



RE: Sustainable Civil Engineering Services

2010

- LID, LEED and Living Buildings

Ladies and gentlemen,

We are pleased to present to you additional information about **2020 ENGINEERING** that will give you some ideas about the type of sustainable civil engineering services we can provide on new or redeveloped 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.

For over a decade, **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 and LEED 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 with promoting the Living Building Challenge including teaching on the Living Builder Leader certification classes; "Water 01: Site Flow": <http://www.cascadiagbc.org/lbl/water/W01>. And we are also pleased to report that our firm was presented 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 innovative and creative "Site" and "Water" plans. 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.

A handwritten signature in black ink, appearing to read 'Mark Buehrer', is written over the typed name.

Mark S. Buehrer, PE,
Director

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OUR GOAL

To provide simple economic solutions to complex environmental issues...to meet future needs.

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 EXPERTISE

2020 ENGINEERING is an engineering consulting company specializing in 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:

Environmental Consulting

- Environmental Management
- Recycling and Solid Waste
- Pollution Prevention Planning
- Composting Facilities

Civil Engineering

- Low Impact Development
- Site Design and Utilities
- Stormwater Management
- Transportation Systems

Ecological Design

- Water Supply & Re-Use Systems
- Natural 'Waste'water Treatment
- LEED & Sustainable Design
- Master Planning

OUR APPROACH

Wholistic Engineering. A Wholistic Engineering approach is defined here as 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 many 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. The implementation of a plan, developed with a wholistic engineering management approach, gains strength by concurrently evaluating all potential costs and benefits that may relate, either directly or indirectly, to the plan action.

SUMMARY

2020 ENGINEERING develops plans with a wholistic perspective of past and present conditions, together with a vision of things yet to come...

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2020 ENGINEERING

Consulting Experience

2020 ENGINEERING provides professional civil engineering and 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.



ENVIRONMENTAL CONSULTING

Parks

US National Park Service, Columbia – Cascades Region, *WA, OR, CA*

- Sustainable Infrastructure Analysis options
- Sustainable Stormwater Management

Washington State Parks, Millersylvania State Park, *WA*

- Ecological Wastewater Treatment (Constructed Wetlands)

Seattle Parks & Recreation, Oxbow Park, *Seattle, WA*

- Sustainable Site Design & Utilities
- Porous Gravel Walkways
- Compost-amended Soils

Snoqualmie Point Park, *Snoqualmie, WA*

- Master Planning
- Low Impact Development Site Design

Recycling & Solid Waste

Northwest Recycling, Inc. *Bellingham, WA*

- Recycling Facility Design
- Pollution prevention

ABC Recycling Ltd, *Vancouver, B.C.*

- Recycling Facility Design
- Environmental Management

Pollution Prevention Planning

Skagit River Steel & Recycling, *Mt. Vernon, WA*

- Facility Design and NPDES Permit
- Pollution Prevention Planning

Port of Willapa Harbor, *Raymond, WA*

- Ecological Wastewater Treatment/Re-use
- Composting & Recycling Option

Native American Groups

Swinomish Smoke House, *La Conner, WA*

- Structural Design

Poo-Ha-Bah, *Death Valley, CA*

- Ecological Wastewater Handling

Duwamish Tribe, *Seattle, WA*

- Sustainable Site Design

Composting

US Navy, NAS Whidbey, *Whidbey Isl., WA*

- NaturTech system for yard waste & biosolids composting facility

Skagit Soils, *Burlington, WA*

- Compost Facility Design and Permitting

CIVIL ENGINEERING

LEED & Sustainable Design

Islandwood, *Bainbridge Island, WA* [LEED-Gold]

- Subsurface Flow Constructed Wetlands
- Living Machine™ System (Water Re-use)
- Rainwater Harvesting
- On-site Composting Systems

Firstenburg Community Center, *Vancouver, WA* [LEED- Gold]

- Porous Pavements, Raingardens

South Lake Union Study, *Seattle, WA*

- Resource guide on sustainable urban development
- Sustainable water & wastewater options

Hale Kumau Ranch, *Big Island, HI*

- Sustainable Infrastructure Planning
- Rainwater Harvesting System Design

Ford Motors Rouge Visitor Center, *Detroit, MI*

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

Educational

Cottage Lake Elementary School, *Woodinville, WA*

- LID Site Design, Sustainable Building

CalPoly University, *San Luis Obispo, CA*

- Master Planning, LEED Charette

Pacific Lutheran University, *Tacoma, WA*

- Master Plan (LID Concepts)

Master Planning

Seattle Art Museum, *Seattle, WA*

- Site Design Eco Charette

Fairview, *Salem, OR*

- Sustainable Site and Infrastructure

New Belgium Brewery, *Fort Collins, CO*

- Sustainable Site and Infrastructure

Wastewater Treatment

Kansas City Discovery Center, *Kansas City, MO*

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

Town of Concrete, *Concrete, WA*

- Municipal Natural Wastewater Treatment

YMCA Camp Seymour, *Gig Harbor, WA*

- On-site Living Machine™
- Water Reuse Irrigation

ECOLOGICAL DESIGN

Low Impact Development

Bayview Corner, *Langley, WA*

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

Eco-Stone Driveway, *Bellingham, WA*

- Porous Paving Blocks

Roche Harbor, *Roche Harbor, WA*

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

Water Supply & Re-use

Seattle Rainwater Pilot Project, *Seattle, WA*

- Residential rainwater catchment systems
- Water conservation

Single family Residential Rainwater Systems, *Whatcom, Skagit, and Kitsap Counties, WA*

- Sole source potable water systems

Non-Profit Organizations

Harmony Hill of Union, *Seattle, WA*

- Sustainable Site Design
- Water and Wastewater Systems

Bellingham Co-Housing, *Bellingham, WA*

- Site Design Assistance

Goosefoot Community Fund, *Langley, WA*

- Bayview Corner – Sustainable "Re-Development"

Presentations at Conferences, Workshops, and Seminars

Low-Impact Development (LID) Workshops – *Washington* (2003-2006)

LEED/Built Green Workshops – *Washington/Oregon* (2003-2007)

Sustainable Development Conference, *Western Washington University* (1996)

University of Washington Department of Architecture and Landscape Architecture (2002 – 2003)



2020 ENGINEERING

Mark Buehrer, PE, Director

Mark is the founder and director of 2020 ENGINEERING located in Bellingham, Washington. 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, ecologically based wastewater treatment & water reuse systems, and material recycling and composting facilities.

Mark has provided Master Planning, Engineering Design and/or Construction Management assistance on dozens of LEED, LID and other sustainable type projects in many parts of the U.S.A. He has also been actively involved in 2008 with providing review and comments to codes and standards for sustainable building practices. This has included a white paper by Cascadia Region Green Building Council titled, “Code Barriers to the Living Building Challenge”; Rainwater Harvesting and Water Reuse draft codes for the Uniform Plumbing Code (UPC) and the International Association of Plumbing and Mechanical Officials (IAPMO), and the co-authored document “Rainwater Catchment Design and Installation Standards” by the American Rainwater Catchment Systems Association (ARCSA) and the American Society of Plumbing Engineers (ASPE). In 2009, Mark was asked to serve on a committee with the purpose of assisting the Washington State Department of Health develop greywater reuse rules allowing for outdoor uses of greywater for irrigation.

Mark is currently serving on the Board of Directors for Cascadia Region Green Building Council. He is a technical development leader on the “Water Team” for the development of The Living Building User’s Guide and the continued development of The Living Building Challenge standard (*Version 2.0*), and an instructor of the Living Building Leader certification sessions. Mark is a frequent speaker at various sustainable and LID conferences and workshops including recent presentations at the 2008 Living Future Unconference in Vancouver, BC, the 2008 American Rainwater Catchment Systems Association (ARCSA) conference held in Santa Monica, CA, and the 2009 AIA Seattle Water Forum: “The New Green is Blue”. He has over 26 years of Civil Engineering experience.



2020 ENGINEERING

Presentations and Articles – Mark Buehrer, PE, Director

[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](#), Built Green Workshop, Bellingham, WA, **2005**

[Sustainable Infrastructure Strategies Including Low Impact Development \(LID\) Techniques](#), Port Townsend, **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**

[Low Impact Development Example Applications in the Pacific Northwest](#), APWA LID, **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**

[Low Impact Development Towards a healthier future..._LID Workshop](#), **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, 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*)

[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**

[Electric Energy Line System \(EELS\): Introduction to a New American Technology-A "Release Rail" Transportation System](#), **1993**, (*transportation-"dual-mode"*)



2020 ENGINEERING

Staff Bios



Matt Randall, PE, Project Manager

Matt is a Project Manager with nine years of progressive design experience in Healthcare, Education, Mixed-Use Development, Stormwater, Transportation, and Recreational/Waterway projects. Matt 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 as well as managed the civil aspect of a couple of overseas embassy projects. He earned a B.S. in Civil Engineering from Washington State University.

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

Colleen is a project manager with five years of civil engineering experience, specializing in water and wastewater systems design, technical report writing, and LID site design. Her educational background includes a B.S. Degree in Civil Engineering with a focus in water resources including courses in "Green Engineering", LEED Rating System and Low Impact Development (LID) site design. Colleen is a LEED Accredited Professional (LEED AP) and a Certified Erosion and Sediment Control Lead (CESCL).



Jennifer Allen, Civil Engineer – Economist

Jennifer is a Civil Engineer specializing in wastewater and hazardous waste engineering, economics, environmental policy and regulation, bioremediation, and constructed treatment wetlands. She earned a Bachelors of Arts in Environmental Economics from Western Washington University and a Masters of Science in Civil Engineering from Washington State University.

Dana Gaffney, EIT, Civil Engineer

Dana is a Civil Engineer with two years experience involving sustainable site design which includes two LEED certified projects, and six years experience in surveying, and AutoCAD drafting. She got her B.S. degree in Civil Engineering from Michigan Technological University with the focus in water resources and Low Impact Development (LID).



Michael Sparling, Senior CAD Designer

Mike is an experienced professional technician and AutoCAD designer. He was educated in mathematics at the University of Missouri, Rolla, and is a registered Senior Engineering Designer /Technician, Grade V. Mike has over 35 years of experience within a broad cross section of engineering disciplines that include site, roadway, and bridge layout design using a variety of CAD software.

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 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.

Amber Nordholm, Marketing Coordinator

Amber provides marketing and project management support, and general office administration at 2020. She holds a B.A. in Geography, with a focus on sustainability and the environment, and a minor in dance from the University of Washington.



EXAMPLE RAINWATER HARVESTING PROJECTS 2020 ENGINEERING

PROJECT NAME	LOCATION						Notes
		Potable	Toilet Flush	Laundry	Irrigation	Wash Down	
Loesch Residence	LaConner, WA	•	•	•	•		
Lieberherr Residence	Whatcom County, WA	•	•	•	•		
Islandwood (Education Center)	Bainbridge Island, WA				•		1
Bayview Corner [LEED GOLD]	Whidbey Island, WA		•	•	•		2
City of Kent City Hall	Kent, WA		•	•	•		
Hale Kamau Ranch	Big Island, HI	•	•	•			3
Vancouver Land Bridge [WSDOT]	Vancouver, WA				•		
zHome "Net Zero Energy" Townhouse Project	Issaquah, WA		•	•	•		
Seattle City Library [LEED SILVER]	Seattle, WA		•	•	•		
Capitol Hill Residence	Seattle, WA		•	•	•		
Wellspring Building	Bellingham, WA		•		•		4
Lummi Community Land Trust	Lummi Island, WA		•		•		
UniverCity Affordable Childcare [LIVING BUILDING]	SFU, Burnaby, Canada	•	•	•	•		5
Portland Residence [LEED PLATINUM]	Portland, OR	•	•	•	•		
San Juan County Home Trust	Friday Harbor, WA		•		•		6
Burgerville Restaurant [LEED PLATINUM]	Centralia, WA		•		•		
Skagit Soils Composting Facility	Skagit County, WA						7
Summit Avenue Residence	Seattle, WA		•	•	•		
Valley View Middle School [LIVING BUILDING]	Snohomish, WA		•		•		
Qwest Field	Seattle, WA					•	8

Notes:

- 1) organic gardens
- 2) public composting toilets
- 3) homes & livestock
- 4) Dual flush (HET) and urine diversion toilets
- 5) Microflush toilets with composting units
- 6) Affordable housing - 120 units
- 7) "Closed Loop" rainwater storage for dust control and compost hydration
- 8) Rainwater used for wash down of spectator seating area.

