

A Second Nature Initiative
CAMPUS GREEN BUILDER

Campus Projects :: Green Building Case Studies :: Spelman College Case Study :: 2009

Institution Profile: Spelman College

Atlanta, GA
 Historically Black College and University (HBCU)
 Enrollment: Approx. 2,100



The Suites at Spelman College
 Photo Credit: www.spelman.edu

INSTITUTION PROFILE

Brief History

Spelman College is a private, independent, and historically Black college for women, founded in April 1881. The college prepares women to change the world. The present college is a campus of 39 acres, dating back to 1883, five minutes west of downtown Atlanta with approximately 25 buildings.¹ "The Suites" dormitory is the first construction on campus in the 21st century and the first campus building to implement features following a green building rating system, more specifically the Leadership in Energy and Environmental Design (LEED®) rating system developed by the **United States Green Building Council (USGBC)**.

The institution has more than 2,100 students, an average of 12:1 faculty-to-student ratio and boasts a 79 percent graduation rate. Over 83 percent of the full-time faculty members hold a Ph.D. or other terminal degrees. The outstanding alumnae include Children's Defense Fund Founder Marian Wright Edelman, former U.S. Foreign Service Director General Ruth Davis, authors Tina McElroy Ansa and Pearl Cleage to name a few.² For more information on the institution, visit <http://www.spelman.edu>.

Academic Programs and Courses

The institution offers an undergraduate liberal arts education with Bachelors of Science and Arts. A Dual Degree Engineering Program provides the opportunity to obtain both a liberal arts education and a professional engineering education in collaboration with a participating engineering school. The academic program also includes a degree in Environmental Science and Studies that aims to, among other things, help students recognize major concepts in environmental sciences and demonstrate in-depth understanding of the environment. The program recognizes that global changes and responses for attaining a more sustainable environment are implemented using multiple disciplines. The program includes courses in Environmental Policy and Politics as well as natural sciences and Soil and Atmospheric Science. Spelman College also offers a Continuing Education program that includes summer conferences, training and other opportunities.³ Spelman College has yet to integrate sustainability throughout the curriculum but offers specialized courses for major. Also, for more information on the institution, visit <http://www.spelman.edu/academics/programs/>.

¹ Spelman College. "History in brief." Retrieved June 9, 2009.

² Text Contribution: Mr. Arthur Frazier, Director of Facilities Management and Services, Spelman College.

³ Spelman College. "Academic Programs." Retrieved June 9, 2009.

SUSTAINABILITY MISSION Institution and Sustainability

With the leadership provided by the president's office, the Facilities Management and Services office executes and manages various sustainability initiatives at the Spelman College. The institution is in the process of evaluating a strategic plan, which proposes a campus-wide sustainability office to focus on the improvement of the physical campus, technology infrastructure and residential programs. This office is also envisioned to facilitate student engagement by promoting student-faculty interactions, and to generate a dynamic learning experience and sustainable living environment. A presentation outlining the goal of this plan can be found [here](#). Spelman has also created, **Sustainable Spelman**, a portal that describes all of the sustainability initiatives conducted at the institution.

Green Initiatives on Campus

Spelman College is implementing many initiatives to promote sustainability on its campus and proving to be a green building champion by implementing sustainable building practice in its brick and mortar projects. Following is an overview of Spelman's sustainability efforts.

- **Single-stream recycling and recycling of shredded secure documents** are practiced throughout the campus.
- **Tray-less dining** is implemented at all the dining halls across the campus, saving the institution over one thousand gallons of water per week.
- **Recycling of HVAC condensate** is utilized to irrigate the landscape of the campus
- **Student-lead sustainability groups** and other Institution involvement
- The Environmental Taskforce and Sustainable Spelman are the two campus groups with goals to promote day-to-day sustainability efforts on and off-campus. Their activities range from coordinating the recycling program, raising sustainability awareness, and organizing debates and conferences. The African American Earth Day Summit and Green Jobs Now initiative are supported by these groups' actions. In addition, Spelman College co-hosted the 2008 Collegiate Environmental Sustainability Conference with the Environmental Protection Agency following its commitment to green building and sustainability. <http://www.spelman.edu/administration/business/fms/greenbuilding.shtml>
- More recently, Spelman embarked on a mission to address and investigate the state of its facility buildings and overall infrastructure of the campus, as well as the energy usage associated with the operations of its facilities.

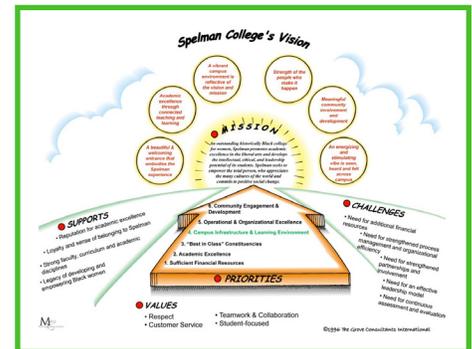


Photo Credit: Strategy Plan Presentation Sustainable Spelman, A Choice to Change the World

The poster is for the "2008 Collegiate Environmental Sustainability Conference" held in Spelman College, Atlanta, Georgia, on October 23-24, 2008. It features a green and brown color scheme. The top left has the slogan "Save the Date!". The top right shows a photograph of Spelman's LEED-certified Residence Hall. The text on the poster includes: "Come learn the dollars and 'sense' of Going Green. Hear about the benefits, success stories and resources available to Colleges and Universities.", "Our environmental decisions now affect us economically later.", and "The window of opportunity is now. Going Green has never made more sense!". It is sponsored by Spelman College and the Environmental Protection Agency (EPA). The bottom of the poster provides the website www.epa.gov/region4/greencolleges for more information and free pre-registration.

Photo Credit: <http://www.spelman.edu/administration/business/fms/green-building.shtml>

- *Energy Management*

The Energy Management Policy, officially launched in March 2009, is part of Spelman’s proposed Strategic Plan for improving campus operations’ efficiency. The policy provides guidelines for students and staff to advance energy efficiency and conservation practices and also outlines the institution’s other conservations efforts. This policy includes tips that could help educate the occupants of the campus buildings regarding the measures that could reduce the energy usage and assist the institution in pursuing its sustainability efforts. This awareness component of the policy encapsulates sustainable practices for using lighting, temperature control, and laboratory refrigeration among other systems that could contribute towards better energy efficiency while reducing institutional emissions. See the document titled “[Spelman College Energy Management Policy](#)” for a draft of this policy letter.

The instituted Energy Management Policy also addresses air conditioning, energy efficient appliances and equipment usage throughout the campus. The institution has recently begun a new initiative that involves the use of meters at various campus buildings to measure utilities and energy efficiency as well as resource usage. This will help the institution analyze and quantify the improvements required to increase the efficiencies of these systems.

- *Campus Assessment*

Spelman College was awarded a grant through the [Grants to Green Program](#), an initiative of Southface Energy Institute, The Community Foundation for Greater Atlanta and Enterprise Community Partners. Southface has undertaken assessment of the carbon footprint of the campus as a whole and that of the Science Center complex for its benchmark evaluation. The Science Center is the largest single complex combining three buildings, which are estimated to be the largest energy users on campus. The second phase of the grant program may provide funding to the institution to implement improvement plans based on the results of the initial investigations. Click [here](#) to read the conclusions reached based on those findings.

- A “measurement verification” program is also being implemented for “The Suites” dormitory to evaluate the building’s performance post-construction.

Sustainability Commitment

Currently Spelman College does not have a specific sustainability policy in place, however, the aforementioned campus sustainability initiatives are continually implemented and evaluated by the Facilities Management and Services office. These initiatives are the result of collaborative efforts and ongoing brainstorming sessions of the administration and the management authorities of the institution. These initiatives chart the path that guide the institution to a more sustainable and energy efficient future. Facilities Management and Services is the primary office addressing campus-wide infrastructure-related issues and integrating sustainable practice wherever possible. President Beverley Tatum has been a strong advocate for change and innovation at Spelman. Her vision for the future of the institution and her understanding of the environmental challenges facing the society and the planet today have proven catalysts in promoting sustainability on the campus.

Thus, the sustainability efforts at the Spelman College could be attributed to the excellent leadership of the president's office and the expertise of the senior management. Spelman College is a stellar example of how the prudence of the president in tandem with the determination of the staff-members could advance an institution towards its ultimate mission of climate neutrality.

Though not a signatory of the **American College and University Presidents Climate Commitment (ACUPCC)**, the institution is on its way to completing a campus wide carbon inventory with the help of the Grants-to-Green program. This undertaking endorses Spelman's commitment of developing an environmentally sustainable institution while transforming the ways in which buildings are built, managed and used on the campus.

As part of the Strengthening the Core Strategic Plan for 2015, Spelman staff and administrators have the following GOALS:

- **G**lobal Perspective, by working to achieve a “greener” Spelman
- **O**perational excellence, which will create an optimal experience for all campus visitors
- **A**ccountability evident in greater cross-institutional cooperation, improved efficiency, and consistently excellent service
- **L**eadership opportunities, including professional development and training, for continued growth and development
- **S**ervice and community engagement beyond our gates

To enhance the experience of community for all constituents, Spelman staff and administrators will lead the college's efforts to create a more environmentally sustainable campus. Spelman's goal is to establish itself as a model academic institution in this regard, and it intends its leadership to affect lives and effect positive social change.

Campus Green Building

The Suites is the first and only green building and LEED®-Certified building on the Spelman campus. As part of the campus strategic plan, six existing buildings, aging between 30 and approximately 108 years, will be renovated in the coming years. The institution hopes to achieve LEED® certification for all the six buildings upon the completion of the renovation.

Challenges with regard to Building Green on Campus

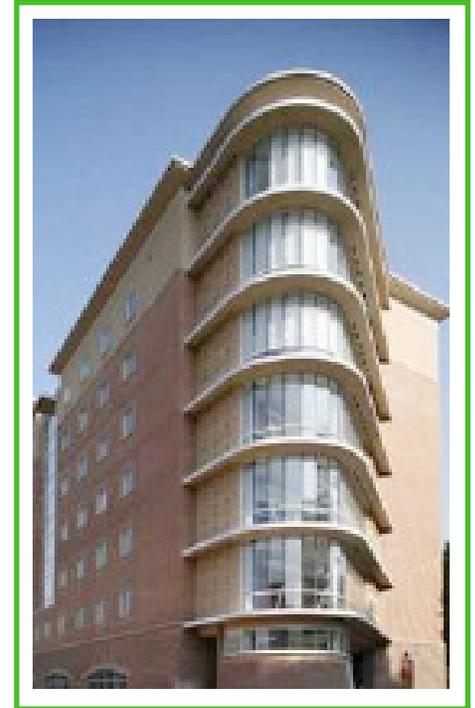
Members of the institution, administration and management alike, are supportive of green building projects at Spelman. “The Suites” is the first new construction on the Spelman campus in the 21st century. Following are the challenges faced by the administration and the project team during the planning, design and construction stages.

1. Delayed Decision-making creating avoidable barriers

The decision to make this building green and LEED®-certified, at a minimum, came after the actual construction of the project had started. That meant that the planning and the design of the building project were concluded before the decision of building a LEED®-certified building was brought to the project team. Because of this delay, the project team confronted various hurdles that could have been easily avoided by timely decision-making.

2. Difficulties faced while integrating potential green building features in the building

Due to the fact that the green building idea was brought to the table much later in the process, the integration of the green features into the building proved to be a more cumbersome and resource-intensive undertaking. The team opted to implement LEED® and green features into the existing design wherever possible and extensively revised the existing design to accommodate the new green features.



Exterior view of The Suites building
 Photo Credit: Spelman College

3. Missed opportunities of incorporating more green building features in the building

In many cases, the cost of the LEED® credits that could be obtained had to be critically evaluated to determine the value of the added features compared to the previously planned cost of the overall project. This did not leave much scope for incorporating more green building features that could have been optimally included with a premeditated integrated design process.

Identifying and Assessing Opportunities to Build Green

Like any other aging infrastructure, Spelman's campus facilities face challenges with retrofitting these building systems and also sizeable costs associated with the facilities' operations and energy usage. To overcome these challenges and plan for efficient and healthy built environments, Spelman assessed the identified the need for creating a strategic plan for the campus. Energy savings, lower maintenance needs and costs along with the transformation of Spelman campus into a more sustainable campus are the benefits of the proposed campus strategic plan.

In addition, educating occupants, including students, staff and faculty, through campus awareness and educational activities such as the Energy Management Policy are essential to begin the quest for energy conservation and transform the way in which buildings are perceived. The institution recognizes that, though the upfront expenses would be accrued, building green and maintaining campus efficiency are cost saving investments for the future of the institution and its community.

Green Building Protocols

The institution is reviewing a strategic plan and outlining the protocol that would eventually result in incorporating green building features and addressing occupant's behavior throughout the campus.

The college's president, Dr. Beverly Tatum, in her 2006 convocation speech, expressed a strong desire to "[build] for the next 100 years and pay attention to environmental impact." The president instructed that The Suites be constructed under a recognized green standard, at a minimum LEED®-Certified level. Dr. Tatum talks about sending Spelman women into the world with adequate education and awareness that would enable them to recognize the environmental catastrophes affecting the planet and act as stewards for our planet. Her aspiration to transform the campus into a more sustainable environment coupled with the facility director's first-hand exposure to the difficulties the institution faces due to the aging infrastructure, created a great support for the green building idea at the institution.

In addition, assessment of the largest complex at the institution (3 buildings dating year 2000) is underway. There are also plans to renovate 6 non-air conditioned residence halls, with the goal that they will be LEED®-Certified upon the completion of the renovation. The need for this renovation was assessed based on the first-hand experience with substantial cost savings offered by energy and water efficiency and conservation measures. The need for newer systems and feedback from the occupants also supported the decision to retrofit the older buildings. The recognition of the direct link between energy efficiency, cost savings and over-arching institutional sustainability will inform the Green Building Protocols at the Spelman College.

In essence, Spelman College has its sight set on the future and the paybacks offered by a sustainable campus, while taking the role of a sustainability leader in the Historically Black Colleges and Universities community.

GREEN BUILDING PROJECT PROFILE

Project Introduction

The Suites

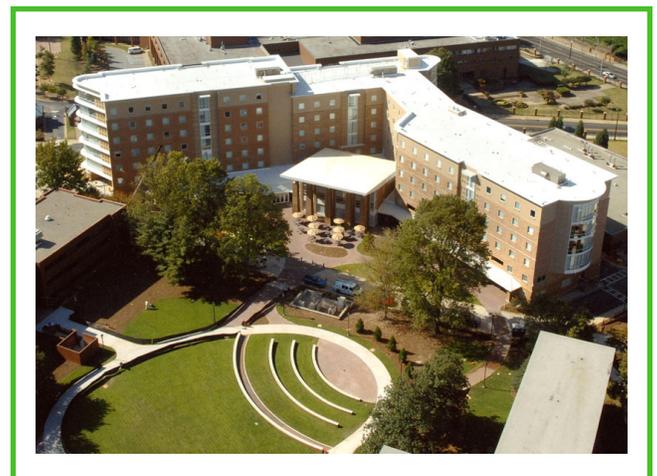
Functions: Residential Housing, Dining Hall and Underground Parking

Completion: July 2008

LEED® Rating Version: LEED® NC 2.2

Certification: Awarded LEED® Silver

Approximate Built-up Area: 200,000 sq.ft.



Bird's Eye view of The Suites building Photo Credit: Brookwood Group

"The Suites" building is located on the southwest end of the Spelman campus. It is the first LEED®-Certified residential hall on any Historically Black College or University and the first construction to take place on the Spelman campus in the 21st century. The building, which houses approximately 300 students, can accommodate 100 cars in its underground parking and includes a 175-seat dining hall. The parking deck includes preferred parking for environment-friendly, low-emission and fuel-efficient vehicles as well as covered secure bicycle storage areas.

Following are the steps⁴ that were taken to guarantee minimal impact on the environment as well as to increase quality of indoor air quality.

- A previous parking lot was converted into a green space for students, which now provides natural habitat for local flora and fauna. Removed trees were relocated on the campus.
- Steel and finishes with high-recycled contents were used to reduce the impact on virgin materials.
- Low or no VOC paints were applied across the building.
- GreenGuard-certified carpets and carpet adhesives were used in the building.
- Forest Stewardship Council Certified woods and composite woods were used in the interior spaces and furniture systems.
- Green housekeeping practice is employed to reduce the overall impact of cleaning on the health of the occupant as well as the environment.

Project Process

Design Stage

Design of "The Suites" underwent much iteration because the planning and design were completed prior to the decision was made by the administration about assimilating green features complying with LEED® criteria in the building. For example, the initial configuration of the building (that was determined by the first design iteration) needed to be altered in order to increase energy efficiency (pertaining to LEED® standards) while maintaining the original intent of the initial design. The team performed a feasibility study to evaluate the type of LEED® components that could be incorporated at the construction stage versus the benefits offered by these features. A spreadsheet/list of feasibility options was compiled for that purpose and assessed against the initial investment. Extensive collaboration was required from the involved consultants such as the architects, civil, HVAC, MEP engineers as well as the construction team to transform this building into a high-performance building, which was not planned to be one.

Construction Stage

Planning for construction of "The Suites" took place in the mist of the hurricane Katrina aftermath. Multiple construction management companies were issued a Request for Proposals (RFP) for the project, however bids were higher than what the institution had budgeted for. At which point the team decided to proceed with the initial design of the building and reissue the project. Negotiations with many potential contractors failed until New South Construction expressed interest. CxGBS was retained as the LEED® consultants for the project partly due to previous alliance between Jay Enck (CxGBS) and Arthur Frazier (Spelman) on the one of the building projects at Morehouse College.

⁴ H.J. Enck. (September 2007) "Building Green for Future Generations." Environmental Design + Construction. Retrieved June 9, 2009

Operation and Maintenance

The operation and maintenance of the new residence hall, in some aspect, becomes a case study for the institution since monitoring is an essential verification component of the post-construction and occupation stages.

- Green housekeeping is employed in the building to eliminate the environmental hazards caused by the chemicals from the cleaning products.
- The institution educates the facilities staff and personnel about the best practices.
- Measurement Verification Program is being implemented to evaluate the building's performance.
- The campus has already instituted an Energy Management Policy, which guides occupants in best ways to conserve energy and alert the institution when malfunction occurs.

Post-occupancy Issues

The post-occupancy of any building facilities is one of the principal markers for gauging the building's performance.

In the Spelman's case, the Operations and Maintenance staff monitors the building throughout the year. The Suites building utilities are metered to observe the performance and efficiency of the new building systems. Continuous feedback from the students and staff is also informing the facilities staff about the post-occupancy performance of the HVAC system, and lighting and other electrical loads. Spelman College is in the process of metering the utilities across all the campus facilities using The Suites building as their model project.

Project Finance

Funding Plan

The College financed this project as part of a \$75 million bond issue. The revenue bond issue was 63 million in lieu of \$75 million of which the cost of the suites was 43 million dollars. The remaining funds were for infrastructural improvements and the amphitheater for the Suites, as well as the landscaped area that connects The Suites to campus.

The bond issue was obtained to assist Spelman in financing campus projects that the administration had planned for or was in the process of planning. The funds were not issued specifically for green building projects, however, they were issued to finance the campus wide infrastructural retrofit/new construction projects.

Project Features

Site Selection

- Utilization of an existing campus site formerly a surface parking lot
- Addition of an underground parking garage with reserved parking for fuel efficient vehicles
- Highly reflective roof for minimal heat retention
- Landscaping and irrigation features around the building promote runoff infiltration
- Oriented to maximize sunlight, particularly in common areas

Energy

- 19.2% total energy cost savings were achieved
- Occupancy sensors are used throughout the building
- Efficient heating and cooling systems were installed with thermal controls
- Energy recovery units are located on top of the building to improve efficiency in heating and cooling

Water

- 30.8% total water use reduction
- High efficiency fixtures, low flow showers and waterless urinals
- Water efficient landscaping allows 20% reduction in water usage
- Low maintenance vegetation is part of the landscape design

Material and Resources

- 21.414% of the content used was recycled
- 78.885% of construction waste was diverted from landfills
- 31.436% of materials used were manufactured locally
- Structural system that minimized waste production
- Reinforced, cast-in-place system utilizing forms that become part of the structure.
- Pre-cast, pre-tensioned floor slab brought on site
- UL rated which requires no additional fireproofing throughout the majority of the building
- See Innovations credits in LEED® scorecards/submittal

Air Quality

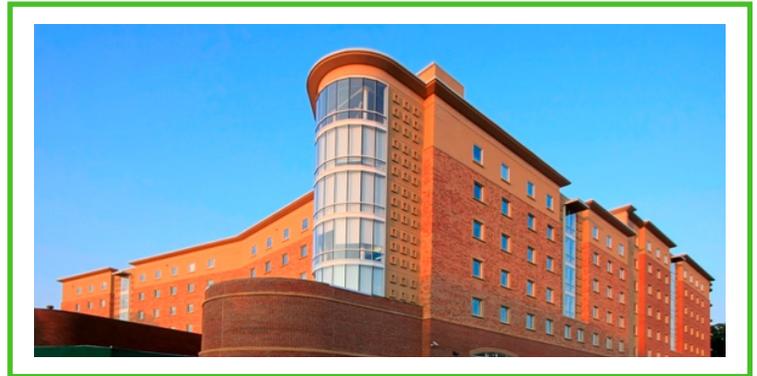
- Efficient HVAC system
- Use of green housekeeping products and practices
- Use of low-emitting materials and furniture
- Use of low or no VOC paints and sealants
- GreenGuard-certified carpet systems and carpet adhesives

For more information, please refer to The Suites at Spelman's [LEED®-NC Application Review](#) and [LEED® Facts](#).

Lessons Learned

Educational

- Having a green building constructed on the campus and the energy management policy that is implemented as part of the management of the new building prior to occupation adds intrinsic value to the overall educational experience at Spelman.



The Suites Exterior View Photo Credit: New South Construction

- More than the actual construction of the building, the post-occupancy education elevated the sustainability and green building awareness of the occupants-students, staff and faculty.
- At Spelman, students show interest in understanding strategic aspects of sustainability, in particular activities such recycling, energy conservation, etc.
- The new building has also sparked conversation among students and neighboring colleges about green buildings and its features, and how they act as educational tools providing a comprehensive community learning opportunity

Financial

The institution has addressed campus occupancy over the past two decades as its population grew significantly in this timeframe. In order to meet the required number of available on-campus housing, the decision was made to build The Suites. The new dormitory and its features are a result of the administration's desire to raise the standard of living on campus as well as student's feedback regarding their needs as building residents. The project, as Arthur Frazier indicated, was entirely funded by bond issued funds. The team learned that:

- The administration's support and dedication could create efficient financial planning strategy and build consensus regarding investment in sustainability.
- Deferred integration of green criteria into the design could cost additional financial cost and staff-time.
- Careful planning and assessment of needs and requirements for LEED® criteria were essential to minimizing cost.
- Due to the type of funding obtained to finance the project, there were restrictions and limitations on tapping into other sources of financing. For example, Mr. Frazier mentioned that additional funds needed for a landscape watering feature could not come outside of the bond issued funds therefore the feature had to be forgone.

Social

- The construction of “The Suites” has not only sparked public interest but also presented new opportunities for the institution to maintain a healthy relationship with its neighbors.
- Other colleges and groups have expressed interest in visiting the new dormitory building to learn about its sustainability component.
- Other institutions that border the campus as well as neighbors of the Spelman campus were kept in the loop about the progress made on the construction of this green building project, and this helped Spelman build camaraderie with these colleges and universities.
- Spelman hosted a conference that attracted colleges of the Southeast, which also included a visit of “The Suites”.

Technical

- As indicated by Arthur Frazier, having worked with CxGBS (LEED® Consultants) in the past was a valuable advantage to the planning of the project.
- The LEED® consultants were key components in determining the equipment and materials that would meet green and LEED® criteria. The LEED® team acted as guides in deciding what the institution needed and could accomplish given the constraints added by using an existing design and the urgency to adhere to the original schedule.
- The team also found that they encountered severe time constraint with the need for redesign and reconfiguration of the building. Meeting their deadline on time for students’ return to campus in the fall was particularly challenging.

Recommendations

“Start early!”

The project team unanimously agrees that starting early in the planning and the decision-making process is the single most crucial constituent of the success of a green building project. “If we had to do it all over again, that’s what I would do. Start early in programming with [LEED®] criteria. That definitely was our biggest challenge, starting late in the game”, said Arthur Frazier, Director of Facilities Management and Services at Spelman College. He also added, “I think we would be greener for less.” The team stressed that redesigning the building to implement green features while the building was already under construction significantly added to the previously budgeted project cost.

The team recommends that one needs to think about various specialties that will be needed to provide the appropriate expertise and most efficient construction management practices. Bringing on board the LEED® accredited professionals and commissioning experts early in the process, either as independent consultant or as part of the design team, definitely streamlines the designing and the planning process.

The team also recommends that it is important to consider investments in energy saving, maintenance, efficiency as long-term paybacks rather than short-term expenses. These investments will eventually present manifold benefits, such as saved operations and maintenance costs, reduced energy consumptions, better indoor air quality, better health of the occupants, reduction in GHG emissions and eventually wellbeing of the environment. Also, the Life Cycle Cost Analysis of building green versus its alternative should be one of the decisive procedures performed before planning any brick and mortar project.

Finally, the education of the building occupants and facilities staff is vital to the management of any high-performance building facility. Green buildings that are used by and managed by individuals unaware of the green features and sustainable operation practices could encumber the building systems from performing at the desired efficiency levels.

Project Documents

- [Sizemore Interview with Mr. Arthur Frazier](#) about the need for the new dormitory
- [Spelman Carbon Footprint Analysis](#)
- [Spelman Carbon Footprint Conclusion](#)
- [Spelman College Energy Management Policy](#)
- [Spelman Draft Policy Letter](#)
- [Spelman LEED® Chart](#)
- [Spelman LEED®-NC Application Review](#)
- Spelman Vision for the campus [Strategic Plan](#)
- [“Choice to Change the World” Speech](#) delivered by Spelman President, Dr. Beverly Tatum

Documents requested:

- Strategy Paper “Sustainable Spelman”
- [LEED® Submittals](#)
- Specifications and Plans
- Construction and Other Project Photos
- Notes/Documents showing strategy during construction/planning for team selection and needs
- Design and Construction Manuals/Documents

Other Sources of Information

- Links to school’s main site, contact, sustainable department/facilities.
[Spelman College Website](#)
[Spelman Facilities Management Services](#)

- Links to team's sites.
 - Architect/Mechanical Engineer/Interior Designer:
[The Facility Group of Cobb County, Georgia.](#)
[The Facility Group's LEED History](#)
 - LEED® Consultant:
[CxGBS/Commissioning and Green Building Solutions, Inc..](#)
[CxGBS Sustainable Design.](#)
 - Contractor (Design/Build):
[New South Construction Company of Atlanta.](#)
[New South's Environmental Commitment](#)
 - Project Manager:
[Brookwood Group.](#)
[Brookwood Group Project Management.](#)
 - Design Consultant:
[Sizemore Group of Atlanta.](#)
[Sizemore Sustainable Design projects](#)
 - Interior Designer for Furnishings and Finishings:
[TVSDESIGN](#)

Links to any external resources (organizations, etc.) that the institution used.

[Grants to Green](#)

Publicity, Articles and other:

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- Spelman College. (October 20, 2006). "[Spelman College Breaks Ground for a 'Greener' Future.](#)" Retrieved June 9, 2009.
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CONTACT PROJECT TEAM

Contact Information

- Architect/Mechanical Engineer/Interior Designer: [The Facility Group of Cobb County, Georgia](#)
- LEED® Consultant: [CxGBS/Commissioning and Green Building Solutions, Inc.](#)
- Contractor (Design/Build): [New South Construction Company of Atlanta](#)
- Project Manager: [Brookwood Group](#)
- Design Consultant: [Sizemore Group of Atlanta](#)
- Interior Designer for Furnishings and Finishings: [TVSDESIGN](#)