



Building Commissioning

Consultant Services

Executive Summaries

2011-820

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Washington State Department of

**Enterprise Services**

Energy Program



## **Statement of Qualifications**

***State of Washington, Department of General  
Administration, Division of Engineering &  
Architectural Services, Facilities Engineering,  
As-Needed Commissioning Services for Public  
Facilities Statewide, Project No. 2011-820***

1201 Western Avenue Suite 325  
Seattle WA 98101

PMB 319  
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Engineering Economics, Inc.



## Engineering Economics, Inc.

1201 Western Avenue, Suite 325  
Seattle, Washington 98101

telephone: 206.622.1001



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March 24, 2011

Ms. Kathi Fyfe  
Division of Engineering & Architectural Services  
General Administration Building  
210 11<sup>th</sup> Avenue Southwest, Room 206  
PO Box 41012  
Olympia, WA 98504-1012

**Re: State of Washington, Department of General Administration, Division of Engineering & Architectural Services, Facilities Engineering, As-Needed Commissioning Services for Public Facilities Statewide, Project No. 2011-820, EEI Project No: 03-10005**

Dear Ms. Fyfe:

Thank you for giving our firm this opportunity to present our qualifications for commissioning services for statewide Washington public facilities. The EEI Seattle office was established in 1986, and since that time, we have completed numerous projects with various state agencies throughout Washington. We look forward to continuing our successful relationship through this opportunity.

EEI is a full-service building systems consulting firm, specializing in building commissioning, retro-commissioning, LEED commissioning, facility assessments and mechanical/electrical/plumbing consulting services. We customize our services to meet our clients' specific needs—with a focus on quality assurance and sustainability.

EEI has provided its clients with commissioning and retro-commissioning services since 1991, and has commissioned more than 120 million square feet of space in new and existing buildings with total construction value on these projects in excess of \$19 billion over this 20-year period.

EEI employs over 70 highly trained and experienced employees who are committed to excellence. Our technical staff includes registered engineers, LEED Accredited Professionals, building automation system specialists and commissioning authorities certified by the Building Commissioning Association, the National Environmental Balancing Bureau and the Association of Energy Engineers, with an average of 21 years of experience in building systems.

The EEI Seattle office employs 19 professionals. Within this group there are 17 technical personnel (8 licensed Professional Engineers, 10 LEED APs, 7 certified commissioning authorities and 1 Certified Energy Manager), as well as 2 administrators. Nationwide, EEI has provided LEED commissioning services for 400+ projects throughout the country, with 151 of these jobs completed by our Seattle and Spokane staff.

Please note we have teamed with OAC Services, Inc. for the provision of building envelope/enclosure commissioning services. OAC is dedicated to providing innovative building and process solutions to public and private clients from locations in Seattle and Spokane. EEI and OAC have collaborated on numerous past projects.

We thank you for your interest in our firms, and we look forward to the opportunity to discuss your needs and our qualifications in further detail.

Sincerely,

**Engineering Economics, Inc.**

Jeff Nichols, PE, LEED AP, CEM, CPMP  
Principal-in-Charge

# *Table of Contents*

Firm Qualifications & Resumes

Geographic Proximity & Relevant Experience

Previous Performance

# *Firm Qualifications & Resumes*

## **INTRODUCTION**

Engineering Economics, Inc. (EEI) was founded in 1984 as a facility consulting firm, which today specializes in building commissioning, Leadership in Energy and Environmental Design (LEED), facility assessments and mechanical/electrical/plumbing (M/E/P) consulting services. These services are customized to our clients' specific needs with a focus on quality assurance and sustainability.

## **HISTORY**

EEI began as an energy service consulting firm providing expertise on a variety of operational issues and building systems. Originally specializing in retrofit designs, particularly energy-related conservation projects, EEI is particularly well-suited for today's market. From our inception, we have specialized in the integration of energy-efficient equipment and control strategies. These services are "core values" of our firm and integrated into nearly everything we do.

EEI commissioned the first formal "commissioning" project in 1991 in the United States – The Fred Hutch Cancer Research Center in Seattle. Since that time, we have provided commissioning and retro-commissioning services for a variety of clients across the United States. Over the past 20 years, we have commissioned over 120 million square feet of space valued in excess of \$19 billion. As part of this commissioned square footage total, EEI has provided LEED commissioning services 400+ projects across the country, of varying certification levels (Certified, Silver, Gold and Platinum), some of which have already received certification and some which are in process.

## **OFFICES**

We serve our clients from offices located throughout the United States, including Arizona, California (2 locations), Colorado, Kansas, Kentucky, Missouri, New Mexico, North Carolina, Oregon, Texas, Virginia, Washington (Seattle and Spokane) and Washington DC.

## **STAFFING**

EEI employs over 70 highly trained and experienced employees who are committed to excellence. Our technical staff includes:

- 23 registered engineers
- 30 LEED Accredited Professional
- 13 certified commissioning professionals, certified through the Building Commissioning Association, Association of Energy Engineers, AABC Commissioning Group, ASHRAE, the National Environmental Balancing Bureau and the University of Wisconsin
- 4 Certified Energy Managers

In addition, EEI employs building automation system specialists certified by the National Environmental Balancing Bureau. Our technical staff average 21 years in building systems experience.

## **PRACTICE AREAS**

Commissioning services (including retro-commissioning, re-commissioning and LEED commissioning) comprise approximately 80% of the work that we do. In addition, EEI provides energy consulting services, facility assessments, and M/E/P consulting services.



*Bill & Melinda Gates Foundation, 500 5<sup>th</sup> Avenue North  
Seattle WA*

## ***Jeffrey D. Nichols, PE, LEED AP, CPMP, CEM, Principal-in-Charge & Branch Manager***

**EDUCATION** B.S., Architectural Engineering, Environmental Systems, University of Colorado, 1980

**PROFESSIONAL REGISTRATION** Registered Professional Engineer in Alaska , California, Oregon and Washington

**EXPERIENCE** Mr. Nichols is the managing principal of EEI's Seattle office and project manager for special projects. Most projects personally completed by Mr. Nichols involve owner's representative services, assisting with design criteria, M/E/P construction management and final commissioning of the mechanical and electrical systems. His technical expertise is focused on facilities engineering, with special emphasis on systems documentation and systems analysis, improving performance and efficiency of HVAC systems. Typical analysis includes connected loads and demand profiles, physical plant capacities and performance in relation to the demands, age, life cycle costing and conversion potential to more efficient modes of operation.

### **REPRESENTATIVE PROJECTS**

- **Amazon Headquarters**, Seattle, WA: Principal-in-Charge for commissioning this 1.6 Million SF corporate headquarter project. This 11-building commissioning project is being completed in phases from 2008 – 2011. The control systems include energy management and control system equipment (control sequences, alarms, trending, graphics, basic metering and fire alary interface)
- **Expedia.Com Headquarters**, Seattle, WA: Principal-in-Charge for commissioning this 250,000 SF build-out project encompassing primarily offices, conference rooms and support spaces. EEI commissioned the following systems/equipment: series fan – VAV terminal units; DX fan coil units; CRAC units; HVAC control systems; and lighting control system
- **500 5<sup>th</sup> Avenue**, Seattle, WA: Principal-in-Charge for commissioning this three building, 1-Million SF Bill and Melinda Gates Foundation project. EEI commissioned all campus control systems
- **University of Washington School of Medicine, Lake Union Research Facility, Phases I & II**, Seattle, WA: Principal-in-Charge of commissioning this 387,00 SF (total) project broken out into two distinct phases
- **Kitsap County Administration Building**, Port Orchard, WA: Principal-in-Charge for commissioning of this 68,000 SF facility housing Board of County Commissioners, Administrative Services, Auditor, Assessor, Treasurer, and Department of Community Development
- **Enumclaw Regional Hospital**, Enumclaw, WA: Principal-in-Charge of this new LEED certified 90,000 SF acute care facility campus expansion. EEI is commissioning the air handling systems; chilled water system; heating water system; building automation system; emergency generators and fuel system; medical gas piping; and lighting/daylighting controls.
- **Microsoft Building 98 and Garage**, Redmond, WA: Principal-in-Charge for commissioning this 50,000 SF building containing offices as well as a restaurant/cafeteria facility and associated parking garage built to accommodate approximately 5,000 vehicles. Systems commissioned include lighting and controls systems; HVAC; kitchen exhaust; and domestic water systems
- **KCTS Channel 9**, Seattle, WA: Principal-in-Charge for commissioning a mechanical systems performance evaluation for this 85,000 SF improvement project. EEI developed a plan for improvement and replacement of the building HVAC and control systems. In conjunction with this effort, EEI also provided a focused evaluation of the existing chiller, which was determined to be in need of immediate replacement

### **SPECIAL QUALIFICATIONS**

- Certified Energy Manager
- LEED Accredited Professional
- Commissioning Process Management Professional (CPMP) - ASHRAE

### **PROFESSIONAL AFFILIATIONS**

- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
- Building Commissioning Association (BCA)
- Association of Energy Engineers (AEE)

## ***Brendon Mattis, PE, LEED AP, CxA, Project Manager***

**EDUCATION** B.S., Mechanical Engineering, University of Missouri, Columbia, Missouri, 1996

**PROFESSIONAL REGISTRATION** Registered Professional Engineer in Washington

**EXPERIENCE** Mr. Mattis has gained extensive experience in the construction management, commissioning and mechanical design fields. He has been involved in central plant and chilled water loop design/installation/commissioning, tenant improvements, laboratory and hospital design/commissioning, computer-aided building energy load calculation, energy analysis, performance contracting and energy conservation retrofit. His interests lie in energy conservation, commissioning, system troubleshooting and optimizing systems energy use. Most recently, Mr. Mattis has been involved with performing and managing the commissioning process on a variety of projects which brings a wide variety of design and engineering tools to the construction process.

### **REPRESENTATIVE PROJECTS**

- **Pierce College, Rainier Building**, Seattle, WA: Senior Project Manager for commissioning this LEED-Silver 70,000 SF science and technology facility including winter gardens with radiant flooring and natural ventilation.
- **Microsoft Buildings 37 & 99**, Redmond, WA: Project Manager for commissioning two LEED prototype office facilities totaling 240,000 SF. Systems included smoke control; underfloor air distribution; lab cooling; process cooling; a chilled water plant; lighting control; and emergency power
- **University of Washington South Lake Union Phases I & II**, Seattle, WA: Commissioning Project Manager for this 2-phased project totaling 392,000 SF housing laboratory research space, office areas and Vivarium facilities. The building utilizes chilled beam for space cooling and houses biomedical research centers that cross organizational and disciplinary lines
- **Bill & Melinda Gates Foundation Headquarters**, Seattle, WA: Project Manager for the commissioning of this multi-phase contiguous office campus of three buildings totaling 1 million SF, as well as underground parking facilities, which includes extensive rain water harvesting, radiant floor system, distribution and treatment and complex domestic water supply systems
- **Amazon Headquarters**, Seattle, WA: Senior Project Manager for LEED tenant improvement commissioning services of this multi-building facility consisting of 1.6 million SF of office and 100,000 SF of retail space
- **University of Washington, Benjamin Hall**, Seattle, WA: Senior Project Manager for this LEED 90,000 SF, 6-story university lab research building. The facility has a 5,000-SF basement and two levels of basement parking and houses research facilities for nanotechnology, photonics, genome technology, information technology, energy, biometrics, and mind and brain sciences
- **Lake Washington High School**, Redmond, WA: Project Manager for this 226,000+ SF LEED modernization project. The project features natural ventilation and radiant heat systems
- **Whitworth University, Biology & Chemistry Building**, Spokane, WA: Senior Project Manager for this new 60,000-square-foot biology/chemistry building, with state-of-the-art laboratories, instrumentation and animal-research facilities. The building also includes classrooms designed to be easily converted into labs, common rooms, offices and stockrooms
- **Battelle Memorial Institute Biological Sciences Facility**, Richland, WA: Senior Project Manager for this 150,000 SF LEED Gold laboratory research facility which combines bio-safety level 2 (BSL-2) wet research laboratories with extensive dry computational laboratories. The building also includes office and conference spaces, all under high security containment
- **Pierce College Science Facility**, Lakewood, WA: Senior Project Manger for commissioning this LEED Silver \$21.3 Million research building. The systems utilized are a combination of central boiler plants, with VAV air handling units and laboratory systems

### **SPECIAL QUALIFICATIONS**

- LEED Accredited Professional
- Certified Commissioning Authority (ACG)

### **PROFESSIONAL AFFILIATIONS**

- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)

## ***Mark Macomber, PE, LEED AP, Project Manager***

### **EDUCATION**

B.S., Mechanical Engineering, Michigan Technological University, Houghton, Michigan, 1996

### **PROFESSIONAL REGISTRATION**

Registered Professional Engineer in Washington

### **EXPERIENCE**

Mr. Macomber has extensive experience with HVAC system design, commissioning and facilities engineering. Since joining EEI, his main focus has been on commissioning of mechanical and electrical building systems. Mr. Macomber specializes in HVAC systems design, construction support, commissioning and systems troubleshooting. He has participated in several design and construction teams, coordinating with architects, designers and contractors to ensure that building systems requirements are met.

Mr. Macomber commissioned the first Leadership in Energy & Environmental Design (LEED) building for the Seattle office and has continued his involvement on LEED projects. He has obtained the following LEED credits for Energy & Atmosphere: Prerequisite 1, Fundamental Building Systems Commissioning; Credit 3, Additional Commissioning; and Credit 5, Measurement & Verification.

### **REPRESENTATIVE PROJECTS**

- **King County Tire & Millwright Shop**, Seattle, WA: Project Manager for commissioning this new 9,000-SF building which houses King County Metro's tire repair facility, a machine shop, staff offices, a breakroom, restrooms and showers
- **Snoqualmie City Hall**, Snoqualmie, WA: Project Manager for commissioning this facility which consolidates 41 city offices that were dispersed among five city buildings. The new building houses the Mayor's Office, city administration, six different departments and the City Council Chambers
- **Olympia City Hall**, Olympia, WA: Project Manager for provision of energy engineering consultant services to prepare energy performance specifications for this 80,000 SF LEED facility
- **818 Stewart Office Tower**, Seattle, WA: Project Manager for commissioning this tenant improvement project that comprised 3 full floors and 2 partial floors (covering almost 73,000 SF). The tenant's space encompasses open office space, private offices, meeting rooms and core space. The owner received LEED-CI Silver certification
- **Microsoft Campus, Various Buildings**, Redmond, WA: Project Manager for LEED commissioning services for Lincoln Square and Redmond corporate campus headquarter buildings 37, 94, 95, 96, 97, 98 and 99, 120 and GSOC
- **Coeur D'Alene Casino Resort**, Worley, ID: Project Manager for LEED commissioning this 150,000 SF expansion which has applied for Silver rating with the USGBC. The expansion includes 105 hotel rooms; a steakhouse with kitchen; spa; bar (Night Sky Lounge), as well as supporting facilities such as laundry, workout, room service and office spaces
- **Bill & Melinda Gates Foundation Headquarters**, Seattle, WA: Project Manager for commissioning this multi-phase contiguous office campus of three buildings totaling 1 million square feet, as well as underground parking facilities
- **Kent Events Center (Showare Center)**, Kent, WA: Project Manager for commissioning this 153,000 SF community center which accommodates a variety of events ranging from concerts, hockey games, trade shows to dirt shows and other community events. The building consists of three primary elements: the Bowl, the Concourse, and the Roof structure

### **SPECIAL QUALIFICATIONS**

- LEED Accredited Professional

### **PROFESSIONAL AFFILIATIONS**

- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)

## ***Bryan Lackey, LEED AP, Project Manager***

**EDUCATION** B.S., Mechanical Engineering, Washington State University, 1994

**PROFESSIONAL REGISTRATION** Registered EIT, State of Washington

**EXPERIENCE** Mr. Lackey has extensive experience in project management and DDC controls programming. He also has experience with commissioning. Because of his commitment to quality assurance and attention to detail, he has been selected to work on projects as the Commissioning Authority for educational facilities, general-purpose office buildings and biotech research laboratories.

His commissioning background includes specification review, writing of pre-functional test documentation, writing and performing functional tests, O&M review, trouble-shooting systems, and DDC controls programming.

His design background includes reviewing designs to create ELCCA reports.

**REPRESENTATIVE PROJECTS**

- **Pierce College Center Building**, Puyallup, WA: Project Engineer for commissioning this new classroom/commons facility
- **Pierce College Science & Technology Center**, Lakewood, WA: Project Engineer for commissioning this 80,645-SF college science facility
- **Thurston County Family Court and Detention Center**, Tumwater, WA: Project Engineer for retro-commissioning of this public facility
- **Olympia School District – Washington Middle School**, Olympia, WA: Project Engineer for commissioning this 97,000-SF school facility
- **Lake Washington School District – Rose Hill Elementary School**, Kirkland, WA: Project Engineer for commissioning this new 52,000-SF school facility
- **Lake Washington School District – Rachel Carson Elementary School**, Sammamish, WA: Project Engineer for commissioning this new 57,198-SF school facility
- **Green River Community College**, Auburn, WA: Project Engineer for commissioning this 75,000-SF laboratory center
- **Muckleshoot Tribe Natural Resource Building**, Auburn WA: Project Engineer for commissioning the HVAC and plumbing systems in this new office and research building
- **Green River Community College Science Center**, Auburn, WA: Project Engineer for commissioning this new 76,000-SF science center
- **Highline School District – Mount View Elementary School**, Seattle, WA: Project Engineer for commissioning this 70,000-SF building consisting of classrooms, office space, library, computer labs, meeting rooms, common areas, gym, cafeteria/multi-purpose room and prep kitchen to support student and faculty needs
- **Olympia School District – LP Brown Elementary School**, Olympia WA: Project Engineer for commissioning this elementary school remodel project
- **Sumner School District – Bonney Lake High School**, Sumner, WA: Project Engineer for commissioning this school construction project
- **Lake Washington School District – Kirkland Junior High School**, Kirkland, WA: Project Engineer for commissioning this 110,000-SF Junior High School
- **Seattle University Student Center**, Seattle, WA: Project Engineer for LEED commissioning
- **Amgen Helix Laboratory**, Seattle, WA: Mechanical Project Engineer for commissioning this research laboratory facility
- **Confidential Project**: Project Engineer for evaluation of air conditioning system to find cause of and elimination of gas smells into the occupied building spaces.

**SPECIAL QUALIFICATIONS**

- LEED Accredited Professional

**PROFESSIONAL AFFILIATION**

- American Society of Heating, Refrigeration & Air Conditioning Engineers (ASHRAE)

## *J. Craig Johnas, LEED AP, CxA, Commissioning Engineer*

### EDUCATION

AAS, Bellevue Community College, 1998  
AAS, Aviation Maintenance Technology, US Air Force, 2001  
B.S., Computing and Software Systems, University of Washington, 2001  
Project Management Certification, University of Washington, 2006

### EXPERIENCE

Mr. Johnas spent four years in the BAS industry. During the first few years of this period, he troubleshooted DDC systems remotely for customers such as Costco and REI for facilities located throughout the US, Canada and Mexico, as well as for local hospitals, schools and businesses. He performed in-depth audits of new Costco BAS systems prior to the opening of a new warehouse. These audits also involved making enhancements to the original and modified programming of existing systems, which ultimately would help in running a more efficient building.

Later, Mr. Johnas was involved in managing all aspects of controls systems for new Costco warehouses. This included visiting each new warehouse, commissioning, discovering and resolving discrepancies, and closely managing the budget during the project lifecycle.

Since joining EEI, Mr. Johnas has expanded his commissioning experience by writing functional tests, performing point-to-point functional testing, and commissioning of several businesses and schools throughout the local area.

### REPRESENTATIVE PROJECTS

- **Amazon Headquarters**, Seattle, WA: Commissioning Engineer for this 1.6 Million SF corporate headquarter project. This 11-building commissioning project is being completed in phases from 2008 – 2011. The control systems include energy management and control system equipment (control sequences, alarms, trending, graphics, basic metering and fire alary interface)
- **Everett Community College, Gray Wolf Hall**, Everett, WA: Commissioning Project Engineer for this 55,000 SF LEED Undergraduate Education Center, containing offices and classrooms
- **Olympia City Hall**, Olympia, WA: Commissioning Engineer for this LEED Silver 80,000 SF municipal facility. The building reused existing materials from deconstruction of the old City Hall, which was an important factor in achieving LEED certification
- **Pacific Lutheran University**, Tacoma, WA: Project Engineer for all aspects of the commissioning process including site visits, creating a commissioning plan, and writing and conducting functional tests
- **Aberdeen High School**, Aberdeen, WA: Project/Commissioning Engineer for preparing commissioning specifications, commissioning plan and functional tests as well as conducting functional testing of all mechanical equipment
- **Pierce College – Health Science/Student Recreation Center**, Ft. Steilacoom, WA: Project/Commissioning Engineer for writing both pre-functional and functional tests and conducting functional tests on this new college addition
- **Microsoft Corporation – Lincoln Square Building**, Bellevue, WA: Project/Commissioning Engineer for writing functional test and conducting point-to-point and functional testing for this interiors project located within a new 15-story high-rise building seeking LEED certification
- **Microsoft Corporate Campus, Buildings 94, 95 and 96**, Redmond, WA: Commissioning Project Engineer for three LEED certified facilities totaling 250,000 SF. These three buildings rounded out Microsoft's \$1 billion West Campus expansion of their headquarter facility
- **Snohomish School District, Snohomish High School, Glacier Peak High School and Little Cedars Elementary School**, Snohomish, WA: Commissioning Project Engineer for these K-12 facilities. Snohomish High School was an expansion and modernization project while Glacier Peak (\$40.7 Million) and Little Cedars (\$19.6 Million) were new construction projects for which EEI provided construction and acceptance phase commissioning services.

### SPECIAL QUALIFICATIONS

- LEED Accredited Professional
- Certified Commissioning Authority through AABC Commissioning Group (ACG)

### PROFESSIONAL AFFILIATIONS

- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)



Mosler Lofts – Seattle, WA

## Building Envelope Commissioning

Building envelope commissioning is a component of “whole building commissioning” which is now a holistic approach to building commissioning incorporating systems that make up the exterior skin of the building of roof, walls and floor, with the traditionally commissioned systems of mechanical, electrical, fire and such. This new view of commissioning has been spurred on by changes in building codes emphasizing energy conservation and efforts by building owners, designers and engineers to prevent energy loss and cut operating costs.

While the traditional concept of building commissioning was typically to verify the operation of building systems upon completion of construction, the new concept is to check the building enclosure design against the design intent.

Building envelope commissioning carries with it three main components:

- Design
- Construction
- Testing

To expand on the three components, good envelope commissioning begins with the Owner’s Project Requirements and ends with post-construction services such as review of the overall building envelope prior to expiration of warranties. In between, there is design review, submittal review, construction observation, performance testing, close-out document review and development of a long-term maintenance plan.

OAC Services has years of experience in investigating and evaluating why building envelopes fail. We have parlayed this experience into designing successful envelopes that perform as they are intended to perform. This work has been done with new buildings as well as existing buildings, weatherproofing and tightening up existing buildings for durability and energy efficiency. We have extensive experience in field construction observation and directing air and water façade testing for performance verification of the building envelope.

## Geographic Proximity & Relevant Experience

EEI has two offices in Washington from where we can serve that State's commissioning needs: Spokane and Washington. OAC Services, Inc. also has locations in Seattle and Spokane from where they will provide building envelope/enclosure commissioning services. Following are some sample project descriptions for review. Please note that we have had to limit our representation of projects due to the RFP page limitation but will gladly provide additional project experience information upon request:

### UNIVERSITY OF WASHINGTON MOLECULAR ENGINEERING BUILDING, Seattle, WA LEED Silver Project (or higher)

In 2009, UW Medicine broke ground on the nation's largest molecular engineering building. When complete, this LEED Silver facility will consist of a 28,000-SF basement, an 8,000-SF sub-basement, and four above-ground levels each measuring about 12,000 SF. The total building is about 90,000 SF including hallways, utilities and common spaces. The main purpose of the large underground space is to protect research components from vibrations and electromagnetic interference. Above it will be a courtyard, and the above-ground building will accommodate preparatory laboratories and flexible research / teaching space.



The current estimated project cost is \$78 million, and the building is expected to meet at least a LEED silver rating for energy savings, water efficiency, carbon dioxide emissions reduction and other measures. Designs include natural ventilation in the office spaces, a partial green roof, natural lighting and storm water management, all of which may ultimately qualify for an even higher LEED rating.

Long-term plans include a second building connected to the first. The second building will be slightly smaller than the first and will include mainly teaching and office space.

EEI is providing LEED commissioning services from design through warranty for the following systems/equipment:

#### ARCHITECTURAL

- Research Lab Envelope Tightness
- Autoclave Systems

#### MECHANICAL

- HVAC Systems & Controls
- Domestic Hot Water and Lab Hot/Cold Systems
- Natural Ventilation System
- Process Cooling Water system – Heat Recovery Chiller
- Pure Water System
- Natural Gas System
- Lab Gases, and Air and Vacuum Systems
- Ductwork and Piping Distribution Systems
- TAB Verification (10% back-check)

#### ELECTRICAL

- Lighting and Daylighting Controls
- HVAC Interface to Fire Alarm System
- Emergency Power System Testing
- Building Power Failure and Restart

Owner/Developer/Client ..... State of Washington  
 User/Tenant..... University of Washington  
 Architect..... ZGF Architects of Seattle  
 Commissioning Authority..... Engineering Economics, Inc.  
 Completion Date ..... 2012  
 Area..... 90,000 SF

### PIERCE COLLEGE RAINIER BUILDING, Lakewood, WA LEED Silver Project

The Rainier Building houses science and math curriculums for Pierce College. This unique project is LEED-certified Silver and features winter gardens between three classroom pods joined by vertical glass structures. A spiral sculpture crafted with dichromatic glass, a rock garden, a planetarium-style classroom, solar panels, and “green” roofs are just a few of the many amenities featured in this 80,000+ SF structure.

The systems utilized are a combination of central boiler plants, natural ventilation, radiant heat, and VAV air handling units and laboratory systems. Lighting control, daylight control and electrical usage are monitored for optimal efficiency. EEI was contracted to provide design and construction phase commissioning as well as TAB services.



LEED credits include EAp1 – Fundamental Commissioning, EAc3 – Additional Commissioning, and EAc5 – Measurement and Verification.

Owner..... *State of Washington*  
 Tenant .....*Pierce College*  
 Architect.....*OPSIS and MSGS Architecture Firms of Olympia and Portland*  
 Completion Date ..... *2010*  
 Area.....*80,645 SF*

**UNIVERSITY OF WASHINGTON BENJAMIN HALL INTERDISCIPLINARY RESEARCH BUILDING, Seattle, WA**  
**LEED CS Pilot Gold Project**



The new University of Washington Benjamin Hall Interdisciplinary Building is approximately 90,000 SF. The design-build-operate-maintain (DBOM) agreement used on this project obligated the designers and builders to operate and maintain the building at a guaranteed price during the 30-year contract. Building life-cycle costs drove the decisions about what building materials and systems to use, which helped the design-build team beat cost predictions. The DBOM approach also resulted in a better asset for the University because long-term building maintenance can be performed without draining scarce resources.

This 6-story university lab research building has a 5,000-SF basement and two levels of basement parking. The facility houses research facilities for fields of nanotechnology, photonics, genome technology, information technology, energy, biometrics, and mind and brain sciences. The building is on the west fringe of the UW main campus and is on a sloped site by Interstate 5. Benjamin Hall is first building in Washington State and at the University to receive the CS Pilot Gold rating.

All floors are supplied with variable volume, 100% outside air. Supply air is provided by two custom chilled water, air-handling units.

EEI commissioned the shell-and-core system for this project in coordination with McKinstry Company, and has performed commissioning for each of the buildouts since then. The systems consist of central boiler and chiller plant, with two large fan wall AHUs serving laboratory spaces, lab pressure control, sump pumps, lighting control, emergency systems, lab compressed air, and vacuum.

Owner..... *State of Washington*  
 Tenant .....*University of Washington*  
 Architect.....*McKinstry Company*  
 Completion Date ..... *2006*  
 Area.....*Approx. 90,000 SF*

**EVERETT COMMUNITY COLLEGE GRAY WOLF HALL, Everett, WA**  
**LEED Project**



The Undergraduate Education Center, also known as Gray Wolf Hall, was constructed on the Everett Community College campus, and consists of classrooms and offices.

EEI provided the commissioning plan that detailed and guided the commissioning process; provided detailed pre-functional and functional test procedures, and executed functional testing; reviewed preliminary TAB and control system documentation to verify system readiness for functional testing; and reviewed O&M documentation.

Systems commissioned include:

- Heating & cooling systems
- HVAC systems
- Domestic water systems
- Lighting system
- Controls system

EEI provided a final commissioning report and, as a requirement of LEED certification, EEI provided a Systems Manual that summarizes the building operations. EEI also provided a post-occupancy review to verify operations and resolution of all outstanding issues.

Owner/Developer/Client ..... *State of Washington*  
 User/Tenant.....*Everett Community College*  
 Architect.....*LMN Architects*  
 Commissioning Authority.....*Engineering Economics, Inc.*  
 Completion Date ..... *2009*  
 Area.....*55,000 SF*

**GREEN RIVER COMMUNITY COLLEGE, TECHNOLOGY CENTER, Auburn, WA  
Retro-Commissioning Project**



The original construction of the Technology Center was completed in 2005, and provides state-of-the-art training services for aviation and information technology programs. The building was suffering from inefficient systems design and operation and costing the college undue expense. In an effort to determine the cause and resolve the challenges, Green River requested that EEI evaluate the heating water, chilled water, air-handling and the natural ventilation systems. EEI conducted TAB and retro-commissioning services. EEI’s efforts resulted in the following issues being resolved:

- Severe leakage was found in the under floor system.
- Chilled water pumping issues caused frequent chiller failures and band aid fixes increased energy use.
- The natural ventilation system did not originally work on the second floor.
- Exhaust fans were added to the AHU to allow heat to be removed from the building and to increase the AHU supply capacity.
- Heating water circuit setters were replaced to provide adequate heating water.
- Operational sequences were drastically revised to increase occupant comfort and reduce energy use.
- VFD’s were added to transfer fans to increase comfort and reduce energy use.

*Owner/Developer/Client* ..... *Green River Community College*  
*User/Tenant*..... *Green River Community College*  
*Commissioning Authority*..... *Engineering Economics, Inc.*  
*Completion Date* ..... *2009*  
*Area*..... *34,000 SF*  
*Total Construction Cost*..... *\$27,360 (fee)*

**HIGHLINE COMMUNITY COLLEGE SCIENCE CENTER  
Des Moines, Washington**



EEI was hired to provide commissioning services for this new science facility for Highline Community College. The project consisted of a new laboratory and office space to update and expand the science educational offerings at the college.

EEI’s commissioning services included design review, preparation of commissioning specifications and functional testing for all mechanical systems, electrical systems and lighting control for this project.

*Owner*..... *State of Washington*  
*Architect*..... *Highline Community College*  
*Architect*..... *N/A*  
*Completion Date* ..... *2005*  
*Area*..... *95,000 SF*  
*Total Construction Cost* ..... *Unknown*

**AMAZON HEADQUARTERS  
Seattle, Washington  
LEED Project**



Amazon.com is finalizing its corporate headquarters move to a six-block campus in the South Lake Union neighborhood of Seattle. Amazon plans to lease up to 1.6 million SF in as many as 11 planned buildings, with initial move-in taking place in mid-2010 and full occupancy in all buildings in 2011.

The project is taking place in five different phases. Construction of the first four buildings began in January 2008, and occupants moved into those facilities in the summer of 2010. The last portion of the project began in fall 2009, with a target occupancy date in August 2011. Each of the buildings include office and 100,000 SF of street-level retail space. Three of the buildings are 12 stories tall.

EEI was hired to provide tenant improvement commissioning services on this 1.6 million SF corporate campus. EEI’s services include design review, submittal review and the development of the commissioning specifications, commissioning plan, installation/start-up, pre-functional tests and functional tests. EEI used (is also using) Issue Logs to report, track and recommend solutions for system deficiencies/failures. EEI reviewed (is reviewing) TAB reports, conducted (is conducting) back-checks of 10% of the TAB measurements, reviewed (is reviewing) the operations and maintenance manuals and monitored (is monitoring) operations training.

Following occupancy, EEI conducted (is conducting) post-occupancy commissioning reviews. As part of this process, EEI made (will make) suggestions for additional improvements, identified (will identify) problem areas that may be covered under warranty and assisted (will assist) facility staff in remedying any outstanding issues.

EEI’s scope of work includes the following systems:

- HVAC: Rooftop units, returns fans, heating/cooling coils, fan terminal units, dampers, valves, actuators, sensors, controls components and strategies.
- Lighting: Occupancy sensors, daylight sensors, photocells, switch controls, programmable controllers and strategies.
- Controls: Energy management control system equipment, including control sequences, alarms, trending, graphics, basic metering and fire alary interface.
- Fire/Life Safety: HVAC smoke detection shutdown and dry contact interface between fire alarm and DDC systems (only).

*Owner/Developer/Client* ..... *Vulcan/Amazon*  
*User/Tenant*.....*Amazon & Various Tenants TBD*  
*Architect*.....*NBBJ, LMN Architects and Callison Architecture, Inc.*  
*Commissioning Authority*..... *Engineering Economics, Inc.*  
*Completion Date* ..... *2010-2011*  
*Area*..... *1.6 Million SF of Office and 100,000 SF Retail*

**500 FIFTH AVENUE NORTH – PHASE I, Seattle, WA**

**LEED Project**

The Bill & Melinda Gates Foundation headquarters is located in downtown Seattle and is a multi-phase contiguous office campus of three buildings totaling 1 million square feet, as well as underground parking facilities. Two of the three buildings were constructed in Phase 1 of the project—one of which is a 15,000-SF visitor’s center that explains the Foundation’s work in global health, development and education.



The project includes an underground rainwater collection tank and a thermal energy storage tank. A “green roof” structure with plant materials covers most of the lower level roof areas. Extensive landscaping with water features, sidewalks, plaza and other site work are in various places throughout the 12-acre campus.

EEI was hired as the Commissioning Authority for the impressive LEED project. In that role, EEI provided a commissioning plan that detailed and guided the process, wrote the commissioning specifications, reviewed design and construction documents, provided functional test procedures, and performed functional testing of the following systems and equipment:

- Mechanical HVAC equipment
- Central plant equipment (heat recovery chiller, exchangers and pumps)
- Energy management and monitoring system
- Building automation system
- Domestic water, pumping and mixing systems
- Occupancy sensors
- Lighting controls and daylighting controls
- Emergency electrical systems
- Uninterruptible power systems

As a requirement of LEED certification, EEI provided the recommissioning manual that summarizes the building operations from conception through construction. EEI also provided a post-occupancy review that verified operations and resolution of all outstanding issues.

*Owner/Developer/Client* ..... *Bill & Melinda Gates Foundation*  
*User/Tenant*..... *Bill & Melinda Gates Foundation*  
*Architect*.....*NBBJ*  
*Commissioning Authority*..... *Engineering Economics, Inc.*  
*Completion Date* ..... *December 2010*  
*Area*..... *1,000,000 SF*



## RAINIER BUILDING AT PIERCE COLLEGE FORT STEILACOOM

Provided building envelope investigation, design administration and commissioning services for a new construction science and technology building at Fort Steilacoom campus of Pierce College. The distinct building consists of three multi-story pods with winter garden spaces between the pods, unique curtainwall and skylight systems, and challenging plane changes in the siding.

During design, OAC worked collaboratively with the design team to develop customized, three-dimensional details and solutions that clearly defined waterproofing for building geometry, end conditions, and transitions.

During construction, OAC provided services to help assure that the requirements established during design were carried out in construction. OAC oversaw the repairs and provided building envelope commissioning for the project. These services included, field observation, documentation, and testing.

### Services

- Building Envelope Investigation, Design, Administration and Commissioning



## Cascade Building at Pierce College Fort Steilacoom

During construction for renovations, mold was discovered within the exterior walls of the Cascade Building. OAC was contacted to determine the sources of water intrusion causing the mold growth. OAC conducted a forensic investigation of the building's roof, cladding, and windows which included visual observations, probes, and water testing. The investigation concluded that a complete building re-clad was necessary due to discovered deficiencies in the window, flashing, and cladding systems.

Following our investigation, OAC teamed with the college facilities staff, the state project manager, and architect of record to provide building envelope details for the re-clad project. In addition, we oversaw the repairs and provided building envelope commissioning for the project. These services included, field observation, documentation, and testing.

The Cascade Building was originally clad with "Marble-Crete" cementitious cladding and subsequently re-clad with exterior insulation finish system (EIFS). Roofs were a combination of metal and single-ply membrane.

### Services

- Building Envelope Investigation, Design, Administration and Commissioning



## Highline Medical Center

The Highline Medical Center is a five-story hospital structure that had to be completely re-clad due to a failed building envelope. During severe weather, water leaks commonly forced critical areas of the hospital to be closed-off and people and staff relocated. OAC provided envelope design, contract administration and building envelope commissioning services for the re-clad project.

The hospital remained in operation throughout the re-clad project. New wall panels were fabricated on the ground and then hoisted into place. OAC's structural engineers evaluated the contractor's steel framed rig used to hoist the new wall panels. Patient rooms were vacated two at a time per floor to perform the work with minimal disruption. Temporary containment walls were built and negative air pressure was created to contain dust, debris, and mold. A staging area was constructed away from the critical hospital functions to limit the amount of noise and disruption to staff and patients.

The hospital is approximately 77,500 square feet, and the re-clad project totaled approximately \$760,000.

## Services

- Building Envelope Investigation, Design, Administration and Commissioning



## King County Airport Boeing Field

The King County Airport at Boeing Field vintage two story brick masonry in South Seattle. In recent years the building had experienced a number of water intrusion issues primarily related to the exterior window assembly. All repairs previous to OAC's involvement had fully addressed the problems. The detailing around the windows turned out to be the issue.

OAC carried out an investigation to determine the extent of the problems prior to generating repair drawings. We provided new detailing for the window assembly and worked King County to determine how the existing brick masonry would be rehabilitated. OAC selected new components to preserve the buildings historical integrity where possible.

OAC oversaw the repairs and provided Building Envelope commissioning. Services included site visits, submittal and RFI review, attendance at construction meetings, and testing.

## Services

- Building Envelope Investigation, Design, Administration and Commissioning



State of Washington  
**Department of General Administration**  
**Facilities Division**  
**Engineering & Architectural Services**

210 11<sup>th</sup> Avenue, SW • PO Box 41012 • Olympia, WA 98504-1012  
(360) 902.7272 • FAX (360) 753.2848

March 23, 2011

Engineering Economics Inc  
780 Simms Street, Suite 210  
Golden, Colorado 80401

RE: Project No. 2011-820  
On-Call Commissioning Services for Public Facilities Statewide

To Whom It May Concern:

Engineering Economics Inc. (EEI) provided commissioning services for Everett Community College's new Fitness Center. This was a LEED project, which required addition commissioning services. EEI's effort was led by Mr. Mark Macomber. The project was a difficult one, fraught with multiple schedule delays, a less than cooperative general contractor, and a mechanical subcontractor bankruptcy. Despite the difficulties, Mr. Macomber was successful in guiding everyone successfully through the process.

The college was so pleased with the results; we have engaged EEI's service for a renovation project currently under construction.

Working with Mr. Macomber and EEI has been an excellent experience. They are professional and are dedicated to delivering a quality project no matter what it takes. I highly recommend them and, given the opportunity, I would willingly work with them again.

Feel free to contact me if you would like any additional information at (360) 902-7214.

Sincerely,

Jonathan Martin, Project Manager  
Engineering and Architectural Services



State of Washington

**Department of General Administration**

**Facilities Division**

**Engineering & Architectural Services**

210 11<sup>th</sup> Avenue, SW • PO Box 41012 • Olympia, WA 98504-1012

(360) 902.7272 • FAX (360) 753.2848

March 23, 2011

Christina Morley  
Engineering Economics Inc.  
780 Simms St., Suite 210  
Golden, Colorado 80401

Dear Christina:

I want to take this opportunity to express my appreciation for the Building Commissioning work your firm has provided to the State of Washington.

EEL provided building startup and system commissioning services for several recently completed remodels and new construction projects on the Pierce Community College campus. EEL's commissioning work for the problem plagued Rainier Science building in particular has been invaluable. EEL's experience, problem solving skills and hands on involvement has been a great asset as we have struggled to correct performance issues in the mechanical systems.

I have been particularly impressed with your ability to look out for the owner's best interest in regards to completing a thorough commissioning process, while still making efficient use of the owner's budget.

I am pleased to recommend your firm and would be happy to answer any questions regarding my experience working with you.

Sincerely,

A handwritten signature in black ink that reads "Todd Flynn".

Todd Flynn, P.E.  
Project Manager



Engineering Economics Inc



***Arizona***

12835 West Cabrillo Court  
Sun City AZ 85375

***New Mexico***

3200 Carlisle Boulevard NE Suite 250  
Albuquerque NM 87110

***Northern California***

152 Oakmont Way  
Los Gatos CA 95032

***North Carolina***

2501 Blue Ridge Road Suite 250  
Raleigh NC 27607

***Southern California***

5721 W. Slauson Avenue Suite 160  
Los Angeles CA 90230

***Oregon***

12042 SE Sunnyside Road #365  
Clackamas OR 97015

***Colorado***

780 Simms Street Suite 210  
Golden CO 80401

***Texas***

11503 Jones Maltzberger Road Suite 276  
San Antonio TX 78216

***Kansas/Missouri***

8700 Monrovia Suite 310  
Lenexa KS 66215

***Virginia***

5115 Bernard Drive Suite 205  
Roanoke VA 24018

***Kentucky***

4949 Old Brownsboro Road Suite 277  
Louisville KY 40222

***Washington***

1201 Western Avenue Suite 325  
Seattle WA 98101

***Washington***

509 North Sullivan Road Suite C  
Spokane Valley WA 99037

# KBA Commissioning Services Statement of Qualifications

## **Project No. 2011-820 Commissioning Projects for Public Facilities, Statewide**

State of Washington Department of General Administration  
Division of Engineering & Architectural Services  
Facilities Engineering Services  
Olympia, Washington

March 25, 2011



14237R Ambaum Blvd. SW, Burien, WA 98166  
Tel: 206.835.8254 Fax: 206.246.1691

332 Pine St., Suite 307, San Francisco, CA 94104  
Tel: 415.788.0211 Fax: 206.246.1691

[www.keithlybarber.com](http://www.keithlybarber.com)

March 25, 2011

State of Washington Department of General Administration  
Division of Engineering & Architectural Services  
General Administration Building  
210 11<sup>th</sup> Ave. SW, Room 206  
Olympia, WA 98504-1012

Attention: Kathie Fyfe

RE: Project # 2011-820 – Commissioning Services for Public Facilities, Statewide

Thank you for this opportunity to submit our commissioning services qualifications. Keithly Barber Associates (KBA) is a Burien, Washington based building commissioning firm that also provides commissioning-related services, such as condition surveys and diagnostics for new construction and existing building systems. Our 11-person technical staff has commissioned many K-12 schools, as well as, universities, recreational facilities, healthcare facilities, laboratories, office buildings, recording studios, and correctional institutions. We have provided these services for hundreds of clients in the United States, Europe and Asia. The sizes of these projects range from a few thousand to nearly one million square feet and have utilized many different project delivery methods, including design/build, GC/CM, spec/bid/build and Toyota Way Type Lean Delivery. Over 70% of our clients have come from the public sector, and we have extensive experience working for the Washington Department of General Administration.

Pete Keithly founded our original company in 1996. In May of 2005, Kent Barber, PE, LEED AP joined our firm as a principal, and Keithly Barber Associates was incorporated. Kent has been a specialized commissioning professional since 1993 and is recognized as a building commissioning pioneer. He is a founding member of the Building Commissioning Association (BCA) and played a major role in developing the essential commissioning attributes set forth by the BCA for commissioning providers. Today KBA is owned by Kent Barber and Senior Project Managers Ryan Hay, PE, ACG CxA, LEED AP and Jeremy Fugere, ACG CxA, LEED AP.

Our contact information is as follows:

Keithly Barber Associates, Inc.  
14237R Ambaum Blvd. SW  
Burien, WA 98166  
206-835-8254 Office  
206-246-1691 Fax  
www.keithlybarber.com

Contact: Rebeca De Jesus, Administrative & Marketing Manager  
Ph: 206-835-8254 / Fx: 206-246-1691  
email: rebeca@keithlybarber.com

We appreciate the opportunity to have worked with the Department of General Administration in the past and we look forward to pursuing future opportunities as they arise. Thank you again for your consideration of our qualifications.

Sincerely,



Kent Barber, Principal  
Keithly Barber Associates, Inc.

## Table of Contents

<b>QUALIFICATIONS OF STAFF .....</b>	<b>1</b>
<b>RELEVANT EXPERIENCE .....</b>	<b>4</b>
<b>PREVIOUS PERFORMANCE .....</b>	<b>6</b>
<b>GEOGRAPHICAL PROXIMITY .....</b>	<b>11</b>

## Qualifications of Staff

KBA employees have an average of 19 years of experience designing, installing, operating, troubleshooting and commissioning building systems of all types. The building systems experience of individual employees ranges to 35 years, and is greater than 10 years for all but one individual. Our technical staff also has extensive commissioning-specific experience; ranging from 5 to 17 years per individual. Our employees have hands-on testing experience and most have extensive experience with energy efficient design and control strategy optimization.

### **Top Level Professional Standards:**

KBA is committed to top level commissioning standards. Our principals and engineers give commissioning presentations and training around the country and serve as officers and active participants in leading commissioning organizations, such as the Building Commissioning Association (BCA), ASHRAE commissioning advisory committees, and the California Commissioning Collaborative. KBA services are provided in accordance with the highest professional commissioning standards, including the Building Commissioning Association's "Essential Attributes of Commissioning," ASHRAE Commissioning Guidelines, U.S. Green Building Council's LEED requirements, CHPS, and Washington Sustainable Schools Protocol (WSSP).

### **Commitment to Sustainability:**

KBA is also a leader in the commissioning of "Sustainable Buildings." We are a U.S. Green Building Council member, and our principals have given presentations related to commissioning LEED projects to ASHRAE Chapters, the State of Washington Department of Engineering & Architectural Services, National Sustainable Building Advisor Program courses, and the National Conference of Building Commissioning (NCBC). Our resume of completed and active LEED projects includes over 70 projects within the New Construction, Core & Shell, and Commercial Interiors programs; some with Gold, Silver and Platinum ratings. In addition to our USGBC experience, KBA is a member of the Collaborative for High Performance Schools (CHPS) and has been heavily involved with CHPS and the Washington Sustainable Schools Protocol (WSSP) since their inceptions. In fact, our firm commissioned some of the first CHPS pilot projects. KBA employees are also approved commissioning providers for existing buildings energy optimization programs administered by Puget Sound Energy and Portland Energy Conservation Incorporated.

### **Washington Corporate Office**

#### **Kent Barber, P.E., LEED AP Managing Principal**

**Relevant General Commissioning Experience & Background:** Kent is a professional engineer that has specialized in building commissioning since 1992. Nationally recognized as a commissioning pioneer, Kent was a founding member of the Building Commissioning Association (BCA). He chaired the committee that developed the BCA's Essential Attributes of Building Commissioning; a widely recognized benchmark for quality commissioning services. Kent has also developed commissioning guidelines and protocol such as the State of Idaho's guidelines for new building commissioning and retro-commissioning, and has been a leader in promoting and refining cost-effective proactive commissioning techniques, such as the control logic and integration process.

Kent has over 15 years experience commissioning many different project types using most well known approaches to commissioning. He has vast first hand experience performing design reviews, writing and coordinating specifications, troubleshooting, and writing and performing functional performance tests (FPTs). Kent is also widely recognized for his ability to build a truly effective commissioning team, including owner, designers, builders and equipment suppliers.

Kent's commissioning success is rooted in his diverse 35-year building industry background. He began his construction career with 10 years as a carpenter. After obtaining his BSME he became an HVAC systems designer; eventually gravitating to facilities consulting in which he worked closely with facilities managers and operators providing hands on diagnostics and mitigating design issues.

Though Kent is KBA's Managing Principal, he still personally manages and performs hands on commissioning services for KBA projects. He is based in KBA's Burien, Washington office; however, he spends substantial time working in and out of KBA's San Francisco office.

Kent holds a B.S. degree in Mechanical Engineering from the University of Colorado, and is a registered professional mechanical engineer in Washington and Colorado.

**Jeremy Fugere, LEED AP, ACG CxA**  
**Principal/Senior Project Manager**

**Relevant General Commissioning Experience & Background:** Jeremy has over 17 years experience installing, operating & maintaining, troubleshooting and commissioning building mechanical, electrical and plumbing (MEP) systems. He began his career in the HVACR (heating, ventilation, air-conditioning and refrigeration) industry in 1992 after graduating with honors from Universal Technical Institute with a concentration in HVACR Technologies. Immediately following graduation, he was engaged in a five-year apprenticeship program consisting of ten thousand hours of academic studies and on-the-job training from which he also graduated with honors. For 9 years, Jeremy worked for one of the largest mechanical contractors in Washington State, installing, commissioning, trouble-shooting and maintaining HVACR equipment. He quickly became a Journey-Level Foreman and went on managing design/build projects. He subsequently spent three years as Engineer and Maintenance Manager for a prominent Seattle businessman and property owner; in charge of operating and optimizing the performance of commercial buildings and high-end residences located throughout the United States and Europe.

Jeremy is an ACG certified Commissioning Authority that has specialized in building commissioning for over 6 years. He began commissioning projects for KBA's parent company and has served as a primary CxA and commissioning project manager for KBA since May of 1995. His résumé of new and existing systems commissioning projects includes educational facilities, laboratories, high rise buildings and mixed use projects; including many LEED and other sustainable building projects.

**Ryan Hay, P.E., LEED AP, ACG CxA**  
**Principal/Senior Project Manager**

**Relevant General Commissioning Experience & Background:** Ryan has over 16 years of mechanical and electrical systems experience. He brings to his commissioning practice a broad base of experience as an HVAC tradesman, controls designer and installer, and systems design engineer. This background has given him expertise in design, installation, and maintenance of an extensive range of systems; including HVAC, automation/controls, power distribution, lighting, data/communication, and integrated security. Ryan's electrical and low voltage systems experience includes designing, verifying, and commissioning power distribution, lighting, data/communication, and city wide integrated security systems. His résumé includes many facility types, such as large correctional centers, hospitals, military facilities, industrial plants, retail centers, and educational facilities.

During his 5 years as a commissioning specialist, Ryan has performed all design and construction phase commissioning activities for new and existing systems, including, owner's project requirements (OPR) and basis of design (BOD) facilitation, control logic and integration reviews, constructability reviews, commissioning plan formulation, commissioning specification writing, functional performance test writing, commissioning kickoff meetings, periodic construction site visits, maintaining commissioning issues logs, coordination of start-up activities, witnessing and performing functional tests, documenting commissioning activities in a final commissioning report. Ryan is an ACG certified Commissioning Authority (CxA). He has served as a primary CxA and commissioning project manager for KBA since July of 1995. Ryan is based in KBA's Burien, Washington office, though he commissions projects throughout the country.

Ryan has a B.S. degree in Architectural Engineering from the University of Colorado. His professional engineering licenses include: Architectural Engineer, Colorado; Building Systems Engineer Washington; Mechanical Engineer, California.

**Myra Ferriols AA, BCA CCP, LEED AP**  
**Project Manager**

**Relevant General Commissioning Experience & Background:** Before becoming a commissioning professional, Myra spent 15 years in the field of HVAC maintenance, repairs and installation. She has

employed her extensive hands-on knowledge of HVAC systems as a Commissioning Agent since 2004, when she began commissioning for KBA's parent company. As a commissioning professional Myra has performed all commonly recognized design, construction and post-occupancy phase commissioning activities, including: developed commissioning plans and specifications; developing and reviewing Owner's project Requirements and AE's Basis of Design Documentation; design submittal and control logic and integration reviews; reviewing equipment and control submittals; maintaining issues logs; performing and reporting on site observations; writing, performing, and witnessing functional performance tests and system readiness and installation verification plans; developing final commissioning reports and systems manuals; and uploading LEED templates with supporting documents. Myra has commissioned or been involved in the commissioning of a wide variety of project types, including early learning centers, K-12 schools, higher education, science labs, pharmacy scale-up labs, performance halls, vivariums and hospitals. Her excellent technical abilities are matched by an ability to communicate effectively with a wide range of project participants and to help resolve issues cooperatively. Myra is a member of ASHRAE and the LEED U.S. Green Building Council, and is a BCA Certified Commissioning Professional (CCP).

**Don Meyer, LEED AP**  
**Project Engineer**

**Relevant General Commissioning Experience & Background:** Don has over 35 years of HVAC industry experience. He has vast experience performing installation, startup, and service for most major HVAC equipment types as a licensed operating engineer working for commercial mechanical contractors. He also worked for 18 years as a service and overhaul technician with McQuay International; providing service on HVAC systems serving many different facility types, including educational, health care, hospital, bio-medical, correctional, manufacturing, communication, entertainment and retail.

Don began his career as a commissioning professional at KBA in 2008. His extensive HVAC experience has enabled him to quickly excel as a new and existing systems commissioning field engineer, and to establish himself as an expert in the area of commissioning new and existing packaged and major mechanical equipment.

**Jeremy Bromley**  
**Project Engineer**

**Relevant General Commissioning Experience & Background:** Jeremy has over 10 years of experience with mechanical and electrical systems; including 3 ½ years as a lead technician with an international controls contractor, designing, installing, programming, troubleshooting, and maintaining building automation systems. His work as a controls tech also included training new technicians and owner's facility staff members. Prior to working in controls, Jeremy was a maintenance supervisor/plant operator in the US Navy. In the Navy his work included troubleshooting and maintaining all mechanical and electrical systems related to propulsion and power generation onboard a nuclear powered aircraft carrier. Jeremy has worked on and commissioned new and existing systems for hospitals, correctional facilities, K-12 schools, office buildings and condominiums. Jeremy graduated from the Navy Core Mechanical School in 1999, and was meritoriously promoted for academic performance.

**Wesley Ellis**  
**Project Engineer**

**Relevant General Commissioning Experience & Background:** Since joining KBA in August of 2006 Wes has been teamed with Ryan Hay. He has performed commissioning reviews, written commissioning plans and specification, performed installation verification of equipment, observed TAB, completed field documentations, and observed and written functional performance tests. Wes' commissioning resume includes many project types including Gold & Platinum LEED projects. Prior to going into building commissioning, Wes designed and drafted building HVAC systems and performed building energy load analysis. Wes graduated from the University of Washington in 2003, with a B.S. degree in Mechanical Engineering.

## Relevant Experience

KBA's 11-person technical staff has commissioned museums; correctional, judicial and law enforcement facilities; office, retail and mixed use buildings; laboratories and healthcare facilities; schools, universities and libraries; recreational facilities and recording studios for hundreds of private, public and governmental clients in the United States and abroad. The sizes of these projects range from a few thousand to nearly one million square feet and have utilized many different project delivery methods including design/build, GC/CM, spec/bid/build, and Toyota Way type Lean Delivery. KBA takes pride in our industry-wide reputation for our ability to tailor a commissioning approach that cost-effectively meets the specific needs of each of our clients.

### **Services Provided:**

KBA provides commissioning and commissioning related services including: new construction commissioning • existing building/systems commissioning (re-commissioning & retro-commissioning) • existing conditions surveys • existing systems evaluation, diagnostics and optimization • commissioning program development.

### **New Commissioning:**

Over 250 different projects. Building types: Public K-12 Schools, Colleges/Universities, Commercial Office Buildings, Parking Garages, Mixed Use Buildings, Non-Profit, Private, Utilities, Hospital/Lab, Correctional Facilities, Federal/State/Local Government Buildings, Military, Libraries, Recreational and Activity Centers.

### **Retro-Commissioning:**

Over 26 different projects. Building types: K-12 Schools, State Government Building, Correctional Facilities, Retail, Office and Military.

### **Re-Commissioning:**

3 projects. Building types: K-12 School, Pool House, and high-end residential.

### **LEED Commissioning:**

70 projects. Building Types: K-12 Schools, Office Building, Mixed Use Building, Visitor and Recreation Centers, Parking Garages, Colleges/Universities, Local Government Buildings, and Labs. LEED program types and ratings: New construction, Core & Shell, Commercial Interiors; ratings through Platinum.

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*The following paragraphs provide additional related information.*

### **Maintaining Commissioning Schedules:**

KBA commissioning professionals have reputations for success that can come only with successful project management and scheduling skills. Having collectively completed hundreds of commissioning projects, our team has become highly skilled at determining commissioning task durations and task links, and at working with contractors to integrate the commissioning process into the contractor's master MEP construction schedule. Our experience provides us with the expertise and flexibility to coordinate and lead the commissioning process to completion, in accordance with the resulting schedule. We fully understand the importance of avoiding project delays and continually work with the entire project team to insure adequate and realistic schedules are established and maintained for completion of commissioning procedures. We encourage you to contact our project references for confirmation of our performance in this regard.

### **Working with Sub-Consultants:**

KBA has in-house mechanical, electrical and low-voltage systems commissioning expertise. Our commissioning professionals also have experience commissioning specialty medical, laboratory, aerospace and industrial process systems. Because of this we can commission many projects without the use of sub-consultants. Sometimes, however, sub-consultants become appropriate in order to

address the needs of highly specialized projects or intensive human resource demands. When this occurs, KBA calls on the excellent professional associations we have with companies that provide us with sub-consultant support in the following fields: electrical systems engineering and testing, low voltage engineering and testing, acoustics engineering and testing, lighting engineering and testing, air & water balancing, energy analysis, energy measurement and verification (M&V), comprehensive design constructability review, and mechanical & electrical design. KBA does not use any sub-consultant without the advanced approval of the client.

**Experience Establishing Commissioning Criteria:**

The fundamental purpose of building commissioning is to confirm and document, through a designed and repeatable process, that building systems function in accordance with the owner's functional requirements. It is, therefore, critical for commissioning success to identify and document these functional requirements and their related acceptance criteria. KBA works closely with the client and designers to establish the acceptance criteria early in the project. We are skilled with facilitating the development and clarification of these criteria as part of the ASHRAE recommended and LEED required Owner's Project Requirements and AE Basis of Design documentation.

## Previous Performance

Because of the space limitations on this SOQ, a very small sample of many projects commissioned by KBA is provided within. We believe these projects exemplify our experience and expertise in areas listed in the RFQ. The following paragraphs provide additional related information.

### **Budget Control and Compliance:**

KBA professionals have decades of commissioning experience that predates most of today's commonly referenced commissioning guidelines. In fact, KBA principals have been leaders in the development of the commissioning profession. Because of our vast experience, our commissioning professionals are widely known for the ability to customize a cost-effective process for the unique requirements of individual projects. Budget is of course one of the most significant of all project requirements, and our expertise in customized process design enables us to be more cost effective than firms that take a one-process-fits-all approach to commissioning. We are very seldom required to ask for adjustments in our original contract agreement, once the project is underway; and we have never been involved in a project where a commissioning associated change order was issued to a contractor, when KBA provided commissioning specifications were included in the bid documents.

### **Schedule Control and Compliance:**

KBA believes that the key to successful schedule management is proactive and consistent coordination with the project team. Our commissioning professionals are expert at determining commissioning task durations and task links, and coordinating the integration of the commissioning process into the contractor's master MEP construction schedule. Further, we are alert to the effect of day to day issues on the commissioning schedule, proactive in communicating the resultant scheduling impacts, and creative participants in resolving related issues.

### **KBA as the Prime Commissioning Consultant:**

As a commissioning specialty firm, KBA has been the prime commissioning consultant on over 95% of the projects we have worked on. In addition to having top-level technical expertise, the leadership and management skill of our commissioning professionals is widely know thought the commissioning profession and the buildings' industry. For confirmation of this we encourage you to contact the designers and contractors, as well as the clients, from our previous projects.

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*KBA offers the following sample project descriptions to illustrate our team's relevant experience. We have also provided a list of projects in the Northwest where we have served in the role of primary commissioning firm, over the past five years. KBA has commissioned hundreds of projects and will gladly provide a more extensive list of sample projects upon request.*

#### **Science & Allied Health Building**

**Skagit Valley College**, Mount Vernon, WA

KBA Role: Consultant to Washington State Dept of General Administration

KBA Principal In Charge: Kent Barber, PE, LEED AP

KBA Project Engineer: Myra Ferriols, LEED AP, BCA CCP, Don Meyer, LEED AP

Project Reference: Bob Colasurdo, Dept of GA, (360) 902-7264, rcolasu@ga.wa.gov

Construction Cost: Unknown

**Completion Date: 2010**

**LEED® NC 2.2**

Project Description: New construction of a 57,400 square-foot science and allied health building. Enhanced commissioning credit for LEED NC 2.2

Systems Commissioned: HVAC systems equipment and controls, phoenix valves

Commissioning Services and Deliverables: Develop preliminary commissioning plan. Conduct commissioning meeting. Meet with project team to discuss design intent, basis of design and control sequences. Develop OPR. Review design development submittal. Develop commissioning specification. Review 95% complete design documents. Review contractor provided product and shop-drawing submittals. Conduct site visits and reports. Review and approve contractor submitted system readiness forms. Perform final installation verification. Perform and witness functional performance test. Verify specified training has been provided. Provide final commissioning report.

**Science & Technology Building**

**Bellevue Community College**, Bellevue, WA

KBA Role: Consultant to Washington State Dept of General Administration

Principal In-Charge: Kent Barber, PE, LEED AP

Project Manager: Jeremy Fugere, LEED AP, ACG CxA

Project Engineer: Myra Ferriols, LEED AP, BCA CCP, Don Meyer, LEED AP

Project Reference: Bob Colasurdo, Project Manager, WA State Dept of GA, (360) 902-7198

KBA Project Engineer: Don Meyer, LEED AP, Myra Ferriols, LEED AP, BCA CCP

Construction Cost: \$22,348,000

**Completion Date: 2010**

**LEED® Prerequisite**

Project Description: New construction of a 69,500 square-foot building. Seeking LEED prerequisite and additional commissioning credits.

Systems Commissioned: HVAC systems equipment and controls. Building lighting controls. Fume and snorkel hoods, laboratory plumbing, emergency showers and eye wash stations, and laboratory vacuum pump system

Commissioning Services and Deliverables: Develop commissioning plan and conduct initial commissioning meeting. Review design intent, basis of design and control sequence. Develop OPR. Develop commissioning specifications. Review 95% complete design documents. Review contractor provided product and shop-drawing submittals. Conduct job site visits with reports. Review and approve contractor submitted system readiness forms. Confirm completion of specified contractor start up and testing routines. Perform final installation verification and witness functional performance tests. Provide commissioning for domestic and laboratory hot water heaters, pumping, mixing controls and emergency showers and eye wash stations. Witness fume hood certification, laboratory plumbing testing, laboratory vacuum pump startup and testing, duct pressure and smoke/fire damper tests. Verify specified training has been provided or arranged. Perform job site visits and attend meetings to discuss and confirm the resolution of issues. Develop re-commissioning manual per LEED additional commissioning requirements. Prepare final commissioning report. Conduct site review of systems performance at 10 month into the warranty period.

**College Activities Building**

**The Evergreen State College**, Olympia, WA



THE EVERGREEN STATE COLLEGE  
OLYMPIA, WASHINGTON

KBA Role: Consultant to Washington State Dept of General Administration

KBA Principal In Charge: Kent Barber, PE, LEED AP

KBA Project Engineer: Myra Ferriols, LEED AP, BCA CCP, Don Meyer, LEED AP

Project Reference: Bob Colasurdo, Dept of GA, (360) 902-7264, rcolasu@ga.wa.gov

Construction Cost: Unknown

**Completion Date: 2010**

**LEED® NC 2.2**

Project Description: This project is a major renovation of an existing building; including: activity areas, bookstore, bike shop, art gallery, newspaper publishing, lounges, meeting & conference facilities, radio station, and multiple kitchen and dining facilities. The estimated project size is 91,000 square feet. LEED NC 2.2 registered.

Systems Commissioned: HVAC, plumbing, lighting control, photovoltaic power generation system, normal and backup power distribution, fire alarm system and security system.

Commissioning Services and Deliverables: LEED NC Fundamental Cx Prerequisite & Enhanced Cx Credit. Provide commissioning plan and design phase kickoff meeting. Review OPR and BOD. Provide LEED commissioning credit design review. Lead a design phase controls logic and integration process. Provide commissioning specs. Present commissioning at pre-bid meeting. Lead construction phase Cx kickoff meeting. Review major equipment submittals. Provide on site observations. Verify systems readiness. Provide Systems Readiness Checklists and Functional Performance Test (FPT) procedures. Witness FPTs. Review O&Ms and training plan, and witness owners training sessions. Provide the final commissioning report, systems manual and warranty period review. Review normal electrical distribution, fire alarm system and security system. Test emergency power distribution.

**Washington State School for the Blind  
Dept of GA, Vancouver, WA**



**KBA Role:** Prime commissioning agent and consultant to Washington State Dept of General Administration  
**KBA Project Manager:** Ryan Hay, PE, LEED AP, ACG CxA  
**Project Reference:** Dwayne Harkness, WA State Dept of GA, E&A Services, (360) 902-0942  
**Construction Cost:** Unknown

**Completion Date: 2010  
LEED® NC 2.1 Fundamental & Enhanced**

**Project Description:** A recreational facility housing a pool, gym, workout rooms, and some classrooms. The project was approximately 20,000 S.F.; LEED NC 2.1 Fundamental & Additional (Enhanced) Commissioning. The project used the mass of the pool water as a type of “ground source” heating or cooling for heat pumps located throughout the building. The heat pumps could either dump heat during the cooling function or gather heat from the pool to aid during heating. Control of humidity was paramount in the pool area and used an air to air heat exchanger to minimize thermal losses while constantly ventilating the pool area.

**Systems Commissioned:** HVAC related equipment and controls. A central building automation system (BAS) (Honeywell Tridium Controls) was used to control an air to air heat exchanger for the pool, two tandem controlled high efficiency boilers for both pool heat as well as building hydronics. Also controlled by the BAS was a whole building pressurization relief fan, one heat and vent unit for the gym, and 3 water source heat pumps using the pool as the “ground source.” In order to comply with LEED requirements, domestic hot water production and delivery was verified at the point of use as well as verification of lighting controls’ (daylighting, occupancy sensors, and scheduled control) operation.

**Commissioning Services and Deliverables:** Update specifications. Provide final design submittal review. Review major equipment submittals. Provide commissioning plan. Perform on-site observation, attend meetings and verify systems readiness. Witness FPT procedures. Review O&M and training plan and witness owner training sessions. Provide final commissioning report, systems manual and warranty period review.

**Stafford Creek CC CI Furniture Factory  
WA State Dept of Corrections, Aberdeen, WA**



*Photo courtesy of www.washingtonci.com*

**KBA Role:** Prime commissioning agent  
**KBA Principal in Charge:** Kent Barber, PE, LEED AP  
**KBA Project Manager:** Myra Ferriols, BCA CCP, LEED AP  
**Project Reference:** Gary Myers, Project Manager, Washington State Department of Corrections, (360) 725-8339, Gary.Myers@doc.wa.gov  
**Construction Cost:** \$6,500,000

**Completion Date: 2010**

**Project Description:** Major renovation of a 47,000 square-foot building at the Stafford Creek Correctional Center. The building houses the facility’s furniture factory, and will be completed continuously through design and construction, without phasing.  
**Systems Commissioned:** HVAC systems: 3 condensing boilers with primary-secondary pumping; 2 central station constant-flow single-zone air handling units; 1 heat recover unit; 1 central toiler/general exhaust system; 11 exhaust fans; and 3 unit heaters. Domestic hot water: 1 water heater and 1 circ pump; and 3 tempering valves. Lighting control: exterior lighting with photocell, low voltage switches and time-of-day inputs; occupancy sensors will be provided for offices and multi-purpose rooms; digital timer switches will be provided for storage rooms and similar space; and automatic daylighting controls, utilizing multi-level switched lighting will be provided in the high-bay spaces. Fire Alarm: HVAC/Fire Alarm integration – fire smoke dampers and duct smoke detectors shutdown.

**Commissioning Services and Deliverables:** Develop and provide a commissioning process plan and commissioning specification sections. Lead a design phase commissioning kickoff meeting. Review OPR, BOD and one design submittal, and provide one back-check of the nearly completed construction documents. Lead a construction phase commissioning kickoff meeting. Review submittals of major equipment and systems included in the Cx scope of work, and provide one back-check of re-submittals. During construction, provide a commissioning issues log. Perform on-site observations and provide construction phase Cx meetings.

Provide systems readiness checklists and review contractors' installation and systems readiness prerequisites for functional testing. Review contractor startup, testing and TAB plans, and witness TAB demonstration of measurements and settings. Provide functional performance tests (FPT) procedures and systems readiness forms, and witness contractors' demonstration of FPTs. Review the Contractor's owner training plan. After commissioning has been completed, provide Final Commissioning Report and sign LEED template letters. Provide a Systems Manual and one training session for the building operating staff. Near the end of the warranty period, provide a post-occupancy review.

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**K – 12 School Facilities:**

- **Aviation High School – Highline School District, Burien, WA**
- **Marvista Elementary School – Highline School District, Burien, WA**
- **Tolt Middle School – Riverview School District, Carnation, WA**
- **McDonald Elementary School – Seattle School District, Seattle, WA**
- **East Hill Elementary School – Kent School District, Kent, WA**
- **Kallas Junior High – Puyallup School District, Puyallup, WA**
- **Kenmore Junior High School – Northshore School District, Kenmore, WA**
- **Snohomish High School – Snohomish School District, Snohomish, WA**
- **Sherwood Forest Elementary School – Bellevue School District, Bellevue, WA**
- **Apollo Elementary School – Issaquah School District, Issaquah, WA**
- **Issaquah Valley Elementary School – Issaquah School District, Issaquah, WA**

**College & Universities:**

- **Hogue Hall – Central Washington University, Ellensburg, WA**
- **Student Village South – Central Washington University, Ellensburg, WA**
- **Dean Hall – Central Washington University, Ellensburg, WA**
- **Science and Technical Building - Bellevue Community College, Bellevue, WA**
- **Student Housing Phase 1 – University of Washington, Seattle, WA**
- **College Activities Building – The Evergreen State College, Olympia, WA**
- **Lab I 1<sup>st</sup> Floor – The Evergreen State College, Olympia, WA**
- **Science & Allied Health Building – Skagit Valley College, Mount Vernon, WA**

**Commercial/Office:**

- **505 Union Station – Vulcan Northwest, Seattle, WA**
- **Northshore District Headquarters – Gray & Osborne, Seattle, WA**
- **Tacoma Business Office Building – Puget Sound Energy, Tacoma, WA**
- **Eden Hill – Weber Thompson Architects, Seattle, WA**
- **505 First Ave – Starbucks Corporation, Seattle, WA**

- **Terry Avenue Office Building – Weber Thompson Architects, Seattle, WA**

**Hospital/Lab:**

- **St Anthony’s Hospital – Sellen Construction, Gig Harbor, WA**
- **Birch Wing and Central Plant – Highline Medical Center, Burien, WA**
- **Island Hospital Renovation & Addition – Island Hospital, Anacortes, WA**
- **Medical Arts Pavilion – Island Hospital, Anacortes, WA**
- **Bellevue Ambulatory Care Center – Seattle Children’s Hospital, Bellevue, WA**

**Federal, State & Local Government/Correctional Facilities:**

- **Mukilteo City Hall – City of Mukilteo, Olympia, WA**
- **Bachelor Enlisted Quarters (BEQ) – Naval Base Kitsap, Bremerton, WA**
- **Recreation and Activity Center – City of Auburn, Auburn, WA**
- **800 Pike Street Conversion – WA State Convention Trade Center, Seattle, WA**
- **Port Townsend City Hall Renovation & Addition, Port Townsend, WA**
- **Central/Atlantic Operations Building – King County Metro Transit, Seattle, WA**
- **Kitsap County Jail, Port Orchard, WA**
- **Monroe Correctional Facility, Monroe, WA**
- **P-305 BEQ & Parking Garage – Absher Construction Company, Bremerton, WA**
- **Lacey City Hall Retro-Commissioning, Lacey, WA**
- **GSA Bothell FDA Laboratory – APSI Construction Management, Bothell, WA**
- **Fire Station #10 and #2 – City of Seattle, Seattle, WA**

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*KBA is well known for top level service and the ability to collaborate effectively and successfully with the owner and project team. We believe that the representative project descriptions that we have submitted will demonstrate this, and we encourage you to consult the associated project contacts for confirmation of our performance. We have also attached letters of recommendation that confirm our performance in these areas.*



## CENTRAL WASHINGTON UNIVERSITY

March 22, 2010

### LETTER OF REFERENCE

FIRM: Keithly Barber Associates

Central Washington University (CWU) has retained Keithly Barber Associates for building commissioning services for five of our recent major capital building projects. These include, a theater renovation, student union and recreation facility, gymnasium renovation, science/instructional building with Native American Museum renovation, and a 460 bed student housing facility construction. Their performance in the design and planning stage through post construction seasonal system performance verification has been highly instrumental in the success of these projects. They are currently performing commissioning services for our most current project to renovate and construct a major expansion to our engineering building, Hogue Hall. Of these projects, the above science/instructional building and the Hogue Hall Project are LEED projects that are anticipated to achieve not less than LEED Silver status.

CWU continues to retain Keithly Barber Associates for commissioning of buildings because of their expertise and commitment to thorough planning, specifying, and execution of testing complex building HVAC and controls systems. The majority of these commissioning projects has been lead by Mr. Ryan Hay, P.E. whose breadth of field experience and engineering competence allows him to successfully coordinate essential tests and confirm performance of complicated systems. His expertise was particularly beneficial in testing and confirming performance of the Native American Artifacts Museum in above mentioned science/instructional building (Dean Hall Renovation) that required precise control of temperature and humidity to preserve the textile and plant fiber artifacts.

I highly recommend Keithly Barber Associates for the commissioning of building mechanical, electrical, and control system.

Pat Nahan, P.E.

Manager, Engineering Services and Resource Conservation

September 2, 2010

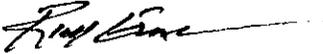
To Whom It May Concern:

I am pleased to write this letter of recommendation for Keithly Barber Associates and Ryan Hay for commissioning services. I have worked with Ryan as the commissioning agent for the Sabey Data Center for the past several years on three separate projects.

Ryan is a hard-working self-starter who invariably understands exactly what a project is all about from the outset, and how to get it done quickly and effectively. He is proactive and solution oriented. Ryan has strong communication skills and keeps the team focused on the tasks necessary to successfully complete the commissioning and start-up of the project.

As detailed above, based on my experience working with Keithly Barber Associates and particularly Ryan Hay, I highly recommend Keithly Barber Associates for any commissioning agent needs.

Sincerely,



**Ricky Evans | Commissioning Engineer | McKinstry Co. LLC.**

5005 3rd Avenue S. Seattle, WA 98848

C: 206.786.6353

**"FOR THE LIFE OF YOUR BUILDING"**

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CITY OF



MUKILTEO

11930 CYRUS WAY • MUKILTEO, WASHINGTON 98275

March 18, 2011

Rebeca De Jesus  
Administrative & Marketing Manager  
Keithly Barber Associates, Inc.  
14237R Ambaum Blvd. SW  
Burien, WA 98166

RE: Letter of Recommendation

Dear Ms. De Jesus:

The City of Mukilteo has used Keithly Barber Associates (KBA) as our commissioning agent on two projects. Two years ago, we completed an 18,000 square foot city hall. This building attained a LEED gold certification. We are currently building a 29,000 square foot community center to a LEED silver standard. KBA's understanding of LEED was beneficial to our success.

As the commissioning agent, KBA provided design review, test standards and schedule, and monitored all testing and inspection of commissioned systems. I have been very pleased with their performance and particularly the detail and thoroughness of the work by Myra Ferriols.

Both of our facilities have hydronic ground loop/heat pump systems for the HVAC. These systems are complex for buildings of this size. The monitoring of the test and balance for these systems was critical for the proper operation of the facility. The City has limited in house expertise to understand the systems. Ms. Ferriols was our eyes and ears, and we have a system that works well for us.

The communication and coordination with the design team, the City, and the contractor and their subs was excellent. KBA's insistence on adherence to schedule prevented delays or increased start-up costs.

I would recommend KBA to anyone commissioning a building.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim Niggemyer". The signature is fluid and cursive.

Jim Niggemyer  
Assistant City Engineer  
425-263-8081

[jniggemyer@ci.mukilteo.wa.us](mailto:jniggemyer@ci.mukilteo.wa.us)

Pc: Correspondence

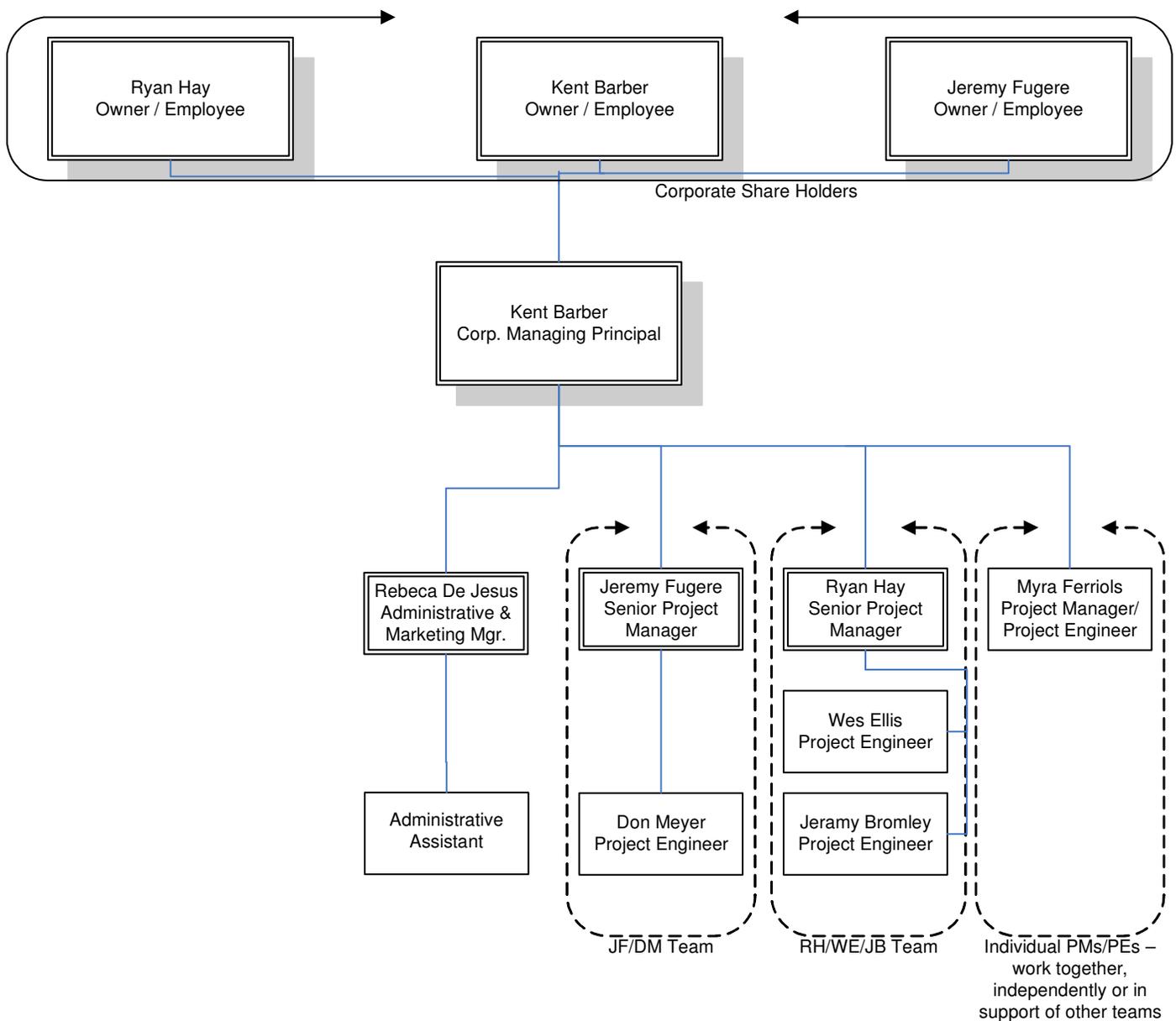
## Geographical Proximity

The following contains Keithly Barber Associate's physical location and the names and titles of our dedicated staff.

### Company Location:

Keithly Barber Associates (KBA) is an S Corporation in the State of Washington, located at 14237R Ambaum Blvd SW, Burien WA 98166. Our office is located within 10 minutes of all major highways, such as I-5, 405, and 167, which connects to Interstate 90 within 20 minutes. We are also located 15 minutes from Sea-Tac airport.

### Dedicated Staff at this Location:



# Staff Qualifications

## McKinstry Commissioning Team Qualifications

McKinstry has assembled a commissioning team consisting of individuals who are both skilled in their profession and skilled at working together to produce effective results. As a whole, the commissioning project team proposed for to the Department of General Administration has a total of 162 years of combined project experience.

Additionally, our commissioning team has the ability to leverage any of McKinstry's resources over the duration of the project. This includes but is not limited to our design engineers, construction managers, craft personnel, operational teams, and administrative support staff.

Information on the specific qualifications of each team member can be found below. Additional experience and qualifications for each team member is listed on the SF 330 form included with this submission.

Greg Bogard — Project Director	
Experience	Greg has more than 20 years of construction experience, and has specialized in design-build, design-bid-build and integrated project delivery services. Gregory also brings extensive experience as a project engineer focusing on scheduling and project cost management and managing construction project staff (Project Managers, Engineers, Superintendents, Support Staff) as well as direct hire labor with the local unions for Carpenters, Laborers, Electricians, Pipe Fitters and Teamsters.
Role on this Project	Greg will serve as the Department of General Administration's Single Point of Accountability for assigned projects across the Public Facilities Commissioning Services Program. Greg will oversee the project from inception to 100% completion. He will be responsible for determining staffing needs and assigning staff as required. Greg will also be responsible for managing project budgets with the help of Jeremy Wolff, Commissioning Manager.
Industry Experience	20 years

Dan Caldwell — Seattle Project Director	
Education	University of Rhode Island — B.S. Mechanical Industrial Engineering
Certifications & Affiliations	<ul style="list-style-type: none"> <li>▪ Member, SEAW</li> <li>▪ Member, ACI National</li> <li>▪ Member, ACI WA State</li> <li>▪ Former Board Member, ACI WA State</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Lake Washington School District</li> <li>▪ Northshore School District</li> <li>▪ Mukilteo School District — Kamiak High School</li> <li>▪ University of Washington, Tacoma Branch Campus</li> </ul>
Role on this Project	Dan will provide additional project oversight for all projects coordinated out of the Seattle office. Dan brings extensive experience in budget and schedule management of K-12 projects. Dan will help client facilities bridge the gap between design and operations/maintenance.
Industry Experience	35 years



# Staff Qualifications

## Jeremy Wolff — Commissioning Manager

Education	Central Washington University — B.S. Mechanical Engineering Technology 1998
Certifications & Affiliations	<ul style="list-style-type: none"> <li>▪ ABET/TAC Accredited</li> <li>▪ OSHA 10 Certified</li> <li>▪ Member, Building Commissioning Association</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Lower Columbia Community College</li> <li>▪ Port of Seattle — Pier 66</li> <li>▪ Bethel School District</li> <li>▪ Verio Data Center</li> <li>▪ Vancouver School District</li> <li>▪ Washington Department of Ecology</li> <li>▪ Eastern Washington University</li> <li>▪ State of Washington Department of General Administration — Capitol Campus</li> </ul>
Role on this Project	<p>Jeremy serves as McKinstry's Commissioning Manager. His responsibilities include oversight of all aspects of the deliverable process and maintaining client relationships. He will assign McKinstry resources to provide and manage the work process while leveraging project efficiencies, knowledge capital, commissioning/energy innovations, and cost benefits. The Commissioning Manager will report directly to the Greg Bogard, Project Director, and will assist in making critical decisions and will be personally responsible for the following:</p> <ul style="list-style-type: none"> <li>• Approve contracts, maintain terms and conditions, and facilitate billing requests</li> <li>• Develop commissioning plan, schedule, milestones, training, and O&amp;M specifications</li> <li>• Quality assurance and quality control</li> <li>• Review and approve reports for Owner acceptance</li> </ul>
Industry Experience	12 years

## Craig Hawkins— Senior Commissioning Engineer

Certifications & Affiliations	<ul style="list-style-type: none"> <li>▪ Certified Commissioning Authority (CxA), AABC Commissioning Group-ACG</li> <li>▪ Building Commissioning Association-BCA</li> <li>▪ AABC Commissioning Group-ACG</li> <li>▪ National Fire Protection Association-NFPA</li> <li>▪ United States Green Building Council-USGBC</li> </ul>
Project Experience	<p><b>LEED® GOLD, Lead CxA</b></p> <ul style="list-style-type: none"> <li>▪ Carkeek Park Environmental Learning Center</li> <li>▪ Northgate Civic Center</li> <li>▪ Puyallup City Hall</li> </ul> <p><b>LEED Silver, Lead CxA</b></p> <ul style="list-style-type: none"> <li>▪ North Cascades Environmental Learning Center, Lake Diablo, WA</li> <li>▪ Los Alamos Transfer Station, Los Alamo, NM</li> <li>▪ MWK Office Building, Albuquerque, NM</li> </ul> <p><b>Additional Cx experience</b></p> <ul style="list-style-type: none"> <li>▪ Swedish Hospital-Women's &amp; Infants Center</li> <li>▪ Washington State Patrol Indoor Firing Range</li> <li>▪ Fisher Plaza, Phases I &amp; II</li> </ul>



# Staff Qualifications

Role on this Project	As the Commissioning Agent of record, Craig will be responsible for delivering all aspects of commissioning from planning through transition to sustainable operations. He will be personally responsible for the delivery of preliminary evaluations, facility assessments, systems evaluations, system recommendations, technical document evaluations, commissioning oversight, and quality control and assurance. His goal is to ensure the overall performance and workflow of the commissioning process, through design to construction (where applicable) and into operations. Craig and his team members will work closely with facility personnel, and the Project Director to identify improvements, efficiencies, and optimization opportunities from design through transition to occupancy and operational turnover.
Industry Experience	36 years

## Jeff Flogel, P.E. — Commissioning Engineer

Education	University of Idaho Masters of Engineering, Heat Transfer and Fluid Flow University of Wisconsin — B.S. Mechanical Engineering
Accreditations	<ul style="list-style-type: none"> <li>▪ Professional Engineer (WA)</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Woodinville High School Commons</li> <li>▪ Bellevue High School</li> <li>▪ Bethel School District</li> <li>▪ Fernwood Elementary School</li> <li>▪ Northshore School District Transportation Center</li> <li>▪ Canyon Park Junior High Retro-Commissioning</li> <li>▪ Lockwood Elementary Retro-Commissioning</li> <li>▪ Bear Creek Elementary DDC Upgrade</li> </ul>
Role on this Project	As the commissioning engineer, Jeff will be responsible for assisting with design reviews, development of the commissioning plan, executing the commissioning plan and associated reporting, and supporting the final report publication. In particular, we will leverage Jeff's extensive K-12 energy and indoor air quality experience to confirm component interface and reporting.
Industry Experience	12 years

## Sam Wong, CEM, LEED® AP — Commissioning Engineer

Education	Chinese University of Hong Kong — Masters of Business Administration Hong Kong University — B.S. Electrical Engineering
Certifications	<ul style="list-style-type: none"> <li>▪ Certified Energy Master</li> <li>▪ LEED® Accredited Professional</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Seattle Art Museum Expansion</li> <li>▪ University of Washington Chemistry Building Energy Upgrades</li> <li>▪ Swedish Madison Tower Retro-Commissioning</li> <li>▪ St. Joseph Hospital Retro-Commissioning</li> <li>▪ Museum of Glass</li> <li>▪ Snohomish County Administration Building and Parking Facility</li> </ul>

# Staff Qualifications

Role on this Project	As the commissioning engineer, Sam will be responsible for assisting with design reviews, development of the commissioning plan, executing the commissioning plan and associated reporting, and supporting the final report publication. In particular, we will draw on Sam's extensive experience with control systems and engineering design.
Industry Experience	25 years

Les Wilson — Commissioning Engineer	
Specialties	<ul style="list-style-type: none"> <li>▪ Commercial &amp; Industrial Auditing</li> <li>▪ Project Development</li> <li>▪ Energy Conservation Measurement &amp; Verification</li> <li>▪ Analog &amp; DDC Control Systems</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Seattle Art Museum Expansion</li> <li>▪ Washington State University, Compton Union Building New Commissioning</li> <li>▪ Washington State University, Bio Life Sciences Building New Commissioning</li> <li>▪ Eastern Washington University Lighting Retrofit Commissioning</li> <li>▪ City of Everett, Wall Street Building</li> <li>▪ Yakima County, Courthouse Building Re-Commissioning</li> <li>▪ Yakima County, Detention Facilities Commissioning</li> <li>▪ Yakima County, Health Building Re-Commissioning</li> <li>▪ Kadlec hospital Re-Commissioning</li> <li>▪ Good Samaritan Hospital Re-Commissioning</li> <li>▪ ALK Abello New Commissioning</li> </ul>
Role on this Project	As commissioning engineer for our inland Northwest team, Les will be responsible for assisting with design reviews, development of the commissioning plan, executing the commissioning plan and associated reporting, and supporting the final report publication.
Industry Experience	25 years

Mike Phenicie, EIT— Commissioning Engineer	
Education	South Dakota School of Mines & Technology, B.S. Mechanical engineering
Project Experience	<ul style="list-style-type: none"> <li>▪ University of Idaho Campus wide Improvements Commissioning</li> <li>▪ Washington State University, Bio Life Sciences Building New Commissioning</li> <li>▪ Washington State University, Campus wide Improvements Commissioning</li> <li>▪ Cascade School District, MT Retro-Commissioning</li> <li>▪ Townsend School District, MT Retro-Commissioning</li> <li>▪ Davenport, IA Federal Courthouse (GSA)* <i>*completed with previous employer</i></li> </ul>
Role on this Project	As commissioning engineer for our Inland NW team based out of Spokane, Mike will be responsible for assisting with design reviews, development of the commissioning plan, executing the commissioning plan and associated reporting, and supporting the final report publication. Mike has extensive experience commissioning K-12 schools, universities, labs and commercial buildings.



# Staff Qualifications

Industry Experience	6 years
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## Domenic Maiani — Commissioning Engineer

Specialties	<ul style="list-style-type: none"> <li>▪ HVAC Systems</li> <li>▪ Hydronic Heating and Cooling Systems</li> <li>▪ Domestic Piping Systems</li> <li>▪ Controls/Building Automation Systems</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Post Falls High School Commissioning</li> <li>▪ Couer d'Alene School District Commissioning</li> <li>▪ Pateros School District Commissioning</li> <li>▪ Frontier Junior High School Commissioning</li> <li>▪ Monument Elementary School Commissioning</li> <li>▪ Washington State University, Bio Life Sciences Building New Commissioning</li> <li>▪ Washington State University, Compton Union Building New Commissioning</li> <li>▪ Sacred Heart Medical Center, Children's Hospital Re-Commissioning</li> <li>▪ Eastern Washington University, Student Recreation Center</li> <li>▪ Central Valley School District Commissioning</li> <li>▪ Eastern State Hospital HVAC Upgrades New Commissioning</li> <li>▪ Washington State Penitentiary (Walla Walla) Commissioning Program</li> </ul>
Role on this Project	As commissioning engineer for our Inland NW team, Domenic will be responsible for assisting with design reviews, development of the commissioning plan, executing the commissioning plan and associated reporting, and supporting the final report publication. Domenic will work jointly with the commissioning team to develop testing and communication protocols in an effort to advance the building systems from installation to full dynamic operation and optimization.
Industry Experience	14 years

## Kirk Carl — Commissioning Engineer

Certifications	<ul style="list-style-type: none"> <li>▪ EPA Universal Refrigeration CFC Certified</li> <li>▪ OSHA Forklift Operator Trainer Certified</li> <li>▪ Green Plumbers Certificate</li> <li>▪ Certified Quality Assurance Inspector for USN</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Tualatin Hills Parks &amp; Recreation Commissioning</li> <li>▪ Hood River School District Commissioning</li> <li>▪ Dallas School District New Commissioning</li> <li>▪ Parkrose School District New Commissioning and Retro-Commissioning</li> <li>▪ Providence Medical Center Retro-Commissioning</li> </ul>
Role on this Project	As commissioning engineer for the Portland team, Kirk will be responsible for assisting with design reviews, development of the commissioning plan, executing the commissioning plan and associated reporting, and supporting the final report publication. Kirk has extensive experience commissioning all energy and mechanical, and building control systems.



# Staff Qualifications

Industry Experience	19 years
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## Ken Abbott — Commissioning Engineer

Certifications	<ul style="list-style-type: none"> <li>▪ Cisco Controls System Integration Training 2007 &amp; 2009</li> <li>▪ Local 290 Steamfitter Apprenticeship 2007</li> <li>▪ ITT Modern Hydronics</li> <li>▪ OSHA 10 Certified</li> <li>▪ EPA Universal Refrigeration CFC Certified</li> </ul>
Project Experience	<ul style="list-style-type: none"> <li>▪ Camas School District New Commissioning</li> <li>▪ Coos Bay School District New Commissioning and Retro-Commissioning</li> <li>▪ Marion County Courthouse New Systems Commissioning</li> <li>▪ Greater Albany Public Schools Commissioning</li> <li>▪ City of Vancouver Retro-Commissioning</li> <li>▪ Roseburg Public Schools</li> </ul>
Role on this Project	As a commissioning engineer for the Portland team, Ken will be responsible for assisting with design reviews, development of the commissioning plan, executing the commissioning plan and associated reporting, and supporting the final report publication. Ken will also provide test, balance tasks, and assist with performance monitoring.
Industry Experience	6 years

# Relevant Experience

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## New Commissioning

### NORTHSHORE SCHOOL DISTRICT — WOODINVILLE HIGH SCHOOL PHASE 1 AND 2

Northshore SD is expanding Woodinville High School through a new construction project that includes the addition of a commons, a three-floor classroom wing, administration offices, and a performing arts center. The McKinstry commissioning team, including Jeff Fogel, is responsible for writing and executing the commissioning plan as well as all testing and tracking observations to resolution and preparing the final Commissioning Report

Project Completion: 2012

## Retro-Commissioning



### EDMONDS SCHOOL DISTRICT

McKinstry conducted retro-commissioning and DDC upgrades for nine elementary schools and one high school. Five of the schools were completed in 2010, with the remaining schools set to be completed by May 2011.

Jeff Fogel and Sam Wong served as Cx Engineers for the project, and provided point-to-point verification and functional performance test of AHU and boiler systems and all controls modifications. The McKinstry team generated a master deficiency list and made recommendations for sequence changes to improve operation and reduce energy wastage.

Project Completion: 2010

### TUKWILA SCHOOL DISTRICT

The McKinstry project team led by Jeremy Wolff provided retro-commissioning services of mechanical systems at three schools – Foster High School, Showalter MS, and Cascade View Elementary. The commissioning project scope included point-to-point verification and functional performance test of AHU and boiler systems. The McKinstry Cx team identified 250 active issues, 10% of which were able to be resolved at no cost to the district. An additional 80% of the remaining issues were resolved through a repair allocation included in the project budget.

Project Completion: 2010

### UNIVERSITY OF IDAHO —HAGERRMAN CX



The University of Idaho's Fish Culture Experiment Station in Hagerman was retro-commissioned as part of McKinstry's energy services contract with the University. The intent was to improve system efficiency and operations and commissioning focused on the HVAC mechanical equipment and the Building Automation System.

The McKinstry commissioning team performed equipment tested that included the make-up air unit, boiler and heating system pumps, general and laboratory exhaust fans, supply and exhaust VAV terminal units, and fume hoods.

Components were adjusted, repaired, or replaced as necessary to improve comfort and efficiency. Modifications and adjustments were made to the building



# Relevant Experience

automation system to improve operations and add control of additional equipment. Some of the identified issues were a faulty differential pressure switch, transducer inputs reversed, incorrect set points, inoperable controls, and reversed wiring.

Project Completion: 2009

## Re-Commissioning

### THE EVERGREEN STATE COLLEGE

The McKinstry commissioning team coordinated by Jeremy Wolff is providing a comprehensive systems review at the Evergreen State College Library. The facility itself is a 347,000 sq. ft. library with four stories above grade and a basement level. The McKinstry team is commissioning mechanical systems that include two large central air handling units with economizer and chilled water controls. Chilled water and central steam are supplied by campus loops. McKinstry will also be re-commissioning VAV systems, DC ventilation systems and lighting/lighting control systems. Craig Hawkins is the commissioning engineer in charge of verification for this project.

Project completion: *In progress*



### FEDERAL WAY HIGH SCHOOL

McKinstry's commissioning team, led by Jeremy Wolff, served as the Program Manager for the re-commissioning of three schools: Federal Way High School, Illahee Middle School and Sequoyah Middle School. Control systems were re-commissioned at all three schools to optimize performance. McKinstry replaced the existing boilers at Illahee MS with dual-fuel boilers, requiring additional commissioning. In all, the commissioning project identified a total of 550 active issues, 20% of which were able to be resolved at no cost to

the district.

Project Completion: 2010

## LEED®

McKinstry is well versed at integrating sustainable design practices and concepts into our delivery process. We have the capabilities to review, analyze, and participate in the design of a multitude of sustainable building concepts. Our staff has been involved in this activity on many projects and our resume of sustainable design and energy conservation projects is extensive. We have participated in several LEED Certification studies and resulting designs. We have also completed multiple LEED EB (Existing Building) projects achieving full certification. McKinstry is a full member of the U.S. Green Building Council and our staff includes members of the steering committee for the local Cascadia Chapter, where we are a proud Gold Level Sponsor.

Our Energy, Facility & Technical Services group includes approximately 140 professionals including mechanical designers, electrical designers, lighting designers, and sustainability specialists. Our engineering team includes 86 LEED® Accredited Professionals.

McKinstry has participated in several LEED design and cost studies and is currently working on several projects submitting documentation for LEED Certification.

### CURRENT LEED PROJECTS

LEED	Project Name	Client Name	Project Amount	Description	LEED Rating
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# Relevant Experience

Rating					Awarded/Targeted
NC	Montgomery Block	Damin Tarlow & Paul Kisling	\$7,000,000	Condos	LEED-NC
	West Campus	Fortune 50 Software Corporation	\$90,000,000	Office/Campus	LEED-NC Silver
	Korry	Korry Electronics	\$11,000,000	Industrial	LEED-NC
EB	Department of Ecology	Washington State	\$2,000,000	Office	
	LBA Von Karman	LBA	\$60,000	High Rise Commercial	In review for Silver
	Tiarna Cerritos Towne Center	Tiarna	\$42,000	Commercial (4 Buildings)	
	Tiarna Metroplex	Tiarna	\$40,000	Commercial	
	One Union Square	Washington Holdings	\$3,200,000	Commercial	
	Two Union Square	Washington Holdings		Commercial	
	South Hill Data Center	Benaroya	\$5,000,000	Data Center	LEED-EB Gold
	Rosetta Inpharmatics Ph1	Merck Co		Lab	
CS	Icehouse	Sabey	\$2,000,000	Shell and Core Office	LEED-CS Silver
	McKinstry 210 Hudson	McKinstry	\$12,000,000	Office	LEED-CS
	McKinstry Portland Office	McKinstry	\$10,000,000	Office	LEED-CS Gold
	McKinstry Portland TI	McKinstry	\$2,000,000	Office	LEED-CS Gold
	Intergate Data Center	Sabey	\$1,000,000	Data Center	LEED-CS Silver
CI	McKinstry 210 TI	McKinstry	TBD	TI	LEED-CI
	VMware	VMware	\$7,000,000	Data Center	LEED-CI Platinum
	Avista	Avista	0.14	Office	

## COMPLETED LEED™ PROJECTS

LEED Rating	Project Name	Client Name	Project Amount	Description	LEED Rating Awarded/Targeted
NC	Bellevue Towers	Gerding Edlen	\$36,000,000	High-Rise Condos	LEED-NC Gold
	West Campus Building 99 & 37	Fortune 50 Software Corporation	\$24,000,000	Office Campus	LEED-NC Gold
	Microsoft West Building 97	Fortune 50 Software Corporation	\$16,200,000	Office Campus	LEED-NC Silver



# Relevant Experience

	West Campus Commons	Fortune 50 Software Corporation	\$15,300,000	Office Campus	LEED-NC Gold
	Seattle Central Library	City of Seattle	\$12,800,000	Library	LEED-NC Silver
	1900 Morrison Housing Authority of Portland	Gerding Edlen	\$2,300,000	Low-Income Housing	LEED-NC
	1900 Morrison Condos	Gerding Edlen	\$6,000,000	Residential	LEED-NC
	UW Ecogenomics	University of Washington	\$1,100,000	Lab	LEED-NC
	Allenmore MOB	Unico	\$1,450,000	Medical Office Building	LEED-NC
<b>115,150,000</b>					
EB	Tiarna Cerritos-DeRevere	Tiarna	\$120,000	Commercial (1Building)	LEED-NC
<b>\$120,000</b>					
CS	307 Westlake / SBRI Building	Harbor Properties / SBRI / Vulcan	\$8,300,000	Shell & Core	LEED-CS Silver
	Unico Allenmore Bldg C	Unico	\$880,000	Medical Office Building	LEED-CS Silver
	University of Washington Research and Technology Building	University of Washington	\$4,600,000	Shell and Core Lab	LEED-CS Gold
	The Civic Condos	Gerding Edlen	\$7,500,000	Residential	LEED-CS Gold
	Alley24	Vulcan and Harbor Properties	\$4,500,000	Shell & Core Office	LEED-CS Silver
<b>\$25,780,000</b>					
CI	Zimmer Gunsul Frasca Office	Hines Development	\$250,000	Office TI	LEED-CI Certified
	NBBJ TI @ Alley24	Vulcan and Harbor Properties	\$600,000	Office TI	LEED-CI Gold
	Paladino & Company Office Expansion			Office TI	LEED-CI Gold
	Skanska TI @ Alley24	Vulcan and Harbor Properties	\$90,000	Office	LEED-CI Gold
	Bastyr Center for Natural Health		\$20,000	Educational	LEED-CI Certified
	PLU University Center	PLU	\$2,300,000	Educational	LEED-CI Silver
	Fenwick & West	Fenwick & West	\$200,000	Office	LEED-CI
<b>\$3,460,000</b>					
Schools	Van Buren & Washington Elementary Schools	Caldwell SD	\$6,000,000	Elementary School	LEED-Schools

# Relevant Experience

## Maintaining Commissioning Schedules

One of the most critical areas of focus for projects is start-up and commissioning. The best of installations and construction processes can fall short of meeting the clients' objectives unless a thorough and well-managed commissioning process is implemented. McKinstry has a fully staffed in-house commissioning team. This includes all post-construction service and performance assurance, including energy use measurement and verification.

We will develop a Commissioning Program Master Plan in accord with the client in order to coordinate our commissioning schedule with the overall construction and design schedule.

A completed plan will define and communicate to all parties responsible the (1) goals for quality, efficiency, and functionality; (2) commissioning approach and scope; (3) schedules; (4) roles and responsibilities of all groups or individuals; (5) specific deliverables and their required content/detail; (6) documentation requirements with examples; and (7) a process for system, equipment, and building acceptance.

We have learned through years of commissioning experience that communication is the key to integrating commissioning into the design and construction process. The Construction Phase spans from construction inception through system installation. During the construction process, the Commissioning Authority (CxA) is involved through meetings and site visits. The CxA performs the following steps:



**Review Construction Submittals** – The CxA reviews the submittals that pertain to the Cx scope to confirm the systems/equipment meet the Owner's requirements and goals. The CxA documents their feedback and provides it to the Account Executive and Project Manager as necessary.

**Cx Kickoff Meeting** – The CxA coordinates a Cx Kickoff Meeting with the Project Manager, client stakeholders, and project leaders from construction subcontractors to communicate the Cx process, their responsibilities, and overall expectations.

**Site Visits & Meetings** – The CxA will conduct site visits and attend project meetings as necessary to stay apprised of project status and to identify issues; such issues will be identified and communicated via the Observation Log. The CxA's presence will gradually increase as the project nears the Acceptance Phase.

**Submit Cx Tests for Review** – The CxA develops Point to Point, and Functional Performance Tests and provides them to the Project Manager for review. The CxA incorporates feedback as necessary.

**Distribute Pre-/Start-Up Tests** – The CxA distributes the Pre-Start and Start-up Tests to the project team. The Project Manager shall provide CxA 7 days notice prior to starting up and equipment.

**Maintain Observation Log** – The CxA will document identified issues from site visits and tests in the Observation Log. The CxA will communicate such issues as needed to the Project Manager, and the client. The CxA will maintain and update the log throughout the project and will submit a final log as part of the Cx Report.

# Relevant Experience

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## Working with Sub Consultants

McKinstry expects a level of quality from its partners far above the industry standard. McKinstry works hard to assure that all subcontracted work meets the highest specifications. Rigorous design reviews ensure that specified work addresses the long-term solutions our clients desire. We track material and equipment submittals and follow up by performing onsite delivery inspections. The final phase of our quality management is a full slate of commissioning inspection and testing that culminates in a final commissioning report.

### QUALITY CONTROL (QC) OF SUBCONTRACTOR DELIVERY

McKinstry's mission with respect to Quality Control (QC) of subcontractors is to provide a system that has a bias toward action, provides management with early recognition of problems, and establishes a pathway not only for corrective action but also a means of evolving improvement in the absence of error. We will provide a Quality Control System developed specifically for each project site. This Quality Control System is a hybrid composite of the best elements of the McKinstry Quality Management System, the Quality Self-Assessment Program, and the Customer Feedback System, which is designed to squarely focus our emphasis precisely where the customer requires it.

### ELEMENTS OF OUR QC PROGRAM

#### *McKinstry Quality Management System*

Our approach to Total Quality Management (TQM) has played a significant role in our success with subcontractors. Also, we expect it to play an even larger role in our ability to remain a competitive, successful solution provider in the future. This process is founded in the philosophy of continuous improvement and in transforming the entire organization, at every level, into a customer-driven business entity. In this context, each and every McKinstry employee understands the importance of, and takes responsibility for, the quality of their work. All employees are charged with doing the job right...the first time; and this attitude will be extended to the other sub consultants we partner with on this program.

#### *Quality Self-Assessment Program*

In addition to a philosophy that stresses responsibility for quality at the worker level, we recognize the need for objective examination of contract services both at the supervisory level and independent of the operating organization altogether. Therefore, our program includes some more traditional elements. First, it includes select operations personnel, trained in QC techniques, who inspect the subcontractors and equipment vendors work product as part of their daily tasks. Second, our QC program includes operationally independent QC inspections by the McKinstry QA/QC manager and our corporate leadership team. The McKinstry Project Director is also responsible to teach, monitor QC effectiveness, assess performance problems, and verify and assess deficiency resolution.

#### *Customer Feedback System*

The ultimate objective of the overall Quality Control System is to be so effective that this part of our three-part system is used only for positive reinforcement. The first two parts of our Quality Control System, as discussed above, are proactive measures. The Customer Feedback System is the reactive segment of the program. We recognize that there is a fundamental requirement for Quality Assurance to be conducted by the client agency. This QC program element is designed to provide the responsive means for correctly reacting to the findings of the customer.

### QUALITY ASSURANCE AND QUALITY CONTROL

The key to McKinstry's approach to any project is the ability to define the desired outcomes of our clients and provide a process that assures these outcomes will be met. While our experienced and capable staff is the key ingredient to achieve this, we have put in place a system of Quality Assurance/Quality Control to provide additional measure of discipline to our project delivery.

### CLEARLY DEFINING THE PROJECT OUTCOMES



# Relevant Experience

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Both within this pre-qualification and within the initial stages of our involvement in the project, you can expect the delivery of a complete description of scope, budget, schedule and other salient information on all systems to be commissioned. This will provide a clear communication benchmark with all other team members to establish the desired outcome.

## Experience Establishing Commissioning Criteria

In addition to the detailed technical requirements outlined for a specific project, we will draw on our years of facility design, build, operate, commissioning, and maintain experience throughout our company. We hold high standards for ourselves and truly believe in the company motto of “for the life of your building”. Often the best barometer of determining the appropriate level of testing is to consider what our expectations would be should we be operating the facility and engage our management teams to validate our thought process.

At a minimum, the systems will be tested at the component then system level under all modes of operations. This includes alarming and reporting along with functional validation.

# Previous Performance

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## Letters of recommendation

Letters of recommendation for the three McKinstry locations proposed for the public facilities commissioning program have been provided at the end of this document.

## Budget and schedule control and compliance

### BUDGET MANAGEMENT

McKinstry is committed to delivering successful projects to our clients within or below budget. We are able to realize overall savings for our clients in many cases, and our ability to forecast these savings in advance has allowed active clients to introduce additional project scope prior to key cut-offs. Our ability to forecast cost overruns gives the team the flexibility to make difficult yet responsible decisions before budget problems arise.

### SCHEDULE MANAGEMENT

McKinstry has a long history of meeting or exceeding our clients' deadlines while providing the flexibility essential to accommodate changing client realities. We update work status frequently to ensure that the project will pass all milestones without issue. McKinstry also coordinates with subcontracting partners to review upcoming deliverables and dependencies weeks in advance, further protecting target dates.

McKinstry will provide scheduling and reporting capabilities as a tool to plan and monitor the auditing, design, and construction process, and to flag potential scheduling concerns. We utilize the most current computer software designed specifically for the demands of project scheduling. These scheduling tools include Primavera, Basepin, Newforma and Microsoft Project.

Our line leaders are experienced in precision scheduling and are well aware of the benefits to all parties when schedules are accurately developed and maintained. We will develop the project critical path schedule and determine the optimum sequencing and task duration to minimize the construction costs for the project team. We will develop this in conjunction with the master project schedule so key tasks are integrated, as applicable.



# Previous Performance

## Recent commissioning projects

The projects below represent a highlight just some of the key of the projects our commissioning teams in Seattle, Spokane and Portland have completed in the past three years.

Name of Project	Role on Project	Year Completed
Woodinville HS (Northshore)	Commissioning Eng. and Mgmt.	Ongoing
Northshore School District	Commissioning Eng. and Mgmt.	Ongoing
Eastern Washington University, Sports and Recreation Building	Commissioning Eng. and Mgmt.	Ongoing
University of Washington Medical Center	Commissioning Eng. and Mgmt.	Ongoing
Large Social Networking Company	Commissioning Eng. and Mgmt., Facility Mgmt.	2011
University of Idaho, Campus Wide Cx Program	Commissioning Eng. and Mgmt.	2011
Alk Abello Facility	Commissioning Eng. and Mgmt.	2010
Tacoma General Hospital ER Trauma Treatment Center	Commissioning Eng. and Mgmt.	2010
Tukwila School District Retro Cx	Commissioning Eng. and Mgmt.	2010
Federal Way School District Re-Cx	Commissioning Eng. and Mgmt.	2010
Edmonds School District Retro Cx	Commissioning Eng. and Mgmt.	2010
Seattle Justice Center	Commissioning Eng. and Mgmt.	2010
University of Idaho, Hagerman	Commissioning Eng. and Mgmt.	2009
Camas School District	Prime Contractor, Commissioning Eng. and Mgmt.	2009
Bainbridge Island School District, Building 200	Commissioning Eng. and Mgmt.	2009
Valley Medical Center	Commissioning Eng. and Mgmt.	2009
Caldwell School District	Prime Contractor, Commissioning Eng. and Mgmt.	2009
PeaceHealth — St. Joseph Hospital	Commissioning Eng. and Mgmt.	2009
Seattle City Hall Retro Cx	Commissioning Eng. and Mgmt.	2009



# Geographic Proximity

McKinstry's strong presence in Pacific Northwest uniquely positions us to provide local resources for public facility commissioning projects throughout the state of Washington. Commissioning services through the Department of General Administration's program will be coordinated through McKinstry's Seattle headquarters as well as regional offices in Spokane, Washington and Portland, Oregon. Dedicated commissioning personnel staff each of these locations. In addition, McKinstry can draw upon resources from a nationwide team of commissioning experts, as needed.

## Office Locations

### SEATTLE

5005 3rd Avenue South  
Seattle, WA 98134  
Phone: 206.762.3311  
Fax: 206.762.2624

**Commissioning team:** 19 employees  
**Total employees:** 85 employees

### SPOKANE

9 South Washington Street, Suite 605  
Spokane, WA 99201  
Phone: 509.747.3389  
Fax: 509.747.3313

**Commissioning team:** 4 employees  
**Total employees:** 27 employees

### PORTLAND

16790 NE Mason St Suite 100  
Portland, OR 97230  
Phone: 503.331.0234  
Fax: 503.331.6906

**Commissioning team:** 2 employees  
**Total employees:** 25 employees

## Additional McKinstry Offices

<b>TACOMA</b> 2306 Pacific Ave. Tacoma, WA 98402 Phone: 253.572.9876	<b>PULLMAN</b> 60 Dairy Road Pullman, WA 99163 Phone: (509) 334-1037	<b>MINNEAPOLIS, MN</b> 8451 Xerxes Ave. North Brooklyn Park, MN 55444 Phone: 763.767.0304
<b>BOISE</b> 950 W. Bannock St., Suite 805 Boise, ID 83702 Phone: 208.344.2781	<b>MISSOULA, MT</b> 135 West Main Missoula, MT 59802 Phone: 406.214.3500	<b>DALLAS, TX</b> 13465 Midway Road, Suite 100 Dallas, Texas 75244 Phone: 972.532.4290
<b>BOZEMAN, MT</b> 1982 Stadium Dr., Unit #1 Bozeman, MT 59715 Phone: 406.214.3500	<b>DENVER, CO</b> 112 N. Rubey Dr. Suite 200 Golden, CO 80403 Phone: 303.215.4040	<b>SAN ANTONIO, TX</b> 20658 Stone Oak Parkway, Suite 103 San Antonio, Texas 78258 Phone: (210) 301-7174
<b>IRVINE, CA</b> 4 Jenner St, Suite 120 Irvine, CA 92618-3828 Phone: 949.333.4299	<b>MADISON, WI</b> 2310 Crossroads Dr. Suite 5200 Madison, WI 53718 Phone: 608.242.9196	<b>KANSAS CITY, KS</b> 13287 Blue Jacket St Overland Park, KS 66213 Phone: 913.967.9373
<b>HOUSTON, TX</b> 4606 FM 1960 West, Suite 400 Houston, TX 77069		



## Support Services



Support Services Center  
22105 23<sup>rd</sup> Drive S. E.  
Bothell, WA 98021-4409  
Phone: (425) 489-6603  
Fax: (425) 489-6419  
[www.nsd.org](http://www.nsd.org)

Date: March 21, 2011

To: Whom it may concern:

Re: Reference – McKinstry Company Commissioning Services

The Northshore School District has partnered with McKinstry Co. as our commissioning agent over the past 7 years. These projects have included commissioning of new construction and modernizations, retro-commissioning, technical consulting, and energy upgrades.

Below are a few of the projects either successfully completed or are currently in progress:

- |   |                              |
|---|------------------------------|
| • Canyon Creek Phase 1                          | Energy Upgrade Commissioning |
| • Woodinville High School Phase 1               | Modernization Commissioning  |
| • EPA Environment for Excellence Awards         |                              |
| • Canyon Park Junior High                       | Retro-Commissioning          |
| • New Transportation Center                     | Commissioning                |
| • Lockwood Elementary                           | Retro-Commissioning          |
| • Fernwood Elementary Modernization             | Commissioning                |
| • Secondary Academy for Success (SAS)           | Commissioning                |
| • Phase 7.3 Energy Upgrade                      | Commissioning                |
| • Northshore Junior High AHU Replacement        | Commissioning                |
| • Woodinville High School Phase 2 Modernization | Commissioning                |
| • Crystal Springs Energy Upgrade                | Commissioning                |
| • Administration Building (Phase 8.1)           | Commissioning                |
| • OSPI Upgrades 2010                            | Commissioning                |
| • Shelton View Energy Upgrades                  | Commissioning - Ongoing      |
| • Canyon Creek Energy Upgrades                  | Commissioning - Ongoing      |

The McKinstry Company has done an excellent job with executed these projects on-time and on-budget. We've been extremely pleased with their project team's dedication, flexibility, and commitment to the Northshore school district. Their open communication with management, labor and teaching staff has been a key aspect to our success.

## Support Services

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Support Services Center  
22105 23<sup>rd</sup> Drive S. E.  
Bothell, WA 98021-4409  
Phone: (425) 489-6603  
Fax: (425) 489-6419  
[www.nsd.org](http://www.nsd.org)

We have been extremely satisfied with all of the services received from McKinstry to date and would highly recommend them for your team. If you have any additional questions please feel free to contact us.

Regards,

A handwritten signature in black ink, appearing to read "Ryan Fujiwara", with a long horizontal line extending to the right.

Ryan Fujiwara  
Northshore School District  
Director of Support Services  
425-408-7803

A handwritten signature in black ink, appearing to read "Evan Ujiiye", written in a cursive style.

Evan Ujiiye  
Northshore School District  
Director of Capital Projects  
425-408-7853

Date: March 27, 2009

To: Whom it May Concern

Subject: Biotechnology-Life Sciences Research Building, WSU-Pullman  
McKinstry Essention Commissioning Services

Washington State University is approaching completion of a new 130,000 SF research building located in Pullman, Washington. As the Project Officer for Washington State University, I was responsible for the successful completion of the overall project.

The facility contains four floors of open research laboratories (17 benches each), support spaces, small animal vivarium, and administrative spaces for the staff. The facility includes fume hoods, vented biosafety cabinets, air handling systems, automated building controls, backup power, and other miscellaneous items.

As the commissioning agent for the project, McKinstry Essention has successfully developed and implemented the commissioning plan and schedule. Their team was knowledgeable, professional, and a pleasure to work with. They actively engaged with the project team throughout the course of construction to ensure the highest level of success and worked diligently to bring various issues to completion.

WSU is very pleased with the commissioning effort provided by McKinstry Essention. We also look forward to their providing digitized maintenance and operations procedure manuals for standard and emergency procedures, along with interactive record drawings and critical system component data manuals.

If you would like any more specifics on the project related to McKinstry Essention's performance, feel free to call me at 509-335-1658.

Sincerely,  
Capital Planning & Development



Virgil Hanson  
Project Officer



841 NE 22ND AVENUE  
CAMAS, WA 98607-1142  
WWW.CAMAS.WEDNET.EDU  
TEL 360.335.3000  
FAX 360.335.3001

BOARD OF DIRECTORS  
CONNIE HENNESSEY  
CASEY O'DELL  
DOUGLAS QUINN  
JULIE ROTZ  
MARY TIPTON

SUPERINTENDENT  
MIKE NERLAND

March 16, 2011

To: Whom it May Concern

Re: Camas School District  
"Prune Hill Elementary School Energy Savings Performance Contract"  
Commissioning Services Performed by McKinstry Essention

Camas School District completed an Energy Savings Performance Contract at our Prune Hill Elementary School with McKinstry Essention in 2009. As the designated project contact person for Camas School District, I was responsible for the successful completion of the overall project.

Prune Hill Elementary School is a 57,907 ft<sup>2</sup> educational facility. The project consisted of upgrades to the direct digital control system and replacement or relocation of 22 heat pumps to right-size heating and cooling units. The spaces affected included two classroom wings and a computer lab.

As the commissioning agent for the project, McKinstry Essention successfully developed and implemented the commissioning plan and schedule. Their team was knowledgeable, professional, and responsive.

Camas School District is pleased with the commissioning effort provided by McKinstry Essention, and to date, Prune Hill Elementary School has achieved energy savings in excess of what was originally predicted in the Energy Services Proposal.

If you would like any more specifics on the project related to McKinstry Essention's performance, feel free to call me at (360) 335-3000, extension 78224.

Sincerely,

Helen Charneski  
Project Manager  
Camas School District



2211 E. Sprague Ave. ♦ Spokane, WA 99202  
Phone: (509) 533-0498 ♦ Fax: (509) 536-8491

March 21, 2011

State of Washington, Division of Engineering & Architectural Services  
General Administration Building  
210 11<sup>th</sup> Avenue SW, Room 206  
Olympia, WA 98504-1012

Attention: Kathi Fyfe

Subject: **Project No. 2011-820: Commissioning Projects for Public Facilities,  
Statewide - Statement of Qualifications**

TESTCOMM is pleased to offer this statement of qualifications to provide commissioning services to the State of Washington, Division of Engineering & Architectural Services.

TESTCOMM is a leading commissioning provider in eastern Washington and throughout the Inland Northwest. Our firm and commissioning authorities possess the certifications and affiliations that match those required in your RFQ.

We have been fortunate to be repeatedly selected for your program since inception and feel that our performance throughout the previous contracts warrants us further consideration. Successful projects for the community colleges of Spokane, Yakima, and Wenatchee were completed since our last qualification.

With a long list of satisfied customers and repeat business, we hope you find our qualifications match your requirements. Your consideration of our firm is greatly appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jerry Ensminger', is written in a cursive style.

Jerry Ensminger  
Manager  
TESTCOMM, LLC

Attachments:

(6) CDs with qualification statements, letters of recommendation, and SF330

# TESTCOMM<sub>LLC</sub>

## Project No. 2011-820: Commissioning Projects for Public Facilities, Statewide – Statement of Qualifications

### Table of Contents

Cover Letter .....	1
Table of Contents.....	2
Statement of Qualifications .....	3-10
Relevant Experience .....	11-18
Letters of Recommendation .....	19-21



Commissioning  
Testing, Adjusting, & Balancing

Statement of Qualifications  
Commissioning Services



*Member since 2004*



2211 E. Sprague Ave., Spokane, WA 99202  
Phone: (509) 533-0498 Fax: (509) 536-8491





2211 E. Sprague Ave., Spokane, WA 99202  
Phone: (509) 533-0498 ♦ Fax: (509) 536-8491

## TESTCOMM and the Building Commissioning Process

Textbooks describe building commissioning as a systematic and documented process of ensuring that specific building systems perform interactively, according to design intent and the owner's operational needs. The goal of commissioning is to deliver a facility that operates as intended, meets the needs of the building owner, and provides proper training to the facility operators.

TESTCOMM believes it is *more* than a textbook process. We believe that commissioning should be an added value to the owner; an exceptional service to provide systems that work, solutions to problems encountered, with the least impact on project cost and schedule.

TESTCOMM<sub>LLC</sub> was formed in 1996 to provide building systems **TEST**ing and **COMM**issioning services. We provide the following commissioning related services:

- **New Building Commissioning** - Formal design reviews, commissioning plans, preparation of schedules, installation verification, functional performance testing, training oversight and related services to verify installed equipment and systems operate as designed. TESTCOMM also provides LEED related reviews and documentation; LEED based commissioning; and measurement and verification services after construction completion.
- **Retro-Commissioning** - Identifying and providing solutions to ongoing problems in buildings that have not been previously commissioned. This process also examines building systems for operations, efficiency and energy cost savings that have not been realized by the building owner.
- **Re-commissioning/ Continuous Commissioning** - Verifying that equipment and systems continue to operate correctly on a long-term basis. These services can be provided in new and existing facilities on a one time or periodic basis, depending on the owner's needs.

Since our inception, TESTCOMM has completed numerous highly technical projects for diverse clients, including hospitals, laboratories, historic buildings, schools and universities, retail and commercial facilities. Our customers include industry leaders such as Costco Wholesale, Providence Health Services, the State of Washington, Eastern Washington University, Community Colleges throughout eastern WA, University of Montana, Washington State University, Spokane School District, Albertson's Stores, and many others

TESTCOMM has been recognized for our commissioning services in case studies performed for the State of Washington by the Northwest Energy Efficiency Alliance.

We are the largest commissioning and testing firm in Eastern Washington, and are currently working on projects in Washington, Idaho, Oregon, Montana, and California.

The greatest resource at TESTCOMM is its employees. Our staff includes commissioning authorities, field technicians, technical writers, and administrative personnel. Their diverse backgrounds and technical expertise in commissioning related fields, coupled with a wealth of experience, are at the hub of our services. We are committed to completely satisfying our customer's needs.

## **TESTCOMM Approach to Projects**

TESTCOMM provides exceptional service by adding value to each project, identifying issues and presenting solutions, and by providing a knowledgeable, talented and competent staff with the tools and equipment to perform the job. We do this through:

- **Dedication to the project** - TESTCOMM recognizes that every project is unique, and deserves special attention, depending on the type of facility, the owner's project requirements, the complexity of the systems, and the available budget. We review each project and strive to provide the most value with the least impact on the project schedule. Within our abilities, TESTCOMM will do whatever is needed to make it happen for the owner.
- **Teamwork** - Because each project is unique, we work together with the owner, architects, engineers, contractors and consultants to create an effective "commissioning team". This team acts in concert through design, construction and post construction activities to insure the owner that he is getting the best value and the building will perform as designed.
- **Attention to detail** - Focusing on design intent and owner expectations, TESTCOMM performs a comprehensive project review to help identify issues before they become problems. Working with the project team, we propose ideas that can result in better solutions for the owner. Our constant focus is on delivering quality service through the project cycle and continuing after the project is completed.
- **Taking the Long Term Perspective**- Buildings and relationships are meant to last for many years. To that end, TESTCOMM strives to provide the most value for the building owner during the project, while building lasting positive relationships with owners, consultants and contractors. We strive to become the long-term provider of choice through consistently providing quality service and building lasting relationships.

During new building commissioning, our goal is to provide the *greatest added value* to the owner with the *least impact* on the project schedule. To this end, we stay involved with the project throughout design and construction to find problems, coordinate with the team, build relationships, and offer resolutions before the problems impact the owner or the contractor. During the warranty period we return to the project to assist in troubleshooting problems that may occur and, if necessary re-test and re-commission equipment to insure the owner is satisfied with the performance of the building and equipment.

A typical, full scope, new building commissioning process includes a thorough plan review and report; preparation of a commissioning plan outlining the procedures to be used, tests to be performed and responsibilities for all parties concerned. TESTCOMM performs installation verifications to insure the equipment and components are installed in accordance with the manufacturer's and project requirements and we are on site for equipment start-up to insure all prerequisite testing and verifications are completed to insure a safe start. TESTCOMM tests and verifies components, equipment and systems to insure full integration and proper performance; coordinates training for the Owner; and issues a final commissioning report with test results, observations and recommendations for the owner.

We maintain a full inventory of calibrated tools and the equipment necessary to fully test and commission all types of facilities. Our tools include airflow and velocity measurement equipment, temperature sensors, humidity sensors, pressure sensors, electronic water flow gauges, light level meters, sound and vibration analyzers, infrared imaging, electrical meters, and power quality analyzers. All instruments are calibrated at intervals recommended by certifying agencies and the equipment manufacturer.

## Affiliations



TESTCOMM is an original member of the Building Commissioning Association (BCA). The BCA is a national organization dedicated to the enhancement of commissioning. TESTCOMM, as a full member of the BCA, promotes building commissioning practices that maintain high professional standards and fulfill building owners' expectations. Our employees remain active in the BCA committees and chapter leadership. Our manager is a Certified Commissioning Professional (CCP) by the BCA, the highest certification available.



TESTCOMM is certified by the National Environmental Balancing Bureau (NEBB) in mechanical systems commissioning; HVAC air and hydronic systems testing, adjusting, and balancing; and sound and vibration analysis. These certifications ensure our customers that their systems are fully operational and capable of operating at maximum capacities and efficiencies within design limitations.



*Member since 2004*

TESTCOMM is member of the United States Green Building Council (USGBC). This membership allows TESTCOMM to update our knowledge of current procedures and technical advances, and maintain close relationships with other firms interested in sustainability. Several TESTCOMM employees are LEED accredited professionals.

TESTCOMM is a member of the Associated Builders and Contractors (ABC) and the Washington State Society for Healthcare Engineering (WSSHE).

National Environmental Balancing Bureau



Recertification

THIS IS TO CERTIFY THAT

*Testcomm, LLC*

*in Spokane, WA*

HAS MET ALL REQUIREMENTS FOR RENEWAL OF NEBB  
CERTIFICATION IN THE FOLLOWING DISCIPLINE

*Building Systems Commissioning*

FOR THE BOARD OF DIRECTORS:

*Exp. March 31, 2011*

*Testcomm, LLC/WA*

*No. 3178*

NEBB Cert. No.

*J. M. B. Stevenson*

President

*Stephen R. Wegman*

President-Elect

# Building Commissioning Certification Board

Gerald Ensminger

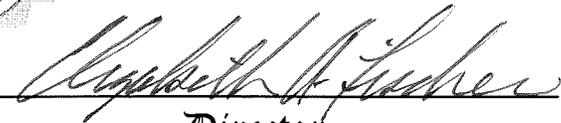
Certified Commissioning Professional – CCP

*Certified Professional since 8/24/2004*

*For demonstrated continuance of a high level of competence and experience in the building commissioning process by successfully upholding the prescribed standards of performance and conduct required for CCP.*



President



Director

*Certification Number: 23*

*Expires: 6/30/2011*

# The U.S. Green Building Council

hereby presents to

***TESTCOMM, LLC***

*Spokane, WA*

## Certificate of Membership

As a balanced, consensus coalition representing the entire building industry, we promote the design, construction, and operation of buildings that are environmentally responsible, profitable, and healthy places to live and work.



*Member since 2004*

  
James Hartzfield, Chairman

  
S. Richard Fedrizzi, President,  
CEO and Founding Chairman



### **Commissioning Team:**

#### **Jerry Ensminger - Senior Commissioning Authority – Founder of TESTCOMM**

Jerry's qualifications include over 20 years experience in systems testing, evaluation and training. Jerry is the owner of TESTCOMM and will oversee all commissioning related procedures for this project. His experience includes nuclear power systems testing; process controls programming, start-up and testing; HVAC systems testing and balancing; sound and vibration analysis; and building systems commissioning. He is a LEED accredited professional, has NEBB certifications in mechanical systems commissioning, HVAC systems testing and balancing, and sound and vibration analysis. Jerry is a Certified Commissioning Professional by the Building Commissioning Association. Jerry has served on the board of directors for the Northwest Chapter of the Building Commissioning Association and is a past president of the organization.

#### **Gerald Ensminger, Sr. - Commissioning Authority – 14 Years at TESTCOMM**

Mr. Ensminger, Sr. has qualifications that include over 30 years experience in various commissioning related disciplines. He has over ten years experience with TESTCOMM commissioning systems in Washington, Idaho and Montana. In addition to his career with TESTCOMM, Gerald served his country for 27 years in the United States Navy, spending two and a half of those years performing sea tests and evaluation of electronic systems for the Navy. He was a field service and testing engineer in textile manufacturing; evaluated manufacturing, testing and quality control for a computer and flat panel system design/build company and has extensive experience in building systems operations and maintenance with emphasis on energy management and technical systems testing and evaluation.

#### **Todd Corder - Commissioning Authority – 10 Years at TESTCOMM**

Todd brings a wide-ranging base of knowledge and experience with HVAC and mechanical systems operations, testing and controls verification in complex building systems. During his 17 years as a test and balance technician, Todd was involved in a wide variety of sophisticated HVAC systems testing, including complex laboratory and hospital systems and control systems. In the seven years he has been performing building systems commissioning, he has been involved in significant, high profile projects at Sacred Heart Medical Center, St. James Healthcare in Butte, Montana, Kadlec Medical Center in Richland, Washington, and projects at several colleges and universities in the area.

#### **Ed Simpson - Commissioning Authority – 5 Years at TESTCOMM**

Ed's background includes 10 years in the HVAC trades performing service and installation work, and over 15 years in the facilities maintenance and operations field in the healthcare industry and at colleges and universities. During his time in facilities maintenance and operations, he spent over five years performing project management and commissioning new facilities for a national healthcare company. He also served as a regional director of maintenance, performing building and equipment evaluations and testing through the western US. As head of facilities maintenance at two colleges, he

supervised staff, developed projects, evaluated facilities and equipment, and managed maintenance projects. He is a LEED Accredited Professional, Certified Plant Maintenance Manager through the Association of Facilities Engineers (AFE) and is a member of the Technical Advisory Committee for K-12 Schools for the Office of the Superintendent of Public Instruction for the State of Washington. Ed is currently on the board of directors for the NW chapter of the BCA.

**Herb Zielke** - Commissioning Authority – 2 Years at TESTCOMM

Herb has 30 years of facilities maintenance experience with high tech, hospitality, non-profit and building management organizations. Included in those years, he served as Facilities Maintenance Manager with the Coeur d'Alene Resort in Coeur d'Alene, Idaho, and as Facilities Director for the YMCAs of eastern Washington. He has extensive experience in HVAC systems, and in the development and implementation of preventative maintenance schedules according to manufacturer's specifications of industry specific equipment and machinery, as well as building systems equipment. Herb has commissioned numerous commercial buildings in Washington and Oregon, including LEED Enhanced projects with Washington State University, Deer Park High School, and Main Market CO-OP of Spokane.

**David Howard** - Commissioning Authority – 1 Year at TESTCOMM

Dave has 21 years of commercial construction experience with high tech, medical, mixed-use, office, high-rise, and government projects. In those years, he served as Foreman, Assistant Project Manager, Project Superintendent, and MEP Superintendent for General Contractors. He has extensive experience in commercial construction and in commissioning and closeout requirements. Dave has commissioned commercial buildings in California, Idaho, and Washington. He led the commissioning of LEED Enhanced Coyote Ridge Correctional Center Expansion project with Washington State Department of Corrections. The \$223 million expansion included 22 buildings that were commissioned and achieved the United States Green Building Council's Gold Rating.

**T.J. Sharkey** – Commissioning Authority – 1 year at TESTCOMM

TJ has 7 years of commercial construction experience as a Project Engineer/Manager that includes: condominiums, retail TI spaces, theaters, hotels, office buildings, healthcare facilities (OSPHD), high tech manufacturing and industrial plants. His experience includes complete involvement of projects from design development to owner turnover. While at TESTCOMM, TJ has been directly involved in commissioning multiple facilities for the Community Colleges of Spokane. TJ has his Engineer-in-Training (EIT) certification and is a LEED Accredited Professional.



2211 E. Sprague Ave., Spokane, WA 99202  
Phone: (509) 533-0498 ♦ Fax: (509) 536-8491

## Current Commissioning Projects

**COSTCO Wholesale** – Numerous locations throughout the United States, Canada and Mexico. In 2004, TESTCOMM was selected by COSTCO to perform operational verification and test and balance services for all new facilities and major remodels. With over 180 locations tested so far, this relationship continues today. TESTCOMM developed procedures that integrate equipment start-up, balancing of HVAC equipment, and functional testing into a concise package to meet the needs of COSTCO Wholesale. As a result of our testing and recommended improvements, substantial energy savings have been realized nationwide by COSTCO. Subsequently, TESTCOMM has performed LEED Fundamental and Enhanced Commissioning at several warehouses.

### References

Les Perry, COSTCO Project Manager-Energy Department (425) 427-7056 [lperry@costco.com](mailto:lperry@costco.com)  
Craig Peal, AVP Energy and Controls (425) 313-8520 [cpeal@costco.com](mailto:cpeal@costco.com)

### **Walla Walla Police Station**, Walla Walla, WA -

The \$12 million building has a total gross area of 32,800 ft<sup>2</sup>. The new station will house the Walla Walla Police Department. The single-story building mechanical, plumbing, fire protection, fire alarm, electrical, and building management controls are being commissioned by TESTCOMM per the contract documents provided by Integrus Architecture and in compliance with USGBC LEED v3.0 (without submission) and WA State Commissioning requirements.

### Reference

Rob Robinson, Construction Manager  
Buildings Dynamic, LLC  
509-301-0578  
[bldgdynamics@charter.net](mailto:bldgdynamics@charter.net)

### **Survival, Evasion, Resistance, and Escape (SERE) Training Facility**, White Bluff, WA

The \$11.6 million project for the Joint Personnel Recovery Agency and the U.S. Navy SERE School consists of two special use buildings and an addition to an existing structure. A total project area of 25,000 ft<sup>2</sup> is to be completed. The two new buildings and addition mechanical, plumbing, electrical and building management controls are being commissioned by TESTCOMM per the contract documents provided by the U.S. Navy's Naval Facility Command and per USGBC LEED v2.2 Fundamental Commissioning requirements.

### Reference

Taylor Landa, QC Manager  
LarKor Construction  
509-869-1680  
[taylorl@larkor.com](mailto:taylorl@larkor.com)

**SGL Automotive Carbon Fibers Production Facility, Moses Lake, WA -**

This project consists of an office/warehouse building at 45,000 SF and a process facility building of 110,000 SF. This facility is being constructed to supply carbon fiber used in the automaker BMW megacity vehicle. This is a breakthrough step in the evolution of carbon fiber as this is the first time carbon fiber will be utilized as the major structural component of a series production automobile. This project is pursuing LEED Gold certification. A heat recovery loop is used in conjunction with two thermal oxidizers in the process area and VFDs are utilized for the majority of the HVAC and Process equipment to aid in energy efficiency. TESTCOMM is providing the commissioning services for the mechanical, plumbing, electrical lighting, and building management controls for this project.

**Reference**

Nick Lambdin, Lydig Construction  
(509) 869-2523  
[nlambdin@lydig.com](mailto:nlambdin@lydig.com)

**City of Moses Lake (WA) Civic Center** A new two story building above grade, plus a basement that is located between the existing City Hall and Parks/Police Buildings. The building is approximately 41,000 SF which includes council chamber, administrative offices for two city departments, public library, galleries, auditorium, collection storage and classrooms. The project is pursuing LEED certification and employs sustainable strategies such as a passively vented and cooled common event space, sun shading devices and has provisions for future array of photo-voltaic panels.

TESTCOMM is providing the commissioning services for the mechanical, plumbing, electrical lighting, and building management controls for this project.

**Reference**

Jim Doyle, MW Engineers  
(509) 838-9020  
[JimD@MWEngineers.com](mailto:JimD@MWEngineers.com)

**Spokane Falls Community College Chemistry & Life Science Building, Spokane, WA -**

This 63,000 ft<sup>2</sup>, \$16.2 million building is replacing an outdated, mid-60's building with classrooms, lecture rooms, science laboratories, dissection room, and a planetarium. The building is targeted for LEED Gold rating, and includes several new concepts in design and energy management, including increased use of radiant heat, passive heating and air conditioning, advanced metering, advanced techniques for landscape management, and a "Science on Display" information panel that will allow students to monitor weather conditions, building conditions, and energy usage throughout the day. The passive systems being utilized on the project are being monitored by outside agencies to evaluate their effectiveness in the Pacific Northwest. The building is slated for completion in 2011.

**Reference**

Dennis Dunham, Facilities Director, 509-533-8630, [ddunham@ccs.spokane.edu](mailto:ddunham@ccs.spokane.edu)  
Malcolm Hain, DDB, Architect, 509-327-1538, [Malcolm@ddbarch.com](mailto:Malcolm@ddbarch.com).

**Spokane Community College Technical Education Building** - This 73,000 ft<sup>2</sup>, \$11 million building is replacing program sections located in several campus buildings with a single training and classroom area for HVAC, Electrical and Electrical Maintenance, Fluid Power and associated trades programs. The building includes advanced laboratories for several trades, including electronics labs, HVAC labs and use of solar hot water heating as part of the technical programs. Students will work on actual equipment used in the trades, and, through control integration, be able to use the building equipment for practical demonstration and practice on commercial facilities. The building is slated to receive LEED Silver accreditation and will open for fall quarter 2011.

Reference

Dennis Dunham, Facilities Director  
509-533-8630  
[ddunham@ccs.spokane.edu](mailto:ddunham@ccs.spokane.edu).

**Fairchild AFB Fitness Center, Airway Heights, WA** -

This \$25 million project consists of the design and construction of a single, one-story, fitness facility with mezzanine space that provides a gymnasium, indoor pool, locker rooms, fitness equipment spaces, racquetball courts, and an elevated running track, as well as necessary support spaces. The building will also house a Health and Wellness Center and support facilities for the Water Survival Training Center. The resulting facility shall be designed as such to accommodate future expansion.

The building mechanical, plumbing, fire protection, fire alarm, electrical, and building management controls are being commissioned by TESTCOMM per the requirements of the U.S. Army Corps of Engineers and USGBC LEED v3.0 Enhanced Commissioning requirements to achieve Gold status.

Reference

Ryan Swartz, QC Manager  
Lydig Construction  
509-869-1680  
[rswartz@lydig.com](mailto:rswartz@lydig.com)

Other Significant Projects Ongoing:

**Ferris High School Modernizations, Spokane, WA**

**Wenatchee Valley College – Music & Arts Building, Wenatchee, WA**

**Bonnors Ferry, Colville & Oroville New Border Patrol Stations, WA and ID**

**Washington State University Duncan Dunn and Community Hall Renovations – Pullman, WA**

### Sprinkling of Completed Projects

**Deer Park High School**, Deer Park, WA – TESTCOMM performed full scope commissioning on this multi-year modernization project, performed under the Washington Sustainable Schools Protocol (similar to LEED). Our services included preparation of the commissioning specifications, the commissioning plan, design reviews, writing and performing functional performance tests, coordinating training and preparing the final commissioning report for the Owner. This was a multi-phased project and throughout the various phases, TESTCOMM worked closely with the HVAC and control systems, electrical and lighting systems, Life safety systems, building envelope requirements and specialty equipment being installed in the building. The project was completed in 2010. Contact Steve Howard at (509) 464-5546 [howard@deerpark.wednet.edu](mailto:howard@deerpark.wednet.edu)

### **Coulee Community Hospital**

A \$25 million dollar, 65,000 ft<sup>2</sup> new hospital housing a 25 bed patient care ward, operating rooms, emergency department, acute care, administration offices, heliport and kitchen. Completed in 2011.

TESTCOMM successfully commissioned the following systems and equipment:

- Building Envelope
- Fire Suppression
- Plumbing Systems
- Domestic hot water systems
- Medical Gas
- Heating, ventilating, air conditioning and refrigeration systems and related controls.
- Electrical Systems
- Lighting and daylighting controls
- Fire Alarm
- Access Control
- Testing Adjusting and Balancing of the HVAC systems

Greg Hanoff was the hospital project manager, he can be reached at: 509-633-1753

**MSU Animal Bioscience Building**, Bozeman, MT – This new three story building houses classroom and lecture halls, faculty offices and laboratory spaces to support the animal sciences programs at the University. TESTCOMM provided a full scope commissioning on the project, including mechanical, plumbing, HVAC, electrical and life safety systems testing. The project was completed in 2010. Contact Cody Mitchell with the Montana State Department of A&E, (406) 444-3326 [comitchell@mt.gov](mailto:comitchell@mt.gov) or Debbie Drews, Project Manager for MSU at (406) 994-5463 [deborah.drews@montana.edu](mailto:deborah.drews@montana.edu)

**University of Montana Law School**, Missoula, MT – This addition to the existing Law School building is coupled with extensive remodeling in the existing building. The addition includes additional classroom and conferencing spaces, lecture hall facilities and faculty offices to support the law program at the University. TESTCOMM provided a full scope commissioning, including general contract items, life safety, mechanical and HVAC, controls and electrical testing. The project was completed in 2010. Contact Jameel Chaudhry, Project Manager at (406) 243-5576 [jameel.chaudhry@mao.umt.edu](mailto:jameel.chaudhry@mao.umt.edu) or Bob Warfle, Montana State Department of A&E at (406) 444-0771 [bwarfle@mt.gov](mailto:bwarfle@mt.gov)

**Northeast Community Center Addition**, Spokane, WA - The \$4 million multi-use building has three levels of tenant space for a total gross square footage of approx. 30,500. Space usage includes medical and dental clinics.

The two-story building mechanical, plumbing, fire protection, fire alarm, electrical, and building management controls were commissioned by TESTCOMM per USGBC LEED v3.0 Enhanced Commissioning requirements. Completed in 2011.

Reference

Jean Farmer, Director  
Northeast Community Center  
509-487-1603  
[jfarmer@aimcomm.net](mailto:jfarmer@aimcomm.net)

**SFCC Business and Social Sciences Building**, Spokane, WA. – TESTCOMM was retained to perform full commissioning services for the Community Colleges of Spokane, with a LEED Silver certification at the completion of the project. We provided plan and specification reviews at the design phase, then provided a commissioning plan, wrote and executed functional performance test procedures and prepared final reports for the College. The new science building provides laboratory space, classrooms and faculty offices for expanding the College's science program. Full scope commissioning on this project entailed mechanical, plumbing, electrical and life safety systems, including a sophisticated control system for the laboratory areas, training, and building envelope testing. Contact Dennis Dunham, Facilities Director at (509) 533-08630 [ddunham@ccs.spokane.edu](mailto:ddunham@ccs.spokane.edu)

**YVCC Brown Dental Building**, Yakima, WA – This shell and core remodel and addition to the existing building allows Yakima Valley Community College to expand its dental programs. The building contains classrooms and dental laboratory/practical exercise areas to support the program. TESTCOMM provided full commissioning services for the project including testing on mechanical, plumbing, electrical and life safety systems. Completed in 2010. Contact Jeff Woods, Facilities Director at (509) 574-4695 [jwoods@yvcc.edu](mailto:jwoods@yvcc.edu)

**Shadle Park High School Modernizations and Additions**, Spokane, WA - TESTCOMM provided full commissioning services for this multi-year, multi-phase modernization and expansion of the original high school, built in 1957. This project was built under the Washington Sustainable Schools Protocol (WSSP). With much of the work being done while school was in session, the project included HVAC and mechanical systems, electrical and life safety systems, plus specialty theater lighting, kitchen equipment and security systems

commissioning. Contact Dennis Cihak, Spokane Public Schools Capital Projects Office at (509) 354-5776 [dennisc@spokaneschools.org](mailto:dennisc@spokaneschools.org)

**WSU Bio-Products, Science and Engineering Laboratory**, Richland, WA – TESTCOMM provided full building commissioning services for the \$24 million research and teaching laboratory jointly promoted by WSU and Pacific Northwest National Laboratory. With 57,000 square feet of laboratories and offices, it houses activities required to research and develop the processes involved in bio-based product manufacture and bio-fuels, as well as the WSU Center for bio-fuels and bio-research. Contact Larry Harris, Owner's Representative, Washington State University (509) 335-3564 [lawrence\\_harris@wsu.edu](mailto:lawrence_harris@wsu.edu)

**WSU Rotunda Dining Facility Renovation, WSU Regents Dining Facility Renovation**, Pullman, WA – TESTCOMM performed full commissioning services for the complete renovation and remodel of two of the campus dining facilities. Scope of work included air systems, controls, electrical systems and plumbing systems. TESTCOMM wrote the commissioning plan, wrote and performed start-up and functional test procedures, witnessed testing, tracked deficiencies and problem resolution, and prepared associated reports. Contact Virgil Hansen, Project Officer, WSU Capital Planning (509) 335-5571 [vhansen@wsu.edu](mailto:vhansen@wsu.edu)

**Wenatchee Valley College Allied Science Building**, Wenatchee, WA – This 89,000 square foot building, complete in the summer of 2007, houses new science programs and provides laboratory space, classrooms, lecture halls, and faculty offices. TESTCOMM's commissioning services included building envelope testing, HVAC, mechanical, electrical, energy management controls, life safety and security systems, specialty laboratory systems, equipment testing, training and publishing a commissioning report. Contact Travis Taylor, A&E Director at (509) 682-6455 [ttaylor@wvc.edu](mailto:ttaylor@wvc.edu) or Dave Lohrengel, Washington State E & A Services at (360) 902-7249 [dlohren@ga.wa.gov](mailto:dlohren@ga.wa.gov)

**Providence Sacred Heart Medical Center, Radiology and Laboratory Remodels**, Spokane, WA TESTCOMM provided commissioning services for these ongoing remodeling projects within the medical center under contract with the owner. TESTCOMM's scope included testing of 100% of the mechanical, HVAC and related equipment in the affected areas. This project was complicated by the need for the hospital to remain operational in the areas under construction while the remodeling and additions were being worked on. Contact Bill Bouten, Bouten Construction (509) 342-0280 [billb@boutenconstruction.com](mailto:billb@boutenconstruction.com) or Mike Kelly, Director of Facilities Sacred Heart Medical Center (509) 474-3290 [kellym@shmc.org](mailto:kellym@shmc.org)

#### Other Significant Projects

- Eastern WA University Monroe Hall Renovation
- Spokane Comm College Health Science Building Renovation and Addition
- Spokane Falls Comm College Library Addition
- Northwest Museum of Arts and Culture – Spokane, WA
- St. James Healthcare Project Excellence – Butte, MT
- Washington State Archives, Eastern Region Branch – Cheney, WA

Providence Sacred Heart Medical Center & Children's Hospital

PO Box 2555  
101 West Eighth Avenue  
Spokane, WA 99220-2555  
509.474.3131  
www.shmc.org



TestComm LLC  
Attn: Jerry Ensminger  
2211 E Sprague Avenue  
Spokane WA 99202

Dear Mr. Ensminger:

Providence Sacred Heart Medical Center has used your company's services for testing, balancing and commissioning of various construction projects for over ten years. During this time, your company has provided excellent consulting services to the Medical Center. Your professional staff and thorough reports have improved system operations and provided functional verification of equipment performance.

I am pleased to recommend your company to Washington State for Commissioning Consultant status and to others who need T&B or commissioning services. We look forward to continuing to work with your company in the future.

Sincerely Yours,

A handwritten signature in black ink that reads "Michael J. Kelly". The signature is written in a cursive style with a large, looping "J" at the end.

Michael J. Kelly  
Director of Facilities

## District Administration

### Facilities

MS 1016 ▪ 2000 N Greene St ▪ Spokane WA 99217-5499  
Facilities@ccs.spokane.edu  
(509) 533-8630 ▪ FAX (509) 533-8649



March 24, 2009

RE: TestComm, LLC

To Whom It May Concern,

Community Colleges of Spokane has been working with TestComm LLC for over eight years on an almost continuous basis beginning with commissioning a new addition to the Health Science Building Addition at Spokane Community College in 2001. This was the first project that we utilized a full version of building commissioning and initially the general contractor and subcontractors were very apprehensive of the process, especially the time impacts imposed on them. When the project was completed however, the consensus was that the commissioning process was well worth the effort because it actually saved a large amount of time performing corrective or remedial work as well as numerous call backs.

Our Department has continued to use TestComm for projects both large (over \$2 million) and small because we don't have the resources or expertise in-house to perform the technically specific work required and keep the directives to the contractors factually neutral as TestComm has done. We have found that their work is performed very professionally and that they are very responsive to owner concerns. Additionally, contractors are adapting to the fact of having a commissioning agent on the project and are very accepting of the professionalism that TestComm displays throughout the process and continuing into the training portion.

As the initial role of building commissioning has evolved, we now bring TestComm into the design process well ahead of what has traditionally been accepted as a start time for commissioning, to work with our department and the design team beginning with the schematic design phase. Part of the impetus for this has been the evolution of the LEED requirements for our building projects. This is in addition to the added benefits that we have derived from having that "third set of eyes" on a project. This perspective lends that critical third party view of ensuring that the systems not only work well together, but also adhere to our project requirements. The natural extension of this has been during the year long Monitoring and Verification portion of the LEED certification process, which TestComm has accomplished flawlessly.

It is our opinion that TestComm is very capable, professional, knowledgeable, and has served us well in the past, so we are confident in their services for both commissioning as well and testing and balancing in the future.

Feel free to contact me at 509-533-8630 or e-mail me at [ddunham@ccs.spokane.edu](mailto:ddunham@ccs.spokane.edu) for any further information in this regard.

Sincerely,

A handwritten signature in blue ink, appearing to read "Dennis E. Dunham".

Dennis E. Dunham  
Director of Capital Projects  
Community Colleges of Spokane

# CORTNER ARCHITECTURAL COMPANY

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ARCHITECTURE, CONSTRUCTABILITY REVIEWS & CONSTRUCTION ADMINISTRATION

March 25, 2009

TestComm, LLC  
2211 E. Sprague Ave.  
Spokane, WA 99202

Re: Letter of Recommendation

To: Whom It May Concern

We have had the opportunity to work with TestComm, LLC who provided commissioning services on several projects, such as the Spokane International Airport Rental Car Renovation Project (\$14 Million construction cost, completion date of November 2008) and Spokane International Airport Cascade MRO Mechanical/Electrical/Plumbing project (\$960,000 construction cost, completion date of February 2009).

We found TestComm to be both responsive and reasonable to work with. We had an accelerated construction schedule for both projects; and we were pleased that Ed Simpson, commissioning agent for TestComm was able to complete his work without impact to the overall schedule.

We would be pleased to recommend TestComm, LLC provide commissioning work on future projects.

Sincerely,



Jim Cortner  
Cortner Architectural Co.



*Welsh Commissioning Group, Inc.*

Leading Provider of Building Commissioning  
and Facilities Maintenance Related Services

**Statement of Qualifications  
Commissioning Services  
for  
Statewide Public Facilities**

**State of Washington  
Department of General Administration  
Division of Engineering & Architectural Services  
Facilities Engineering Services**



*4508 Auburn Way N., Suite B  
Auburn, WA 98002  
Tel: 253.856.3322  
Fax: 253.859.2072*

**[www.wcxg.com](http://www.wcxg.com)**

# Letter of Introduction

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*Welsh Commissioning Group, Inc.*

March 24, 2011

Kathi Fyfe  
Division of Engineering & Architectural Services  
General Administration Building  
210 11th Ave. SW, Room 206  
PO Box 41012  
Olympia, WA 98504-1012

Re: Commissioning Projects for Public Facilities, Project No. 2011-820

Thank you for this opportunity to present our Statement of Qualifications and SF330 for Commissioning Services for the State of Washington Department of General Administration, Project No. 2011-820.

Welsh Commissioning Group, Inc. (WCG) is a consulting firm specializing in third-party commissioning services. The primary focus of our business is commissioning, and we have built our reputation upon a strong base of experience in this field. We have served over 195 clients on more than 495 facilities in Washington, Oregon, California, Idaho, Utah, Nevada, Alaska and Hawaii. We have commissioned a wide variety of facility types for both public and private entities, including many projects for Washington State's General Administration. WCG has experience on over 95 projects with sustainable goals and building certifications such as USGBC, and six of our project managers are LEED Accredited Professionals.

WCG is well qualified for providing commissioning services because of our strong familiarity with building systems from the perspective of the building operator as well as the designer. We have experience commissioning large and complex projects and understand how systems work from an equipment level to a whole-system level. Our philosophy is that commissioning should be a collaborative process involving all members of the project team including the Owner, maintenance staff, designers, contractors and any specialists. WCG is well equipped to provide the State of Washington with an excellent commissioning value.

Again, thank you for providing us with this opportunity and we look forward to the prospect of working with you on future statewide projects.

Sincerely,

A handwritten signature in black ink that reads 'Joan W. Welsh'. The signature is fluid and cursive, with the first name 'Joan' being the most prominent.

Joan W. Welsh  
VP Business & Operations

# Table of Contents

---

Staff Qualifications

---

Page 1



Staff Resumes

---

Page 2



Relevant Experience

---

Page 8



Previous Performance

---

Page 13



# Staff Qualifications

## Professional Background

Welsh Commissioning Group, Inc. (WCG) has been providing third party commissioning services since 1999. The company was formed and thrived prior to the green building movement which embraces and requires building commissioning. From inception, our services were in response to a growing demand for a quality assurance strategy for the building delivery process. With the introduction and adoption of the green building movement the demand for commissioning services has increased. In response, WCG has grown with the demand and adapted to the requirements of the various sustainability protocols and the individual needs of our clients. WCG currently has 12 staff at your service and our offices are located in Auburn, WA

Our commissioning team members have successfully designed and completed commissioning procedures on a variety of buildings including municipal buildings, community and recreation centers, military facilities, healthcare facilities, universities, K-12 schools, office buildings, laboratories, and correctional institutions.

## WCG Memberships and Certifications

WCG is a member of the Building Commissioning Association (BCA) and we conduct our work in accordance with the BCA Essential Attributes of Building Commissioning. WCG is a member of the AABC Commissioning Group (ACG) and has eight ACG Certified Commissioning individuals on staff. Three of our commissioning team members have achieved the BCAs Certified Commissioning Professional designation. WCG recognized the importance of the green building movement early on and has been a member of the US Green Building Council since 2001, shortly after the LEED standards were adopted. We conduct all sustainable projects in accordance with LEED requirements.

## A Strong and Diverse Background

Our commissioning team members have a strong background in facility engineering, management and design which gives them a practical hands-on understanding of building systems which is critical to successful commissioning. We have a full staff of project managers and technical support specialists as well as an assortment of associates and sub-consultants providing support in specialized fields.

## A Team Philosophy

WCG personnel understand and appreciate the experience and expertise of all building industry professionals. Our goal is to work as a team with the Owner, Architect, Engineers, Sub-Consultants and Contractors in a collaborative fashion to deliver a high quality, effective and efficient facility to the Building Owner.

*"Tower-1 was quite a success as Okland received our TCO on the 15<sup>th</sup> of December which happens to be the date we had projected over 2 years ago for substantial completion. I wanted to thank your group for playing a huge part in this success. Welsh's proactive involvement in helping us hit this huge milestone is most appreciated. I wanted to let you know it has been a pleasure working with your staff and that Okland appreciates the professionalism and insight that your group provided us on this project."*

**Ron Keller, Okland Construction ~ Utah**



## BRYAN WELSH, PE

MBA, LEED™ AP, CCP, CCA

### MANAGING PRINCIPAL



#### EDUCATION

- Professional Engineer, Mechanical Engineering, Washington & Idaho
- MBA, University of Washington, 1998
- B.S. Mechanical Engineering, Washington State University, 1983
- A.A.S., Technical Metals, Clark College, 1979

#### CERTIFICATIONS

- Certified Commissioning Professional ~ CCP



- LEED™ Accredited Professional



- Certified Commissioning Authority ~ CCA



#### ASSOCIATIONS



WAMOA



#### COMMISSIONING EXPERIENCE AND QUALIFICATIONS

Full-time commissioning provider since 1999 including experience designing, performing and supervising building commissioning procedures on hundreds of facilities. Bryan has written and implemented commissioning plans for facilities including K-12 schools, higher education, correctional, laboratories, commercial and government buildings. He has developed the standard commissioning processes used by the project managers at WCG and is responsible for training WCG personnel. He has extensive experience in the fields of computerized building management systems, utility/energy management systems, maintenance management systems, test procedure development, and facilities operations.

#### COMMISSIONING

- **GSA Federal Courthouse** (Coeur d'Alene, ID) *LEED™*  
60,000sf, 3-story, federal courthouse, design-build
- **Multiple community centers/correctional facilities** (WA, UT) *LEED™*
- **Multiple fire stations/fleet facilities** (Seattle, WA) *LEED™*
- **Salt Palace Convention Center** (Salt Lake City, UT) *LEED™*  
515,000sf, 3-story, exhibit hall and meeting room facility, new construction
- **Ladd Tower Apartments** (Portland, OR) *LEED™*  
370,000sf, 23-story, apartment building
- **Multiple government facilities** (WA, AK, OR, UT) *LEED™*  
COFs, barracks, maintenance buildings, and offices
- **Multiple K-12 schools throughout Washington and Oregon State** *WSSP, LEED™*
- **Multiple buildings/labs at University of Washington and Utah** *LEED™*

#### EXISTING BUILDING COMMISSIONING

- **Washington State, Dept of General Administration** (Olympia, WA)  
Office Building II, ESCO Controls Upgrade
- **Battelle Memorial Institute, Pacific NW National Labs/** (Richland, WA)  
EMSL (lab), Sigma III Office
- **State of Hawaii, Dept of Accounting and General Services** (HI)  
Kaahumanu / Kauikeaouli / Liliuokalani /Kakuhihew, Office Buildings

#### RELATED/OTHER EXPERIENCE

- Frequent presenter on commissioning for the National Conference on Building Commissioning, ASHRAE, the Sustainable Building Advisor and other organizations.
- Certification Chairman, Building Commissioning Association Program
- Eight years, Director of Maintenance and Operations for the Auburn S.D., Auburn, WA. Managed 23 facilities; 1.5M sf; staff of over 100.
- Two years, District Project and Energy Engineer, So Kitsap S.D., Port Orchard, WA
- Four years as Senior Design Engineer for Boeing Aerospace, Kent, WA.
- Two years as Machinery Reliability Engineer, Chevron Oil Company, El Segundo, CA



**TIM O'NEILL, PE**

**LEED™ AP, CCP, CCA**

**COMMISSIONING OPERATIONS MANAGER**



## EDUCATION

- Professional Engineer, Mechanical Engineering, Washington, 2004
- M.S. Mechanical Engineering, Iowa State University, 2000
- B.S. Physics, Grinnell College, 1997

## CERTIFICATIONS

- Certified Commissioning Professional ~ CCP



- LEED™ Accredited Professional



- Certified Commissioning Authority ~ CCA



## ASSOCIATIONS



## COMMISSIONING EXPERIENCE AND QUALIFICATIONS

Prior to joining WCG in 2005, Tim spent five years as a lead nuclear facilities engineer designing industrial ventilation systems to support maintenance on nuclear power plants. He was responsible for preparing commissioning, TAB, and maintenance and operations procedures for facility ventilation systems. He has three years experience managing energy audit programs for industrial facilities and has trained teams of junior engineers on multiple projects. His responsibilities at WCG include Commissioning Project Manger and oversight of all WCG projects, including:

### COMMISSIONING

- **SW Regional Crime Lab, Washington State Patrol** (Vancouver, WA) 35,356sf, 2-story bldg. with admin areas, lab, and indoor ballistics testing facility
- **Google Lakeview Campus** (Kirkland, WA) *LEED™ Platinum* 80,000sf, two, 2-story office buildings, tenant improvements
- **The Cobb Building, UNICO Construction** (Seattle, WA) *LEED™* 75,300sf, 11-story, conversion of a century old building on the historical register
- **The Granary Building, Weston Miles Architects** (Morgan Hill, CA) *LEED™* 14,200sf, 2-story renovation of historical building converted to office space
- **Legacy Corporate Center** (Redmond, WA) *LEED™* 103,883sf, 3-story new construction, office building and parking garage *LEED™*
- **8th & Virginia Office Building, S/I Seattle Investments** (Seattle, WA) *LEED™* 670,000sf, 36-story new construction of Class A office tower with retail and subterranean parking
- **Lemieux Library, Seattle University** (Seattle, WA) *LEED™* 96,000sf renovation with 33,000sf addition of 5-story library
- **Multiple Buildings, University of Washington** (Seattle, WA) *LEED™* Historic renovation, tower data ctr, parking garage office
- **Multiple K-12 schools in WA and CA** *LEED™ & WSSP*

### EXISTING BUILDING COMMISSIONING

- **State of Hawaii, Dept of Accounting and General Services** (HI) Kaahumanu / Kauikeaouli / Liliuokalani / Kakuhihew, Office Buildings
- **Capital High School, Olympia School District** (Olympia, WA)

### RELATED/OTHER EXPERIENCE

5 years total mechanical engineering experience, including 4 years as Lead Nuclear Facilities Engineer for a major naval shipyard in Bremerton, WA.

- 4 years, Lead Nuclear Facilities Engineer, Puget Sound Naval Shipyard (2000-2004)
- 3 years, Graduate Assistant, Industrial Assessment Center (1997-2000)



## SHANE DOIG

LEED™ AP, CCP, CCA

### COMMISSIONING PROJECT MANAGER



#### EDUCATION

- Universal Technical Institute, Associate of Applied Science, 1997
- Kennedy Western University, Mechanical Engineering Studies
- University of Washington, ASHRAE A/C Design Fundamentals Certificate, 1999

#### CERTIFICATIONS

- Certified Commissioning Professional ~ CCP



- LEED™ Accredited Professional



- Certified Commissioning Authority ~ CCA



#### ASSOCIATIONS



#### COMMISSIONING EXPERIENCE AND QUALIFICATIONS

A proven and highly-capable project manager, Shane has been a commissioning provider since 2003. Shane's design experience includes plumbing and HVAC systems in commercial hi-rise, mid-rise, healthcare, and laboratory facilities. His work on these project included implementation of LEED design criteria and energy codes. Shane also has building envelope commissioning experience. He has worked with a wide variety of trades and subcontractors on his past projects and is a committed team player. Some of his recent projects include:

#### COMMISSIONING

- **Multiple Recreation Centers and Libraries (UT) LEED™**
- **Hurst Center for Lifelong Learning, Weber State Univ (Ogden, UT) LEED™**  
41,255sf, new 2-story, academic facility with a partial basement, offices, workstations, conference & work rooms, IT room, assembly hall & kitchen
- **KPLU Broadcast Center, Pacific Lutheran University (Tacoma, WA) LEED™**  
18,000sf broadcast center, on-air studios, production rooms, performance space & offices, new construction
- **Moran Eye Center II, University of Utah (Salt Lake City, UT)**  
101,000sf, new 5-story, eye clinic and 108,000sf, 6-story, research laboratory
- **Facilities, Operations & Maintenance Building, Renton S.D. (Seattle, WA)**  
22,000sf, facilities, maintenance and operations building, new construction
- **Eastvold Hall Theatre, Pacific Lutheran University (Tacoma, WA) LEED™**  
43,450sf, new 3-story theater bldg & addition of a 2,200sf scene shop and lobby
- **Bellevue International School, Bellevue S.D. (Bellevue, WA)**  
78,000sf reconfiguration and modernization to include new technology infrastructure, seismic and fire/life/safety upgrades
- **Multiple K-12 schools (WA) WSSP, LEED™**

#### EXISTING BUILDING COMMISSIONING

- **Yelm Prairie Elementary School, Yelm School District (Yelm, WA)**  
40,400sf retro-commissioning of all existing systems
- **Gregory Heights Elementary, Highline School District (Burien, WA)**

#### RELATED/OTHER EXPERIENCE

- VP and Treasurer, NW Chapter, Building Commissioning Association
- Committee Chair, NW Chapter, Building Commissioning Association
- Five years, Project Engineer/Mechanical Designer, MacDonald Miller Facility Solutions, Seattle, WA
  - Designed and assisted in the project management of new construction plumbing and HVAC systems for large commercial, retail, healthcare, laboratory facilities
  - Responsible for implementation of energy codes and LEED™ criteria



## ANDREW BALMER

CCA

### COMMISSIONING PROJECT MANAGER



#### EDUCATION

- University of Washington, B.A., 2005

#### CERTIFICATIONS

- Certified Commissioning Authority ~ CCA



#### COMMISSIONING EXPERIENCE AND QUALIFICATIONS

Andrew is a graduate of the University of Washington and has been commissioning building control systems since 2005. Andy also has experience as a construction application engineer and controls services technician which gives him exceptional insight to how building control systems are installed and programmed. His control system experience includes open architecture systems such as BacNet and LonWorks. Andrew joined WCG in April 2008 and has commissioning experience on a wide range of building and system types. His project experience includes the following:

#### COMMISSIONING

- **Auto Body Repair Shop, South Seattle Community College** (Seattle, WA)  
9,600sf addition, auto collision repair, renovation of classroom and office spaces
- **Multiple YMCA/Recreation facilities, throughout Washington State** *LEED™*
- **Riverfront Industrial Park Warehouse, CLDS** (Puyallup, WA) *LEED™*  
388,000sf, single story warehouse facility
- **Park 19 Apartments, Opus** (Portland, OR) *LEED™*  
114,000sf, 6-story apartment building, 101 units, mixed use area
- **Ladd Tower Apartments, Opus** (Portland, OR) *LEED™*  
370,000sf, 23-story apartment building
- **Fibre Federal Credit Union, Momentum** (Longview, WA)  
43,000sf, 3-story office building
- **Ft. Lewis Dental Building, J&J Maintenance** (Ft. Lewis, WA)  
16,000sf clinic, waiting area, treatment rooms, x-ray/lab, and sterilization rooms
- **Facilities, Operations and Maintenance Ctr, Renton School Dist** (Renton, WA)  
22,000sf facilities, maintenance and operations building
- **Multiple buildings for Boeing Developmental Center** (Tukwila, WA)  
Various office space, warehouse, department of defense buildings
- **Multiple Fire Stations, Seattle Fleets & Facilities** (Seattle, WA) *LEED™*
- **Multiple K-12 schools in Washington and Oregon State** *LEED™*

#### RELATED/OTHER EXPERIENCE

- Construction Application Engineer – Control Contractors, Inc.
- Controls Service Technician



## JEFFERY SMALL

CCA, CDT

### COMMISSIONING PROJECT MANAGER



#### EDUCATION

- University of Alaska, B.A., 1989
- Certified Documents Technologist, Construction Specifications Institute, 2003

#### CERTIFICATIONS

- Certified Commissioning Authority ~ CCA



#### COMMISSIONING EXPERIENCE AND QUALIFICATIONS

Jeff has a strong background in building systems commissioning, facilities management and computer systems. As a commissioning project manager, Jeff has written and implemented commissioning plans for more than 65 separate facilities with a strong focus on K-12 school projects. He has successfully managed projects of various sizes and complexity and has worked in the role of both commissioning agent and test engineer. He has a strong operational knowledge of all major building systems and has experience with such open architecture based control systems as LonWorks and Wonderware. Some of his most recent projects include:

#### Commissioning

- **TASS Barracks, Camp Williams, Utah National Guard** (Riverton, UT) *SPiRiT* 90,000sf, new 2-story, training & billeting facility for the Army National Guard; administration & education building with high tech classrooms, barracks building
- **284 Barracks, Ft. Wainwright, US Army Corps of Engineers** (Fairbanks, AK) 62,420sf, 144 man barracks complex, new construction
- **Sutton Geology/Geophysics Bldg, Univ of Utah** (Salt Lake City, UT) *LEED™* 90,000sf, new 4-story, laboratory and office building with teaching spaces,
- **Salt Palace Convention Center, Salt Lake County** (Salt Lake City, UT) *LEED™* 515,000sf, 3-story, exhibit hall and meeting room facility, new construction
- **P-346 CVN Maintenance Complex, U.S. Navy** (Bremerton, WA) *LEED™* 67,000sf, new 3-story bldg, enclosed mezzanine between the first & second floors
- **Lane County Armed Forces Reserve Center** (Springfield, OR) *LEED™* 178,000sf maintenance shop, storage bldg, vehicle wash, office bldg, warehouse, loading docks, flammable storage & paint shop, new construction
- **Department of Homeland Security Border Patrol Station** (Sumas, WA) 19,194sf border patrol facility, new construction
- **Arctic Heritage Center & Maintenance Bldg, Nat'l Parks Service** (Kotzebue, AK) 11,000sf Heritage Center and 1,200sf maintenance facility, new construction
- **Graham-Kapowsin High School, Bethel School District** (Spanaway, WA) 161,000sf high school, new construction
- **Liberty Junior High, Bethel School District** (Spanaway, WA) 97,639sf new construction of a junior high school
- **Spanaway Junior High, Bethel School District** (Spanaway, WA) 100,241sf, 2-story, new construction of a junior high school

#### Previous Experience

- Parks and Recreation Director, Kitsap County Parks and Recreation

# Staff Resumes

The proposed commissioning team members are assigned for the duration of the contract for continuity. Other WCG staff members are crossed trained in the project and the commissioning process to be available if needed. Our team is known as much for their technical expertise as they are for their ability to work well with project owners and to help build positive relationships with the project participants. Following is a list of additional staff available for your projects.

**Caleb Aring, Project Manager**

BSME, EIT  
Commissioning provider since 2008  
LEED Accredited Professional

**Phil Mueller, Project Manager**

BSCE, EIT  
Commissioning provider since 2008  
LEED Accredited Professional

**Don Parker, Associate Project Manager**

Extensive design and construction management experience  
Commissioning provider since 2003

**Nate Aring, Associate Project Manager**

BSME, EIT  
Commissioning provider since 2010

**Ryan Green, Commissioning Consultant**

Licensed PE, LEED Accredited  
HVAC and controls design background  
Commissioning provider since 2001

**Administration**

Joan Welsh - VP Business Operations  
Cathy Rigg - Marketing and Business Development Manager  
Jeni Carr - Office Manager

*"The State of Washington used WCGs commissioning services to help ensure that facilities and systems meet our operational needs during the rehabilitation of the 99,000sf historical John C. Cherberg Senate Office Building. WCG has been a valuable asset to this project by providing complete and comprehensive commissioning services.*

*I recommend WCG as a competent provider of commissioning services."*

**Richard Price, Project Manager**  
State of Washington

## Relevant Experience

**New Commissioning** constitutes the majority of our commissioning projects. The types of buildings we have commissioned in this category include K-12 schools, university and community college facilities, office buildings, healthcare facilities, laboratories, barracks and dorms, apartments/condos, recreation centers, convention centers, warehouses, performing arts, and correctional institutions.

In addition to new commissioning, WCG has completed multiple **Retro-Commissioning** (Existing Building Commissioning) projects. The types of buildings we have commissioned in this category include K-12 and municipal buildings, laboratories and office buildings.

While WCG has not participated in any **Re-Commissioning** projects, we have prepared re-commissioning manuals as part of our commissioning procedures for many of our New Commissioning projects for the various types of buildings outlined in other sections.

The types of buildings we have commissioned under **LEED** guidelines includes K-12 schools, university and community college facilities, military barracks, convention centers, office buildings, resort facilities, condominiums, laboratories, and correctional institutions. WCG has helped building Owners to work toward LEED certification by obtaining the credits available for commissioning. WCG also supports other LEED prerequisites and credits in Water Efficiency, Energy & Atmosphere and Indoor Air Quality. Our project managers are fully qualified to perform all aspects of associated LEED-related commissioning procedures at the same high level of proficiency that we employ in the commissioning of all of our projects. Most of all, we are committed to improving the environmental and economic performance of buildings and passing along these benefits to our clients.

### Wood Construction Center, Seattle Central Community College - Seattle, WA

**Project Description:** New construction of a 2-story 58,000 square foot academic facility. The project has the goal of achieving **LEED** Silver Certification.

**Commissioned Systems:** Heating, ventilating, air conditioning, and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls, lighting and daylighting controls, and domestic hot water systems

**WCG Scope:** LEED Fundamental and Enhanced Commissioning services to include OPR and BOD and document reviews, preliminary commissioning plan and specifications development, submittals review, commissioning plan development, commissioning meetings and site observations, contractor start-up and equipment installation verification, functional testing with back-checks, TAB verification, issues tracking, O&M manuals review, trending, training, project closeout activities, final commissioning report and systems manual development, and near warranty end review.

**WCG Team:** Shane Doig, PM; Tim O'Neill, COM; Bryan Welsh, Managing Principal

**Project Reference:** Lee Knawa, Project Manager, WA Dept. of GA, (360-902-7198)



# Relevant Experience

## Inland Power and Light Administration Building – Spokane, WA

**Project Description:** New construction of a 26,000 square foot office building, remodel of an existing 24,700 square foot warehouse and construction of a new 7,150 square foot vehicle maintenance facility. The project has the goal of achieving **LEED** Gold Certification for the Administration Building.

**Commissioned Systems:** The HVAC and associated controls, domestic hot water and lighting control systems. The HVAC system consisted mainly of packaged rooftop heat pump units serving an underfloor distribution system and air handling units with heat pumps serving additional spaces. Domestic hot water was provided using a combination of electric water heaters with circulation pumps and point-of-use instantaneous water heaters.

**WCG Scope:** LEED Fundamental and Enhanced Commissioning services to include OPR development, design and document reviews, commissioning specifications development, submittals review, commissioning plan development, commissioning meetings and site observations, witnessing contractor start-up activities, installation verification, functional testing with back-checks, TAB verification, issues tracking, O&M manuals review, training verification, project closeout activities, final commissioning report and systems manual development, and near warranty end review.

**WCG Team:** Ryan Green, PM; Tim O’Neill, COM; Bryan Welsh, Managing Principal

**Project Reference:** Jeff Warner, ALSC Architects, (509-838-8568)



## Student Union Building – Highline Community College, Des Moines, WA

**Project Description:** New construction of a 45,000 square foot multi-story building housing the campus bookstore, student services, meeting rooms, kitchen and dining area for students and faculty.

**Commissioned Systems:** Commissioning of the HVAC systems & controls, fire alarm & security system.

**WCG Scope:** WCG provided a PSE Energy Report for refund to owner. Deliverables included project document and equipment submittals review, commissioning specification and plan development, commissioning meetings and site observations, start-ups witnessing, installation & TAB verification, functional testing, retests, training verification, O&M manuals review, and final report production.

**WCG Team:** Bryan Welsh, PM and Managing Principal

**Project Reference:** Lee Knawa, Project Manager, WA Dept. of GA (360-902-7198)



## Relevant Experience

### Kauikaouli Hale, Honolulu District Court, Honolulu, Hawaii

**Project Description:** The Kauikaouli Hale Building is an approximately 215,000 square foot, 14-level office building housing a variety of State Judiciary office functions including offices, court rooms, chambers and a computer data center. The building was selected for **retro-commissioning** and facility assessment due to the aging condition of the HVAC systems and a desire to reduce energy costs.

**WCG Scope:** The goals for the project include providing an assessment of the current condition of the HVAC systems, developing a capital improvement plan for upgrading the HVAC systems, identifying short term energy efficiency measures, evaluate the indoor environment quality and to evaluate the effectiveness of the maintenance program. The HVAC system consisted of a chilled water plant with three 250 ton water cooled chillers, 80 air handling units, central exhaust and an assortment of VAV terminal units. The control system consisted of a newer Delta DDC system for the chilled water plant and a combination of electronic and pneumatic controls for the air handling systems.

**Issues:** Through the retro-commissioning process, 150 issues were identified that negatively impact the operation and energy efficiency of the building. 26 Energy Efficiency Measures were identified that, if implemented, will produce an estimated annual savings of 1,344,703 kWh and \$279,698 (26%), with a totalized payback of about 6 months. Taking into consideration the cost of retro-commissioning services, the totalized payback is approximately 1.3 years.

**WCG Team:** Phil Mueller, PM; Tim O'Neill, COM; Bryan Welsh, Managing Principal

**Project Reference:** Lloyd Maki, DAGS PM (808) 586-0479.



### Office Building Two – Washington State Capitol Campus - Olympia, WA

**Project Description: Retro-commissioning** of 325,000 sq ft, multi-story, office building built in the 1970's known for building static pressure problems. Project goals included solving pressure problems, improving occupant comfort and indemnifying energy efficiency measures.

**WCG Scope:** Retro-commissioning of HVAC and related control system. Scope included testing, repair, and reconfiguration of VAV boxes, resolution of control issues related to JCI control system, functional testing and trouble-shooting of air handling units, conducting detailed trend logging and analysis, and resolution of building static pressure problems.

**Issues:** Dozens of issues discovered including incorrect control sequences and parameters, failed variable speed drives, calibration problems, sensor location problems, failed heating valves and failed primary air valves. The project resulted in all issues being resolved and occupant complaints dramatically reduced. An independent case study is available for this project which determined the first year cost benefit to be \$52,300 and an annual energy savings of \$12,200. Total cost for commissioning and repairs was \$120,270.

**WCG Team:** Shane Doig, PM; Tim O'Neil, COM; Bryan Welsh, Managing Principal

**Project Reference:** Roger Wigfield, Washington State Dept. of General Administration, (360-902-7198) or Bonnie Scheel, Division of Facilities, State of Washington, (360-902-0983)



## Relevant Experience

### Google Lakeview Buildings, Kirkland, WA

**Project Description:** Tenant Improvements (TI) of one-half of one floor of a two-story building and all of an adjacent two-story building on a three-building campus. TI spaces included office areas, conference rooms, a Café, a fitness center, server rooms, and miscellaneous support spaces. Total project area was approximately 80,000 square feet. The project achieved **LEED CI Platinum** certification.



**Commissioned Systems:** Domestic hot water, HVAC and lighting control systems.

The HVAC systems consisted primarily of four (4) rooftop air handling units with gas-fired heating and DX cooling, 176 fan-powered VAV terminal units with electric reheat, and three (3) split-system air conditioning units.

**WCG Scope:** LEED Fundamental and Enhanced Commissioning services to include OPR development, design and construction document reviews, commissioning specifications development, submittals review, commissioning plan development, commissioning meetings, site observations, witnessing contractor start-up activities, installation verification, functional testing with back-checks, TAB verification, issues tracking, training verification, project closeout activities, final commissioning report, systems manual development, near-warranty-end review.

**WCG Team:** Tim O'Neill, PM; Don Parker, APM; Bryan Welsh, Managing Principal

**Project Reference:** Mike Nolan, Facility Manager, Google Inc., (425-344-8297)

### Airway Heights Corrections Center, WA Dept. of Corrections, Spokane, WA

**Project Description:** New construction of a 6,000 square foot visitation building plus renovations and additions to 2 other buildings for 200 additional minimum security beds. The project is pursuing **LEED** certification.



**Commissioned Systems:** Mechanical and electrical commissioning per LEED Fundamental & Enhanced commissioning requirements. The design included 4 packaged AC units with programmable thermostats and demand ventilation control, a single hot water heater and circulation pump. The design also included up to 4 daylighting control zones.

**WCG Scope:** LEED Fundamental and Enhanced Commissioning services to include OPR development, design reviews, specification development, commissioning plan development, submittal review, site observations, witness start-up activities, installation verification, functional testing, TAB verification, trending, training, project closeout activities, develop systems manual and near warranty end review.

**WCG Team:** Ryan Green, PM; Tim O'Neill, COM; Bryan Welsh, Managing Principal

**Project Reference:** James Standish, Integrus Architecture (509-838-8681)

# Relevant Experience

## Specific System Experience

We have experience in, and are capable of testing, a wide variety of complex building systems with in-house staff and equipment. There are some instances that necessitate the use of one of our sub-consultants. These instances include specialized testing such as acoustical, infra-red building envelope analysis, and sensitive and/or especially complex electrical systems (such as security systems). We maintain relationships with sub-consultants that are highly expert in their field and share our philosophy on building commissioning.

### **HVAC and Mechanical Systems:**

- Air Handling Systems
- Building Automation and Control Systems
- Chilled Water Plants
- Controlled Environment Rooms
- Cooling Towers and Controls
- Displacement Ventilation Systems
- Domestic Water Systems
- Ductwork
- Dust Collectors and Controls
- Fire Dampers
- Fire Suppression Systems
- Fuel Oil Systems
- Fume Hoods and Cabinets
- Ground Source Heating/Cooling
- Heat Recovery Systems
- Hydronic Systems
- IAQ Systems
- Lab Compressed Air Systems
- Lab Deionized Water Systems
- Lab Vacuum Systems
- Lab Airflow Control Systems
- Lab Process Liquid and Gas Systems
- Natural Gas Piping Systems
- Natural Ventilation Systems
- Packaged Boilers and Controls
- Paint Booths
- Plumbing
- Pumping Systems
- Radiant Floor/Ceiling Heat Systems
- Rainwater Harvesting
- Refrigeration Systems
- Snow Melt Systems
- Solar Hot Water Systems
- Central Plant Steam Systems
- Sound Control Systems
- Vehicle Emission Exhaust Systems

### **Electrical Systems:**

- A/C and CCTV
- Daylight Harvesting Controls (dimming and switching)
- Data Communications/Telephone
- Fire Alarm
- Generators
- Life Safety Systems
- Lighting Controls
- Photovoltaic Array Systems
- Power Distribution
- Security
- Transformers
- UPS Systems

### **Integrated Systems:**

- Fire Alarm – Fire Suppression – HVAC
- HVAC – Security – Lighting
- Lighting – HVAC
- Legacy Systems

### **Building Envelope:**

- Fenestration (Doors/Windows)
- Insulation
- Masonry/Exterior Skin
- Moisture/Vapor Barriers
- Roofing Systems

### **Other:**

- Elevator and Conveyance
- Irrigation

# Previous Performance

## Letters of Recommendation



MHTN  
ARCHITECTS

From: Mick Gaviglio [mailto:Mick.Gaviglio@mhtn.com]  
Sent: Thursday, April 23, 2009 3:47 PM  
To: Shane Doig  
Cc: Akbar@eceonline.com; Bill Bowen; bbriggs@vbfa.com; Bryan Welsh; Mark HALVERSON  
Subject: Re: Hurst Center Cx Issues

Now that the dust is settling for the design team, I wanted to take a minute to express my appreciation for the very thorough and professional way in which you have handled the Cx services for this project. Although you are located a time zone to the northwest, that has never presented any concerns in your involvement or availability. I am a big fan of Cx Logs, yours has been in existence since Schematic Design and continued until now. Although my involvement with you has been limited, as a "bystander" I have seen you work well with the engineers, GC and subcontractors. Thanks for a job well done.

Mick Gaviglio, AIA  
Vice President  
MHTN Architects  
420 E. South Temple #100  
SLC, UT 84111



Monday, October 25, 2010

Mr. Shane Doig  
Welsh Commissioning Group  
4508 Auburn Way N., Suite B  
Auburn, WA 98002

**RE: Letter of Recommendation**

To Whom It May Concern:

I recently had the pleasure of working with Welsh Commissioning Group on the new 65,000 square foot North West Recreation Center located in Salt Lake City, Utah. This facility is the first of its type in the state to receive the coveted LEED Gold Accreditation and is only the second in the country.

This project has very complex Mechanical Systems that utilizes the excess heat produced from the pool, indirect cooling off the cooling tower, free cooling off the domestic cold water system and many other energy saving concepts requiring a deep knowledge and understanding of mechanical systems.

Shane Doig of Welsh Commissioning Group proved to be just what this project needed. With the many parties involved that are required to make a project like this successful, a high level of communication is required between owners, engineers and construction professionals. Each step of the way Shane kept everyone well informed with his unique ability to bring everyone to the table in a professional manner with the true spirit of a win-win atmosphere while keeping the owners best interest at heart.

Shane will bring a level of expertise and peace of mind to any project that employs him. For these reasons, we anxiously await the time when we have the privilege to work with him again. For any further inquiry about my experience with Welsh Commissioning, feel free to give me a call at 800-921-6324.

Sincerely,

Chuck Zitting,  
Managing Member,  
All States Mechanical, L.L.C.

# Previous Performance

## Letters of Recommendation



STATE OF WASHINGTON  
GENERAL ADMINISTRATION  
ENGINEERING AND ARCHITECTURAL SERVICES  
210 SW 11th Ave, Rm 206 \* PO Box 41012 \* Olympia, WA 98504-1012  
(360) 902-7272 \* Fax (360) 753-2848

March 8, 2007

RE: Letter of Recommendation, Welsh Commissioning Group, Inc.

To Whom It May Concern:

I am pleased to offer this letter of recommendation for Welsh Commissioning Group. WCG provided commissioning services for the Capitol Campus John C. Cherberg Building for which I was the project manager. The project included rehabilitation of the 99,000 square foot historical Senate office building, including full replacement of the HVAC system. WCG provided commissioning on the mechanical systems and some electrical systems.

The State of Washington uses commissioning services to help ensure that facilities and systems meet our operational needs. WCG has been a valuable asset to this project by providing complete and comprehensive commissioning services.

I recommend Welsh Commissioning Group as a competent provider of commissioning services.

Sincerely,

A handwritten signature in cursive script that reads "Richard Price".

Richard Price

Project Manager  
Engineering and Architectural Services

# Previous Performance

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## **Maintaining Budget, Schedule Control and Compliance**

WCG has an excellent record of maintaining our project obligations. We have effectively completed commissioning on projects located across the Western United States. Our project managers have proven their ability to manage many projects simultaneously, and we are committed to supporting our employees with all the necessary resources they may need to work effectively on their projects.

We have extensive experience working with the owner and design team to tailor the work scope to meet their needs and provide a quality commissioning process. Over the years we have developed a proven commissioning process that is effective and efficient. We do not make a research project out of our commissioning activities. Our project managers have extensive facilities related experience so we know what works in the real world.

An important aspect in controlling costs and ensuring a successful commissioning process is to include the commissioning consultant when developing the scope of commissioning services and developing commissioning specifications. This builds in two critical cost control mechanisms. First, allowing the commissioning consultant to work with the design team and owner to determine the scope of systems to be commissioned will narrow the scope to the important systems. Our extensive experience allows us to guide the team through the process and we are careful to listen for problem areas from past experiences of the owner. Second, having the commissioning consultant write the specification allows them to define the role of the contractors in the process. In this way, contractor labor is used optimally for pre-functional test work, start-up and some functional testing, thus reducing the effort required by the commissioning consultant.

An additional tool we have used to maximize commissioning resources is to use available maintenance staff to assist in fieldwork. This is not always an option for the owner, but in any case, we welcome and encourage the maintenance staff to participate or observe during the commissioning process, as it is a good opportunity to learn the new systems.

In summary:

- We utilize a proven process that is efficient and effective.
- We have experienced commissioning agents that can get the job done quickly.
- We are experienced in tailoring the scope of work to focus on critical systems.
- We are experienced in writing specifications to maximize the use of project contractors.
- We will utilize available maintenance staff as appropriate to perform portions of the commissioning tasks.

## Partner, Commissioning Specialist

Mr. Jones brings over sixteen years of expertise in the field of mechanical engineering to his role as Commissioning Specialist at Wilson Jones Consulting. He started his career as a mechanical design engineer specializing in laboratory design. His background also includes construction administration, energy analysis, central plant design, utility distribution, and controls design. Additionally, Mr. Jones has extensive hands on experience working with DDC and unitary equipment controls and TAB verification instrumentation. Mr. Jones has earned a reputation for successful troubleshooting of complex operational issues and for exceeding customer expectations.

## Representative Experience

### 1999 – Present: Wilson Jones Consulting, LLC

Mr. Jones is a partner of Wilson Jones Consulting and a Commissioning Specialist. He works as a project leader and is responsible for carrying out all aspects of commissioning throughout the design, construction, and acceptance phases.

### Savery Hall Renovation, University of Washington, Seattle WA – Commissioning

Savery Hall is one of the original “quad” buildings constructed in the early development of the University of Washington Seattle campus. The building presented significant challenges related to updating the interior for modern programming functions while maintaining the historic nature of the exterior. Many of the new design elements needed to blend into the existing exterior architecture, affecting window selections, door selections, stairways, HVAC system types, and penetrations of the building exterior. In the end, the exterior remained historically intact with some of the interior historic elements giving a clue to the past interior architecture as well. The HVAC system was especially challenging since some level of comfort cooling was to be added without the use of a chiller plant. In the end, a relatively new HVAC configuration was used that exceeded the base energy usage performance criteria for the Seattle Energy Code while providing the desired level of cooling and significantly minimizing the impact to the exterior appearance of the building. Wilson Jones Consulting was hired by the Owner’s Construction Representative to provide Commissioning Authority services, including design reviews, participation in engineering charettes during design, review of major submittals, development/execution of installation audits, integration of commissioning schedule into overall project schedule, oversight of Contractor startup, writing/execution of the functional test procedures, review of the O&M documentation, and oversight of the Owner Training process.

### Select Additional Project Experience:

- Seattle Children’s Hospital Expansion, Phase 1, Seattle, WA, M & E Cx
- UW Medical Center Phase 1 Expansion, Seattle, WA, M & E Cx
- UW J1/J2 Lab Renovation, Seattle, WA, M & E Cx
- Harborview Medical Center Inpatient Expansion Building, Seattle, WA, M & E Cx
- U.S. Naval Station Everett BEQ, Everett, WA, Mech. and elec. Cx, (LEED Gold)
- Epiphany School, Seattle, WA, Mechanical Cx (LEED Silver)
- Whatcom County Children’s Museum, Bellingham, WA, Mech. Cx (LEED Silver)
- U.W. Savery Hall Renovation, Seattle, WA, Mech.I and electrical Cx (LEED Silver)
- U.W. Bagley Hall Consolidated Labs, Seattle, WA, Mechanical and electrical Cx
- U.W. Hagggett Hall, Smoke management special testing agent
- Evergreen Healthcare Expansion, Smoke management special testing agent
- Large Seattle Biotech Bldg E Central Utility Plant, Seattle, WA, Mechanical Cx
- NW Chimpanzee Retirement Sanctuary, Cle Elum, WA, Mechanical design

## Profile

### Education:

Mechanical Engineering,  
Washington State University, 1990

### Work History:

#### 1999–Present

Partner, Commissioning Specialist  
Wilson Jones Consulting, LLC  
Seattle, Washington

#### 2001-2002

Commissioning Specialist  
CDi Engineers

Lynwood, Washington

#### 1994-1998

Mechanical Design Engineer

Affiliated Engineers

Seattle, Washington

#### 1991-1994

Mechanical Design Engineer

D.W. Thomson Consultants Ltd.

Seattle, Washington

### Registration:

Licensed Professional Mechanical  
Engineer - Washington State  
LEED 2.0 Accredited Professional

### Memberships:

Building Commissioning Association  
American Society of Heating  
Refrigeration and Air Conditioning  
Engineers  
American Society of Plumbing Engineers  
Tau Beta Pi Engineering Honor Society

### Areas of Specialty:

Design and controls review.  
Commissioning of complex systems for  
mechanical, low voltage electrical, and  
life safety systems in Hospitals,  
Laboratories and Higher Education  
buildings.  
Coordination of system interfaces.  
Smoke management testing



## Partner, Commissioning Specialist

Mr. Mostajo has over nine years experience in the construction industry. His primary areas of experience include MEP commissioning, DDC controls design, programming and loop tuning and lighting controls. He has experience with commissioning low voltage lighting control systems, emergency power systems and fire alarm integration. Mr. Mostajo is characterized by his peers and clients as being very detailed and conscientious to both Owner and Contractor needs in successfully executing commissioning on both large and small scale projects. He is keenly adept at focusing the commissioning team on critical issue resolution.

## Representative Experience

### 2002 - Present: Wilson Jones Consulting, Commissioning Specialist

Mr. Mostajo is a partner of Wilson Jones Consulting and a Commissioning Specialist. He works as a project leader and is responsible for carrying out all aspects of commissioning throughout the design, construction, and acceptance phases.

#### UW Johnson Hall Renovation, Seattle, WA – M&E Commissioning (Under LEED Review)

The existing Johnson Hall building was constructed in 1930 and underwent a major addition in 1948. The building is home to the Earth and Space science departments for the University of Washington. This project included the complete gutting of the interior of the building, addition of seismic/structural upgrades, and fit-out of the existing spaces with updated facilities, services, and interiors. Nate provided commissioning Test Engineering services, hired by the General Contractor, including design review, commissioning installation audits, start-up plan review, start-up oversight, functional performance test development and execution, O&M documentation review, and Owner training oversight for this project.

#### Stadium High School, Tacoma, WA – M & E Commissioning

This project involved the complete modernization of the historic Stadium High School building and addition of the new Stadium Performing Arts Center. The modernization added all new mechanical, HVAC and electrical systems. The new addition included a new auditorium, basketball courts, classrooms, and offices. The two buildings are connected through an existing pool area in the basement. Great care was taken to repair and maintain the look of the exterior structure. Both the existing high school and the new building are each being served by nine new air handling units and a hot water boiler system. Wilson Jones Consulting was contracted by the Tacoma Public Schools to provide Commissioning Authority services. Nate was the designated CxA and provided design review, construction review, wrote functional performance tests, witnessed mechanical start-up and provided commissioning oversight for this project.

### Additional Project Experience:

- Issaquah High School, Issaquah, WA, M&E Commissioning
- UW Foster School Of Business, Seattle, WA, M&E Commissioning (**LEED Silver**)
- Snohomish High School Modernization, Snohomish, WA, HVAC Commissioning
- Tacoma Gray Middle School, Tacoma, WA M&E Commissioning
- Hyla Office Building, Issaquah, WA, M&E Commissioning (**LEED Silver**)
- U.W. Guggenheim Hall Renovation, Seattle, WA, M&E Commissioning
- Evergreen Hospital Emergency Department Expansion and Patient Tower Facility,
- U.W. QRC Cold Rooms, Seattle, WA Mechanical Commissioning
- University of Washington , Clark Hall M&E Commissioning (**LEED Silver**)
- Whidbey Island NAS Hangar 5, M&E Commissioning
- U.W. EE/CSE Chillers, Seattle, WA, HVAC Retro-Commissioning
- U.W. Conibear Shellhouse, Seattle, WA, M&E Commissioning
- Marion Oliver McCall Opera House, Seattle, WA, DDC Controls
- Qwest Field, Seattle, WA, DDC Controls & HVAC Commissioning
- Mercer Arena Temporary Venue, Seattle, WA, DDC Controls
- Vulcan Corporate Office, Seattle, WA, DDC Design & Integration Commissioning

## Profile

### Education:

Mechanical Engineering,  
United States Military Academy 1994  
West Point, NY

### Experience:

#### 2002–Present

Partner, Commissioning Specialist  
Wilson Jones Consulting, LLC  
Seattle, Washington

#### 1997-2002

Sr. Engineering Specialist  
Siemens Building Technologies  
Seattle, Washington

#### 1997-2002

Field Artillery Officer  
United States Army National Guard

#### 1994-1997

Field Artillery Officer  
United States Army

### Registration:

Mechanical Engineer EIT, New York

### Memberships:

Building Commissioning Association

### Areas of Specialty:

DDC control systems review and integration.  
Commissioning of complex systems for mechanical and low voltage electrical, and fire life safety systems in Hospitals, Laboratories, Educational, and Institutional Buildings.  
Commissioning schedule integration with MEP activities.



## Commissioning Specialist

Mr. Andersen has over ten years experience in the DDC controls and construction industry. His primary areas of experience include WAN and LAN DDC network infrastructures, systems integration, DDC controls design and implementation, programming, loop tuning and lighting controls. Mr. Andersen is certified in industry standard BACnet and Lonworks networks and has extensive experience in Modbus. He has experience with commissioning DDC systems and systems integration. Mr. Andersen is characterized by his peers and clients as being very detailed and knowledgeable in complex DDC systems design, integration and industrial networking. He is viewed as one of the most knowledgeable and skilled DDC technical resources. He has often been requested for technical integration expertise on an international level with projects ranging from Bio-pharma, government, healthcare, educational, research, industrial and high-end office and residential facilities.

## Representative Experience

### 2008- Present: Wilson Jones Consulting, LLC

Mr. Andersen is a Commissioning Specialist at Wilson Jones Consulting. He works as a project leader and is responsible for carrying out all aspects of commissioning throughout the design, construction, and acceptance project phases. One of his great strengths is his technical knowledge and ability to identify solutions to problems.

### New Gray Middle School, Tacoma School District, Tacoma WA- Commissioning

New Gray Middle School is a new construction facility on the former Mt. Tahoma site. It is a 21<sup>st</sup> Century School that combines state of the art technology and it is a Washington State Sustainable Schools Protocol building. The environmentally conscious building design features recycled conditioned beams as well as rain gardens to accept building run off that nurture the school's landscaping. This new site is adjacent to the Metro Parks Southend Recreation Area that will become part of an extensive outdoor activity center. WJC was contracted by the Tacoma Public Schools to provide Commissioning Authority Services. WJC provided design review, construction review, development and testing of comprehensive functional performance tests, mechanical startup oversight and commissioning oversight for this project.

### Project Experience:

- Ft Lewis Firing Range, Ft Lewis WA, M and E Cx (**LEED**)
- Ft Lewis Medical Dental, Phase 1, Ft Lewis WA, M and E Cx (**LEED**)
- Ft Lewis Medical Dental, Phase II, Ft Lewis WA, M and E Cx (**LEED**)
- Ft Lewis Aviation Battalion Dining, Ft Lewis WA, M and E Cx (**LEED**)
- Rocky Mountain Laboratories NIH BSL-4, Hamilton, MT, DDC Integration and Networking Solutions Waste Neutralization, Power Monitoring and High Containment Alarming
- University of Alaska at Fairbanks Power Monitoring, Fairbanks, AK, DDC Integration and Networking
- Lifestpoint Church Lonworks Rooftop units retrofit, Anchorage, AK, DDC Integration
- Providence Hospital Boiler Upgrade, Anchorage, AK, DDC Integration
- Matanuska Telephone Association, Palmer, AK, Networking Support Remote station monitoring
- Washington State University Johnson Hall Boiler and Chiller Upgrade, Pullman, WA, DDC Integration
- Washington State University North Campus Chiller Upgrade, Pullman, WA, DDC Integration
- Lewiston Regional Hospital Chiller Upgrade, Lewiston, ID, DDC Integration
- Micron New Chip Fab Facility, Boise, ID, DDC Integration

## Profile

### Education:

Management Information Systems,  
Washington State University 1998  
Pullman, WA

### Experience:

#### 2008–Present

Commissioning Specialist  
Wilson Jones Consulting, LLC  
Seattle, Washington

#### 2001-2008

District Automation Specialist  
Siemens Building Technologies  
Seattle, Washington

#### 1998-2001

Engineering Specialist  
Siemens Building Technologies  
Seattle, Washington

#### 1991-1998

University Computer Resources  
Washington State University

#### IT Consultant

Washington Credit Union League  
Robert Half Technology

#### Residential HVAC Installer

G&M Mechanical

## Certifications:

BACnet and Lonworks

## Areas of Specialty:

Industrial Networking for wired and wireless technologies.  
DDC network communications analysis and troubleshooting.  
Integrated systems utilizing OPC, BACnet, Lonworks and Modbus.  
Specialty DDC systems design and implementation to meet complex system requirements.



## Commissioning Specialist

Ms. Sanborn brings a mechanical engineering background with a strong interest in energy efficiency to her role at WJC. While working as a Biomechanical Engineer she gained valuable experience in mechanical systems and test equipment. She has worked extensively on all of our VRF projects and fully understands the complications of integrating the control systems into the building DDC. Her experience in manufacturing and Quality Control has honed her skills in systems analysis, organization, and attention to detail. Ms. Sanborn has a strong interest in conservation, energy efficiency, and alternative energy and building design. She is active in several conservation groups in the Pacific Northwest where she continues to expand her knowledge on these topics.

## Representative Experience

### 2009 – Present: Wilson Jones Consulting, LLC

Ms. Sanborn is a Commissioning Specialist and works in all aspects of projects from Project Manager to supportive role with other project managers. She is responsible for carrying out all aspects of commissioning throughout the design, construction, and acceptance phases.

### UW Savery Hall Renovation, Seattle, WA – Commissioning

This 85-year old historic building houses 4 departments at UW and is part of the Liberal Arts Quadrangle, or “the Quad”. As a LEED Gold project, the renovation and restoration of this building includes the installation of a state of the art, extremely energy-efficient Variable Refrigerant Flow (VRF) system to satisfy the building’s heating and cooling needs. Savery Hall also features technology-enhanced learning spaces including four seminar rooms, 14 medium-sized classrooms, and two large auditoriums with advanced lighting controls and A/V systems. Ms. Sanborn provided Commissioning Authority services for the mechanical and lighting systems for this impressive university building.

### UW WDS Building for Early Childhood Oral Health Seattle, WA – Commissioning

The WDS Building for ECOH is a full renovation project (formerly Administration Building 25), located on the western edge of Magnuson Park. The three story facility includes 31 Dental Chairs; 3 Operating Rooms, and a total square footage, including non-clinical usage, of 28,000 square feet. Ms. Sanborn was the project manager for this project providing the Test Engineering services for all systems in this building.

### Additional Project Experience:

- Epiphany School, Seattle, WA, M&E Commissioning (LEED)
- Ft Lewis Medical Dental Phase I, Ft Lewis, WA M&E Commissioning (LEED)
- Bellingham Art Museum, Bellingham, WA, M&E Commissioning
- U.W. HSC Vivarium RR 2<sup>nd</sup> Floor, Seattle, WA, M&E Commissioning
- Issaquah High School, Issaquah WA, M&E Commissioning
- John Muir Elem, Lake WA School District, Kirkland, WA, M&E Commissioning
- Seattle School District, Rainier View Elem. Seattle, WA M&E Commissioning

## Profile

### Education:

Mechanical Engineering, Biomechanics  
Michigan State University, 2002

### Work History:

#### 2009–Present

Commissioning Specialist  
Wilson Jones Consulting, LLC  
Seattle, Washington

#### 2005-2008

Physics & Math Teacher  
U.S. Peace Corps  
Njombe, Tanzania

#### 2004-2005

Quality Control Engineer  
Motion Water Sports, LLC  
Redmond, Washington

#### 2002-2004

Biomechanical Engineer  
Brooks Sports, Inc.  
Bothell, Washington



UW Savery Hall  
Commissioning Authority



UW WDS Building for ECOH  
Commissioning Authority

### Memberships:

Building Commissioning Association  
Building Simulation Users Group  
Seattle Renewable Energy Meetup Group

### Areas of Specialty:

Commissioning of Variable Refrigerant  
Flow Systems  
Coordination of system interfaces  
Occupancy and Daylighting Controls

## Commissioning Authority Approach

Wilson Jones Consulting expertise and our approach to commissioning comes from years of mechanical system and controls system design, years of experience in control system programming and installation, years of systems testing and verification, years of working as contractors and years of hands on commissioning. As design and control engineers, we specialized in complicated buildings such as laboratories and hospitals and we have continued to do so as Commissioning Specialists. We have an acute understanding of the complications of the designers and the contractors. We see ourselves as collaborators. We approach each projects with the mindset of making things easier on all parties. We actively look for solutions and make recommendations where we can see possible improvements. We feel that the best job we can do is to make problems go away before they become big issues. We have a reputation of being good project partners.

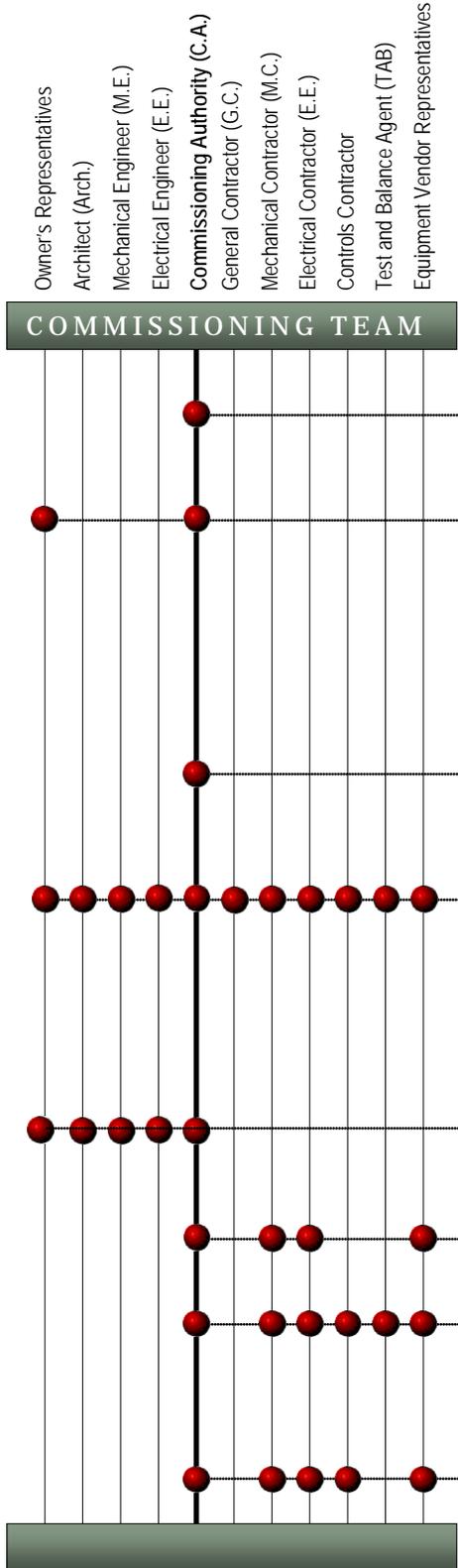
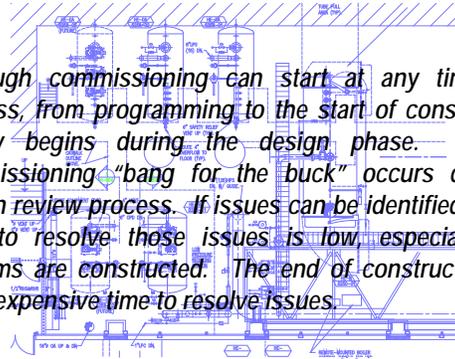
We have commissioned large and small new buildings, large and small renovations and large and small historic renovations. We are always cognizant of the effect our work has on our surroundings and that the buildings that we leave will be used for years to come by people who shouldn't have to worry about the building's basic operations.

Wilson Jones Consulting has acted as Commissioning Authority for many of the major projects in the Puget Sound area, including many LEED™ projects. For ease of explanation, we have developed a set of documents that tabulates our approach to commissioning and the services that we specialize in and regularly provide as Commissioning Authority, as well as the requirements for the Seattle Energy Code, the LEED™ Commissioning prerequisite credit, and the LEED™ Commissioning additional credit. The first three pages outline the Commissioning process from design phase through acceptance phase. The last page outlines the LEED™ requirements.

# DESIGN PHASE

## THE COMMISSIONING PROCESS

Although commissioning can start at any time in the process, from programming to the start of construction, it ideally begins during the design phase. The best commissioning "bang for the buck" occurs during the design review process. If issues can be identified early, the cost to resolve these issues is low, especially before systems are constructed. The end of construction is the most expensive time to resolve issues.



### DEFINE COMMISSIONING APPROACH

- **Commissioning Plan:**  
The commissioning authority prepares a commissioning plan that outlines how the process will be implemented for the project and what everyone's roles and responsibilities will be.
- **(Optional) Identify Owner's Personnel Participation:**  
Owner identifies engineering/maintenance personnel for participation in the commissioning process as a way to incorporate early owner training and to help the owner's staff "learn" the systems before occupancy. This helps to create a smooth operational transition during turnover of these systems to the owner.

### COMMISSIONING DESIGN INTENT

- **Project Documents Review:**  
The commissioning authority reviews the A/E's "basis of design" and the design drawings/specifications during DD, CD and Bid phases with an emphasis on design aspects that may affect performance or maintainability of equipment and systems.
- **Design Intent Clarification Meeting:**  
After review of the project documents, the commissioning authority holds a "design intent clarification meeting" with the A/E and contractor's team to ensure that the A/E and contractor agree on the design intent and how it is to be implemented. The meeting will be broken up by discipline for efficient participation of the team.

### COMMISSIONING DOCUMENTS PREPARATION

- **Commissioning Specifications:**  
The commissioning authority prepares commissioning Specifications for inclusion into the project construction documents, coordinating with the Owner and the design team.
- **Installation Audit Forms:**  
The commissioning authority prepares the installation audit forms with assistance from the contractors and equipment vendors.
- **Startup Plan:**  
The commissioning authority prepares the startup file. The startup file includes a list of all the specified contractor-performed startup testing requirements. The commissioning authority will gather blank equipment startup forms and startup plans from the pertinent contractor and incorporate them into the startup file along with a commissioning/startup schedule.
- **System Manuals and Functional Performance Test Forms (SM & FPT's):**  
The commissioning authority prepares the Systems Manuals and the Functional Performance Testing forms. These forms provide a step-by-step procedure for ensuring that the systems meet their design intent through their various operating modes. The equipment vendors may be required to assist where proprietary unit controls are provided. Development of these documents continues into the Construction Phase

# CONSTRUCTION PHASE



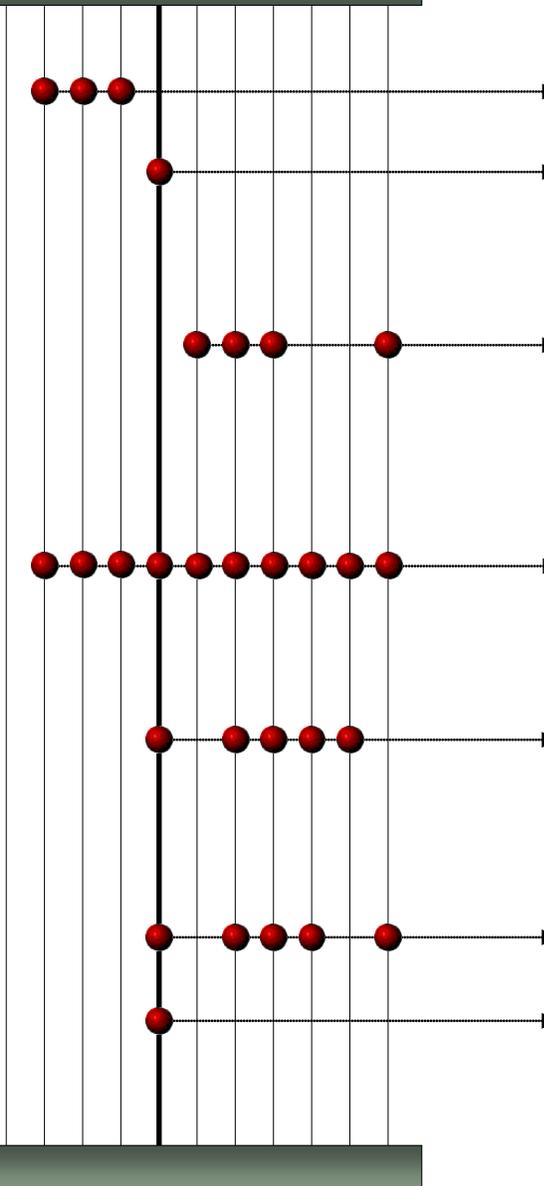
## THE COMMISSIONING PROCESS

Owner's Representatives  
 Architect (Arch.)  
 Mechanical Engineer (M.E.)  
 Electrical Engineer (E.E.)  
**Commissioning Authority (C.A.)**  
 General Contractor (G.C.)  
 Mechanical Contractor (M.C.)  
 Electrical Contractor (E.E.)  
 Controls Contractor  
 Test and Balance Agent (TAB)  
 Equipment Vendor Representatives

*WJC advocates startup oversight as an integral part of the commissioning process. Past experience has shown us that success in this task can lead to the difference between a smooth, efficient commissioning process, and a long, drawn-out commissioning process. The startup activities often bring to light operational issues that are not readily apparent from the design documents or equipment submittals.*



### COMMISSIONING TEAM



#### INSTALLATION AUDITS

- **A/E Punchlist:**  
The A/E team performs their normal punchlist site observations in order to point out areas of installation that do not conform to the design documentation.
- **Installation Audits:**  
As the equipment and systems are installed, the commissioning authority will perform regular site visits called installation audits. These audits are separate from the A/E team's punchlist in that they concentrate on areas of installation that will affect equipment or system maintenance and operation. The installation audits also serve as a prerequisite to functional performance testing, ensuring that the systems are ready for testing.
- **Deficiency Corrections:**  
The Contractor will be required to resolve issues found during the installation audits in a timely manner so that functional performance testing can take place.

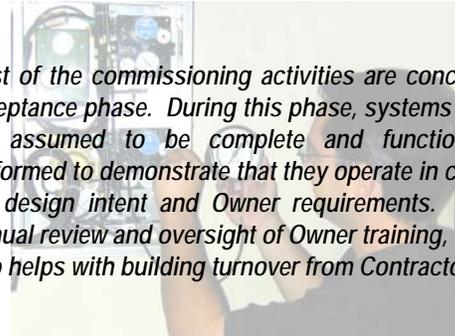
#### EQUIPMENT/SYSTEM STARTUP

- **Commissioning Meetings:**  
When the construction has progressed far enough to allow for equipment and system startups, the commissioning authority will start to lead weekly commissioning meetings. At a minimum, the commissioning authority, general contractor, mechanical contractor, electrical contractor, and controls contractor will be required to attend. The TAB contractor, equipment vendors, mechanical engineer, and electrical engineer may be requested to attend as needed.
- **System Startup Activities:**  
The contractors perform the required systems startup activities according to the startup plan. The commissioning authority will randomly spot witness the piping and ductwork leakage testing. The commissioning authority will witness all of the piping flushing/cleaning/passivation startup activities as well as sanitization activities. The commissioning authority will randomly spot witness the DDC point to point testing. If desired, the commissioning authority will conduct TAB back-checks to verify confidence in the preliminary TAB report values.
- **Equipment Startup Activities:**  
The contractors perform equipment startup as specified or required to make the equipment operational. The commissioning authority witnesses equipment startup.
- **Startup Binder:**  
The commissioning authority gathers the completed startup documentation and compiles them into the startup binder.

# ACCEPTANCE PHASE



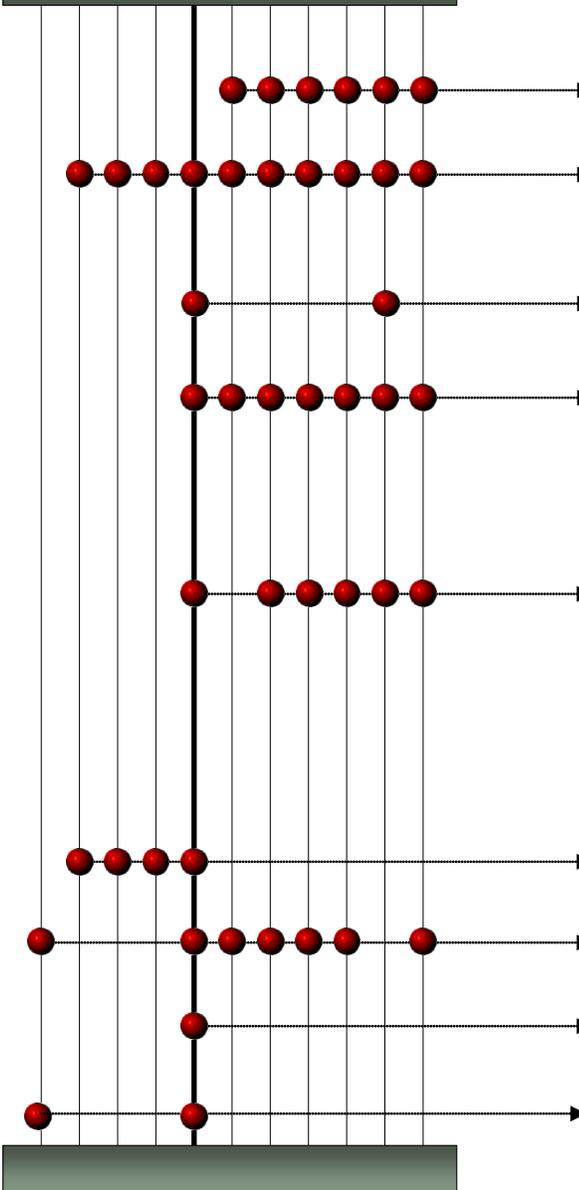
## THE COMMISSIONING PROCESS



Most of the commissioning activities are concentrated in the acceptance phase. During this phase, systems and equipment are assumed to be complete and functional testing is performed to demonstrate that they operate in compliance with the design intent and Owner requirements. Through O&M Manual review and oversight of Owner training, commissioning also helps with building turnover from Contractor to Owner.

- Owner's Representatives
- Architect (Arch.)
- Mechanical Engineer (M.E.)
- Electrical Engineer (E.E.)
- Commissioning Authority (C.A.)
- General Contractor (G.C.)
- Mechanical Contractor (M.C.)
- Electrical Contractor (E.E.)
- Controls Contractor
- Test and Balance Agent (TAB)
- Equipment Vendor Representatives

### COMMISSIONING TEAM



### FUNCTIONAL PERFORMANCE TESTING

- **Commissioning Prerequisites Fulfilled:**  
All functional performance testing prerequisites have been completed including installation audits, startup, DDC pt to pt testing/programming, and TAB.
- **Commissioning Meetings Continued:**  
The commissioning authority continues to lead weekly commissioning meetings to keep all parties informed on the progress of commissioning and to allow for discussions regarding resolution to deficiencies found during installation, startup, and functional testing.
- **TAB Backchecks (optional)**  
The commissioning authority participates in the 10% TAB backchecks for the air and water balancing with assistance from the controls and TAB contractors.
- **Functional Performance Testing:**  
The Commissioning Authority leads the systems functional performance testing with assistance from the mechanical contractor, electrical contractor, controls contractor, TAB contractor, and equipment vendor technicians as necessary. Issues found during this testing must be corrected quickly by the team in order to finish most testing before building occupancy. The commissioning authority distributes commissioning progress reports for testing status of each system.
- **Seasonal Testing:**  
Some testing will require favorable outside weather conditions or building occupancy conditions to exist in order to be performed. This seasonal testing takes place as those conditions are met in order to finish the functional performance testing.

### SYSTEMS TURNOVER TO OWNER

- **O&M Documentation Review:**  
The commissioning authority and A/E review O&M manuals prepared by the contractors for completeness, content, usability, and organization.
- **Owner Training Plan and Oversight:**  
The commissioning authority prepares the owner training plan. C.A. oversees owner training by contractors and equipment vendors per the specifications.
- **Final Commissioning Report and Re-commissioning Manual:**  
The commissioning authority prepares the final commissioning report and re-commissioning manual and recommends final acceptance of the systems to the Owner.
- **Post Occupancy Review:**  
The commissioning authority conduct a post occupancy review with the Owner to ensure continued building optimal operations.

## LEED COMMISSIONING MATRIX

The following matrix details the normal commissioning activities that we perform, the Seattle Energy Code requirements, the LEED Commissioning prerequisite credit requirements, and the LEED Commissioning additional credit requirement.

COMMISSIONING ACTIVITIES	WJC TYPICAL COMMISSIONING ACTIVITIES	SEATTLE ENERGY CODE COMMISSIONING REQUIREMENTS	LEED EA.P1 FUNDAMENTAL COMMISSIONING REQUIREMENTS	LEED EA.C3 ENHANCED COMMISSIONING REQUIREMENTS
<b>DESIGN PHASE</b>				
3 <sup>rd</sup> - Party, Independent Commissioning Authority	✓		✓	✓
Commissioning Specification Integration (by CA or Others)	✓		✓	
Review Owner's Project Requirements/Basis of Design Documentation	✓		✓	✓
Design Review – Prior to Mid-Construction Documents	✓			✓
Design Review – Construction Documents/Pre-Bid	✓			
<b>CONSTRUCTION PHASE</b>				
Develop and Utilize Commissioning Plan	✓	✓	✓	
Conduct Design Intent Meeting with Subcontractors	✓			
Develop Installation Audit Forms and Execute	✓		✓	
Submittal Review of Commissioned Systems	✓			✓
Develop and Integrate Commissioning/Startup Schedule	✓			
Develop Startup Plan and Execute Startup Oversight	✓			
Lead Regular Commissioning Meetings	✓			
Maintain a Running Issues Log	✓			
Distribute Commissioning Progress Reports	✓			
<b>ACCEPTANCE PHASE</b>				
Tab Verification	✓			
Functional Performance Testing (FPT)	✓	✓	✓	
Smoke Control Testing (where applicable)	✓			
Owner Training Oversight	✓	✓		✓
O&M Documentation Review	✓	✓		
Preliminary Cx Report (Required For CO)	✓	✓		
LEED Form Confirming Cx Credit Completion			✓	✓
<b>POST-ACCEPTANCE</b>				
Final Commissioning Report	✓	✓	✓	
Development of Systems Manual	✓			✓
Off Season Functional Performance Testing	✓	✓		
Near Warranty End Review/Lessons Learned Meeting	✓			✓

## RELEVANT EXPERIENCE

Buildings	New-Commissioning	Retro-Commissioning	Re-Commissioning	LEED	*Renovation-Commissioning
Hospital/Medical	7	1		2	4
Education Facilities**	16	1		9	10
Laboratories	4		2		8
Prisons	2				
Sports Facilities	1	1			1
Court		1			
Industrial	4	1	1	1	
Housing	2	1			1
Office Buildings	1	1		2	1
Museums	1	1		1	
Hotel	1				
Military		1		1	

\*Renovation Commissioning: WJC has commissioned numerous existing buildings that were gutted and retrofit with new building systems. These buildings include the historic Tacoma Stadium High School and many University Washington Campus buildings whose interiors were modernized but the integrity of their exterior was respected.

\*\* We have or are currently commissioning many schools that are not LEED projects but are Washington State Sustainable Schools

### New LEED Building Commissioning

*A description of one of our New Building projects which is also a LEED project:*

#### **Epiphany School K-5**

Seattle, WA

Completion Date: 2010  
 Construction Cost: \$11,000,000  
 Size: 28,000 sqft.  
 Reference - Contact: Dana Warren (206) 749 -9484  
 Staff Involved: Ed Jones, Sandy Andersen, Jessica Sanborn



**Project Description:** This project involves the construction of a new 28,000 square foot lower elementary school in downtown Seattle to expand the current Epiphany School. This venture adds 17,500 sqft. of new classroom space as well as 10,500 sqft. within a new parking structure. The project has a very strong emphasis towards green building and sustainability.

**Services Provided:** Wilson Jones Consulting, LLC was hired by the Owner to provide Commissioning Services. WJC was responsible for the development and execution of the installation audits, start up oversight and functional performance testing. WJC also developed the commissioning plan, commissioning specifications, 100% DD review for LEED™, and 95% DC review for LEED™. During the construction phase, WJC kept and updated a commissioning issues matrix, led weekly commissioning meetings, produced the re-commissioning systems manual for LEED™, provided oversight of the Owner training, reviewed the O&M documentation, and conducted a “near end of warranty” review for LEED™.

**Systems Tested:** (1) ground source loop and circulation pump system, (7) radiant floor heating systems, (1) rooftop air handling unit, (2) heat recovery units, (1) split system A/C unit, (26) solar exhaust fan systems, (2) CO2-controlled garage exhaust fan systems, (1) mechanical room ventilation fan, (2) toilet room exhaust fan systems, and lighting control systems.

### Retro-Commissioning

*A description of one of our Retro-Commissioning projects:*

#### **Athletic Facility – University of Washington**

**Bank of America Arena**

**Formerly the Hec Edmundson Pavilion**

Seattle, WA

Completion Date: 2001

## RELEVANT EXPERIENCE

Construction Cost: \$39M  
 Size: 250,000 sq.ft.  
 Reference - Contact: Bob Dillon, Owner CM, (206) 685-6745  
 Staff Involved: Ed Jones, Cindy Wilson

**Project Description:** Originally constructed in 1927, the Hec Edmundson Pavilion underwent a major renovation. The 9,000-seat arena is home to the University of Washington Husky basketball teams. Objectives of the project were to increase seating capacity, remove interior columns for unobstructed views, and improve the ventilation systems. The functions of the building include the sports arena, concessions, practice courts, gymnastics facilities, band rooms, locker rooms, a sports medicine clinic, coaches' offices, and meeting rooms.

**Services Provided:** WJC was sub-contracted by the General Contractor to provide Test Engineer services. WJC provided a commissioning plan, performed design reviews, assisted in establishing the operational basis of design, wrote/executed functional performance tests, conducted weekly commissioning meetings, and assisted in the resolution of mechanical system operational problems.

**Systems Tested:** DDC control system, 2 air-cooled chillers, 17 air handling units, 3 run-around loop heat recovery systems, 5 exhaust fans, 1 make-up air unit, 6 fan-coils, 3 unitary air conditioning units, 3 steam unit heaters, 50 duct hot water coils, 2 steam heating hot water converters, 3 steam condensate receivers, 2 steam-fired domestic water heaters, arena smoke control system, DDC/Fire Alarm System interface operation, and Seattle Fire Department testing.

### Re-Commissioning

*A description of one of our Re-Commissioning projects:*

#### **Laboratory – University of Washington Asbury Lab** Seattle, WA

Completion Date: 2006  
 Construction Cost: N/A  
 Size: 800 sq.ft.  
 Reference Contact: Troy Stahlecker, Owner PM, (206) 616-5609  
 Staff Involved: Ed Jones



**Project Description:** Asbury Laboratory is a critical temperature laboratory environment whose purpose is to study the faint energy levels of micro-biological entities. As such, it is critical to maintain the measuring surfaces within the lab free of ambient energy fluctuation. Such as, vibration, air traps from HVAC and temperature variations. This requires a very sophisticated HVAC system to minimize these ambient energy disruptions.

**Services Provided:** When Wilson Jones was first contacted regarding this project, the laboratory had been in operation for approximately one year, Although the project had been commissioned when first built, the first commissioning report indicated that the HVAC systems would only maintain the room temperature for a short period of time before drifting out of range. During this time period the existing HVAC were unable to maintain the required environmental conditions. Wilson Jones Consulting was hired by the owner to provide re-commissioning of the existing HVAC system to determine which part of the system was working and which parts needed improvement. Responsibilities included review of existing design documents, field survey of equipment installation & operation, re-design of the HVAC equipment and follow-up commissioning to verify system performance.

**Systems Tested:** Single zone DX cooling air handling units with SCR controlled variable electric heating coil and room temperature controls.

### LEED Commissioning

*A description of one of our LEED projects*

#### **Naval Station– Everett BEQ** **(Bachelor Enlisted Quarters)** Everett, WA

Completion Date: Spring, 2009  
 Construction Cost: \$61M  
 Size: 64,000 sq. ft.  
 Reference - Contact: Steve Bragg, Contractor MEP, (206) 286-6697  
 Staff Involved: Ed Jones, Cindy Wilson



## RELEVANT EXPERIENCE

**Project Description:** This project involves the construction of a 128 apartments approximately 900 sq. ft. in a new facility on the Naval Station in Everett, WA. This project is working towards achieving LEED™ Gold Level.

**Services Provided:** WJC is providing LEED™ commissioning Authority services. WJC provided design review, developed/performed commissioning installation audits, developed startup plan and provided startup oversight, integration of commissioning schedule into overall project schedule, developed/performed commissioning functional performance testing, provided O&M documentation review and oversight, and provided Owner training oversight for this project.

**Systems Tested:** Elevators, waste chutes, landscape irrigation, fire alarm, fire sprinklers, egress lighting fixtures and signage, fire dampers, fire doors, chilled water systems, heating hot water systems, make up air/ heat recovery units, air handling units, exhaust fans, unit heaters, fan coil units, air terminal units, emergency ventilation system, variable frequency drives, building automation system, domestic hot water systems, trap primer systems, sump pumps, plumbing systems, electrical power systems, and electrical low voltage systems.

### **Renovation Commissioning**

*A description of one of our Renovation Commissioning projects*

#### **University of Washington Savery Hall Renovation**

Seattle, WA

Completion Date: 2009  
 Construction Cost: \$61M  
 Reference - Contact: Mark Sweeters, Owner CM, (206) 391-66364  
 Staff Involved: Ed Jones, Jessica Sanborn



**Project Description:** This project is a complete renovation and restoration of Savery Hall on the University of Washington Campus. The project is a full exterior restoration and complete redesign of the interior spaces. The work involves upgrades to its mechanical, electrical, seismic systems, interior layout, life safety, and accessibility. These upgrades and correction to other code deficiencies will ensure the long preservation of this 85-year old campus building on the Liberal Arts Quadrangle. The projected work achieved LEED™ Gold level requirements.

**Services Provided:** WJC was hired by the Owner to provide LEED™ Commissioning Authority services. These services included design reviews, reviewing major submittals, development and execution of installation audits, integration of commissioning schedule into overall project schedule, oversight of Contractor startup, writing and overseeing the execution of the functional test procedures, review of the O&M documentation, and oversight of the Owner Training process.

**Systems Tested:** (144) variable refrigerant flow systems including (12) outdoor unit zones, (1) heat recovery ventilation air handling unit, (3) natural ventilation wind tower systems with powered exhaust fan backup and occupant-interface controls for window operation (red light/green light control), (3) miscellaneous exhaust systems, (1) split system air conditioning unit, (5) unit heaters, (1) domestic hot water heating system, (4) sump pumps, trap primers, classroom AV controls, lighting controls, building DDC system controls, and emergency power systems including egress lighting.

### **Commissioning Activities:**

**Maintaining Commissioning Schedules:** We work with all of the Contractors and Owners on all of our project to integrate commissioning activities in detail into the overall project schedule. We often see Commissioning set up as a single task at the end of a project. We work carefully to incorporate our activities into the project schedule to be completed as soon as possible. We look for milestones such as permanent power, start up activities, point to point testing and TAB as guides. We discuss schedule opportunities at all of our commissioning meetings, which usually occur weekly usually about a month prior to equipment start up.

**Working with Sub consultants:** Some of our projects require us to hire sub consultants. Lately, this has largely been in the area of Building Air Barrier Testing. We coordinate their schedule into our commissioning schedule and make sure to keep information flowing to them as necessary so that they can complete their work.

**Establishing Commissioning Criteria:** Often times we will start working on a project early in the DD phase of design. Since we do not know the final commissioning scope required at that time, we sometimes will start out with a design phase contract and then negotiate a construction and acceptance phase contract as an addition to the design phase contract. Otherwise we make a best guess about final design equipment and adjust our contract accordingly once the design is finalized. We break out our pricing so that the Owner can see what each task costs for each piece of equipment. We will itemize additional tasks for enhanced commissioning for LEED, for example. We also sometime will prioritize tasks and systems so that the Owner can see which tasks are required by the energy code, which tasks are good practice to perform and which tasks are just nice to have done but maybe not necessary.

## Sample Project Experience

### University of Washington Medical Center Expansion, Phase 1 Seattle, WA

**Completion Date:** 2009-2012  
**Construction Cost:** \$104,000,000  
**Size:** 263,000 sqft.  
**Reference Contact:** Joel Matulys - Project Manager (206)-221-4232  
**Staff Involved:** Ed Jones, Commissioning Authority  
 Jessica Sanborn, Cindy Wilson- Commissioning Support



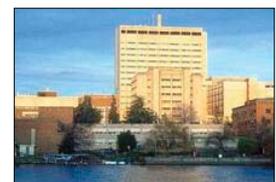
**Project Description:** The project programmed, designed and is constructing a new building addition directly south of the Medical Center's Pacific Tower on Columbia Road. The project includes a five-level hospital addition of approximately 173,000 gross square feet (GSF), including a complete mechanical/electrical interstitial level, mechanical basement, and penthouse spaces and substantial on-site emergency power, chilled water, and oxygen system infrastructure. This phase will provide a new 50-bed Neonatal Intensive Care Unit (NICU), a 32-bed adult surgical oncology unit, acute care nursing units, diagnostic imaging expansion, shelled space for eight future operating rooms, a reconfigured loading dock, and mechanical and electrical infrastructure for current and future expansion needs.

**Services Provided:** WJC is providing full building commissioning services.. WJC is providing design review, developing commissioning specifications, basis of design documentation, commissioning installation audits, startup oversight, commissioning functional performance testing , O&M documentation review, Owner training oversight, and general commissioning oversight for the project.

**Systems To Be Tested:** Emergency lighting and signage, fire alarm system, combination fire/smoke dampers and fire doors, fire sprinklers, stairwell shaft pressurization, elevator shaft pressurization, active smoke control, ductwork distribution systems, steam and condensate systems, heating hot water systems, chilled water systems, heat recovery system, supply air handling unit systems, general exhaust heat recovery air handling systems, isolation room exhaust fan systems, chiller room ventilation and emergency purge systems, mechanical room ventilation system, main electrical room ventilation system, loading dock exhaust fan, MRI ventilation and purge exhaust system, fan coil units, hot water unit heaters, room level HVAC, DDC controls commissioning, domestic hot water and preheat systems, fuel oil systems, lighting control systems, emergency power systems, blackout and recovery test.

### University of Washington Magnuson Health Sciences 6th Floor and RR Wing Renovations Seattle, WA

**Completion Date:** 2011  
**Construction Cost:** \$29,000,000  
**Size:** 20,000 sqft.  
**Reference Contact:** Troy Stahleker - Project Manager (206)-616 5609  
**Staff Involved:** Ed Jones, Commissioning Authority



**Project Description:** This project consists of two separate areas within the University of Washington Health Sciences Center. It was originally set up as two projects but resulted in combining the 6th floor and RR- Wing into a single project to optimize construction overhead. This combined project resulted in the renovation of approximately 20,000 square feet of current vivarium research laboratories for the University's Comparative Medicine department. The projects are intended to upgrade these facilities to better comply with current AAALAC standards as well as reprogram the spaces to better suit the current usage. The infrastructure is being replaced and re-designed with redundant systems and attention to greatly improving environmental conditions within the spaces.

**Services Provided:** WJC was hired by the Owner to act as the Commissioning Authority for the project. Services provided included multiple design phase reviews, development of a full set of commissioning specifications, development of a commissioning systems manual document, conducting installation audits, overseeing contractor startup and testing, leading and conducting functional performance testing, review of O&M documentation, oversight of Contractor's owner training, tracking commissioning issues, and leading weekly commissioning meetings.

*Systems Tested:* (2) custom animal environmental monitoring systems for AAALAC reporting and monitoring including integration to existing campus DDC controls system, (4) steam to heating hot water converters, (2) chilled water systems, (2) steam preheat systems with “Wing” coils, (2) run-around heat recovery loop systems, (4) 100% outside air supply air handling units, (4) general exhaust/heat recovery air handling units, (1) BL-2 room and exhaust fan system, and (2) animal watering systems.

**University of Washington J1/J2 Renovation  
Seattle, WA**

*Completion Date:* 2011  
*Construction Cost:* \$21,000,000  
*Size:* 25,000 sqft.  
*Reference Contact:* Troy Stahleker - Project Manager (206)-616 5609  
*Staff Involved:* Ed Jones, Commissioning Authority



*Project Description:* The project involved the renovation of the existing J Wing, University of Washington, School of Medicine, Department of Microbiology laboratory. The project updates the lab research, academic and support areas to improve the space and provide a better more cohesive environment for personnel and a more modern space for collaborative research.

*Services Provided:* WJC was hired by the Owner to act as the Commissioning Authority for the project. Services provided included multiple design phase reviews, development of a full set of commissioning specifications, development of a commissioning systems manual document, conducting installation audits, overseeing contractor startup and testing, leading and conducting functional performance testing, review of O&M documentation, oversight of Contractor’s owner training, tracking commissioning issues, and leading weekly commissioning meetings.

*Systems Tested:* (6) Existing 100% OSA Supply air units, (1) New General Exhaust unit, (2) air cooled rooftop chillers, bio-safety cabinets, fume hoods, emergency showers, trap primers, lab gas cross connection, lab pressurization, split system heat pump, dual duct air terminal units.

**Harborview Medical Center - Inpatient Expansion Bldg.  
Seattle, WA**

*Completion Date:* 2008  
*Construction Cost:* \$145,000,000  
*Size:* 240,000 sqft.  
*Reference Contact:* Joel Matulys - Project Manager, (206) 221-4232  
*Staff Involved:* Ed Jones Commissioning Authority  
 Cindy Wilson Commissioning support



Photo rendering by NBBJ

*Project Description:* This project consisted of the building of an 11-story high rise inpatient building located on the existing Harborview Medical Center (HMC) campus. The new building houses a new ICU, patient bed floors, central sterile, surgery suites, and clinics. The new building connects to the existing East hospital wing through a 6-story skybridge, housing offices and sleeping quarters.

*Services Provided:* WJC provided full building commissioning services including architectural, mechanical, and electrical systems commissioning. WJC provided design review, developed commissioning specifications, basis of design documentation, commissioning installation audits, startup oversight, commissioning functional performance procedures and testing, O&M documentation review, Owner training oversight, and general commissioning oversight for the project.

*Systems Tested:* Building envelope (IR testing), pneumatic tube system, fire alarm, fire sprinklers, shaft pressurization systems, active smoke control system, DDC control system, high pressure (100 psig) steam system, medium pressure (60 psig) steam system, low pressure (15 psig) steam system, (2) condensate pumps, (30) steam traps, (4) steam to heating hot water converters, (4) heating hot water distribution pumps, run-around loop heat recovery system including (2) heat recovery pumps, auxiliary condenser water system including (4) distribution pumps and (3) plate/frame heat exchangers, central chiller plant including (4) chillers, (2) cooling towers, and (10) distribution pumps, (6) central supply air handling units, (6) central general exhaust air handling units, (2) isolation room exhaust fans, (1) chiller room ventilation and emergency purge fan system, (5) miscellaneous exhaust fans, (4) air conditioning units, (400) air terminal units including supply/exhaust tracking controls, (4) stairwell pressurization fans, (6) elevator shaft pressurization fans, (1) active smoke control system, (1) domestic water booster skid, (2) 15,000 gal. underground fuel oil storage tanks and control system, (33) reduced pressure backflow preventers, (6)

steam-fired domestic hot water heaters, (2) medical air compressors, (2) medical vacuum pumps, (1) building air compressor, (1) DI pure water skid system.

**University of Washington Dental Services Building for Early Childhood Oral Health  
Seattle, WA**

*Completion Date:* 2010  
*Construction Cost:* \$13,500,000  
*Size:* 28,000 sqft.  
*Staff Involved:* Jessica Sanborn – Test Engineer



*Project Description:* This project is a substantial renovation of building 25 of Magnuson Park. The remodel will house clinical services for the University of Washington School of Dentistry Pediatric Dental Program which anticipates serving 30,000 patients in the first year of operation. The facility will be equipped with 31 dental exam chairs and three operating rooms. The historical building consists of a basement, two floor levels, and a smaller 3<sup>rd</sup> floor area which houses offices and administrative areas. Although the building will be outfitted with state-of-the-art mechanical and electrical systems, careful attention has been taken to preserve the historical integrity of the exterior appearance of the building.

*Services Provided:* WJC provided full test engineering services including writing and conducting, commissioning installation audits, startup oversight, commissioning functional performance testing, O&M documentation review, Owner training oversight, and general commissioning oversight for the project.

*Systems Tested:* Piping Distribution System, Domestic Hot Water Heater Equipment and Systems, Medical Vacuum Equipment and Systems, Trap Primers, Medical Air Equipment and Systems, Ductwork Distribution Systems, VRF System, Air Handling Units with integral heat pipe recovery and natural gas-fired furnaces, 58 manifolded refrigerant heat recovery fan coil units, exhaust fans, supply fans, air conditioning units, electric wall-mounted heaters, Building Automation System, Interfaces to Fire Alarm Systems, LV Lighting Relay Control Panels, Occupancy Sensors, Photocell Sensors, LV Light Switches, Building Power Loss, and Emergency Power.

**University of Washington Husky Union Building  
Seattle, WA**

*Completion Date:* 2012  
*Construction Cost:* \$128,0500,000  
*Size:* 260000 sqft.  
*Staff Involved:* Nate Mostajo



*Project Description:* The project involves the renovation of the existing Husky Union Building to create and enhance spaces, programs, and services to foster community engagement and offer opportunities for students, faculty, staff, alumni, and other members of the campus community to experience, appreciate, celebrate, and revere their interactions with the University of Washington.

*Services Provided:* WJC is providing comprehensive LEED commissioning services including, design reviews, commissioning plan development, commissioning installation audits, start up oversight, commissioning functional performance testing, O&M documentation review and owner training oversight, providing system manuals and near end review to meet LEED requirements and to ensure the best operating building possible.

*Systems Tested:* Chilled water systems, heating water system, heat recovery systems, air handling systems, exhaust air systems, room level systems including terminal units and fan coil units, natural ventilations systems, kitchen exhaust systems, miscellaneous plumbing systems, Low voltage electrical and lighting systems, intersystem operations including fire alarm testing.

## PROXIMITY

Wilson Jones Consulting office is located at 1530 Westlake Ave. North, Seattle, WA 98109. We maintain a mail box at 2442 NW Market Street, Seattle, WA 98107.