GREEN ADVANTAGE®
ENVIRONMENTAL CERTIFICATION

GREEN ADVANTAGE® CERTIFICATION
- EXAM AND PREPARATION –
SUSTAINABLE DESIGN & CONSTRUCTION PROGRAM
AIA/CES PROGRAM - GACEP1

2012

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- EXAM AND PREPARATION -

SUSTAINABLE DESIGN & CONSTRUCTION PROGRAM

This workbook is designed as a supplement for the use of candidates planning to sit for the Green Advantage Certification Exam and is offered as a companion document to the Green Advantage Exam Content Overview.

AIA/CES PROGRAM # GACEP1

OFFERING **8** SUSTAINABLE DESIGN/ HSW LEARNING UNITS

Green Advantage, Inc. PO Box 3170, Frederick, Maryland 21705 540-822-9449

GREEN ADVANTAGE (GA) is a Registered Provider with the American Institute of Architects Continuing Education System. Credits earned upon successful completion of this Exam and Preparation workbook will be reported to CES Records for AIA members.

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This workbook program has been registered with the AIA/CES and upon successful completion* will satisfy **8** HSW/Sustainable Design Learning Unit Requirements.

***Successful completion requires that participants seeking AIA/CES Learning Units (LUs) and/or a Certificate of Completion also register for one of the Green Advantage® Certification Exams and demonstrate their knowledge by passing with a score of 80% or higher as required by AIA/CES.**

For additional information contact CES@greenadvantage.org

To receive 8 AIA/CES HSW/Sustainable Design Learning Unit credits and/or a Certificate of Completion:

1) Prepare for your exam using this Workbook along with any other independent study resources such as the GA Open Book Exam Reference supplied at the time of exam registration.* This workbook will not be collected or reviewed by GA.
2) Take the Residential, Commercial *or* Residential/Commercial Green Advantage Certification Exam.
3) **Upon receiving a score of 80% or higher, individuals wishing to have LUs reported are required to provide Green Advantage the following information:**
    - **Full Name**
    - **AIA Member Number (For AIA Members seeking LUs)**
    - **Phone Number**
    - **Email Address**
    - ***Optional*- Time spent preparing for exam not including formal training**

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CES@greenadvantage.org

***NOTE:** Attending formal training events that offer further preparation for the Green Advantage Certification Exam, may qualify for additional LUs beyond the 8 offered here for this Green Advantage Certification Exam and Preparation program.

Individuals not passing the GA Exam® may elect to retest. Please refer to the **Green Advantage Exam Candidate Handbook** for cost and registration information.

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PART I

RATIONALE FOR SUSTAINABILITY AND GREEN BUILDING

This topic includes the foundational concepts of sustainability and the role that the built environment plays in either perpetuating unsustainable practices or contributing to more sustainable living patterns. It details how buildings affect the environment throughout their life cycles – from construction and operation to deconstruction or demolition. Major building certification rating systems or standards, such as LEED, Green Globes, NAHB National Green Building Certification and Living Building Challenge, as well as green building operations and maintenance, options for green personnel credentialing and certification are important to this topic.

- Identify and review the vocabulary within the **Open Book Exam Reference** (OBER) relating to the rationale for sustainability and green building.
- Explain why green building is important from the following perspectives:

    1) Environmental

    2) Human

- List three environmental problems related to conventional building practices:

    1)

    2)

    3)

- List three health problems related to conventional building practices:

    1)

    2)

    3)

- How can green building address three of the above problems?

    1)

    2)

    3)

- List three economic benefits of green building:
  1)
  2)
  3)
- List ten possible stakeholders on any given green project:
- Define and describe the importance of an integrated team approach during design and construction:
- List four construction personnel team practices that can help ensure successful completion of a green building – including ways team work among trades can be encouraged:
  1)
  2)
  3)
  4)
- List several conventional design or construction practices that work against green building best practices:
- List several ways to keep up to date with changes in green construction best practices, techniques, and certifications:

- Describe three performance tests utilized during the building commissioning process:

    1)

    2)

    3)

- List three metrics or performance indicators that can be used to evaluate and/or compare completed green building projects:

    1)

    2)

    3)

- Provide an example of how green building techniques differ from conventional building techniques in the areas of:

    1) Design

    2) Construction

    3) Operation

    4) Performance Evaluation

    5) Decommissioning

- Describe and distinguish between the following green certification programs designed for **building projects**: LEED, Green Globes, NAHB National Green Building Program as well as widely recognized regional programs such as Build It Green, Earthcraft and EarthAdvantage (visit and note associated web sites for each):

    1)

    2)

    3)

    4)

    5)

- List three national green builder certification programs designed for **individual practitioners** (visit and note associated web site for each):

    1) **Green Advantage, Inc. – www.greenadvantage.org**

    2)

    3)

- Differentiate between Green Advantage® Certification and the US Green Building Council's LEED Accreditations (LEED Green Associate, LEED AP, and LEED AP+):

- What types of construction projects can be LEED Certified?

- List the LEED Green Building Rating System credit categories and explain the certification levels:

- Give two examples of how construction personnel might contribute to points on a LEED project:

    1)

    2)

- Give two examples of how construction personnel might cause points to be denied on a LEED project:

    1)

    2)

- List several marketing opportunities green building presents to project developers, builders, building owners, and occupants:

    1)

    2)

    3)

    4)

PART II

SITE AND LAND USE

This topic focuses on the concepts and best practices associated with site and land use in the building process. It addresses a) choosing a building site, b) locating the proposed building on the site, and c) developing the site so as to cause the least amount of environmental damage or provide the greatest amount of ecological benefit to human and natural environments. The topic also includes some of the problems associated with conventional site and land use design and practice and how they can be addressed through green building.

- Identify and review the vocabulary within the **Open Book Exam Reference** (OBER) relating to site and land use.

- Provide three reasons why site planning and land development are important aspects of green building:

    1)

    2)

    3)

- List three major considerations architects and other building design practitioners need to consider during site design and land development:

    1)

    2)

    3)

- List three green best practices for construction personnel related to site and land use:

  1)

  2)

  3)

- List two ways construction personnel can have a negative impact on site and land use during the construction process:

  1)

  2)

- Discuss ways (positive and negative) in which building occupants affect site and land use through procurement, operations and maintenance activities:

PART III

WATER

This topic explores the importance of water conservation, quality, and management. It addresses opportunities for reducing demand for fresh water and for ensuring good water quality both inside and outside buildings. It focuses on best practices used to capture and re-use rainwater and treat and re-use wastewater.

- Identify and review the vocabulary within the **Open Book Exam Reference** (OBER) relating to water.

- Explain why water is an important consideration in green building design and operation:

- Identify five water-related considerations architects and other design-based practitioners need to address when designing a green building or building site and provide examples of current best practices for each:

  1)

  Best practices:

  2)

  Best practices:

  3)

  Best practices:

  4)

  Best practices:

  5)

  Best practices:

- List five ways field personnel can impact water quality and conservation during construction:

  1)

  2)

  3)

  4)

  5)

- Discuss ways (positive and negative) in which building occupants affect water use and quality through procurement, operations and maintenance activities:

PART IV

ENERGY AND ATMOSPHERE

This topic focuses on the energy and atmospheric impacts of buildings and their component products including the connection between buildings and global climate change. It addresses how design and field personnel can contribute to energy demand reduction in the planning, design and construction processes. It examines green building best practices including passive solar design, energy efficiency, energy diagnostics, daylighting, lighting efficiency, commissioning, as well as renewable energy alternatives and their applications.

- Identify and review the vocabulary within the **Open Book Exam Reference** (OBER) relating to energy and atmosphere.
- Explain the impact of fossil fuels on the earth's atmosphere and climate:
- List three renewable energy sources:

  1)

  2)

  3)
- Identify several energy-saving materials, systems and techniques utilized in green building:
- Explain ways in which energy used in a building can create pollution and how green building approaches can reduce it:

- List four energy related issues architects and other design related practitioners need to consider when designing a green building:

  1)

  2)

  3)

  4)

- List five ways builders and other field personnel impact energy and atmosphere during the construction phase:

  1)

  2)

  3)

  4)

  5)

- List five energy-related best practices employed by builders and field personnel:

  1)

  2)

  3)

  4)

  5)

- Discuss ways (positive and negative) in which building occupants affect energy and atmosphere through procurement, operations and maintenance activities:

PART V

MATERIALS

This topic focuses on the environmental and health impacts of materials during their entire life cycle. It considers green product certifications and explores materials selection criteria including local sourcing, toxicity, recyclability, recycled content, embodied energy, and others. This topic also addresses best practices for using concrete, lumber certification systems, solid waste issues and others.

- Identify and review the vocabulary within the **Open Book Exam Reference** (OBER) relating to building materials.
- Describe waste management (reduce, recycle, reuse) as it applies to green building:

- Define the importance of locally sourced materials and give three possible examples:

  1)

  2)

  3)

- Define the importance of rapidly renewable materials and give three examples:

  1)

  2)

  3)

- Define the importance of high-recycled content materials and give three examples:

  1)

2)

3)

- Identify additional considerations that design professionals need to address when selecting materials:

- List five ways in which field personnel need to be involved in monitoring materials selection and use:

  1)

  2)

  3)

  4)

  5)

- Give three examples of building materials that may be economically salvaged during a deconstruction process and list potential re-uses for each:

  1)

  2)

  3)

- Explain how green materials and green building procedures prevent or reduce the release of toxic materials into the ground, water and air:

- List three ways builders and field personnel can ensure green standards related to materials are met:

  1)

  2)

  3)

- List several ways green materials criteria can influence building operations, procurement and maintenance:

PART VI

INDOOR ENVIRONMENTAL QUALITY

This topic explores how green building construction, maintenance, and renovation can result in improved indoor environmental quality (IEQ). It includes air quality-related problems (e.g., sick building syndrome, multiple chemical sensitivity, building-related illness), which can result from chemical or biological contaminants and poorly designed or poorly functioning ventilation in conventionally designed and constructed buildings. In addition to air quality, IEQ includes the quality of water, lighting, color, texture, thermal comfort, odor and sound.

- Identify and review the vocabulary within the **Open Book Exam Reference** (OBER) relating to indoor environmental quality.

- Discuss VOCs, describe their health hazards and list five common building materials that are likely to contain unhealthy levels of VOCs:

  1)
  2)
  3)
  4)
  5)

- List corrective best practices for three additional contributors to poor IEQ:

    1)

    2)

    3)

- Identify three IEQ considerations that architects and other design professionals must take into account when designing a healthy building:

    1)

    2)

    3)

- List three best practices builders and other field personnel can use to ensure IEQ standards are met:

    1)

    2)

    3)

- Discuss ways (positive and negative) in which building occupants affect IEQ through procurement, operations and maintenance activities:

Thank you for your time!

This concludes the AIA/CES Workbook program

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