

PRACTICE EXAM 21: OREGON CCB SIMULATION (80 QUESTIONS)

80 Multiple-Choice Questions | 200 Minutes | Open-Book Format

1. A contractor submits a bid on a prevailing wage project in Oregon. The bid includes labor rates for journeyman carpenters at thirty-eight dollars per hour plus twelve dollars per hour in fringe benefits. The published prevailing wage rate for journeyman carpenters on this project is forty-two dollars per hour plus sixteen dollars per hour in fringe benefits. If the contractor is awarded the project, what must the contractor pay the carpenters?

- A. The bid rate of thirty-eight dollars per hour plus twelve dollars in fringe benefits because the bid rate becomes the contractual obligation
- B. Thirty-eight dollars per hour in base wages plus the full sixteen dollars per hour in fringe benefits as a compromise rate
- C. The published prevailing wage rate of forty-two dollars per hour plus sixteen dollars per hour in fringe benefits regardless of what was included in the bid
- D. The average of the bid rate and the prevailing rate, calculated as forty dollars per hour plus fourteen dollars in fringe benefits

2. A contractor is building a commercial office building and the mechanical engineer specifies a dedicated outdoor air system to provide ventilation air to all occupied spaces. The contractor installs the system but does not connect the outdoor air intake to the building automation system for demand-controlled ventilation. What is the consequence of this omission?

- A. The system operates normally because demand-controlled ventilation is an optional energy-saving feature and not a code requirement
- B. The building automation system automatically compensates by adjusting the return air dampers to control outdoor air volume
- C. The system may provide excessive or insufficient ventilation because it cannot adjust outdoor air volume based on actual occupancy levels, wasting energy or compromising indoor air quality
- D. The omission affects only the commissioning documentation and has no impact on the system's day-to-day operational performance

3. Under Oregon law, a contractor enters into a residential construction contract for a kitchen remodel valued at forty-two thousand dollars. The contract does not include a three-day right of rescission provision. Is this an issue?

A. Oregon law requires a three-day right of rescission in certain residential contracts, and the contractor should verify whether the contract meets the criteria requiring this provision based on how the sale was solicited

B. No, because the right of rescission applies only to contracts exceeding one hundred thousand dollars in total project value

C. No, because the right of rescission was eliminated from Oregon law and no longer applies to residential construction contracts

D. Yes, all residential construction contracts in Oregon must include a ten-day right of rescission regardless of how the sale occurred

4. A contractor is managing a commercial project and the concrete subcontractor pours a structural slab that does not meet the specified flatness and levelness tolerances. The floor will receive a thin-set ceramic tile finish. The tile installer states that the out-of-tolerance slab will require extensive leveling compound before tile installation. Who bears the cost of the leveling compound?

A. The tile installer bears the cost because surface preparation is included in the standard tile installation scope of work

B. The concrete subcontractor bears the cost because the slab does not meet the specified flatness and levelness tolerances, and providing a code-compliant substrate is the concrete subcontractor's contractual obligation

C. The building owner bears the cost because the owner's architect specified the flatness tolerance that the concrete subcontractor failed to achieve

D. The general contractor absorbs the cost from the project contingency because trade coordination issues are the general contractor's responsibility

5. A contractor is hired to install a residential solar panel system on an existing roof. During the installation, the contractor's crew drops a panel that slides off the roof and damages the homeowner's vehicle parked in the driveway. Which insurance policy provides primary coverage for the vehicle damage?

A. The contractor's commercial general liability insurance policy covers the vehicle damage as property damage to a third party's property caused by the contractor's operations

B. The homeowner's auto insurance policy provides primary coverage because the vehicle was parked on the homeowner's property

C. The contractor's builder's risk insurance policy covers damage to all property on the construction site including parked vehicles

D. The solar panel manufacturer's product liability insurance covers damage caused by panels that fall during the installation process

6. A contractor is building a commercial structure and the specifications require all structural welds to be performed by certified welders. One of the contractor's welders does not hold current certification for the type of weld specified. The contractor allows this welder to perform several critical welds before the deficiency is discovered during a quality audit. What must the contractor do?

A. Submit the uncertified welder's work history as evidence of equivalent qualification to avoid retesting the completed welds

B. Apply a surface reinforcement weld over all joints made by the uncertified welder to increase the weld cross-section area

C. Request the building inspector to accept the welds based on a visual inspection showing no visible surface defects present

D. Have the completed welds inspected and tested by a qualified independent testing agency, and if any welds fail testing, remove and replace them using a certified welder

7. Under Oregon employment law, an employer must provide employees with rest periods during the workday. A construction worker works a ten-hour shift. How many paid rest periods is the worker entitled to during this shift?

A. Two paid rest periods of at least ten minutes each, plus an additional rest period for the hours worked beyond eight, for a total that depends on the applicable law's definition of major fraction

B. One paid rest period of fifteen minutes at the midpoint of the ten-hour shift regardless of the work schedule arrangement

C. Three unpaid rest periods of five minutes each distributed evenly throughout the ten-hour shift at the employer's discretion

D. No paid rest periods are required for construction workers because outdoor construction work is exempt from rest period requirements

8. A contractor is installing a residential HVAC system and the mechanical plans show the return air grille located in the hallway ceiling. The contractor installs the return air grille inside a bedroom closet instead to save ductwork material. What problem does this installation create?

A. The installation passes inspection because return air grilles can be located in any room that is connected to the central air space

- B. The closet location restricts return airflow when the closet door is closed, reducing system performance, and return air grilles are generally prohibited from closets used for storage because they can draw dust and contaminants into the system
- C. The closet location is acceptable because closets provide better sound attenuation for the return air noise than hallway locations
- D. The installation is acceptable as long as the contractor installs a louvered closet door to allow airflow when the door is closed

9. A contractor is building a residential home and the plans require a fireplace with a factory-built zero-clearance firebox. The manufacturer's installation instructions specify minimum clearances from the firebox to combustible materials. The contractor installs the firebox with reduced clearances to fit the framing layout. What fire safety hazard does this create?

- A. Combustible materials positioned closer than the manufacturer's specified clearances can ignite from radiated and conducted heat during prolonged fireplace operation, creating a concealed fire within the wall assembly
- B. The reduced clearances have no safety impact because zero-clearance fireboxes are designed to operate with no clearance from combustibles
- C. The reduced clearances affect only the fireplace warranty and do not create a fire hazard during normal residential fireplace use
- D. The fire hazard exists only during the first year of operation until the combustible materials become heat-tempered and stabilize

10. A contractor is managing a commercial project and the owner requests a schedule update showing the impact of a three-week delay caused by an owner-directed design change. The contractor performs a time impact analysis. What does a time impact analysis demonstrate?

- A. The total cost of the delay expressed in dollar amounts for each day the project is extended beyond the original completion date
- B. The number of additional workers needed to recover the three-week delay without extending the original project completion date
- C. The percentage of the project budget consumed by the delay compared to the total change order budget allocated for the project
- D. The effect of the delay on the project schedule by inserting the delay event into the current schedule and recalculating the critical path to determine whether the project completion date is extended

11. A contractor is hired to install a commercial flat roof with a thermoplastic polyolefin membrane. The specifications require the membrane seams to be heat-welded per the

manufacturer's instructions. The contractor's crew uses adhesive instead of heat welding at several seam locations. What is the primary risk of this installation deficiency?

- A. The adhesive seams provide stronger bonds than heat-welded seams because adhesive fills gaps between the membrane sheets
- B. The adhesive seams are acceptable if the contractor provides a written warranty covering any leaks at the adhesive-bonded seams
- C. The adhesive seams affect only the roof's appearance and have no impact on the waterproofing performance of the membrane system
- D. Adhesive-bonded seams may not achieve the required bond strength and can fail over time, causing leaks that compromise the waterproofing integrity and void the manufacturer's warranty

12. A contractor is estimating a residential project and needs to calculate the number of roof trusses required. The building is forty-eight feet long and the trusses are spaced at twenty-four inches on center. Including the starting truss, how many trusses are needed?

- A. Twenty trusses based on the building length divided by the truss spacing without including the starting truss position
- B. Forty-eight trusses based on one truss per linear foot of building length regardless of the specified on-center spacing
- C. Twenty-five trusses based on the building length divided by the two-foot spacing plus one additional truss for the starting position
- D. Thirty trusses based on the building length divided by the truss spacing plus a twenty percent waste factor for damaged trusses

13. A contractor is performing a commercial renovation and the existing building has cast iron drain pipes that are severely corroded. The renovation scope includes replacing the bathroom fixtures but not the drain piping. During demolition, a section of the cast iron pipe collapses and blocks the drain system. What should the contractor do?

- A. Reconnect the new fixtures to the collapsed pipe using rubber couplings and proceed with the renovation as planned per scope
- B. Replace the entire building drain system at the contractor's expense because the contractor should have anticipated the pipe failure
- C. Stop work, document the collapsed pipe, notify the owner of the condition, and present a change order for the necessary pipe replacement
- D. Abandon the renovation project because the collapsed drain pipe makes the building uninhabitable and the project cannot proceed

14. Under Oregon law, a contractor is required to provide specific notices to homeowners in residential construction contracts. One required notice informs the homeowner of their right to request a copy of the contract before signing. What is the purpose of this requirement?

- A. To give the homeowner adequate time to review the contract terms, seek legal advice if desired, and make an informed decision before entering into the binding agreement
- B. To allow the CCB to review all residential contracts before they become legally binding between the contractor and homeowner
- C. To ensure the contractor's attorney has reviewed the contract language before it is presented to the homeowner for execution
- D. To provide the homeowner with a complete list of all subcontractors who will work on the project before the contract is signed

15. A contractor is building a commercial parking garage and the specifications require all concrete surfaces exposed to vehicle traffic to receive a penetrating silane sealer for protection against chloride intrusion from road deicing salts. The contractor applies the sealer to the traffic surfaces but skips the parking garage columns and walls. Why is this a deficiency?

- A. Columns and walls in parking garages do not require sealer because they are not directly exposed to vehicle tire contact
- B. The sealer is only required on horizontal surfaces and vertical surfaces are exempt from the chloride protection specification
- C. Skipping the columns is acceptable because the concrete column reinforcement is deeper than the chloride penetration depth
- D. Chloride-laden splash and spray from vehicle traffic contacts the columns and walls, and without sealer protection, chlorides penetrate the concrete and corrode the embedded reinforcing steel

16. A contractor is managing a residential project and the building inspector requires the contractor to demonstrate that the smoke alarms are interconnected so that activation of one alarm triggers all alarms in the dwelling. The contractor installed individual battery-operated smoke alarms that are not interconnected. What must the contractor do?

- A. Add wireless interconnection modules to the existing battery-operated alarms as a field modification to satisfy the inspection
- B. Replace the standalone alarms with interconnected smoke alarms that are either hardwired with battery backup or wirelessly interconnected as required by the applicable code
- C. Demonstrate to the inspector that each individual alarm functions properly because interconnection is an optional building feature
- D. Install one additional alarm in the hallway and connect it to the electrical panel to satisfy the interconnection requirement

17. A contractor is reviewing a commercial project's specifications and finds a requirement for the contractor to provide attic stock for several finish materials including carpet tile, ceiling tile, and paint. What is the purpose of providing attic stock?

- A. To provide the building owner with a supply of matching replacement materials for future repairs and maintenance, ensuring consistency in color, pattern, and product specification
- B. To store excess materials in the building's attic space as insulation between the finish ceiling and the structural roof above
- C. To provide the architect with sample materials for inclusion in the project record documents and the design portfolio
- D. To satisfy the building department's requirement for surplus materials on site during the final inspection and commissioning

18. A contractor is building a commercial structure and the structural plans require anchor rods embedded in the concrete pier foundations for the steel columns. The plans specify the anchor rod pattern, diameter, embedment depth, and projection height. The contractor's crew sets the anchor rods but the pattern is rotated ninety degrees from the specified orientation. What is the consequence of this error?

- A. The rotated pattern has no structural consequence because the anchor rod pattern is symmetrical and functions identically in any orientation
- B. The steel column base plates will not align with the misoriented anchor rods, requiring either the anchor rods to be corrected or the base plate holes to be modified, both of which require structural engineering review
- C. The rotated anchor rods function correctly because the column base plate is round and can be oriented in any position on the pier
- D. The contractor can drill new holes in the base plate to match the rotated anchor rod pattern without structural engineering approval

19. Under Oregon law, a contractor who holds a residential general contractor license hires a subcontractor to perform plumbing work on a residential project. The subcontractor does not hold a plumbing contractor license but does hold a general CCB license. Is this subcontractor legally authorized to perform plumbing work in Oregon?

- A. No, Oregon requires plumbing work to be performed by individuals and contractors holding the appropriate plumbing license, and a general CCB license alone does not authorize plumbing work
- B. Yes, because any contractor with an active CCB general contractor license may perform all trades including plumbing on residential projects

- C. Yes, but only if the plumbing work is valued at less than five thousand dollars and involves no new connections to the municipal water system
- D. No, but the general contractor may perform the plumbing work themselves because the general contractor's license covers all trades

20. A contractor is managing a project and uses the critical chain method for scheduling instead of the traditional critical path method. What is the primary difference between critical chain scheduling and traditional critical path scheduling?

- A. Critical chain scheduling accounts for resource constraints and moves individual activity safety buffers to project and feeding buffers at strategic points in the schedule, improving overall schedule reliability
- B. Critical chain scheduling eliminates all float from the schedule and requires every activity to start at its earliest possible date
- C. Critical chain scheduling uses only calendar days while critical path scheduling uses only working days for all calculations
- D. Critical chain scheduling applies only to projects with budgets exceeding one million dollars and is not used for smaller work

21. A contractor is hired to install a commercial building's underground fire service water main. The specifications require the pipe to be ductile iron with mechanical joint connections, bedded on six inches of compacted gravel, and backfilled with select granular material. The contractor uses native soil for both bedding and backfill instead of the specified materials. What is the primary risk of this substitution?

- A. The native soil provides equivalent support because all soil types have the same bearing capacity and compaction characteristics
- B. The native soil bedding is acceptable but the backfill must be granular to allow for future excavation access to the pipe joints
- C. The pipe installation is unaffected by the bedding material because ductile iron pipe is strong enough to support its own weight
- D. Native soil may contain rocks, debris, or expansive materials that can damage the pipe coating, create point loading that stresses the pipe, and settle unevenly causing joint separation and leaks

22. A contractor is building a residential home and the energy code requires the contractor to install a heat recovery ventilator to meet the indoor air quality requirements while minimizing energy loss. What does a heat recovery ventilator do?

- A. It recirculates indoor air through a HEPA filter system without exchanging any air with the outdoor environment
- B. It draws excess heat from the attic space and distributes it to the living areas during winter months for energy savings
- C. It exhausts indoor air and draws in outdoor air while recovering heat from the outgoing air stream without mixing the two streams
- D. It transfers heat energy from the incoming outdoor air to the outgoing exhaust air, pre-heating the exhaust and pre-cooling the supply

23. A contractor is managing a commercial project and the specifications require the contractor to perform a pre-installation meeting with the curtain wall subcontractor before glazing installation begins. What is the primary purpose of a pre-installation meeting?

- A. To review the installation procedures, quality standards, safety requirements, and coordination issues with the subcontractor before work begins, ensuring alignment between the specification requirements and the planned field operations
- B. To negotiate the subcontractor's price for the curtain wall installation before the subcontract agreement is finalized
- C. To allow the building inspector to approve the subcontractor's work crew before they are permitted to begin glazing work
- D. To demonstrate the curtain wall system to the building owner so they can approve the appearance before installation starts

24. A contractor is performing a residential renovation and the project requires removal of an existing chimney that extends from the basement through the roof. The chimney is constructed of unreinforced masonry and shares a common wall with the neighbor's property in this duplex building. What critical concern must the contractor address before beginning demolition?

- A. The contractor must verify that the chimney mortar does not contain asbestos before any demolition work begins on the project
- B. The contractor must determine whether the chimney is a party wall that provides structural support to the neighbor's unit, and if so, must engineer a solution that maintains structural integrity for both units during and after removal
- C. The contractor must obtain the neighbor's written permission to demolish any portion of the chimney visible from the exterior
- D. The contractor must install a temporary chimney for the neighbor's use during the demolition period if both units share the flue

25. A contractor is building a commercial cold storage facility and the floor slab will be maintained at minus ten degrees Fahrenheit. The structural engineer requires a sub-slab heating

system to prevent frost heave beneath the floor. At what depth below the slab is the heating system typically installed?

- A. Directly beneath the concrete slab surface with no insulation between the heating elements and the cooled slab above
- B. Twelve inches below the insulation layer that is installed beneath the heated slab to maximize heat distribution in the soil
- C. Above the insulation layer between the insulation and the concrete slab so the heat warms the slab rather than the soil
- D. Below the insulation layer and above the subgrade, so the heat maintains the soil temperature above freezing while the insulation prevents heat from reaching the cooled slab above

26. A contractor is reviewing the project specifications for a commercial building and finds that all interior steel stud walls must achieve a minimum Sound Transmission Class rating of forty-five. The contractor installs the walls with single-layer gypsum board on each side, steel studs at twenty-four inches on center, and no insulation in the cavity. Testing reveals an STC rating of thirty-three. What is the most effective modification to improve the wall's sound rating?

- A. Replace the twenty-four-inch stud spacing with sixteen-inch spacing to reduce the area of unsupported gypsum board between studs
- B. Apply a sound-dampening paint to both sides of the gypsum board to absorb sound energy before it reaches the wall surface
- C. Add acoustical insulation in the stud cavity and install a second layer of gypsum board on at least one side of the wall, and consider resilient channel to decouple the gypsum from the framing
- D. Seal only the electrical box penetrations with acoustical caulk because the primary sound transmission path is through the outlets

27. A contractor is managing a residential project and the homeowner asks the contractor to explain the difference between a building permit and a certificate of occupancy. What is the correct explanation?

- A. A building permit authorizes the contractor to advertise the project while a certificate of occupancy confirms the project was advertised
- B. A building permit authorizes the commencement of construction work, while a certificate of occupancy is issued after all inspections pass and confirms the building is safe and suitable for its intended use
- C. A building permit and a certificate of occupancy are the same document issued at different stages of the construction process
- D. A building permit is issued by the CCB and a certificate of occupancy is issued by the homeowner's insurance company

28. A contractor is installing a commercial building's fire alarm system. The fire code requires the fire alarm control panel to be installed in a location that is accessible to the fire department and visible upon entering the building. The contractor installs the panel in a locked storage room in the basement. Why does this installation fail inspection?

- A. The panel location is acceptable because fire alarm panels must be in secure locations to prevent unauthorized access or tampering
- B. The panel must be installed on the roof of the building so firefighters can access it before entering the structure during a fire
- C. The locked basement location is not readily accessible to fire department personnel upon entering the building, and the panel must be installed in a location that allows immediate identification and access
- D. The panel must be installed in the elevator machine room because the fire alarm and elevator systems must share the same location

29. Under Oregon law, a contractor who provides construction work on a residential project is subject to the Oregon Residential Specialty Code for all applicable work. A homeowner asks the contractor whether the code allows the use of PEX tubing for the domestic water supply piping throughout the house. What is the correct answer?

- A. PEX tubing is prohibited for all residential water supply applications under the Oregon Residential Specialty Code without exception
- B. PEX tubing is generally accepted under the Oregon plumbing code for residential water supply distribution, subject to compliance with listed standards and manufacturer installation requirements
- C. PEX tubing is allowed only for hot water supply lines and copper must be used for all cold water supply piping in the house
- D. PEX tubing is allowed only in single-story homes and copper piping is required for all multi-story residential plumbing systems

30. A contractor is performing a commercial renovation and the architect issues a request for proposal for the contractor to provide a cost estimate for adding a rooftop terrace with a green roof system. The contractor has no experience with green roof installations. What is the most appropriate way for the contractor to develop this estimate?

- A. Obtain pricing from a qualified green roof subcontractor who has experience with similar installations, include the subcontractor's pricing plus the contractor's overhead and profit, and identify any assumptions and exclusions

- B. Estimate the green roof cost using a standard landscaping cost per square foot multiplied by the terrace area without consulting any specialists
- C. Decline to provide the estimate because the contractor is not qualified to install green roof systems on any commercial building
- D. Use the architect's budget estimate as the basis for the contractor's proposal without performing any independent pricing verification

31. A contractor is building a residential home and the plans specify a standing seam metal roof. The manufacturer requires the metal panels to be installed with clips that allow thermal expansion and contraction movement. The contractor fastens the panels directly through the face with exposed screws instead of using the specified clip system. What is the consequence of this installation method?

- A. Direct fastening with exposed screws prevents the panels from expanding and contracting with temperature changes, causing the panels to buckle, the fastener holes to elongate, and leaks to develop at the screw penetrations
- B. Direct fastening is the preferred method because exposed screws provide a stronger connection than concealed clips in all conditions
- C. The installation method has no practical impact because metal roofing does not expand or contract enough to affect the installation
- D. Exposed screw installation is acceptable for residential applications and concealed clips are required only on commercial buildings

32. A contractor is managing a commercial project and the building inspector requires a special inspection of the structural masonry during construction. Under the building code, what does the special inspector verify during structural masonry construction?

- A. The color consistency of the masonry units to ensure the finished wall meets the architect's aesthetic design intent for the project
- B. The speed at which the masons complete each course of masonry to verify compliance with the project schedule requirements
- C. The surface texture of the mortar joints to ensure they match the sample panel approved during the preconstruction phase
- D. The grout placement, reinforcement positioning, mortar mix proportions, and masonry unit quality to verify compliance with the structural engineer's specifications and the applicable masonry code

33. A contractor is hired to install a residential swimming pool. The pool will have an automatic cover system. Under Oregon building codes, does the automatic cover satisfy the barrier requirement for residential swimming pool safety?

- A. No, because automatic covers are classified as convenience features and do not meet any pool safety barrier code requirements
- B. An automatic pool cover that meets ASTM F thirteen-forty-six standards may be accepted as a barrier alternative under certain building codes, provided it meets the specific performance requirements for pool safety covers
- C. Yes, but only when combined with a separate four-foot-high fence around the pool perimeter as an additional safety measure
- D. Automatic covers satisfy the barrier requirement only for indoor pools and a physical barrier is always required for outdoor installations

34. A contractor is reviewing the insurance requirements for a commercial project and discovers that the owner requires an Owner's and Contractor's Protective Liability policy. What does this type of policy provide?

- A. Coverage for the contractor's employees against workplace injuries that exceed the limits of the workers' compensation policy
- B. Coverage for the owner's existing building against physical damage caused by natural disasters during the construction period
- C. Coverage for the architect's professional errors and omissions in the design documents used for the commercial construction project
- D. A separate liability policy purchased by the owner that provides coverage specifically for the owner's vicarious liability arising from the contractor's operations on the project

35. A contractor is building a residential addition and the plans require a fire-rated assembly at the wall between the existing garage and the new living space. The contractor uses regular gypsum board instead of the specified type X fire-rated gypsum board. The building inspector catches the error during the drywall inspection. What must the contractor do?

- A. Remove the regular gypsum board and replace it with the specified type X fire-rated gypsum board to achieve the required fire-resistance rating before the inspection can pass
- B. Apply fire-retardant paint over the regular gypsum board to achieve the equivalent fire-resistance rating of type X board
- C. Add a second layer of regular gypsum board on top of the first layer because two layers of regular board equal one layer of type X
- D. Request a variance from the building department because the regular gypsum board provides adequate fire protection for the garage wall

36. Under Oregon tax law, a contractor operates as a sole proprietor and reports business income on Schedule C of the personal tax return. The contractor's gross revenue is three

hundred fifty thousand dollars and business expenses total two hundred eighty thousand dollars. What is the contractor's net self-employment income subject to self-employment tax?

- A. Seventy thousand dollars, calculated as the gross revenue minus all allowable business expenses reported on the Schedule C
- B. Three hundred fifty thousand dollars because self-employment tax is calculated on gross revenue before deducting expenses
- C. Two hundred eighty thousand dollars because self-employment tax is calculated on the business expenses rather than the profit
- D. Thirty-five thousand dollars because self-employment tax applies only to the first ten percent of gross revenue earned

37. A contractor is installing a commercial building's plumbing system and the specifications call for copper drain piping in the laboratory areas due to chemical waste requirements. The contractor substitutes PVC drain piping to reduce costs. Why is this substitution problematic?

- A. PVC piping is always superior to copper for chemical waste drainage applications because PVC is resistant to all chemical compounds
- B. The substitution is acceptable because PVC drain piping meets the same plumbing code requirements as copper drain piping
- C. PVC piping may not be compatible with the specific chemicals used in the laboratory, and certain chemicals can degrade, soften, or dissolve PVC piping, causing leaks and environmental contamination
- D. Copper piping is only specified for aesthetic purposes in laboratory settings and PVC provides identical chemical resistance

38. A contractor is managing a residential project and discovers that the site grading plan directs stormwater from the project site toward the neighbor's property. Under Oregon law, a property owner generally cannot direct surface water onto an adjacent property in a manner that causes damage. What should the contractor do?

- A. Revise the grading plan to direct stormwater to an approved drainage system that does not discharge onto the neighbor's property, and verify compliance with the approved stormwater management plan
- B. Proceed with the grading plan as designed because the civil engineer who prepared the plan is responsible for drainage compliance
- C. Notify the neighbor that stormwater will be directed toward their property and proceed with the grading plan as designed
- D. Install a berm along the property line to block the water flow and allow it to pond on the contractor's project site instead

39. A contractor is building a commercial structure and the fire protection engineer requires the installation of fire dampers in all ductwork penetrations through fire-rated wall and floor assemblies. The contractor installs the ductwork through the rated assemblies but does not install the fire dampers. What life safety deficiency does this create?

- A. Fire dampers are optional components that improve energy efficiency but do not affect fire and life safety code compliance
- B. Without fire dampers, the duct penetrations create unprotected openings in the fire-rated assemblies that allow fire, smoke, and toxic gases to spread between fire compartments through the ductwork
- C. The missing dampers affect only the building's insurance premium and do not create an actual fire safety hazard for occupants
- D. Fire dampers are required only in hospitals and schools and are optional in standard commercial office building construction

40. A contractor is estimating a commercial project and needs to calculate the total weight of structural steel for foundation design purposes. The structural drawings show wide-flange beams totaling four hundred linear feet of W12x26 members. What does the "26" in the W12x26 designation represent?

- A. The minimum yield strength of the steel member expressed in thousands of pounds per square inch for the specified grade
- B. The depth of the web in inches measured from the inside face of the top flange to the inside face of the bottom flange
- C. The moment of inertia of the beam cross-section expressed in inches to the fourth power for deflection calculations
- D. The weight of the beam per linear foot in pounds, meaning each foot of this beam weighs twenty-six pounds

41. A contractor is performing a residential renovation and the homeowner asks whether the contractor needs to install a sump pump in the basement. The basement currently has no water intrusion issues and the foundation is in good condition. Under Oregon building codes, when is a sump pump required?

- A. A sump pump is required in every residential basement regardless of water intrusion history or soil conditions on the property
- B. A sump pump is typically required when the basement has a below-grade perimeter drain system or when the design requires active removal of groundwater to maintain a dry basement environment
- C. A sump pump is required only in basements deeper than eight feet below the exterior finished grade on the lot perimeter

D. Sump pumps are never required by building codes and are purely optional equipment installed at the homeowner's preference

42. Under Oregon law, a contractor's CCB license is subject to disciplinary action by the CCB for various violations. Which of the following actions would most likely result in CCB disciplinary action against a licensed contractor?

A. Performing construction work in a negligent or improper manner, failing to complete contracted work, or violating Oregon's construction contractor laws and regulations

B. Hiring an employee who does not hold a valid Oregon driver's license for transportation to and from the construction site

C. Failing to attend the annual CCB conference held in Salem for all licensed residential and commercial contractors in the state

D. Using a brand of construction adhesive that is not listed on the CCB's approved product list for residential construction work

43. A contractor is installing a commercial fire sprinkler system and the fire protection engineer requires flow switches on each floor's sprinkler zone. What is the purpose of a flow switch in a fire sprinkler system?

A. To regulate the water pressure at each sprinkler head to ensure uniform coverage across the entire floor area during activation

B. To measure the total volume of water discharged by the sprinkler system for calculating the water damage costs after a fire event

C. To detect water flow in the sprinkler piping when a sprinkler head activates, triggering the fire alarm system to alert building occupants and notify the fire department of the fire location

D. To automatically shut off the water supply to the sprinkler system after a specified volume of water has been discharged

44. A contractor is building a residential home and the structural plans show a steel beam supporting the second floor. The plans specify a W8x31 beam with a clear span of sixteen feet. The contractor substitutes a W8x24 beam because it was available in the supplier's inventory. What is the structural concern with this substitution?

A. The W8x24 is a lighter beam with less weight per foot but identical structural properties to the W8x31 in all load conditions

B. The substituted beam has the same depth but a wider flange that interferes with the wall framing at the beam bearing points

C. The W8x24 has a lower section modulus and moment of inertia than the specified W8x31, meaning it has less load-carrying capacity and may deflect excessively or fail under the design loads

D. The W8x24 is structurally stronger than the W8x31 because the lighter weight reduces the dead load on the supporting columns

45. A contractor is managing a commercial project and the owner requests that the contractor provide a schedule of values with the first progress payment application. What is a schedule of values and what purpose does it serve?

A. A list of all subcontractor bid amounts ranked from highest to lowest contract value for the owner's financial review and approval

B. A detailed breakdown of the contract price into individual work items or trade categories, used as the basis for calculating monthly progress payment amounts based on the percentage of each item completed

C. A valuation of the completed building performed by a licensed real estate appraiser to confirm the project's market value for financing

D. A listing of all material costs organized by specification section that the contractor submits to the owner for cost verification

46. A contractor is building a residential deck and the structural plans require the deck posts to bear on precast concrete pier blocks set on compacted soil. The contractor places the pier blocks directly on undisturbed topsoil without compacting or removing the organic layer. What is the structural risk of this installation?

A. The pier blocks are designed to bear on any soil type and the installation method has no effect on the deck's structural performance

B. The topsoil placement is acceptable if the contractor installs the pier blocks during dry weather when the soil is naturally firm

C. Organic topsoil compresses and decomposes over time, causing the pier blocks to settle unevenly, resulting in deck movement, structural distress, and potential failure at the post-to-beam connections

D. The only risk is aesthetic because the deck may develop a visible slope but the structural connections remain secure and functional

47. A contractor is reviewing a commercial lease for office space and the landlord requires the contractor to provide a personal guarantee on the lease. What does a personal guarantee on a commercial lease mean for the contractor?

- A. The contractor guarantees that the leased space will be maintained in good condition throughout the entire lease term period
- B. The landlord guarantees that the contractor's personal property stored in the office space is insured against theft and damage
- C. The contractor guarantees that they will renew the lease at the end of the initial term for at least one additional renewal period
- D. The contractor becomes personally liable for the lease obligations, meaning the landlord can pursue the contractor's personal assets if the business entity defaults on the lease payments

48. A contractor is installing residential electrical wiring and the plans show a dedicated circuit for the garbage disposal. The contractor connects the garbage disposal to the same circuit as the dishwasher to save a circuit breaker space in the panel. Under the National Electrical Code, is this installation acceptable?

- A. The NEC generally allows the dishwasher and garbage disposal to share a single twenty-ampere circuit, provided the circuit is properly protected and installed according to code requirements
- B. No, the dishwasher and garbage disposal must always be on separate dedicated circuits under all circumstances per NEC requirements
- C. Yes, but only if the garbage disposal has a horsepower rating of one-half or less and the dishwasher draws less than eight amperes
- D. No, because the garbage disposal must be on a dedicated fifteen-ampere circuit and the dishwasher requires a separate twenty-ampere circuit

49. A contractor is building a commercial warehouse and the specifications require the contractor to install a trench drain system in the loading dock area. The trench drain collects water from truck wash-down operations and routes it to a water quality treatment system before discharge. The contractor installs the trench drain but connects it directly to the storm drain without the specified treatment system. What is the consequence?

- A. The direct connection to the storm drain without the treatment system violates the project specifications and likely violates environmental regulations governing the discharge of contaminated wash water into the storm drainage system
- B. The storm drain connection is acceptable because loading dock wash water is classified as clean water that does not require treatment
- C. The treatment system is an optional component that improves water quality but is not required by environmental regulations
- D. The direct connection is acceptable if the contractor installs a sediment filter at the trench drain inlet to remove visible particles

50. Under Oregon law, a contractor is required to notify the CCB of certain changes to the contractor's business information. Which of the following changes requires notification to the CCB within the specified timeframe?

- A. A change in the contractor's preferred hardware store vendor for purchasing construction materials used on active projects
- B. A change in the number of active construction projects the contractor is currently managing during the calendar quarter reporting period
- C. A change in the contractor's business address, ownership structure, responsible managing individual, or bond and insurance status
- D. A change in the brand of work vehicle the contractor uses for transportation to and from active construction project sites

51. A contractor is managing a commercial project and the roofing subcontractor installs the roof membrane in below-freezing temperatures. The membrane manufacturer's installation instructions specify a minimum application temperature of forty degrees Fahrenheit. The contractor discovers the cold-weather installation during a routine quality inspection. What should the contractor do?

- A. Accept the installation because experienced roofing crews can install membrane systems in any temperature conditions successfully
- B. Apply an additional coat of adhesive over the cold-applied membrane to improve the bond strength achieved during the installation
- C. Approve the installation because the membrane will bond properly once temperatures rise above forty degrees in the following weeks
- D. Require the roofing subcontractor to inspect all seams and bonds for deficiencies caused by the below-temperature installation, and repair or replace any areas where the membrane did not achieve proper adhesion

52. A contractor is building a residential home and the building code requires an automatic fire sprinkler system throughout the dwelling. The homeowner asks the contractor to explain the residential sprinkler system's design concept. Which standard governs the design and installation of residential fire sprinkler systems?

- A. NFPA 72 governs the design and installation of all fire sprinkler systems in both residential and commercial building applications
- B. The International Building Code directly specifies sprinkler head spacing and pipe sizing for residential sprinkler system installations
- C. NFPA 13D is the standard for the installation of sprinkler systems in one- and two-family dwellings and manufactured homes
- D. NFPA 13 is the exclusive standard governing all sprinkler installations regardless of whether the building is commercial or residential

53. A contractor is estimating a project and needs to determine the overhead cost as a percentage of direct costs. The contractor's annual overhead expenses total one hundred eighty thousand dollars and the annual direct project costs total one million two hundred thousand dollars. What is the contractor's overhead rate?

- A. Fifteen percent, calculated by dividing the annual overhead expenses by the annual direct project costs
- B. Six-point-six-seven percent, calculated by dividing the annual overhead by the combined total of overhead and direct costs
- C. Twenty percent, calculated by dividing the annual direct costs by the combined total of overhead and direct project costs
- D. Eighty-five percent, calculated by dividing the annual direct project costs by the combined total of all business expenses

54. A contractor is performing a commercial renovation and encounters unmarked post-tensioning cables in an existing concrete slab during core drilling for a new plumbing penetration. The drill contacts a cable and damages it. What is the immediate concern?

- A. The damaged cable releases mild tension that settles within the existing slab without any structural consequence to the building
- B. A damaged post-tensioning cable can release significant stored energy and reduce the slab's structural capacity, potentially causing progressive failure, and the contractor must stop work immediately and notify the structural engineer
- C. The damaged cable affects only the appearance of the slab surface and does not compromise the structural integrity of the floor
- D. Post-tensioning cables in existing slabs are always de-tensioned during renovation and the damaged cable poses no structural risk

55. A contractor is building a residential home and the plans call for a concrete masonry unit stem wall foundation. The building code requires horizontal reinforcement at specific courses in the CMU wall. The contractor builds the wall without the specified horizontal reinforcement. What is the structural consequence?

- A. The wall performs identically with or without horizontal reinforcement because CMU walls derive their strength from the mortar joints
- B. The horizontal reinforcement is an aesthetic feature that creates a straight course line and has no structural function in the wall

- C. The unreinforced wall lacks the tensile capacity and crack resistance that horizontal reinforcement provides, making the wall vulnerable to lateral soil pressure, seismic forces, and foundation settlement
- D. The missing reinforcement affects only the wall's fire resistance rating and has no impact on its structural load-carrying capacity

56. A contractor is reviewing a contract for a commercial tenant improvement project. The contract specifies that the work must comply with the current edition of the Americans with Disabilities Act Accessibility Guidelines. The existing restroom door opening is thirty inches wide. The ADA requires a minimum clear opening width for accessible restroom doors. Does the existing thirty-inch opening meet ADA requirements?

- A. No, the ADA generally requires a minimum clear opening width of thirty-two inches for accessible doorways, and the existing thirty-inch opening does not meet this requirement
- B. Yes, the thirty-inch opening meets ADA requirements for all restroom door applications in commercial building tenant spaces
- C. Yes, but only if the door is equipped with an automatic opener that eliminates the need for manual force to open the door
- D. No, but ADA compliance is waived for existing buildings undergoing tenant improvement renovations under all circumstances

57. A contractor is managing a residential project and the homeowner provides a set of plans downloaded from the internet. The plans are not stamped by a licensed architect or engineer. Under Oregon law, can the contractor build from these unstamped plans?

- A. Yes, because all residential construction plans are exempt from the requirement for professional architectural or engineering stamps
- B. The contractor should verify whether the specific project requires plans prepared by a licensed professional based on the project scope, complexity, and local jurisdiction requirements, because certain residential projects may require professionally prepared and stamped documents
- C. No, because Oregon law requires all residential construction plans to be prepared and stamped by a licensed architect without exception
- D. Yes, because the homeowner assumes all liability for the design when they provide their own plans to the contractor for construction

58. A contractor is installing a commercial building's fire protection system and the specifications require fire caulking at all penetrations through fire-rated assemblies. The fire caulking must be a tested and listed assembly. The contractor uses standard silicone caulk and labels it as fire caulk. What is wrong with this approach?

- A. Standard silicone caulk provides adequate fire resistance and the labeling correction satisfies the code requirement for documentation
- B. The issue is that the standard silicone caulk should have been painted red to match the color coding requirement for fire-rated sealants
- C. Standard silicone caulk is not a tested and listed firestopping material, will melt and fail during a fire, and does not maintain the fire-resistance rating of the assembly, creating an unprotected penetration
- D. Standard silicone caulk meets the fire-resistance requirements but must be installed in two coats to achieve the specified hourly rating

59. A contractor is building a commercial structure and the plans require the installation of a building-mounted flagpole. The flagpole will be thirty feet tall and mounted on the roof parapet. The structural engineer requires the contractor to provide a foundation detail for the flagpole base. Why is a structural foundation detail necessary for a flagpole?

- A. The foundation detail is required only for aesthetic purposes to ensure the flagpole is plumb and visually aligned with the building
- B. The flagpole is classified as a sign and requires a separate sign permit but no structural foundation design is needed for mounting
- C. A thirty-foot flagpole generates significant wind loads that must be transferred through the mounting bracket into the building structure, and the foundation detail ensures the parapet and roof structure can resist these forces without failure
- D. The foundation detail is required only for flagpoles exceeding fifty feet in height and is not necessary for the thirty-foot pole

60. A contractor is managing a residential project and the building inspector discovers that the attic insulation has been installed with the vapor barrier facing the wrong direction. The vapor barrier is facing the cold side of the wall assembly instead of the warm side. What moisture problem does this create?

- A. The reversed vapor barrier has no practical impact because modern insulation products function identically regardless of orientation
- B. The reversed vapor barrier traps moisture within the wall or ceiling assembly because it prevents the moisture-laden warm air from reaching the cold surface but blocks the moisture from drying back toward the interior, leading to condensation, mold growth, and structural deterioration
- C. The reversed vapor barrier improves the insulation's thermal performance by reflecting radiant heat back toward the attic space
- D. The reversed vapor barrier affects only the insulation's R-value rating and has no impact on moisture management within the assembly

61. A contractor is hired to build a commercial tenant improvement project in an existing multi-story office building. The existing building has a fire sprinkler system, but the new tenant layout changes the room configurations significantly. What obligation does the contractor have regarding the fire sprinkler system?

- A. No obligation because the existing sprinkler system was designed for the original building layout and modifications are the owner's responsibility
- B. The contractor must verify that the new room layout maintains adequate sprinkler coverage, and if the new walls or ceiling changes affect coverage, the sprinkler system must be modified to comply with the fire code
- C. The contractor must remove all existing sprinkler heads and install a completely new fire sprinkler system designed for the new layout
- D. The contractor may cap off sprinkler heads that are located inside the new wall partitions without replacing them in accessible locations

62. A contractor is reviewing a commercial project's geotechnical report and finds that the report recommends the use of helical piles for the building foundation due to weak surface soils. What is the primary advantage of helical piles in weak soil conditions?

- A. Helical piles are less expensive than all other deep foundation options regardless of the soil conditions or building load requirements
- B. Helical piles are installed using hand tools and require no heavy equipment, making them ideal for restricted-access urban sites
- C. Helical piles provide only temporary support during construction and must be replaced with permanent foundations after the building is complete
- D. Helical piles transfer building loads through weak surface soils to deeper bearing strata by screwing into the ground until adequate resistance is achieved, without the vibration and noise of driven pile installation

63. A contractor is installing a residential tankless water heater and the installation requires a category three stainless steel vent pipe due to the condensing nature of the flue gases. The contractor installs a standard galvanized B-vent pipe instead. What is the consequence of using the wrong vent material?

- A. Standard galvanized B-vent provides superior corrosion resistance compared to stainless steel for condensing flue gas applications
- B. The galvanized vent pipe is acceptable if the contractor applies a corrosion-resistant coating to the interior surface before installation

- C. The acidic condensate from the condensing water heater will corrode the galvanized vent pipe from the inside, causing premature failure, potential flue gas leakage into the living space, and a carbon monoxide hazard
- D. The vent material has no impact on safety because all flue gases are non-toxic and pose no health risk to building occupants

64. A contractor is managing a commercial project and the mechanical engineer requires balancing of the HVAC air distribution system after installation is complete. What does air balancing involve?

- A. Adjusting the thermostat settings in each zone to match the owner's preferred temperature for the occupied spaces in the building
- B. Cleaning all air filters and ductwork before the building is occupied to remove construction dust and debris from the air system
- C. Replacing any ductwork that was damaged during the construction process to restore the designed airflow capacity of the system
- D. Measuring and adjusting the airflow at each supply and return register to ensure the actual air volumes match the mechanical engineer's design specifications for each room and zone

65. A contractor is performing a residential renovation and discovers that the existing home has knob-and-tube wiring in the walls and attic. The homeowner wants to add blown-in insulation to the attic. What concern does the knob-and-tube wiring create for this insulation installation?

- A. Knob-and-tube wiring has no interaction with blown-in insulation and the insulation can be installed directly over the existing wiring
- B. Covering knob-and-tube wiring with insulation creates a fire hazard because the wiring was designed to dissipate heat through free air circulation, and insulation traps heat around the conductors, potentially causing overheating and fire
- C. The insulation must be a specific color to distinguish it from the knob-and-tube wiring for future identification purposes
- D. The insulation can be installed over knob-and-tube wiring if the contractor installs a vapor barrier between the wiring and insulation

66. A contractor is building a commercial structure and the building code requires the roof drainage system to include overflow drains or scuppers as a secondary drainage system. What is the purpose of the secondary roof drainage system?

- A. To collect condensation from the rooftop HVAC equipment and route it to the building's sanitary sewer connection for treatment

- B. To provide a backup drainage system for routine rainfall events when the primary drains are operating at normal flow capacity
- C. To filter debris from the roof surface before the water enters the primary roof drainage system for discharge to the storm sewer
- D. To prevent ponding and potential roof collapse by providing an emergency drainage path if the primary roof drains become blocked or overwhelmed during extreme rainfall events

67. A contractor is managing a residential project and the homeowner asks the contractor to explain the purpose of a home warranty from a third-party warranty company compared to the contractor's own workmanship warranty. What is the primary difference?

- A. A third-party home warranty and the contractor's workmanship warranty provide identical coverage and are interchangeable options
- B. The contractor's warranty is always longer in duration than any third-party warranty available for residential construction projects
- C. A third-party warranty covers only cosmetic defects while the contractor's warranty covers only structural defects in the home
- D. A third-party warranty is an independent insurance product that provides coverage for specified systems and components, often extending beyond the contractor's warranty period and remaining valid even if the contractor goes out of business

68. Under Oregon law, a contractor is required to include specific information in all advertising. A contractor posts an advertisement on social media for a kitchen remodel special. The advertisement includes the company name, phone number, and a project portfolio but does not include the contractor's CCB license number. Is this advertisement compliant with Oregon law?

- A. Yes, because social media posts are classified as informal communications and are exempt from CCB advertising requirements
- B. Yes, because the CCB license number is only required on formal printed materials such as business cards and letterhead
- C. No, Oregon law requires the contractor's CCB license number to be included in all forms of advertising including social media
- D. No, but only if the advertisement includes pricing information for the services being promoted to potential customers

69. A contractor is installing a commercial building's emergency generator and the electrical code requires an automatic transfer switch between the utility power and the generator. The transfer switch must meet specific code requirements for transfer time. What is the typical maximum transfer time for emergency power systems serving life safety loads?

- A. Sixty seconds is the maximum transfer time for emergency systems serving life safety loads in commercial building applications
- B. Ten seconds is the typical maximum transfer time required by the electrical code for emergency power systems serving life safety loads such as egress lighting and fire alarm systems
- C. Five minutes is the maximum transfer time allowed for all emergency generator systems regardless of the connected load type
- D. Thirty seconds is the standard transfer time for emergency systems serving both life safety and optional standby loads equally

70. A contractor is building a residential home and the plans call for a whole-house humidifier integrated with the HVAC system. The humidifier requires a water supply connection and a drain for overflow. The contractor connects the humidifier drain to the condensate drain of the air conditioning evaporator coil. Is this connection acceptable?

- A. No, the humidifier must have a completely separate drain line routed to the building's exterior at a location approved by the inspector
- B. The connection is generally acceptable because both the humidifier overflow and the AC condensate are non-contaminated condensate waste that can share a common drain line, provided the installation meets the applicable plumbing code requirements
- C. No, because the humidifier drain must be connected to the sanitary sewer through a dedicated indirect waste receptor in all installations
- D. The connection is acceptable only if the contractor installs a backflow prevention device between the two drain connections

71. A contractor is managing a commercial project and the specifications require the contractor to maintain daily construction logs throughout the project. What information should be documented in a daily construction log?

- A. Only the names and social security numbers of all workers on site each day for payroll verification and tax reporting purposes
- B. Only the weather conditions and temperature readings taken at the beginning and end of each workday on the active project
- C. Only the material deliveries received on site each day with the corresponding purchase order numbers and supplier names
- D. Weather conditions, workforce counts by trade, work activities performed, equipment on site, deliveries received, visitors, safety incidents, inspection results, and any issues or delays encountered

72. A contractor is installing residential windows and the manufacturer's installation instructions require a specific sequence of flashing integration with the weather-resistive barrier. The contractor installs the windows before the weather-resistive barrier is applied. What moisture management problem does this sequence error create?

- A. The installation sequence has no impact on moisture management because the window frame provides its own waterproof barrier
- B. The window flashing cannot be properly integrated with the weather-resistive barrier because the barrier must be in place before the window is installed so the flashing layers can be shingled correctly to direct water outward
- C. The reversed sequence improves moisture management because the window frame is sealed directly to the structural sheathing
- D. The installation sequence affects only the aesthetic appearance of the exterior trim and has no functional moisture impact

73. A contractor is building a commercial structure and the specifications require the contractor to install seismic joint covers at all building separation joints. What is the purpose of seismic joint covers?

- A. To permanently bond the two building sections together so they move as a single structure during a seismic event for stability
- B. To prevent water and debris from entering the joint opening while providing a watertight barrier across the building separation
- C. To span the separation joint between building sections while allowing the independent structural movement required during a seismic event, and to maintain fire separation, weatherproofing, and a finished appearance
- D. To reinforce the structural connection between the two building sections so the joint does not open wider during normal operations

74. A contractor is performing a residential renovation and the existing home has a forced-air heating system with the supply ducts running through an unconditioned crawl space. The ducts are uninsulated. The renovation scope does not include HVAC work. Should the contractor address the uninsulated ducts?

- A. The contractor has no obligation because the duct insulation is outside the contracted renovation scope and is an existing condition
- B. The contractor must insulate all ducts at the contractor's expense because the contractor has a duty to correct all code deficiencies
- C. The contractor should only insulate the ducts if the homeowner specifically requests duct insulation as an add-on to the renovation

D. The contractor should inform the homeowner that the uninsulated ducts in the unconditioned crawl space are wasting energy and recommend insulation, potentially through a change order if the homeowner authorizes the work

75. A contractor is managing a commercial project and the owner requests that the contractor provide monthly cash flow projections showing anticipated expenditures for the next three months. What is the primary purpose of these projections for the project owner?

A. To allow the owner to negotiate lower material prices with the contractor's suppliers based on the projected purchase volumes

B. To enable the owner to plan financing draws, manage construction loan disbursements, and ensure adequate funds are available to meet the project's upcoming payment obligations

C. To provide the owner with data to calculate the building's projected return on investment before the project reaches completion

D. To satisfy the building department's requirement for financial documentation before each monthly building inspection is scheduled

76. A contractor is installing a commercial roof and the specifications require a fully adhered single-ply membrane system. The contractor installs the membrane with mechanical fasteners instead of adhesive. What is the primary concern with this installation method change?

A. Mechanically fastened membranes are always superior to fully adhered membranes because the fasteners provide a stronger attachment

B. The mechanical fasteners are visible from inside the building and create an aesthetic concern for the ceiling finish below the roof

C. Mechanical fastening changes the roof system's wind uplift resistance characteristics, may void the manufacturer's warranty for a fully adhered system, and the fastener penetrations create potential leak points that a fully adhered system avoids

D. The installation method has no impact on performance because both attachment methods provide identical wind resistance and warranty coverage

77. A contractor is reviewing a commercial project's payment application and the owner withholds payment citing unsatisfactory work on the exterior masonry. The contractor believes the masonry work meets the specification requirements. Under standard contract terms, what dispute resolution mechanism should be used first?

A. The contractor should file a construction lien against the property immediately without attempting any other resolution method

B. The contractor should stop all work on the project until the owner releases the withheld payment in full without conditions

- C. The contractor should file a CCB complaint against the owner for withholding payment on a commercial construction project
- D. The architect typically reviews the disputed work against the specification requirements and makes an initial determination, which can be appealed through the contract's dispute resolution procedures

78. A contractor is building a residential home and the structural plans require a Simpson Strong-Wall shear panel at a specific location on the first floor to resist lateral forces. The contractor substitutes a standard plywood shear wall at the same location. What is the structural concern?

- A. A Simpson Strong-Wall is an engineered prefabricated shear panel designed to provide significantly higher shear capacity in a narrow width than a standard plywood shear wall, and the substitution may not provide the required lateral force resistance
- B. The standard plywood shear wall provides identical shear resistance to the Simpson Strong-Wall in all residential applications
- C. The Simpson Strong-Wall is a cosmetic product that provides a finished appearance and is not structurally different from plywood
- D. The substitution is acceptable because the building code allows any shear wall method as long as the wall height does not exceed eight feet

79. A contractor is managing a commercial project and the fire marshal requires the building's fire protection system to include a fire pump. The fire pump is tested during commissioning and fails to achieve the required flow rate and pressure at the most remote sprinkler head. What must the contractor do?

- A. Accept the test results because fire pumps are designed with a built-in safety factor that compensates for test-day performance variations
- B. Install additional sprinkler heads at the remote location to compensate for the reduced pressure and flow at the end of the system
- C. Submit the test results to the fire marshal and request a variance accepting the reduced performance as adequate for the building
- D. Investigate the cause of the inadequate performance, which could include pipe sizing errors, pump selection issues, or water supply limitations, and correct the deficiency until the system passes the required flow and pressure test

80. A contractor is reviewing a residential construction contract and the homeowner asks whether the contract should include a detailed payment schedule tied to construction milestones. What is the advantage of a milestone-based payment schedule for both parties?

- A. A milestone payment schedule benefits only the contractor by accelerating payments ahead of actual work completion progress
- B. A milestone payment schedule benefits only the homeowner by delaying all payments until the end of each construction phase
- C. A milestone payment schedule protects both parties by tying payments to verified completion of defined work stages, ensuring the contractor receives payment for completed work while the homeowner pays only for work actually performed and inspected
- D. Milestone payment schedules are prohibited in Oregon residential construction contracts because they create unfair payment terms

Practice Exam 21: Answer Key and Explanations

- 1. C** — Prevailing wage rates are established by BOLI and represent the minimum compensation that must be paid to workers on public works projects. Regardless of the labor rates included in the contractor's bid, the contractor must pay the published prevailing wage rate for each trade classification. Bidding below the prevailing rate does not reduce the contractor's legal obligation to pay the full required rate.
- 2. C** — Without connection to the building automation system for demand-controlled ventilation, the outdoor air system operates at a fixed rate regardless of actual occupancy. During low-occupancy periods, the system wastes energy by conditioning unnecessary outdoor air. During high-occupancy periods, the system may deliver insufficient fresh air, compromising indoor air quality for the occupants.
- 3. A** — Oregon law requires a three-day right of rescission in certain residential contracts, particularly those resulting from door-to-door solicitations or sales made at locations other than the contractor's place of business. The contractor should verify whether the circumstances of how the contract was solicited trigger this requirement. Failure to include the provision when required can void the contract.
- 4. B** — The concrete subcontractor is contractually obligated to provide a slab that meets the specified flatness and levelness tolerances. When the slab fails to meet these tolerances, the concrete subcontractor bears the cost of corrective measures including the leveling compound needed to bring the surface into compliance. The deficient substrate is the concrete subcontractor's responsibility to correct.
- 5. A** — The contractor's commercial general liability insurance covers property damage to third-party property caused by the contractor's operations. The homeowner's vehicle damaged by a falling solar panel is third-party property damage resulting from the contractor's work activities. This is a standard CGL claim for property damage arising from the contractor's operations.
- 6. D** — Structural welds performed by uncertified welders do not meet the specification requirements and may contain hidden defects that compromise the building's structural integrity. All welds made by the uncertified welder must be inspected and tested by a qualified

independent agency to verify their adequacy. Any welds that fail testing must be removed and replaced by a properly certified welder.

7. A — Oregon requires a paid rest period of at least ten minutes for every four hours of work or major fraction thereof. For a ten-hour shift, the worker is entitled to rest periods based on the applicable law's calculation of major fractions of four-hour work segments. The specific number depends on how the Oregon statute defines major fraction in relation to the hours worked.

8. B — Return air grilles in closets create airflow restrictions when the door is closed because the enclosed space cannot draw sufficient air volume. Additionally, closets used for storage contain dust, lint, and potentially chemical vapors from stored items that get drawn into the HVAC system. Building codes generally prohibit return air grilles in closets for these performance and air quality reasons.

9. A — Zero-clearance fireboxes are tested and listed with specific minimum clearances that must be maintained from combustible materials. The term "zero-clearance" refers to the ability to install the unit within a combustible framing enclosure at the manufacturer's specified distances, not at zero inches. Reducing the specified clearances creates a fire hazard from heat transfer to the nearby framing.

10. D — A time impact analysis inserts the delay event into the current project schedule as a new activity and recalculates the critical path to determine whether the project completion date is extended. This analysis provides an objective, schedule-based demonstration of the delay's impact on the overall project. It is the standard method for evaluating and documenting the schedule effect of owner-caused delays.

11. D — Adhesive-bonded seams on TPO membranes may not achieve the same bond strength as heat-welded seams and can deteriorate over time from temperature cycling, moisture exposure, and UV degradation. The manufacturer specifically requires heat welding because it fuses the membrane sheets together at a molecular level, creating a permanent, watertight bond. Using adhesive instead of heat welding voids the manufacturer's warranty.

12. C — Forty-eight feet divided by two-foot spacing equals twenty-four spaces between trusses. Adding one truss for the starting position yields twenty-five trusses. This calculation follows the standard formula for determining the number of equally spaced members: total length divided by spacing plus one for the starting member.

13. C — When existing conditions create unexpected problems during renovation, the contractor must stop work, document the condition, and present a change order to the owner before proceeding with repairs that are outside the original scope. The collapsed cast iron pipe is a concealed condition that was not part of the contracted work. The homeowner must authorize and fund the additional repair work.

14. A — The requirement to provide a copy of the contract before signing gives the homeowner time to read and understand all terms, conditions, and disclosures before making a binding commitment. This consumer protection measure ensures informed consent by allowing the homeowner to seek legal advice or compare terms with other contractors. Rushing homeowners into signing without review time can lead to disputes.

15. D — Chloride-laden water from vehicle traffic splashes onto parking garage columns and walls, not just the traffic surfaces. Without sealer protection, chlorides penetrate the concrete cover over time and initiate corrosion of the reinforcing steel. Corroding rebar expands and causes concrete spalling, which compromises the structural capacity of the columns.

16. B — The building code requires smoke alarms to be interconnected so that when one alarm detects smoke, all alarms in the dwelling sound simultaneously. Standalone battery alarms that are not interconnected do not meet this requirement. The contractor must replace them with code-compliant interconnected alarms using either hardwired connections with battery backup or approved wireless interconnection technology.

17. A — Attic stock provides the building owner with a supply of matching replacement materials from the same production lot, ensuring consistency in color, pattern, texture, and product specification for future repairs. Materials purchased later may not match due to production variations, discontinued products, or lot-to-lot color differences. Attic stock eliminates this matching problem for common maintenance repairs.

18. B — Steel column base plates have pre-drilled bolt hole patterns that must align precisely with the anchor rods embedded in the concrete piers. A ninety-degree rotation of the anchor rod pattern misaligns the holes, preventing the base plate from being installed as designed. Correcting this error requires either relocating the anchor rods with engineering approval or modifying the base plates, both of which add cost and delay.

19. A — Oregon requires plumbing work to be performed by individuals and contractors holding the appropriate plumbing license. A general CCB license does not authorize the holder to perform plumbing work, which is a separately licensed trade in Oregon. The general contractor must hire a properly licensed plumbing contractor to perform all plumbing installations on the project.

20. A — Critical chain scheduling addresses resource constraints that traditional critical path scheduling ignores by identifying resource conflicts and resolving them during the planning phase. Individual activity safety buffers are removed and consolidated into project buffers and feeding buffers at strategic points, reducing the tendency to waste individual activity contingencies. This approach improves overall schedule reliability.

21. D — Native soil may contain rocks that damage the pipe's protective coating, organic materials that decompose and create voids, or expansive clays that exert uneven pressure on the pipe. Compacted gravel bedding provides uniform support and prevents point loading, while granular backfill provides consistent lateral support and prevents settlement. Using improper bedding and backfill materials leads to pipe damage and joint failures.

22. D — A heat recovery ventilator transfers heat from the outgoing exhaust air stream to the incoming outdoor air stream using a heat exchanger core, without mixing the two air streams. In winter, it pre-heats the cold incoming air using heat recovered from the warm exhaust air. In summer, it pre-cools the incoming air. This reduces the energy required to condition the ventilation air.

23. A — Pre-installation meetings ensure that the subcontractor understands the installation procedures, quality standards, safety requirements, and coordination issues before work begins. Reviewing these topics before mobilization prevents field errors, reduces rework, and aligns

the subcontractor's planned approach with the specification requirements. These meetings are a standard quality management practice on commercial projects.

24. B — In a duplex building, a chimney that shares a common wall may function as a party wall providing structural support to both units. Removing the chimney without understanding its structural function could compromise the neighbor's unit. The contractor must determine the chimney's structural role and engineer a solution that maintains structural integrity for both units during and after demolition.

25. D — The sub-slab heating system is placed below the insulation layer and above the subgrade so the heat maintains the soil temperature above freezing. The insulation above the heating system prevents the heat from reaching the cooled slab, which would waste energy and increase the refrigeration load. This arrangement keeps the soil warm while keeping the slab cold.

26. C — Achieving STC forty-five from a starting point of thirty-three requires multiple improvements working together. Adding acoustical insulation in the cavity absorbs sound energy, a second gypsum layer adds mass, and resilient channel decouples the gypsum from the studs to reduce structure-borne sound transmission. Each modification addresses a different sound transmission path through the wall assembly.

27. B — A building permit authorizes the commencement of construction work and establishes the regulatory framework for inspections during construction. A certificate of occupancy is issued after all required inspections pass, confirming the building meets all applicable codes and is safe for its intended use. The two documents serve fundamentally different purposes at different stages of the construction process.

28. C — The fire alarm control panel must be in a location that is immediately accessible and visible to fire department personnel upon entering the building. A locked basement storage room does not meet this requirement because firefighters cannot quickly locate and access the panel during an emergency. The panel location is critical for emergency response coordination.

29. B — PEX tubing is generally accepted under the Oregon plumbing code for residential water supply distribution and has become widely used due to its flexibility, corrosion resistance, and ease of installation. The tubing must comply with listed standards such as ASTM F876 and F877, and must be installed per the manufacturer's instructions. Local jurisdiction requirements should be verified for any specific restrictions.

30. A — When the contractor lacks experience with a specialized scope like green roof installation, the most appropriate approach is to obtain pricing from a qualified subcontractor with relevant experience. The subcontractor's pricing provides a realistic cost basis, and the contractor adds their own overhead and profit. Clearly identifying assumptions and exclusions protects both the contractor and the owner.

31. A — Standing seam metal roofing panels expand and contract significantly with temperature changes. The clip attachment system allows this movement while maintaining a weathertight connection. Direct face-fastening with exposed screws prevents thermal movement, causing panels to buckle in heat and contract around the screws in cold, elongating the screw holes and creating leak points.

32. D — Special inspection of structural masonry verifies that the grout is properly placed and consolidated in the cells, reinforcement is correctly positioned, mortar proportions meet the specification, and the masonry units meet quality standards. These inspections ensure the wall achieves the structural capacity required by the engineer's design. Deficiencies in any of these elements can compromise the wall's structural performance.

33. B — An automatic pool cover that meets ASTM F1346 standards may be accepted as a barrier alternative under certain building codes because the standard verifies the cover can support specified loads and prevent access to the pool water. The specific acceptance depends on the building code edition adopted by the local jurisdiction. The contractor should verify acceptance with the local building department.

34. D — An Owner's and Contractor's Protective Liability policy is a separate policy purchased by the owner that provides coverage for the owner's vicarious liability arising from the contractor's operations. This policy protects the owner independently from the contractor's general liability policy. It provides the owner with their own dedicated coverage and defense for claims arising from the construction work.

35. A — Regular gypsum board does not contain the glass fiber reinforcement found in type X fire-rated board and cannot achieve the required fire-resistance rating. The contractor must remove the non-compliant material and install the specified type X board to meet the fire separation requirement. No paint, coating, or additional layers of regular board can substitute for the tested and listed fire-rated assembly.

36. A — Net self-employment income is calculated by subtracting allowable business expenses from gross revenue. Three hundred fifty thousand minus two hundred eighty thousand equals seventy thousand dollars in net self-employment income. This net amount is subject to self-employment tax covering both the employer and employee portions of Social Security and Medicare.

37. C — Certain laboratory chemicals including strong acids, solvents, and oxidizers can degrade, soften, or dissolve PVC piping, causing joint failures and chemical leaks. Copper piping was specified because it resists the specific chemicals used in this laboratory application. Unauthorized material substitutions in chemical waste drainage create environmental contamination risk and potential regulatory violations.

38. A — The contractor should revise the grading plan to direct stormwater to an approved drainage system that does not discharge onto adjacent properties. Oregon law generally prohibits property owners from redirecting surface water onto neighboring properties in a manner that causes damage. The contractor must ensure the grading complies with both the approved stormwater management plan and applicable drainage laws.

39. B — Fire dampers are critical life safety components that close automatically when fire is detected, sealing the duct penetrations through fire-rated assemblies. Without dampers, the ductwork creates unprotected pathways for fire, smoke, and toxic gases to spread between fire compartments. This defeats the purpose of the fire-rated walls and floors and endangers building occupants in adjacent compartments.

40. D — In steel beam designations, the number after the "x" represents the weight per linear foot in pounds. A W12x26 is a wide-flange beam approximately twelve inches deep that weighs

twenty-six pounds per linear foot. This weight information is essential for calculating total steel tonnage, determining foundation loads, and planning crane lifting operations during erection.

41. B — A sump pump is typically required when the building design includes a below-grade perimeter drain system that collects groundwater and directs it to a sump pit for removal. The pump activates when the water level in the pit rises to a set point and discharges the water away from the foundation. Without a pump, the collected groundwater would accumulate and flood the basement.

42. A — The CCB has authority to discipline contractors for performing work in a negligent or improper manner, failing to complete contracted work, hiring unlicensed subcontractors, and violating Oregon's construction contractor laws. Disciplinary actions can include fines, license suspension, and license revocation. These enforcement powers protect consumers from incompetent or dishonest contractors.

43. C — Flow switches detect water movement in the sprinkler piping when a sprinkler head activates, triggering the fire alarm system to notify building occupants and alert the fire department. The flow switch identifies which zone has activated, helping firefighters locate the fire quickly. This automatic detection and notification occurs without any manual intervention.

44. C — The W8x24 has a lower section modulus and moment of inertia than the W8x31, meaning it can carry less load and will deflect more under the same loading conditions. The structural engineer specified the W8x31 based on calculated loads and deflection limits for the sixteen-foot span. Substituting a lighter beam without engineering approval creates a structural deficiency that may cause excessive deflection or failure.

45. B — A schedule of values breaks down the total contract price into individual work items or trade categories, each with an assigned dollar value. This breakdown serves as the basis for calculating monthly progress payments by determining the percentage of each line item completed during the billing period. It provides transparency and a standardized method for measuring and billing project progress.

46. C — Organic topsoil contains decomposable materials that compress and break down over time, causing the bearing surface beneath the pier blocks to settle unevenly. This differential settlement causes deck movement, structural distress at post-to-beam connections, and potential failure. Pier blocks must bear on compacted mineral soil or gravel with the organic topsoil layer removed.

47. D — A personal guarantee makes the contractor individually liable for the lease obligations beyond the business entity's assets. If the business defaults on the lease, the landlord can pursue the contractor's personal assets including bank accounts, real estate, and other property to satisfy the unpaid lease obligations. This significantly increases the contractor's personal financial risk.

48. A — The NEC generally permits the dishwasher and garbage disposal to share a single twenty-ampere, one-hundred-twenty-volt branch circuit in residential applications. This shared circuit arrangement is commonly used in residential kitchen wiring and is specifically addressed in the code. Both appliances must be properly protected by the shared twenty-ampere circuit breaker.

49. A — Discharging truck wash-down water directly into the storm drain without the specified treatment system violates both the project specifications and environmental regulations governing pollutant discharge. Wash water from loading dock operations contains oil, grease, sediment, and other contaminants that must be treated before discharge. Direct connection to the storm drain creates an illicit discharge that can result in significant fines.

50. C — Oregon law requires contractors to notify the CCB within the specified timeframe of changes to the business address, ownership structure, responsible managing individual, and bond and insurance status. These changes affect the contractor's license record and the public's ability to verify the contractor's current credentials. Failure to notify the CCB of required changes can result in disciplinary action.

51. D — Membrane installed below the manufacturer's minimum temperature may not achieve proper adhesion at the seams and sheet-to-substrate bonds because the adhesive or welding process requires adequate temperature for molecular bonding. The subcontractor must inspect all areas installed in cold conditions for adhesion deficiencies and repair or replace any sections with inadequate bonds.

52. C — NFPA 13D is the specific standard governing the design and installation of sprinkler systems in one- and two-family dwellings and manufactured homes. This standard recognizes the unique characteristics of residential occupancies and provides design criteria tailored to residential fire protection. NFPA 13 applies to commercial and industrial installations, while NFPA 13R applies to residential occupancies up to four stories.

53. A — The overhead rate is calculated by dividing annual overhead expenses by annual direct project costs. One hundred eighty thousand divided by one million two hundred thousand equals fifteen percent. This rate is applied to each project's direct costs to allocate the company's overhead proportionally. Accurate overhead calculation is essential for profitable bidding and project cost management.

54. B — Post-tensioning cables store significant energy under tension, and a damaged cable can release this energy violently, posing a serious safety hazard. Additionally, the loss of a tendon reduces the slab's structural capacity and can initiate progressive failure if the slab cannot redistribute the loads. The contractor must stop all work immediately and notify the structural engineer for evaluation and repair direction.

55. C — Horizontal reinforcement in CMU walls provides tensile capacity that the unreinforced masonry alone cannot deliver. Without this reinforcement, the wall is vulnerable to cracking and failure from lateral soil pressure, seismic forces, wind loads, and differential settlement. The reinforcement ties the wall together as a structural system and is a code requirement for structural masonry construction.

56. A — The ADA generally requires a minimum clear opening width of thirty-two inches for accessible doorways, measured between the face of the door and the opposite stop with the door open ninety degrees. The existing thirty-inch opening falls two inches short of this requirement. The contractor must widen the door opening or install an offset hinge to achieve the required clear width.

57. B — Oregon's requirements for professionally prepared plans vary by project scope, complexity, and local jurisdiction. Simple residential projects may be built from owner-

provided plans, while more complex projects involving structural modifications, multi-story construction, or commercial elements may require plans prepared and stamped by a licensed professional. The contractor should verify with the local building department.

58. C — Standard silicone caulk is not a tested and listed firestopping material and will melt, burn, or shrink away during fire exposure. This allows fire, smoke, and toxic gases to pass through the penetration, defeating the fire-rated assembly. Only tested and listed firestopping systems that have been evaluated for the specific penetration type and fire-rating duration may be used.

59. C — A thirty-foot flagpole acts as a vertical cantilever that generates significant lateral forces at the base from wind loading. These forces must be transferred through the mounting bracket into the building's parapet and roof structure. Without a proper foundation detail designed to resist the calculated wind loads, the flagpole could fail during high winds, damaging the building and creating a falling hazard.

60. B — The vapor barrier must face the warm side of the assembly to prevent moisture-laden warm air from reaching the cold surfaces where condensation would form. When reversed, the barrier traps moisture within the assembly by allowing warm moist air to reach the cold side but preventing it from drying back toward the interior. This trapped moisture causes mold growth, wood rot, and insulation degradation.

61. B — When new partition walls change the room layout, existing sprinkler heads may be obstructed or the coverage pattern may no longer adequately protect the new room configurations. The contractor must verify that sprinkler coverage remains adequate for the new layout and modify the system as needed. Obstructed or inadequately spaced sprinkler heads cannot effectively control a fire.

62. D — Helical piles are screwed into the ground until the helical plates reach competent bearing strata below the weak surface soils, transferring building loads to the deeper soil layer. The installation produces minimal vibration and noise compared to driven piles, making helical piles suitable for sites near existing structures. The installation torque correlates directly to the pile's load capacity.

63. C — Condensing water heaters produce acidic flue gas condensate that rapidly corrodes galvanized steel from the interior. Category three stainless steel vent pipe is specified because it resists the acidic condensate and maintains its integrity over the life of the equipment. A corroded vent pipe can develop holes that leak combustion gases including carbon monoxide into the living space.

64. D — Air balancing involves measuring the actual airflow at each supply and return register using calibrated instruments and adjusting dampers to ensure the delivered air volumes match the mechanical engineer's design specifications. Proper balancing ensures each room receives the correct amount of conditioned air for occupant comfort and energy efficiency. Unbalanced systems cause hot and cold spots throughout the building.

65. B — Knob-and-tube wiring was designed to dissipate heat through free air circulation around the conductors. Covering this wiring with blown-in insulation traps heat around the conductors, potentially causing the insulation on the wires to deteriorate and creating a fire

hazard. The knob-and-tube wiring must be de-energized and replaced before insulation can be installed in contact with it.

66. D — Secondary roof drainage prevents catastrophic ponding and potential roof collapse by providing an emergency drainage path when primary drains become blocked by debris or overwhelmed during extreme rainfall events. Without secondary drainage, water accumulates on the roof, and the increasing weight can exceed the roof structure's load capacity. Building codes require this redundancy for life safety.

67. D — A third-party home warranty is an independent insurance product that provides coverage for specified building systems and components, often extending beyond the contractor's workmanship warranty period. The third-party warranty remains valid even if the original contractor goes out of business. It provides the homeowner with ongoing protection backed by an insurance company rather than an individual contractor.

68. C — Oregon CCB regulations require the contractor's license number to be included in all forms of advertising, including social media posts, website content, print advertisements, and vehicle signage. This requirement ensures consumers can verify the contractor's license status before hiring them. Failing to include the CCB number in advertising is a violation that can result in CCB enforcement action.

69. B — The electrical code typically requires emergency power systems serving life safety loads such as egress lighting, fire alarm systems, and smoke control to restore power within ten seconds of a normal power failure. This rapid transfer time ensures that critical life safety systems remain operational during the brief transition from utility power to generator power, protecting building occupants during evacuation.

70. B — Both the humidifier overflow and the air conditioning condensate are non-contaminated condensate waste that can generally share a common drain line. The combined drain must be properly sized to handle the flow from both sources and must be connected to an appropriate waste receptor or drain per the applicable plumbing code. This is a common and acceptable installation practice in residential HVAC systems.

71. D — A comprehensive daily construction log should document weather conditions, workforce counts by trade, work activities performed, equipment on site, material deliveries, visitors and inspections, safety incidents, test results, and any issues or delays encountered. This documentation creates a contemporaneous record that is invaluable for tracking progress, resolving disputes, and supporting claims.

72. B — Proper window installation requires the weather-resistive barrier to be in place first so the window flashing can be integrated in the correct shingled sequence. The flashing layers must overlap the barrier below the window and tuck under the barrier above the window, creating a continuous drainage plane. Installing the window before the barrier makes proper flashing integration impossible.

73. C — Seismic joint covers span the separation between independently moving building sections while allowing the structural movement required during a seismic event. They also maintain fire separation, weatherproofing, and a finished appearance across the joint. The covers must accommodate the calculated maximum joint movement without binding or separating.

74. D — While the uninsulated ducts are outside the renovation scope, the contractor has a professional responsibility to inform the homeowner about energy waste from uninsulated ducts in unconditioned spaces. Heat loss from bare ducts in a cold crawl space significantly increases energy costs. Recommending insulation through a change order demonstrates professional care without overstepping the contracted scope.

75. B — Monthly cash flow projections enable the owner to plan financing draws from the construction loan, manage disbursement schedules with the lender, and ensure adequate funds are available to meet upcoming progress payment obligations. Without accurate projections, the owner may face cash shortfalls that delay payments to the contractor and disrupt the project schedule.

76. C — Changing from a fully adhered to a mechanically fastened system fundamentally alters the roof's wind uplift resistance characteristics because the two attachment methods distribute wind forces differently. Mechanical fasteners create concentrated stress points and penetrations that a fully adhered system avoids. The change may also void the manufacturer's warranty for the specified fully adhered system.

77. D — Under standard AIA contract terms, the architect serves as the initial interpreter of the contract requirements and reviews disputed work against the specifications. The architect's determination can be appealed through the contract's dispute resolution procedures, which may include mediation and arbitration. This structured process provides an orderly mechanism for resolving quality disputes.

78. A — A Simpson Strong-Wall is an engineered prefabricated shear panel designed to provide high lateral force resistance in a very narrow width, often needed beside garage doors or at narrow wall segments. A standard plywood shear wall in the same narrow width cannot achieve the same shear capacity. The substitution may leave the building with inadequate lateral force resistance at that critical location.

79. D — When the fire pump fails to achieve the required flow rate and pressure, the contractor must investigate the root cause, which could include undersized piping, incorrect pump selection, inadequate water supply, or installation deficiencies. The system must be corrected and retested until it meets the required performance criteria. A fire pump that cannot deliver adequate flow and pressure cannot protect the building during a fire.

80. C — A milestone payment schedule protects both parties by tying payments to verified completion of defined construction phases. The contractor receives payment for completed work without waiting until the end of the project, maintaining positive cash flow. The homeowner pays only for work that has been performed and can be inspected, preventing overpayment for incomplete work.

