Innovative Recycling and Waste Reduction Grant
IG09-03

FINAL REPORT
October 15, 2010

Green Learning Center – Phase 1
Institutionalizing Green Building for Future Generations: Build and Learn the Green Way

Prepared for:

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Section 1.0
Introduction

1.1 Project Background

In 2007, Okaloosa County (County) sought Innovative Grant funding to build an active Green Teaching and Learning Center (GTLC) in partnership with Construction Technologies Institute (CTI), part of the school district's Community High Okaloosa Institute for Career Education (CHOICE^{tm}) a program that prepares students for workforce results. The 3,000 square foot Center would become a part of the Okaloosa Public School District and would be made with and showcase as much recycled content, reusable, and renewable material as possible, and would apply for Green commercial building certification. The teachers and students would learn, build, and experience the Green process during construction and thereafter on an annual basis.

The project proposal was originally one document and the project was ranked #3 out of the submissions that year. Only three grants were funded that year. The first and second grant were fully funded, the third grant (OKA GLC) was only partially funded 10.4%). Therefore, the project was to be staged in two phases; only the first phase, recommendations for a Green curriculum, was funded during the 2008 – 2009 grant award period. A significantly modified scope and $62,781 of the original $606,160 requested, or 10.4 percent ($62,781/$606,160), was approved and funded.

1.2 Project Goals & Objectives

Okaloosa County, in Northwest Florida, sought to *institutionalize* Green Building for teachers, students and the building community through the design and construction of a GTLC. Although grant funding for the full scope of the project was not awarded, a small portion of the total budget was approved for the recommendation of a green curriculum for high and middle school students preparing for careers in construction trades. Participating teachers from the Okaloosa Applied Technology Center (OATC) included those teaching electrical, carpentry, welding, plumbing, and engineering, architecture, and construction management. Participating faculty members, when applicable, were to apply for United States Green Building Council (USGBC) LEED® accreditation.

The project intended to research, develop, and recommend a dedicated Green Building curriculum in the classroom to further the goal of Green Building in Florida. The education of students in Green Building and their subsequent entry into the workforce

would contribute to the long term waste reduction and recycling goals of the State. Designing Green can reduce the resources required to construct and operate a building throughout its lifetime. Incorporating recycled content materials into construction preserves virgin resources and "closes the loop" in recycling. During demolition and construction, Green Buildings are capable of diverting 50 percent or more of their C&D waste stream; some have been shown to divert over 75 percent. Green Buildings recycle and divert substantially higher levels of waste and incorporate greater amounts of recycled or reused materials than conventional buildings.

1.3 Innovative Features

To the project team's knowledge, there is no construction curriculum being taught in Florida that is built around Green Building techniques and materials. This project has lead to the development of a Green Building curriculum provided to OATC that will instill Green Building concepts into the next generation of architects, builders, developers, and contractors/tradesmen. Advancement of graduates from a Green Building curriculum to the construction site bring their knowledge and beliefs to impact the design, understanding, and behavior of the existing workforce.

1.4 Proposed Audience and Information Dissemination

The results of this project are transferable to every vocational curriculum in Florida high and middle schools that prepare students for careers in construction trades. While the project was specific to OATC teachers and students, the research conducted and training are applicable to other electrical, carpentry, welding, plumbing, and engineering, architecture, and construction management teachers in Florida.

Information about this project was developed and disseminated at the 2010 BIA Home Show on March 27, 2010 and SWANA FL Sunshine Chapter Fall/Winter newsletter.

2.1 Initial Project Activities & Timeline

Project Schedule

The information listed below details the scope of services listed in the County's contract with the Florida Department of Environmental Protection (FDEP), including the project tasks, project schedule, a task description, and the deliverables for the project. The relative deliverables for each task that have already been delivered to FDEP as part of quarterly reports are referenced only in this report. Section 3.0 details the actual deliverable results prepared and produced.

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Table 1 - Grant Schedule/Timeline

Task	1Q	2Q	3Q	4Q	5Q	6Q	7Q	8Q	Final Report
Task 1: Develop and convene a project team	X	X	X	X	X	X	X	X	
Task 2: Obtain Building Green Suite and USGBC Membership, and Green Building Educational Resources and Training Supplies	X	X					X	X	
Task 3: Hold USGBC LEED Green Building Training Program for OATC Staff/Students and Okaloosa Staff							X		
Task 4: LEED Accreditation Exam for 15 OATC staff/students and County Staff Members									
Task 5: Perform Curriculum Research and make Program Recommendations	X	X	X	X	X	X	X		
Task 6: Project Team Travel, Training Travel, Accreditation Testing Travel, and Venue Rental	X	X	X				X		
Task 7: Project Management and Administration	X	X	X	X	X	X	X	X	
Task 8: Quarterly and Final Reports	X	X	X	X	X	X	X	X	10/15/10

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Table 2 - Grant Scope of Services

Task	Activities	Project Deliverables and Results
Task 1: Develop and convene a project team	Identify team members from Okaloosa Applied Technology Center (OATC), County, and Consultant and secure participation, discuss project objectives, and solicit member input.	Prepare team list and convene meetings/conference calls.
Task 2: Obtain Building Green Suite and USGBC Membership, and Green Building Educational Resources and Training Supplies	Order Green Building Materials, Resources/Recycled Content Materials and Resources Directory, LEED Reference Guides for OATC and County staff/students. Become members of Building Green Suite and USGBC to gain educational resource access and member discounts.	Obtain and utilize memberships, Green Spec directories, LEED reference manuals, brochures, and other support materials.
Task 3: Hold USGBC LEED Green Building Training Program for OATC Staff/Students and Okaloosa Staff	Hold LEED sanctioned training course with certified LEED trainers.	LEED accredited training workshop for 23 OATC staff, teachers, students, County staff with USGBC certified trainer.
Task 4: LEED Accreditation Exam for 15 OATC staff/students and County Staff Members	Take LEED NC exam at Prometric/Sylvan Learning Center in Tallahassee (closest location to Okaloosa County).	Testing at Prometric/Sylvan Learning Center for up to 15 OATC teachers/students and County staff was not completed.
Task 5: Perform Curriculum Research and make Program Recommendations	Gather curriculum information; gather existing LEED curriculum information from outside FL; and prepare results report that identifies curriculum protocol.	Research with USGBC and the National Center for Construction and Education Research the protocol and steps necessary to develop LEED curriculum. Prepare letter report with recommendation.
Task 6: Project Team Travel, Training Travel, Accreditation Testing Travel, and Venue Rental	Travel costs associated with training, accreditation/testing, conferences (e.g. Greenbuild, RFT/SWANA).	Documentation and billing for travel expenses for appropriate project team members.
Task 7: Project Management and Administration	Coordinate and oversee all project tasks and ensure compliance with FDEP agreement. Identify expenditure items and costs.	Maintain project goals and objectives, project momentum, and project team participation.
Task 8: Quarterly and Final Reports	Prepare and deliver quarterly and final reports as specified in the terms of the contract.	Quarterly reports and One Final Report

2.2 Equipment and Services Procured

Listed below are the equipment, supplies, and technical services procured for the project.

The following technical and professional services were procured for the project:

- SCS Engineers (SCS) and Kessler Consulting, Inc. (KCI) provided ongoing project management and technical assistance for all project tasks for the duration of the project.
- SCS provided the County with project oversight and financial management of KCI.
- United States Green Building Council (USGBC) conducted a training workshop "LEED Core Concepts and Strategies" on the OATC campus.

The following supplies and materials were procured:

- Green Building Materials and Resources/Recycled Content Materials and Resources Directory,
- LEED Reference Guides for OATC Teachers/Students/Staff,
- Membership in the Building Industry Association of Okaloosa & Walton Counties,
- "Your Role in the Green Environment" workbook and presentation CD published by National Center for Construction Education and Research (NCCER)'s,
- LEED Core Concepts and Strategies workbooks (part of training workshop of same name), and
- USGBC membership and Florida Green Building Coalition (FGBC) membership for County Recycling Coordinator, Jim Reece.

2.3 Problems Encountered

The original project contact, Mr. Matt Clark, Construction Technology Institute (CTI) Dean, changed employment just before the project started, leaving the project without a project contact. During the second quarter the project team contacted Mr. Al Gardner, OATC Principal, and requested he act as the project contact for the duration of the project; Mr. Gardner agreed.

OATC was urged to purchase Green Building Materials and Resources, Recycled Content Materials and Resources Directory, and LEED Reference Guides for faculty

under the grant; however, these purchases were never made. The County procured these resources on behalf of OATC and delivered them.

The cost of the training workshop was $400 higher ($6,900) than the original quote obtained when applying for the grant funding over two years earlier. The County requested and the FDEP Grant Manager approved the use of $400 from the Task 6 travel budget to pay for the Task 3 LEED workshop.

The project achieved only 31.2 percent of the $37,390 in-kind contribution specified in the grant. The $37,390 was based in part on anticipated contributions from private organizations and businesses; however, the County's grant office determined that no in-kind contributions from private organizations or businesses could be reported unless the organization or business verified its labor rates. The private sector generally prefers not to make labor rates publicly available, so those in-kind hours were lost.

Also, although OATC teachers and staff were asked to account for their hours reading or discussing the Green Building concepts and/or training, and hours spent teaching Green Building concepts in the classroom, they were unable to provide a detailed accounting of hours engaged in such activities on a daily basis.

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Section 3.0
Project Results

3.1 Achievement of Goals and Objectives

Task 1 – Develop and Convene a Project Team

The original project contact, Mr. Matt Clark, CTI Dean, stepped down as project contact just prior to the project's beginning. The project team met with Mr. Al Gardner, OATC Principal, during the second quarter and requested he step in as project contact. Principal Gardner agreed to participate in the project, and communications with Mr. Gardner continued as needed throughout the project.

A presentation was made during the August 2009 kick-off meeting to OATC staff and teachers to introduce the grant project goals and tasks, and outline the roles of project team members, including the reporting of in-kind contributions. Communications with OATC staff and teachers as well as County staff continued as needed throughout the project. A copy of the PowerPoint presentation made at the kick-off meeting was included in a previous Quarterly Report.

Task 2 – Obtain Building Green Suite and USGBC Membership; Green Spec Building Directory, Green Building Educational Resources and Training Supplies

These resources were researched and recommendation made to Principal Gardner to procure the membership, directory, and other educational resources. The County purchased these resources for County use during the sixth quarter of the project. During the seventh quarter, the County also procured the BD&C Reference Guide, LEED-Schools 2007, the LEED for Homes Reference Guide, and membership in the Building Industry Association of Okaloosa & Walton Counties on behalf of OATC and delivered them to Principal Gardner to be used by teachers and students.

Task 3 – Hold USGBC LEED Green Building Training Program for OATC Staff/Students and Okaloosa Staff

Research was conducted to identify the training program most appropriate for earning the Green Associate accreditation. Several training alternatives were researched including the Green Building Fundamentals for the LEED Green Associate course offered by the

Center for Training, Research, and Education for Environmental Occupations (TREEO), a private LEED workshop sponsored by Amy Stalbosky, RA, LEED AP, and USGBC's LEED Core Concepts and Strategies facilitator-led workshop. Based on the scope task curriculum content, cost, and facilitator qualifications, the USGBC workshop was chosen.

The County contracted with USGBC to conduct the LEED workshop on April 23, 2010 on the OATC campus for up to 30 attendees; 23 students, teachers and staff attended. The all day workshop was facilitated by Mr. David Freeman, PE who was formerly the Chief Engineer for the Georgia Department of Natural Resources. All attendees received a certification of completion to be used as proof of satisfaction of the educational requirement when applying to be a Green Associate candidate. A list of attendees, the facilitator's biography, registration materials, certificates of completion, and workbook were included in prior period Quarterly Reports.

Task 4 – LEED Accreditation Exam for 15 OATC Staff/Students and County Staff Members

During the course of this project the USGBC revised its accreditation structure and requirements. The revised structure was examined and discussed with USGBC staff to determine which accreditation exam would be the most appropriate for OATC staff/students and County staff members. It was determined that the new LEED Green Associate exam would be most appropriate, so steps were taken to gather information to register for and schedule the exam.

OATC teachers and staff and County staff were provided training in preparation for the exam and assistance in applying for Green Associate candidacy, and exam scheduling. Unfortunately, the OATC teachers and staff did not take advantage of this opportunity. County staff, due to workload priorities, also could not take advantage of the opportunity to take the exam before the grant period end.

Task 5 – Perform Curriculum Research and Make Program Recommendations

Research was conducted on current trends in High School Curriculum Development nationwide and how to materially add green building components to it. Additional research was conducted on the Florida Department of Education (FDE) Curriculum

Framework for Architecture and Construction career cluster in the Academy of Building Trades and Construction Design Technology program to understand the State minimum requirements. Discussions were held with Ms. Julia Feder, Manager of K-12 Education of the USGBC regarding development of a LEED curriculum, the appropriate credential for OATC project teachers and staff, and to obtain information about similar secondary education Green curricula programs. Two referenced programs, East Iowa Community College (EICC) and the Urban Assembly were contacted for additional information and insights. Discussions were held with Mr. Brian Ritter of EICC; however, repeated attempts to reach the Urban Assembly went unanswered.

Additional research included review of materials from the 2008 Greenbuild conference, including "From Old Schools to Green Teaching Tools," "Education Revolution: Empowering the Next Generation of Sustainable Designers," and "Greening the Trades of Tomorrow."

The National Center for Construction Education and Research (NCCER) organization was researched and contacted regarding their efforts to integrate green building concepts into that organization's curriculum development and to learn the preliminary outcomes of those efforts. NCCER is affiliated with the University of Florida's "Rinker School of Building Construction" and offers coursework through the Contren® Learning Series (online and in the classroom). NCCER's new curriculum module, "Your Role in the Green Environment" was reviewed for integration or application by OATC teachers. During an interview, Mr. Robert Stroh of NCCER noted that the focus of NCCER curriculum is to certify the worker, not the building, asserting that if the workers are green, the resultant building will follow.

The deliverable under this task, the Curriculum Letter Report, was included as part of a previous Quarterly Report.

Task 6 – Project Team Travel, Training Travel, Accreditation Testing Travel, and Venue Rental

Travel budget dollars were spent for KCI staff to travel from Tampa to Ft. Walton Beach to meet with other project team members, conduct the kick-off meeting on August 18, 2009, and to attend and coordinate the LEED training workshop on April 23, 2010. County and OATC did not expend any travel dollars during the grant period.

Task 7 – Project Management and Administration

This project was funded through an Innovative Grant that was awarded to Okaloosa County by FDEP. Effectively managing the project, coordinating activities, and administering the grant was a joint effort between the County, SCS, and KCI. Provided below is an explanation of how the team maintained open lines of communication, as well as a summary of the County's in-kind service involvement that was critical to the project's success.

Project Meetings: KCI held regular project team meetings/calls with the County and OATC staff, as necessary, either by telephone conferencing or in person. KCI prepared the meeting agenda based on the approach described herein. Regular updates were provided and open communication was maintained between KCI staff, SCS, and the County regarding project activities, deliverables, and relevant updates. These calls and meetings were crucial for the momentum and exchange of clear communication between the County and KCI regarding project work and activities to ensure the County's objectives and requirements were being met.

All meeting/call agendas and notes were included in previous Quarterly Reports.

County Involvement: County staff contributed support in the areas outlined below.

- Participated in an initial kick-off meeting, as well as the monthly meetings/calls mentioned above.
- Coordinated project components with KCI and, when needed, OATC.
- Approved and edited, when applicable, all KCI draft documents for final approval before final production.
- Contacted and solicited meetings with appropriate community partners.
- Worked to procure items listed in County's Scope of Services with FDEP.

3.2 Advanced Technology or Process Demonstration

This project advanced the introduction of new Green Building concepts and strategies into the existing construction management and related trades curriculum in Florida secondary schools. A Curriculum Letter Report that included research findings regarding green building curriculum development and implementation, and recommendations was delivered to OATC for review and implementation. In addition, participating teachers received newly revised training in the LEED Green Building accreditation system and

were provided the opportunity to obtain advanced Green Building educational resources such as the Green Building Materials and Resources, Recycled Content Materials and Resources Directory, and the LEED Reference Guide.

3.3 Material Recovery

This project was a small segment of the scope of a much larger, unfunded construction project to design and construct a Green Teaching and Learning Center. Any increase in material recovery resulting from this project will be realized in the long term through the increased C&D reuse and recycling efforts of the graduates of the Green Building curriculum that will be developed and applied in Florida educational institutions.

3.4 Transferability

The results, lessons learned, and all materials developed from this project are transferable through the FDEP website to all Florida jurisdictions. The following materials were developed and shared:

- Poster describing the GTLC project was featured by County staff at the 2010 BIA Home Show on March 27, 2010
- Fall/Winter 2010 SWANA Florida Sunshine Chapter Newsletter (upcoming)

3.5 Cost-Effectiveness and Efficiency

The following sections describe how the project resulted in cost-effectiveness or efficiencies including total project expenditures, avoided disposal fees, and cost/benefit rational.

3.5.1 Project Expenditures

The table below provides a breakdown of the total expenditures of this Innovative Grant project by category/expenditure type and vendor payments. The total grant funds expended equaled $50,137.60 out of $62,781.

Table 6 – Innovative Grant Expenditures

Category / Expenditure Type	Vendor	Total Expenditures
Professional/Technical Services		
Consulting Services	Kessler Consulting, Inc.	$37,592.20
Consulting Services	SCS Engineers	$4,182.90
Workshop Training	USGBC	$6,900.00
	Subtotal	$48,675.10
Memberships, Educational Resources		
	USGBC membership - Jim Reece	$500.00
	FGBC membership - Jim Reece	$100.00
	BD&C Reference Guide	$167.50
	LEED-Schools 2007	$167.50
	LEED for Homes Reference Guide	$107.50
	BIA Membership - Jim Reece	$420.00
	Subtotal	$1,462.50
	Total Costs	$50,137.60

The table below provides a breakdown of the total in-kind contributions provided by County staff and project partners not directly paid for their services or time on the project. The total in-kind contributions equaled $11,671.17, whereas the grant called for $37,390 in-kind contributions. This discrepancy was caused by the OATC teachers and staff not being able to fully trace their time each quarter due to their busy schedules and heavy workload. Additionally, any private business time was not counted due to County requirements for additional documentation for reporting purposes beyond the FDEP protocol.

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Table 7 – In-Kind Contributions

Quarter/Work Period	Contribution
Project Budget	$37,390.00
First Quarter – Period end 12/31/08	$469.30
Second Quarter – Period end 3/31/09	$244.00
Third Quarter – Period end 6/30/09	$683.20
Fourth Quarter – Period end 9/30/09	$1,256.98
Fifth Quarter – Period end 12/31/09	$1,057.17
Sixth Quarter– Period end 3/31/10	$2,006.32
Seventh Quarter – Period end 6/30/10	$4,054.12
Eighth Quarter – Period end 9/30/10	$1,900.08
Total	$11,671.17
Ending Balance	$25,718.83

3.5.2 Avoided Disposal Fees

The project proposal was originally one document and the project was ranked #3 out of the submissions that year. Only three grants were funded that year. The third grant (OKA GTLC) was only partially funded. Therefore, the Okaloosa project was to be staged in two phases; only the first phase, recommendations for a Green curriculum, was funded during the 2008 – 2009 grant award period. A significantly modified scope and $62,781 of the original $606,160 requested, or 10.4 percent ($62,781/$606,160), was approved and funded.

Any avoided disposal fees resulting from this project will be realized in the long term through the increased recycling efforts of the graduates of the green building curriculum that will be developed and applied in Florida educational institutions.

3.5.3 Cost/Benefit

Conserving Natural Resources

As previously stated, this project was a significantly modified version of the originally proposed grant project; therefore, the natural resources conserved cannot be immediately documented. As a result of this project it will be realized in the long term through the

increased reduction, reuse, and recycling efforts of the graduates of the green building curriculum applied at OATC and that will be developed and applied in Florida educational institutions.

Net Benefit/Cost Savings Per Capita

As previously stated, this project was a significantly modified version of the originally proposed grant project; therefore, the natural resources conserved cannot be immediately quantified. As a result of the education and training provided during this project it will be realized in the long term. This project targeted the teachers and students of the construction management and related trades classes in order to promulgate increased Green Building in Florida's future. No per capita net benefit or cost savings may be calculated at this time. Six OATC teachers participated in the project and their classrooms totaled 116 students.

3.5.4 Nontraditional Materials

As previously stated, this project was a significantly modified version of the originally proposed grant project; therefore, the natural resources conserved cannot be immediately documented as a result of the project activities. It will be realized in the long term; therefore, the project sought to introduce and recommend Green Building concepts and strategies into the OATC curriculum using newly developed and nontraditional educational materials such as those in use by the NCCER.

The project activities also introduced the teachers and staff to the newly revised certification standard of the USGBC, the Green Associate. Teachers and staff received training under that innovative program to enhance their awareness of Green Building standards and show them how they can incorporate Green Building concepts and strategies into their existing curriculum on a daily basis.