




## STATEMENT OF QUALIFICATIONS

### CORPORATE HISTORY AND STRUCTURE

Chelsea Group, Ltd. is a building sciences consulting firm with specialties in mechanical systems, energy management, and indoor environmental quality. Chelsea Group was formed in 1990 to assist clients in applying building science to protect and enhance the value of their real estate holdings.

The firm and its principals have worked extensively in HVAC, central plant, and BAS assessment, design, construction oversight, and commissioning in Hawaii since 1994. Major current and recent projects in Hawaii include The Queen's Medical Center (QMC), Campbell Square, Pearlridge Uptown Mall, and Waterfront Plaza. Significant metering, monitoring, and automation projects have also been implemented by Chelsea Group at QMC (central plant optimization), Financial Plaza of the Pacific (Bank of Hawaii, central plant benchmarking), and 10 other properties across the State.



*Chelsea Group, dedicated to the art of building science. Providing practical solutions for existing buildings by applying science and technology.*

Chelsea Group began its history in Chicago, and has implemented significant projects on the Mainland in energy management and sustainability. Chelsea Group expanded to a national presence and, in 2004, completed the shift of its leadership to Hawaii, serving the rest of the country through virtual office operations. In 2017, the company is Hawaii-based and staffed, with the majority of its work taking place in the Islands.

Chelsea Group is an Illinois corporation registered as a foreign corporation in Hawaii. Administrative and executive functions of the company are provided from offices in Maunaloa, Hawaii. The firm's base of operation is located in downtown Honolulu.

### SCOPE OF SERVICES

Chelsea Group provides building science consulting to its clients in Hawaii. Specific service offerings include:

- Assessment of conditions and opportunities in existing buildings
  - Mechanical and related equipment condition, efficiency, and anticipated service life
  - Energy performance and improvement potentials
  - Sustainability performance and improvement potentials
  - Conditions for certification for ENERGY STAR® and LEED
- Planning and design of upgrades and retrofits
  - HVAC engineering for replacement or upgrades of existing central plant, air handling, distribution, and related ancillary systems
  - Application of state-of-the-art technology where appropriate to achieve reliability, efficiency, and other operational goals
  - Implementation strategies for existing buildings to minimize impacts on ongoing operations
  - Integrated construction documents for bidding, permitting, and implementation
- Construction oversight
  - Construction sequence planning and job site logistics, especially for occupied buildings

- Contractor prequalification, procurement strategy, and assistance to owners in bidding based on construction documents
- On-site presence to minimize the potential for change orders, including observation of contractor compliance to design, budget, schedule, and quality of workmanship
- Owner's representative functions in the administration of construction projects
- Commissioning (Cx), retrocommissioning (RCx), and continuous commissioning (CCx)
  - Integrated Cx function in the development and implementation of projects
  - Investigation and oversight of implementation of RCx opportunities
  - Functional performance testing and oversight of Test, Adjust, Balance (TAB) work
  - Continuous commissioning for dynamic compliance with specified conditions and performance
- Certification assistance related to building performance
  - Planning and oversight of applications for LEED Certification by the US Green Buildings Council
  - Investigation and application for ENERGY STAR Certification by the USEPA

## REPRESENTATIVE DESIGN AND REPLACEMENT OF HVAC SYSTEMS

Chelsea Group and its principles have a long track record in the design and replacement of HVAC systems for commercial real estate, universities, and healthcare facilities. For the past 30 years, George Benda, the company's CEO, and Dave Munn, PE, the company's Senior Engineering Advisor, have led teams in the assessment, design, construction, and commissioning of major HVAC capital programs throughout the United States.

The current flagship HVAC project for Chelsea Group is an ongoing multi-year project to replace the air handling and ventilation systems for the patient wings of The Queen's Medical Center (QMC) in Honolulu, Hawaii. Chelsea Group, which prides itself on sustaining long-term client relationships, initiated work with QMC in 2008 with a project that evaluated the operating room (OR) air handling units. The recommended revised control strategies that have successfully extended the life of those systems – buying time for a well-planned replacement program. A series of successful similar projects ensued, including targeted problem solving in air systems and optimization of central plant operations.

Based on those successes, in 2013, Chelsea Group was engaged by QMC to conduct an assessment of all exhaust systems in Queen Emma Tower. Using robotics to find and document operational challenges, Chelsea Group identified necessary improvements to provide trouble-free operation of the systems over the long term. Success in the exhaust system project resulted in a request from QMC for Chelsea Group to evaluate the supply and outdoor air components of the HVAC systems in Queen Emma Tower and the Pauahi Wing. The combined result of the exhaust and supply work was a comprehensive roadmap for a multi-year capital improvement program, putting QMC on track for meeting patient needs for twenty-years into the future.

Chelsea Group has been engaged at QMC in the multi-year program to upgrade roughly 100 HVAC systems in Queen Emma Tower and Pauahi Wing. The work includes replacement of rooftop outdoor air units and multiple units on each patient floor, conversion of most spaces from constant volume to

### In this project:

- Assessment
- Design and planning
- Construction project management
- Commissioning

### Special features:

- Dynamic three dimensional plan of space transformations
- Key Performance Indicators (KPI) for multi-year executive tracking
- Adaptive design process integrating Cx results back into ongoing designs

variable volume air distribution, addition of ducted return in some areas, and development of a comprehensive ventilation air demand control (DCV) system that will operate once all of the units are replaced and controls can be consolidated. The designs use new fan-array technology to provide system redundancy, easier fan maintenance, greater reach in variable load management, and overall efficiency improvements.

In parallel, Chelsea Group was retained by QMC to upgrade the Punchbowl Campus Central Plant through replacement of an aging chiller and cooling tower with contemporary equipment and modern controls. The 1350-ton chiller will bring the latest magnetic levitation compression technology to Hawaii and transform the Central Plant with higher efficiency operations which are better tailored to the fully variable air side of the property. Expected energy savings from the project are anticipated to be in the range of 15% to 20% of total QMC energy consumption.

The most significant challenge in the QMC projects has been, and remains, the execution of the work without disruption of hospital operations. Chelsea Group assisted QMC in developing strategies that would allow the Medical Center to continue at its historically high occupancy rates while construction work moves through the hospital. With careful planning and extensive preparation by Chelsea Group, the project has already transformed critical care floors to contemporary care standards using modern HVAC technology without any unplanned outages or disruptions to patient services.

- Contact for The Queen’s Medical Center: David Lee

### ***REPRESENTATIVE ENERGY RELATED EXPERIENCE***

Chelsea Group provides a systematic approach to reducing the energy use in existing buildings, progressing from assessment through audits to design, project management, commissioning and continuous commissioning. Clients select the role they need Chelsea Group play in order to meet their plans and resources. Projects range from “heavy iron” central plant projects to air handler upgrades, BAS/EMS controls and energy dashboards, lighting projects, garage ventilation, building and area air balance, envelope improvements, on-site solar, and specialty projects, such as the evaluation of Honolulu Sea Water Air Conditioning (HSWAC) applications in client buildings. Additionally, Chelsea Group aids in obtaining rebates and financing for energy management efforts.

### ***COMPREHENSIVE ENERGY MANAGEMENT PROJECTS IN HAWAII***

- 1) BlackSand Capital – Uptown Pearlridge Shopping Center
  - ENERGY PROJECT OF THE YEAR, 2016, Association of Energy Engineers, Region V, international competition
  - Engaged to develop a comprehensive energy audit and capital expenditure (CapEx) plan for the aging shopping center property
  - Owner faced energy costs in excess of what could be recovered in CAM, as well as pending failure of the chillers and related central plant equipment serving the shopping center
  - In parallel, the owner was upgrading the aesthetics of the mall to improve the shopping experience, including the ambience gained through better quality lighting
  - The project, completed in 2015, reduced energy use in the central plant by 53% and resulted in substantial improvement in the financial performance of the property
  - The property sold in 2017, earning Black Sand a substantial return on its investment, in part, because of the wise decision to implement the plan done by Chelsea Group, bringing the vision for the property to one that is future-facing
  - Contact at BlackSand: Bryan K.K. Li

- 2) Shidler Pacific Advisors, Honolulu, portfolio of commercial office and mixed use buildings, energy efficiency technical consulting, design, and construction project management
  - Investment initially estimated at \$7 million across the portfolio, including central plant replacement, major renovations to air handling systems, BAS replacement and portfolio-level controls and monitoring overlay, envelope improvements, potential integration of HSWAC, potential solar application
  - Priority of ownership focused the project on rebuilding the central plant and BAS for Waterfront Plaza, a 550,000 square foot campus entailing five mid-rise buildings with a central plant located beneath its plaza
  - Waterfront Plaza was built in stages from the mid-1970s to 1985, and was still served for the most part by original equipment that was at – or near – its end-of-life condition
  - Waterfront Plaza ownership proceeded with central plant replacement, including multiple chillers, cooling towers, pumps and CHW distribution system component, and building automation system, with construction completed in 2016
  - The project reduced annual energy consumption by 1.2 million kWh, valued currently at about \$275,000 per year, winning a rebate from Hawaii Energy of roughly a quarter of a million dollars
  - Contact for Shidler Pacific Advisors: Steve Sullivan
  
- 3) Ali'i Place, Honolulu, multi-year energy and sustainability technical consulting, design, project management
  - Investment of approximately \$220,000 over seven years, including improvements to automation system, air handling VFDs, building envelope tightening, prior and on-going chiller studies
  - Building comprises 362,000 square feet of commercial office space constructed in 1992
  - Average payback on projects of about two years
  - Assisted in improving ENERGY STAR® rating from 79 in 2003 to a current rating of 97
  - Contact at Ali'i Place: Sandra Bollozos-Fraticelli
  
- 4) Ward Centers, Honolulu, parking lighting cost reduction program
  - Parking lighting for a newly constructed shopping area anchored by T.J. Maxx created utility costs in excess of anticipated or appropriate charges
  - The new construction had been designed for aesthetics without consideration of efficiency
  - Chelsea Group developed a plan for a lighting retrofit that provided a different but equally attractive aesthetic, shifting from metal halide to LED lamps, circular to linear fixtures, and adding motion and daylighting controls
  - The lighting retrofit for the T.J. Maxx parking structure produced a 93% reduction in electrical consumption related to lighting
  - Contact at Ward Centers: Bobbie Lau

***CENTRAL PLANT ENERGY EFFICIENCY PROGRAMS IN HAWAII***

- 1) The Queen's Medical Center (QMC), Honolulu, Central Plant Optimization Program (2011-2012)
  - ENERGY PROJECT OF THE YEAR, 2015, Association of Energy Engineers, Region V, international competition
  - Investment totaling \$289,000 in equipment and services, completed in July 2012
  - Followed preliminary chiller capacity study by Chelsea Group (2010-2011), as well as related studies of subsystems beginning in 2008

- Chelsea Group assessed chilled water and condensate systems in the central plant and distribution lines throughout a tunnel system leading to 11 buildings totaling approximately 2.8 million square feet
  - Designed permanent metering and monitoring program, including installation of 56 meters to measure CHW and CW flow, temperature, and electrical usage
  - Integrated monitoring system with existing Trane BAS through an ns2u server to collect data from a total of more than 100 points in real time
  - Designed custom dashboard to meet QMC needs for integrated data reporting
  - Implementation of recommendations was tracked for one year, with documented savings of roughly 690,000 kWh, valued at about \$200,000 annually
  - Collaborative effort with Hawaii Energy achieved rebates equal to the investment of \$289,000
  - Contact at QMC: Darren Ito-Ohara
- 2) PM Realty Group, 677 Ala Moana, Honolulu, Central Plant Optimization Program (2011-2012)
- The property was part of a Morgan Stanley sustainability effort and developed a comprehensive sustainability plan in 2011, which recommended improved monitoring and control
  - Investment totaling \$180,000 in equipment and services, substantial rebates from Hawaii Energy, and completed in 2012, resulted in significant operational savings
  - Implemented related project to allow variable speed pumping of CHW that had been recommended in the 2011 plan
  - Building comprises 293,000 square feet of commercial office space constructed in 1969
  - Contact at 677 Ala Moana: Marlene Daley
- 3) Similar on-going projects combining metering, monitoring, and energy measures
- Pacific Guardian Center, Honolulu
  - HMSA headquarters, Honolulu
  - Bank of Hawaii (Financial Plaza of the Pacific), Honolulu
  - TOPA Financial Center
  - Davies Pacific Center
  - Pan Am Building
  - Waterfront Plaza
  - Mauna Kea Resort, Kona
  - Prince Hapuna Beach Resort, Kona
  - Maui Marriott
  - First Hawaiian Bank
  - Executive Center AOAO
  - Overview contact at Hawaii Energy: Brian Kealoha

***IMPORTANT ENERGY PROJECTS ON THE U.S. MAINLAND***

- 1) University of Illinois at Urbana-Champaign (UIUC), commissioning (Cx) of the Oak Street Chiller Plant provided on a turnkey basis by Siemens
- Investment of approximately \$10 million for an 8,430-ton central chiller plant and ancillary equipment and buildings, ESCO financed
  - Chelsea Group provided fundamental Cx of the chiller and ancillary mechanical equipment
  - The first chiller, 5,630-tons, went operational in early July, 2012
  - Cx of entire plant completed in 2013

- Contact for Siemens: Dan Miller
- 2) Great American Tower, Phoenix, multi-year, multi-project, latest is a replacement of pneumatic thermostats with hybrid digital-pneumatic (D-P) thermostats
    - Investment of \$300,000, for hybrid Cypress D-P thermostats, pilot in 2011 full installation completed in 2012
    - Property is a 340,000 square foot commercial office high rise
    - Installed over 500 new Cypress D-P thermostats on variable air volume (VAV) boxes
    - Resulted in 14% annual energy use reduction, a total of 777,648 kWh
    - Utility rebates plus savings produced a payback of 1.6 years
    - Improved from 2009 ENERGY STAR rating of 87 to 2012 rating of 94
    - Contact at Great American Tower: Al O'Conner
  - 3) US Bank Centre, Seattle, multi-year, multi-project effort of BAS improvements, air handler improvements, and retrocommissioning (RCx)
    - Investment of approximately \$350,000 over an 8-year period, primarily for air handler modifications and retrocommissioning
    - The property is a commercial office high rise comprising over 1 million square feet, including data centers and two floors of retail space
    - The 2011 ENERGY STAR rating for the property is 81
    - Contact at Bentall Kennedy, US Bank Centre: Betsy Sutherland

## REPRESENTATIVE SUSTAINABILITY MASTER PLANNING (SMP) PROGRAMS

### *SMP SCALE AND SCOPE*

Sustainability Master Planning (SMP) includes benchmarking of building performance using criteria established by ENERGY STAR and LEED for Existing Buildings Operations & Maintenance (EBOM). Since 2007, over 500 buildings comprising more than 150 million square feet have moved through parts – or all – of this program with Chelsea Group. Also, more than 20 ownership and management groups, including Morgan Stanley, Paramount Group, and Alexander & Baldwin, have selected this process for their portfolios.

In the first step of the process, each property is reviewed based on utility data analysis and self-evaluation against basic LEED prerequisite requirements. Gap analysis is then performed to define and quantify current conditions and to assess actions required to meet LEED EBOM requirements at various levels of certification. Detailed assessments incorporate these elements and add an on-site sustainability review, an ASHRAE Level 1 energy audit identifying both low-cost/no-cost measures as well as potential capital improvements, and an initial IAQ review. The final report of the detailed assessment is a Sustainability Management Report (SMR) that provides all assessment results and compiles a complete benchmarking against performance standards. Recommended actions are summarized in a “Sustainability Roadmap” that includes a 10-year Capital Expenditure (CapEx) plan to achieve financially recommended sustainability goals. Where appropriate, portfolio summaries are provided to guide multi-property investment strategies.

For several ownership entities, the SMP process has become a routine event. One example of the success achieved using the Chelsea Group SMP process is Hills Plaza in San Francisco, CA. The property was benchmarked by Chelsea Group in 2009, including definition of a program of performance improvements and capital investments for sustainability. In marking 2013 performance to the 2008 baseline, the property achieved avoided costs of 17% (2008 resource usage at 2013 rates compared to 2013 actual costs).

Resource costs considered included energy (17% cost avoidance), Water (17%), and solid waste (11%). Chelsea Group also assisted Hills Plaza in achieving LEED Certification at the Gold level in 2012.

***EXAMPLES OF NATIONAL PORTFOLIO SMP PROGRAMS AND IMPLEMENTATION***

- 1) Morgan Stanley, multiple ownership funds, Atlanta, multi-year, multi-level sustainability planning program for U.S. mainland portfolios in office, hotel, retail, industrial, and multi-family residential sectors
  - Reviewed a total of 110 buildings comprising approximately 42 million square feet for sustainability performance in 2008-2010
    - Benchmarking program with routine tracking of performance
  - Sample results for the Prime Property Fund (PPF) based in New York, national office portfolio
    - Total of 11 office properties comprising 10 million square feet
    - Recommended investment of \$7.5 million with a 43% IRR
    - Recommended improvements would improve the average of ENERGY STAR ratings from 74 in 2008 to an estimated average of 80
    - Reduced portfolio energy use by the equivalent of 17 million kWh
  - Continuing program, initially benchmarked in 2009
    - Completed LEED certification of six properties in 2011-2012
    - Tracked and updated SMP in 2014
  - Sample results for the Crescent Real Estate Equities, based in Dallas, office portfolio in Texas, Colorado, and Nevada
    - Total of 23 properties comprising over 12 million square feet
    - Recommended investment of \$16 million with a 41% IRR
    - Recommended improvements would improve the average of ENERGY STAR ratings from 71 in 2008 to an estimated average of 83
    - Reduced portfolio energy use by 20% or the equivalent of 52 million kWh
  - Renewal of benchmarking of 12 leading Morgan Stanley properties across the country occurred in 2014-2015 on the planned 5-year cycle, tracking performance against 2009 benchmarking
  - Contact at Morgan Stanley: Robert Poole
- 2) Bentall Kennedy, multiple portfolios, Seattle, multi-year, multi-level sustainability planning programs for commercial office and medical office properties, U.S mainland
  - Reviewed a total of 23 buildings comprising approximately 4.6 million square feet for sustainability performance in 2007-2011
  - Sample results for one office portfolio, completed in 2011
    - Total of 7 buildings comprising roughly 1.5 million square feet
    - Recommended investment of \$1.2 million with a 99% IRR
    - Recommended improvements would improve the average of ENERGY STAR ratings from 69 in 2009 to an estimated average of 82
    - Following earlier advice from Chelsea Group advanced ENERGY STAR ratings from 69 in 2009 to 75 in 2010
  - Largest properties, including US Bank Building and Century Square, achieved LEED Certification and significant operational performance improvement
  - Contact at Bentall Kennedy, office portfolio: Betsy Sutherland
- 3) Paramount Group, New York, implementation of 2009 roadmap recommendations for their office portfolio from 2011 through 2015

- Reviewed a total of 9 buildings comprising 8.5 million square feet, located in New York City, Washington DC area, and San Francisco
  - Recommended investments of \$10 million with projected IRR of 64%
  - Client split the portfolio for implementation; Chelsea Group was assigned the six largest buildings totaling over 6 million square feet
  - Updated SMR process in 2011 showed significant performance improvement, new technology based energy use and cost reduction potential
  - LEED certification achieved in 2012 - 2013 for all six properties
  - Contact at Paramount: Paul Hitzel
- 4) Glenborough Properties, San Mateo, CA, implementation of roadmap recommendations in their direct ownership office portfolio, 2009 and on-going
- Reviewed a total of nine buildings comprising 1.5 million square feet
  - Recommended investments of \$1.1 million showing a 61% IRR
  - Client decided on a two prong strategy of showcasing their top performing property and bringing the property with greatest savings potential up to par
  - Achieved LEED EBOM Platinum Certification for The Aventine, San Diego, CA in 2010
  - Brought 1525 Wilson, Arlington, VA, from an ENERGY STAR rating of 54 in 2008 to a rating of 97 in 2010
  - Contact at Glenborough: Carlos Santamaria

## LEADERSHIP AND SENIOR ADVISORS

### *GEORGE BENDA, CHAIRMAN AND CEO, 1990 TO PRESENT*

Based in Maunaloa, Hawaii. Over 40 years of experience in energy and sustainability related fields. Mr. Benda has been the CEO of Chelsea Group since its founding in 1990, leading the company through changes in market and economy; guiding the group to its goals in building science consulting on infrastructure, sustainability, and efficiency. Earlier career highlights include a role as asset manager for the State of Illinois \$70 million investment fund in renewable energy and clean coal technology development in the late 1970s and Director of Energy Programs for the State from 1980 to 1983. As an independent consultant, he wrote a series of books and manuals and trained hospital engineers in energy management on behalf of the American Hospital Association. Mr. Benda also was CEO of an ESCO, HEC Energy, in the late 1980s, where he oversaw over \$15 million in investment in energy efficiency measures in healthcare and university settings. He was responsible for turning the company around to profitability and selling it to Northeast Utilities in 1990. Mr. Benda is an active ASHRAE member, and has led and chaired certification programs related to indoor air quality on a national basis at the IAQ Association – now a part of ASHRAE -- (2000-2004) where he was on the Board of Directors. He also chaired the indoor air quality certification programs for the Association of Energy Engineers (1993-2000), where he has been an active member since the 1970s. Mr. Benda is now a member of the Board of Directors of the AEE Hawaii chapter. He also served on the Board of Directors of BOMA Hawaii (2007-2010). From 2008-2012, Mr. Benda chaired the BOMA Hawaii sponsored “Sustainability Week for Commercial Real Estate,” which has helped educate the industry on energy and sustainability issues. Mr. Benda has a BS from Rockford College and a Master’s Degree from the University of Chicago.

### *DAVE MUNN, PE, LEED-AP, BCA, SENIOR ENGINEERING ADVISOR, 1998 TO PRESENT*

Based in Phoenix, Arizona. Over 40 years of experience in mechanical engineering, energy management, and sustainability related design, specification, and project management. Mr. Munn joined Chelsea Group in 1998, and served as Chief Technical Officer for the company until his retirement in 2016, at



which time he transitioned to his current role as an advisor. Earlier career highlights include hospital facility mechanical design in the Midwest, for which Mr. Munn was recognized by appointment to a Federal panel on hospital design standards. Mr. Munn joined HEC Energy (formerly the Hospital Efficiency Corporation) in 1986 as a regional technical director, and later started and developed a joint venture of HEC with Arizona Public Service called Southwest HEC, where he served as President until 1998. Mr. Munn is active in the Association of Energy Engineers (AEE), and has served as President of the Arizona Chapter. He is also active in BOMA Phoenix, where he developed their sustainability programs, including a highly successful program called "KiloWatt Crack-down". Mr. Munn holds a BSME from the University of Illinois at Chicago and is a registered professional engineer in Hawaii, Arizona, and Illinois. He is a Certified Energy Manager from AEE and teaches its courses.

*DR. WAYNE THOMANN, SENIOR HEALTHCARE ADVISOR, 1995 TO PRESENT*

Based in Durham, North Carolina. Wayne Thomann, Doctor of Public Health (DrPH), and Senior Building Consultant with Chelsea Group, is an experienced member of the Chelsea team. He currently provides technical guidance and training to Chelsea team members on the QMC project, specifically in relation to ASHRAE Standards and protocols of The Joint Commission. He has provided technical and scientific consulting on moisture and mold related Chelsea Group projects since 1996. Combining his scientific expertise in aerobiology with his practical experience in managing health and safety for Duke University Medical Center, Dr. Thomann brings a seasoned eye to indoor air problems and building science solutions. His work with the Chelsea Group includes projects resolving a wide range specialized problems and forensic analysis. Dr. Thomann is also the Director of Occupation and Environmental Safety at Duke University Medical Center. He sits on the ASHRAE Committee for Standard 62, relating to indoor air quality in commercial buildings. Dr. Thomann received a bachelor of science and a master of science in Microbiology from Florida Atlantic University in Boca Raton, Florida. He received a doctorate in public health from the University of North Carolina in Chapel Hill, North Carolina.

*KEN BRAZZEL, SENIOR CONSTRUCTION ADVISOR, 2014 TO PRESENT*

Based in Ocala, Florida. Ken Brazzel provides guidance, mentorship, and training to Chelsea Group's team of young professionals, based on his years of experience and expertise in construction project management. Mr. Brazzel brings over 40 years of construction project management experience to Chelsea Group, including executive level leadership for new construction and major renovations. Mr. Brazzel is an adept problem solver prepared with backup plans to accomplish projects on time and within budget.

Mr. Brazzel brings a senior level of experience in managing projects having strong cost control, schedule management, forecasting and change management requirements. He has overseen operations for projects valued as high as \$135M and supervised as many as 12 personnel. He has also managed budget and P&L, as well as client and consultant relations. He led the \$135M Marriott Maui Ocean Club project in Lahaina, Kaanapali Maui, which consisted of two time-share towers (10 and 12 stories) and high end finishes. Mr. Brazzel led both phases of the project and received awards from Hawaii GCA in recognition for a noteworthy job in Hawaii. Mr. Brazzel received his BS degree from the University of Louisiana in Building Construction

## **CHELSEA GROUP PROFESSIONALS**

*ZACHARY MAIN, EIT, SENIOR BUILDING SCIENTIST, 2013 TO PRESENT*

Based in Honolulu, Hawaii. Zack Main leads the *construction project management* efforts of Chelsea Group, working with a team of engineers to provide oversight of contractors and coordinating client needs

during project implementation. Mr. Main is the single point of client contact (SPOCC) for the QMC account, where he maintains the client relationship in a multi-year, multi-million-dollar upgrade to the HVAC systems of the Medical Center. On the technical side, his work is focused on the construction management aspects of current jobs, and he has played key roles in the commissioning of major installations. Mr. Main is currently working on projects including significant asset improvements, such as chiller plant, automation system, and HVAC system replacement. Additionally, Mr. Main provides on-site condition assessments, as well as energy audits, to provide building improvement recommendations to clients. Prior to starting his HVAC career at Chelsea Group, Mr. Main experienced a laboratory internship that explored robotics focusing on automation and control theory. He received a BS degree from University of Hawaii at Manoa in the discipline of mechanical engineering.

*LISA REDDINGER, CEM, SENIOR BUILDING SCIENTIST, 2017 TO PRESENT*

Based in Honolulu, Hawaii. Lisa Reddinger leads Chelsea Group's *business development* efforts. In the twelve years prior to joining Chelsea Group, she pursued her building science journey, beginning while still in college as an intern for Chevron Energy Solutions (CES). From there, Ms. Reddinger was employed full time with CES as a Business Development Manager where she worked for six years—initiating and completing projects, selling advanced building efficiency solutions, and expanding a customer base within various client geographies. Ms. Reddinger followed the successful launch of her career at CES by joining Siemens Building Technologies and later, Johnson Controls (JCI), within their Energy Solutions group in Hawaii. Focusing on infrastructure improvement and efficiency measures Ms. Reddinger expertly combined performance contracting and third party financing with technical solutions. Miss Reddinger received her BS in marketing from Penn State University; she is a member of the Association of Energy Engineers and a Certified Energy Manager.

*ATMA BHAWUK, PE, LEED AP, SENIOR BUILDING SCIENTIST, 2016 TO PRESENT*

Based in Honolulu, Hawaii. Atma Bhawuk leads Chelsea Group's *engineering design teams* in technical analysis, conceptual development, through construction documents. He provides hands-on management of engineering design, construction document production, training, troubleshooting, and providing quality assurance for each project assigned to his team. Mr. Bhawuk leads his design team in projects that include The Queen's Medical Center (QMC) supply air system upgrades project, as well as replacement of a chiller and a cooling tower leading to the modernization and optimization of the QMC central plant. In his role as a design team leader, Mr. Bhawuk not only oversees his engineering design team, but also serves on the review team for all design work, and tracks with the construction and commissioning teams during implementation. As a SPOCC leader, Mr. Bhawuk works to align design intent to owner requirements, and to deliver the systems that operate reliably and at peak efficiency.

Prior to joining Chelsea Group, Mr. Bhawuk was a design engineer at Mechanical Engineers of Hawaii Corporation. While there, he developed his knowledge in HVAC, fire protection, and plumbing, as well as LEED aspects of their projects. Mr. Bhawuk also was an integral collaborator on large scale projects, such as the Honolulu Rail Station and the Kona International Airport Terminal Modification. Upon graduating from President Obama's alma mater—and Oahu's most prestigious—Punahou School, Mr. Bhawuk completed his BS and his MS from the University of Hawaii at Manoa in the discipline of mechanical engineering

*WYETH CRAWFORD, PE, CBCP, CEM, SENIOR BUILDING SCIENTIST, 2016 TO PRESENT*

Based in Honolulu, Hawaii. Wyeth Crawford leads Chelsea Group's *commissioning (Cx) and retrocommissioning (RCx) programs*. Mr. Crawford begins the Cx process during the assessment and planning stages, helping to formulate the "Owner's Project Requirements" (OPR), and then, in design,

helping to craft the Basis of Design (BOD) and making sure it complies with the OPR. He leads a team of engineers in field observation of work in progress for compliance with OPR and BOD requirements, then in functional testing, documentation, troubleshooting, and providing quality assurance. He also works extensively with the Central Plant Energy Optimization (CPEO) program at Chelsea Group, using the big data concepts of the program as a foundation for a retrocommissioning (RCx) and continuous commissioning approach. Mr. Crawford interacts with the design and construction project management teams for The Queen's Medical Center supply air system upgrade and central plant project, commissioning the designed systems. He is also the technical lead on the RCx program at James Campbell building in Kapolei. There, he is working on an innovative monitoring program that daily updates and enables continuous commissioning of the facility.

Prior to joining Chelsea Group, Mr. Crawford worked with Energy Industries in Honolulu. There, he analyzed the energy efficiency of more than 100 plants and facilities via a wide variety of data acquisition tools, performing ASHRAE level 1,2, and 3 audits, and also developed numerous projects. Mr. Crawford's most notable central plant projects include the Kuakini Health System and Kauai Beach Resort. Mr. Crawford received his BS from Oregon State University in the discipline of mechanical engineering. He is a licensed Professional Engineer, a Certified Building Commissioning Professional, and a Certified Energy Manager.

*WILL MORRIS, SENIOR BUILDING SCIENTIST, 2016 TO PRESENT*

Based in Honolulu, Hawaii. Will Morris leads an *engineering design team* under the guidance of Atma Bhawuk, PE. Mr. Morris provides hands-on management of engineering design, construction document production, training, troubleshooting, and providing quality assurance for each project assigned to his team. His design team in projects include The Queen's Medical Center (QMC) supply air system upgrades project, replacement of a chiller and a cooling tower for the QMC central plant, as well as numerous other client projects.

Prior to joining Chelsea Group, Mr. Morris led the development of the HVAC system for the 2018 Ford Focus global platform, a design that will be manufactured in more than 2 million automotive units around the world. With more than 10 years of HVAC design experience, Mr. Morris brought his extensive team management skills to improving the speed and quality of design work at Chelsea Group. Mr. Morris holds a BSME from Western Michigan University, and is preparing for his PE.

*DRICKA THOBOIS, SENIOR BUILDING SCIENTIST, 2012 TO PRESENT*

Based in Honolulu, Hawaii. Dricka Thobois leads the Chelsea Group *sustainability studio*, with responsibility for LEED and ENERGY STAR certification projects, as well as technical projects related to the indoor environment. Mrs. Thobois trained in environmental sciences and indoor environmental quality, and brings those technical skills to a broad range of problem solving for Chelsea Group clients. Since joining Chelsea Group, she has managed assessments in indoor environmental quality and also directs activities related to LEED Certification in Hawaii. Major projects include: LEED Certifications and recertifications for Ali'i Place, Pacific Guardian Center, and the James Campbell properties in Kapolei. Recently, Mrs. Thobois brought a new condominium project, Symphony, through the LEED Certification process. Prior to joining Chelsea Group, she worked at Group 70, a Hawaii architectural firm. While there, she coordinated the development of their sustainability showroom, which drew recognition as a focal point for green technology in the Pacific. She holds a BS in environmental sciences from the University of California, Santa Barbara. She is a LEED accredited professional.

*COLTON GORMAN, BUILDING SCIENTIST, 2012 TO PRESENT*

Based in Honolulu, HI. Colton Gorman is a design engineer working on one of the design teams under the supervision of Will Morris and Atma Bhawuk, PE. Mr. Gorman is presently working on the design of the QMC HVAC supply air systems. He also provides a skill set developed in various assessment projects at QMC that brings him into virtually all problem-solving projects at the QMC campus. His ability to relate to the staff, both operations and medical, at QMC, has brought him onto the construction management team for all special projects, which have earned both him and Chelsea Group recognition for accomplishing difficult tasks without disrupting the flow of operations at the Medical Center. Mr. Gorman joined Chelsea Group as a college intern, transitioning to full time once he graduated from the University of Hawaii in 2015. Colton's work has included assisting engineers in field work and support documentation. He has also played roles in several chiller plant benchmarking projects as well as several other building analysis projects including jobs at The Queens Medical Center, Ward Village Center and St. Francis Hospital. Mr. Gorman received his BS from University of Hawaii at Manoa in mechanical engineering and is currently studying to become an EIT.

*RYAN KOHARA, EIT, BUILDING SCIENTIST, 2016 TO PRESENT*

Based in Honolulu, HI. Ryan Kohara is a design engineer working under the supervision of Atma Bhawuk, PE. Mr. Kohara's focus has been on the QMC air supply system project, where he has assessed complex areas of the Medical Center, overseen existing condition analysis, developed equipment selection protocols, and has also completed basic design work in CAD and REVIT for multiple mechanical rooms and air distribution system retrofits. He has worked on the construction site to oversee contractor implementation of his designs. Prior to joining Chelsea Group, Mr. Kohara was a mechanical engineer at WSP Group, where he gained experience using programs such as REVIT, CAD MEP, Sefaira, and Trane Trace 700. Mr. Kohara completed his BS at The University of Portland in the discipline of mechanical engineering and is currently studying to complete his PE.

*BRENT COOPER, BUILDING SCIENTIST, 2015 TO PRESENT*

Based in Honolulu, Hawaii. Brent Cooper is a draftsman and designer working under the supervision of Atma Bhawuk, PE. Mr. Cooper has worked on the team effort to continue to advance Chelsea Group design standards, as well as introducing the design teams to advancements in computer design, specifically REVIT. His present work is predominantly on the QMC HVAC program, where he focuses on quality control and on polishing designs in preparation for release of construction documents. Mr. Cooper is an experience draftsman with more than 20 years of experience with CAD related design work. Prior to joining Chelsea Group, Mr. Cooper led projects at M. Watanabe Electrical Contractor, Moss Engineering, Inc., and Thermal Engineering Corp., assignments in which he collaborated with other disciplines as Project Manager, BIM Specialist, and drafting and design. He has Autodesk certified training in AutoCAD, Revit & Revit Architecture from US CAD, as well. Mr. Cooper's education and experience also includes electro/mechanical design and architectural design.

*HALLE SENGER, BUILDING SCIENTIST, 2015 TO PRESENT*

Based in Honolulu, HI. Halle Senger is a design engineer working under the supervision of Atma Bhawuk, PE. Ms. Senger's focus has been on the QMC air supply system project, where she has done the basic design work in CAD and REVIT for multiple mechanical rooms and air distribution system retrofits. She has also worked on the construction site to oversee contractor implementation of her designs. Recently, she prepared background analysis and assisted in preliminary design concepts for assessment of the solar photovoltaic potential at five large, diverse commercial properties across the United States. Prior to joining Chelsea Group, Ms. Senger worked for two years on mechanical design of

natural gas propulsion systems for big-rig trucks and related technology at a firm in Ohio. Ms. Senger received her BSME from University of Akron and is currently studying to become an EIT.

*SHANE WEBB, EIT, BUILDING SCIENTIST, 2016 TO PRESENT*

Based in Honolulu, HI. Shane Webb is a design engineer working on one of the design teams under the supervision of Will Morris and Atma Bhawuk, PE. Mr. Webb is presently working on the design of the QMC HVAC supply air systems, specifically the complex designs of the operating room mechanical support systems, and has collaborated extensively on the QMC central plant designs. His high level of computer skills, especially related to REVIT software, has kept him involved in the development and advancement of new 3-D modeling and design technology, often teaming with Mr. Brent Cooper to develop standards and train team members. Mr. Webb often provides thought leadership to the group, most recently bringing virtual reality technology to the design review process. Prior to joining Chelsea Group, Mr. Webb participated in a general engineer internship at the Pearl Harbor shipyard, and was also a lab assistant at the R3 laboratory, a position which saw him conducting experiments in verbatim compliance with ASTM. Mr. Webb earned his BS from University of Hawaii at Manoa in the discipline of mechanical engineering.

*SHELBY PATTON, BUILDING SCIENTIST, 2016 TO PRESENT*

Based in Honolulu, HI. Shelby Patton is a design engineer working on one of the design teams under the supervision of Will Morris and Atma Bhawuk, PE. Ms. Patton is presently working on the design of the QMC HVAC supply air systems. Her primary focus has been the assessment of existing spaces and conditions. Ms. Patton performs ventilation and energy load calculations so that a retrofitted design for a more efficient and sustainable system can be created. Ms. Patton also takes part in producing the construction documents for Chelsea Group's projects, as well as the firm's design reviews. Prior to joining Chelsea Group full-time as a Building Scientist, Ms. Patton was a student intern with the corporation during her final year at the University of Hawaii at Manoa, where she received her BS in the discipline of mechanical engineering. She is currently preparing for her EIT examination.

*VICTOR HO, BUILDING SCIENTIST, 2016 TO PRESENT*

Based in Honolulu, HI. Victor Ho is a design engineer working on one of the design teams under the supervision of Will Morris and Atma Bhawuk, PE. Mr. Ho is presently working on the design of the QMC HVAC supply air systems. His primary focus has been the assessment of existing spaces and conditions in order to perform ventilation and energy load calculations. Mr. Ho also takes part in producing the construction documents for Chelsea Group's projects, as well as the firm's design reviews. Prior to joining Chelsea Group full-time as a Building Scientist, Mr. Ho was a student intern with the corporation during his final year at the University of Hawaii at Manoa, where he received his BS in the discipline of mechanical engineering. Mr. Ho is preparing for the EIT examination.

*TOM MISKE, BUILDING SCIENTIST, 2017 TO PRESENT*

Based in Honolulu, HI. Tom Miske is a commissioning (Cx) engineer working under the supervision of Wyeth Crawford, PE. Mr. Miske is focused on supporting the Cx field work at QMC, the ongoing RCx work at Campbell Square, and preparing analytical work related to the Central Plant Energy Optimization (CPeO) initiative that reaches more than a dozen of the largest central plants in Hawaii. He has gained extensive experience through these projects in the functional testing, documentation, troubleshooting, and quality assurance aspects of Cx work. Prior to joining Chelsea Group, Mr. Miske was employed at Pearl Harbor Naval shipyard and IMF, where he worked as a control and testing engineer, overseeing the maintenance of nuclear submarines, coordinating and conducting tests,

reporting, and acting as a liaison between the civilian and military workforce. Mr. Miske also served as a safety engineer, responsible for ensuring that systems work safely, and tasked with striving to pinpoint and eliminate any potentially harmful facets from being present during operation. Mr. Miske received his BS from University of Hawaii at Manoa in the discipline of mechanical engineering.

## **ADMINISTRATIVE AND SUPPORT TEAM**

*PATRICIA TURNER BENDA, CHIEF INFORMATION AND ADMINISTRATIVE OFFICER, 1996 TO PRESENT*

Based in Maunaloa, Hawaii. Pat Benda provides leadership for information technology and all administrative functions at Chelsea Group. She provides continuous updating of the virtual office platform that enables the smooth working of the project teams, including the SharePoint portal and the entire MS Office 365 platform. In addition, Ms. Benda manages the day-to-day administrative functions of project accounting, overall bookkeeping, asset tracking, purchase supervision, contract review and tracking, insurance, overall HR, and tax preparation. With over 35 years of information technology and administrative experience, Ms. Benda has kept Chelsea Group IT on the cutting edge mobile computing and its administration well organized. Her earlier career highlights include the development of IT systems and administrative streamlining for the Illinois Department of Nuclear Safety in the early 1980s. Ms. Benda led a professional services group in the later 1980s for Entre Computer, a retail computer services company in the Chicago area, where she developed a network installation and software training team that served corporate accounts, such as Quaker Oats. In the early 1990s, Ms. Benda was an IT manager for a global printing company, Rignier International, where she provided local area network support to the wide-area network development and trained plant personnel across the country in PC applications in a manufacturing environment. Ms. Benda holds a Master's Degree from the University of Chicago.

*EDITH KIM, PROJECT ADMINISTRATOR, 2015 TO PRESENT*

Based in Honolulu, Hawaii. Edith Kim provides project administrative support to all projects at Chelsea Group. Her duties include supporting Ms. Benda in daily management of SharePoint, contract administration, and supporting the project teams in tracking permit applications, bidding process, contractor requests for payment and change orders, and client invoicing. Ms. Kim came to Chelsea Group to assist in the implementation of construction project management techniques brought to the group by Mr. Ken Brazzel, with whom she had worked in prior projects. She continues to refine and streamline the application of those processes and techniques on a daily basis. Ms. Kim also provides support to the team in the office, making sure office logistics are working properly and that all needed support is available. Ms. Kim brings more than 20 years of experience as project administrator in the construction industry. She has worked for general contracting firms, including Jacobs Engineering.

*JOE PALMA, MARKETING ASSISTANT, 2016 TO PRESENT*

Based in Honolulu, Hawaii. Joe Palma joined Chelsea Group to redevelop the company's web presence. He currently works on an ongoing basis with Ms. Lisa Reddinger to improve the overall quality of marketing materials and support systems. Mr. Palma brings award winning writing skills to the firm and has demonstrated his abilities as both an editor and a photographer in support of emerging Chelsea Group stories. Mr. Palma begins his journey towards a journalism degree at the University of Hawaii at Manoa in 2017.

## CORPORATE AFFILIATIONS

- National Institute of Building Science (NIBS), corporate member
- American Society of Heating, Refrigerating, and Air Conditioning Engineering (ASHRAE), individual members
- U.S. Green Building Council (USGBC), corporate member, plus individual memberships
- International Facility Managers Association (IFMA), corporate member
- Indoor Air Quality Association (IAQA), corporate member
- Building Owners & Managers Association (BOMA), chapter members in Honolulu and Phoenix
- National Association of Industrial and Office Properties (NAIOP), chapter members in Honolulu
- National Association of Real Estate Investment Trusts (NAREIT), corporate member