# PRACTICE EXAM 20: OREGON CCB SIMULATION (80 QUESTIONS)

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

1. A contractor operating in Oregon receives a written complaint from a homeowner claiming that the new concrete driveway has developed map cracking across the entire surface within ninety days of placement. The contractor inspects the driveway and confirms the cracking is consistent with rapid moisture loss during curing. Under the implied warranty of workmanlike construction, what is the contractor's responsibility?

A. No responsibility because surface cracking is a normal characteristic of all concrete driveways and is not a construction defect
B. The contractor must offer the homeowner a fifty percent discount on a new driveway pour as a compromise settlement
C. The contractor is responsible for the defective curing practices that caused the map cracking and must provide an appropriate repair or replacement at no cost to the homeowner
D. The contractor's responsibility is limited to applying a surface sealer to prevent further deterioration of the existing cracking

2. A contractor is preparing to bid on a public school construction project in Oregon. The bid documents require a first-tier subcontractor disclosure listing. The contractor plans to self-perform the concrete work and subcontract the electrical, plumbing, and HVAC scopes. Under Oregon public contracting law, when must the subcontractor disclosure be submitted?

A. At the mandatory pre-bid conference held at least seven days before the bid opening date for the school project
B. Thirty calendar days after the notice to proceed is issued to allow the contractor time to finalize subcontract agreements
C. Within two hours after the bid closing time, or as otherwise specified in the solicitation documents, listing each first-tier subcontractor's name, CCB license number, and scope of work
D. Seven days before the bid opening date so the contracting agency can verify all listed subcontractors before evaluating bids

3. A general contractor on a commercial project receives a claim from the painting subcontractor for additional costs due to excessive surface preparation caused by drywall defects left by the drywall subcontractor. The painting subcontractor's scope includes standard

surface preparation but not repair of defective drywall. Under standard subcontract terms, who bears responsibility for the additional costs?

A. The painting subcontractor bears the cost because surface preparation is included in the painting subcontractor's scope of work
B. The general contractor bears responsibility for coordinating the work between trades and ensuring the drywall subcontractor provides an acceptable substrate before the painting subcontractor begins work
C. The building owner bears the additional cost because all unforeseen conditions are the owner's risk under standard contract terms
D. The architect bears the cost because the specifications did not adequately define the acceptable drywall finish level required

4. Under Oregon law, a contractor renovating a residential bathroom discovers extensive termite damage in the floor joists beneath the bathroom. The damage was not visible before demolition began and was not included in the contract scope. What is the contractor's appropriate course of action?

A. Repair the termite damage at the contractor's expense because the contractor should have anticipated the possibility of hidden damage
B. Continue the renovation without addressing the termite damage because structural repairs are outside the bathroom remodel scope
C. Stop work in the affected area, document the damage, notify the homeowner, and present a written change order for the structural repair before proceeding
D. Contact the CCB to request authorization to expand the scope beyond the original contract without the homeowner's approval

5. A contractor is managing a commercial project and the structural engineer requires load testing of a repaired concrete beam to verify its structural capacity after a reinforcement repair. Who typically bears the cost of the load testing?

A. The structural engineer bears the cost because testing is part of the engineer's design verification responsibilities for the project
B. The building inspector bears the cost because load testing is a standard part of the building department's inspection process
C. The project owner bears the cost only if the repair was caused by a design error in the original structural engineering documents
D. The party responsible for the condition that required the repair typically bears the cost of the load testing needed to verify the repair's adequacy

6. A contractor is building a residential home and the plans specify a tankless water heater with a dedicated condensate drain. The installer routes the condensate drain to discharge directly onto the grade adjacent to the foundation without connecting it to the building's drainage system. What is the problem with this installation?

A. Condensate drains from tankless water heaters are always connected to the sanitary sewer and never discharged to the exterior
B. Acidic condensate discharged directly against the foundation can deteriorate the concrete over time, and the discharge must be routed to an approved location per the plumbing code
C. The condensate volume from a tankless water heater is negligible and the drain line is unnecessary for residential installations
D. The discharge is acceptable as long as the contractor installs a splash block to redirect the condensate away from the foundation

7. A contractor is hired to perform a commercial roof replacement on a building with a steel deck. The existing roof system is a ballasted single-ply membrane. The contractor's crew begins removing the ballast stone and discovers that the steel deck has corroded through in several locations beneath the membrane. The contract scope includes only the roofing system replacement and not structural steel repair. What should the contractor do?

A. Install the new roof membrane over the corroded deck areas and note the condition in the project documentation for the owner
B. Patch the corroded deck areas with sheet metal screwed to the surrounding deck and proceed with the new membrane installation
C. Stop work in the affected areas, document the deck corrosion, notify the owner and the structural engineer, and request direction before proceeding because the corroded deck may not support the new roof system
D. Remove the corroded deck sections and replace them with new steel deck at the contractor's expense as part of the roofing scope

8. Under Oregon employment law, an employer terminates a construction worker and the worker requests their personnel file. Is the employer required to provide access to the personnel file?

A. No, Oregon law does not require employers to provide access to personnel files under any circumstances after termination
B. Yes, but only if the employee submits a written request within seven calendar days of the termination date to the employer
C. No, unless the employee files a formal request through the Oregon Bureau of Labor and Industries with a processing fee payment
D. Yes, Oregon law generally requires employers to provide a former employee with reasonable access to their personnel records upon request within a specified timeframe

9. A contractor is building a residential addition and the local jurisdiction requires the contractor to demonstrate compliance with the Oregon energy code through one of the approved compliance pathways. Which of the following is a recognized compliance pathway under the Oregon energy code?

A. The prescriptive pathway, which requires each building component to meet specific predetermined R-values, U-factors, and equipment efficiency standards as specified in the code
B. A verbal confirmation from the HVAC installer that the equipment meets minimum efficiency standards for residential applications
C. A signed statement from the homeowner accepting responsibility for energy performance of the addition after construction
D. A cost comparison showing that the addition's energy costs will be lower than the average utility bill in the same zip code

10. A contractor is performing a commercial renovation and the building's existing fire alarm system must remain operational during construction. The contractor's work requires temporarily disabling smoke detectors in the renovation area to prevent false alarms from construction dust. Under the fire code, what must the contractor do while the detectors are disabled?

A. Post a sign on the building entrance stating that the fire alarm system is partially offline during construction activities
B. Notify only the building maintenance staff that the detectors are offline so they can respond to any fire emergencies manually
C. No action is required because construction sites are exempt from fire alarm requirements during active renovation work activities
D. Notify the fire department and the building owner, implement a fire watch in the affected area, and restore the detectors to service as soon as possible

11. A contractor is estimating the cost of installing a chain-link fence around a commercial construction site for security and safety. The site perimeter is eight hundred linear feet. The fence contractor quotes twelve dollars and fifty cents per linear foot installed. The contractor also needs two vehicle gates at one thousand two hundred dollars each and one pedestrian gate at four hundred fifty dollars. What is the total estimated cost for the temporary fencing?

A. Twelve thousand eight hundred fifty dollars based on the linear footage cost plus the three gate installations for the perimeter
B. Ten thousand dollars based on the linear footage cost only without the additional cost of the vehicle and pedestrian gates
C. Fourteen thousand five hundred dollars based on the linear footage cost plus a twenty percent contingency for unforeseen conditions
D. Eleven thousand two hundred fifty dollars based on the linear footage at a reduced rate with one vehicle gate and no pedestrian gate

12. A contractor is managing a residential project and the homeowner asks the contractor to explain what happens if the contractor goes out of business before the warranty period expires. Under Oregon law, what protection does the homeowner have?

A. The homeowner has no protection because all warranty obligations terminate when the contractor's business ceases operations
B. The homeowner's only recourse is to contact the original material suppliers for individual product warranties on each component
C. The CCB assigns the warranty obligations to another licensed contractor in the same service area at no cost to the homeowner
D. The homeowner may file a claim against the contractor's surety bond on file with the CCB within the applicable filing period, even after the contractor has ceased business operations

13. A contractor is installing a commercial elevator and the elevator code requires an emergency communication device inside the elevator cab. What is the purpose of this requirement?

A. To allow building maintenance staff to communicate with the elevator service company during routine maintenance procedures
B. To provide passengers trapped in a stalled elevator with a means of communicating with emergency personnel or building staff for rescue assistance
C. To enable the fire department to override the elevator controls and direct the cab to a specific floor during firefighting operations
D. To monitor elevator usage patterns and transmit ridership data to the building management system for maintenance scheduling

14. A contractor is building a residential home and the plans call for an attached greenhouse with a glass roof. The building code requires the glass roof panels to be safety glazing material. What is the primary reason for this requirement?

A. Safety glazing reduces the risk of serious injury from falling glass if the overhead panels break, because safety glass either crumbles into small fragments or is held together by an interlayer
B. Safety glazing provides superior thermal insulation compared to standard glass, reducing the greenhouse's heating and cooling costs
C. Safety glazing blocks harmful ultraviolet radiation that could damage the plants growing inside the residential greenhouse space
D. Safety glazing is required only for aesthetic reasons to provide a clearer view of the sky compared to standard glass panels

15. Under Oregon law, a contractor enters into a residential construction contract with a provision that limits the homeowner's right to file a CCB complaint to thirty days after project completion. Is this contract provision enforceable?

A. No, contract provisions that attempt to limit or waive a homeowner's statutory right to file a CCB complaint are generally unenforceable under Oregon law
B. Yes, because both parties voluntarily agreed to the limitation period when they signed the residential construction contract

C. Yes, but only if the contractor provided the homeowner with a separate written disclosure explaining the shortened filing period
D. No, but the provision becomes enforceable if the contractor extends the limitation period to ninety days after project completion

16. A contractor is managing a commercial project and discovers that the specified exterior stone cladding has a sixteen-week lead time. The current project schedule does not account for this lead time. The stone installation is on the critical path with installation scheduled to begin in eight weeks. What is the most effective project management action?

A. Substitute a different stone product with a shorter lead time without consulting the architect or the owner about the change
B. Delay the entire project by eight weeks to accommodate the stone's sixteen-week lead time without exploring other options
C. Order the stone immediately, evaluate schedule alternatives such as resequencing other critical path activities, and notify the owner and architect of the lead time impact with proposed mitigation strategies
D. Remove the stone cladding from the project scope entirely and substitute a painted stucco finish to eliminate the lead time issue

17. A contractor's employee is operating a skid steer loader on a commercial site and accidentally ruptures an underground water main that was not marked by the utility locating service. Water floods the excavation and the adjacent parking lot. Who is primarily liable for the damage caused by the rupture?

A. The contractor bears full liability because the contractor should have hand-dug to locate all underground utilities before using equipment
B. The utility locating service may bear primary liability for failing to accurately mark the water main, assuming the contractor followed proper procedures including requesting utility locates and exercising reasonable care
C. The property owner bears full liability because the owner should have provided the contractor with a complete utility map before work began
D. The equipment manufacturer bears liability because the skid steer loader should have been equipped with underground utility detection sensors

18. A contractor is building a residential home and the energy code requires the installation of a programmable thermostat for the HVAC system. The homeowner asks the contractor to install a basic non-programmable thermostat instead to save money. Under the building code, can the contractor comply with the homeowner's request?

A. No, the contractor must install the programmable thermostat required by the energy code because the code establishes minimum requirements that cannot be reduced by homeowner preference

B. Yes, because the homeowner has the right to select any thermostat that is compatible with the HVAC system installed in the home
C. Yes, if the contractor documents the homeowner's request and includes a disclaimer in the contract releasing the contractor from liability
D. No, but the contractor may install a non-programmable thermostat if the HVAC system's overall efficiency exceeds the code minimum

19. A contractor is performing a pre-construction site evaluation for a commercial building project. The contractor observes that the adjacent building's foundation wall is within two feet of the property line where excavation for the new building's basement will occur. The new excavation will extend eight feet below the adjacent foundation. What precaution must the contractor take?

A. Notify the adjacent property owner, engage a structural engineer to design a protection system for the adjacent foundation, obtain necessary permits, and implement the engineered shoring plan before excavating below the adjacent foundation level
B. Proceed with excavation because the new building's property rights extend to unlimited depth below the property line boundary
C. Install sheet piling on the property line without engineering design because sheet piling automatically protects adjacent foundations
D. Excavate rapidly past the adjacent foundation level so that the exposure time is minimized and the adjacent building is at risk briefly

20. A contractor is reviewing a commercial project's specifications and finds a requirement for the contractor to provide a mock-up of the exterior curtain wall system. What is the primary purpose of constructing a mock-up before full-scale installation begins?

A. To train the building inspector on the curtain wall components so they know what to look for during the installation inspections
B. To verify the design intent, material quality, color, workmanship standards, and installation methods before the full-scale production begins, providing a reference standard for the remainder of the work
C. To calculate the exact quantity of materials needed for the full installation by measuring waste from the mock-up construction
D. To test the structural capacity of the curtain wall framing under simulated wind loads before the panels are manufactured

21. A contractor is building a residential home and installs the bathroom exhaust fan ductwork using flexible vinyl duct. The building inspector rejects the installation. Why is flexible vinyl duct not acceptable for bathroom exhaust fan applications in most jurisdictions?

A. Flexible vinyl duct is rejected because it exceeds the maximum duct diameter allowed for residential bathroom exhaust applications

B. Flexible vinyl duct sags between supports, traps condensation, restricts airflow, and may not meet fire safety requirements, making rigid or semi-rigid metal duct the preferred material for bathroom exhaust
C. Flexible vinyl duct is acceptable for bathroom exhaust fans but must be wrapped with fiberglass insulation before installation
D. Flexible vinyl duct is rejected only because it is not available in the four-inch diameter required for bathroom exhaust connections

22. A contractor is managing a commercial project and the owner requests the contractor to provide a cost-loaded schedule. What does a cost-loaded schedule provide that a standard construction schedule does not?

A. A detailed list of all subcontractor bids organized by trade division and sorted from highest to lowest contract value
B. A comparison of the contractor's estimated costs against the actual costs incurred to date for each completed activity
C. A forecast of the owner's tax liability based on the construction expenditures made during each quarter of the project
D. A schedule with budget values assigned to each activity, enabling the contractor and owner to track planned expenditure rates over time and use the schedule as the basis for monthly progress payment applications

23. A contractor is installing a commercial building's plumbing system and the specifications require isolation valves on all branch lines serving individual tenant spaces. What is the primary purpose of installing isolation valves on tenant branch lines?

A. To allow the building's water meter to measure individual tenant water usage for separate billing by the property manager
B. To increase the water pressure at each tenant's fixtures by reducing the total system volume served by the main supply line
C. To allow maintenance or repair work on one tenant's plumbing without shutting off the water supply to the entire building or other tenant spaces
D. To comply with the fire code requirement for individual shut-off valves on all plumbing lines within commercial tenant spaces

24. Under Oregon law, a contractor completes a residential construction project and the homeowner identifies defects during the final walkthrough. The contractor and homeowner create a punch list of items to be corrected. The contractor begins the corrections but then stops responding to the homeowner's calls and does not complete the remaining punch list items. What recourse does the homeowner have?

A. The homeowner must hire an attorney and file a lawsuit in circuit court as the only remedy for incomplete punch list work

B. The homeowner must wait until the one-year warranty expires before taking any action against the contractor for incomplete work
C. The homeowner may only pursue a claim against the material suppliers for the defective items remaining on the incomplete list
D. The homeowner may file a complaint with the CCB for failure to complete the contracted work, pursue a claim against the contractor's surety bond, and potentially file a civil lawsuit for breach of contract

25. A contractor is performing a commercial building renovation and the existing building has a single-pane window system. The renovation scope includes replacing the windows with double-pane insulated glazing units. During removal of the existing windows, the contractor discovers that the window frames contain lead-based paint. The building was constructed in nineteen sixty-five. What must the contractor do?

A. Follow EPA lead-safe renovation practices because the building was constructed before nineteen seventy-eight, contain the work area to prevent dust migration, and ensure workers are trained in lead-safe procedures
B. Proceed with window removal using standard construction practices because lead paint regulations apply only to residential buildings
C. Remove the window frames and dispose of them in standard construction dumpsters because the frames are being discarded entirely
D. Seal the lead paint with an encapsulant coating and install the new windows over the existing frames to avoid disturbing the paint

26. A contractor is building a commercial cold storage facility and the specifications require a heated floor slab beneath the cold storage area. What is the purpose of heating the floor slab in a cold storage facility?

A. To maintain a comfortable temperature for workers walking on the floor during loading and unloading operations in the facility
B. To accelerate the curing of the concrete floor slab so the cold storage equipment can be installed sooner after the concrete pour
C. To prevent the ground beneath the slab from freezing, which would cause frost heave that lifts and cracks the floor slab and damages the building structure
D. To reduce the refrigeration system's energy consumption by pre-cooling the air above the heated slab before it enters the cold box

27. A contractor is managing a residential project and the homeowner asks whether the contractor needs to obtain a separate demolition permit for the removal of an existing detached garage before building the new addition. Under Oregon building codes, when is a separate demolition permit typically required?

A. A demolition permit is generally required before demolishing or removing a structure, and the contractor should check with the local building department for specific requirements including asbestos survey obligations
B. Demolition permits are never required for detached residential structures under one thousand square feet in total floor area
C. A demolition permit is required only if the structure being demolished is more than fifty years old and may have historical significance
D. Demolition permits are issued only by the CCB and are included automatically with the contractor's active license renewal

28. A contractor is installing a commercial rooftop HVAC system and the equipment manufacturer specifies a minimum clearance of thirty-six inches around all sides of the unit for service access. The contractor installs the unit with only eighteen inches of clearance on two sides due to the rooftop layout. What is the consequence of this reduced clearance?

A. The reduced clearance has no practical impact because HVAC technicians can perform all service work from the two accessible sides
B. The installation passes inspection if the contractor provides a roof access ladder within ten feet of the equipment location
C. The installation fails inspection because the minimum service clearance specified by the manufacturer and required by the mechanical code is not met, and future maintenance and repair will be significantly more difficult
D. The reduced clearance affects only the equipment warranty and does not impact the mechanical inspection approval process

29. A contractor is hired to construct a retaining wall on a steep hillside lot. The retaining wall will be seven feet high. Under Oregon building codes, what permit and engineering requirements apply to this retaining wall?

A. No permit is required for retaining walls under ten feet in height when constructed on residential properties in the state
B. A building permit is required but engineering calculations are waived for retaining walls under eight feet in total height
C. Only a grading permit is required and the retaining wall design may be based on the contractor's experience without engineering
D. A building permit is required and the retaining wall must be designed by a licensed professional engineer because it exceeds the height threshold for engineered design

30. A contractor is reviewing a commercial project's safety plan and finds that the plan does not include a rescue plan for workers who may become suspended in a personal fall arrest system after a fall. Under OSHA regulations, why is a rescue plan essential for fall arrest systems?

A. OSHA requires rescue plans only for confined space entry operations and does not require them for fall arrest system suspension
B. A worker suspended in a fall arrest harness can develop suspension trauma within minutes, which can cause serious injury or death if the worker is not rescued promptly
C. Rescue plans are only recommended as best practice guidance and are not a mandatory OSHA requirement for construction sites
D. Rescue plans are required only when workers are at heights exceeding fifty feet above the ground or lower working level

31. A contractor is building a residential home and the plans require a whole-house audio system with speakers installed in the ceiling of multiple rooms. The low-voltage wiring for the audio system does not require an electrical permit in most jurisdictions. However, the contractor discovers that the audio system requires a dedicated twenty-ampere circuit for the amplifier equipment. Does this dedicated circuit require an electrical permit?

A. Yes, the installation of a new dedicated electrical circuit requires an electrical permit and must be performed by a licensed electrician or the appropriately licensed contractor
B. No, because the dedicated circuit is classified as part of the low-voltage audio system and is covered by the same exemption
C. Yes, but only if the circuit is two hundred forty volts, with one hundred twenty-volt circuits exempt from permit requirements
D. No, because dedicated circuits for audio equipment are classified as communication circuits and do not require electrical permits

32. Under Oregon law, a contractor performs residential work and provides the homeowner with a one-year written warranty on workmanship. Fourteen months after completion, the homeowner discovers a plumbing leak behind a wall caused by a defective solder joint made by the contractor's crew. Can the homeowner still pursue a claim?

A. Yes, because Oregon's implied warranty of workmanlike construction exists independently of the contractor's written warranty and may provide coverage beyond the one-year express warranty period
B. No, because the one-year written warranty has expired and the contractor has no further obligation for defects discovered after that date
C. Yes, but only if the homeowner purchased an extended warranty at the time the original construction contract was signed
D. No, because latent defects are excluded from both express and implied warranties under Oregon residential construction law

33. A contractor is managing a commercial project and the HVAC subcontractor requests approval to install ductwork in a location that differs from the mechanical drawings. The new location routes the ductwork through a structural beam pocket, requiring a penetration through the steel beam's web. What should the contractor do before approving this routing change?

A. Approve the routing change because the HVAC subcontractor has the expertise to determine where ductwork can be safely routed
B. Require the HVAC subcontractor to obtain written approval from the structural engineer before any penetration is made in the structural steel beam
C. Approve the change if the duct diameter is smaller than the beam depth and the penetration is centered in the beam's web section
D. Deny the routing change and direct the HVAC subcontractor to reroute the ductwork around the beam without any structural penetration

34. A contractor is reviewing a change order proposal from a subcontractor. The change order includes direct costs of eighteen thousand dollars for additional work plus a markup of fifteen percent for overhead and profit. The contractor's own contract with the owner allows a ten percent markup on subcontractor change order work. What is the total cost to the owner for this change order?

A. Eighteen thousand dollars because the contractor cannot mark up the subcontractor's direct costs under standard contract terms
B. Twenty thousand seven hundred dollars based on the subcontractor's price with the contractor's ten percent markup applied to direct costs
C. Twenty-three thousand eight hundred five dollars based on compounding the subcontractor's and contractor's markups sequentially
D. Twenty-two thousand seven hundred seventy dollars based on the subcontractor's total price of twenty thousand seven hundred dollars plus the contractor's ten percent markup

35. A contractor is installing a residential deck and the building code requires the deck guardrail to withstand a minimum concentrated load of two hundred pounds applied in any direction at the top of the rail. The contractor installs a guardrail using decorative balusters without structural top rail connections. The guardrail fails a load test during inspection. What must the contractor do?

A. Request a variance from the building department to accept the existing guardrail design because the balusters provide adequate visual barrier
B. Add a horizontal wire cable between the top rail and the balusters to increase the lateral load resistance of the guardrail system
C. Install a second row of balusters directly behind the existing ones to double the guardrail's load resistance without changing design
D. Redesign and reconstruct the guardrail with proper structural connections at the top rail and posts to meet the required load capacity

36. A contractor operating in Oregon is hired to perform a tenant improvement project in an existing commercial building. The scope includes new interior walls, ceiling, flooring, and lighting. The contractor begins demolition and discovers that the existing ceiling tiles contain asbestos. What is the contractor's immediate obligation?

A. Remove the ceiling tiles using wet methods and standard personal protective equipment because the tiles are non-friable asbestos material
B. Continue demolition of the non-asbestos components and work around the ceiling tiles until the owner decides on an abatement plan
C. Stop work immediately in the affected area, notify the building owner of the asbestos discovery, and do not disturb the asbestos-containing materials until a licensed asbestos abatement contractor is engaged
D. Encapsulate the asbestos ceiling tiles with a spray-applied sealant and install the new ceiling system directly below the existing tiles

37. A contractor is managing a commercial project and the concrete subcontractor submits a request for payment covering concrete placed in the foundation walls. The project manager inspects the work and discovers that the concrete walls have significant honeycomb voids on multiple surfaces. Under standard contract terms, should the project manager approve payment for this work?

A. Approve full payment because honeycombing is a cosmetic defect that does not affect the structural capacity of the foundation walls
B. Approve payment but deduct ten percent as a quality allowance for the cosmetic defects in the concrete wall surfaces
C. Approve payment because the concrete subcontractor is responsible for repairing the honeycombing at their own expense separately
D. Withhold payment for the defective work until the honeycomb voids are evaluated by the structural engineer and properly repaired, because honeycombing indicates potential structural deficiencies in the concrete

38. Under Oregon law, a homeowner hires a contractor to build a new deck. The contract states that the contractor will obtain all required permits. The contractor builds the deck without obtaining the building permit. The deck later fails a retroactive inspection because the footings do not meet the code requirements. Who bears the cost of bringing the deck into compliance?

A. The contractor bears the cost because the contractor was contractually obligated to obtain the permit and build the deck to code, and both failures are the contractor's responsibility
B. The homeowner bears the cost because the homeowner should have verified that the contractor obtained the required permit before allowing work to begin
C. The cost is shared equally between the contractor and the homeowner because both parties failed to verify the permit was obtained
D. The building department bears the cost because the department should have discovered the unpermitted construction sooner during routine inspections

39. A contractor is building a commercial structure and the specifications require expansion joints in the building's brick veneer facade at intervals not exceeding thirty feet. The contractor installs the veneer without expansion joints. After one year, vertical cracks appear in the brick veneer at multiple locations. What caused the cracking?

A. The cracking was caused by settlement of the building's foundation beneath the brick veneer wall sections along the facade
B. The mortar joints between the bricks were mixed with excessive water which weakened the bond strength and caused cracking
C. The brick veneer expanded due to thermal and moisture movement and without expansion joints to accommodate the movement, the veneer cracked at its weakest points
D. The cracking was caused by wind pressure acting on the unsupported brick veneer between the structural columns of the building

40. A contractor is reviewing OSHA's confined space entry requirements for a commercial project. The project involves work inside a large underground utility vault that contains electrical equipment. The vault has a single access point, limited ventilation, and the potential for hazardous atmospheric conditions. Under OSHA regulations, what classification does this space receive?

A. A permit-required confined space because it has limited entry and exit, is not designed for continuous occupancy, and contains potential hazards including atmospheric dangers
B. A non-permit confined space because the electrical equipment provides sufficient lighting for workers to see potential hazards
C. A standard work area because underground utility vaults are exempt from confined space regulations when electrical equipment is present
D. A restricted access area that requires only a supervisor's verbal authorization before workers may enter the space for work

41. A contractor is building a residential addition and the existing home has an older two-hundred-ampere electrical service. The addition requires an additional one hundred amperes of electrical capacity for the new kitchen, bathroom, and living area circuits. The total calculated load for the existing home plus the addition exceeds the capacity of the existing two-hundred-ampere service. What must the contractor do?

A. Add a second one-hundred-ampere panel fed from the existing two-hundred-ampere service without upgrading the main service
B. Install the additional circuits on the existing panel and rely on the main breaker to trip if the total load exceeds panel capacity
C. Reduce the number of circuits in the addition to fit within the existing service capacity without upgrading the electrical service
D. Upgrade the electrical service to a higher amperage rating that accommodates the combined load of the existing home and the new addition

42. A contractor's project requires the installation of a commercial kitchen grease exhaust system. The mechanical code requires the exhaust duct to be constructed of minimum sixteen-gauge carbon steel welded at all joints with liquid-tight connections. The contractor installs the

duct using standard snap-lock sheet metal joints instead of welded connections. Why does this installation fail inspection?

A. Snap-lock joints are not liquid-tight and cannot contain the grease-laden vapors at elevated temperatures, creating a fire hazard from grease accumulation at the unsealed joints
B. Snap-lock joints are acceptable for grease exhaust ducts when used with a fire-rated sealant applied at every joint connection
C. The inspection failure is due to the duct gauge being too heavy and snap-lock joints would pass with lighter-gauge duct material
D. Snap-lock joints are only rejected on horizontal duct runs and are acceptable on all vertical sections of grease exhaust ductwork

43. A contractor is managing a residential project and the homeowner asks whether the contractor carries completed operations coverage on their general liability insurance policy. What does completed operations coverage protect against?

A. Claims for defective materials discovered during the construction phase before the contractor completes the project work
B. Claims for bodily injury or property damage arising from the contractor's finished work after the contractor has left the project site and the work has been completed
C. Claims for injuries to the contractor's employees that occur after the project is completed during the warranty period
D. Claims for damage to the contractor's own tools and equipment that were left on the project site after demobilization

44. Under Oregon construction lien law, a homeowner makes the final payment to the general contractor. The general contractor does not pay the roofing subcontractor. The roofing subcontractor files a construction lien against the homeowner's property. Can the homeowner be required to pay twice for the roofing work?

A. Yes, the homeowner may be required to pay the lien claim even though they already paid the general contractor, unless the homeowner obtained lien waivers from the roofing subcontractor before making the final payment
B. No, because Oregon law prohibits double payment and the homeowner's payment to the general contractor automatically satisfies the subcontractor's lien claim
C. Yes, but only if the roofing subcontractor's lien claim exceeds the amount of the general contractor's surety bond on file
D. No, because the general contractor's CCB license automatically guarantees payment to all subcontractors working on the project

45. A contractor is performing a commercial building renovation and the fire protection engineer requires the contractor to install a clean agent fire suppression system in the server room. Clean agent systems use gaseous suppression agents instead of water. What is the primary advantage of a clean agent system in a server room?

A. Clean agent systems are less expensive to install than standard wet-pipe sprinkler systems in commercial server room applications
B. Clean agent systems provide faster fire detection than standard sprinkler systems because they use more sensitive detection devices
C. Clean agent systems eliminate the need for portable fire extinguishers in the server room because the fixed system provides complete protection
D. Clean agent systems suppress fire without damaging sensitive electronic equipment, because the gaseous agent leaves no residue and does not conduct electricity

46. A contractor is building a residential home and the plans specify a truss roof system. The truss engineer's sealed drawings include detailed permanent bracing requirements. The contractor installs the trusses but does not install the permanent bracing shown on the truss engineer's drawings. What is the structural consequence?

A. The permanent bracing is optional because the roof sheathing provides all necessary lateral bracing for the truss system
B. The trusses perform identically with or without permanent bracing because the truss design accounts for the absence of bracing
C. The trusses may experience lateral buckling, web member failure, or excessive deflection because the permanent bracing is an integral part of the truss system's structural design
D. The missing bracing affects only the aesthetic alignment of the trusses and has no impact on structural performance

47. A contractor is estimating a commercial project and needs to calculate the cost of structural steel for the building frame. The structural drawings show a total steel weight of one hundred twenty tons. The steel fabrication and erection cost is estimated at three thousand two hundred dollars per ton installed. What is the estimated cost for the structural steel?

A. Two hundred forty thousand dollars based on a reduced unit cost for orders exceeding one hundred tons of structural steel
B. Four hundred eighty thousand dollars based on an inflated unit cost that includes the cost of all miscellaneous metals and stairs
C. Three hundred eighty-four thousand dollars based on the total steel tonnage multiplied by the unit cost per ton installed
D. One hundred ninety-two thousand dollars based on applying the unit cost only to the steel fabrication portion without erection

48. A contractor is managing a residential project and discovers that the concrete foundation walls have cured for only three days when the framing crew arrives to begin backfilling and loading the walls. The structural engineer specified a minimum of seven days curing before backfilling. What should the contractor do?

A. Proceed with backfilling because three days is adequate for modern concrete to reach sufficient strength for backfill loading
B. Wait until the concrete reaches the minimum seven-day curing period specified by the engineer before allowing backfill or framing loads to be applied to the foundation walls
C. Backfill one side of the foundation at a time to reduce the lateral pressure on the partially cured concrete walls during filling
D. Apply a curing compound to the walls and begin backfilling immediately because the compound accelerates the curing process

49. Under Oregon law, a contractor is required to maintain accurate records of all construction-related transactions. The IRS recommends that businesses retain tax-related records for a specific minimum period. What is the general minimum record retention period recommended by the IRS for business tax records?

A. A minimum of three years from the date the tax return was filed, though longer retention is recommended for specific situations such as property records and employment tax records
B. One year from the date of each individual transaction recorded in the company's accounting system during the fiscal year
C. Five years from the date the contractor's CCB license was last renewed with the Oregon Construction Contractors Board
D. Seven years from the date the construction project was completed and all warranty obligations have expired for the project

50. A contractor is installing a commercial building's emergency power system including a diesel generator. The generator must be installed on a concrete pad with vibration isolation mounts. The contractor installs the generator directly on the concrete pad without the specified vibration isolation mounts. What is the consequence of this omission?

A. The generator operates normally because the concrete pad absorbs all vibration without the need for additional isolation mounting
B. Generator vibration transmits directly through the concrete pad into the building structure, causing noise complaints, potential structural fatigue in the mounting connections, and premature wear on the generator's internal components
C. The generator's electrical output frequency becomes unstable without vibration isolation, causing damage to connected equipment
D. The vibration isolation mounts are a manufacturer recommendation only and their omission has no impact on inspection approval

51. A contractor is building a commercial structure and the specifications require the contractor to install expansion joints in the concrete floor slab at the locations shown on the structural drawings. The contractor installs the expansion joints but fills them with rigid epoxy filler instead of the specified flexible sealant. What is the consequence of using rigid filler?

A. The rigid epoxy provides superior durability compared to flexible sealant and the substitution improves the joint's performance
B. The rigid filler is acceptable because it prevents debris from entering the joint and maintains a smooth floor surface for traffic
C. The rigid epoxy filler prevents the joint from functioning as intended because it does not allow the thermal expansion and contraction movement the joint was designed to accommodate, potentially causing the adjacent slab sections to crack
D. The rigid filler affects only the aesthetic appearance of the joint and has no impact on the structural performance of the slab

52. A contractor is managing a commercial project and the owner requests that the contractor accelerate the schedule to complete the project two months early. The contract does not include an acceleration clause. The contractor agrees to accelerate but does not execute a written change order documenting the acceleration agreement and associated costs. What risk does the contractor face?

A. No risk because verbal acceleration agreements are legally binding and the contractor can recover all costs through the final payment
B. Limited risk because the contractor can file a CCB complaint against the owner to recover acceleration costs without documentation
C. No risk because the contractor's daily logs documenting the overtime hours provide sufficient legal basis for cost recovery alone
D. The contractor risks being unable to recover the additional costs incurred for acceleration because there is no written documentation of the owner's authorization and the agreed-upon compensation

53. A contractor is installing residential plumbing and the code requires a cleanout fitting at specific locations in the drainage system to provide access for clearing blockages. Where are cleanouts typically required in a residential plumbing system?

A. Only at the connection between the building sewer and the municipal sewer main at the property line or right-of-way edge
B. At the base of each drainage stack, at changes in direction exceeding forty-five degrees, at specific intervals in horizontal runs, and at the upper terminus of the building drain
C. Only at the main building cleanout located inside the foundation wall where the building drain exits the structure to the exterior
D. At every plumbing fixture connection to provide individual access for clearing blockages at each fixture trap and drain line

54. A contractor is building a commercial structure and the specifications require non-shrink grout beneath all steel column base plates. The contractor uses standard concrete mix instead of non-shrink grout. What is the consequence of this substitution?

A. Standard concrete provides equivalent performance to non-shrink grout when placed in thin lifts beneath structural steel base plates
B. The substitution is acceptable if the contractor adds an expansive admixture to the standard concrete mix before placement
C. Standard concrete shrinks as it cures, potentially creating gaps beneath the base plate that prevent full bearing contact and load transfer between the column and the foundation
D. Non-shrink grout is only required for column base plates larger than twelve inches square and standard concrete is acceptable for smaller plates

55. Under Oregon employment law, an employer must provide employees with access to toilet facilities on the construction site. A contractor has twenty-five workers on a commercial project. Under OSHA sanitation standards, what is the minimum number of toilet facilities required for this workforce?

A. Two toilet facilities are required for twenty or more employees of the same gender, with the specific number determined by the applicable OSHA standard based on workforce size
B. One toilet facility is sufficient for any construction site regardless of the number of workers employed on the active project
C. Five toilet facilities are required based on one toilet for every five workers on the active commercial construction project site
D. Three toilet facilities based on one for every ten workers plus one additional facility for the site superintendent's exclusive use

56. A contractor is managing a commercial project and the specifications require the installation of a stormwater detention system to manage runoff from the developed site. The system includes an underground detention vault, outlet control structure, and overflow spillway. What is the primary purpose of the stormwater detention system?

A. To filter pollutants from the stormwater before it enters the municipal storm drain system through activated carbon filtration
B. To temporarily store stormwater runoff and release it at a controlled rate that does not exceed the pre-development flow rate, preventing downstream flooding and erosion
C. To permanently store all stormwater on site and prevent any discharge to the municipal storm drain system under any conditions
D. To provide a potable water reservoir for the building's domestic water system during periods of municipal water supply interruption

57. A contractor is performing a residential renovation and discovers that the existing bathroom has no ventilation fan. The bathroom has an operable window. Under the Oregon Residential Specialty Code, does the operable window satisfy the ventilation requirement, or must a mechanical exhaust fan be installed?

A. A mechanical exhaust fan is always required in bathrooms regardless of whether an operable window is present in the space

B. An operable window of the required minimum size may satisfy the bathroom ventilation requirement under the code, though mechanical ventilation is generally preferred and may be required depending on the specific code edition and local amendments
C. Neither a window nor an exhaust fan is required in bathrooms because natural air circulation through the door opening is sufficient
D. An operable window satisfies the ventilation requirement only if the window faces south and receives direct sunlight for drying

58. A contractor is building a commercial office building and the structural plans specify moment-resisting steel frames for lateral force resistance. During erection, the contractor's ironworker crew bolts all moment connections instead of welding them as specified on the structural drawings. What is the structural consequence of this unauthorized change?

A. Bolted connections provide equivalent moment resistance to welded connections in all steel frame applications without exception
B. The bolted connections improve the building's seismic performance because bolted joints are more ductile than welded connections
C. The structural engineer approves the change because modern bolting methods have eliminated the need for welded moment connections
D. The bolted connections may not provide the required moment resistance because the connection design was based on welded details with specific strength and stiffness characteristics

59. A contractor is managing a residential project and the homeowner requests that the contractor install a hot tub on the existing rear deck. The deck was designed for a standard residential live load of forty pounds per square foot. A filled hot tub weighs approximately four thousand pounds concentrated on a six-foot by six-foot area. What should the contractor do before installing the hot tub?

A. Install the hot tub on the existing deck because residential decks are overdesigned and can support concentrated loads without modification
B. Have a structural engineer evaluate the deck's capacity to support the concentrated hot tub load and recommend any necessary reinforcement before installation
C. Install the hot tub in a corner of the deck where the joists are shortest and the load path to the foundation is most direct
D. Distribute the load by placing a sheet of three-quarter-inch plywood beneath the hot tub to spread the weight across multiple joists

60. A contractor is reviewing a commercial project's specifications and finds a reference to LEED certification requirements. The project is targeting LEED Gold certification. Which organization administers the LEED green building certification program?

A. The Environmental Protection Agency administers the LEED certification program through its Green Building Initiative division

B. The American Institute of Architects administers LEED certification as part of their professional development and accreditation program
C. The U.S. Green Building Council administers the LEED certification program, which evaluates buildings on energy efficiency, water conservation, materials selection, indoor environmental quality, and other sustainability criteria
D. The International Code Council administers LEED certification as a supplement to the International Building Code requirements

61. A contractor is building a residential home and the plans specify a concrete stem wall foundation with anchor bolts at specific spacings. The contractor discovers that several anchor bolts were not placed during the foundation pour and are missing from the stem wall. What is the most appropriate corrective action?

A. Attach the sill plate to the foundation using concrete screws as a substitute for the missing cast-in-place anchor bolts
B. Install adhesive anchor bolts in drilled holes at the specified locations and spacing using an approved adhesive anchor system
C. Attach the sill plate using powder-actuated fasteners driven directly into the concrete stem wall at the missing bolt locations
D. Install retrofit anchor bolts by drilling through the sill plate and into the concrete stem wall, setting them with an approved adhesive or mechanical expansion anchor system

62. Under Oregon law, a contractor enters into a residential construction contract. The contract includes a clause requiring the homeowner to pay the contractor's attorney fees if the homeowner files a claim that is later determined to be without merit. Is this clause enforceable?

A. Attorney fee provisions in Oregon contracts are generally subject to the state's reciprocal attorney fee statute, meaning if one party can recover fees, the other party has the same right, and the clause must comply with applicable Oregon law
B. The clause is unenforceable because Oregon law prohibits all attorney fee provisions in residential construction contracts entirely
C. The clause is enforceable only if the contractor's attorney reviews and approves the specific language before the contract is signed
D. The clause is automatically void because homeowners can never be required to pay contractor attorney fees under any circumstances

63. A contractor is building a commercial structure and the fire code requires emergency exit signs at all required exits and along the path of egress. The specifications call for illuminated exit signs with battery backup. The contractor installs non-illuminated exit signs without battery backup. What fire and life safety deficiency does this create?

A. Non-illuminated exit signs are acceptable because the building's emergency lighting system provides adequate illumination of the exit locations

B. Non-illuminated signs meet the code requirement if they are made of photoluminescent material that glows after the lights go out
C. The deficiency is purely aesthetic because exit signs serve only as visual markers and are not critical life safety components in buildings
D. During a power failure, non-illuminated exit signs without battery backup are not visible, preventing building occupants from locating exits and safely evacuating during an emergency

64. A contractor is managing a commercial project and the architect issues a bulletin revising the floor tile pattern in the main lobby. The bulletin changes the tile layout from a straight grid to a diagonal pattern. The contractor has already purchased all the tile for the straight grid layout. What is the contractor's right regarding the cost impact of this design change?

A. The contractor must absorb the cost of additional tile needed for the diagonal pattern because design revisions are included in the original contract price
B. The contractor waives the right to additional compensation if they do not reject the bulletin within twenty-four hours of receipt
C. The contractor may only recover the cost of the additional tile material and cannot claim labor or waste factor cost differences
D. The contractor is entitled to a change order covering the additional material cost, increased waste factor for diagonal cuts, and additional labor time required for the more complex installation pattern

65. A contractor is building a residential home and the plans call for a radon mitigation system. The system includes a sub-slab depressurization system with a vertical vent pipe routed through the building. The contractor terminates the vent pipe in the attic instead of extending it through the roof to the exterior. What is the problem with this installation?

A. Terminating the vent pipe in the attic is acceptable because the attic ventilation system dilutes the radon gas before it enters the living space
B. The attic termination is correct because the warm attic air creates a natural thermal draft that pulls radon from beneath the slab upward
C. The termination location has no impact because radon mitigation systems are passive and do not require the pipe to extend above the roof
D. Terminating the vent pipe in the attic releases radon gas into the attic space where it can migrate into the living areas through ceiling penetrations, defeating the purpose of the mitigation system

66. A contractor is reviewing the project schedule and identifies that a concrete pour is scheduled during a week when temperatures are forecast to exceed one hundred degrees Fahrenheit. Under ACI hot weather concrete guidelines, what precautions should the contractor take?

A. Use chilled mixing water, ice, or cooled aggregates to reduce the concrete temperature, schedule placement during cooler morning hours, apply curing compounds or wet curing immediately after finishing, and avoid rapid moisture loss
B. Add extra water to the concrete mix to keep it workable in the heat and allow the concrete to air-cure without protective measures
C. Pour the concrete at midday when the sun is directly overhead to maximize the radiant heat that accelerates the curing process
D. Cancel the pour and wait for temperatures to drop below eighty degrees Fahrenheit because concrete cannot be placed in temperatures above ninety-five degrees

67. A contractor is building a commercial parking structure and the specifications require all post-installed anchors in the concrete to be tested per the engineer's special inspection requirements. The contractor installs two hundred anchors and the engineer requires proof testing of ten percent. How many anchors must be proof-tested?

A. Ten anchors based on a flat ten-anchor minimum regardless of the total number of anchors installed in the parking structure
B. Twenty anchors based on ten percent of the two hundred total anchors installed, selected at random locations throughout the structure
C. All two hundred anchors must be tested because proof testing every anchor is the standard requirement for post-installed anchors
D. Five anchors based on testing only the anchors in the most critically loaded locations identified by the structural engineer

68. A contractor is performing a residential renovation and the homeowner asks the contractor to explain the purpose of a home energy audit. What does a home energy audit evaluate?

A. The appraised value of the home relative to other homes in the neighborhood based on the energy efficiency rating of the property
B. The contractor's qualifications to perform energy-related renovation work on the homeowner's residential property
C. The home's energy performance by identifying areas of energy loss, recommending improvements to insulation, air sealing, HVAC efficiency, and building envelope performance to reduce energy consumption
D. The utility company's billing accuracy by comparing the home's metered energy usage against the average consumption for the area

69. A contractor is managing a commercial project and the roofing subcontractor completes the roof installation. The specifications require a flood test to verify the waterproof integrity of the new roof membrane before the warranty is issued. The subcontractor refuses to perform the flood test, claiming it is unnecessary because they followed the manufacturer's installation instructions. What should the contractor do?

A. Accept the subcontractor's position because proper installation technique eliminates the need for post-installation testing verification
B. Require the subcontractor to perform the flood test as specified because the test is a contractual requirement regardless of the installation quality claimed by the subcontractor
C. Waive the flood test and request the manufacturer to issue the warranty based solely on the installer's certification of compliance
D. Perform the flood test using the contractor's own crew and deduct the cost from the roofing subcontractor's final payment amount

70. Under Oregon law, a residential contractor advertises a special promotion offering free kitchen cabinet installation with any kitchen remodel exceeding twenty-five thousand dollars. After a homeowner signs the contract, the contractor adds a two-thousand-dollar cabinet installation charge to the invoice. What legal issue does this create?

A. No legal issue because the promotional offer applies only to new customers and the homeowner may have been a returning client
B. The contractor may have committed a deceptive trade practice by advertising a free service and then charging for it after the contract was signed, potentially violating Oregon's Unlawful Trade Practices Act
C. The charge is permissible if the contractor provides a written explanation of why the installation charge was necessary for the project
D. The charge is acceptable because promotional offers are non-binding marketing statements and are never incorporated into contracts

71. A contractor is building a commercial building and the structural engineer requires the concrete to achieve a minimum compressive strength of five thousand psi at twenty-eight days. The seven-day cylinder break results show a compressive strength of only two thousand eight hundred psi. Based on this result, should the contractor be concerned?

A. The seven-day result of two thousand eight hundred psi is approximately fifty-six percent of the specified twenty-eight-day strength, which is within the typical range for normal concrete and suggests the mix will likely reach five thousand psi at twenty-eight days
B. The seven-day result is critically low and the contractor should immediately remove and replace all concrete placed from this batch
C. Seven-day cylinder breaks have no predictive value for twenty-eight-day strength and should not be used for quality control decisions
D. The concrete has failed and the contractor must add a surface-applied strength enhancer to the cured concrete to reach the required psi

72. A contractor is installing a commercial fire alarm system and the fire code requires visual notification appliances (strobe lights) in addition to audible alarms in all public and common areas. The contractor installs audible alarms throughout the building but omits the visual strobes. What life safety deficiency does this create?

A. The omission has no safety impact because audible alarms provide adequate notification for all building occupants during fire events
B. The visual strobes are required only in restrooms and are optional in all other public and common areas of commercial buildings
C. The building fails to meet ADA accessibility and fire code requirements because occupants who are deaf or hard of hearing cannot be alerted to fire emergencies without visual notification appliances
D. The missing strobes affect only the fire alarm system warranty and do not impact the building's certificate of occupancy issuance

73. A contractor is building a residential addition and the existing home has a crawl space foundation. The addition will also have a crawl space. The building code requires crawl space ventilation to prevent moisture accumulation. What are the code options for managing crawl space moisture?

A. Sealing the crawl space completely with no ventilation or ground cover is acceptable because the enclosed space will self-regulate
B. Installing only a ground vapor barrier without any ventilation openings is sufficient to control moisture in all crawl space conditions
C. The code typically allows either a ventilated crawl space with operable vents and a ground vapor barrier, or a sealed conditioned crawl space with insulated walls, a complete vapor barrier, and mechanical ventilation or conditioning
D. Crawl space ventilation requirements were eliminated in the most recent code cycle and no ventilation or moisture control is required

74. A contractor is managing a commercial project and the building envelope consultant requires the contractor to perform a water infiltration test on the installed curtain wall system before the interior finishes are installed. The test involves spraying water on the exterior of the curtain wall at a specified rate and pressure while inspecting the interior for leaks. What is the purpose of this test?

A. To measure the thermal performance of the curtain wall glazing by evaluating the temperature differential across the glass during testing
B. To verify the structural capacity of the curtain wall framing by applying hydraulic pressure to simulate wind loads on the facade
C. To clean the exterior glass surfaces before the building is occupied and the final window cleaning contract takes effect for maintenance
D. To verify the watertight integrity of the curtain wall installation by identifying any leaks at joints, seals, and glazing before they are concealed by interior finishes

75. A contractor is reviewing the insurance requirements for a commercial project and the owner requires the contractor to carry professional liability insurance. What type of claims does professional liability insurance cover?

A. Claims arising from the contractor's professional errors, omissions, or negligent acts in providing design, engineering, or consulting services as part of a design-build or other professional services engagement
B. Claims arising from bodily injury to third parties caused by the contractor's construction operations on the project site
C. Claims arising from damage to the contractor's own equipment, tools, and materials stored at the jobsite or in transit
D. Claims arising from employee injuries that exceed the limits of the contractor's workers' compensation insurance policy

76. A contractor is building a commercial structure and the specifications require the contractor to install a building automation system that controls the HVAC, lighting, and security systems. The contractor installs the hardware but does not commission the system. What does commissioning the building automation system involve?

A. Connecting the building automation system to the internet so the building owner can monitor the systems remotely from home
B. Registering the building automation system with the manufacturer to activate the equipment warranties for each component
C. Testing, adjusting, and verifying that all system components function correctly and interact as designed, confirming that the sequences of operation perform as specified and the system delivers the intended building performance
D. Training the building's janitorial staff on how to adjust the thermostat settings for the occupied spaces during business hours

77. A contractor is managing a residential project and the homeowner requests a change that increases the project cost by fifteen thousand dollars. The contractor verbally agrees to perform the additional work but does not prepare a written change order. After completing the extra work, the homeowner refuses to pay the additional amount. What is the contractor's legal position?

A. The contractor has a strong legal position because the verbal agreement was witnessed by the homeowner's neighbor during the conversation
B. The contractor must file a construction lien immediately because verbal change orders automatically preserve all lien rights in Oregon
C. The contractor has full legal standing because Oregon law recognizes verbal change orders on residential projects under all circumstances
D. The contractor's legal position is weakened because Oregon law requires written change orders for residential construction projects, and the lack of documentation makes it difficult to prove the homeowner authorized the additional work

78. A contractor is building a commercial warehouse and the specifications require a sealed concrete floor with a vapor barrier beneath the slab. The contractor installs the vapor barrier

but does not seal the overlapping seams between the barrier sheets. What is the consequence of not sealing the seams?

A. The unsealed seams have no practical impact because the weight of the concrete slab compresses the overlapping barrier sheets together
B. Moisture can migrate through the unsealed seams and penetrate the slab from below, potentially causing floor coating failure, efflorescence, and damage to stored goods
C. The unsealed seams improve the vapor barrier's performance by allowing trapped air beneath the slab to escape during concrete placement
D. The building inspector accepts unsealed seams if the overlap distance between sheets exceeds twelve inches at every joint location

79. A contractor is performing a commercial renovation and the specifications require the contractor to provide a warranty for all work performed. The contractor provides a one-year warranty on workmanship. The specifications also require the contractor to assign all manufacturer warranties for installed equipment to the building owner. What is the purpose of assigning manufacturer warranties to the owner?

A. To relieve the contractor of all warranty obligations immediately upon project completion by transferring responsibility to manufacturers
B. To ensure the building owner has direct access to manufacturer warranty coverage for equipment repairs and replacements that extend beyond the contractor's one-year workmanship warranty period
C. To allow the building owner to return defective equipment directly to the manufacturer for a full refund of the purchase price
D. To transfer the contractor's insurance obligations to the equipment manufacturers for the duration of their respective warranty periods

80. A contractor is reviewing the final project cost report for a completed commercial project. The original contract price was one million two hundred thousand dollars. The total approved change orders added one hundred forty-five thousand dollars. The contractor's actual costs were one million one hundred eighty thousand dollars including all change order work. What is the contractor's gross profit on this project?

A. One hundred forty-five thousand dollars based solely on the total value of approved change orders added during the project
B. Twenty thousand dollars based on the difference between the original contract price and the actual costs without change orders
C. One million three hundred forty-five thousand dollars based on the total contract revenue without deducting any project expenses
D. One hundred sixty-five thousand dollars based on total revenue of one million three hundred forty-five thousand dollars minus actual costs of one million one hundred eighty thousand dollars

# Practice Exam 20: Answer Key and Explanations

**1. C** — Map cracking across an entire driveway surface within ninety days is consistent with rapid moisture loss during curing, which is a workmanship deficiency. Oregon's implied warranty of workmanlike construction requires the contractor to perform work with the skill and care of a reasonably competent contractor. Improper curing practices fall below this standard, making the contractor responsible for appropriate repair or replacement.

**2. C** — Oregon public contracting law requires the apparent low bidder to submit a first-tier subcontractor disclosure within two hours after bid closing, or as specified in the solicitation documents. The disclosure must include each subcontractor's name, CCB license number, and category of work for all first-tier subcontractors exceeding the specified threshold. Failure to submit the disclosure on time can result in the bid being declared non-responsive.

**3. B** — The general contractor is responsible for coordinating the work between trades and ensuring that each subcontractor provides an acceptable work product for the next trade in the sequence. When the drywall subcontractor's defective work creates additional costs for the painting subcontractor, the general contractor must resolve the issue by requiring the drywall subcontractor to correct the defects or compensating the painting subcontractor for the additional preparation work.

**4. C** — When unforeseen conditions such as concealed termite damage are discovered during renovation, the contractor must stop work, document the condition, and present a written change order to the homeowner before proceeding with repairs. The homeowner needs to understand the extent of the damage, the proposed repair, and the associated cost before authorizing additional work. Proceeding without written authorization risks nonpayment and violates Oregon's change order requirements.

**5. D** — The cost of load testing to verify a structural repair is typically borne by the party whose actions or negligence necessitated the repair. If the contractor's work caused the damage requiring repair, the contractor pays for the testing. If a design error caused the condition, the owner or designer bears the cost. The contract terms and the specific circumstances determine the allocation.

**6. B** — Tankless water heater condensate is acidic and can deteriorate concrete foundation walls over time when discharged directly against the foundation surface. The plumbing code requires condensate to be routed to an approved discharge location such as an indirect waste receptor or a properly designed exterior drain that directs the condensate away from the building foundation. Improper condensate discharge creates long-term foundation damage.

**7. C** — Corroded steel deck sections may not have adequate structural capacity to support the new roofing system's weight and applied loads. The contractor must stop work, document the condition, and notify the owner and structural engineer because installing a new roof on a compromised deck creates a structural safety hazard. The engineer must evaluate the corrosion and specify appropriate repairs before the roofing work continues.

**8. D** — Oregon law generally requires employers to provide former employees with reasonable access to their personnel records upon request within a specified timeframe. This right ensures employees can review their employment documentation including performance evaluations,

disciplinary records, and other personnel file contents. Employers should have a clear policy for responding to personnel file access requests.

**9. A** — The prescriptive compliance pathway requires each building component to meet specific predetermined standards including wall insulation R-values, window U-factors, lighting efficiency, and HVAC equipment efficiency ratings. This pathway provides a straightforward checklist approach where compliance is verified by confirming that each individual component meets or exceeds the specified minimum values. It is the most commonly used compliance method for residential construction.

**10. D** — When smoke detectors must be temporarily disabled during construction, the fire code requires notification to the fire department and the building owner, implementation of a fire watch with trained personnel in the affected area, and restoration of the detectors to service as quickly as possible. These measures ensure fire safety is maintained while the automatic detection system is offline. Fire watch personnel must patrol continuously and have communication devices and fire extinguishers readily available.

**11. A** — Eight hundred linear feet at twelve dollars fifty cents equals ten thousand dollars. Two vehicle gates at one thousand two hundred dollars each equals two thousand four hundred dollars. One pedestrian gate at four hundred fifty dollars adds to the total. The sum is ten thousand plus two thousand four hundred plus four hundred fifty, equaling twelve thousand eight hundred fifty dollars for the complete temporary fencing installation.

**12. D** — Oregon law allows homeowners to file claims against a contractor's surety bond even after the contractor has ceased business operations. The bond remains in effect for a specified period after the license expires to provide protection for homeowners who discover defects after the contractor goes out of business. This protection is a fundamental purpose of the CCB surety bond requirement.

**13. B** — The elevator code requires an emergency communication device inside the cab to provide passengers trapped in a stalled elevator with a means of contacting emergency personnel or building staff for rescue. This device must operate independently of the building's normal communication systems and must connect to a continuously monitored location. The requirement ensures passenger safety during elevator malfunctions.

**14. A** — Safety glazing in overhead applications reduces the risk of serious injury from falling glass because tempered glass crumbles into small, relatively harmless fragments and laminated glass is held together by an interlayer that prevents large shards from falling. Standard annealed glass breaks into large, dangerous shards that can cause severe lacerations when falling from overhead. Building codes require safety glazing in all overhead and other hazardous locations.

**15. A** — Contract provisions that attempt to limit or waive a homeowner's statutory right to file a CCB complaint are generally unenforceable under Oregon law. The CCB complaint process is a statutory consumer protection mechanism that cannot be contractually shortened or eliminated. Homeowners retain their right to file complaints with the CCB regardless of any contract language attempting to restrict this right.

**16. C** — The contractor should order the stone immediately to start the sixteen-week procurement clock, then evaluate schedule alternatives such as resequencing other critical path activities to minimize the overall delay. Notifying the owner and architect of the lead time

impact with proposed mitigation strategies allows collaborative decision-making. Proactive management of long lead time items is essential to maintaining the project schedule.

**17. B** — When the utility locating service fails to accurately mark an underground utility and the contractor followed proper procedures including requesting locates and exercising reasonable care during excavation, the locating service may bear primary liability for the resulting damage. The contractor's responsibility is to call for locates, wait for the marking to be completed, and use appropriate excavation methods within the tolerance zone. Accurate utility marking is the locating service's fundamental obligation.

**18. A** — The energy code establishes minimum equipment and component standards that cannot be reduced by homeowner preference. A programmable thermostat is a code requirement designed to reduce energy consumption through automated temperature setbacks during unoccupied periods. The contractor must install the code-required thermostat regardless of the homeowner's desire for a less expensive non-programmable alternative.

**19. A** — Excavating below an adjacent building's foundation creates a risk of undermining the adjacent structure and causing settlement, cracking, or collapse. The contractor must notify the adjacent property owner, engage a structural engineer to design an appropriate protection system such as underpinning or shoring, obtain necessary permits, and implement the engineered plan before excavating to the required depth.

**20. B** — A mock-up serves as a quality reference standard by verifying design intent, material quality, color, workmanship, and installation methods before full-scale production begins. Once approved by the architect and owner, the mock-up establishes the minimum acceptable quality standard for the remainder of the installation. This proactive quality control measure prevents costly rework during full-scale production.

**21. B** — Flexible vinyl duct sags between supports, creating low points where condensation accumulates and potentially drips back into the exhaust fan. The sagging also restricts airflow and reduces the fan's effective exhaust capacity. Additionally, flexible vinyl duct may not meet fire safety requirements in certain installations. Rigid or semi-rigid metal duct maintains its shape, prevents condensation pooling, and provides superior airflow performance.

**22. D** — A cost-loaded schedule assigns budget values to each activity, creating a time-phased budget that shows when money will be spent throughout the project. This enables the contractor and owner to track planned versus actual expenditure rates, forecast cash flow needs, and use the schedule as the basis for monthly progress payment applications. A standard schedule shows only time relationships without financial information.

**23. C** — Isolation valves on individual tenant branch lines allow maintenance or repair work on one tenant's plumbing system without disrupting water service to the entire building or other tenants. This is essential in multi-tenant commercial buildings where shutting down the entire water supply for a single tenant's repair would be disruptive and costly. Properly located isolation valves improve building operability and reduce maintenance downtime.

**24. D** — The homeowner has multiple remedies including filing a CCB complaint for the contractor's failure to complete the contracted work, pursuing a claim against the contractor's surety bond for financial losses, and potentially filing a civil lawsuit for breach of contract. These remedies are not mutually exclusive and may be pursued simultaneously. The CCB

complaint process provides an accessible dispute resolution mechanism without requiring immediate litigation.

**25. A** — The EPA's RRP Rule applies to renovation work in buildings constructed before nineteen seventy-eight, including commercial buildings where lead-based paint is being disturbed. The contractor must follow lead-safe work practices, contain the work area to prevent dust migration, and ensure workers are properly trained. Although the RRP Rule's applicability to commercial buildings differs from residential, lead safety practices still apply under OSHA lead standards.

**26. C** — In cold storage facilities, the refrigerated slab can freeze the ground beneath it if the soil temperature drops below thirty-two degrees Fahrenheit. Frozen soil expands due to ice lens formation, creating frost heave that lifts and cracks the floor slab and can damage the entire building structure. A heated floor system maintains the soil temperature above freezing to prevent this destructive frost heave cycle.

**27. A** — A demolition permit is generally required before demolishing or removing a structure, and the contractor should verify specific requirements with the local building department. Many jurisdictions also require an asbestos survey before demolition to identify any asbestos-containing materials that require special handling. The permit process ensures the demolition is performed safely and that environmental requirements are met.

**28. C** — The installation fails inspection because the minimum service clearance specified by the manufacturer and required by the mechanical code ensures that HVAC technicians can safely access all sides of the equipment for maintenance, repair, and replacement of components. Inadequate clearance makes routine maintenance difficult or impossible, leading to deferred maintenance, reduced equipment life, and potential safety hazards.

**29. D** — A seven-foot retaining wall exceeds the typical height threshold for engineered design, requiring both a building permit and a structural design by a licensed professional engineer. The engineering design accounts for soil properties, surcharge loads, drainage requirements, and the specific site conditions. Building without engineering on a wall of this height creates significant risk of structural failure and potential liability.

**30. B** — Suspension trauma, also called orthostatic intolerance, occurs when a worker hangs motionless in a fall arrest harness and blood pools in the legs due to the harness pressure on the femoral veins. This condition can cause serious injury or death within minutes if the worker is not rescued promptly. OSHA requires employers to have a rescue plan that ensures prompt rescue of suspended workers before suspension trauma develops.

**31. A** — The dedicated twenty-ampere circuit for the amplifier equipment is a standard electrical power circuit that requires an electrical permit and must be installed by a licensed electrician or appropriately licensed contractor. The low-voltage exemption applies only to the communication wiring carrying audio signals, not to the power circuits supplying electricity to the equipment. The power circuit must comply with the NEC and pass electrical inspection.

**32. A** — Oregon's implied warranty of workmanlike construction exists independently of any express written warranty provided by the contractor. A defective solder joint that causes a plumbing leak is a workmanship deficiency that falls below the standard of a reasonably

competent contractor. The implied warranty may provide the homeowner with coverage beyond the one-year express warranty period, subject to the applicable statute of limitations.

**33. B** — Any penetration through a structural steel beam must be reviewed and approved by the structural engineer before the penetration is made. Unauthorized penetrations can weaken the beam by removing critical cross-sectional area at the web, potentially causing the beam to fail under design loads. The structural engineer evaluates the proposed penetration location, size, and reinforcement requirements to ensure the beam's structural integrity is maintained.

**34. D** — The subcontractor's total price is eighteen thousand dollars in direct costs plus fifteen percent markup, equaling twenty thousand seven hundred dollars. The contractor's ten percent markup is applied to the subcontractor's total price, adding two thousand seventy dollars. The total cost to the owner is twenty-two thousand seven hundred seventy dollars. Markups are typically applied sequentially, with the contractor marking up the subcontractor's total price.

**35. D** — A guardrail that fails a two-hundred-pound concentrated load test does not meet the building code's structural requirements for fall protection. The contractor must redesign and reconstruct the guardrail with proper structural connections at the posts and top rail to withstand the required loads. Adding cables, extra balusters, or requesting variances does not address the fundamental structural inadequacy of the guardrail system.

**36. C** — When asbestos-containing materials are discovered during demolition, the contractor must stop work immediately in the affected area and not disturb the materials. The building owner must be notified, and a licensed asbestos abatement contractor must be engaged to safely remove the materials following all applicable federal, state, and local regulations. Disturbing asbestos without proper containment releases dangerous fibers that pose serious health risks.

**37. D** — Significant honeycomb voids in concrete walls indicate areas where the concrete did not fully consolidate around the reinforcement, potentially creating structural deficiencies in those locations. The project manager should withhold payment until the structural engineer evaluates the severity of the honeycombing and specifies appropriate repair procedures. Approving payment for defective work reduces the contractor's leverage to require proper correction.

**38. A** — The contractor bears full responsibility for both failing to obtain the required permit and failing to build the deck to code. The contract specifically assigned permit responsibility to the contractor, and the contractor's failure to meet this obligation and to construct code-compliant footings makes the contractor liable for all costs of bringing the deck into compliance.

**39. C** — Brick veneer expands due to thermal cycling and moisture absorption over time. Without expansion joints to accommodate this movement, the veneer has no relief point and cracks at its weakest locations. Expansion joints at the specified intervals allow the veneer to expand and contract without developing damaging stress concentrations that cause cracking.

**40. A** — The underground utility vault meets all criteria for a permit-required confined space: it has limited entry and exit through a single access point, is not designed for continuous occupancy, has limited ventilation, and contains potential hazards including electrical equipment and possible atmospheric dangers. OSHA requires a written entry permit, atmospheric monitoring, an attendant, and rescue provisions before workers enter this space.

**41. D** — When the combined electrical load of the existing home and the new addition exceeds the capacity of the existing service, the contractor must upgrade the electrical service to a higher amperage rating. Operating the existing service beyond its rated capacity creates a fire hazard from overloaded conductors and equipment. The upgrade must comply with the NEC and be properly permitted and inspected.

**42. A** — Commercial kitchen grease exhaust duct requires welded, liquid-tight joints because grease-laden vapors condense on the interior duct surfaces and the accumulated grease is combustible. Snap-lock joints allow grease to seep through the unsealed connections, creating fire hazards from grease accumulation on surfaces outside the duct. The welded joints contain the grease within the duct where it can be cleaned during regular maintenance.

**43. B** — Completed operations coverage protects the contractor against claims for bodily injury or property damage that arise from the contractor's finished work after the contractor has left the project. For example, if a railing installed by the contractor fails two years later and injures someone, completed operations coverage responds. This coverage is distinct from the contractor's operations coverage that applies during active construction.

**44. A** — Oregon law permits subcontractors who have not been paid to file construction liens against the homeowner's property, even if the homeowner paid the general contractor in full. The homeowner may be required to pay twice unless they obtained lien waivers from all subcontractors before making the final payment. Lien waivers confirm that subcontractors have been paid and will not file liens against the property.

**45. D** — Clean agent fire suppression systems use gaseous agents that suppress fire without leaving residue and do not conduct electricity, making them ideal for protecting sensitive electronic equipment in server rooms. Water-based sprinkler systems would damage the electronic equipment and data storage devices. The clean agent displaces oxygen or interrupts the chemical reaction of combustion while leaving the protected equipment undamaged.

**46. C** — Permanent bracing is an integral part of the truss system's structural design and is required to prevent lateral buckling of compression members, stabilize web members, and distribute loads across multiple trusses. Without the bracing specified on the truss engineer's sealed drawings, individual trusses may buckle, web members may fail, and excessive deflection may occur. The roof sheathing alone does not provide all the bracing required by the truss design.

**47. C** — One hundred twenty tons multiplied by three thousand two hundred dollars per ton equals three hundred eighty-four thousand dollars. This unit-cost method is the standard approach for estimating structural steel costs in commercial construction. The per-ton price includes fabrication, shop painting, delivery, and field erection of the structural steel members.

**48. B** — The structural engineer specified a minimum seven-day cure period before backfilling because the concrete needs adequate strength to resist the lateral earth pressure from the backfill. Loading partially cured walls before they reach sufficient strength can cause cracking, deflection, or structural failure. The contractor must wait until the specified curing period is complete before allowing any backfill or construction loads on the foundation walls.

**49. A** — The IRS generally recommends retaining business tax records for a minimum of three years from the date the tax return was filed. However, certain records such as property records,

employment tax records, and records supporting claimed losses should be retained for longer periods. Construction contractors should consult with a tax professional to establish a comprehensive record retention policy.

**50. B** — Without vibration isolation mounts, generator vibration transmits directly through the concrete pad into the building structure. This transmitted vibration causes noise complaints from building occupants, potential structural fatigue in the mounting connections and building frame, and premature wear on the generator's bearings and internal components. Vibration isolation is a critical installation requirement for all rotating equipment.

**51. C** — Expansion joints are designed to accommodate thermal expansion and contraction of the concrete slab. Rigid epoxy filler prevents the joint from moving, effectively eliminating the joint's function. When the slab expands and the joint cannot accommodate the movement, compressive stress builds up and causes cracking in the adjacent slab sections. Flexible sealant allows the joint to move while keeping debris out.

**52. D** — Without written documentation of the owner's acceleration directive and the agreed-upon compensation, the contractor has no contractual basis to recover the additional costs of overtime, added crews, and extended supervision required for acceleration. Verbal agreements are difficult to prove and may not satisfy the contract's written change order requirements. The contractor should always execute a written change order before performing acceleration work.

**53. B** — Cleanouts are required at the base of each drainage stack, at changes in direction exceeding forty-five degrees, at specified intervals in horizontal drainage runs, and at the upper terminus of the building drain. These access points allow plumbers to clear blockages throughout the drainage system without cutting into walls or floors. Proper cleanout placement is essential for long-term maintenance of the plumbing system.

**54. C** — Standard concrete shrinks as it cures due to water evaporation and cement hydration. When placed in thin lifts beneath steel base plates, this shrinkage creates gaps that prevent full bearing contact between the column and the foundation. Non-shrink grout is specifically formulated to maintain its volume or slightly expand during curing, ensuring complete contact and proper load transfer at the base plate connection.

**55. A** — OSHA sanitation standards require a minimum number of toilet facilities based on the workforce size. For twenty-five workers, the specific requirement depends on the applicable OSHA standard, but generally two or more facilities are required with the exact number determined by the workforce size and gender distribution. The contractor must ensure adequate facilities are available and properly maintained throughout the project.

**56. B** — Stormwater detention systems temporarily store runoff from developed sites and release it at a controlled rate that does not exceed the pre-development flow rate. Development increases impervious surfaces that generate faster and higher-volume runoff compared to undeveloped land. The detention system prevents downstream flooding and erosion by slowing the release of stormwater to match natural flow patterns.

**57. B** — Under the Oregon Residential Specialty Code, an operable window of the required minimum size may satisfy the bathroom ventilation requirement in lieu of a mechanical exhaust fan, depending on the specific code edition and any local amendments. However, mechanical ventilation is generally more effective because it operates regardless of weather conditions and

user behavior. The contractor should verify the applicable code requirements with the local building department.

**58. D** — Moment connections designed as welded details have specific strength and stiffness characteristics that differ from bolted connections. The structural engineer designed the lateral force resisting system based on welded connection properties including complete joint penetration welds that develop the full strength of the connected members. Substituting bolted connections without engineering approval may result in connections that cannot resist the design forces.

**59. B** — A filled hot tub creates a concentrated load of approximately one hundred eleven pounds per square foot on a thirty-six-square-foot area, which is nearly three times the deck's forty-pound-per-square-foot design load. A structural engineer must evaluate the deck's capacity and recommend reinforcement before the hot tub is installed. Placing the hot tub without evaluation risks structural failure of the deck framing and support system.

**60. C** — The U.S. Green Building Council administers the LEED certification program, which provides a framework for evaluating building sustainability across multiple categories including energy efficiency, water conservation, materials selection, indoor environmental quality, and sustainable site development. LEED certification levels range from Certified to Platinum based on the total points achieved across all credit categories.

**61. D** — Retrofit anchor bolts installed by drilling through the sill plate and into the concrete stem wall using an approved adhesive or mechanical expansion anchor system is the standard corrective method for missing cast-in-place anchor bolts. The retrofit anchors must meet the same spacing requirements and load capacity as the originally specified cast-in-place bolts. The structural engineer should approve the retrofit anchor system and installation method.

**62. A** — Oregon's reciprocal attorney fee statute provides that when a contract allows one party to recover attorney fees, the other party has the same right. This means that if the contractor includes a clause allowing recovery of attorney fees from the homeowner, the homeowner can also recover fees from the contractor if the homeowner prevails. The clause must comply with applicable Oregon law to be enforceable.

**63. D** — During a power failure, non-illuminated exit signs without battery backup are invisible in the dark, preventing building occupants from locating exits during an emergency evacuation. The building code requires illuminated exit signs with battery backup to ensure exits are identifiable at all times, including during power outages. This is a critical life safety requirement that directly affects occupant survivability during fire emergencies.

**64. D** — A design change from a straight grid to a diagonal tile pattern increases material waste from diagonal cuts, requires more labor for the complex layout, and may require additional tile to complete the pattern. The contractor is entitled to a change order covering all additional costs resulting from the architect's design revision, including material, waste, and labor differentials between the two installation methods.

**65. D** — Terminating the radon vent pipe in the attic releases radon gas into the attic space where it can migrate through ceiling penetrations, light fixtures, and other openings into the living areas below. The vent pipe must extend through the roof and terminate above the roofline

so radon gas disperses into the outdoor atmosphere. Attic termination defeats the purpose of the mitigation system entirely.

**66. A** — Hot weather concrete precautions include using chilled water, ice, or cooled aggregates to reduce the concrete temperature at placement, scheduling pours during cooler morning hours, and applying curing compounds or wet curing immediately after finishing to prevent rapid moisture loss. High temperatures accelerate cement hydration, reduce workability, and increase the risk of plastic shrinkage cracking and thermal cracking.

**67. B** — Ten percent of two hundred anchors equals twenty anchors that must be proof-tested. The test anchors should be selected at random locations throughout the structure to provide a representative sample of the installation quality. Proof testing verifies that the installed anchors achieve the required pullout resistance specified by the structural engineer for the design loads.

**68. C** — A home energy audit evaluates the building's energy performance by identifying areas of energy loss including inadequate insulation, air leakage, inefficient HVAC equipment, and building envelope deficiencies. The audit provides recommendations for improvements that reduce energy consumption, lower utility costs, and improve occupant comfort. Energy audits are often performed before renovation projects to prioritize energy efficiency investments.

**69. B** — The flood test is a contractual specification requirement that the subcontractor is obligated to perform regardless of their confidence in the installation quality. The test provides objective verification of the membrane's waterproof integrity before the warranty is issued and before interior finishes conceal the roof assembly. Waiving a specified test based on the installer's assurance does not satisfy the contract requirements.

**70. B** — Advertising a free service and then charging for it after the contract is signed may constitute a deceptive trade practice under Oregon's Unlawful Trade Practices Act. The promotional offer created an expectation that the homeowner relied upon when signing the contract. Adding charges for services advertised as free is misleading and can result in legal liability and CCB disciplinary action.

**71. A** — Concrete typically reaches approximately sixty-five to seventy-five percent of its twenty-eight-day strength by day seven. A seven-day result of two thousand eight hundred psi represents approximately fifty-six percent of the specified five thousand psi, which is within the normal range for most concrete mix designs. The twenty-eight-day cylinder break will provide definitive confirmation, but the seven-day result does not indicate an immediate problem.

**72. C** — Omitting visual notification appliances fails to meet both ADA accessibility requirements and fire code provisions because occupants who are deaf or hard of hearing cannot be alerted to fire emergencies by audible alarms alone. Visual strobes provide the critical notification that enables these individuals to evacuate safely. The installation is incomplete without both audible and visual notification as required by code.

**73. C** — The building code typically provides two options for crawl space moisture management: a ventilated crawl space with operable vents and a ground vapor barrier, or a sealed conditioned crawl space with insulated walls, a continuous vapor barrier, and mechanical ventilation or conditioning. Each approach addresses moisture control through

different mechanisms, and the contractor should select the approach specified in the plans or most appropriate for the site conditions.

**74. D** — Water infiltration testing verifies the watertight integrity of the curtain wall installation by identifying leaks at joints, seals, gaskets, and glazing before interior finishes conceal the wall assembly. Discovering leaks after interior finishes are installed requires costly demolition to access and repair the leak source. Pre-finish testing allows the contractor to identify and correct deficiencies while the assembly is still accessible.

**75. A** — Professional liability insurance covers claims arising from the contractor's professional errors, omissions, or negligent acts in providing design, engineering, or consulting services. This coverage is particularly important for design-build contractors who assume design responsibility as part of their contract. General liability insurance does not cover professional services claims, making professional liability insurance a separate and essential coverage.

**76. C** — Commissioning involves systematic testing, adjusting, and verification that all building automation system components function correctly, interact as designed, and perform the specified sequences of operation. This process confirms that the HVAC, lighting, and security systems deliver the intended building performance. Without commissioning, the systems may operate improperly, wasting energy and failing to provide the designed comfort and functionality.

**77. D** — Oregon law requires written change orders for residential construction projects, and the absence of written documentation significantly weakens the contractor's ability to prove the homeowner authorized the additional work and agreed to the price. Verbal change orders are difficult to enforce in disputes because they rely on one party's word against the other. The contractor should always insist on written change orders before performing additional work.

**78. B** — Unsealed seams in the vapor barrier allow moisture to migrate through the gaps and penetrate the concrete slab from below. This moisture can cause floor coating adhesion failure, efflorescence on the slab surface, and damage to stored goods that are sensitive to moisture. All vapor barrier seams must be sealed with manufacturer-approved tape to create a continuous moisture barrier beneath the slab.

**79. B** — Assigning manufacturer warranties to the building owner ensures the owner has direct access to warranty coverage for equipment repairs and replacements that may be needed after the contractor's one-year workmanship warranty expires. Many equipment manufacturers provide warranties of five, ten, or more years that extend well beyond the contractor's warranty period. Direct assignment gives the owner a clear path to warranty service without going through the contractor.

**80. D** — Total revenue equals the original contract price of one million two hundred thousand dollars plus approved change orders of one hundred forty-five thousand dollars, totaling one million three hundred forty-five thousand dollars. Subtracting the actual costs of one million one hundred eighty thousand dollars yields a gross profit of one hundred sixty-five thousand dollars. This represents the contractor's profit before deducting home office overhead and other non-project expenses.