

- Low Impact Development (LID)
- LID, LEED, and Living Buildings

The Wellspring Building
814 Dupont Street
Bellingham, WA 98225
360.671.2020
www.2020engineering.com



Wilson Motors

LID Site Design: 4 acres pervious pavements & raingardens (\$465,000 savings compared to conventional stormwater design)



Firstenburg Recreation Center

LEED Gold: 3 acres pervious pavement, raingardens & water reuse (*Opsis Architects*)



Bullitt Center [Bullitt Foundation]

Living Building Challenge: Net Zero Water system; rainwater harvesting, composting toilets, constructed wetlands for greywater treatment and reuse (*Miller Hull Partnership*)

We are pleased to present to you additional information about 2020 ENGINEERING that will illustrate the type of low impact or sustainable civil engineering services we can provide on new construction or redevelopment projects.

Since 1995, 2020 ENGINEERING has been at the forefront of the research and development of sustainable methods, systems, and infrastructures that reduce capital and operating costs, recycle and reduce material consumption and waste, restore and protect ecological systems, and create and maintain healthy communities. Our company's primary focus is sustainable water resource management.

For over 16 years, 2020 ENGINEERING has been able to demonstrate the use of Sustainable and Low Impact Development (LID) methods in over 100 projects. We have researched, planned and/or designed LID, LEED, and Living Building Challenge projects in many different areas of the country at residential, commercial, educational and municipal levels as well as presenting at numerous conferences and sustainable/LID workshops. An example report of a sustainable development resource guide that we helped prepare for the Seattle-South Lake Union area (2002) can be found at: http://www.usgbc.org/Docs/Resources/SLU_Final_10-22-02.pdf. A number of our LID projects have also been included in the Puget Sound Action Team's report document "Natural Approaches to Stormwater Management: Low Impact Development in Puget Sound." (See: http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf). The past few years we have been actively involved in promoting the Living Building Challenge including teaching the Living Builder Leader certification classes; "Water 01: Site Flow": <http://www.cascadiagbc.org/lbl/water/W01>. Additionally, our firm was awarded the "2003 Governor's Award for Pollution Prevention and Sustainable Practices" for our efforts in promoting sustainable solutions for infrastructure applications.

We look forward to the possibilities of working with you to help provide our economy with innovative and creative "Site" and/or "Water" designs. Please feel free to call me at 360-671-2020, or email at mark@2020engineering.com, if you have any questions or require additional information.

Sincerely,

2020 ENGINEERING, Inc.

Mark S. Buehrer, PE, Director





Established 1995

CIVIL ENGINEERING

Low Impact Development (LID)

 Porous Pavements

 Raingardens

 Rainwater Harvesting

 Site Design and Utilities

 Master Planning

ECOLOGICAL DESIGN

 Living Buildings

 LEED & Sustainable Design

 Net Zero Water Systems

 Urban Agriculture

 Living Machine™

 Constructed Wetlands

ENVIRONMENTAL CONSULTING

 Environmental Management

 Recycling and Solid Waste

 Pollution Prevention Planning

 Composting Facilities

 Stormwater Management

 Water Supply and Re-use Systems

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2020 ENGINEERING is an engineering consulting company specializing in the development and implementation of civil engineering designs that utilize the best of today's conventional engineering practices along with new, emerging and alternative technologies. 2020 has a broad range of public and private engineering design and project management experience, applied to "Water" and "Site" designs.

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2020's award winning and recognized environmentally sensitive design expertise for roadway and site development, on all of our projects, has often been called upon for projects built in environmentally sensitive areas, such as near or along shorelines and/or wetlands.

OUR MISSION

2020 ENGINEERING is dedicated to providing simple and innovative solutions for long term economic and environmental sustainability of local, national, and international communities.

OUR APPROACH

We apply a WHOLISTIC ENGINEERING approach to all our projects. A WHOLISTIC ENGINEERING approach is a management method for "problem solving," which involves the comprehensive inclusion of all issues and possible conditions related to the primary task or mission. The challenges facing businesses and communities today involve cross-relationships among many kinds of complex components, such as laws & regulations, social concerns, politics, special interests, economic & environmental issues, technology, and resources. By using the wholistic engineering management approach, we implement a plan that evaluates all potential costs and benefits that are related both directly or indirectly to the project goals.

2020 ENGINEERING provides professional civil engineering and project management assistance at any one of, or combination of, a project's various development phases. A wholistic engineering approach can begin at the conceptual feasibility assessment, be incorporated with value engineering or peer review during plan preparation, include design drawings and reports, and/or implementation and project management of the final adopted plan.

Example projects include:

PUBLIC

City of Bellingham

- Sustainable Water Resource Management
- Rainwater Design Guideline
- Greywater Reuse Planning

Seattle Rainwater Pilot Project

Seattle, WA

- Residential rainwater catchment systems
- Water conservation

Washington State Parks

Millersylvania State Park, WA

- Ecological Wastewater Treatment (Constructed Wetlands)

Seattle Parks & Recreation

Oxbow Park, Seattle, WA

Kansas City Discovery Center,

Kansas City, MO

- Living Machine™ System with wastewater re-use for toilet flushing

EDUCATIONAL

Wilkes Elementary School

Bainbridge Island, WA

- Living Building Challenge
- LID Site Design
- On-Site Water Reuse and Wastewater Systems
- Study and Design

Bertschi School

Seattle, WA

- Living Building Challenge
- Net Zero Water
- Rainwater Harvesting - Potable
- Greywater Reuse - Indoor Living Wall

Islandwood

Bainbridge Island, WA [LEED-Gold]

- Subsurface Flow Constructed Wetlands
- Living Machine™ System - Water Reuse
- Rainwater Harvesting
- On-site Composting Systems

PRIVATE

Ford Motors Rouge Visitor Center

Detroit, MI

- Feasibility Study
- Water Re-use options (On-site systems)

Roche Harbor Resort

Roche Harbor, WA

- Low Impact Development
- "Narrow" streets
- Raingardens
- Compost-amended Soils
- Porous Pavements
- Rainwater Catchment Systems

Bullitt Center

Bullitt Foundation Headquarters

Seattle, WA

- Living Building Challenge
- Net Zero Water
- Rainwater Harvesting - Potable
- Composting Toilets
- Greywater Reuse

Pringle Creek Community

Salem, OR

- Sustainable Site and Infrastructure
- Master Planning

zHomes

Issaquah, WA

- Net Zero Energy
- Rainwater - Toilet Flush
- Raingardens
- Pervious Pavements

Single Family Residential Rainwater Systems

Whatcom, Skagit, and Kitsap Counties, WA

- Sole source potable water systems

NON PROFIT

San Juan Community Home Trust Affordable Housing

Friday Harbor, San Juan Island, WA

- Living Machine™ - Natural Wastewater Treatment
- Water Reuses
- Rainwater Harvesting
- LID Site Design

Poo-Ha-Bah

Death Valley, CA

- Ecological Wastewater Handling
- Composting Toilets

Hale Kumau Ranch

Big Island, HI

- Sustainable Infrastructure Planning
- Rainwater Harvesting System Design

Bayview Corner

Langley, WA

- Grass Paving
- Public Composting Toilet Restrooms
- Sustainable Stormwater Management
- Solar Power & "Green Building"

Harmony Hill

Union, WA

- Sustainable Site Design
- Water and Wastewater Systems



Islandwood Rainwater Cisterns





Mark Buehrer, PE, Director, Principal in Charge

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.

EDUCATION

B.S. Civil Engineering
Ohio Northern University, 1982

REGISTRATIONS

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

COMMUNITY INVOLVEMENT

Low Impact Development,
Workshop Advisory Committee
(2011 Manual Update)

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

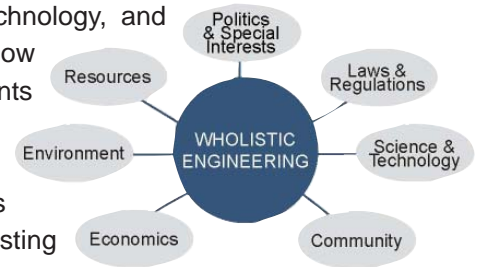
Watershed Advisory Board

Lake Whatcom Reservoir Technical
Review Task Force Member
(Mayor selected)

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

Cascadia Green Building Council
Board Member

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, ecologically based wastewater treatment & water reuse systems, 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 and other projects in many parts of the U.S.A. He has also been actively involved with providing review and comments to codes and standards for Low Impact Development and sustainable building practices. Since 2009, Mark has been serving on a committee with the purpose of assisting the Washington State Department of Health in developing greywater reuse rules allowing for outdoor uses of greywater for irrigation. 2020 ENGINEERING assisted with the development of the 2005 Low Impact Development Technical Guidance Manual for Puget Sound. In 2010, Mark was asked to serve on the Technical Advisory Committee for updating the LID Technical Guidance Manual to be released in 2011. Mark is also currently serving on a committee to develop design criteria and business plans for commercial scale “Building-Integrated Urban Agriculture” projects.

Mark is currently serving on the Cascadia Green Building Council. He is a frequent speaker at various sustainable and LID conferences and workshops and he has over 30 years of civil engineering experience.

PRESENTATIONS AND ARTICLES

Mark Buehrer, PE, Director

[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 <http://www.arcadejournal.com/public/IssueArticle.aspx?Volume=28&Issue=2&Article=353>

[WHOLISTIC ENGINEERING: Applied to a Living Building Water System](#), Living Future 08 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

[Best Practices of Sustainability and Low Impact Development](#), Big Island, Hawaii, September, 2007

[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](#), LID Workshop, City of Bellingham, 2005

[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

[Low-Impact Development and Sustainable Water Management](#), US Green Building Council, LEED Workshop, Portland, WA, 2004

[Green Building and Sustainable Design](#), American Society of Plumbing Engineers, Portland, OR, April 2003

[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)

Mr. Buehrer 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) and the University of Washington Department of Civil Engineering:

[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)

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[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





Matt Randall, PE, Project Manager

Matt has over ten years of progressive design experience in Healthcare, Education, Mixed-Use Development, Stormwater, Transportation, and Recreational/ Waterway projects. He has managed the civil development process from master planning and project scoping through construction including the design of site grading, street, water, storm sewer, sanitary sewer, and erosion control plans for public and private projects around the states of Oregon and Washington. His project portfolio includes projects with innovative stormwater solutions using porous pavements, raingardens, stormwater fountain features, bioswales, storm planters and on-site infiltration. Matt's project responsibilities range from managing budgets and staff, coordinating and managing sub-contractors, public and private collaboration, writing and reviewing design documents, reports, and specifications, and working as a project liaison with utility districts, cities, counties, state and federal agencies.

EDUCATION

B.S. Civil Engineering
Washington State University,
1999

REGISTRATIONS

Professional Engineer, Oregon

EXPERIENCE

10 Years Civil Engineering

Matt's project management experience includes the Marubeni Chilled Water Line, located in Portland, OR. This project features 400 lf of 16-inch chilled water line supply and return pipe in a crowded public street. As contractors discovered old steam lines, Tel-com lines and vaults, Matt also provided infield engineering. In addition, Matt managed the Hood River Waterfront Park project, a new 6.4 acre public park along the Columbia River through design, permitting, and construction. Services included grading and excavation for a large swimming cove, riverbank re-grading and restoration, meandering concrete pathway, green riverbank reinforcement, site grading, utility and retaining wall design, as well as an informational/fishing platform. Currently, Matt is managing the new Peace Island Medical Center located on San Juan Island. The project will provide San Juan Island with a primary and specialty medical clinic, diagnostic, services, 24-hour emergency room, and a 10 bed critical access hospital. The civil design includes designing a stormwater system that maintains the hydrology to the large existing wetland on site, as well as providing a site layout and grading plan on the sloped, forested site to minimize bedrock excavation and tree removal.

Colleen Mitchell, PE, LEED AP, CESCL, Project Manager

Colleen specializes in LID site and stormwater, technical report writing, water and wastewater systems design and brings five years experience to 2020. Colleen has completed the LID Technical Training Program certified by Washington State University and the Puget Sound Partnership. The 64 hours of training included design and construction considerations for bioretention systems (raingardens), porous pavement, green roofs, low impact foundations, rainwater harvesting, and erosion and sediment control. Colleen uses stormwater modeling on small and large scale projects using LID techniques to meet and exceed jurisdictional requirements. She is the committee chair for the Program Development committee for the Built Green program in Whatcom County.

Several of Colleen's projects are pursuing the Living Building Challenge, including the Bertschi School and the Bullitt Center in Seattle, which will achieve Net Zero Water. Currently, she is on the Bellingham Living Building Committee which seeks to bring a Living Building to Bellingham. Colleen's project experience includes project management and plan submittal for Wilson Motors (located on sensitive water body, Whatcom Creek, design included pervious concrete and raingardens that filter water before joining the creek) and project management for the East Whatcom Regional Resource Center (services included utility main extensions, low impact site design, and WSDOT highway access design with raingardens). Colleen is assisting or has assisted with many other projects throughout Washington State including Whatcom, San Juan, Skagit, Thurston, Snohomish, and King County.



EDUCATION

B.S. Civil Engineering
Ohio University, 2005

REGISTRATIONS

LEED AP
Certified Erosion & Sedimentation
Control Lead, WA

Low Impact Development
Professional
Puget Sound Partnership, WA

COMMUNITY

Engineers Without Borders
Member & Volunteer

Built-Green Board Member

Jennifer Allen, Civil Engineer - Economist

Collaborating with professionals in different vocations, Jennifer frequently researches emerging, sustainable technologies, conducts long-term economic estimates (Life Cycle Analysis), designs LID water and wastewater treatment systems, and models stormwater. Current projects, such as Valley View Middle School, Wilkes Elementary School, and Peace Island Medical Center, involve designs and economic analysis for rainwater harvesting, reclaimed water, and wastewater treatment systems. Her design work for the Bullitt Center, a construction attempting Living Building certification, has included composting toilets, urine diversion, green house evapotranspiration and on-site greywater treatment system sizing. Jennifer is also contributing research to a decentralized and centralized wastewater treatment system study for the Cascadia Regional Green Building Council.

Prior to working with 2020 ENGINEERING, Jennifer investigated several aspects of nutrient cycling in constructed treatment wetlands and lakes. Specifically, she examined oxygenation effects on nutrient cycling, bacterial diversity, trace gas emissions, and halogenated aliphatic compound treatment. Her research on constructed treatment wetlands, recently published in the Bioresource Technology, has resulted in full scale implementation in the midwest wetlands. Jennifer also has significant economic research experience. Working with a research group at the University of British Columbia, she managed projects reviewing the economic effects of intelligent transportation systems on cross border commerce and freight process mapping.



EDUCATION

M.A. Environmental Economics, 2006, Western Washington University

M.S. Civil and Environmental Engineering, 2009, Washington State University

COMMUNITY

Surfrider Foundation, Member and Volunteer

American Association of University Women, Member



Joseph Ford, LEED AP, CAD Designer

Joseph holds a certificate in Civil Engineering and Survey Technology from Santa Rosa Junior College in Santa Rosa, CA, along with a B.A. in Humanities in Culture, Ecology, and Sustainable Community. Joseph provides AutoCAD design to 2020 projects as well as other project support with over five years of experience. Joseph's interests include rainwater harvesting and permaculture and he is a LEED Accredited Professional (LEED AP).

Jessie Buehrer, VP, Business Manager

Jessie oversees 2020's financial and operational administration and brings over 25 years of experience in office management, project management, marketing and business development.



Lindsay Burmeister, Marketing Coordinator

Lindsay coordinates marketing and public relations strategies for 2020, in addition to providing project management support and executive assistance. She holds a B.A. in English from the University of Washington, followed by a decade of experience writing for international publications and renowned websites, such as PBS.org and KCTS.org. Lindsay has six years of comprehensive Human Resources experience, and is an active member of the Society for Human Resource Management.

