RFQ DGS C-0972-0009, PHASE 1

LANDIS VALLEY MUSEUM - INFRASTRUCTURE & HVAC UPGRADE

LANDIS VALLEY MUSEUM
MANHEIM TOWNSHIP,
LANCASTER COUNTY, PA

DUE: APRIL 15, 2022

TECHNICAL PROPOSAL
Dear Mr. Perez & Selection Committee,

Thank you for extending Commissioning & Green Building Solutions, Inc. (CxGBS®) the opportunity to provide independent, third-party commissioning services for the Building Commissioning Services of DGS C-0972-009, Phase 1 - Landis Valley Museum - Infrastructure & HVAC Upgrade project.

CxGBS is committed to raising the standards for design, construction, and operation of healthy, high-performing buildings that meet or exceed the owner’s performance goals, reduce the total cost of building ownership, and improve occupant and stakeholder satisfaction. In 2002, CxGBS was created to provide commissioning and related sustainability solutions to the built industry. With our team’s century of backgrounds in design, construction, service, and operations and the commissioning of over $6 billion in construction in our 20-year history, CxGBS has yet to meet a problem it cannot solve.

CxGBS Holistic Commissioning® process goes beyond the traditional industry model by addressing the interactions between a building’s mechanical, electrical, plumbing, and fire safety systems with the building enclosure, sustainability goals, and unique project requirements in mind. Our process embraces the high industry standards of ASHRAE, the Building Commissioning Association, and the U.S. Green Building Council. Our staff is comprised of engineers, not technicians, and each project manager holds a professional commissioning certification.

CxGBS is an owner’s advocate and is dedicated to being a committed and responsive project team member. Our philosophy is · Put People First · Practice Personal, Social, and Environmental Accountability · Seek Innovative, Realistic Solutions · Lead by Example & · Continually Strive for Excellence.

CxGBS’s history and experience demonstrate our leadership. CxGBS is a Certified Commissioning firm by BCCB and is a certified woman-owned company. We have led the way in providing our clients with a proven commissioning process, which guides their projects towards a high-performing building – RIGHT FROM THE START!

We appreciate the opportunity to provide DGS with our proposal and look forward to working with you in the future. If any additional information is needed, please call 770.831.6760.

Sustainably,

Christine Miley  
CEO & Principal  
CxGBS, Inc.

H. Jay Enck  
CTO & Principal  
CxGBS, Inc.
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SECTION A: CONTRACTOR PRIOR EXPERIENCE

YOUR COMMISSIONING AUTHORITY - RIGHT FROM THE START
CxGBS Services on Projects Similar in Scope, Size, and Building Type & Complexity

CxGBS assists long-term building owners by providing innovative solutions to achieve high-performing buildings through the process of commissioning right from the start. CxGBS' commissioning experience includes projects of all types: public and private; federal, state, and local governments; K–12 schools and higher education. Our experience in commissioning services includes:

<table>
<thead>
<tr>
<th>New Building Commissioning</th>
<th>20,000,000 SF</th>
<th>Energy Assessments</th>
<th>7,500,000 SF</th>
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<tr>
<td>Building Enclosure Commissioning</td>
<td>18,000,000 SF</td>
<td>O&amp;M Plans, Training, and Analysis</td>
<td>25,000,000 SF</td>
</tr>
</tbody>
</table>

The following projects showcase similar scope, size, and building type and complexity to the Landis Valley Museum - Infrastructure & HVAC Upgrade Project:

1. Golden Triangle Campus – Student Union – East Mississippi Community College (EMCC)

   **I. Student Union Golden Triangle | Mayhew, MS | 2013-2017 | 84,379 SF – EMCC’S Golden Triangle campus was established in 1968 and currently serves about 4,000 commuter students. Construction of this new, two-story, Student Union on the Golden Triangle Campus began in 2010. The facility includes a large dining area, bookstore, classrooms, a lecture hall and computer lab, study spaces, offices, gallery space, and a fitness center. The Student Union building is served by a central ground coupled water source heat pump system in place of traditional chiller/boiler combinations and employs extensive use of energy recovery ventilation. The facility utilizes the buildings heating water systems to provide heating for the domestic hot water system serving the restroom areas. The north-facing front of the facility includes a large curtainwall system design to maximize the natural lighting in the main open dining area.**

   **II. Construction Cost: $7.3M | CxGBS Contract: $194,571.00 | CxGBS Responsibility: 100% Primary Commissioning Authority – Services included: Holistic Commissioning® including building enclosure, mechanical, electrical, plumbing systems, and lighting controls. Further, CxGBS conducted a pre-construction building enclosure meeting to address coordination between subcontractors with the multiple systems to be installed. And recommended utilizing unfaced or paper-faced batt insulation in lieu of PSK-faced to eliminate the potential for condensation to incur in exterior walls on interior side of vapor barrier.**

   **III. Owner: East Mississippi Community College | Reference: Garry Stegall | Garry.Stegall@dfa.ms.gov | 601.359.6321**
I. Brainerd High School Geothermal Tech Program | Chattanooga, TN | 2012 | 136,436 SF – Built in 1962, Brainerd High School is a single-story facility located in Chattanooga, Tennessee. In 2010, under Tennessee’s Energy Efficient School Initiative (EESI), CxGBS® was hired by the State of Tennessee Board of Education to provide Holistic Commissioning® services from the pre-design through two years after project completion to K-12 school districts to evaluate the cost effectiveness of hybrid ground-source heat pump systems. The project was made possible through the Department of Energy Recovery Act—Geothermal Technologies Program for Ground Source Heat Pumps Initiative, from which the Tennessee Department of Energy was awarded through the "Technology Demonstration Project." This award necessitated the inclusion of a data gathering, analysis, and reporting component to provide data on system performance, benefits, installation techniques, and other best practices. Following project completion, CxGBS provided data collection services for evaluation. CxGBS also provided these services to multiple schools participating in the EESI project, including South Lawrence Elementary, Lawrence Public High School, Bolivar High School, and Hardeman County Middleton School.

II. Construction Cost: $N/A | CxGBS Contract: $318,114.00 | CxGBS Responsibility: 100% Primary Commissioning Authority – Services included: Holistic Commissioning of the HVAC. As part of the Energy Efficient Schools Initiative (EESI), Brainerd High School has been retrofit with energy efficiency upgrades, including water-source heat pump units to provide heating and cooling to classroom spaces as well as a hybrid ground-coupled heat exchange and cooling tower system to increase the efficiency of the heat pump units. CxGBS provided basic commissioning services during design and construction for the upgrades to the HVAC systems and the installation of the geothermal wells.

III. Owner: State of Tennessee | Reference: Greg Higgins | higgins_greg@hcde.org | 601.359.3894
I. ASHRAE HQ Facility | Atlanta, GA | 2006-2008 | 33,570 SF - ASHRAE Headquarters is a living lab, showcasing the current sustainable components of a building. The building includes interior spaces such as offices, classrooms, and a data center. Exterior features include a green roof and solar array. The building has three types of systems—a dedicated outside air unit to condition outdoor air, the VRF system to condition the first floor, and a ground source heat pump to condition the second floor. Significant issues were identified during design, relevant to meeting ASHRAE Standard 15 – Safety Code for Mechanical Refrigeration. CxGBS® identified solutions to protect the egress paths in the event of uncontrolled refrigerant release.

CxGBS helped to resolve conflicts between the Japanese-based control system and the U.S. control system in regards to read/write issues. Those issues negatively impacted VRF performance, a control point cross-over issue causing heating and cooling conflicts between adjacent zones, and internal control issues effecting performance of VRF. As a result of our findings during the four-year, monitoring-based commissioning process, we were able to provide valuable input to VRF manufacturer’s Japanese research department that traveled to the site for review, discussion, and resolution.

II. Construction Cost: $8M | CxGBS Contract: $57,732.25 | CxGBS Responsibility: 100%
Primary Commissioning Authority – Services included: Holistic Commissioning®, Retro Commissioning, Measurement and Verification, and Monitoring-Based Commissioning. Systems commissioned included but were not limited to the Building Enclosure, HVAC, HVAC Controls, Plumbing, Electrical, and Renewable Energy Systems. This building achieved LEED® NC 2.2 Platinum.

III. Owner: ASHRAE | Reference: Jeff Littleton | jlittleton@ashrae.org | 678.539.1100
4. FDR's Little White House Museum

I. FDR’s Little White House | Warm Springs, GA | 2004 | 12,000 SF– Visitors to the museum at Roosevelt’s Little White House State Historic Site get close to history when they discover Franklin Delano Roosevelt’s 1938 Ford convertible with hand controls while listening to his Fireside Chats over a 1930s radio. This important historical site, where FDR initially came in search of a cure for his polio, eventually became his presidential retreat. To provide an ideal space for visitors to view museum exhibits chronicling the life and times of President Franklin D. Roosevelt, the Georgia Department of Natural Resources constructed a new museum and visitor center for Roosevelt’s presidential retreat. The environmental impact was minimized during site development and construction to preserve and protect natural resources. Construction waste management reduced potable water use and optimized energy performance.

II. Construction Cost: $5M | CxGBS Contract: $37,187.00 | CxGBS Responsibility: 100% Primary Commissioning Authority – Services included: Using Holistic Commissioning®, LEED® Project Administration, and energy modeling, CxGBS® ensured that the museum met very special requirements for maintaining indoor temperature and humidity conditions to maintain historic artifacts. The project was awarded a LEED Silver certification. And systems commissioned included building enclosure, mechanical, electrical, and plumbing. CxGBS services added value by reducing water through low water consuming toilets, a rainwater collection system to provide cooling tower water, and implementation of CO2 demand-based ventilation.

III. Owner: Georgia Department of Natural Resources | Reference: Toby Evans | toby.evans@dnr.state.ga.us | 404.656.3500
SECTION B: UNDERSTANDING PROJECT REQUIREMENTS

YOUR COMMISSIONING AUTHORITY - RIGHT FROM THE START
CxGBS Project Understanding

CxGBS understands that this project involves a variety of improvements to site facilities and infrastructure of the Landis Valley Museum including the renovation of roads, parking lots, stormwater management systems, pedestrian paths, and utility infrastructure (sewer, water, electrical, data). Also included are energy conservation improvements (including multiple geothermal HVAC systems) and accessibility improvements to various buildings, including upgrades and expansion of restroom facilities. The scope of the project is challenging due to the number of different buildings involved across the Landis campus.

Selective upgrades across a large campus of buildings are consistent with CxGBS's experience at many academic campuses. CxGBS has worked at Georgia Tech, Mississippi State University, Ole Miss, University of Southern Mississippi, Georgia Southern University, Georgia Gwinnett College, Atlanta Public Schools, etc. We frequently are working on multiple buildings across a campus at a single time. We will work with the owner and design team to help develop a matrix that utilizes a combination of individual building codes or color-coded charts to help differentiate the buildings and keep track of the required scope of services.

The specific scope of work for this project involves a lot of fire alarm and communication upgrades which fits well with our experience. CxGBS has extensive experience with Geothermal Systems and Traditional HVAC Systems. We have experience with water source heat pumps on the Oak Ridge High School in Oak Ridge, TN, George Washington Carver High School in Muscogee County, GA, and Brainerd High School in TN. John Rippel has passed the ACG Certified Geo-exchange Designer examination which focuses on the design and installation of Geothermal HVAC systems.

Our Holistic Commissioning® process, developed from years of design, construction, and operations experience, provides a single thread of information beginning with project concept through the life of the building. Here is an overview of what to expect:

**Design Phase**

**Owner's Project Requirements**

CxGBS requests the Owner’s representative to schedule the OPR workshop and provide a meeting space suitable for audio and video equipment usage. CxGBS requests that the Owner include the Owner's PM, representatives from Operation and Maintenance, each educational provider, a student (if available), and critical design team members. The workshop should have a minimum of 5 participants not including members of the design team. The workshop duration is approximately 4 hours. CxGBS will lead the workshop and develop the initial OPR from the information gathered during the workshop. During the OPR development, it may be necessary to circulate a questionnaire if the information was not received during the workshop. The OPR shall contain the information required by ASHRAE Standard 202, "The Commissioning Process for new buildings and systems."

**Basis of Design Documentation**

CxGBS provides a format for the designers to document the Basis of Design. The purpose of the basis of design (BOD) is to record the underlying assumptions made by the designers to meet the Owner’s stated objectives and criteria in the OPR as the design progresses.

**Commissioning Plan**

**Design Phase Cx Plan**

CxGBS will develop a Design Phase Commissioning Plan for the Design Phase Kickoff meeting. The Design Cx Plan explains the design phase review process, the review report contents, including categorization of comments, the roles and responsibilities of the project team, the resolution of different perspectives that may occur, and a schedule of activities that the project team agrees to for the project. During the Design Phase, CxGBS develops the Construction Phase Draft Commissioning Plan, which summarizes the requirements per the Commissioning Specifications.
Additionally, the document includes Construction Phase checklists and associated test procedures for building systems included in the commissioning scope and defined in the RFP and any modification directed by the Owner of the OPR document development. These actions will clearly define the contractor's scope.

**CxGBS typical Design Phase Cx Plan table of contents:**

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**Commissioning Design Reviews**  
At predetermined points in the design phase, CxGBS reviews the design documents and compares the design with documented objectives and criteria from the OPR. CxGBS will identify and report concerns and opportunities for the designers and Owner to consider during the development of contract documents. CxGBS will document each design review and upload it to the project SharePoint site, which will allow all project team members access. Using the CxGBS design review form, the team members will respond to the design review comments through the architect. CxGBS will facilitate an adjudication process with the designers, and the Owner’s representative for any outstanding statements or concerns after the designer's written responses are returned.

**Commissioning Specifications**  
The commissioning specifications incorporate the construction commissioning requirements into the project and provide detailed and specific criteria for the commissioning process. These specifications intend to give a clear understanding to all participants of their roles, responsibilities, effort, testing procedures, and pass/fail criteria for the project. CxGBS develops the specifications during the project's design development phase and will provide them to the architect in electronic format for inclusion in the 90% contract document submittal. In addition, the specifications will be reviewed and blended into the project specifications by the design professionals.

**Construction Phase**

**Submittal Review**  
Concurrent with the design team CxGBS reviews submittals and provides comments to the design team typically a week before the submittal return deadline for their consideration. CxGBS reviews product, equipment, and shop drawings;
installation, operation, and maintenance manuals to confirm compliance with the OPR and design intent per contract documents. CxGBS will review and provide feedback to the design professionals on the submissions relative to commissioning issues expressed in the contract documents.

Project Meetings

The Owner directs which entity provides CxGBS with progress reports of Owner, architect, and contractors (OAC) meeting minutes. In addition, CxGBS will attend selected planning and job-site meetings to provide input, coordinate commissioning schedule activities, discuss identified issues, stay informed on construction progress, and update the parties involved in the commissioning process. CxGBS will review meeting minutes to determine items that may affect commissioned systems or changes in the commissioning schedule. During construction, CxGBS, through the Owner, will schedule additional meetings with the project team if needed to resolve commissioning identified issues.

Job Construction and Commissioning Meetings

CxGBS will visit the site periodically to witness systems, assemblies, equipment, etc., and installations. CxGBS site visits will increase to help identify potential problems as construction progresses and the building systems and assemblies included in the commissioning scope (building enclosure, mechanical, plumbing, electrical, fire protection, etc.) installation activity increases. Additionally, assisting contractors with minimizing rework, punch lists, and callbacks will reduce project costs. Typically, CxGBS participates in preinstallation meetings to discuss expectations, lessons learned, and commissioning process procedures. Along with observing the first work installation to establish a standard of care. CxGBS will hold the contractor to that standard during the commissioning process.

Construction Observation and Testing

Construction checklists are essential to document that the assemblies, equipment, and systems are installed per specifications. The Installer’s field forepersons and start-up technicians directly know the work, so they fill out the checklists. Checklists provide valuable information to the commissioning team in assessing work progress, identifying potential problem areas, and contractor work coordination issues. When installers have completed the required items in their checklists, they submit the checklist to the GC/CM. The GC/CM confirms the work presented by the trade, then signs the commissioning checklist covering the completed work, and forwards the signed checklist to CxGBS to schedule a site visit to evaluate the installed work. CxGBS provides project-specific checklists for each system and assembly included in their commissioning scope to be executed by the trade and GC/CM. Final test procedures/functional testing procedures contained in the specifications are updated as needed after submittals for commissioned systems are approved by the design team and issued to the contractor and design team for review and comment.

Issues and Resolution Log

CxGBS will document any issues discovered during site observations or functional testing on the Cx Issues Log. Each issue will include a reference to the construction documents, an opportunity for designer direction, and a recommended resolution from the Commissioning Provider. Our recommendations help bring issues to resolution quickly to avoid issues lingering on a project for an extended period.
Systems Manual

CxGBS will provide a final commissioning systems manual to the PM after substantial completion of the project. The systems manual shall be in electronic format and include the following:

- **Executive Summary** – An overall description of the building and its systems, significant activities completed during commissioning, reference to any outstanding issues, and description of systems manual contents.
- **Recommendations** – A list of recommendations from the CxA to the Owner for increasing energy efficiency, reducing maintenance issues, ongoing optimization of building performance, etc. This list will also contain schedule of maintenance requirements, retesting of commissioned systems, and calibration of sensors.
- **Commissioning Plan & Specifications** – Completed commissioning plan including specifications.
- **Owner's Project Requirements** – Requirements of the project and expectations of how it will be used. Includes benchmarks, measurable performance criteria, success criteria, etc.
- **Basis of Design** – Concepts, calculations, decisions, and product selections are used to meet the Owner’s project requirements and satisfy applicable regulatory requirements.
- **Design Reviews** – Issues, comments, and resolutions from commissioning review of design documents.
- **Submittal Reviews** – Issues, comments, and resolutions from the commissioning submittal review.
- **Field Reports** – Reports documenting the observations of the CxA during site visits.
- **Issues Log** – Formal and ongoing record of issues, concerns, and their resolution as recorded by the CxA during the commissioning process.
- **Completed Testing Forms** – Completed forms documenting the compliance or failure of building systems during performance testing, including all TAB reports.
- **Completed Training Forms** – Completed forms documenting training agendas and training attendees.
- **Completed Construction Checklists** – Completed installer checklists.
- **Single Line Drawings and Sequences of Operation** – Single line drawings for the entire system and final sequence of operation, including final set points.
- **Building Occupant Assessment** – A building occupant assessment will be prepared and administered to at least ten (10) occupants on each floor to survey comfort, acoustics, indoor air quality, lighting, and thermal comfort. CxGBS will include the results of the survey in the final commissioning report. CxGBS will also utilize the results of the occupant assessment to identify correctable issues about the building. CxGBS will develop an implementation plan to provide corrective action and improve the quality of life for the building occupants.
- **Other** – TAB Reports, trend logs, monitoring reports, meeting minutes, etc.

Pre-Functional and Functional Performance Testing

Functional performance testing is the dynamic testing of assemblies and systems (rather than just components) under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint). Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. CxGBS develops the commissioning test procedures in a sequential written form and coordinates, oversees, and documents the actual testing performed by the Installer, who will test the system or assembly, including operation of all equipment and controls during testing.

Training Plans and Records

In conjunction with the contractor and the Owner’s O&M staff, CxGBS creates a training plan that notes what equipment and assemblies training will occur for and the regular training to be conducted by the installing contractor. Once the training plan is set, CxGBS will create training agendas for each piece of equipment or assembly. The schedules include information about who will be training, the training level, topics to be covered, and materials to be used. The contractor will fill out who will be conducting the training and return the agendas to CxGBS to be reviewed and approved by the Owner. Once training occurs, CxGBS will confirm that the proper individuals were trained by roster.

End of Warranty Cx Report

CxGBS will visit the site during the warranty period to provide an End of Warranty Cx Report. The report will identify issues that have presented themselves over the first year of occupancy for correction by the project contractor. The end of warranty Cx report will include the results of post-occupancy operation commissioning, including incomplete, delayed, and seasonal testing and warranty issues. In addition, CxGBS will provide off-season for peak heating and peak cooling seasons.
Preliminary and Final Cx Report

A preliminary commissioning report will be prepared showing the commissioning progress and systems, assembly, and equipment performance to date when the Certificate of Occupancy is issued. The final commissioning report will be assembled and provided to the Owner and others as required by the OPR, typically near the end of the warranty period. The final commissioning report will include the final commissioning plan, copy of design and submittal review reports, all start-up documentation, field reports, verification of functional testing, the verified sequence of operation, the final Issues and Resolutions log, and a summary of the performance of commissioned systems. CxGBS will additionally administer a building occupant assessment to at least ten (10) occupants on each floor to survey the acoustics, indoor air quality, lighting, and thermal comfort. The results of the building occupant survey will be compiled and included in the commissioning report. Any issues that were a specific concern as identified in the occupant survey will consist of a recommended course of resolution.
SECTION C: GEOGRAPHIC LOCATION

YOUR COMMISSIONING AUTHORITY - RIGHT FROM THE START
CxGBS will be utilizing our Pennsylvania office for the duration of the project. That location is at 2200 Stoney Point Rd., East Berlin, PA. Travel reimbursement is billed at a Technical Level 1 rate as it is provided in the owner cost sheet.

**Commissioning & Green Building Solutions, Inc. (CxGBS®)**

<table>
<thead>
<tr>
<th>Corporate Headquarters</th>
<th>1885 Lawrenceville-Suwanee Rd., Suite 110</th>
<th>Lawrenceville, GA 30043</th>
<th>(770) 831-6760 office</th>
<th>(770) 831-6761 fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Branch Office</td>
<td>1000 Highland Colony Parkway Building 5000, Ste 5203</td>
<td>Ridgeland, MS 39157</td>
<td>(770) 831-6760 x141</td>
<td>(770) 831-6761 fax</td>
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<tr>
<td>Branch Office</td>
<td>901 North Mopac Expressway S. Building 1, Suite 300</td>
<td>Austin, TX 78746</td>
<td>(770) 831-6760 x140</td>
<td>(770) 831-6761 fax</td>
</tr>
<tr>
<td>Branch Office</td>
<td>2200 Stoney Point Road East Berlin, PA 17316</td>
<td></td>
<td>(770) 831-6760 x101</td>
<td>(770) 831-6761 fax</td>
</tr>
<tr>
<td>Primary Contact</td>
<td>David Cantrill, P.E.</td>
<td>Regional Manager</td>
<td>(P) (770) 831-6760 x140</td>
<td>(E) <a href="mailto:DCantrill@cxgbs.com">DCantrill@cxgbs.com</a></td>
</tr>
<tr>
<td>Form of Ownership</td>
<td>CxGBS is a Georgia Corporation (20 years in business), a City of Atlanta Certified Female Business Enterprise (FBE), a Third-Party Certified Women-Owned Small Business (WOSB), and a Small Business Enterprise (SBE).</td>
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SECTION D: PROJECT WORK PLAN

YOUR COMMISSIONING AUTHORITY - RIGHT FROM THE START
I. High Level Summary and Approach to Deliverables
II. Resources Needed to Complete the Assignment

CxGBS performs all work internally.

Design Phase resources:

John Rippel will conduct mechanical, plumbing, fire protection commissioning design reviews. Donna Leban reviews lighting, lighting controls, daylighting (if included in Cx scope), visual acuity of spaces with windows. Steve Head reviews lighting, electrical distribution, and fire alarm systems, H. Jay Enck reviews the building enclosure, interviews O&M staff, and develops draft training requirements for Owner approval for inclusion in the contract documents. Finally, David Cantrill reviews all the design review comments for compliance with Design Phase Cx Plan and OPR.

Construction Phase resources:

Each design reviewer will conduct a review of submittals associated with their expertise and provide comments to the design team. The primary on-site staff is H. Jay Enck, David Cantrill, and Sophie Wilkes. David Cantrill and, as needed, H. Jay Enck and Sophie Wilkes will participate in the project meeting. Sophie Wilkes and H. Jay Enck will conduct on-site observations, provide field reports, maintain issues log. David Cantrill, Sophie Wilkes, and H. Jay Enck will direct, document, and evaluate testing performed by the contractors. Sophie Wilkes will assemble the systems manual, which David Cantrill will review. David Cantrill and John Rippel will evaluate building automation trends during the testing of HVAC systems and during the warranty period to identify operational issues that did not show up during testing.

The design and construction phase commissioning plans include further explanations of team member roles and responsibilities. In addition, we will engage the Owner for information on training (such as dates and level of training needed) as the construction nears completion.

III. Notes of Inefficiencies or Risk, Travel Mitigation, and Required Coordination

CxGBS promotes good communication and team collaboration in identifying and solving problems on every project. We work with the team and assist with finding solutions. Commissioning is a team effort that includes the entire project team in delivering a building that meets the Owners goals and objectives while also forming solid relationships with our team members. CxGBS works closely with the GC/CM superintendents, so we are on-site, when needed, and helping prevent systemic problems from occurring. We have perfected the commissioning over the last 20 years and continuously improved our value to the Owner and project team. Our process has many checks and balances that help ensure success for the Owner and project team.

For example, before we conduct and witness trade/GC requested testing, we require signed construction checklists. The checklists signed by the related trades and certified by each trade foreperson and the GC minimize false starts. During our participation in preinstallation meetings for commissioned systems, we review what we expect from the trade, discuss issues we have seen in the past that we want the team to avoid, answer any questions of when we wish to observe installed work, etc. We conduct ongoing observations of all work included in the commissioning scope and bring any issues we see to the Trade foreman and construction team before we leave the site, along with suggested corrections they should consider. This is very important as time is of the essence in construction, and the quicker the team knows, the faster they can react to correct.

Field reports and updated issues and resolution logs are produced generally within 24 hours of the site visit to the Owner with copies to the construction team. We work with the design and construction team to solve problems. CxGBS Pennsylvania office is less than two hours away from the project, which means we can be on-site quickly, making servicing this project conveniently. Good communication participating in scheduling meetings with two or three-week look-ahead schedules allows us to ask questions, remind the construction team when we need to be on-site and plan to
meet the project's needs. We have several procedures built into our process to help minimize inefficiencies and risks to the project, such as frequent on-site observations as construction progresses, receiving completed commissioning checklists before evaluation, and testing that helps ensure the field's process goes smoothly.

CxGBS's focus is to be the Owner and team's advocate. We found our approach as a team member on respect and the practice of collaboration. As a result, CxGBS has successfully delivered over 20 million GSF of complex buildings. We accomplished this by utilizing a realistic cost-efficient solution in coordination with our holistic view and knowledge gained through forensic investigations. These techniques have made us true innovators when it comes to helping project teams and building owners achieve sustainable, high-performing buildings for the life of their facility.

The CxGBS staff includes commissioning professionals, building enclosure experts, professional engineers, and LEED-accredited professionals. These professionals offer over half a century of experience in commissioning, which represents over 5.5 billion dollars in construction. CxGBS has over an eleven-year, ongoing relationship with the MS Bureau of Buildings with numerous projects completed for the MS Department of Public Safety, over six years with Georgia Institute of Technology implementing cutting edge systems, and more than eighteen years with the General Services Administration (GSA) including museums, research laboratories, courthouses, and office buildings. In addition, many of our higher-ed, state/municipal, and federal projects have included museums, conference rooms, kitchens, auditoriums, and office spaces of similar scope to the Landis Valley Museum – Infrastructure & HVAC Upgrade project.
## IV. Anticipated Number of Hours Required for Completion of Work Described

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<tr>
<th>Labor Category</th>
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<th>Technical Level #2</th>
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SECTION E: CONTRACTOR PERSONNEL AND QUALIFICATIONS

YOUR COMMISSIONING AUTHORITY - RIGHT FROM THE START
Senior project leadership for the commissioning of the projects will be provided by H. Jay Enck. Mr. Enck has served as the commissioning professional for more than 20 million square feet of new and existing building commissioning projects. As a part of this experience, he has led the building enclosure, HVAC, and electrical commissioning efforts for these facilities. In addition, he has forty plus years in MEP design experience and over twenty years in forensic investigation of building enclosure, moisture intrusion, and indoor air quality issue investigations. Jay is a LEED Fellow and the ASHRAE Chair for all Commissioning Standards and Guidelines.

David Cantrill is a P.E. and regional manager out of the TX branch office and has served as the commissioning professional for more than 8 million square feet of new and existing building commissioning projects during the past ten years. As a part of this experience, he has led the building enclosure, HVAC, and electrical commissioning efforts for over fifty facilities.

John Rippel is a P.E. in the MS branch office and is a highly accomplished commissioning professional in the education, healthcare, federal, and commercial industries. He is proven leader and project manager, known for his excellent commissioning management and guidance. John brings seventeen years of MEP design experience to the CxGBS team.

Sophie Wilkes is a recent graduate of the Karlsruhe Institute of Technology in Germany with a B.S. in Mechanical Engineering with a focus on Energy Engineering and an M.S. in Energy Engineering with a double focus in Energy in Buildings and Renewable Energies & Energy Storage. Since joining the team as a commissioning technician, she has performed functional testing and drafted commissioning plans and systems.

Steven Head is a P.E. in GA and has more than thirty years of experience in electrical engineering design and electrical construction. As our electrical engineer Steven provides detailed design reviews, construction observations, testing, commissioning specifications development, and forensic investigations concerning electrical systems, equipment, and components.

Donna Leban, with an M.S. in Architecture, is a lighting and daylighting specialist in GA. Specializing in high performance lighting design, she also performs lighting and daylighting reviews for LEED® and all other green rating systems. Donna brings more than thirty years of experience across a wide variety of project types.

Our team resumes and credentials follow below.
H. JAY ENCK

HDBP, BEAP, BCxP, LEED AP BD+C, LEED Fellow
Chief Technical Officer & Co-Founder
Commissioning Provider

Jay Enck, credited for the creation of the Holistic Commissioning® process, is a well-established, innovative leader in commissioning, operational efficiencies, building forensics and enclosures, green design, and sustainable development. With over forty years of experience in engineering, construction, and building operations in multiple market sectors, Jay is a widely sought-after subject matter expert who serves as a speaker at industry conferences. Jay is currently the ASHRAE Chair for commissioning and serves as a contributing author for several ASHRAE industry guidelines and standards as well as USGBC LEED® Rating System Reference Guides.

Education

- B.S. – Mechanical Engineering
  California Polytechnic University

Experience

- ARMED FORCES RESERVE CENTER – Georgia National Guard - Marietta, GA – Commissioning – 5,506 SF
- FORT HOOD MILITARY BUILDINGS (25 total) - Fort Hood, TX – Commissioning – varied
- ERDC PRECISION MACHINE SHOP – Army Corp of Engineers - Vicksburg, MS – Commissioning – 10,000 SF
- MILITARY WORKING DOG KENNEL – Naval Air Station - Fort Worth, TX – Commissioning – 6,100 SF
- VEHICLE MAINTENANCE BUILDING – GA Air National Guard - Savannah, GA – Commissioning – 5,500 SF
- U.S. DIPLOMACY CENTER – General Services Administration - Washington, D.C., Commissioning – 50,000 SF
- PRICE GILBERT CROSランド TOWER – Georgia Institute of Tech. - Atlanta, GA – Commissioning – 230,000 SF
- SCHOOL OF MEDICINE – University of Mississippi - Jackson, MS – Commissioning – 151,000 SF
- ACADEMIC BUILDING C4 – Georgia Gwinnett College - Lawrenceville, GA – Commissioning – 52,091 SF
- GOLDEN TRIANGLE CAMPUS – East MS Community College - Lawrenceville, GA – Commissioning – 84,000 SF
- ALEXANDER HALL RENOVATION – Jackson State University - Jackson, MS – Commissioning – 61,000 SF
- CENTRAL CRIME LAB – MS Department of Public Safety - Whitfield, MA – Commissioning – 92,200 SF
- ADMINISTRATION BLDG. & CONF. CENTER – Cherokee Cnty. - Canton, GA – Commissioning – 78,183 SF
- VAN LEER INTERDISCIPLINARY DESIGN COMMONS – GA Tech. - Atlanta, GA – Commissioning – 134,000 SF
Building Commissioning Professional (BCxP)

ISSUED TO

Harry Enck

Issued on: 29 JUL 2020 | Expires on: 31 DEC 2023 | Issued by: ASHRAE
Verify: https://www.youracclaim.com/go/5nIfB5Ei
DAVID CANTRILL
PE, BEAP, CCP, OSHA
Regional Manager
Commissioning Provider

David Cantrill has extensive experience serving as a project manager for the commissioning process. Having commissioned more than 8 million square feet of building projects, he provides excellent commissioning management and guidance during the pre-design, design, construction, warranty operations and maintenance phases of projects. Additionally, David’s experience with energy modeling software allows him to assist the design team with energy efficiency and sustainable design goals.

Contact
TX Office - 901 North Mopac Expressway So., Building 1, Suite 300
Austin, TX 78746
DCantrill@CxGBS.com  770.831.6760  x140

Certifications
Professional Engineer - TX, GA, TN, KY, AL, & MS
ASHRAE Building Energy Assessment Professional (BEAP)
Building Commissioning Association Certified Commissioning Provider (CCP)
Occupational Safety and Health Administration (OSHA)

Commissioned Projects
8,291,000 SF

Education
B.S. – Mechanical Engineering
Texas A&M University
M.S. – Mechanical Engineering
Texas A&M University

Experience
- JOHN C GODBOLD FEDERAL BLDG. – General Services Administration - Atlanta, GA – Commissioning – 134,000 SF
- HAROLD D. DONAHUE FEDERAL BLDG. & COURTHOUSE – General Services Administration, Atlanta, GA – Commissioning, Post Construction Monitoring – 164,775 SF
- CHEROKEE COUNTY FACILITIES – Cherokee County Commissioners - Canton, GA – Commissioning, Forensics – SF Varies
- ASHRAE HEADQUARTERS – ASHRAE - Atlanta, GA – Commissioning – 34,500 SF
- U.S. DIPLOMACY CENTER – General Services Administration - Washington, D.C., Commissioning – 50,000 SF
- C3 ACADEMIC BUILDING – Georgia Gwinnett College - Lawrenceville, GA – Commissioning – 35,000 SF
- PRICE GILBERT CROSLAND TOWER – Georgia Tech - Atlanta, GA – Commissioning – 230,000 SF
- OAK RIDGE HIGH SCHOOL – Oak Ridge Schools - Oak Ridge, TN – Commissioning – 346,400 SF
- JOSEPH P. WHITEHEAD BIOMEDICAL – Emory University - Atlanta, GA – Commissioning – 325,000 SF
- CAMBRIDGE BETHANY BEND HIGH SCHOOL – Fulton County Schools - Atlanta, GA – Commissioning – 320,800 SF
- SCHOOL OF MEDICINE – University of Mississippi - Jackson, MS – Commissioning – 151,000 SF
- FANT MEMORIAL LIBRARY – Mississippi University for Women - Columbus, MS – Commissioning – 62,000 SF
- VAN LEER INTERDISCIPLINARY DESIGN COMMONS – Georgia Tech - Atlanta, GA – Commissioning – 15,000 SF
- O’KEEFE BUILDING RENOVATION – Georgia Tech - Atlanta, GA – Commissioning – 30,000 SF
Building Commissioning Certification Board

CONFERRED UPON

David Cantrill

THE DESIGNATION OF

Certified Commissioning Professional (CCP)

The BCCB is accredited by ANSI to the ANSI/ISO/IEC 17024:2012 standard. Registration number: 1191

FOR DEMONSTRATING A HIGH LEVEL OF COMPETENCE AND EXPERIENCE FOR THE BUILDING COMMISSIONING PROCESS BY SUCCESSFULLY COMPLETING AN EXAMINATION, DOCUMENTING PROFESSIONAL AND EDUCATION ACHIEVEMENTS AND FULFILLING PRESCRIBED STANDARDS OF PERFORMANCE AND CONDUCT REQUIRED FOR CCP.

EXPIRES ON 12/31/2023
CCP #230
JOHN RIPPEL

PE, BCxP, LEED AP BD+C, OSHA
Project Manager
Commissioning Provider

John Rippel is a highly accomplished commissioning professional in the education, healthcare, federal, and commercial industries with over 19 years of experience and more than 1.5 million square feet of buildings commissioned. John recently passed the ACG Certified Geoexchange Designer exam – achieving certification in design and installation of Geothermal HVAC systems. John is a proven leader and project manager, known for his excellent commissioning management and guidance.

Contact

MS Office - 1000 Highland Colony Parkway, Building 5000, Suite 5203
Ridgeland, MS 39157
JRippel@CxGBS.com 770.831.6760 x141

Certifications

Professional Engineer - AR, FL, GA, MS, & TN
ASHRAE Building Commissioning Professional (BCxP)
LEED® Accredited Professional Building Design and Construction (LEED® AP BD+C)
Occupational Safety and Health Administration (OSHA)

Commissioned Projects
1,500,000 SF

Education

B.S. – Mechanical Engineering
Georgia Institute of Technology

MBA - University of South Florida

Experience

• SCHOOL OF MEDICINE – University of Mississippi - Jackson, MS – Commissioning – 151,000 SF
• GOLDEN TRIANGLE CAMPUS – East Mississippi Community College - Lawrenceville, GA – Commissioning – 84,000 SF
• ALEXANDER HALL RENOVATION – Jackson State University - Jackson, MS – Commissioning – 61,000 SF
• FANT MEMORIAL LIBRARY – Mississippi University for Women - Columbus, MS – Commissioning – 62,000 SF
• HOLY CROSS RENOVATION – St. Edward’s University - Austin, TX – Commissioning – 22,000 SF
• CENTRAL CRIME LAB – Mississippi Department of Public Safety - Whitfield, MA – Commissioning – 92,200 SF
• U.S. DIPLOMACY CENTER – General Services Administration - Washington, D.C., Commissioning – 50,000 SF
• UNIVERSITY OF MISSISSIPPI - NEW SCHOOL OF LAW BUILDING - Oxford, MS – Commissioning – 160,000 SF
• VANDERBILT UNIVERSITY COHEN MEMORIAL BUILDING - Nashville, TN – Commissioning – 21,000 SF
• UNIVERSITY OF SOUTHERN MISSISSIPPI HEALTH AND SCIENCE LAB FACILITY – Hattiesburg, MS - Commissioning – 40,000 SF
• BETHEL COLLEGE SCIENCE BUILDING - McKenzie, TN – Commissioning – 21,000 SF
• MEMORIAL HOSPITAL BED TOWER ADDITION - Gulfport, MS - Commissioning - 100,000 SF
• MEMORIAL HOSPITAL OPERATING ROOM RENOVATION - Gulfport, MS – Commissioning – 20,000 SF
• NORTH RIVERSIDE READINESS CENTER ILLINOIS NATIONAL GUARD - N. Riverside, IL – Commissioning – 45,000 SF
• OAK RIDGE NATIONAL LABORATORY BUILDING 1059 - Oak Ridge, TN – Energy audit, commissioning, energy modeling
Be it known that

John Rippel, BCxP

I.D. 7980099

having successfully completed all requirements and criteria has been certified as a

Building Commissioning Professional

and has accordingly been awarded all the rights, honors, and privileges thereunto appertaining.

The BCxP certification, recognized by the U.S. Department of Energy (DOE) as meeting the Better Buildings Workforce Guidelines (BBWG), validates competency lead, plan, coordinate and manage a commissioning team to implement commissioning processes in new and existing buildings.

Barne W. Olsson, Ph. D., Fellow ASHRAE, Life Member, ASHRAE President 2017-2018

Jeff Littleton
Executive Vice President

5/21/2018 / 12/31/2021

Effective Date/Expiration Date
Commissioned Projects
1,448,200 SF

Education

- B.S. – Electrical Engineering
  Southern Polytechnic State University

Experience

- HAROLD DONOHUE FEDERAL BLDG – General Services Administration - Worcester, MA – Retro-Commissioning – 164,000 SF
- ASHRAE HEADQUARTERS – ASHRAE - Atlanta, GA – Commissioning – 34,500 SF
- CHEROKEE COUNTY FACILITIES – Cherokee County Commissioners - Canton, GA – Commissioning,
  Forensics – SF Varies
- OAK RIDGE HIGH SCHOOL – Oak Ridge Schools - Oak Ridge, TN – Commissioning – 346,400 SF
- ENVIRONMENTAL SCIENCE EDUCATION CENTER – Alabama 4H - Columbiana, AL – Commissioning –
  33,000 SF
- NORTH CHARLESTON ELEM. SCHOOL – North Charleston Schools - North Charleston, SC –
  Commissioning – 120,000 SF
- R.B. STALL HIGH SCHOOL – North Charleston Schools - North Charleston, SC – Commissioning – 228,000 SF
- THATCHER HALL – Darlington School - Rome, GA – Commissioning – 53,800 SF
- AFRC JOINT HEADQUARTERS – US Army National Guard - Marietta, GA – Commissioning – 213,400 SF
- ARTHUR M BLANK FAMILY OFFICE – AMB Real Estate Foundation - Atlanta, GA – Commissioning – 90,000 SF
- JOHN C GODBOLD FEDERAL BLDG. – General Services Administration - Atlanta, GA – Commissioning – 134,000 SF
- VAN LEER INTERDISCIPLINARY DESIGN COMMONS – Georgia Tech - Atlanta, GA – Commissioning – 15,000 SF
- O’KEEFE BUILDING RENOVATION – Georgia Tech - Atlanta, GA – Commissioning – 30,000 SF

Steven Head has more than 30 years of experience in electrical engineering design and electrical construction. As our electrical engineer Steven provides detailed design reviews, construction observations, testing, commissioning specifications development, and forensic investigations concerning electrical systems equipment and components.

Contact

GA Office - 1885 Lawrenceville-Suwanee Rd., Suite 101, Lawrenceville, GA 30043

Sales@CxGBS.com  770.831.6760

Certifications

Professional Engineer - Georgia
Eaton Electrical Safety Certified L2
Occupational Safety and Health Administration (OSHA)
DONNA LEBAN
AIA, CLD
Architect, Lighting & Daylighting Specialist
Lighting Systems Design Review

As an architectural lighting and daylighting design expert, Donna Leban is a well-established industry leader with more than 30 years of experience across a wide variety of project types. Specializing in high performance lighting design, she also performs lighting and daylighting reviews for LEED projects throughout the eastern United States. Donna has been an advocate for Advanced Lighting and Sustainable Design through the Northeast Sustainable Energy Association and as a Speaker and Online Educator of Professional Engineers, Architects, Interior Designers, and Efficiency Program Providers.

Education

Bachelor of Architecture
M.S. Architecture, Adv. Building Studies
Carnegie-Mellon University

Experience

- CAMPUS LIGHTING & CONTROLS STANDARDS – Dartmouth College - Location, TBD – Lighting Upgrades, Standards, and Controls
- WAR MEMORIAL BUILDING – Mississippi Bureau of Buildings - Jackson, MS – Lighting Audit Recommendations
- CHARLOTTE CAPERS BUILDING – Mississippi Bureau of Buildings - Jackson, MS – Lighting Audit Recommendations
- VERMONT STATEHOUSE – State of Vermont - Montpelier, VT – Energy Audit, Dome & Façade Retrofit
- KREITZBERG LIBRARY & MUSEUM – Norwich University - Northfield, VT – Lighting Audit and Design
- CROSSETT LIBRARY – Bennington College - Bennington, VT – Class III Lighting Audit & Retrofit
- COLCHESTER SCHOOLS – Colchester School District - Colchester, VT – Exterior Lighting Audit & Retrofit
- BARRY CENTER – Dartmouth University - Hanover, NH – Relighting & Controls Design
- CORPORATE HEADQUARTERS – National Life of Vermont - Montpelier, VT – Lighting Design
- C3 ACADEMIC BUILDING – Georgia Gwinnett College - Lawrenceville, GA – Commissioning – 35,000 SF
- T1 CARPET TILE PLANT – Shaw Industries - Adairsville, GA – Commissioning – 675,000 SF
- U.S. DIPLOMACY CENTER – U.S. State Department - Washington, D.C. – Commissioning – 42,500 SF

Certifications

National Council on Qualifications for the Lighting Professions – Lighting Certification (LC)
Sophie Wilkes is a recent graduate of the Karlsruhe Institute of Technology in Germany, having earned a B.S. in Mechanical Engineering with a focus on Energy Engineering and also an M.S. in Energy Engineering with a double focus in Energy in Buildings and Renewable Energies & Energy Storage. Sustainability has always been an interest for her and proved useful when she worked with a team to find a more sustainable indoor climate concept for buildings by ensuring a zero-energy building concept. Since joining the CxGBS team as a commissioning technician, Sophie has performed functional testing and drafted commissioning plans and systems.

**Contact**

SWilkes@CxGBS.com  
770.831.6760 x120

**Certifications**

Occupational Safety and Health Administration (OSHA)

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**Commissioned Projects Asst.**

1,866,746 SF

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**Education**

- B.S. – Mechanical Engineering  
  Karlsruhe Institute of Technology  
- M.S. – Energy Engineering  
  Karlsruhe Institute of Technology

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**Experience**

- PRICE GILBERT – CROSLAND TOWER – Georgia Institute of Technology - Atlanta, GA – Commissioning – 230,000 SF
- HOWEY PHYSICS BUILDING – Georgia Institute of Technology - Atlanta, GA – Commissioning – 230,000 SF
- CENTER FOR ADVANCED SURGICAL SERVICES – Grady Hospital - Atlanta, GA – Commissioning – 198,000 SF
- O’KEEFE BUILDING HVAC UPGRADE – Georgia Institute of Technology - Atlanta, GA – Commissioning – 30,000 SF
- FIRE HOUSE 2 – Athens Clark County - Athens, GA – Commissioning – 23,000 SF
- CW HILL ELEMENTARY SCHOOL – Atlanta Public Schools - Atlanta, GA – Commissioning – 86,300 SF
- SOUTH ATLANTA HIGH SCHOOL – Atlanta Public Schools - Atlanta, GA – Commissioning – 156,000 SF
- BOLTON ACADEMY – Atlanta Public Schools - Atlanta, GA – Commissioning – 141,000 SF
- DEERWOOD ELEMENTARY SCHOOL – Atlanta Public Schools - Atlanta, GA – Commissioning – 15,224 SF
- OLEANDER APARTMENT COMPLEX – Toll Brothers Apartment Living - Atlanta, GA – Commissioning – 382,319 SF
- OSPREY APARTMENT COMPLEX – Toll Brothers Apartment Living - Decatur, GA – Commissioning – 374,903
CxGBS Awards and Certifications

ASHRAE Chair for Commissioning
ASHRAE Distinguished Service Award,
USGBC LEED Fellow
Professional Engineers (P.E.)
Certified Commissioning Firm (CCF)
Building Commissioning Association Certified
Certification Provider (CCP)
University of Wisconsin Commissioning Process
Authority
Professional (CxAP)
ASHRAE High Performance Building Design
Professional (HBDP)
ASHRAE Building Energy Assessment Professional
(BEAP)
ASHRAE Commissioning Process Management
Professional (CPMP)
ASHRAE Building Commissioning
Professional (BCxP)
USGBC LEED® Accredited Professionals Building
Design and Construction (LEED AP BD+C)
Occupational Safety and Health
Administration (OSHA)

“Construction Owners Project Leadership Award” -
Construction Owners Association of America - New
Museum for the Little White House Historic Site,
CxGBS Holistic Commissioning
“Development of Excellence Award” - Urban Land
Institute Balzer Theatre at Herren’s, CxGBS
Commissioning and LEED Project Administration
“GSA Office of Design and Construction 2012
Project Management Award” – General Services
Admin. Tuscaloosa Federal Building & Courthouse,
CxGBS LEED Project Administration
“GSA Office of Design and Construction 2012
Project Management Award” – General Services
Admin. John C. Godbold Building/Elbert P. Tuttle
Federal Courthouse Annex, CxGBS Holistic
Commissioning
“US Department of State, Assistant Secretary’s
Award for Excellence in 2017” - US Diplomacy
Center, CxGBS Holistic Commissioning
THANK YOU FOR CONSIDERING CXGBS FOR THE LANDIS VALLEY MUSEUM - INFRASTRUCTURE & HVAC UPGRADE PROJECT

CXGBS IS YOUR COMMISSIONING AUTHORITY - RIGHT FROM THE START