: Applied to Pervious Surface Design](#) Impervious Surface Reduction Research Symposium, Washington State Department of Ecology/City of Olympia, 1996, (water resources)

[WHOLISTIC ENGINEERING: Applied to PRT & Dual Mode Transportation](#) The International Conference On Personal Rapid Transit (PRT) & Other Emerging Transportation Systems, the Institute of Intelligent Transportation Systems (ITS), University of Minnesota, 1996, (transportation)

[CyberTran: Is there a place for it here?](#) (Seattle Daily Journal of Commerce), Seattle, WA, 1995, (transportation)

Mark authored and presented four papers at the 1995 International Symposium of Public Works & The Human Environment, sponsored by the Washington Chapter of the American Public Works Association (APWA)

[WHOLISTIC ENGINEERING: Applied to Water & Wastewater Conservation & Management](#) (water resources)

[Please! Drive On The Grass: Applications of Reinforced Grass Pavement Sections Using Cellular Confinement](#) (transportation & stormwater management)

[Very Light Rail \(VLR\) Technology-A New, Simple, Safe, Cost- Effective Environmental Solution to Meet Future Transportation Needs](#) (transportation)

[Trash To Treasures: New Trends in Waste Reduction](#) (recycling & solid waste management)

[An Alternative On-Site Sewage System: Subsurface Flow Constructed Wetlands](#). Washington State Department of Health, 1994

[Water Rights - Draft](#). Washington State, (Office of the Governor), 1993