

12.12.08

Hawaii Preparatory Academy – Energy Lab Building



PORTLAND

133 SW Second Avenue
Suite 201
Portland, OR 97204
MAIN: 503-467-4710

SACRAMENTO

1721 2nd Street, Suite 200
Sacramento, CA 95814
MAIN: 916-448-3072
TOLL FREE: 866-743-4277

HOUSTON

5116 Bissonnet
#408
Bellaire, TX 77401
TOLL FREE: 866-743-4277

ORLANDO

112 Lake Avenue
Orlando, FL 32801
MAIN: 407-367-2901

December 12, 2008

Hawaii Preparatory Academy
65-1692 Kohala Mountain Road
Kamuela, Hawaii 96743

RE: Proposal for Fundamental and Enhanced Commissioning under LEED for Schools (LEED-S)

Dear Ann:

Thank you for the opportunity to present our proposal for Green Building Services, Inc. to provide fundamental and enhanced commissioning services for the design and construction of the Hawaii Preparatory Academy-Energy Lab Building, in Kamuela, Hawaii as requested in the RFP dated December 2, 2008. We appreciate the opportunity to work with you and we know that we will be able to provide your team with the comprehensive commissioning approach necessary to successfully meet the project's sustainability goals.

It is our understanding that this project entails the design and construction of a new laboratory building that is 6,100 gross square feet. Construction Documents are currently complete and construction is anticipated to start in January 2009. The core goal of this commissioning effort is to ensure LEED for Schools Platinum certification for the project.

Thank you again for the opportunity to provide you with a proposal for our services on this project. We hope you find that we are your best choice to provide the guidance necessary to create a high-performance green building that is a source of pride and value. This proposal is valid for a period of ninety (90) days. Please contact me at (503) 467-4742 with questions about this proposal. We look forward to working with you and the entire team on this exciting project.

Sincerely,



Darren Goody, PE
Manager, Commissioning Services
Green Building Services, Inc.

PROPOSED FEES

FUNDAMENTAL AND ENHANCED COMMISSIONING FEES

TECHNICAL SERVICES

Fundamental Building Systems Commissioning (LEED EAp. 1)

Project Management/Coordination	\$987
Meeting Attendance, Coordination	\$2,115
OPR/BOD Development and Request	\$564
Develop and Incorporate Cx Specs into Construction Documentation	\$705
Develop and Implement a Commissioning Plan	\$705
Prefunctional Tests	\$3,102
Functional Tests	\$3,384
Site Visits and Reports	\$564
Issue Log Tracking and Maintenance	\$564
Summary Commissioning Report	\$1,410

FUNDAMENTAL COMMISSIONING SUBTOTAL **\$14,100**

Enhanced Commissioning (LEED EAc. 3)

Project Management	\$355
Commissioning Design Review of OPR and BoD	\$568
Design Document Review	\$1,207
Submittal Reviews	\$1,136
O&M Review	\$355
Develop Systems Manual	\$1,704
Training Verification	\$568
Building Operations Review (Warranty Review)	\$1,207

ENHANCED COMMISSIONING SUBTOTAL **\$7,100**

TOTAL **\$21,200**

Reimbursable Expenses Estimate

Copies, printing, travel, etc. \$3,000
 All expenses will be billed at cost plus 15%

For the proposed fees itemized above, we propose to bill monthly, according to the percentage of completed work within the scope of each service. Percentage of work completed within each service area will be provided at the end of each month as a part of the billing statement. Reimbursable expenses will be billed as they are incurred. Invoices are due at net 30 days. Any requested work that falls outside of the stated scope would be separately estimated and approved prior to commencing work.

ACCEPTED BY:

Hawaii Preparatory Academy

By: _____
 Its: _____

_____ Date

GBS BACKGROUND AND RESOURCES

Green Building Services, Inc. (GBS) is among the leading green building consulting firms in the United States. Established in 2000, Green Building Services, Inc. (GBS) is dedicated to enhancing the well being of our communities and the environment. GBS is a unique multidisciplinary firm comprised of architects, mechanical engineers, civil engineers, interior designers, planners and other professionals. We have more than a dozen licensed architects and engineers on our team which cornerstones our ability to successfully address an array of even the most complex green building and facility management challenges. Our consultants actively guide clients to identify and implement green building, development and facility management strategies. With offices in Oregon, California, Florida, and Texas, GBS is nationally recognized for its achievements in supporting green building projects. We work with a variety of clients and project types bringing to them a working knowledge of the applicability and relevance of different sustainability frameworks including the collaborative High Performance School (CHPS).

GBS has successfully managed the certification of 105 LEED projects with more than 200 in process. Currently we have six USGBC LEED faculty members and have an active involvement with multiple LEED committees. We are also one of the firms selected to produce the LEED 2009 reference guides. In addition to LEED expertise, we are 3rd party reviewers for CHPS and recently completed the first CHPS Verification on the American Canyon High School in Napa, California.

Our commissioning team is made up of seven highly trained and experienced engineers all coming from the mechanical engineering field, five of which hold professional engineering licenses in various states. With a combined total experience of over 80 years designing, constructing and commissioning buildings, the GBS commissioning staff has held a wide variety of titles during their careers including mechanical designer, test and balance engineer, energy engineer, controls engineer as well as commissioning related titles. This diversity of experience is of the utmost importance when commissioning buildings as it is this experience that is drawn from in determining what can go wrong with building systems and how to protect against that. Various staff qualifications include LEED AP certification, certification in commissioning by the Association of Energy Engineers and certification to provide commissioning services by the American Air Balancing Council (AABC).

We have in-house experience and capabilities to perform new construction commissioning, existing building commissioning or retro-commissioning, utility sponsored retro-commissioning, energy auditing and implementation of measurement and verification plans. The GBS commissioning team has completed or is in the process of completing LEED commissioning services for over 80 projects totaling approximately 10,000,000 sqft of building space.

RELEVANT PROJECT EXPERIENCE

GBS has taken over 100 projects through successful LEED certification. We are currently providing commissioning services on a number of school projects. The following list summarizes our most recent and relevant school projects. While there are only two school related projects listed below, we also

da Vinci Arts Middle School, Portland, OR

The da Vinci Arts Middle School High Performance Classroom will consist of a free standing music classroom building and is pursuing LEED Platinum certification under LEED-NC v2.2. Various sustainability measures are employed on the project including high performance daylighting, natural ventilation with a heat recovery ventilator, integrated photovoltaic roof tiles, on-site stormwater management, and is designed to use net zero energy.

Additionally, the project will utilize low-emitting building materials, enjoy a high degree of occupant controllability, and serve as a real world example of an alternative to conventional modular classrooms.

Client: Portland Public Schools

Contact: Nancy bond (503) 916-2000 extension 4279

Architect: SRG Partnership, Inc.

621 SW Morrison, Suite 200

Portland, Oregon 97205

Contact: Tim Grinstead, AIA (503) 222-1917

Status: Under Construction

Redding School of the Arts, Redding, CA

This project is seeking either CHPS or LEED-S certification. GBS is currently providing fundamental and enhanced commissioning, energy modeling, energy efficiency consulting, renewable energy systems consulting and code compliance consulting services.

Client: McConnel Foundation

Architect: Trilogy Architecture

2055 Pine St.

Redding, CA 96001

James Theimer (530) 243-3000

Status: In Design

Punahou K-1 School Addition

This project entails the renovation of two existing buildings, and the design of 10 to 12 additional buildings. We are currently providing fundamental and enhanced commissioning, energy efficiency consulting and modeling, daylight analysis, and general consulting services.

Client: Punahou School

Architect: Urban Works

831 Pohoukaina St., Suite E-1
Honolulu, HI 96813
Randy Overton (808) 944-5898
Status: In Design

University of Hawai'i Student - Services Building

This project entails the construction of a 34,722 square foot, 3-level building. The project is pursuing LEED Silver Certification. GBS is currently providing fundamental and enhanced commissioning, LEED consulting and project management services, and design simulation services and related consulting.

Client: University of Hawai'i at Hilo

Architect: Urban Works

831 Pohoukaina St., Suite E-1
Honolulu, HI 96813
Kyle Hamada (808) 597-1155

Coldwater Creek, Multiple Locations

These projects are located across the country in various locations and are pursuing LEED-CI certification. GBS is currently providing fundamental and enhanced commissioning services for 17 stores as well as consulting and assessment services for some stores.

Client: Coldwater Creek

Architect: Coldwater Creek

1 Coldwater Creek Drive
Sandpoint, ID 83864
Megan Emery (208) 265-6560
Status: 9 Stores Complete

Columbia Sportswear, Portland, OR and Seattle, WA

The Mountain Hardware store project entails the design and construction of a 5,000 square foot tenant improvement space within an existing building located at 700 SW Taylor Street in Portland, Oregon. The project is currently pursuing LEED-CI certification. GBS is currently providing fundamental and enhanced commissioning and consulting and project management services for the project.

Client: Columbia Sportswear

Architect: GBD Architects

1120 NW Couch Street, Suite 300
Portland, OR 97209
Bob Ames (503) 520-7188
Status: Complete

US Bank

This project is seeking certification under the LEED EBOM Rating System. The project entails the LEED-EB certification of the 43-story, 1.1 million square foot US Bancorp Tower and Plaza. GBS is currently providing commissioning services as related to EAp1 and EAc2 under the EBOM Rating System as well as consulting and project management services.

Client: Unico Properties

111 SW 5th Avenue, Suite 4070

Portland, OR 97204

Ty Barker (503) 425-6705

Status: Nearing Completion

Salinas Valley State Prison

This project entails the design and construction of a new 50,965 square foot facility in Vacaville, CA that will serve as a mental health facility for California State Corrections. GBS is currently providing project management and consulting services as well as fundamental and enhanced commissioning services.

Client: State of California

Architect: Nacht & Lewis

600 Q Street

Sacramento, CA 95814

Eric Fadness (916) 329-4000

Status: Complete

HAWAII PREPARATORY ACADEMY TEAM MEMBERS



Darren Goody, P.E.

Darren is a mechanical engineer with 17 years of professional experience. Since 2002, he has worked as a commissioning and Energy Engineer performing building commissioning, retro-commissioning and energy auditing. His commissioning experience involves new construction commissioning, commissioning of energy projects and retro-commissioning for existing buildings targeting energy savings opportunities. He has mastered the use of functional testing, control system data collection and loggers to facilitate commissioning.

Darren has a combination of education, hands-on field experience and technical design and analysis experience including trend analysis, the use of data loggers, energy usage analysis, energy calculation, system auditing and assessment, capital improvement measures and implementing retro commissioning, commissioning, and commissioning for both LEED and CHPS certified projects. Darren has worked with 12 different school districts in Oregon and Washington performing design, commissioning and auditing services.



Mitch Chvilicek, PE, LEED AP, CxA, Commissioning Consultant

As a commissioning consultant at GBS, Mitch manages, schedules, and performs all building commissioning tasks through project completion. Mitch brings 11 years of experience in HVAC system air and water testing, adjusting and balancing as well as building systems commissioning to the GBS team. As a registered Professional Engineer, LEED Accredited Professional and certified commissioning authority by AABC, he works as a commissioning agent performing building commissioning, retro commissioning and energy auditing.

Mitch's commissioning experience involves new construction, commissioning of energy systems and retro-commissioning for existing buildings targeting energy savings opportunities. Commissioning duties include project management, design and construction document review, design intent and owner's project requirement review, writing commissioning specifications and plan, submittal review, writing and performing functional acceptance tests and performance tests, installation review, initial startup, Operations & Maintenance review, staff training review, warranty support and report writing.

Mitch's commissioning experience includes a strong background in air and water testing and balancing. In addition, Mitch has experience with a variety of DDC systems including: Alerton, Johnson Controls, Siemens,

American Automatrix, Trane, Andover, and Automated Logic. He is experienced in the use of data loggers, data acquisition, and trend data analysis. Familiarity in system auditing and assessment, energy efficiency measures, and commissioning helps clients enhance building operations, conserve resources, and save money. Mitch provided HVAC testing for the Fir Acres Theater at Lewis & Clark College and the Portland Art Museum, both located in Portland, Oregon. Mitch has worked with the following school districts:

- Hillsboro School District (10 Cx and TAB projects)
- Beaverton School District (two Cx and TAB projects)
- Three Rivers School District (Grants Pass, OR 6 Cx projects)
- Portland Public Schools (1 Cx and 2 other projects)
- Morrow County School District (1 Cx and TAB project, Umatilla, OR)
- Silverton School District (1 Cx project Silverton, OR)
- ESD-112 (Several Southwest Washington State districts, 8 Cx projects)



Tom Hudson, P.E., LEED AP

As a technical consultant at GBS, Tom manages, schedules, and performs all LEED commissioning tasks through project completion. He supports GBS's goal to commission projects from design through construction with an emphasis on projects implementing energy and resource use reduction measures. Tom is responsible for documenting the project requirements in the design phase (enhanced commissioning) and reviewing design documents including the basis of design, MEP drawings, and associated specifications. Tom is also responsible for reviewing the design documentation, and construction submittals with a focus on decreasing construction costs by helping to provide clear and accurate direction to all project team members.

As the leader on the project's commissioning team, Tom's responsibilities include verifying construction and installation of commissioned systems, documenting start-up and checkout results during construction, sampling verification of commissioned systems, preparing functional test procedures, compiling written verification of training for commissioned systems, reviewing Operations and Maintenance manuals for commissioned systems for completeness and applicability, and preparing all commissioning reports.

Tom also carries out energy audits on existing buildings and performs energy analysis on new buildings to document the projects energy savings as compared to meeting the minimum energy requirements of state, federal and/or LEED standards; and as required to support funding incentives available for high performance buildings. In addition to technical consulting on a wide variety of LEED and green building projects, Tom supports GBS in the review of projects seeking LEED-NC certification from the US Green Building Council.



Doug Crombie, P.E. Commissioning Consultant

Doug is a professional engineer with 18 years of experience in the building/construction industry working on mechanical HVAC systems. His extensive field experience working in air, hydronic and control systems testing has formed his holistic approach to integrating building systems. Doug’s working background has shaped his integrated approach to building commissioning which assures all building systems are working together. Doug is experienced in both new construction commissioning and existing building retro-commissioning. He is experienced in using trend and data logging to analyze building performance in a variety of building types including: healthcare, institutional, commercial and industrial. At Green Building

Services, Doug works as a commissioning consultant in the Technical Services team. He has worked on a variety of project types including LEED for New Construction, LEED for Core and Shell, LEED for Existing Buildings, and LEED for Commercial Interiors. Doug has worked with four Oregon school districts.

GBS STAFF HOURLY BILLING RATES

<u>Classification</u>	<u>Hourly Rate</u>
Principal	\$150
Senior Consultant/Project Manger	\$130
Technical Consultant	\$130
Project Support Services	\$95

SCOPE OF SERVICES

This proposal includes all scope items included in the request for proposal issued on December 2, 2008.

Commissioning Services

Fundamental Building Systems commissioning, in Compliance with the LEED for Schools Energy and Atmosphere Prerequisite, EAp1:

The building systems identified to be commissioned as part of this proposal include:

- HVAC&R systems and associated controls – including louvers, window actuators, and the radiant cooling system
- Lighting and daylighting controls
- Domestic hot water systems, catchment and water re-use systems – including the solar hot water system

- Building Automation System
- Electrical power systems – including the photovoltaic array
- Life safety systems including fire alarm and fire protection systems

The scope of work for this will include:

- Conduct a commissioning kick-off meeting to introduce the commissioning process and to discuss standards, strategies, and target requirements of the commissioned systems.
- Incorporate commissioning requirements into the construction documents.
- Develop a commissioning specification that details responsibility of each commissioning team member and incorporate into construction documents.
- Attend commissioning meetings via conference call as part of the commissioning process. Participate in construction meetings via conference call as required.
- Assist the construction manager and contractors with interpreting and achieving the intent of commissioning activities specified in contract documents.
- Obtain Owner's Project Requirements (OPR) and Basis of Design (BOD) from owner and design engineer of record. Review information with owner.
- Prepare commissioning plan including the following elements:
 - A brief overview of the commissioning process covering key commissioning deliverables
 - A list of all commissioned features and systems
 - Identification of primary commissioning participants and their responsibilities
 - A description of the management, communication, and reporting of the commissioning plan
 - An outline of the commissioning process scope including submittal review, observation, start-up, testing, training, O&M documentation and warranty period activities
 - A list of expected work products
 - An activity schedule that is coordinated with the construction schedule and updated periodically
 - A description of the rigor and scope of testing
- Observe installation of each commissioned system by conducting a site visit to confirm proper installation. The site visit will correspond with the witnessing of start up of commissioned equipment. Submit construction administration items to design team for review and distribution.
- Develop or review start-up and check-out forms.
- Review completed start-up and check-out documents.
- Witness start-up and initial checkout of a randomly selected sample of systems either during the start-up and check out or after these activities have been completed. The sample size will not be less than 10% and not be greater than 20%. If during sampling, it is determined that a systematic failure is occurring within the sample set, the CxA will request the contractor redo the start-up or checkout

activity. Any follow up trip required by the CxA to verify start-up or checkout activities will be paid for (labor and reimbursable) by the GC and subsequent contractor.

- Develop functional testing procedures of commissioned systems; submit to the Owner for review and approval.
- Provide functional test procedures for the installing contractor to perform and verify systems performance in accordance with the commissioning plan. Witness functional testing of commissioned systems.
- Document commissioning issues to all parties.
- Conduct spot checking for testing and air balancing contractor. Verify proper balancing has been completed.
- Develop a Commissioning Report to include: a description of all commissioning activities and the results of these activities, a description of the owners project requirements and project specifications, a list of each commissioned feature or system, disposition on commissioning compliance for each system as compared to the OPR and contract document requirements, O&M documentation evaluation, training program evaluation; outstanding commissioning issues and recommendations on their resolution, a list of compromises, future testing requirements, and completed functional test documents.

Enhanced Commissioning, in Compliance with the LEED for Schools Energy & Atmosphere Credit, EA-c3:

The enhanced commissioning credit provides value to the owner by providing design-phase commissioning review of the mechanical design as well as building operator training and a systems manual. The results typically include better document and system coordination, a significant reduction in related Requests For Information (RFI) and a better performing building. GBS will provide the following:

- Conduct a commissioning kick-off meeting with the design team to introduce the commissioning process and to discuss standards, strategies, and target requirements of the commissioned systems.
- Review and update the Owner's Project Requirements (OPR) and Basis of Design (BOD) documentation from design team as available.
- Review the Design Documents in the Design Development and/or Construction Document phase (at 50% completion and bid set) as the project allows. The review will ensure that the construction documents meet the owners' project requirements in terms of functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality and local environmental impacts. From the time of contract agreement, GBS can perform a design review of the documents posted to the ftp site and present a design review document 3 days.
- A back check design review will also be provided prior to issuance of permit set to ensure that comments with action items agreed to by the A/E team were incorporated into the final documents.

This last review will also address final control system sequence of operation as the sequences are typically not fully developed until this set.

- Review the Contractor Submittals related to systems being commissioned
- Develop a systems manual for the commissioned systems to include: a final version of the OPR and BOD, systems single line diagrams, as-built control documentation including as-built sequences, schedules, setpoints and point lists, ongoing operations and maintenance instructions and recommendations in terms of maintenance activities, their frequency and troubleshooting guides for the installed equipment, schedule for retesting of commissioned systems, and schedule for calibrating sensors.
- Verify the training of maintenance staff meets the requirements in the contract documents. GBS will confirm that training delivered by the GC and their subcontractors covers the following topics: general purpose of the system (design intent), use of the O&M manuals, review of control drawings and schematics, start-up, normal operation, shutdown, unoccupied operation, seasonal changeover, manual operation, controls set-up and programming, troubleshooting and alarms, interaction with other systems, adjustments and optimizing methods for energy conservation, relevant health and safety issues, special maintenance and replacement sources, tenant interaction issues and discussion of how the feature or system is environmentally responsive.
- Review building operation with O&M staff with a focus on resolution of outstanding commissioning-related issues within 10 months after substantial completion. The review will consist of; interviews with the operation staff with a focus on service and operational issues discovered to date, a review of all commissioned systems operation during the walk thru with a comparison to expected operation at the time. GBS will work with the owner to ensure that issues and concerns brought up as a result of the warranty review are sufficiently addressed by the contractors.

Project Assumptions

- All relevant members of the project team will be available for any LEED meetings and will be responsive to GBS requests for LEED information and documentation submittal materials.
- All members of the project team responsible for providing materials for the LEED submittal will deliver the requested materials to GBS in a timely manner with appropriate content and format. GBS will not be responsible for creating supporting documentation for LEED credits other than as stated above.
- Other members of the project team will assist the integrated design process and LEED certification by providing specific information and performing particular tasks. These include, but are not limited to:
 - Owner: Site information, program requirements, occupant information, organizational requirements and policies.

Architect: Site boundary information, site and building takeoffs for calculations, site plans, floor plans, sections and elevations, draft and final specifications.

MEP Engineer: Design intent and basis of design documents, mechanical, electrical, plumbing, lighting and controls narrative. Site lighting design and photometric site plan.

Civil Engineer: Site Erosion & Sedimentation control plan, stormwater system design and calculations, parking design and site perviousness calculations.

Landscape Architect: Site landscape design, planting schedule, irrigation plan, and irrigation water use calculations.

Interior Designer: Interior design finishes schedule, built-in furnishing schedule.

Contractor: LEED material and product submittals, Construction & Demolition weight tickets and construction waste management plan, construction Indoor Air Quality management plan, and FSC chain-of-custody documentation.

Construction Cost Estimator: Construction cost estimate including any associated green building or LEED-related costs.

- This scope assumes that the final LEED documentation effort will be completed immediately following the construction completion for the project, with the exception of the warranty review documentation.
- The project will not experience any significant delays and significant changes in design direction or schedule after the LEED documentation and submittal effort has been initiated and completed.
- If the commissioning agent visits the site for a scheduled equipment test and the equipment is not ready for testing, the time will be billed at an hourly rate of \$115/hr plus expenses.
- The fee indicated for enhanced commissioning services is only valid if GBS is retained for fundamental and enhanced commissioning. If these two services are implemented by two different commissioning providers, the enhanced commissioning provider scope must include oversight of the fundamental commissioning provider per LEED requirements.
- GBS will perform up to 3 site visits. During the first site visit we will review the installation of equipment, witness checkout or sample results of checkout efforts completed previously and witness startup of equipment. The second site visit will include sampling the results of the testing and air balancing effort, reviewing the O&M manuals and as-built documentation and performing functional testing of all systems being commissioned. If some of the training that the owner receives on the commissioned equipment can be coordinated with our site visit, we will witness parts of this training as well in addition to reviewing all proposed training efforts to ensure they meet your needs as stated in the proposal. Finally, the third site visit will consist of the building systems review during the warranty period (10 month review).
- GBS will draft the commissioning specification in its entirety and this specification will be included within the project specifications to ensure that commissioning requirements are enforced for all contractors.
- All members of the construction team whether hired by the general contractor or directly by the owner will abide by the commissioning specifications furnished by GBS.

- While GBS will hold onsite commissioning meetings as necessary, GBS commissioning team attendance of construction team meetings will be limited to only those necessary to implement the Cx process as determined by GBS.
- We will conduct this project on a “best efforts” basis. While we maintain that we are knowledgeable in the LEED Rating System, we cannot, however, guarantee the quality of LEED documentation we will receive or that the USGBC LEED Reviewer will agree with our interpretation of certain credits.
- We anticipate that this contract will be completed by December 2010. In the unlikely event that the project extends significantly beyond that, GBS reserves the right to review our fees for the project for changes in scope and/or duration of the contract.
- Should there be a desire for services outside of the scope of this proposal, a request will be confirmed in writing with the agreed upon fee.



Our Qualifications

Green Building Services, Inc. (GBS) is among the leading green building consulting firms in the United States. GBS is a unique multidisciplinary firm comprised of architects, mechanical engineers, civil engineers, interior designers, planners and other professionals. GBS has more than a dozen licensed architects and engineers on our team which cornerstones our ability to successfully address an array of even the most complex green building and facility management challenges. We are able to work with a variety of clients and project types bringing to them a working knowledge of the applicability and relevance of different sustainability frameworks including the USGBC LEED Rating System, the Collaborative for High Performance Schools, and the Cascadia Living Building Challenge.

GBS is a nationally recognized leader in the practical application of the LEED green building rating system, having successfully managed the certification of 102 LEED certified projects with well over 200 other sustainable building projects in process or with certifications pending. We are also one of only 10 firms on contract with the US Green Building Council (USGBC) to perform certification reviews of LEED project applications, giving us intimate knowledge and up-to-date information on the details of the rating system. In addition, we have six USGBC LEED faculty members on our staff that provides LEED training workshops throughout the country. The depth of our experience enables us to provide each project with the leadership, processes and expertise most relevant to the owner's needs.

GBS technical services consist of building design simulation, commissioning and energy auditing. We have in-house experience and capabilities to perform site bioclimatic analysis, building design simulations, comprehensive daylighting analysis, ventilation analysis, new construction commissioning, existing building commissioning or retro-commissioning and preparation of measurement and verification plans.