

MC3 Green Construction

Hours by Unit – 8

This section is designed to be flexible and can be tailored to your class schedule. Please select either the four-hour or eight -hour options that best accommodates your time constraints.

Learning Objectives:

- Describe the basics elements of green construction and green buildings and the part they will play as a construction worker on green job sites.
- Understand basic green building terms.
- Describe the role of green building certification and how it works.
- Recognize green awareness on construction projects, including sustainable site development, efficient use of water resources, energy conservation, the use of sustainable building materials, reducing and recycling construction waste and protecting indoor and outdoor environmental quality.

Opening Discussion (35 minutes)

Instructor shares: Buildings constructed today are very different from those built 100 years ago. At first glance, these buildings might not appear very different, but they feature specialized “green” designs and materials to limit their environmental impact. “Green construction” includes ideas of sustainability, energy conservation and efficiency, and environmental health and safety. All members of the planning, construction and operating teams must be onboard and working towards sustainable goals.

This lesson will explain why we need to build sustainably, as well as what makes building green, and the role of contractors and trades to achieve sustainability.

Instructor shares: ElectricTV video the [Tower at PNC Plaza](#) (5:56)

- Have students demonstrate their understanding by initiating the following discussion questions:
 1. What are some environmental advantages of building green?
 2. “Being green in today’s construction world is somewhat stale.” Why? What does that statement mean to you?
 - Not because being “green” is any less important today than it has been in the past, but you’ve got to go further. You’ve got to push the limits. How has the building with the distinction of the “World’s Greenest Skyscraper” done that?
 3. What does the Tower at PNC Plaza being a “living, breathing” building mean?
 - The exterior of the building will open and allow fresh air into the building.
 - Temperature, humidity, pollution levels and sunlight are a few factors read by the control system. The system communications when, and for how long the windows open or stay closed, allowing for the building to breath on its own.

Instructor shares: The companion video from the engineering firm that designed the Tower at PNC Plaza [Behind the design of the Tower at PNC Plaza](#) (3:40) (*video has no sound)

- This video shows the blueprint view of the building, and raises the issues of designing and laying out sustainable buildings.
- Have students demonstrate their understanding by initiating the following discussion questions:
 1. What issues did you notice in the designing and laying out of such a sustainable building?

Recommended Instruction (6 hours)

Unit 8 is broken into two parts, Part A: Sustainability and Part B: Green Building. See below for topics covered in each section.

Part A: Sustainability

1. Connection between Buildings and Climate Change
2. What are High-Performance Buildings?
3. Causes and Effects of Climate Change
4. Working Towards Solutions
5. Value of High Performance Buildings

Part B: Green Building

6. Small Changes, Huge Impact
7. Tight Building Envelope
8. Right-Sized HVAC
9. Water Conservation
10. Efficient Lighting and Electrical Systems

Assessments, discussions and teaching notes are incorporated into the PPT for you; please allow time for adequate completion in addition to stopping to check for understanding.

PART A (2.5 hours)

- Instructor shares PPTs GPRO Fund Part A Ch 1-2 and Ch 3-5 (2 hours)
 - **Stop** after slide 57 - in PPT GPRO Fund - Part A - Ch 3-5 and play - Green Building: Jobs of the Future (11:59) [Green Jobs](#)
- Instructor shares: Green Construction video (9:18) - [Green Construction](#)

BREAK

PART B (3.5 hours)

- Instructor shares PPT GPRO Fund Part B Ch 6 -10 (3 hours)
- Use the accommodating instructor's notes provided
- Pop Quizzes are located in PPT GPRO FUND Part B - Ch 6-10 slides 4, 16, 17, 18, 31, 41, 54
 - Use as an elective assessment opportunity to check for understanding.
- Instructor shares: The Building Trades & Green Construction (6:55) [NABTU Green Construction](#)

Closing Discussion (5 minutes)

Instructor shares: The construction industry has gone “green” and the Building Trades unions and their affiliated contractors are leading the way by:

- Working together to develop high quality green building materials and systems
- Educating new and existing members on green materials, processes and systems
- Making important connections between the Building Trades unions, green construction, green construction training and green building certification
- Developing standards for keeping buildings green after the construction is completed.

“We are all in this together. To make integrated design work, we need all members of the design, construction, and operations teams on board, sharing ideas and working towards common sustainable goals. Many environmental changes require action by politicians or big businesses, but individual changes made a difference also. Recycling, for example, only works because millions of people sort their trash, and collectively they make a big difference. It’s the same on the job site where you will have an opportunity to make many decisions, some big and some small that will affect your health and the environment.” - GPRO

Building Skills Project Assessment – 2 hours

Green Construction Audit: Students will conduct a green construction/energy audit of the building in which their training occurs. Drawing upon the information they learned in the *Fundamentals of Building Green Part B* PowerPoint presentation, students will spend 60 minutes “auditing” the building they are in, and then they will provide (in written form) three examples of alternative construction processes, technologies or materials that would reduce energy consumption or deliver measurable building performance in the building and make it more sustainable. In addition, have students either individually, or with teams, prepare a presentation of their findings to share with the class. Presentations should include the results of their audit, as well as their three examples of alternative solutions that would reduce energy consumption or deliver measurable building performance in the building and make it more sustainable.

Materials used (PPT or posters) and time allotted for presentations are at instructor’s discretion.

These alternative processes, technologies or materials should be drawn from the following list:

- The Building Envelope – thermal barrier and insulation;
- Efficient mechanical systems - heating, cooling and ventilation;
- Efficient water systems;
- Efficient lighting and electrical systems,
- Building commissioning;
- Environmentally friendly materials; and
- Improvements to the local building environment.