PRACTICE EXAM 17: OREGON CCB SIMULATION (80 QUESTIONS)

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

1. A residential contractor in Oregon signs a contract for a whole-house remodel valued at one hundred ten thousand dollars. The homeowner asks the contractor to begin demolition immediately and offers to pay fifty percent of the contract price as a down payment. Under Oregon law, how should the contractor respond?

A. Accept the fifty percent down payment because the homeowner voluntarily offered the amount without any coercion
B. Accept the payment but deposit it into a separate escrow account until the demolition phase is fully completed
C. Decline the offer and explain that Oregon law limits the down payment unless a different amount is specified in the written contract terms
D. Accept the payment because down payment restrictions apply only to contracts under fifty thousand dollars in Oregon

2. A contractor is preparing a bid for a commercial office renovation. The project specifications require the contractor to submit a list of proposed material substitutions at least thirty days before the scheduled installation date. What is the primary purpose of this submittal requirement?

A. To allow the contractor to lock in material pricing with suppliers before the manufacturer's price increase takes effect
B. To give the architect or engineer adequate time to review the proposed substitution and verify that it meets the design intent and performance specifications
C. To provide the building inspector with advance notice of all materials that will be installed during the renovation project
D. To satisfy the insurance company's requirement for documentation of all materials used in commercial renovation projects

3. An Oregon contractor hires an employee who will operate a boom lift on a commercial construction project. Under OSHA regulations, what training must the employee complete before operating the boom lift?

A. A four-hour online aerial lift safety awareness course from any commercial training provider is sufficient for certification
B. The employee must hold a valid commercial driver's license because boom lifts are classified as motor vehicles on job sites
C. No formal training is required if the employee has more than five years of general construction experience on similar projects
D. The employer must ensure the employee receives training on the specific type of aerial lift being used, including pre-operation inspection, safe operating procedures, and workplace hazards

4. A homeowner hires a contractor to build a detached workshop on their residential property. The contractor completes the foundation and framing but then abandons the project without explanation or legal justification. Under Oregon law, what remedies are available to the homeowner?

A. The homeowner may pursue only a claim against the contractor's surety bond and has no right to file a lawsuit in court
B. The homeowner must wait ninety days after the abandonment before taking any legal action against the contractor
C. The homeowner may file a CCB complaint, pursue a claim against the contractor's surety bond, and file a civil lawsuit for breach of contract and damages
D. The homeowner's sole remedy is to hire another contractor and deduct the additional cost from the original contract balance

5. A contractor is estimating the roofing material needed for a simple gable roof. Each side of the roof measures fifty feet long and eighteen feet from eave to ridge. The roofing material manufacturer recommends a ten percent waste factor. How many squares of roofing material should the contractor order?

A. Eighteen squares based on the total roof area without any waste factor applied to the material quantity calculation
B. Fifteen squares based on a reduced roof area that accounts for the ridge cap and starter strip already included separately
C. Approximately twenty squares based on the total roof area of one thousand eight hundred square feet plus the ten percent waste factor
D. Twenty-two squares based on the total roof area plus a twenty percent waste factor for the gable roof configuration

6. Under Oregon employment law, an employer discovers that a current employee has an outstanding warrant for a non-violent misdemeanor offense that occurred before the employee was hired. The employee's job performance has been excellent. Can the employer terminate the employee solely based on the outstanding warrant?

A. Yes, because employers have an unconditional right to terminate any employee with a criminal record in Oregon at any time
B. Yes, but only if the employer included a criminal background check provision in the original employment application form
C. No, because Oregon law absolutely prohibits employers from considering any criminal history in employment decisions
D. Oregon's ban-the-box law restricts when and how employers may consider criminal history, and terminating solely based on an unrelated outstanding warrant without a legitimate business justification could expose the employer to legal challenge

7. A contractor is managing a commercial project and the owner's representative issues a directive to the contractor to perform additional work that is clearly outside the original contract scope. The directive is verbal and the owner's representative refuses to put it in writing. What should the contractor do?

A. Perform the additional work immediately and include the cost on the next monthly progress payment application
B. Refuse to perform any additional work until the owner terminates the owner's representative for mismanagement
C. Perform the work and waive the right to additional compensation because verbal directives are binding on both parties
D. Document the verbal directive in writing, send written notice to the owner confirming the scope and requesting a formal change order before performing the additional work

8. A contractor is building a residential addition and the structural plans require Simpson Strong-Tie hurricane clips at every rafter-to-top-plate connection. The contractor's crew installs the clips at every other rafter instead. What is the primary consequence of this installation error?

A. The roof structure has reduced uplift resistance that does not meet the engineered design, creating a structural deficiency that will fail inspection and compromise wind resistance
B. The installation is acceptable because hurricane clips at every other rafter provide adequate uplift resistance for residential structures
C. The installation passes inspection if the contractor installs additional blocking between the rafters to compensate for the missing clips

D. The building inspector issues a conditional approval allowing occupancy while the contractor installs the remaining clips within sixty days

9. Under Oregon construction lien law, a material supplier delivers lumber to a residential construction project. The supplier has no direct contract with the homeowner. To preserve lien rights, what must the supplier do?

A. Deliver a notice of right to a lien to the homeowner within eight business days of first furnishing materials to the residential project
B. File a preliminary lien notice with the county recorder within thirty days of the first material delivery to the project
C. Register with the CCB as an approved material supplier before delivering any materials to the residential construction project
D. Obtain a signed acknowledgment from the homeowner confirming receipt of all materials delivered to the project site

10. A contractor is hired to install a new HVAC system in a commercial building. The specifications require all ductwork to be sealed with mastic at all joints and connections. The contractor's crew uses standard duct tape instead of mastic sealant. What is the primary problem with this substitution?

A. Standard duct tape is more expensive than mastic sealant and will increase the project cost beyond the approved budget
B. Standard duct tape meets the same performance requirements as mastic and the substitution has no practical consequence
C. The building inspector will accept duct tape if it is applied in a double layer at all joints and connections throughout the system
D. Standard duct tape deteriorates over time and does not provide the permanent airtight seal that mastic provides, resulting in energy loss, reduced system efficiency, and potential inspection failure

11. A contractor operating as an LLC in Oregon has two members who both work on construction projects. One member wants to be exempt from workers' compensation coverage. Under Oregon law, can LLC members elect an exemption?

A. All LLC members are automatically exempt from workers' compensation and cannot elect to be covered under any circumstance
B. LLC members are always required to carry workers' compensation coverage regardless of their ownership status in the company

C. LLC members may elect an exemption from workers' compensation coverage by filing the appropriate documentation, but the exemption applies only to the electing members and not to any employees
D. Only the managing member of the LLC may elect an exemption, while all other members must be covered by the policy

12. A contractor submits a bid on a public school construction project in Oregon. The bid includes a subcontractor for the electrical work. After the bid is submitted and the contractor is awarded the project, the electrical subcontractor withdraws. Under Oregon public contracting law, can the contractor substitute a different electrical subcontractor?

A. Yes, the contractor may substitute any subcontractor at any time without restriction on public construction projects in Oregon
B. The contractor may substitute the subcontractor only with the approval of the contracting agency and only for cause as defined by Oregon public contracting law
C. No, the contractor must use the listed subcontractor regardless of the circumstances or forfeit the contract entirely
D. Yes, but only if the replacement subcontractor submits a bid that is lower than the original subcontractor's quoted price

13. A contractor is pouring a concrete patio and the homeowner asks why control joints are being cut into the surface. What is the correct explanation for the purpose of control joints in a concrete slab?

A. Control joints increase the compressive strength of the concrete slab by creating thicker sections between each joint
B. Control joints provide expansion space that allows the concrete to grow larger during hot summer weather conditions
C. Control joints serve only as a decorative element that divides the slab into visually appealing geometric sections
D. Control joints create weakened planes that guide inevitable concrete shrinkage cracking to occur at predetermined locations rather than randomly across the slab surface

14. A contractor's project requires temporary power during construction. The contractor arranges for a temporary electrical service to be installed on the jobsite. Under OSHA regulations, what protection is required for all temporary receptacle outlets on the construction site?

A. Ground-fault circuit interrupter protection is required for all one hundred twenty-volt, single-phase, fifteen- and twenty-ampere temporary receptacle outlets

B. Only receptacle outlets located within six feet of a water source require ground-fault circuit interrupter protection
C. Temporary receptacle outlets require only standard circuit breaker protection without ground-fault circuit interrupter devices
D. Ground-fault circuit interrupter protection is required only for receptacles used to power hand-held tools and portable equipment

15. A general contractor discovers that a painting subcontractor has been disposing of leftover latex paint by pouring it on the ground behind the building under construction. Under Oregon environmental regulations, what is the contractor's obligation?

A. Stop the improper disposal immediately, properly clean up the contaminated area, and ensure all paint waste is disposed of according to applicable environmental regulations
B. Document the improper disposal in the daily log but take no corrective action because the subcontractor is an independent entity
C. Notify the painting subcontractor by email and allow them seven business days to correct the disposal practice independently
D. Continue the project because latex paint is classified as a non-hazardous material and ground disposal is permitted in Oregon

16. A contractor is reviewing a set of construction documents and notices that the general notes on the structural drawings require all anchor bolt embedment depths to meet ACI three-eighteen requirements. The contractor is unfamiliar with this standard. What does ACI three-eighteen govern?

A. The design and installation requirements for structural steel connections in commercial and industrial building construction
B. The building code requirements for structural concrete, including the design, materials, construction, and inspection of concrete structures and their components
C. The fire-resistance rating requirements for all structural assemblies in commercial buildings exceeding three stories in height
D. The seismic design requirements for non-structural building components such as mechanical equipment and light fixtures

17. A contractor is building a commercial structure and the mechanical engineer specifies a variable refrigerant flow HVAC system. During installation, the contractor's crew discovers that the refrigerant piping runs are longer than the manufacturer's maximum allowable length. What should the contractor do?

A. Install the piping at the extended length because VRF systems are designed with sufficient capacity to compensate for longer runs
B. Reduce the pipe diameter to increase refrigerant velocity and maintain adequate system performance over the longer distance
C. Notify the mechanical engineer of the piping length issue and request a design revision or alternative equipment selection that accommodates the actual building conditions
D. Add additional refrigerant charge beyond the manufacturer's specification to compensate for the pressure drop in the longer piping run

18. Under Oregon law, a contractor performs work on a residential property and the homeowner pays with a personal check. The check bounces due to insufficient funds. What are the contractor's rights regarding the returned check?

A. The contractor may pursue collection of the original amount plus any bank fees incurred and may also be entitled to statutory damages for a dishonored check under Oregon law
B. The contractor must write off the loss because Oregon law does not provide remedies for returned checks on construction contracts
C. The contractor may file a criminal complaint but cannot pursue civil remedies for the returned check amount owed
D. The contractor may immediately file a construction lien without providing the preliminary notice that would normally be required

19. A contractor is scheduling a residential project and assigns a concrete crew to pour the foundation and the garage slab on the same day. The foundation walls require three thousand psi concrete and the garage slab requires four thousand psi concrete. What is the most important quality control measure for this dual-pour operation?

A. Using the same concrete mix for both pours to simplify the ordering process and reduce the chance of delivery errors
B. Verifying that each concrete truck is delivering the correct mix design by checking the batch ticket against the specifications before each pour begins
C. Pouring both elements simultaneously using two concrete pumps to reduce the total crew time needed on the project
D. Adding water to the higher-strength mix at the jobsite to make it flow more easily into the garage slab forms

20. A contractor is hired to install a commercial fire alarm system. The system design requires smoke detectors in every office, corridor, and common area. During installation, the contractor realizes that the wire run to a remote storage room exceeds the maximum circuit distance specified by the fire alarm panel manufacturer. What should the contractor do?

A. Install the detector at the extended distance because fire alarm systems have built-in tolerance for longer wire runs
B. Notify the fire alarm system designer and request a solution such as adding a secondary panel, using a different wire gauge, or relocating equipment to accommodate the extended distance
C. Omit the detector in the remote storage room because the building code does not require smoke detection in storage areas
D. Splice the wire at the midpoint to reduce the effective circuit distance and install the detector at the original location

21. A contractor is reviewing a construction contract that contains an indemnification clause requiring the contractor to indemnify the owner against claims arising from the contractor's negligence. Under Oregon law, what limitation exists on indemnification clauses in construction contracts?

A. Oregon law voids construction contract provisions that require a contractor to indemnify another party for liability arising from the other party's own negligence
B. Indemnification clauses are enforceable without any limitation in Oregon as long as both parties sign the contract voluntarily
C. Indemnification clauses are limited to one hundred thousand dollars per occurrence in Oregon construction contracts
D. Oregon law requires all indemnification clauses to be reviewed and approved by the CCB before they become enforceable

22. A contractor is building a residential home and the plans show a beam pocket in the foundation wall for a steel support beam. The beam pocket dimensions on the plans are eight inches wide, twelve inches deep, and sixteen inches into the wall. The contractor pours the foundation without forming the beam pocket. What is the most appropriate corrective action?

A. Cut the beam pocket into the cured foundation wall using a concrete saw and chipping hammer, following the specified dimensions, with engineering approval for the modification
B. Rest the steel beam on top of the foundation wall and add a column beneath it as an alternative support method
C. Pour a new concrete pedestal on top of the foundation wall to match the required beam bearing elevation height
D. Reduce the beam size so it can bear on the standard wall plate without requiring a recessed pocket in the foundation

23. Under Oregon law, a general contractor on a residential project is responsible for the work performed by subcontractors hired for the project. If a plumbing subcontractor installs defective piping that causes water damage to the homeowner's property, who is liable to the homeowner for the resulting damages?

A. Only the plumbing subcontractor is liable because the subcontractor performed the defective installation independently
B. Only the general contractor's surety bond company is liable because the bond exists to cover all subcontractor defects
C. The homeowner must pursue the claim through the plumbing subcontractor's insurance carrier exclusively without any involvement from the general contractor
D. The general contractor is liable to the homeowner for the defective work because the general contractor is responsible for all work performed on the project, regardless of which subcontractor performed it

24. A contractor is managing a commercial project and the schedule shows negative float on several critical path activities. What does negative float indicate about the project status?

A. The project is behind schedule and the current plan shows that the work cannot be completed by the contractual completion date without corrective action such as acceleration or scope reduction
B. The project has excess resources assigned to critical activities that should be redistributed to non-critical work items
C. The schedule calculation contains an error because float values cannot be negative under any scheduling methodology
D. The critical path activities have been completed ahead of schedule and the negative value represents banked time

25. A contractor is installing a residential gas furnace and the installation requires a new gas supply line from the meter to the furnace location. Under Oregon mechanical and plumbing codes, what testing is required before the gas line can be placed in service?

A. A visual inspection of all fittings and connections by the installing contractor is sufficient to verify the integrity of the line
B. A soap bubble test at each threaded connection is the only testing method required for residential gas piping systems
C. A pressure test of the gas piping system at the pressure and duration specified by the applicable code must be performed and pass inspection before the line is charged with gas
D. No testing is required for residential gas lines shorter than fifty feet in total length from the meter to the appliance

26. A contractor's employee is working in a trench five feet deep in Type C soil. Under OSHA's excavation standard, what is the maximum allowable slope angle for the trench walls in Type C soil?

A. One and one-half horizontal to one vertical, which creates the shallowest slope angle, providing the greatest protection against cave-in in the most unstable soil classification
B. Three-quarters horizontal to one vertical, which is the standard slope angle for all soil types under OSHA regulations
C. One horizontal to one vertical, which is the standard slope requirement for Type B soil classifications under OSHA rules
D. Vertical walls are permitted in Type C soil if the trench will be open for fewer than twenty-four hours during the work shift

27. A contractor is reviewing the financial performance of the construction company and discovers that the accounts receivable aging report shows several invoices that are more than ninety days past due. What is the primary business risk associated with aged accounts receivable?

A. The contractor must immediately write off all invoices exceeding ninety days as bad debt on the company's income tax return
B. Cash flow deterioration that may prevent the contractor from meeting current payroll obligations, paying suppliers, and funding ongoing project operations
C. The contractor's CCB license is automatically suspended when accounts receivable exceed the company's total annual revenue
D. The contractor's bonding company cancels the surety bond when accounts receivable exceed sixty percent of the bond amount

28. A contractor is installing a residential bathroom exhaust fan. The building code requires the exhaust to be vented to the exterior of the building. The contractor's crew vents the exhaust fan into the attic space instead. What is the consequence of this improper installation?

A. The installation is acceptable because attic ventilation will dissipate the moisture before it causes any damage to the framing
B. The installation fails inspection because venting moisture-laden air into the attic promotes mold growth, wood rot, and condensation damage to the roof sheathing and framing members
C. The installation passes inspection if the attic has soffit and ridge ventilation that provides adequate natural air exchange
D. The installation is accepted conditionally if the contractor installs an additional attic ventilation fan to remove the exhaust moisture

29. A contractor is hired to perform a commercial roof replacement. The existing roof system contains built-up roofing with suspected asbestos-containing materials in the mastic and felt layers. Before beginning tear-off, what must the contractor do?

A. Proceed with the tear-off using standard personal protective equipment because built-up roofing materials are exempt from asbestos regulations
B. Remove the existing roof in large sections and transport it to a standard construction debris landfill for disposal immediately
C. Wet the existing roofing materials with water during removal to control dust and proceed with the tear-off without testing
D. Have the suspected materials sampled and tested by a certified laboratory, and if asbestos is confirmed, engage a licensed asbestos abatement contractor to remove the materials before proceeding

30. Under Oregon law, a contractor enters into a fixed-price contract for a residential project. During construction, lumber prices increase by twenty-five percent due to market conditions. Can the contractor demand additional payment from the homeowner to cover the increased material costs?

A. No, because a fixed-price contract places the risk of material cost fluctuations on the contractor, and the contractor is obligated to complete the work at the agreed price unless the contract contains an escalation clause
B. Yes, because Oregon law automatically adjusts fixed-price contracts when material costs increase by more than fifteen percent
C. Yes, but only if the contractor provides documentation showing the original material quotes and the current increased prices
D. No, but the contractor may reduce the quality of materials used to offset the cost increase without notifying the homeowner

31. A contractor is managing a large commercial project with multiple subcontractors. The contract requires the contractor to prepare and maintain a site-specific safety plan. Which of the following is a required element of a comprehensive construction safety plan?

A. A list of the nearest restaurants, gas stations, and hardware stores for worker convenience during breaks and lunch periods
B. The personal cell phone numbers of every worker on the project for emergency contact purposes during off-work hours
C. A copy of the contractor's annual financial statements to demonstrate the company's ability to pay for safety equipment
D. Hazard identification and assessment, emergency action procedures, fall protection plans, and site-specific training requirements for all workers

32. A contractor is building a commercial structure and the specifications require fire-rated caulking at all penetrations through fire-rated walls and floor assemblies. The contractor uses standard silicone caulk instead of fire-rated intumescent sealant. What is the consequence of this substitution?

A. Standard silicone caulk provides equivalent fire resistance because all silicone products are inherently fire-resistant materials
B. The substitution is acceptable if the contractor applies the standard silicone caulk in a double-thick application at each penetration
C. The building inspector issues a conditional pass allowing occupancy while the contractor schedules replacement of the caulking
D. The fire-rated assembly is compromised because standard silicone caulk melts and fails during fire exposure, allowing fire and smoke to spread through the penetrations and defeating the rated barrier

33. A contractor is reviewing a subcontract agreement that contains a flow-down clause. What does a flow-down clause do in a construction subcontract?

A. It transfers the surety bond requirements from the general contractor to the subcontractor for the specific scope of subcontracted work
B. It incorporates the terms and conditions of the prime contract into the subcontract, making the subcontractor bound by the same obligations the general contractor has to the owner
C. It transfers the general contractor's insurance coverage to the subcontractor for the duration of the subcontracted work
D. It requires the subcontractor to use the same material suppliers that the general contractor has pre-approved for the project

34. A contractor's employee is working on a scaffold and the scaffold is missing the required midrail on one side. The employee falls through the opening and is injured. Under OSHA regulations, who is responsible for the scaffold deficiency?

A. The scaffold manufacturer is solely responsible because the midrail should have been included in the scaffold kit at delivery
B. The injured employee is responsible because each worker must inspect their own work platform before beginning each shift
C. The employer is responsible for ensuring that scaffolds are erected, maintained, and inspected by a competent person and that all required components including midrails are in place before workers use the scaffold

D. The building owner is responsible because all scaffolding on the property is classified as a temporary structure under the owner's control

35. A contractor is hired to build a residential garage and the plans call for a four-inch concrete slab on grade with welded wire reinforcement. The contractor pours the slab but places the wire reinforcement directly on the ground before the pour, where it remains at the bottom of the slab. What is the problem with this reinforcement placement?

A. The wire reinforcement must be placed above the slab surface and covered with a thin topping layer of concrete for protection
B. Wire reinforcement placed at the bottom of the slab provides minimal crack resistance because it must be positioned near the middle or upper third of the slab thickness to be effective against surface cracking
C. The placement is acceptable because wire reinforcement functions the same regardless of its vertical position within the slab
D. The wire reinforcement should have been placed below the vapor barrier rather than on top of the subgrade material

36. Under Oregon law, what is the statute of limitations for filing a breach of contract claim related to a residential construction project?

A. Two years from the date the homeowner discovers the breach or should have discovered the defect through reasonable inspection
B. Twelve months from the date of substantial completion of the residential construction project as certified by the building inspector
C. Ten years from the date the construction contract was originally signed by both parties regardless of when the breach occurred
D. Six years from the date the breach of contract occurred, which is the general statute of limitations for contract claims in Oregon

37. A contractor is installing commercial vinyl composition tile flooring. The specifications require the contractor to verify that the concrete slab moisture levels are within acceptable limits before installing the tile. The contractor skips the moisture testing and installs the tile directly. Within six months, the tile begins to buckle and separate from the slab. What is the contractor's liability?

A. The tile manufacturer bears liability because the product should have been formulated to resist moisture from below the concrete slab
B. The architect bears liability because the specifications should have required a vapor barrier beneath the slab during original construction

C. The building owner bears liability because the owner approved the installation schedule that did not include time for moisture testing
D. The contractor bears liability for the failure because the contractor skipped the required moisture testing specified in the project documents and installed the tile on a slab that was too wet

38. A contractor is managing a residential project and discovers that the framing lumber delivered to the site is marked as SPF (spruce-pine-fir) grade two, but the structural plans specify Douglas fir number two. Can the contractor use the delivered SPF lumber as a substitute?

A. Yes, because all softwood species are structurally identical and may be substituted freely without engineering review
B. Yes, because SPF grade two has higher allowable stress values than Douglas fir number two in all loading conditions
C. No, because SPF and Douglas fir have different structural properties, and the substitution requires the structural engineer's written approval to verify adequacy for the specific loading conditions
D. No, because only Douglas fir lumber may be used for structural framing in residential construction under Oregon building codes

39. A contractor is performing a residential renovation and encounters vermiculite insulation in the attic. The vermiculite appears to be the type commonly associated with asbestos contamination. What should the contractor do before disturbing this insulation?

A. Remove the vermiculite using standard insulation removal equipment because vermiculite is classified as non-hazardous material
B. Wet the vermiculite with a garden hose to suppress dust and remove it with shovels into standard trash bags for disposal
C. Notify the homeowner that vermiculite must be removed immediately because it is always contaminated with asbestos fibers
D. Treat the vermiculite as potentially contaminated, avoid disturbing it, inform the homeowner of the potential asbestos risk, and recommend professional testing before any disturbance occurs

40. A contractor is building a multi-story commercial structure and the specifications require the contractor to install temporary barricades and warning signs around the construction perimeter. A pedestrian ignores the warning signs, enters the construction zone, and is injured by falling debris. Under Oregon premises liability law, does the contractor have potential liability for the pedestrian's injuries?

A. No, because the warning signs and barricades eliminate all contractor liability for injuries to trespassers who ignore the posted warnings
B. Yes, the contractor may have liability if the barricades and warning measures were inadequate to prevent unauthorized entry, or if the contractor failed to take reasonable precautions to protect foreseeable trespassers from known hazards
C. No, because the contractor's liability ends at the property line and the public sidewalk is outside the construction zone boundaries
D. Yes, but only if the pedestrian can prove that a contractor employee personally invited them into the construction zone area

41. A residential contractor in Oregon wants to expand into commercial construction. What licensing change is required to perform commercial work in Oregon?

A. The contractor must obtain a commercial general contractor endorsement on their CCB license by meeting the applicable bonding, insurance, and experience requirements
B. No licensing change is needed because a residential CCB license authorizes all types of construction work in the state
C. The contractor must pass a separate commercial contractor examination administered by the CCB before obtaining the endorsement
D. The contractor must close the residential business and form a new legal entity to apply for a commercial contractor license

42. A project manager is reviewing change order requests on a commercial project. One change order increases the contract price by forty-five thousand dollars and extends the schedule by twelve working days. Before approving the change order, what should the project manager verify?

A. That the change order has been submitted to the CCB for registration within five business days of the owner's request
B. That the cost is reasonable and supported by documentation, the time extension is justified based on the scope of additional work, and the change order is properly authorized by the parties with contractual authority
C. That the total accumulated change orders do not exceed ten percent of the original contract price as required by Oregon law
D. That the bonding company has approved the change order amount before the owner signs the change order document

43. Under Oregon law, a contractor is required to include specific warranty information in residential construction contracts. What is the minimum implied warranty coverage that Oregon law provides on residential construction projects?

A. Oregon provides a ninety-day warranty on all residential construction work measured from the date of final payment
B. Oregon implies a warranty of workmanlike construction on residential projects, meaning the work must be performed with the skill and care that a reasonably competent contractor would exercise for similar work
C. Oregon provides a five-year express warranty on structural components and a one-year warranty on all other work items
D. Oregon does not provide any implied warranty on residential construction and all warranty terms must be in the written contract

44. A contractor is installing a residential electrical panel and must determine the correct branch circuit wire size for a thirty-ampere dryer circuit. Under the National Electrical Code, what is the minimum wire size for this circuit?

A. Number fourteen AWG copper wire, which is rated for fifteen-ampere circuits in residential wiring applications
B. Number twelve AWG copper wire, which is rated for twenty-ampere circuits in residential branch circuit installations
C. Number ten AWG copper wire, which is the minimum size rated for thirty-ampere branch circuits in residential applications
D. Number eight AWG copper wire, which is required for all two hundred forty-volt circuits regardless of the amperage rating

45. A contractor discovers during a bathroom renovation that the existing floor joists beneath the bathtub are undersized and show signs of deflection and stress. The renovation scope does not include structural work. What is the contractor's professional obligation?

A. Inform the homeowner of the structural concern in writing, recommend evaluation by a structural engineer, and address the issue through a change order before installing the new bathtub to avoid loading an inadequate structure
B. Install the new bathtub on the existing joists because the structural system is outside the contracted scope of renovation work
C. Reinforce the joists with additional lumber at the contractor's expense because the contractor has a duty to correct all deficiencies
D. Reduce the weight of the new bathtub by selecting a lighter model that places less load on the undersized floor joists

46. A contractor is bidding on a prevailing wage project and needs to calculate the total labor burden for a journeyman electrician. The prevailing wage rate is fifty-five dollars per hour including fringes. The contractor must also account for payroll taxes, workers' compensation insurance, and general liability insurance on top of the prevailing wage. What does the total labor burden represent?

A. The net hourly wage paid to the electrician after deducting all taxes, insurance, and union dues from the gross pay
B. The electrician's hourly wage only, because all payroll taxes and insurance are paid from the contractor's overhead budget
C. The total cost of the electrician's annual salary divided by two thousand eighty working hours per year for budgeting purposes
D. The fully loaded hourly cost including the prevailing wage rate plus all employer-paid payroll taxes, workers' compensation, general liability, and other mandatory insurance costs assessed on the labor

47. A contractor's project requires a crane to lift a thirty-thousand-pound precast concrete panel to the third floor of a commercial building. Before the lift, what is the most critical safety document the contractor must prepare and review?

A. A lift plan that includes the load weight, crane capacity at the required radius, rigging configuration, ground conditions, wind limitations, and the designated signal person and qualified rigger assignments
B. A general construction safety plan that covers all daily operations on the jobsite but does not address specific crane lifts
C. An OSHA crane permit application submitted to the regional OSHA office at least seventy-two hours before the scheduled lift
D. A certificate of insurance from the crane rental company confirming coverage for the specific load weight being lifted

48. A residential contractor in Oregon completes a project and provides the homeowner with a detailed final invoice. The homeowner disputes a portion of the invoice claiming the charges exceed the contract price. Under Oregon law, what is the homeowner's right regarding the disputed amount?

A. The homeowner must pay the full invoiced amount within thirty days and then pursue a separate claim for the disputed amount
B. The homeowner may withhold the disputed amount while paying the undisputed portion, provided the homeowner communicates the basis for the dispute to the contractor
C. The homeowner may withhold the entire invoice until the contractor provides a line-by-line cost breakdown verified by an independent auditor

D. The homeowner forfeits all dispute rights if they do not file a formal objection with the CCB within ten business days of receiving the invoice

49. A contractor is building a residential home in an area with a high water table. The foundation design includes a perimeter drain system and sump pit. What is the primary purpose of the perimeter drain system in this application?

A. To collect and redirect groundwater away from the foundation, reducing hydrostatic pressure against the foundation walls and preventing water infiltration into the basement or crawl space
B. To provide an irrigation system for the landscaping surrounding the foundation using collected rainwater from the downspouts
C. To serve as a conduit for running electrical and plumbing utilities along the building perimeter beneath the foundation slab
D. To ventilate the soil beneath the foundation slab and prevent the buildup of radon gas in the living space above

50. A contractor is reviewing a construction contract and finds a clause requiring substantial completion within two hundred forty calendar days of the notice to proceed. The contract defines substantial completion as the point at which the work is sufficiently complete so the owner can occupy or use the building for its intended purpose. At day two hundred forty, the building is usable but a punch list of twenty minor items remains. Has the contractor achieved substantial completion?

A. No, because substantial completion requires every item on the punch list to be completed before the milestone is achieved
B. No, because substantial completion is only achieved when the architect issues a certificate of occupancy from the building department
C. Yes, because substantial completion is achieved when the building is sufficiently complete for its intended use, and minor punch list items do not prevent occupancy or use of the facility
D. Yes, but only if the owner signs a written acceptance of the building in its current condition before the contractor addresses any punch list items

51. Under Oregon employment law, an employer must provide workers with a safe and healthy workplace. A construction worker reports that they are experiencing symptoms of heat illness while working outdoors in ninety-five-degree temperatures. What is the employer's immediate obligation?

A. Provide immediate access to shade, water, and rest, and if symptoms suggest heat stroke or severe heat illness, call emergency medical services without delay

B. Allow the worker to continue working at a reduced pace while monitoring their symptoms for the remainder of the shift
C. Send the worker home without pay because heat illness is a personal health condition unrelated to employment activities
D. Document the complaint in the daily safety log and schedule a follow-up medical evaluation for the following business day

52. A contractor is building a commercial parking garage and the structural plans specify post-tensioned concrete for the elevated floor slabs. During the stressing operation, one of the tendons fails and snaps. What immediate action should the contractor take?

A. Restress the broken tendon by splicing it with a coupler and continuing the stressing sequence without further evaluation
B. Evacuate all workers from the immediate area, secure the site, and notify the structural engineer to evaluate the failed tendon and determine the appropriate repair procedure
C. Abandon the affected slab pour and remove all concrete and reinforcement to start the pour over from the beginning
D. Continue stressing the remaining tendons because a single failed tendon does not affect the overall structural capacity of the slab

53. A contractor is installing a fire sprinkler system in a commercial building and the plans show sprinkler heads in a specific grid pattern based on the hazard classification of each room. The contractor installs the sprinkler heads at wider spacing than shown on the plans to reduce material costs. What is the consequence of this modification?

A. The system passes inspection if the total number of sprinkler heads meets the minimum count specified in the fire protection plan
B. The wider spacing is acceptable because modern sprinkler heads have larger coverage areas than the heads specified in the original design
C. The fire sprinkler system will fail inspection because the sprinkler head spacing exceeds the maximum coverage area per head allowed by the applicable fire protection standard and the approved plans
D. The fire marshal approves the modification if the contractor demonstrates that water pressure at the most remote head exceeds the minimum required pressure for the system

54. A contractor is managing a project and the owner requests weekly progress reports. What information should a comprehensive weekly progress report include?

A. Only the total percentage of project completion and the estimated number of remaining working days to complete all work

B. Only a list of change orders processed during the week and the total number of workers on site for each day of the week
C. Work completed during the week, work planned for the following week, schedule status, budget status, safety incidents, weather impacts, and any issues requiring resolution
D. Only photographs of the construction progress with captions describing each image taken during the weekly site inspection

55. A contractor is building a residential home and the plans call for a twenty-four-inch-wide footing for the foundation walls. During excavation, the contractor discovers that the bearing soil is softer than anticipated. The footing as designed may not provide adequate bearing capacity. What should the contractor do?

A. Pour the footing as designed because the structural engineer is solely responsible for soil bearing capacity determinations
B. Widen the footing to thirty-six inches at the contractor's discretion to increase the bearing area without consulting the engineer
C. Compact the soft soil with a plate compactor until it feels firm and then pour the footing at the specified width without testing
D. Stop work, notify the structural engineer and the homeowner of the soil condition, and request a geotechnical evaluation and revised footing design before proceeding with the foundation

56. A contractor is operating a construction business and receives notification from the Oregon Department of Revenue that the business owes unpaid state payroll taxes. The contractor ignores the notification for six months. What escalating consequence may the contractor face?

A. The Department of Revenue issues a second courtesy reminder with no additional penalties applied to the original tax amount
B. The CCB automatically renews the contractor's license and the tax obligation is deferred until the next biennial renewal period
C. The unpaid taxes are forgiven if the contractor files an amended return showing reduced gross revenue during the tax period
D. The Department of Revenue may assess penalties and interest on the unpaid balance, file tax liens against the contractor's property, and potentially pursue wage garnishment or asset seizure

57. A contractor is building a wood-framed residential structure and the building code requires a fire separation wall between the house and the attached garage. What is the minimum fire-resistance rating required for this separation wall under the Oregon Residential Specialty Code?

A. A one-hour fire-resistance rating using type X fire-rated gypsum board installed on the garage side of the wall assembly
B. A minimum of one-half-inch gypsum board applied to the garage side of the wall, or other approved materials providing the required separation as specified by the applicable residential code
C. A two-hour fire-resistance rating using double layers of type X gypsum board on both sides of the wall framing assembly
D. No fire-resistance rating is required if the garage is equipped with a code-compliant automatic fire sprinkler suppression system

58. A contractor is reviewing insurance options for the construction business and considers purchasing an umbrella liability policy. What type of coverage does an umbrella policy provide?

A. Coverage for employee injuries that exceed the limits of the contractor's workers' compensation insurance policy limits
B. Coverage for property damage to the contractor's own equipment, tools, and vehicles stored at the office or on project sites
C. Coverage for construction defects discovered after the warranty period has expired on completed residential construction projects
D. Additional liability coverage that sits above the limits of the contractor's underlying general liability, auto liability, and employers' liability policies, providing a higher total coverage limit

59. A contractor is performing a commercial building renovation and the specifications require continuous insulation on the exterior walls to meet the energy code. The contractor installs the insulation with gaps and uninsulated areas at wall penetrations and transitions. What is the consequence of this installation deficiency?

A. The energy code inspector approves the installation if the total insulation coverage exceeds eighty-five percent of the exterior wall area
B. The insulation passes inspection because the energy code allows gaps at penetrations and transitions where continuous coverage is impractical
C. The installation fails the energy code inspection because gaps and uninsulated areas create thermal bridges that reduce the wall assembly's overall thermal performance below the code requirement
D. The building inspector defers the energy code evaluation to the mechanical engineer who designed the HVAC system for the building

60. A contractor is building a residential deck with a ledger board attachment to the house. The building code requires lag screws or through-bolts to secure the ledger to the house framing.

The contractor uses deck screws instead of the specified fasteners. What is the structural concern with this substitution?

A. Deck screws provide equivalent withdrawal resistance to lag screws and the substitution has no structural impact on the connection
B. Deck screws are acceptable for ledger attachment if they are installed at half the spacing specified for lag screws in the original plans
C. The building inspector accepts deck screws if the contractor installs a metal ledger connector bracket at each joist location along the ledger
D. Deck screws do not provide the shear strength and withdrawal resistance required for the ledger connection, creating a potential structural failure point that could cause the deck to separate from the house

61. A contractor is hired to construct a retaining wall on a residential property. The geotechnical report recommends a specific drainage system behind the wall to relieve hydrostatic pressure. The contractor omits the drainage system to reduce costs. Two years later, the retaining wall fails due to hydrostatic pressure buildup. What is the contractor's liability?

A. No liability because the geotechnical engineer's recommendation was advisory and the contractor is not required to follow engineering recommendations
B. Liability limited to the original contract price because the contractor's total exposure is capped by the contract amount for the retaining wall
C. The contractor bears liability for the wall failure and resulting damages because the contractor deviated from the geotechnical recommendations by omitting a critical drainage component that directly caused the failure
D. The homeowner bears liability because the homeowner approved the final construction and should have noticed the missing drainage system

62. Under Oregon law, a contractor who fails to obtain a required building permit before performing work on a residential project may face which of the following consequences?

A. A verbal warning from the building department for the first offense with no monetary penalty or required corrective action
B. Monetary penalties from the building department, potential CCB disciplinary action, and the requirement to expose completed work for inspection which may require demolition of finished construction
C. Automatic revocation of the contractor's CCB license for a minimum period of one year with no option for reinstatement
D. The homeowner assumes all liability for the unpermitted work and the contractor faces no consequences from any regulatory agency

63. A contractor is managing a commercial project and the owner's lender requires the contractor to provide monthly lien waivers from all subcontractors and material suppliers before each progress payment is released. What is the purpose of this requirement?

A. To verify that all subcontractors hold active CCB licenses during the current month of the construction project
B. To confirm that subcontractors and suppliers have been paid for previous work and materials, reducing the risk of construction liens being filed against the property that would affect the lender's security interest
C. To transfer all insurance liability from the subcontractors to the general contractor for the duration of the construction project
D. To authorize the lender to withhold funds from the contractor's construction loan if any subcontractor files a formal complaint

64. A contractor is installing a commercial elevator and discovers that the elevator shaft dimensions do not match the elevator manufacturer's specifications. The shaft is two inches narrower than required. What should the contractor do?

A. Install the elevator as planned because two inches of clearance reduction has no impact on elevator function or safety compliance
B. Modify the elevator cab dimensions to fit the narrower shaft without notifying the elevator manufacturer or the building inspector
C. Install temporary shims between the elevator rails and the shaft walls to compensate for the reduced clearance dimension
D. Stop the elevator installation, notify the architect and elevator manufacturer of the dimensional discrepancy, and determine whether the shaft must be modified or the elevator equipment must be changed

65. A contractor is reviewing a project budget and needs to understand the difference between direct costs and indirect costs. The contractor's project has a site superintendent assigned full-time to the project. How should the superintendent's salary be classified?

A. As a direct project cost because the superintendent is assigned exclusively to this project and their salary is directly attributable to the project's operations
B. As an indirect cost because supervisory salaries are always classified as company overhead regardless of the assignment
C. As a general and administrative expense because all management personnel costs are classified as corporate overhead
D. As a contingency expense because the superintendent's salary fluctuates based on the project's schedule performance

66. A contractor is building a commercial structure and the fire protection engineer requires a fire pump to boost water pressure for the sprinkler system. The pump room must meet specific building code requirements. Which requirement applies to the fire pump room?

A. The fire pump room may be located anywhere in the building as long as it has a standard hollow-core door for maintenance access
B. The fire pump room must be located on the top floor of the building to maximize gravity-fed water pressure to all floors below
C. The fire pump room must be separated from the rest of the building by fire-rated construction and must have direct exterior access or access from a fire-rated corridor as required by the applicable code
D. The fire pump room requires no special construction because the pump itself is enclosed in a fire-rated equipment housing

67. A contractor is managing a residential project and the homeowner asks the contractor to hire the homeowner's unlicensed friend to perform the electrical wiring for the addition. The friend is an experienced electrician but does not hold a current Oregon electrical license. What should the contractor do?

A. Hire the friend because the general contractor's license covers all work performed by individuals working under the contractor's supervision
B. Hire the friend as a laborer and have them perform the electrical work under the general contractor's direct supervision daily
C. Decline to hire the friend for electrical work because Oregon law requires electrical work to be performed by licensed electricians, and the contractor could face CCB and electrical board penalties for allowing unlicensed work
D. Hire the friend but require them to obtain a temporary electrical work permit from the local building department before starting

68. A contractor is performing earthwork on a commercial site and the specifications require compaction of the fill material to ninety-five percent of maximum dry density as determined by a modified Proctor test. Who typically performs the compaction testing to verify compliance with this specification?

A. An independent geotechnical testing laboratory performs the compaction testing as a quality assurance measure to verify the contractor's work meets the specified density requirements
B. The contractor's equipment operator verifies compaction by driving the compactor over the fill until the surface feels firm and stable
C. The building inspector performs the compaction testing using a nuclear density gauge as part of the standard foundation inspection

D. The civil engineer who designed the grading plan performs all compaction testing as part of the engineering services contract

69. A contractor is reviewing a project insurance requirement and the owner requires the contractor to name the owner as an additional insured on the contractor's general liability policy. What does this designation provide to the owner?

A. Coverage for the owner's personal property stored at the owner's office or residence during the construction project duration
B. Authority for the owner to modify the contractor's insurance policy terms, limits, and deductibles without the contractor's consent
C. An ownership interest in the contractor's insurance policy that allows the owner to collect the policy limits in the event of cancellation
D. Protection for the owner against third-party claims arising from the contractor's operations on the project, effectively extending the contractor's liability coverage to include the owner as a covered party

70. A contractor is building a residential home and the plans call for a truss roof system. The trusses are delivered to the site and stored for two weeks before installation. The trusses are stacked flat on the ground without supports and are exposed to rain. What is the primary concern with this storage method?

A. The trusses gain weight from absorbed moisture which may overload the crane during the lifting operation on installation day
B. Trusses stored flat without proper support can develop permanent deformation, warping, or damage from ground moisture and uneven bearing, potentially compromising their structural integrity
C. Ground-stored trusses attract termite infestation within the two-week storage period that will spread to the completed structure
D. The truss manufacturer's warranty is voided only if the trusses are stored on the ground for more than thirty consecutive days

71. A contractor is managing a commercial project and the mechanical subcontractor submits a request for early release of retainage. The subcontractor claims that all mechanical work is complete and has passed final inspection. Under standard contract terms, when is retainage typically released to a subcontractor?

A. Retainage is released immediately upon the subcontractor's submission of a written request regardless of the project's overall status

B. Retainage is released when the subcontractor completes a majority of their scope, typically at the seventy-five percent completion mark
C. Retainage is released monthly in equal installments over the final three months of the subcontractor's contract performance period
D. Retainage is typically released after the subcontractor's work is complete and accepted, all close-out documentation is submitted, and the conditions specified in the subcontract for retainage release are satisfied

72. Under Oregon law, a homeowner hires a contractor to remodel a kitchen. The contract requires the contractor to obtain all necessary permits. The contractor obtains the building permit but fails to obtain the required electrical and plumbing permits. When the homeowner discovers the missing permits during construction, what are the homeowner's options?

A. The homeowner may require the contractor to obtain the missing permits immediately, and if the contractor refuses, the homeowner may file a complaint with the CCB and may have grounds for contract termination
B. The homeowner has no recourse because the building permit covers all work including electrical and plumbing installations
C. The homeowner must obtain the missing permits personally because homeowners are ultimately responsible for all permits
D. The homeowner must wait until the project is complete to address the missing permits through the final inspection process

73. A contractor is performing a roof replacement on a residential property. During the tear-off, the contractor discovers that the existing roof sheathing has extensive rot damage covering approximately forty percent of the roof surface. The contract scope includes only roofing material replacement, not sheathing repair. What is the contractor's appropriate course of action?

A. Stop work on the affected areas, document the rotted sheathing with photographs and written notes, notify the homeowner of the additional scope, and present a written change order proposal for sheathing replacement before proceeding
B. Install the new roofing material over the rotted sheathing because the new underlayment will bridge the damaged areas adequately
C. Replace the rotted sheathing at the contractor's expense because the contractor has an implied duty to provide a sound substrate
D. Complete the tear-off and leave the roof exposed until the homeowner agrees to pay for the sheathing replacement separately

74. A contractor is reviewing the project specifications for a commercial building and discovers that the specifications reference ASTM standards for material testing. What are ASTM standards in the context of construction?

A. Government regulations established by OSHA that define maximum allowable worker exposure limits for hazardous construction materials
B. Building code requirements published by the International Code Council that establish minimum construction standards for all buildings
C. Consensus-based technical standards developed by ASTM International that define testing methods, material properties, specifications, and quality requirements used throughout the construction industry
D. Insurance industry standards that establish minimum coverage limits for contractors performing commercial construction work

75. A contractor is installing exterior windows on a residential project. The specifications require a specific flashing sequence to prevent water intrusion at the window openings. The contractor installs the windows without the required sill pan flashing and integrating the window flashing with the weather-resistive barrier. What is the primary risk of this omission?

A. The windows may not open and close properly because the missing flashing creates friction against the window frame
B. The window installation passes inspection because sill pan flashing is an optional enhancement not required by building codes
C. Water may penetrate behind the window frame and enter the wall cavity, causing concealed moisture damage, mold growth, and structural deterioration of the framing and sheathing
D. The window manufacturer's warranty is voided but no physical damage to the building occurs from the missing flashing

76. A contractor operates a construction company and needs to determine whether to purchase or lease a new piece of heavy equipment. Which financial analysis method is most appropriate for comparing the total cost of purchasing versus leasing over the equipment's useful life?

A. A simple payback analysis that calculates only the number of months until the purchase price is recovered through equipment usage
B. A net present value analysis that compares the total cost of ownership including purchase price, maintenance, depreciation, and tax benefits against the total lease cost including payments, maintenance responsibility, and tax treatment
C. A gross revenue analysis that compares the total revenue generated by owned equipment versus leased equipment on all projects
D. A break-even analysis that calculates only the number of billable hours needed to recover the equipment's purchase price

77. A contractor is installing a commercial kitchen exhaust hood system. The building code requires the exhaust duct to be constructed of specific materials and to maintain a minimum clearance from combustible materials. What is the minimum clearance requirement for a commercial kitchen exhaust duct from combustible construction?

A. No clearance is required if the exhaust duct is wrapped with standard fiberglass insulation to protect adjacent combustible materials
B. Three inches of clearance from combustible materials is adequate for all commercial kitchen exhaust installations regardless of type
C. The clearance must meet the requirements specified in the applicable mechanical code, which typically requires eighteen inches from combustible materials for grease-laden exhaust ducts unless a listed reduced-clearance system is used
D. Six inches of clearance is the standard requirement for all commercial exhaust duct installations regardless of the duct temperature rating

78. A contractor is managing a residential project and the homeowner requests weekly written updates on the project's progress, budget status, and any issues that have arisen. Under best practices for residential project management, how should the contractor handle this request?

A. Decline the request because weekly written reports are only required on commercial projects exceeding five hundred thousand dollars
B. Provide verbal updates only because written reports create a paper trail that could be used against the contractor in future disputes
C. Provide the requested weekly written updates because clear, documented communication builds trust, prevents misunderstandings, and creates a record that protects both the contractor and the homeowner
D. Provide monthly written updates instead of weekly because the weekly frequency is excessive for residential construction projects

79. A contractor is installing a prefabricated metal building on a commercial site. The manufacturer's installation manual specifies a specific torque value for all structural bolts. The contractor's crew tightens the bolts by hand without using a calibrated torque wrench. What is the primary concern with this installation practice?

A. Hand-tightened bolts may loosen during equipment transportation but will be adequately tightened once the building is loaded
B. Under-torqued or inconsistently torqued bolts may not achieve the required clamping force, potentially allowing joint movement, bolt failure, or structural instability under design loads
C. Over-torqued bolts void the building manufacturer's warranty but have no structural consequence for the completed installation

D. Hand-tightened bolts require a forty-eight-hour settling period before final torque values can be verified with calibrated equipment

80. A contractor is building a residential home and the local building code requires the installation of arc-fault circuit interrupter protection on specific branch circuits. Under the National Electrical Code as adopted in Oregon, which areas of the home typically require AFCI protection?

A. Bedrooms, living rooms, dining rooms, family rooms, and other dwelling unit habitable spaces as specified by the applicable code edition require AFCI-protected branch circuits
B. Only bedroom circuits require AFCI protection, while all other rooms are protected by standard circuit breakers without arc-fault detection
C. Only circuits serving kitchen countertop receptacles and bathroom outlets require AFCI protection in residential construction
D. AFCI protection is required only in homes exceeding three thousand square feet of total living area and is optional in smaller homes

Practice Exam 17: Answer Key and Explanations

1. C — Oregon law limits the initial down payment on residential projects to one thousand dollars or ten percent of the contract price, whichever is less, unless a different amount is specified in the written contract. The contractor should decline the fifty percent offer and explain the statutory limitation. If both parties want a larger down payment, the specific amount must be written into the contract terms.

2. B — The submittal requirement gives the architect or engineer adequate time to review proposed material substitutions and verify they meet the original design intent, quality standards, and performance specifications. This review process ensures that substitute materials do not compromise the building's function, appearance, or code compliance. Without this review, unapproved materials could create performance failures or liability issues.

3. D — OSHA requires employers to ensure aerial lift operators receive training specific to the type of lift being used, including pre-operation inspection procedures, safe operating techniques, and recognition of workplace hazards. The training must include both instruction and practical demonstration of competency before the employee operates the equipment independently. Generic online courses do not satisfy the requirement for equipment-specific, hands-on training.

4. C — When a contractor abandons a residential project without legal justification, the homeowner has multiple remedies under Oregon law. These include filing a complaint with the CCB, pursuing a claim against the contractor's surety bond for financial losses, and filing a civil lawsuit for breach of contract and resulting damages. These remedies are not mutually exclusive and may be pursued simultaneously.

5. C — Each roof side is fifty feet times eighteen feet, equaling nine hundred square feet, for a total roof area of one thousand eight hundred square feet or eighteen squares. Adding the ten percent waste factor yields nineteen-point-eight squares, rounded up to approximately twenty squares. The waste factor accounts for cutting, overlap, and material damaged during installation.

6. D — Oregon's ban-the-box law restricts when and how employers may consider criminal history in employment decisions. Terminating an excellent employee solely based on an unrelated, non-violent outstanding warrant without demonstrating a legitimate business justification could expose the employer to legal challenge. Employers must evaluate whether the criminal history has a direct relationship to the job duties before making adverse employment decisions.

7. D — When an owner's representative issues a verbal directive for out-of-scope work, the contractor should protect their right to additional compensation by documenting the directive in writing. Sending written notice to the owner confirming the scope, cost implications, and requesting a formal change order creates a record that preserves the contractor's claim. Performing extra work without written authorization risks nonpayment and waiver of the contractor's right to additional compensation.

8. A — Hurricane clips at every rafter are specified by the structural engineer to meet the calculated wind uplift loads for the specific building design. Installing clips at every other rafter reduces the connection's uplift resistance below the engineered design requirements. This structural deficiency will fail framing inspection and leaves the roof vulnerable to wind damage during severe weather events.

9. A — Oregon construction lien law requires material suppliers on residential projects to deliver a notice of right to a lien to the homeowner within eight business days of first furnishing materials. This preliminary notice is a prerequisite for preserving the supplier's lien rights, even though the supplier has no direct contract with the homeowner. Failure to deliver the notice within the statutory timeframe may result in the loss of lien rights.

10. D — Standard duct tape adhesive deteriorates over time from temperature cycling and airflow, causing the tape to fail and joints to separate. Mastic sealant creates a permanent, airtight bond that maintains duct integrity throughout the life of the HVAC system. Using duct tape instead of specified mastic results in air leakage, reduced system efficiency, increased energy costs, and potential inspection failure.

11. C — Oregon law allows LLC members to elect an exemption from workers' compensation coverage by filing the appropriate documentation with the insurer or the state. The exemption applies only to the individual members who file the election and does not extend to any employees of the LLC. All non-exempt employees must remain covered under the company's workers' compensation policy.

12. B — Oregon public contracting law restricts subcontractor substitution after bid submission to specific circumstances with contracting agency approval. Acceptable reasons for substitution include the subcontractor's refusal to execute the subcontract, failure to meet bonding or insurance requirements, or license revocation. The contractor cannot freely substitute subcontractors on public projects without demonstrating a qualifying cause and obtaining agency approval.

13. D — Control joints create intentional weakened planes in the concrete slab that guide inevitable shrinkage cracking to occur at predetermined, straight-line locations rather than randomly across the surface. As concrete cures and shrinks, the reduced cross-section at each joint concentrates the cracking stress at that point. This produces clean, controlled crack lines that are aesthetically acceptable and structurally insignificant.

14. A — OSHA requires ground-fault circuit interrupter protection on all one hundred twenty-volt, single-phase, fifteen- and twenty-ampere temporary receptacle outlets on construction sites. GFCIs detect electrical current imbalances as small as five milliamps and shut off power within milliseconds to prevent electrocution. This protection is mandatory for all temporary receptacles, not just those near water sources.

15. A — The general contractor has overall responsibility for environmental compliance on the jobsite, including the actions of subcontractors. Improper disposal of paint, even latex, by pouring it on the ground violates Oregon environmental regulations. The contractor must stop the practice immediately, clean up the contaminated area, and ensure all waste materials are disposed of properly going forward.

16. B — ACI 318, published by the American Concrete Institute, is the building code standard for structural concrete. It governs the design, materials, construction, and inspection of concrete structures including foundations, slabs, beams, columns, and walls. When structural drawings reference ACI 318, they are requiring compliance with the industry's primary concrete construction standard.

17. C — Exceeding the manufacturer's maximum allowable refrigerant piping length can cause inadequate oil return, excessive pressure drop, and reduced system capacity that prevents the VRF system from performing as designed. The contractor must notify the mechanical engineer so the design can be revised to accommodate the actual building conditions. Installing piping beyond the maximum length voids the manufacturer's performance warranty and may cause system failure.

18. A — Oregon law provides remedies for dishonored checks, including recovery of the original amount, bank fees incurred, and potential statutory damages. The contractor may send a demand letter giving the homeowner a specified period to make the check good before pursuing additional statutory damages. These remedies provide contractors with legal recourse beyond simply redepositing the returned check.

19. B — Verifying each batch ticket against the project specifications before each pour is the critical quality control step when multiple concrete mix designs are being placed on the same day. Delivering the wrong mix to the wrong element can cause structural deficiency or overdesign waste. Checking batch tickets takes seconds but prevents costly errors that are extremely difficult to correct after the concrete has cured.

20. B — When a wire run exceeds the fire alarm panel manufacturer's maximum circuit distance, the contractor must notify the system designer to develop an approved solution. Options may include adding a secondary panel, using a larger wire gauge to reduce voltage drop, or relocating equipment. Installing detectors beyond the maximum circuit distance can cause unreliable operation or failure to activate during a fire event.

21. A — Oregon's anti-indemnity statute voids construction contract provisions that require one party to indemnify another for liability arising from the indemnitee's own negligence. This law prevents owners and general contractors from contractually shifting the financial consequences of their own negligent acts to subcontractors or other parties. Indemnification for the indemnitor's own negligence remains enforceable, but cross-negligence indemnification is prohibited.

22. A — The most appropriate corrective action is to cut the beam pocket into the cured foundation wall using a concrete saw and chipping hammer to match the specified dimensions. This work should be performed with the structural engineer's approval to ensure the modification does not compromise the foundation wall's structural integrity. Alternative support methods that deviate from the approved structural plans require engineering review and approval.

23. D — The general contractor is liable to the homeowner for all work performed on the project, including work performed by subcontractors. The homeowner's contract is with the general contractor, who assumed responsibility for the entire scope of work. The general contractor may then seek recovery from the plumbing subcontractor through the subcontract agreement, but the homeowner's primary claim is against the general contractor.

24. A — Negative float on critical path activities indicates that the project is behind schedule and the current plan cannot achieve the contractual completion date without corrective action. The negative value represents the number of days by which the critical path exceeds the available time remaining before the deadline. Corrective measures such as acceleration, schedule compression, or scope reduction are needed to recover the schedule.

25. C — Oregon mechanical and plumbing codes require a pressure test of the gas piping system before the line can be placed in service. The test must be conducted at the pressure and duration specified by the applicable code, and the system must hold pressure without any drop during the test period. This testing ensures the integrity of all joints and connections before combustible gas is introduced into the piping.

26. A — OSHA classifies Type C as the most unstable soil and requires the shallowest slope angle of one and one-half horizontal to one vertical, creating a fifty-three-degree angle from horizontal. This wide slope angle provides the greatest protection against cave-in by maximizing the distance between the trench walls. Type C soil includes granular soils, submerged soils, and soil from which water is freely seeping.

27. B — Aged accounts receivable represent cash that the contractor has earned but not collected, creating a cash flow gap that can prevent the company from meeting current financial obligations. When significant receivables age beyond ninety days, the contractor may struggle to fund payroll, pay suppliers, and finance ongoing project operations. Aggressive collection efforts and creditworthiness evaluation of clients are essential cash flow management practices.

28. B — Venting a bathroom exhaust fan into the attic space introduces warm, moisture-laden air that condenses on cold roof sheathing and framing members. This condensation promotes mold growth, wood rot, and deterioration of the roof structure over time. Building codes require bathroom exhaust to be ducted directly to the building exterior to prevent moisture damage in concealed spaces.

29. D — Built-up roofing materials from certain eras commonly contain asbestos in the mastic, felts, and adhesives. Before disturbing these materials, the contractor must have samples collected and analyzed by a certified laboratory to confirm or rule out asbestos content. If asbestos is confirmed, a licensed asbestos abatement contractor must perform the removal following all applicable federal, state, and local regulations.

30. A — A fixed-price contract places the risk of material cost fluctuations on the contractor because the contractor agreed to complete the work for a specific price. Unless the contract contains an escalation clause that allows price adjustments for material cost increases, the contractor must absorb the higher costs. This is a fundamental risk allocation principle of fixed-price contracting that contractors must account for during the bidding process.

31. D — A comprehensive construction safety plan must include hazard identification and assessment, emergency action procedures, fall protection plans, site-specific training requirements, and other elements that address the specific hazards present on the project. The plan serves as the roadmap for preventing injuries and responding to emergencies throughout the construction process. OSHA expects employers to develop site-specific safety plans tailored to the actual conditions and hazards of each project.

32. D — Standard silicone caulk melts, burns, or shrinks away during fire exposure, creating openings that allow fire, smoke, and toxic gases to spread through wall and floor penetrations. Fire-rated intumescent sealant expands when exposed to heat, sealing the penetration and maintaining the fire-resistance rating of the assembly. Using non-rated caulk defeats the entire purpose of the fire-rated barrier and creates a life safety hazard.

33. B — A flow-down clause incorporates the terms and conditions of the prime contract into the subcontract, binding the subcontractor to the same obligations the general contractor owes to the owner. This ensures consistency in quality standards, schedule requirements, insurance provisions, and dispute resolution procedures throughout the contracting chain. Subcontractors should carefully review the prime contract terms that flow down before signing the subcontract.

34. C — OSHA places primary responsibility on the employer for ensuring scaffolds are erected, maintained, and inspected by a competent person and that all required safety components are in place. The employer must verify that guardrails, midrails, and toeboards are properly installed before workers access the scaffold. A missing midrail creates a fall hazard that the employer is obligated to identify and correct through competent person inspections.

35. B — Wire reinforcement placed at the bottom of a slab provides minimal resistance to surface cracking because the reinforcement must be positioned in the tension zone near the middle or upper third of the slab to be effective. Concrete slabs crack from the top surface downward due to shrinkage and loading stresses. Reinforcement resting on the subgrade is in the compression zone and does not resist the tensile stresses that cause surface cracking.

36. D — Oregon's general statute of limitations for breach of contract claims is six years from the date the breach occurred. This timeframe applies to both written and oral contracts and establishes the maximum period within which a party must file a legal action. Construction defect claims may involve different limitation periods depending on whether the claim is based in contract, tort, or statutory provisions.

37. D — The contractor bears liability for skipping the required moisture testing that was specified in the project documents. The specifications existed specifically to prevent flooring failure from excess slab moisture, and the contractor's failure to perform the test was a direct deviation from the contract requirements. The resulting tile failure is a foreseeable consequence of the contractor's omission.

38. C — SPF and Douglas fir have different allowable stress values, modulus of elasticity, and connection design values that affect their structural performance. Substituting one species for another without the structural engineer's written approval may result in members that are overstressed under the design loads. The engineer must verify that the substitute species is adequate for the specific loading conditions before approving the change.

39. D — Vermiculite insulation, particularly the Zonolite brand, is commonly associated with asbestos contamination from the Libby, Montana mine. The contractor should treat the material as potentially contaminated, avoid disturbing it, and inform the homeowner of the potential asbestos risk. Professional testing by a certified laboratory is required to determine whether asbestos is present before any disturbance occurs.

40. B — Contractors have a duty to take reasonable precautions to protect foreseeable trespassers from known hazards on construction sites. If the barricades and warning measures were inadequate to prevent unauthorized entry, or if the contractor failed to address a known hazard that injured the pedestrian, the contractor may have liability. The adequacy of the safety measures is evaluated against what a reasonable contractor would have done under similar circumstances.

41. A — Oregon requires contractors to hold the appropriate CCB license endorsement for the type of work being performed. A residential-only license does not authorize commercial construction work. The contractor must obtain a commercial general contractor endorsement by meeting the applicable bonding, insurance, and experience requirements before performing commercial projects.

42. B — Before approving a change order, the project manager must verify that the cost is reasonable and supported by detailed documentation, the time extension is justified based on the additional scope, and the change order is authorized by parties with contractual signing authority. This due diligence protects the project budget, schedule, and contractual integrity. Approving change orders without proper review can lead to cost overruns and schedule disputes.

43. B — Oregon implies a warranty of workmanlike construction on residential projects, meaning the work must be performed with the skill, care, and diligence that a reasonably competent contractor would exercise for similar work. This implied warranty exists by operation of law regardless of whether the contract includes express warranty language. Homeowners may pursue claims for defective workmanship based on this implied standard.

44. C — The National Electrical Code requires a minimum of number ten AWG copper wire for thirty-ampere branch circuits. Number twelve AWG is rated for only twenty amperes and number fourteen AWG for only fifteen amperes, both of which are undersized for a thirty-ampere dryer circuit. Using undersized wire creates a fire hazard due to overheating under the rated circuit load.

45. A — The contractor has a professional obligation to inform the homeowner of discovered structural deficiencies that could affect the safety of the new installation. Installing a heavy bathtub on undersized, deflecting joists could cause structural failure. The contractor should recommend a structural engineer evaluation and propose a change order to address the joist deficiency before loading the structure with a new bathtub.

46. D — The total labor burden represents the fully loaded hourly cost of employing the electrician, including the prevailing wage rate plus all employer-paid costs such as FICA, federal and state unemployment taxes, workers' compensation insurance, general liability insurance, and other mandatory assessments. This fully burdened rate is what the contractor must include in the estimate to accurately reflect the true cost of labor on the project.

47. A — A critical lift of this magnitude requires a detailed lift plan that addresses load weight, crane capacity at the required operating radius, rigging configuration, ground bearing capacity, wind speed limitations, and the assignment of qualified personnel including the signal person and rigger. The lift plan ensures the operation is within the crane's rated capacity and that all safety protocols are established before the lift begins.

48. B — Under Oregon law, the homeowner may withhold the disputed portion of an invoice while paying the undisputed amount, provided they communicate the specific basis for the dispute to the contractor. This protects the homeowner from overpaying while still meeting their obligation on the undisputed portion. The contractor can then address the dispute through negotiation, the CCB complaint process, or legal action.

49. A — A perimeter drain system collects groundwater that migrates toward the foundation and redirects it to a sump pit or daylight outlet, reducing hydrostatic pressure against the foundation walls. Without drainage, water pressure builds against the foundation and forces moisture through cracks, joints, and porous concrete into the basement or crawl space. The sump pump then discharges collected water away from the building.

50. C — Substantial completion is defined as the point at which the work is sufficiently complete so the owner can occupy or use the building for its intended purpose. Minor punch list items do not prevent the building from being used and do not disqualify the project from achieving substantial completion. The contractor remains obligated to complete the punch list items, but the substantial completion milestone has been reached.

51. A — When a worker shows symptoms of heat illness, the employer must provide immediate access to shade, water, and rest. If symptoms suggest heat stroke, such as confusion, loss of consciousness, or cessation of sweating, emergency medical services must be called without delay. Heat stroke is a medical emergency that can cause permanent injury or death if not treated immediately.

52. B — A failed tendon during post-tensioning creates a serious safety hazard due to the high forces involved and the potential for progressive failure. All workers must be evacuated from the immediate area and the site secured until the structural engineer can evaluate the failed tendon, determine the cause, and specify the appropriate repair procedure. Continuing to stress remaining tendons without engineering direction could cause additional failures.

53. C — Sprinkler head spacing is determined by the hazard classification and the coverage area rating of each sprinkler head as specified by NFPA standards. Installing heads at wider

spacing than the approved plans means each head must cover more area than it is rated for, resulting in inadequate water distribution during a fire. The system will fail inspection because it does not meet the approved design or the applicable fire protection standard.

54. C — A comprehensive weekly progress report should include work completed during the reporting period, work planned for the following week, schedule status, budget status, safety incidents, weather impacts, and any issues requiring owner or architect resolution. This level of detail keeps all stakeholders informed, documents project history, and provides early warning of potential problems. Consistent reporting builds trust and reduces the likelihood of disputes.

55. D — Soft bearing soil that does not match the assumptions in the structural design may not support the specified footing loads without excessive settlement or failure. The contractor must stop work, notify the structural engineer and homeowner, and request a geotechnical evaluation of the actual soil conditions. The engineer may need to redesign the footing with a wider base, deeper bearing, or alternative foundation system based on the actual soil capacity.

56. D — Ignoring tax obligations allows penalties and interest to accumulate on the unpaid balance, significantly increasing the total amount owed. The Oregon Department of Revenue has enforcement tools including filing tax liens against the contractor's property, garnishing wages and bank accounts, and pursuing asset seizure. Addressing tax obligations promptly minimizes penalties and prevents escalating enforcement actions.

57. B — The Oregon Residential Specialty Code requires a minimum of one-half-inch gypsum board applied to the garage side of the wall separating the garage from the living space, or other approved materials meeting the required separation. This fire separation protects the living space from fire originating in the garage where flammable materials are commonly stored. The specific requirements vary by code edition and the configuration of the garage and dwelling.

58. D — An umbrella liability policy provides additional coverage above the limits of the contractor's underlying general liability, commercial auto liability, and employers' liability policies. When a claim exceeds the limits of the underlying policy, the umbrella policy responds to cover the excess amount up to the umbrella policy's own limit. This additional layer of protection is critical for contractors exposed to catastrophic loss scenarios.

59. C — Gaps and uninsulated areas in continuous insulation create thermal bridges that allow heat to transfer through the wall assembly at those locations, reducing the overall thermal performance below the code requirement. The energy code requires continuous insulation specifically to eliminate thermal bridging at framing members and transitions. The installation will fail the energy code inspection until all gaps are properly insulated.

60. D — Deck screws are designed for fastening decking boards and do not provide the shear strength and withdrawal resistance required for the critical ledger-to-house connection. Lag screws and through-bolts are engineered fasteners sized specifically to resist the gravity and lateral loads transferred from the deck to the house structure. Improper ledger fastening is one of the leading causes of deck collapse.

61. C — The contractor bears liability for the wall failure because they made a deliberate decision to omit a critical drainage component recommended by the geotechnical engineer. The drainage system was specified to relieve hydrostatic pressure behind the wall, and its omission

directly caused the pressure buildup that led to failure. The contractor's cost-cutting decision created the foreseeable condition that destroyed the retaining wall.

62. B — Performing work without required permits exposes the contractor to monetary penalties from the building department, potential disciplinary action by the CCB, and the requirement to expose completed work for inspection. Exposing concealed work may require demolition of finished surfaces such as drywall, tile, or flooring, significantly increasing the project cost. These consequences reinforce why obtaining all required permits before starting work is essential.

63. B — Monthly lien waivers confirm that subcontractors and suppliers have been paid for previous work and materials, reducing the risk of construction liens being filed against the property. Liens would affect the lender's security interest in the property by creating competing claims against the collateral. The lien waiver process protects the lender's investment by documenting the flow of payments through the contracting chain.

64. D — An elevator shaft that is two inches narrower than required creates clearance problems that affect the installation of guide rails, car and counterweight operation, and code-required safety clearances. The contractor must stop the installation and notify the architect and elevator manufacturer to determine the correct resolution. Proceeding with installation in a non-compliant shaft creates safety hazards and will fail elevator inspection.

65. A — A site superintendent assigned exclusively to one project is a direct cost of that project because their salary is directly attributable to the project's operations. Unlike company officers or administrative staff whose salaries are spread across multiple projects as overhead, a dedicated superintendent's cost is charged directly to the specific project they manage. Proper classification of costs is essential for accurate job costing and project profitability analysis.

66. C — Fire pump rooms must be separated from the rest of the building by fire-rated construction to protect the pump from fire exposure and ensure it continues operating during a fire event. Direct exterior access or access from a fire-rated corridor is required so firefighters can reach the pump room safely. These requirements ensure the fire pump remains operational when the sprinkler system needs it most.

67. C — Oregon law requires electrical work to be performed by individuals holding a current Oregon electrical license. Hiring an unlicensed person to perform electrical work, regardless of their experience, violates both the electrical licensing laws and the contractor's CCB obligations. The general contractor could face penalties from the CCB, the Oregon Electrical Board, and potential liability for any defects or injuries resulting from the unlicensed work.

68. A — An independent geotechnical testing laboratory performs compaction testing as a third-party quality assurance measure to provide objective verification that the contractor's compaction work meets the specified density requirements. This independence ensures the test results are unbiased and reliable. Nuclear density gauge testing or sand cone testing methods are used to measure the in-place density and compare it to the Proctor test standard.

69. D — Naming the owner as an additional insured on the contractor's general liability policy extends the policy's coverage to protect the owner against third-party claims arising from the contractor's operations on the project. If a third party is injured or suffers property damage due

to the contractor's work, the owner can look to the contractor's policy for defense and indemnification. This designation does not give the owner control over the policy or its terms.

70. B — Trusses stored flat on the ground without proper support can develop permanent lateral bowing, warping from uneven bearing, and moisture damage from ground contact and rain exposure. Manufacturers require trusses to be stored upright on blocking with adequate bracing and covered with weather-resistant material. Damaged trusses may not perform as engineered and could create structural deficiencies in the completed roof system.

71. D — Retainage is typically released after the subcontractor's work is fully complete and accepted, all close-out documentation including warranties, as-built drawings, and operation manuals is submitted, and any conditions specified in the subcontract for retainage release are satisfied. Early release of retainage removes the general contractor's financial leverage to ensure the subcontractor completes all remaining obligations including punch list work and close-out requirements.

72. A — The homeowner may require the contractor to obtain the missing permits immediately because the contract assigned permit responsibility to the contractor. If the contractor refuses to comply, the homeowner has grounds for a CCB complaint and potential contract termination based on the contractor's failure to perform a contractual obligation. Working without required permits exposes both parties to enforcement action and creates inspection and code compliance risks.

73. A — The contractor should stop work on the affected areas, document the rotted sheathing condition, and notify the homeowner that additional work is needed beyond the original contract scope. A written change order proposal for sheathing replacement gives the homeowner the opportunity to authorize the additional work and agree to the cost before the contractor proceeds. Installing new roofing over rotted sheathing would result in a defective installation.

74. C — ASTM International develops consensus-based technical standards that define testing methods, material specifications, quality requirements, and performance criteria used throughout the construction industry. When project specifications reference ASTM standards, they establish the minimum quality and testing requirements for materials and installations. Compliance with referenced ASTM standards is typically a contractual and code requirement.

75. C — Omitting sill pan flashing and proper integration with the weather-resistive barrier allows water to penetrate behind the window frame and enter the wall cavity. This concealed moisture causes mold growth, wood rot, and structural deterioration of the framing and sheathing that may not be visible until significant damage has occurred. Proper window flashing is one of the most critical details for preventing water intrusion in residential construction.

76. B — A net present value analysis provides the most comprehensive comparison by accounting for the time value of money and including all relevant costs over the equipment's useful life. For purchasing, this includes the acquisition cost, maintenance, insurance, depreciation tax benefits, and residual value. For leasing, it includes all lease payments, maintenance responsibility, and tax treatment of lease expenses.

77. C — Commercial kitchen grease-laden exhaust ducts operate at high temperatures and carry combustible grease residue, requiring significant clearance from combustible construction materials. The applicable mechanical code typically requires eighteen inches of clearance from combustible materials unless a listed reduced-clearance system with appropriate fire-rated enclosure is used. Inadequate clearance creates a serious fire hazard in commercial kitchen installations.

78. C — Providing weekly written updates demonstrates professionalism, builds trust with the homeowner, and creates a documented record that protects both parties. Written communication reduces misunderstandings about project progress, budget status, and pending decisions. The documentation also serves as valuable evidence if disputes arise after the project is completed.

79. B — Structural bolts that are under-torqued or inconsistently torqued may not achieve the required clamping force at the connection, potentially allowing joint movement under design loads such as wind, snow, and seismic forces. Bolt failure or joint slippage can cause structural instability or collapse. Using a calibrated torque wrench ensures each bolt meets the manufacturer's specified torque value for the required clamping force.

80. A — Current editions of the National Electrical Code require AFCI protection on branch circuits serving bedrooms, living rooms, dining rooms, family rooms, and other dwelling unit habitable spaces. AFCI breakers detect dangerous arcing conditions in the wiring that can cause fires and shut off the circuit before ignition occurs. The requirement has expanded beyond bedrooms in recent code editions to cover most habitable spaces in the home.