1 Chapter 1: Design Process

1. Malcolm Wells’ architectural value scale is best described as:

(a) based on wilderness and reflecting sustainable design values

(b) based on the USGBC LEED green building program

(c) arguing strenuously against restrictive building codes

(d) the basis for the ASHRAE/IESNA Standard 90.1 energy efficiency requirements

Answer: A

2. The design process generally flows from:

(a) conceptual design, to design development, to schematic design

(b) design development, to conceptual design, to schematic design

(c) conceptual design, to schematic design, to design development

(d) guidelines compliance, to standards compliance, to code compliance

Answer: C

3. Design intent is best described as:

(a) a benchmark performance target for a design

(b) a general statement describing expected outcomes

(c) a specific statement of how a design problem will be solved

(d) a statement that outlines the design team’s design process

Answer: B

4. Clear design intent does all of the following except:

(a) set the tone for design efforts

(b) allow all members of the design team to understand what is critical for success

(c) outline a detailed design procedure early in the design process

(d) draw attention to critical or unusual design concerns on the table

Answer: C

5. Design criteria are best described as:

(a) benchmark performance targets for a specific design intent

(b) a general statement describing expected design outcomes

(c) the means and methods by which design intent will be accomplished

(d) the governing code requirements for a given building issue

Answer: A

6. Building commissioning can best be described as:

(a) the process of testing systems before they are selected for project use

(b) a verification that equipment, systems, and design decisions can meet the owner’s project requirements

(c) an evaluation of occupant comfort following project completion

(d) the process of specifying and installing all systems within a building

Answer: B

7. The difference between a code and a standard is essentially:

(a) a code is not legally mandated

(b) a code is enforced by the government

(c) a standard is enforced by the government

(d) more weight is given to standard requirements than to code requirements

Answer: B

8. One of the earliest and strictest limits on design flexibility is typically:

(a) local code requirements

(b) the aesthetic desires of the client

(c) the availability of capable architects and engineers

(d) the maximum construction budget imposed by the client

Answer: D

9. The following statement about passive systems is FALSE:

(a) passive systems use no purchased energy

(b) passive systems are generally well integrated with the building design

(c) passive system components usually perform a single purpose within a building

(d) passive system operation often requires user participation

Answer: C

10. Without validation, design solutions are:

(a) assumed, but not proven, to be valid

(b) more likely to avoid scrutiny by code officials

(c) easier to implement on a project with building commissioning

(d) always cheaper in the long run

Answer: A

11. Green design and design for sustainability are differentiated by their:

(a) design methods

(b) applicable building codes

(c) intended outcomes (relative to performance)

(d) degree of design validation

Answer: C

12. Which carbon release mechanism in buildings contributes the greatest amount of carbon to the atmosphere?

(a) carbon emitted from vehicles traveling to and from the building

(b) carbon released from the decomposition of waste organic construction materials

(c) carbon released from the decomposition of waste produced due to building operation

(d) carbon emitted as a result of the building’s operational energy consumption

Answer: D

13. The design philosophy of “letting nature do the work” relates to:

(a) a preference for unenclosed building spaces

(b) a preference for passive versus active system

(c) a preference for green versus sustainable buildings

(d) a preference for building on rural sites rather than on urban sites

Answer: B

14. Historically, the most commonly encountered means of validating building performance is:

(a) codes

(b) standards

(c) energy simulation software

(d) the post-occupancy evaluation (POE)

Answer: D

15. Codes in the United States:

(a) are continually in transition

(b) have been unchanged since 2005

(c) a set of minimum requirements for some aspect of building design

(d) are not enforceable

Answer: A

16. Although objectives can and do change during all phases of the design process, to ensure a smooth process, fundamental decisions about a proposed building should be made during the:

(a) design development phase

(b) construction phase

(c) conceptual design phase

(d) occupancy phase

Answer: C

17. Which of the following is an example of design intent?

(a) the building will score a 0 on Malcolm Wells’ Architectural Value Scale

(b) the lighting system power density will be no greater than 0.9 W/ft2

(c) the building will be green, with a focus on indoor environmental quality

(d) the building will achieve a Platinum LEED© rating

Answer: C

18. Which of the following is an example of design criteria?

(a) no building space will experience more than 1000 ppm CO2

(b) the building will use primarily passive systems

(c) the building will provide outstanding comfort for its occupants

(d) the building will be aesthetically pleasing

Answer: A

19. Which of the following building requirements are written in prescriptive language?

(a) A public building must maintain a temperature of at least 68oF (20oC) during all seasons.

(b) A building shall be able to resist wind speeds of up to 100 mph (161 km/h) .

(c) A building shall be able to safely drain rain falling at a rate of 2 in./h (50.8 mm/h) .

(d) Pipes in a roof drainage system shall measure no less than 3 in. (76 mm) in diameter.

Answer: D

20. Which of the following entities is most likely to generate building design standards?

(a) the City of San Francisco

(b) The American Federation of Labor – Congress of Industrial Organizations

(c) The American Society of Heating, Refrigerating, and Air-Conditioning Engineers

(d) The International Code Council

Answer: C

21. The term “energy efficiency” as generally used in architecture can best be seen as:

(a) conserving energy as well as balancing outputs and inputs

(b) minimizing depletion of renewable energy resources

(c) the degree to which a building project complies with codes

(d) the ratio of HVAC system output to HVAC system input

Answer: A

22. Which of the following maxims reflect an overall design philosophy that encompasses the concept of sustainability?

(a) consider nature as both model and context

(b) use only the finest materials for building longevity

(c) use only structural insulated panels (SIPs) for insulation and enclosure

(d) maintain a constant temperature of 72°F (22.2°C) within the building envelope

Answer: A

23. Which of the following building features best embodies the design philosophy “manage storage”?

(a) ample closet space

(b) cisterns that capture rainwater for reuse within the building

(c) a separate conditioned space for heat-producing computers

(d) a large, multi-vehicle garage

Answer: B

24. Which of the following characteristics best exemplifies a passive climate control system?

(a) The system uses no energy.

(b) The system uses built-in electric space heaters.

(c) The system/building components play multiple roles.

(d) Mechanical cooling is used with solar heating.

Answer: C

25. Which of the following examples best characterizes a “hybrid” building system?

(a) Ceiling fans aid in natural ventilation, reducing mechanical cooling loads.

(b) Both natural gas and electricity are used for heating/cooling and cooking.

(c) Sealed windows are used to improve the effect of electric heating.

(d) Potted plants are used in the hallways.

Answer: A