



GAC|CI Written Exam Content Overview 6/19/17

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Introduction

The Green Advantage Certified Curtainwall Installer (GAC|CI) written Exam has 60 items (questions, problems, or exercises). These are drawn from material presented in the GAC|CI Study Guide. Study Guide content has been approved by International Glazier Certification Board.

A. CONTENT FEATURES

The GAC|CI Study Guide is written to enhance the knowledge, skills, and abilities of construction field personnel. The information it contains is:

- Compatible with multiple building rating systems, standards, and codes.
- Evidence-based and rigorously sourced.
- Results-oriented, promoting achievement of:
 - Implementation of construction best practices.
 - Problem-spotting in the field.
 - Health, safety and productivity goals.
 - Team collaboration and efficiency.
 - Environmental goals.
 - Disaster resilience goals.
 - Security goals.
 - Cost containment goals and reduced callbacks.
 - Reduction of building operational cost.

B. CONTENT ORGANIZATION

Green building, including curtainwall installation, is a holistic approach to construction. Hence, descriptions of the field are often complicated in such integrative, holistic systems - namely, the idea that everything relates to everything. This creates potential for overlap and duplication to surface when attempting to carve up the field into categories. To circumvent this, Green Advantage has organized the GAC|CI Study Guide based on the typical components of a curtainwall system:

- **Curtainwall systems.** The section recognizes that most curtainwalls are built from standard systems, though customization remains an option. It covers the different systems available on the market, their characteristics, and application.
- **Curtainwall frame.** The section overviews the structural support members of the curtainwall, their types and characteristics, as well as their function, integration, interactions, and installation.
- **Curtainwall glazing.** The section covers glass products used in curtainwall applications and integrated glazing units. It overviews glazing materials, properties and fabrication; protective and performance-enhancing finishes and treatments; advanced materials; and glazing material handling.
- **Curtainwall seals and attachment.** This section covers fastening and sealing products used in curtainwall glazing applications, and their contribution to curtainwall properties—water and air tightness, durability, stability, acoustics, and resilience. It covers sealing materials and methods used toward wet, dry, and combination glazing; as well as sealant compatibility, use, and performance.

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- **Curtainwall construction equipment.** This section overviews the optimal use of machinery used in curtainwall construction, from hand-held power tools to hoisting and rigging equipment and large field machinery such as lifts and cranes.

Additionally, an Introduction section presents basic concepts and functions of a curtainwall. Two other sections focus specifically on the Triple Bottom Line of sustainability: Profits, Planet, and People. They cover the curtainwall installation process, centering respectively, on Reducing the Environmental and Business Risks of Curtainwall Construction, and on Protecting the Health and Safety of Curtainwall Workers and Others.

- **Reducing the Environmental and Business Risks of Curtainwall Construction.** This section recognizes that environmental and business risks of curtainwall construction are tied to construction quality and the resiliency of the curtainwall design and construction. It overviews minimization of such risks given the current trend toward greater curtainwall complexity as well as the increasingly common threats posed by terrorism and by severe weather events.
- **Protecting the Health and Safety of Curtainwall Workers and Others.** This section discusses the health and safety risk mitigation measures associated with curtainwall construction. It acknowledges that those work on curtainwall installation entails exposure to extreme environmental heat and cold, work at high elevations, use of complex machinery and equipment, and often also the handling of hazardous materials. This places high demands on worker health, and often has also implications for the health of building occupants and bystanders during the construction process.

Each section comprises subsections (categories) for Definitions, Measurements, & Standards; Approaches; and Best Practices with Associated Construction Phasing.

1. **Definitions, Measurements & Standards** presents common curtainwall construction vocabulary and significant measurements and standards. These apply to information presented in the category. Additional terms are also defined within the text, and not listed separately in the Definitions section.
2. **Approaches** presents basic information about ways to achieve optimal curtainwall construction. These serve to counter lower quality approaches that can result in curtainwall failure and/or injurious conditions for installers, occupants, and people nearby. The general format lists features and types of specific approaches and their advantages.
3. **Best Practices with Associated Construction Phasing** presents how and when to apply specific methods and techniques that result in superior curtainwall installations. They underline the importance of content previously presented as approaches, and provide examples translated into actionable field practices for optimal curtainwall construction. Each best practice is associated with the construction phase or phases in which they can be enacted: #1 Pre-design phase, #2 Design phase; #3 Pre-construction phase; #4 Construction phase; or #5 Warranty phase.

The organization of the GACCI Study Guide reconciles the perspectives of the different groups involved in curtainwall design and construction. While the major topics reflect how designers “think,” construction phasing reflects how contractors approach their work over the course of a project.

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C. CONTENT RENEWAL

GA plans to update this document triennially. It will do this with the expert assistance of the GA International Glazier Certification Board, trainers who use the document to devise training materials, and individuals who use it to prepare for a GA Certification Exam®. All comments are welcome.

D. GAC|CI EXAM ITEM DISTRIBUTION RELATED TO STUDY GUIDE OUTLINE

The abbreviated Study Guide outline below indicates, by section, the approximate number of exam items and approximate percentage distribution of exam items associated with the 60 items on the written Curtainwall Installer Exam.

GAC CI Abbreviated Study Guide Outline	# of exam items	percentage distribution
I. INTRODUCTION TO CURTAINWALLS	1	2%
Definitions, Measurements, & Standards		
Approaches		
Best Practices		
II. CURTAINWALL SYSTEMS	3	5%
Definitions, Measurements, & Standards		
Curtainwall Systems Approaches		
Best Practices for Curtainwall Systems with Associated Construction Phasing		
III. CURTAINWALL FRAME	7	12%
Definitions, Measurements, & Standards		
Curtainwall Frame Approaches		
Best Practices for Curtainwall Frame with Associated Construction Phasing		
IV. CURTAINWALL GLAZING	8	13%
Definitions, Measurements, & Standards		
Curtainwall Glazing Approaches		
Best Practices for Curtainwall Glazing with Associated Construction Phasing		
V. CURTAINWALL SEALS AND ATTACHMENT	17	28%
Definitions, Measurements, & Standards		
Curtainwall Seals and Attachment Approaches		
Best Practices for Curtainwall Seals and Attachments with Associated Construction Phasing		
VI. CURTAINWALL CONSTRUCTION EQUIPMENT	7	12%
Definitions, Measurements, & Standards		
Approaches for Use of Curtainwall Construction Equipment		
Best Practices for Use of Curtainwall Construction Equipment		

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VII. REDUCING ENVIRONMENTAL AND BUSINESS RISKS OF CURTAINWALL CONSTRUCTION	10	16%
Definitions, Measurements, & Standards		
Approaches for Reducing Environmental and Business Risks of Curtainwall Construction		
Best Practices for Reducing Environmental and Business Risks of Curtainwall Construction		
VIII. PROTECTING HEALTH & SAFETY OF CURTAINWALL WORKERS AND OTHERS	7	12%
Definitions, Measurements, & Standards		
Approaches for Protecting Health & Safety of Curtainwall Workers and Others		
Best Practices for Protecting Health & Safety of Curtainwall Workers and Others		
TOTAL	60	100%