

NCARB

# PRACTICE EXAM

ARCHITECT REGISTRATION EXAMINATION® 5.0

**Construction and Evaluation**  
division



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**Question 1**

An architect receives a pay application for the renovation of a one-story administrative building. During a site visit, the architect notes that duct work, raceways, and fire suppression piping have been installed in the ceiling and plenum area. The ceiling grid has also been constructed, but the lay-in ceiling tiles have not been installed.

The contractor prefers to wait to complete the ceiling until the packaged rooftop units, which are currently being kept offsite in a warehouse, are installed.

Click on the row in the schedule of values that must be adjusted based on the architect's findings.

**Correct answer:**

DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G ÷ C)	BALANCE TO FINISH (C - G)
		FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD				
General Conditions and Bond	81,675.00	0.00	53,010.00	0.00	53,010.00	64.90%	28,665.00
Demolition	45,650.00	0.00	38,788.00	0.00	38,788.00	84.97%	6,862.00
Landscaping	8,280.00	0.00	0.00	0.00	0.00	0.00%	8,280.00
Concrete Steps	12,815.00	0.00	1,100.00	0.00	1,100.00	8.58%	11,715.00
Masonry	7,464.00	0.00	7,090.00	0.00	7,090.00	94.99%	374.00
Metals	7,700.00	0.00	550.00	0.00	550.00	7.14%	7,150.00
Millwork	61,820.00	0.00	0.00	0.00	0.00	0.00%	61,820.00
Doors and Hardware	35,725.00	0.00	10,689.00	0.00	10,689.00	29.92%	25,036.00
Window Treatments	4,620.00	0.00	0.00	0.00	0.00	0.00%	4,620.00
Accessories	6,545.00	0.00	0.00	0.00	0.00	0.00%	6,545.00
Drywall	32,397.00	0.00	20,777.00	0.00	20,777.00	64.13%	11,620.00
Paint	15,840.00	0.00	10,296.00	0.00	10,296.00	65.00%	5,544.00
Acoustical Ceilings	26,070.00	0.00	10,249.00	0.00	10,249.00	39.31%	15,821.00
Flooring	37,400.00	0.00	10,120.00	0.00	10,120.00	27.06%	27,280.00
Marker and Tack Boards	12,815.00	0.00	0.00	0.00	0.00	0.00%	12,815.00
Signage	2,475.00	0.00	0.00	0.00	0.00	0.00%	2,475.00
Equipment	5,638.00	0.00	0.00	0.00	0.00	0.00%	5,638.00
Mechanical	37,934.00	0.00	33,330.00	0.00	33,330.00	87.86%	4,604.00
Electrical	186,095.00	0.00	124,094.00	0.00	124,094.00	66.68%	62,001.00
Sprinkler	22,000.00	0.00	20,900.00	0.00	20,900.00	95.00%	1,100.00
<b>GRAND TOTAL</b>	<b>\$650,958.00</b>	<b>\$0.00</b>	<b>\$340,993.00</b>	<b>\$0.00</b>	<b>\$340,993.00</b>	<b>52.38%</b>	<b>\$309,965.00</b>

**CORRECT RESPONSE**

**Mechanical**

The contractor lets the architect know that the RTUs are being kept in the warehouse. This indicates that materials are presently stored. Additionally, the RTUs are of significant enough value that the work completed in Mechanical will need to be adjusted.

**Section:** Administrative Procedures & Protocols

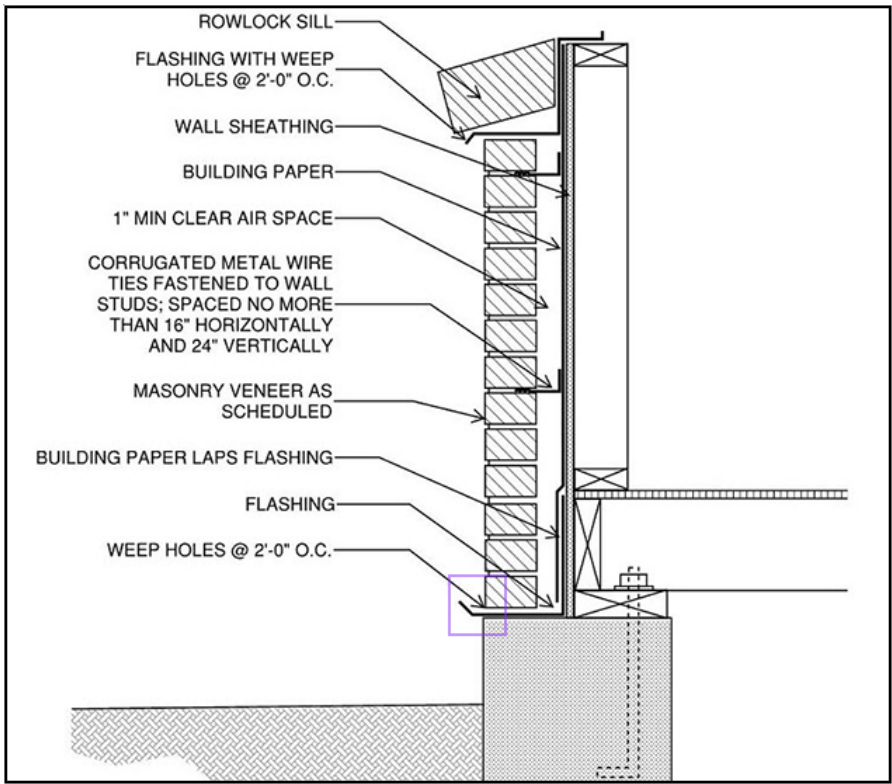
**Question 2**

A contractor submits an exterior masonry shop drawing detail for review.

Click on the component in the shop drawing detail that requires correction.

**Correct answer:**





**CORRECT RESPONSE**

**Drip Edge**

The component should be corrected to allow water to drip away from the wall cavity.

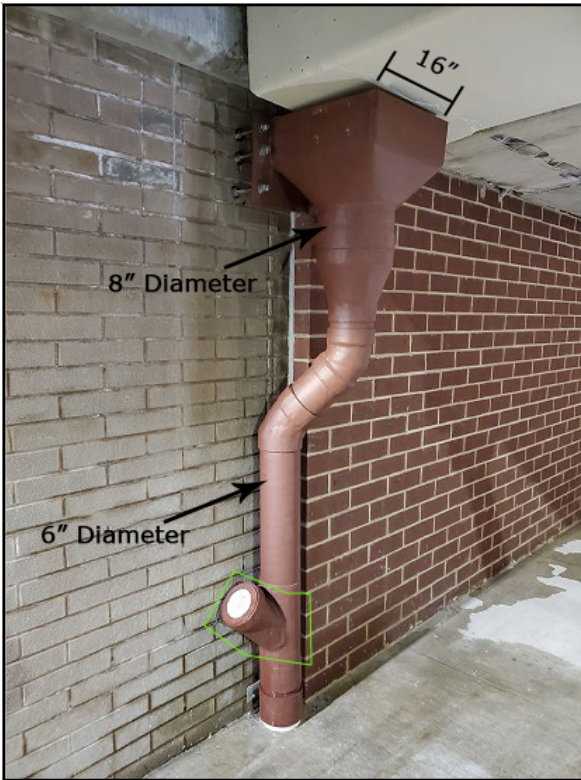
**Section:** Administrative Procedures & Protocols

**Question 3**

Soon before completion of a public plaza outside of a university, a client informs the architect that every time it rains, the plaza on the higher level floods. The architect is now performing a site visit.

Click on the area of the drain riser in the photo that the architect should inspect first to determine the cause of the flooding.

**Correct answer:**



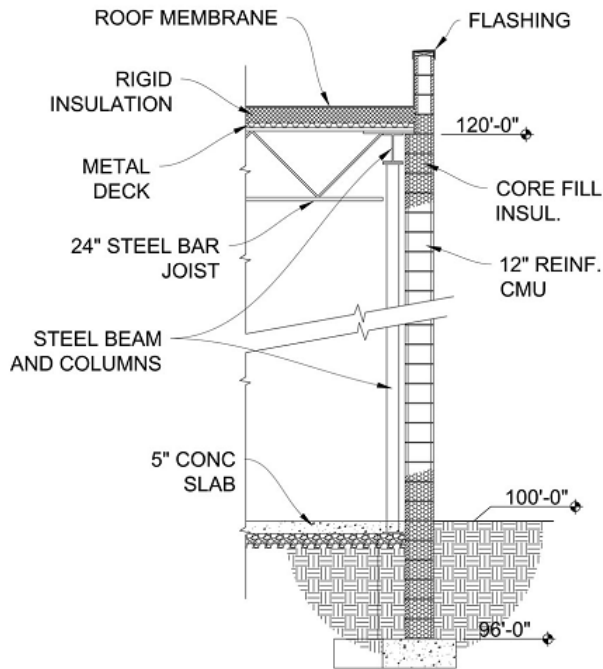
**CORRECT RESPONSE**

**Cleanout**

Based on the photo there is a cleanout at the base of the drain, the cleanout should be investigated first to ensure there is no blockage.

**Section:** Construction Observation

**Question 4**



Refer to the exhibit.

Construction of a proposed heavy manufacturing industrial building is being negotiated with a general contractor. The owner requests a proposal from the contractor for changes to the building walls that will result in a shorter

construction period without compromising building performance functions and characteristics.

Which one of the following proposed changes will satisfy the owner's request?

- A. Change to steel insulated wall panels
- B. Change to precast insulated wall panels
- C. Change exterior wall to 8" reinforced CMU

**Correct answer:** B

**CORRECT RESPONSE**

**Change to precast insulated wall panels**

Precast wall panels are produced with much less labor than field-laid CMU, and the manufacturing of the panels can be done off site but concurrent with excavations and foundation work. Its shorter field erection time significantly reduces overall construction time.

**Section:** Preconstruction Activities

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**Question 5**

A temporary certificate of occupancy (TCO) is issued for a recently constructed office building. While conducting a punch list survey, the architect finds a section of an egress corridor that does not have the code-required illuminated exit sign. The architect informs the owner that the sign should be installed but the owner refuses, arguing that the contract drawings did not call for a sign in this location and the AHJ did not call for it in plan review when issuing the TCO.

What initial action should the architect take?

- A. Document the owner's refusal in the project file and approve substantial completion.
- B. Inform the owner in writing of the applicable code section and the necessity for the sign.
- C. Offer to deduct the cost of the sign from the architect's construction administration fee.

**Correct answer:** B

**CORRECT RESPONSE**

**Inform the owner in writing of the applicable code section and the necessity for the sign.**

Informing the owner of the the code requirements and explaining how it applies to this situation is the appropriate initial action to take, thereby giving the owner the opportunity to address it.

**Section:** Construction Observation

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**Question 6**

		<b>Alternate #1: Carpet Replacement</b>	<b>Alternate #2: Additional Painting</b>	<b>Alternate #3: Playground Equipment Replacement</b>
<b>Contractor</b>	<b>Base Bid</b>			
ABC Contractor	\$ 2,375,000	\$ 65,000	\$ 15,000	\$ 250,000
Good Contractor	\$ 2,400,000	\$ 60,000	\$ 14,500	\$ 260,000
Quality Contractor	\$ 2,380,000	\$ 50,000	\$ 13,000	\$ 210,000

Refer to the exhibit.

Using standard AIA contracts, a school district receives competitive bids for the renovation and addition of a school building. The school district cannot go over their budget of \$2,500,000 and would like to maximize the work that can be completed at the lowest cost. The architect determines all three bidders are qualified.

Which contractor should the architect recommend?

- A. ABC Contractor
- B. Good Contractor
- C. Quality Contractor

**Correct answer:** C

**CORRECT RESPONSE**

**Quality Contractor**

To maximize the work without going over budget, alternates 1 and 2 should be selected. By taking alternates 1 & 2 this is the low bid contractor: \$2,443,000.

**CALCULATIONS**

- Determine how many alternates can be taken for ABC Contractor and their total bid: \$2,375,000 (base bid) + \$65,000 (alternate 1) + \$15,000 (alternate 2) = \$2,455,000
- Determine how many alternates can be taken for Good Contractor and their total bid: \$2,400,000 (base bid) + \$60,000 (alternate 1) + \$14,500 (alternate 2) = \$2,474,500
- Determine how many alternates can be taken for Quality Contractor and their total bid: \$2,380,000 (base bid) + \$50,000 (alternate 1) + \$13,000 (alternate 2) = \$2,443,000
- Alternate 3 cannot be taken by any of the contractors because it would put the project over budget.
- At \$2,443,000 with both alternate 1 and 2 taken, Quality Contractors is the contractor who maximizes the most work at the lowest cost.

**Section:** Preconstruction Activities

**Question 7**

Base Bid Schedule of Values		Bidders		
		AAA Tuckpointers	MJB Masons	Brick Builders
1	General Conditions	\$ 10,000.00	\$ 18,000.00	\$ 16,000.00
2	Mobilization and Protection	\$ 7,000.00	\$ 10,000.00	\$ 10,000.00
3	Scaffold Inspections	\$ 17,000.00	\$ 22,000.00	\$ 19,000.00
4	Adjustable, Unit-Cost Tuckpointing Repairs	1,000 LF \$ 25,000.00	\$ 30,000.00	\$ 15,000.00
<b>TOTAL BID</b>		<b>\$ 59,000.00</b>	<b>\$ 80,000.00</b>	<b>\$ 60,000.00</b>
<b>Unit Costs</b>				
Grinding and Tuckpointing (per LF)		\$25.00	\$30.00	\$15.00

Refer to the exhibit.

An architect solicits bids from three contractors to perform brick masonry tuckpointing repairs on an historic, four-story apartment building. The repairs will be performed on a unit cost basis with repair quantity allowances specified in the bid. The total project cost will be adjusted based on the actual quantity of repairs performed.

It has been determined that the quantity of tuckpointing repairs will exceed the specified allowance by at least 50%.

Which contractor should the architect recommend?

- A. AAA Tuckpointers
- B. MJB Masons
- C. Brick Builders

**Correct answer:** C

**CORRECT RESPONSE**

**Brick Builders**

The total project cost will be adjusted based on actual repair quantities, so unit costs are just as important to consider as the bidder with the lowest total bid. This means that more work can be performed with lower unit costs. While Brick Builders have a higher initial price due to a higher schedule of values for items 1-3, their lower unit costs for schedule of values item 4 will be beneficial if the allowances are exceeded.

**CALCULATIONS**

- Calculate additional cost for AAA: 1,500 (50% more than specified allowance) x \$25 (unit cost) = \$37,500, resulting in an additional cost of \$12,500 for tuckpointing repairs
- Calculate total cost for AAA: \$59,000 (base bid) + \$12,500 (additional cost) = \$71,500
- Calculate additional cost for Brick Builders: 1,500 (50% more than specified allowance) x \$15 (unit cost) = \$22,500, resulting in an additional cost of \$7,500 for tuckpointing repairs
- Calculate total cost for Brick Builders: \$60,000 (base bid) + \$7,500 (Brick Builder's additional cost) = \$67,500
- \$71,500 (AAA's total bid) > \$67,500 (Brick Builder's total bid)

**Section:** Preconstruction Activities

**Question 8**

An architect is hired for a 50-year-old industrial building renovation project, which will be delivered through the design-bid-build method. The building has a plywood roof deck, and an unknown quantity of deteriorated plywood decking will be exposed during the renovation, requiring removal and replacement.

Which one of the following should the architect require from bidders?

- A. Allowance for decking replacement
- B. Estimated quantity of decking to replace

C. Unit cost per square foot to replace decking

**Correct answer:** C

**CORRECT RESPONSE**

**Unit cost per square foot to replace decking**

Unit costs provide a cost in the base bid for a stipulated estimated quantity, while allowing for a comparison of costs for any variance in quantity.

**Section:** Preconstruction Activities

**Question 9**

A contractor, following an accelerated construction schedule, provides a construction submittal for a ceramic tile product and accessories identified in the specifications. The submittal includes product data, test results, shop drawings, and a scanned picture of the product. However, the specifications require a physical sample in the submittal for review and approval, but it is has not been provided.

How should the architect respond to the incomplete submittal?

- A. Submit an RFI to the owner asking for clarification on the incomplete submittal.
- B. Review the compliant portions of the submittal and note that a physical sample is required for approval.
- C. Approve the entire submittal because only the physical sample requirement was not in compliance with the specifications.

**Correct answer:** B

**CORRECT RESPONSE**

**Review the compliant portions of the submittal and note that a physical sample is required for approval.**

An incomplete submittal is a common occurrence, especially during accelerated construction schedules. A review of the compliant portions of the submittal, while noting the requirements that have not been met, allows the architect to provide both a timely response to the submittal and a directive to the contractor that the submittal must be completed in order to be approved. In the situation above, the physical sample can be reviewed and approved at a later time without holding up the rest of the submittal information.

**Section:** Administrative Procedures & Protocols

**Question 10**

Description of Work	Scheduled Value	Work Completed		Materials Presently Stored	Total Completed and Stored to Date	% Complete	Balance to Finish	Retainage
		Previous Applications	This Period					
Sitework	\$125,850.00	\$92,410.00	\$21,073.00	-	\$113,483.00	90%	\$12,367.00	\$11,348.30
Framing	\$211,660.00	\$110,350.00	\$55,732.00	-	\$166,082.00	78%	\$45,578.00	\$16,608.20
Insulation	\$34,700.00	\$21,933.00	\$8,965.00	-	\$30,898.00	89%	\$3,802.00	\$3,089.80
Doors & Hardware	\$75,500.00	-	\$21,058.00	-	\$21,058.00	28%	\$54,442.00	\$2,105.80
Drywall	\$145,940.00	\$65,480.00	\$15,421.00	\$12,562.00	\$93,463.00	64%	\$52,477.00	\$9,346.30
Electrical	\$350,230.00	\$250,671.00	\$17,446.00	-	\$268,117.00	77%	\$82,113.00	\$26,811.70
Finish Carpentry	\$130,490.00	\$25,623.00	-	-	\$25,623.00	20%	\$104,867.00	\$2,562.30
Carpeting	\$65,800.00	-	\$21,870.00	\$25,378.00	\$47,248.00	72%	\$18,552.00	\$4,724.80
<b>Totals</b>	<b>\$1,140,170.00</b>	<b>\$566,467.00</b>	<b>\$161,565.00</b>	<b>\$37,940.00</b>	<b>\$765,972.00</b>		<b>\$374,198.00</b>	<b>\$76,597.20</b>

Refer to the exhibit.

During the construction phase of a new multifamily residential building project, a contractor submits a monthly application for payment, which includes a schedule of values. The owner-contractor agreement stipulates that the full sum of retainage for each description of work may be released and paid to the contractor if the percentage complete for that description is equal to or greater than 90%. Retainage for both work completed and materials stored is 10%.

What is the current payment amount due to the contractor?

- A. \$172,913.30
- B. \$190,902.80
- C. \$199,505.00
- D. \$210,853.30

**Correct answer:** B

**CORRECT RESPONSE**

**\$190,902.80**

In order to arrive at the correct response, the values in the "This Period" column of the schedule of values must be added to the "Materials Presently Stored" column. 10% of the combined value should be removed for retainage. Finally, any work that is 90% or more completed should have the retainage added to the total payment due to the contractor.

**CALCULATIONS**

1. \$161,565 (cost of work completed in "This Period") + \$37,940 (cost of materials presently stored) = \$199,505 (total completed and stored "This Period")
2. \$199,505 X .90 = \$179,554.50 (value less 10% retainage)
3. \$179,554.50 + \$11,348.30 (retainage for sitework) = \$190,902.80 (total payment due after adding retainage for work at 90% complete)

**Section:** Construction Observation

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#### Question 11

Using standard AIA contracts, an owner hires an architect and a contractor for a recreation center project. The architect certifies substantial completion after the contractor corrects items from the punch list that are critical to building occupancy.

Nine months later, with the building fully occupied, the owner informs the architect that black mold has been discovered in one of the locker rooms. The facilities manager reports that the primary exhaust fan in the locker room appears to be working incorrectly and suspects that it was not installed properly.

Which of the following actions should the architect take? **Check the two that apply.**

- A. Instruct the owner to notify the original contractor about the concern.
- B. Ask the MEP Engineer to specify a replacement fan for the owner to purchase.
- C. Suggest the owner solicit bids from other HVAC contractors to correct the issue.
- D. Recommend the owner seek damages from the original contractor related to repairs.
- E. Meet with the owner and facilities manager to review operations at no additional cost.
- F. Request additional services from the owner for the costs of time to review the situation.

**Correct answer:** AE

#### **CORRECT RESPONSES**

**Instruct the owner to notify the original contractor about the concern.**

The owner must give the original contractor a chance to correct the issue or the owner loses the right to file a claim for damages, per the general conditions of the A201.

**Meet with the owner and facilities manager to review operations at no additional cost.**

The owner can request a meeting with the architect to review facility operations and performance at no additional cost for up to one year from the date of substantial completion, per the B101.

**Section:** Project Closeout & Evaluation

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#### Question 12

A contractor prepares a concrete materials submittal that includes cementitious materials and aggregates, curing materials, floor and slab treatments, reinforcement accessories, an air-entraining admixture, and a floor sealer that is a substitution for the specified sealer. The architect approves the submittal without exception.

During installation of the tile flooring, it is discovered that the specified floor tile adhesive is incompatible with the substituted floor sealer. A compatible adhesive is ordered, which requires extra time to deliver, and the general contractor submits a claim for a time extension and the extra costs.

How should this claim be resolved?

- A. The architect should accept the claim because the submittal was approved.
- B. The general contractor is responsible for extra costs and time delays.
- C. The tile subcontractor must supply a compatible adhesive at their own cost.

**Correct answer:** B

#### **CORRECT RESPONSE**

**The general contractor is responsible for extra costs and time delays.**

There are specific processes for requesting substitutions and burying them within other submittals is not appropriate. A substitution request made during the bid process must be carefully reviewed to avoid problematic outcomes.

**Section:** Administrative Procedures & Protocols

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#### Question 13

During an inspection of a 200-unit residential project, an architect notices that the overall length of kitchen cabinetry in accessible units is shorter than designed. The contractor informs the architect that when the cabinets arrived, the 32-inch-wide cabinets had been replaced with 28-inch-wide cabinets due to an oversight in the architect's review of the shop drawings.



The owner wants to occupy the area as soon as possible and insists on accepting the cabinets as-built. The AHJ requires that the narrower removable cabinets allow 30-inch-wide clear floor spaces.

Who is responsible for the error?

- A. Owner
- B. Architect
- C. Contractor

**Correct answer:** C

**CORRECT RESPONSE**

**Contractor**

According to the A201 General Conditions, the contractor is not to be relieved of responsibility for deviations from the requirements of the contract documents - even if the architect approved the shop drawings. Also, the architect's approval of shop drawings does not relieve the contractor of responsibility for errors or omissions in the shop drawings.

**Section:** Project Closeout & Evaluation

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**Question 14**

During phased construction of an apartment complex, the inspector notes that alarm systems must be installed on all doors to and from the pool courtyard in order for the building walls to meet the pool fence code requirements. Because the building is already partially occupied, the owner wants the pool to open as soon as possible. The contractor provides a proposal for the scope of work, but the owner argues that the price is too high. The issue must be resolved before the pool courtyard can be occupied.

What action should the architect take?

- A. Create a change order using a price lower than the contractor proposed.
- B. Issue a construction change directive for the contractor to do the work.
- C. Send an appeal of the inspector's decision to the code council.

**Correct answer:** B

**CORRECT RESPONSE**

**Issue a construction change directive for the contractor to do the work.**

Per A201, a construction change directive (CCD) is appropriate in the absence of total agreement on the terms of a change order. A CCD will allow the work to be carried out so that the owner's priority of opening the pool as soon as possible can be met.

**Section:** Administrative Procedures & Protocols

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**Question 15**

The facility management team for a recently completed high school project is evaluating necessary repairs to the interior finishes and restroom plumbing fixtures. A proposed repair budget must be submitted before the next school year.

Which one of the following is most important for the creation of an accurate budget of repair costs?

- A. Record drawings and submittals
- B. Spare parts and extra stock materials
- C. Procurement receipts and record project manual

**Correct answer:** A

**CORRECT RESPONSE**

**Record drawings and submittals**

The record drawings and submittals include the specific products and materials that were installed. The submittals should include the manufacturer and make/model product information. This can be used to source identical replacement materials/products and solicit current pricing from the manufacturer.

**Section:** Project Closeout & Evaluation

---

**Question 16**

A mixed-use commercial project has entered the bid phase. A bidder contacts the owner and architect to propose a cost-saving substitution to the mechanical equipment, stating that they have a strong relationship with a particular manufacturer and can apply a specialty cost savings opportunity to the owner for alternate condensing units. The mechanical engineer has no issue with the performance of the alternate equipment. The owner is interested in the potential cost savings but is concerned about unfairly favoring a bidder.

What action should the architect recommend?

- A. Reject the substitution request as unethical.
- B. Establish an allowance for all condensing units in the project.
- C. Issue an addendum to identify an additional approved manufacturer.

**Correct answer:** C

**CORRECT RESPONSE**

**Issue an addendum to identify an additional approved manufacturer.**

The architect should issue an addendum to all bidders to notify all parties of an additional allowed manufacturer.

**Section:** Preconstruction Activities

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**Question 17**

An architect is visiting a site where the excavation for a new building is underway. The new building, which is being constructed on the same lot line as an existing building, is to be placed at an elevation lower than the footing of the adjacent building. The specification calls for sections of underpinning of the existing building to be no greater than four feet in width along its foundation.

Click on the area in the photo that the architect should cite as nonconforming.

**Correct answer:**



**CORRECT RESPONSE**

**Underpinning section on the far left of the photo**

According to the scale, this underpinning section is greater than four feet in width.

**Section:** Construction Observation

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**Question 18**

Using a design-bid-build delivery method, an owner hires an architect for the design of a two-story mixed-use historic building located over a train station. After completing the design, the architect is now organizing the contract documents on which invited contractors will base their bids.

Which of the following documents should the architect include? **Check the two that apply.**

- A. Cost estimate
- B. Preservation assessment
- C. Shop drawings
- D. Specifications
- E. Addenda
- F. Change orders

**Correct answer:** BD

**CORRECT RESPONSES**

**Preservation assessment**

Preservation assessments are provided by the architect for a design-bid-build project that features an historic building.

**Specifications**

Specifications are included in a design-bid-build project.

**Section:** Preconstruction Activities

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**Question 19**

The 21st and 22nd floors of an existing 25-story office building are being renovated. The primary elevators serving those floors will be replaced with newer, high-speed models.

Which of the following would the architect be responsible for as part of their elevator submittal review? **Check the four that apply.**

- A. Shaft and pit dimensions
- B. Cab finish samples
- C. Machine room controller
- D. Hydraulic pump equipment
- E. Operating panels
- F. Warranties and maintenance contracts

**Correct answer:** BCEF

**CORRECT RESPONSES**

**Cab finish samples**

The architect is to approve the finishes.

**Machine room controller**

Cable elevators used in high-rise construction will have controller equipment in their machine rooms.

**Operating panels**

The architect is to verify the locations of hall position indicators, hall buttons, etc.

**Warranties and maintenance contracts**

The architect is to verify warranties and the warranty period. Maintenance contracts are provided as specified. These documents are a part of closeout submittals.

**Section:** Administrative Procedures & Protocols

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**Question 20**

During construction, a painting subcontractor informs the architect that they have not been paid on previously approved pay applications and that they are considering leaving the job due to non-payment. The general contractor fails to provide evidence that they have paid the painting subcontractor. The architect believes the general contractor is not financially able to pay their subcontractors.

What should the architect recommend to the owner?

- A. Issue payments for painting subcontractor with joint checks.
- B. Request performance and payment bond from the general contractor.
- C. Deduct the painting costs from the general contractor and pay the subcontractor directly.

**Correct answer:** A

**CORRECT RESPONSE**

**Issue payments for painting subcontractor with joint checks.**

The owner may choose to issue a joint check to the contractor and the subcontractor in order to address payment issues. A joint check requires both parties to sign the check in order to cash it. This ensures that the payment the owner makes to the general contractor will end up being used to pay the subcontractor. This provision is made in AIA A201, Article 9.5.4.

**Section:** Administrative Procedures & Protocols

---

**Question 21**

The owner of a new library visits the site during construction and requests a redesign of the restrooms without consulting the architect. The contractor begins the owner's requested alterations and submits change order #1 to

the architect. The architect reviews the modifications at the job site and identifies code violations that will require a major redesign.

How should the architect proceed? **Check the three that apply.**

- A. Reject change order #1 from the contractor.
- B. Approve change order #1 from the contractor.
- C. Request additional design services from the owner.
- D. Exclude the redesigned area in the substantial completion form.
- E. Issue revised drawings that include the necessary code changes.
- F. Notify the AHJ of the code violation in the owner's requested change.

**Correct answer:** ACE

**CORRECT RESPONSES**

**Reject change order #1 from the contractor.**

Any change to the contract requires approval from the architect and the owner. The architect was not consulted, and the owner did not follow the requirements of the contract.

**Request additional design services from the owner.**

The additional design and scope would require additional design fees from the owner. The architect is not responsible for the owner's directives.

**Issue revised drawings that include the necessary code changes.**

To address the required redesign and create a new change order, the architect will need to develop new drawings that meet the applicable codes.

**Section:** Construction Observation

**Question 22**

DOOR SCHEDULE													
DOOR NUMBER	ROOM		DOOR				OPENING SIZE		FRAME				
	FROM	TO	DOOR TYPE	MATERIAL	THICKNESS	FINISH	GLAZING	WIDTH	HEIGHT	FRAME TYPE	MATERIAL	FINISH	GLAZING
101A		VESTIBULE	TYPE D.	AL	1 3/4"	AN	T	3'-0"	8'-0"	03	AL	AN	-
101B	CORRIDOR	VESTIBULE	TYPE DD	AL	1 3/4"	AN	T	6'-0"	8'-0"	06	AL	AN	-
102A	CORRIDOR	LABORATORY	TYPE B	HM	1 3/4"	PT	T	3'-0"	8'-0"	02	HM	PT	-
102B	CORRIDOR	TRAINING	TYPE A	WD	1 3/4"	ST	-	3'-0"	8'-0"	01	HM	PT	-
102C	CORRIDOR	TRAINING	TYPE A	WD	1 3/4"	ST	-	3'-0"	8'-0"	01	HM	PT	-
133A	ELEC./MECH.	TELECOM	TYPE A	HM	1 3/4"	PT	-	3'-0"	8'-0"	01	HM	PT	-
133B	PCB PREP & WORK ROOM	TELECOM	TYPE A	HM	1 3/4"	PT	-	3'-0"	8'-0"	01	HM	PT	-

Refer to the exhibit.

An architecture firm is performing CA services on a one-story masonry building. While observing the construction of the CMU walls, the architect notices that not all of the masonry movement joints detailed in the contract documents have been included. The joints that have already been installed are indicated by the dashed lines. The specifications note the following masonry movement requirements:

- Joints at changes in wall height or thickness; at columns, pilasters, and wall intersections; and near corners.
- For openings greater than or equal to six feet in width: joints on both sides.
- For openings smaller than six feet in width: joints on one side.

Click on the area of the photo to indicate where a vertical control joint is missing.

**Correct answer:**



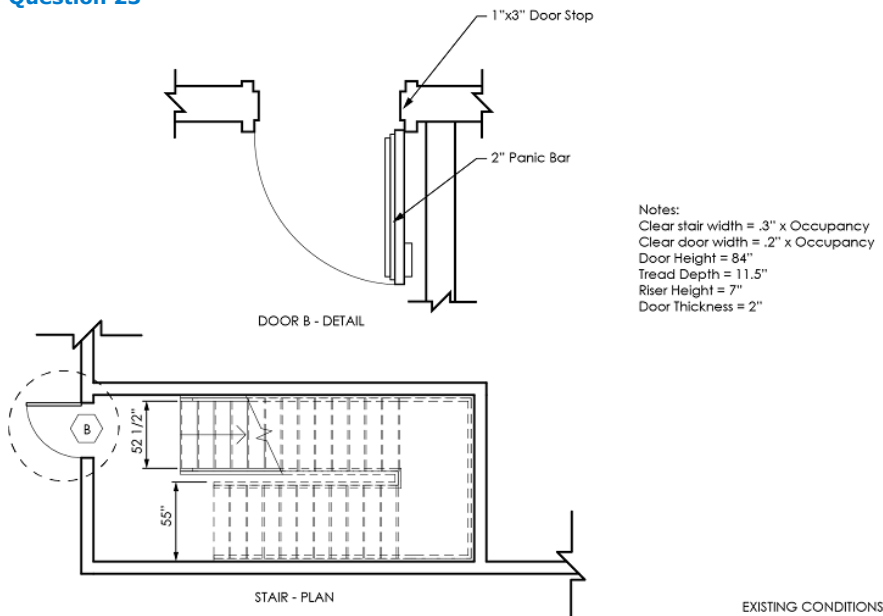
**CORRECT RESPONSE**

**Vertical joint at wall intersection near 101B**

Based on the masonry movement requirements, joints must be installed on both sides of openings greater than or equal to six feet in width. Examining the door schedule shows that the 101B opening is six-feet-wide. The photo also reveals that a joint has only been installed on one side of the 101B opening. Therefore, a vertical joint is missing at the wall intersection near 101B.

**Section:** Administrative Procedures & Protocols

**Question 23**



Refer to the exhibit.

During a routine inspection, the AHJ discovers an issue with the fire escapes of a newly completed 10-story mixed-use building. The AHJ finds that the door openings in the stairs are too narrow for the occupancy load. The minimum 52-1/2" stair width is correct.

What is the minimum door leaf width needed to meet the code?

- A. 32"
- B. 34"
- C. 36"
- D. 38"

**Correct answer:** D

**CORRECT RESPONSE**

**38"**

The clear width opening for the stairway door opening is 35". A 38" door leaf width meets the minimum code requirements for a clear width opening of 35". See calculations below.

**CALCULATIONS**

1. The "EXISTING CONDITIONS" provides the following formula for clear stair width:  $.3 \times \text{occupancy} = \text{clear stair width}$ . The clear stair width is provided, but the occupancy is not.
2. To find the occupancy:  $52.5 \text{ (clear stair width)} / .3 = 175 \text{ occupants}$
3. To find the clear door width:  $175 \text{ occupants} \times .2 = 35 \text{''}$
4. For the minimum door leaf width:  $35 \text{'' (clear door width)} + 1 \text{'' (door stop)} + 2 \text{'' (door thickness)} = 38 \text{''}$

**Section:** Construction Observation

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**Question 24**

A contract for the construction of a three-story condominium project has been signed based on completed construction documents, but construction has not yet begun. The owner requests major changes to the plan layout that will increase the project cost.

What document should the architect use to accommodate the request?

- A. Addendum
- B. Change order
- C. Request for information

**Correct answer:** B

**CORRECT RESPONSE**

**Change order**

A change order is a modification to contract documents that specify changes to be made, change in cost, and change in time of completion after a contract has been signed. A change order is issued when there is time to propose a modification in cost or time, which is the case here.

**Section:** Administrative Procedures & Protocols

---

**Question 25**

A four-story multifamily housing project is 30% into construction when the owner verbally requests that additional security gates be provided to the roof level access stair, which will require revisions to the stair landings. Shop drawings for the stairs have already been submitted to the architect for review. The contractor sends the architect an RFI for revised architectural drawings that incorporate the owner's design request.

What should the architect do first in response to the owner's request?

- A. Issue a design add service proposal to the owner for the roof stair.
- B. Issue a RFI response with revised stair drawings.
- C. Issue a construction change directive to the contractor for the revised stair drawings.

**Correct answer:** A

**CORRECT RESPONSE**

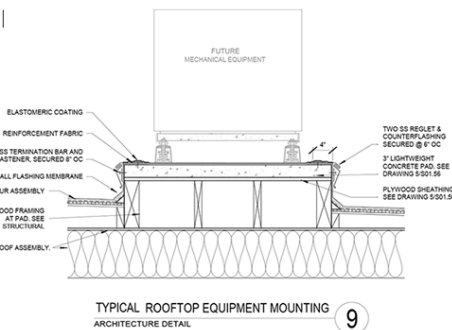
**Issue a design add service proposal to the owner for the roof stair.**

The project is in construction and shop drawings have already been issued, which means that the owner's design request is out of sequence and was given to the architect in an untimely manner. The architect and owner should approve an add service agreement prior to any technical drawing revisions.

**Section:** Construction Observation

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**Question 26**





Refer to the exhibit.

A mixed-use building is 50% into construction. The building consists of a ground level restaurant core and shell and four levels of wood frame apartments above. The contractor is scheduled to start roofing installation in two days when the architect observes that the roof cricketsing was incorrectly installed at the future restaurant tenant's equipment pad. The architect notifies all parties of the following conditions:

- The warranty for the roof requires a minimum 8" vertical rise from the finish roof plane.
- The contractor confirms that cricketsing rework will delay the entire project by five days.
- The restaurant tenant's design is currently under permitting and they estimate construction will start in two months.

What should the architect recommend?

- A. Ask the restaurant tenant to provide alternate equipment mounting details for review.
- B. Instruct the contractor to perform rework on the cricketsing and accept the project delays.
- C. Direct the contractor to provide a credit to the owner to direct the future tenant to build a suitable roof pad.

**Correct answer:** B

**CORRECT RESPONSE**

**Instruct the contractor to perform rework on the cricketsing and accept the project delays.**

The contractor did not install the roof cricketsing in accordance with the contract documents and the built condition cannot be field adjusted without significant impacts to the owner and future restaurant tenant. The rework and five-day delay has the smallest impact on the owner and tenant in this scenario.

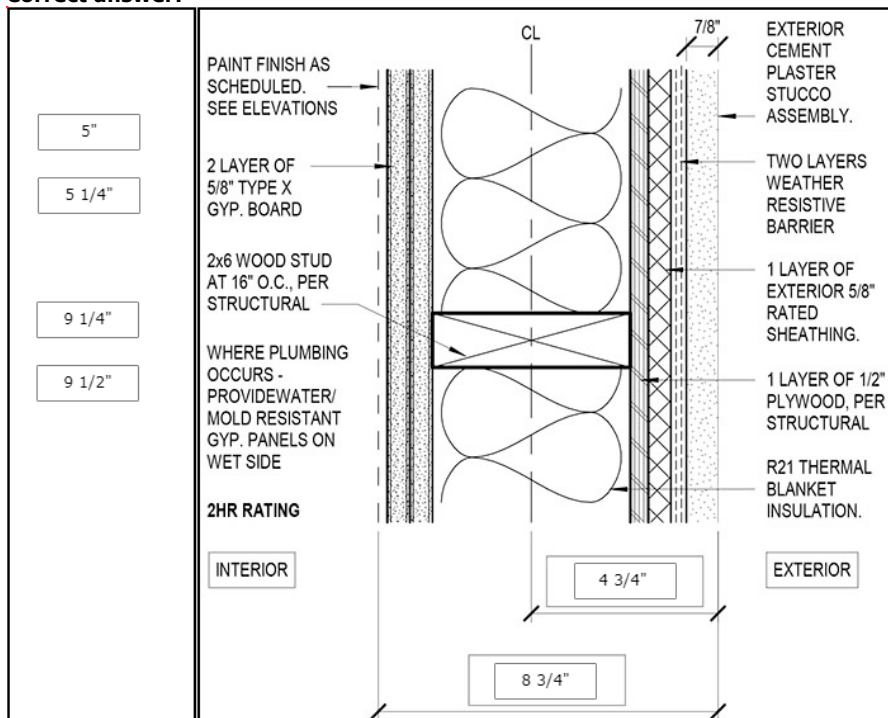
**Section:** Administrative Procedures & Protocols

**Question 27**

A contractor sends a RFI to an architect for the wall assembly dimensions in a 2-hour wood frame exterior wall type detail.

Drag the values into the dimension string boxes on the detail to indicate the wall assembly dimensions. Not all values will be used.

**Correct answer:**



**CORRECT RESPONSES**

- 4 3/4"
- 8 3/4"

**CALCULATIONS**

1. Determine the width of the stud in the width of the wall from centerline:  $5 \frac{1}{2}''$  (stud) / 2 =  $2 \frac{3}{4}''$
2. For the width of the wall from the centerline:  $2 \frac{3}{4}''$  (stud) +  $\frac{1}{2}''$  (plywood) +  $5/8''$  (sheathing) +  $7/8''$  (stucco) =  $4 \frac{3}{4}''$
3. For the width of the wall assembly:  $(5/8'' + 5/8''$  gypsum) +  $5 \frac{1}{2}''$  (stud) +  $\frac{1}{2}''$  (plywood) +  $5/8''$  (sheathing) +  $7/8''$  (stucco) =  $8 \frac{3}{4}''$

**Section:** Construction Observation

**Question 28**

An architect is contracted with an owner and is assisting in soliciting competitive bids for the construction of a factory. The architect is distributing bid documents to local contractors.

Drag the roles into the boxes in the table to indicate the appropriate responsibilities for each role.

**Correct answer:**

	Evaluate Substitution Requests	Open Bids	Execute AIA Construction Contract
	Owner	Owner	Owner
	Architect	Architect	Contractor

**CORRECT RESPONSES**

**Evaluate Substitution Requests - Owner & Architect**

The architect and owner evaluate substitution requests. The contractor is the one who submits those substitution requests for evaluation.

**Open Bids - Owner & Architect**

The owner and architect are the ones who open bids, while the contractor is the one who submits those bids.

**Execute AIA Construction Contract - Owner & Contractor**

The owner and contractor execute the construction contract. The architect is already under contract with the owner at this point in the project.

**Section:** Preconstruction Activities

**Question 29**



**Continuation Sheet**

AIA Document G703®, Application and Certification for Payment, or G732™, Application and Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.				APPLICATION NO: 001					
Use Column I on Contracts where variable retainage for line items may apply.				APPLICATION DATE: 10/29					
				PERIOD TO: 10/28					
				ARCHITECT'S PROJECT NO: 001-000					
A	B	C	D		E	F	G	H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					
1	General Conditions, Overhead and Profit	17,950.00	0.00	7,600.00	0.00	7,600.00	42.34%	10,350.00	
2	Performance Bond	1,950.00	0.00	1,950.00	0.00	1,950.00	100.00%	0.00	
3	Concrete Repairs	86,300.00	0.00	2,200.00	0.00	2,200.00	2.55%	84,100.00	
4	Masonry Repairs	4,500.00	0.00	1,750.00	0.00	1,750.00	38.89%	2,750.00	
5	Landscape Restoration	5,000.00	0.00	0.00	0.00	0.00	0.00%	5,000.00	
6	Engineering	6,000.00	0.00	6,000.00	0.00	6,000.00	100.00%	0.00	
<b>GRAND TOTAL</b>		<b>\$121,700.00</b>	<b>\$0.00</b>	<b>\$19,500.00</b>	<b>\$0.00</b>	<b>\$19,500.00</b>	<b>27.92%</b>	<b>\$102,200.00</b>	

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Refer to the exhibit.

An architect is reviewing a contractor's application for payment and notes that retainage amounts are missing from the G703 Continuation Sheet. The owner-contractor agreement stipulates the following variable retention rates:

- 10% retainage shall be withheld from each application for payment for all hard costs of construction, which is defined as the cost of materials and the labor and equipment necessary to install them.
- 5% retainage shall be withheld for all overhead and other soft costs.

What is the total amount of retainage that should be withheld from the application for payment?

- A. \$792.50
- B. \$1,172.50
- C. \$1,472.50
- D. \$1,950.00

**Correct answer:** B

**CORRECT RESPONSE**  
**\$1,172.50**

A 5% retainage is withheld from overhead and soft cost items and a 10% retainage is withheld from all other items.

**CALCULATIONS**

1. Item 1 - General Conditions, Overhead and Profit:  $0.05 \times \$7,600 = \$380$
2. Item 2 - Performance Bond:  $0.05 \times \$1,950 = \$97.50$
3. Item 3 - Concrete Repairs:  $0.1 \times \$2,200 = \$220$
4. Item 4 - Masonry Repairs:  $0.1 \times \$1,750 = \$175$
5. Item 5 - Landscape Restoration:  $0.1 \times \$0 = \$0$
6. Item 6 - Engineering:  $0.05 \times \$6,000 = \$300$
7. Total amount of retainage to be withheld:  $\$380 + \$97.50 + \$220 + \$175 + \$300 = \$1,172.50$

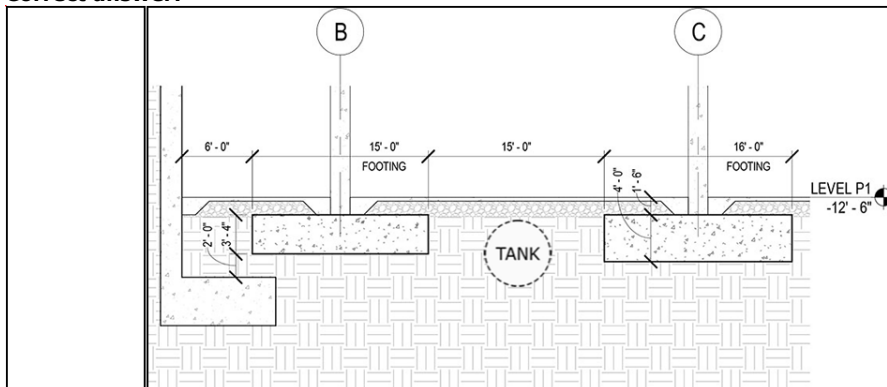
**Section:** Administrative Procedures & Protocols

**Question 30**

A new multifamily housing project is 20% into construction. The project is located in a hot and dry climate and includes one level of underground parking. The civil engineer visits the site and finds that the proposed location of the six-foot diameter fiberglass rainwater storage tank needs to be shifted due to conflicting underground plumbing utilities. The architect and civil engineer confirm an alternate location between grid lines B and C. The contractor issues an RFI with a request for a drawing that shows the location of the tank.

Drag the tank symbol onto the elevation to indicate the most appropriate location for the rainwater storage tank.

**Correct answer:**



**CORRECT RESPONSE**

**The area between the two footings at the highest elevation feasible**

The six-foot diameter fiberglass storage tank should be located in an area that avoids the soil surcharge from the footing's gravitational loads.

**Section:** Construction Observation

**Question 31**

During the bidding phase of a public project, an architect notices that the flooring material selected by the owner is missing from the bidding documents.

How should the architect address the missing information?

- A. Recommend that the owner hold an allowance for the material.
- B. Distribute a change order that adds the cost of flooring to the project.

- C. Issue an addendum to all bidders that includes the missing information.
- D. Ask the flooring contractors who are bidding on the project to include the floor.

**Correct answer:** C

**CORRECT RESPONSE**

**Issue an addendum to all bidders that includes the missing information.**  
Addenda are used to make changes during bidding.

**Section:** Preconstruction Activities

---

**Question 32**

A four-story, wood-framed multifamily residential building is nearing completion and the contractor requests a certificate of substantial completion. Following a site observation visit, the project architect prepares a punch list describing items observed that will need to be corrected.

Which punch list items require correction before the architect can certify substantial completion? **Check the three that apply.**

- A. Stair 5, Typ. All Levels: Missing handrails along east wall of staircase
- B. Corridor Lobby, Level 1: Replace flickering light in accent fixture
- C. Corridor, Level 3: Add missing lock on fire extinguisher cabinet
- D. Unit 123 (1 bed/1 bath): Replace toilet in bathroom (will not flush)
- E. Unit 325 (2 bed/2 bath): Missing smoke detector in bedroom
- F. Unit 424 (1 bed/1.5 bath): Missing screen at sliding balcony door

**Correct answer:** ADE

**CORRECT RESPONSES**

**Stair 5, Typ. All Levels: Missing handrails along east wall of staircase**  
Handrails for stairs are a life safety item required for occupation.

**Unit 123 (1 bed/1 bath): Replace toilet in bathroom (will not flush)**  
Minimum required plumbing fixtures must be operational for occupation and intended use.

**Unit 325 (2 bed/2 bath): Missing smoke detector in bedroom**  
Smoke detectors are a life safety item required for occupation.

**Section:** Project Closeout & Evaluation

---

**Question 33**

An architect is on site to observe the placement of a concrete drive and parking area. The specifications require that samples of fresh concrete be taken every 20 cubic yards during placement for 7-day and 28-day compression strength testing. The architect learns that over 250 yards of the 350 total yards of concrete have been placed and that the contractor has not taken or tested any samples. The project is weeks behind schedule.

What should the architect require of the contractor?

- A. Testing of the remaining concrete every 10 yards.
- B. Additional testing of the in-place concrete after it has cured.
- C. Removal and correction of all concrete that has already been placed.

**Correct answer:** B

**CORRECT RESPONSE**

**Additional testing of the in-place concrete after it has cured.**

According to AIA A201, the architect has the authority to order additional testing regardless of its state of completion. Testing the cured concrete for compression, via core samples, would produce the same results as testing the concrete just before placement, via cylinders.

**Section:** Construction Observation

---

**Question 34**

A 15,000-square-foot privately-owned healthcare clinic is under construction and 30% complete. It is experiencing multiple delays and is in danger of missing the scheduled substantial completion date in the contract. The owner-contractor agreement calls for liquidated damages of \$1,000 per day.

The contractor has documented the causes of the delays and claims no responsibility for them. The architect and owner agree with the contractor's claim on some of the delays but dispute others. The parties have not been able to

negotiate a resolution on the discrepancies. The owner's primary concerns are holding to the substantial completion date in the contract and avoiding legal proceedings.

What should the architect recommend to the owner?

- A. Request a schedule from the contractor to meet the substantial completion date with no additional costs to the owner.
- B. Amend the contract to include a bonus provision to meet the stipulated substantial completion date.
- C. Prepare to seek liquidated damages upon project completion.

**Correct answer:** B

**CORRECT RESPONSE**

**Amend the contract to include a bonus provision to meet the stipulated substantial completion date.**

A bonus is a viable way of incentivizing a contractor to complete work on time. It bypasses the disputed issue of responsibility for delays and focuses efforts on the owner's goal of meeting the substantial completion date.

**Section:** Administrative Procedures & Protocols

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**Question 35**

Two days prior to the bid due date, a major conflict is discovered in the bid documents between the architectural and structural drawings. The conflict will require extensive reworking of the drawings and additional structural steel.

What should the architect issue to bidders?

- A. Architect's supplemental instruction with drawing revisions and a revised bid date.
- B. Addendum that defines the changes and extends the bid due date.
- C. Change order that defines the changes and extends the time of completion.
- D. Construction change directive with a revised substantial completion date.

**Correct answer:** B

**CORRECT RESPONSE**

**Addendum that defines the changes and extends the bid due date.**

An addendum is a modification to the bid documents prior to the execution of the contract.

**Section:** Preconstruction Activities

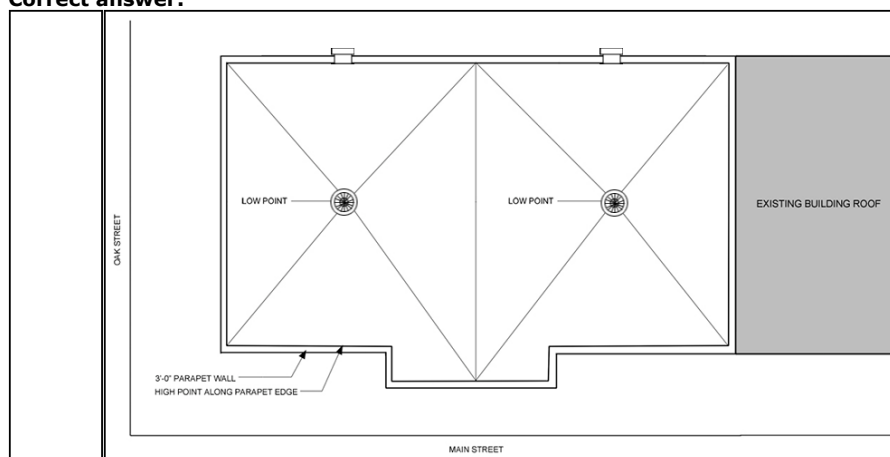
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**Question 36**

A contractor submits an RFI for the location of roof drains and parapet scuppers. During the construction documentation phase, the plumbing engineer determines that one overflow scupper is required for each roof drain. The owner requests that scuppers not be located on the facades along the street.

Drag the roof drains and parapet scuppers onto the areas of roof plan to indicate their most appropriate locations.

**Correct answer:**



**CORRECT RESPONSES**

**Roof Drains**

The roof drains should be located at the two low points of the roof. Any other location on the roof would be inappropriate because water would then be allowed to pool at the low points of the roof.

**Parapet Scuppers**

The parapet scuppers should be located in the exterior wall that is not facing the street or connected to the existing building. Overflow scuppers should not drain onto the neighboring building.

**Section:** Construction Observation

---

**Question 37**

An architect is soliciting competitive bids for an exterior facade restoration, the main goals of which are to repair exterior masonry walls and resolve leak problems. The owner has a maximum budget of \$325,000 and the lowest bid is currently \$352,000. The owner will need to remove an item from the scope of work to bring the total project cost as close to the budget as possible without exceeding it.

Click on the line item in the project costs table that is most appropriate to remove from the scope of work.

**Correct answer:**

1	Mobilization and Protection	\$	30,000.00
2	Limestone Patch Repairs	\$	40,000.00
3	Tuckpointing Open Mortar Joints	\$	60,000.00
4	Steel Lintel Replacement	\$	80,000.00
5	Replacement of Failed Sealants	\$	70,000.00
6	Brick Staining	\$	40,000.00
	Subtotal	\$	320,000.00
	General Conditions (10%)	\$	32,000.00
	Total Project Cost	\$	352,000.00

**CORRECT RESPONSE**

**Brick Staining**

Eliminating this line for \$40,000, plus the applicable general conditions percentage of 10%, results in a total project cost that is closest to the budget without exceeding it. Additionally, brick staining is not required to meet the main goals of the project.

**CALCULATIONS**

1. \$40,000 (for brick staining) + 10% (general conditions) = \$44,000
2. \$352,000 (total project cost) - \$44,000 = \$308,000 < budget of \$325,000

**Section:** Preconstruction Activities

---

**Question 38**

An architect has nearly completed the construction documents for the renovation of a government office building, which is financed using a federal grant. The architect is now preparing the following specification sections:

- 00 11 16 – Invitation to Bid
- 00 21 13 – Instructions to Bidders

Click on the list of items in the array that should be incorporated in those specification sections.

**Correct answer:**



A	B
<ul style="list-style-type: none"> <li>o Public opening of bids</li> <li>o Advertisement in local newspaper</li> <li>o WBE/MBE requirements must be met</li> <li>o Required to meet federal wage scale</li> <li>o Required to submit bid bond of 5%</li> <li>o Description of project</li> <li>o Bid due date, time and location</li> <li>o Pre-bid meeting date, time and location</li> <li>o List of local regulations</li> </ul>	<ul style="list-style-type: none"> <li>o Private opening of bids</li> <li>o Advertisement in town hall</li> <li>o WBE/MBE is preferred but not required</li> <li>o Union labor is required</li> <li>o Required to submit bid bond of 1%</li> <li>o Description of project</li> <li>o Bid due date and time</li> <li>o Pre-bid meeting date, time and location</li> <li>o List of local regulations</li> </ul>
C	D
<ul style="list-style-type: none"> <li>o Private opening of bids</li> <li>o WBE/MBE requirements must be met</li> <li>o Non-union labor is preferred</li> <li>o Required to submit bid bond of 5%</li> <li>o Description of project</li> <li>o Bid due date, time and location</li> <li>o Pre-bid meeting date, time and location</li> <li>o List of local regulations</li> </ul>	<ul style="list-style-type: none"> <li>o Public opening of bids</li> <li>o WBE/MBE requirements must be met</li> <li>o Non-union labor is preferred</li> <li>o Bid bond will not be required</li> <li>o Description of project</li> <li>o Bid due date and time</li> <li>o Pre-bid meeting date, time and location</li> <li>o List of local regulations</li> </ul>

**CORRECT RESPONSE**

**A**

The project is for the renovation of a government building that would require a public bid. The items in this list, such as "Public opening of bids" and "Required to meet federal wage scale," would be included in the specifications for a publicly bid project.

**Section:** Preconstruction Activities

**Question 39**

Soon before completion of a new shopping center, an owner decides that the building signage is too small and requests the installation of new, larger signage before the shopping center opens. While signage is not part of the contract, the architect and engineer determine the new signage will require additional structural support and foundation reinforcing. They revise the drawings and issue them as part of the architect's supplemental instruction.

The contractor states that the change will have an impact on material and labor costs that will need to be determined by a cost estimator, but a cost estimate cannot be negotiated before the owner's desired opening date.

How should the architect address the owner's request?

- A. Reissue as a change order without the cost of material/labor.
- B. Send the matter to third-party arbitration.
- C. Issue a construction change directive.

**Correct answer:** C

**CORRECT RESPONSE**

**Issue a construction change directive.**

The changes requested by the owner are time sensitive, but the cost impact has not yet been determined. With a construction change directive, the necessary changes can be communicated now while allowing for cost negotiation at a later date.

**Section:** Administrative Procedures & Protocols

**Question 40**

Construction is in progress for a new 280-unit apartment complex. To accommodate the desired opening date, the contract provides 18 months for construction. There is also a contingency of 45 weather days. It rains more than expected, though, during the first 17 months of construction, and a winter storm causes a massive power outage in Month 18, bringing the total weather days claimed by the contractor to 66 days. In response to the delays, the contractor requests an extension in contract days and a delayed opening date.

How should the architect advise the owner to proceed?

- A. Require the contractor to accelerate the schedule without overtime pay to meet the opening date scheduled in the contract.
- B. File a claim against the contractor for amounts equivalent to the expected revenue lost by delaying occupancy.

C. Request a change order from the contractor to extend the contract schedule by 21 days.

**Correct answer:** C

**CORRECT RESPONSE**

**Request a change order from the contractor to extend the contract schedule by 21 days.**

According to A201, the contract time should be extended through a change order if there are delays beyond the contractor's control.

**Section:** Administrative Procedures & Protocols

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**Question 41**

A contractor is performing repairs to steel balcony guardrails on a 30-story high-rise condominium building when sparks from steel cutting damage the adjacent glass door at the first balcony repair area. The project manual requires the contractor to protect balcony floors and walls but does not specify protection of glass doors and windows. The contractor agrees to pay for the replacement of the damaged glass but submits a change order for the cost of installing plywood protection over all remaining doors and windows.

The owner argues that it is not their responsibility to pay for additional plywood protection.

How should the architect proceed?

- A. Issue a change order for an increase in the contract duration but no increase in the contract sum.
- B. Issue a field report directing the contractor to install plywood protection over the windows and doors.
- C. Issue a construction change directive for additional plywood protection with no increase in the contract sum.

**Correct answer:** C

**CORRECT RESPONSE**

**Issue a construction change directive for additional plywood protection with no increase in the contract sum.**

The contractor is responsible for all protection, as well as means and methods. The plywood protection should have been included in the contractor's bid. If the costs for the protection are disputed, a change order cannot be signed by all parties, and a construction change directive will be needed from the owner and architect.

**Section:** Construction Observation

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**Question 42**

Following a feasibility study with an architect, the owner of a vehicle maintenance facility wants to construct a 10,000-square-foot addition. The owner does not have any construction experience, wants a guaranteed price, and does not want to manage multiple contracts or disputes.

Which project delivery method should the architect recommend?

- A. Design-bid-build
- B. Integrated project delivery
- C. Design-build

**Correct answer:** C

**CORRECT RESPONSE**

**Design-build**

A design-build project has a single owner-builder-designer agreement, which satisfies the owner's desire for single source responsibility.

**Section:** Preconstruction Activities

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**Question 43**

The facility manager of a recently completed mid-rise office building has informed the owner of multiple light fixtures that are not functioning correctly. The manager also states they have not attempted to fix the issue. The date of substantial completion for the project was 11 months ago, and documentation shows that all light fixtures were functioning properly prior to project closeout.

The owner demands that the architect and contractor pay for all remediation costs associated with the failed light fixtures. The owner-contractor agreement includes the A201.

How should the architect respond first to the owner's demands?

- A. Inform the owner that the correction period for all work has expired and is no longer the responsibility of the architect or contractor.

- B. Instruct the contractor to inspect the nonfunctioning light fixtures to determine if remediation is covered under applicable warranties.
- C. Hire a third-party representative to investigate the nonfunctioning light fixtures and provide a written report with recommendations.
- D. Gather all relevant correspondence between the owner, architect, and contractor in preparation for possible litigation.

**Correct answer:** B

**CORRECT RESPONSE**

**Instruct the contractor to inspect the nonfunctioning light fixtures to determine if remediation is covered under applicable warranties.**

Since the project is still within one year of post-occupancy (based on the substantial completion date), any deficient work or failed systems should be covered by applicable warranties. This should be the first path of action for the project team. A one-year warranty period is standard in the AIA-A201 General Conditions.

**Section:** Project Closeout & Evaluation

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**Question 44**

During construction, a contractor finds that the architectural and structural drawings contain conflicting information about foundation rebar. The contractor submits an RFI, and the architect advises the contractor to follow the structural drawings. The contractor then submits a change order for the more complex work required on the structural drawings, claiming they bid the project based on information in the architectural set.

What action should the architect take?

- A. Approve the change order.
- B. Reject the change order.
- C. Request a revised bid.

**Correct answer:** B

**CORRECT RESPONSE**

**Reject the change order.**

The rebar installation is a structural issue. As such, the structural drawings take precedence over the architectural drawings and should have been priced that way by the contractor.

**Section:** Administrative Procedures & Protocols

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**Question 45**

A mixed-use commercial building with two ground-level restaurants is 35% into construction. After the slabs for the ground-level concrete floor have been poured, the contractor sends an RFI to the architect noting that the plumbing drawings show floor drains in the commercial kitchens, but the architectural drawings do not have floor drains. The contractor excluded floor drains during the slab pour, and the RFI requests that the floor drains be removed. The architect responds that plumbing code requires floor drains and submits a sketch with new floor drain locations.

After closing the RFI, the contractor submits a change order request to the architect and owner for the additional work to drill the concrete slab and retroactively add floor drains.

Who is responsible for the cost of the concrete removal and reinstallation?

- A. Owner
- B. Contractor
- C. Architect
- D. Plumbing engineer

**Correct answer:** B

**CORRECT RESPONSE**

**Contractor**

The contractor is responsible for reviewing the contract documents before starting each portion of work, and the contractor must report any errors, omissions, or inconsistencies in the contract documents to the architect. The contractor did not review the plumbing drawings for the locations of the floor drains prior to the concrete pour, which means that the contractor did not install the floor drains in accordance with the plumbing design. The contractor also did not issue the RFI prior to the slab pour.

**Section:** Construction Observation

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**Question 46**

Construction of a 3,000-square-foot single family home renovation in a temperate climate is completed in February. In June, the owner notifies the architect and contractor that the engineered wood floor planks in the living room are buckling. The contractor repairs the floors, but three months later the living room floor planks buckle again.

The contractor then sends a proposal to the owner to install a different floor product and notes that the product specified by the architect was inappropriate for the climate. The architect confirms with the manufacturer that there is no issue with the climate, product, or the owner's use of the floor.

What should the architect recommend?

- A. The contractor should install their proposed floor product in the living room at no cost to the owner.
- B. The owner should hire a different contractor to repair the original specified floors at no cost to the owner.
- C. The contractor should install their proposed floor product in the living room at an additional cost to the owner.
- D. The contractor should perform additional repairs to the original specified living room floor with the manufacturer present.

**Correct answer:** D

**CORRECT RESPONSE**

**The contractor should perform additional repairs to the original specified living room floor with the manufacturer present.**

AIA A201 establishes a one-year period for the contractor to repair defective work. The contract does not limit the quantity of repairs or site visits. Therefore, the architect can recommend that the contractor return to the project site a second time to perform additional repairs. It is determined that the original floor product is not faulty; the contractor simply installed it incorrectly. The architect should recommend that the contractor perform repairs with additional supervision from the manufacturer in order to avoid a third visit to the site.

**Section:** Project Closeout & Evaluation

---

**Question 47**

An office addition is nearing the end of construction. The owner is facing financial pressure to move into the new addition as soon as possible and asks the architect to conduct a punch list walkthrough. The architect reviews the contractor's work and determines that the building is not yet substantially complete for the owner's use.

Click on the line item in the Office Building Punch List that must be addressed before the building can reach substantial completion.

**Correct answer:**

**Office Building Punch List**

- 1. Missing rubber wall trim in Office 202
- 2. Missing interior door at Break Room 216
- 3. Missing exterior skylight windows at Open Office 120
- 4. Damaged ceiling tiles at Conference Room 218
- 5. A/V system installation incomplete at Conference Room 218
- 6. A/V system missing at Conference Room 219
- 7. Temporary evacuation plan placards throughout the building. Replace with permanent signs
- 8. Display millwork installation incomplete at Lobby

**CORRECT RESPONSE**

### 3. Missing exterior skylight windows at Open Office 120

Substantially complete means that the building can be occupied by the owner. This line item, missing exterior windows, is the only one that directly impacts the building envelope and therefore the completion of the building. Without a complete envelope, the owner cannot protect the building from the exterior elements, properly heat and cool the building, or safely secure the building. This makes the building unacceptable for owner occupancy.

**Section:** Project Closeout & Evaluation

#### Question 48

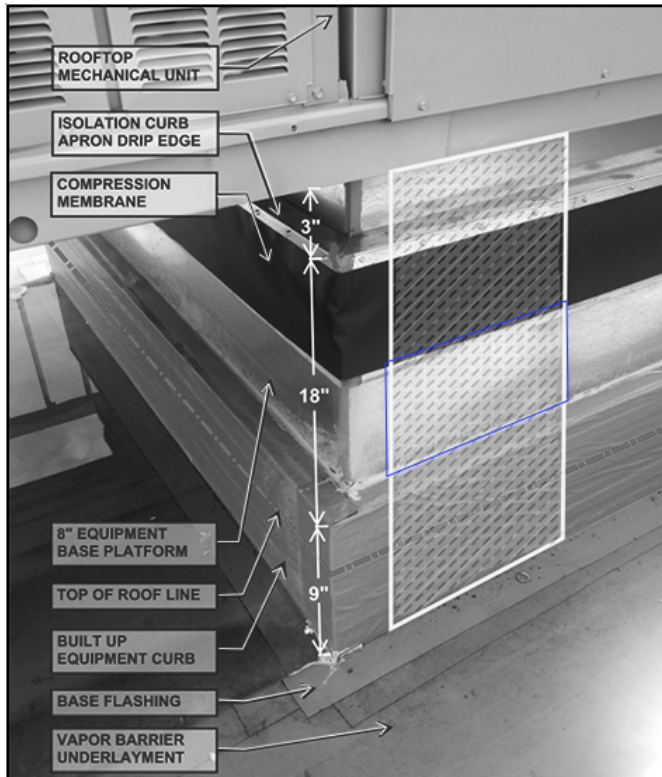
During a site visit to a two-story steel-framed retail and office building, an architect discovers that rooftop equipment curbs are not prepared correctly for a termination bar and counterflashing installation. The construction documents include the following general notes on the roofing sheets:

- Roofing membrane and base flashing to extend vertically 8 -12" above the highest anticipated waterline.
- All vertical non-continuous flashing membranes must overlap by 4" minimum.
- Where vertical flashing transitions occur, a continuous sealed stainless steel termination bar and counterflashing assembly must be installed.
- Rooftop equipment curbs must allow for isolation spring movement in all directions.

The contractor submits an RFI and the proposed solution involves adding a flexible flashing membrane from beneath the isolation curb apron drip edge overlapping the compression membrane. The roof membrane should extend up vertically and overlap with this flexible flashing membrane.

Click on the area within the diagonal hatched zone in the photo that should accommodate the termination bar and counterflashing assembly.

**Correct answer:**



#### **CORRECT RESPONSE**

##### **Equipment base platform**

The assembly must be placed within the equipment base platform area, which is 8" tall and can allow for a 4" minimum overlap between a flashing membrane and roofing membrane.

**Section:** Administrative Procedures & Protocols

#### Question 49

An architect submits a drawing set for a large mixed-use project to the AHJ for building permit plan check. The AHJ is experiencing delays and estimates building permit approval will take 10 months. To make up for the delay, the owner distributes the same drawing set for competitive bidding and provides a 90-day review period for submissions.

The architect is concerned about the potential for plan review comments that may result in design changes and increased construction costs.

How should the architect address this concern?

- A. Provide a contingency for additional architecture design fees in the bidding forms.
- B. Include an allowance for future plan check revisions in the Division 01 specifications and allowance form.
- C. Advise the owner to extend the open bid review timeline to match the estimated building permit approval date.

**Correct answer:** B

**CORRECT RESPONSE**

**Include an allowance for future plan check revisions in the Division 01 specifications and allowance form.**

Because the scope is unknown, an allowance is the most appropriate method of accommodating a future cost.

**Section:** Preconstruction Activities

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**Question 50**



Refer to the exhibit.

The owner of a new multiuse commercial building with a brick veneer exterior requests a meeting with the architect and contractor to review facility performance issues 360 days after substantial completion. At the meeting, the owner directs their attention to defects observed below all of the window sills. After a review of the contract documents, the architect recommends a forensic investigation and creates a list of items to look for that may not have been installed or installed properly.

Which items should the architect list? **Check the three that apply.**

- A. Weeps
- B. Strikes
- C. Sill pan end dams
- D. Shims
- E. Lintels
- F. Head flashing

**Correct answer:** ACF

**CORRECT RESPONSES**

**Weeps**

Weeps evacuate water where through-wall flashing is installed. If not installed, water can not be properly evacuated from within the wall cavity and may migrate to the interior.



### Sill pan end dams

Sill pans must have properly sealed end dams to contain and manage or direct water that finds its way into aluminum storefront framing to the exterior.

### Head flashing

Head flashing is necessary at the top of windows and directs water within a wall cavity to the exterior, preventing it from migrating into storefront framing. While sill flashing/panning manages most of the system's water evacuation, without head flashing, water could make its way down along jambs and vertical framing outside the area of the sill pan.

**Section:** Project Closeout & Evaluation

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### Question 51

Construction is 50% complete for a project. The contractor submits a change order for additional work costing \$25,000, which is then approved. Other project details follow:

- Original construction contract lump sum: \$4,500,000
- Total of previously approved change orders: \$150,000

What is the amount of the new contract?

- A. \$2,337,500
- B. \$4,500,000
- C. \$4,650,000
- D. \$4,675,000

**Correct answer:** D

**CORRECT RESPONSE**  
**\$4,675,000**

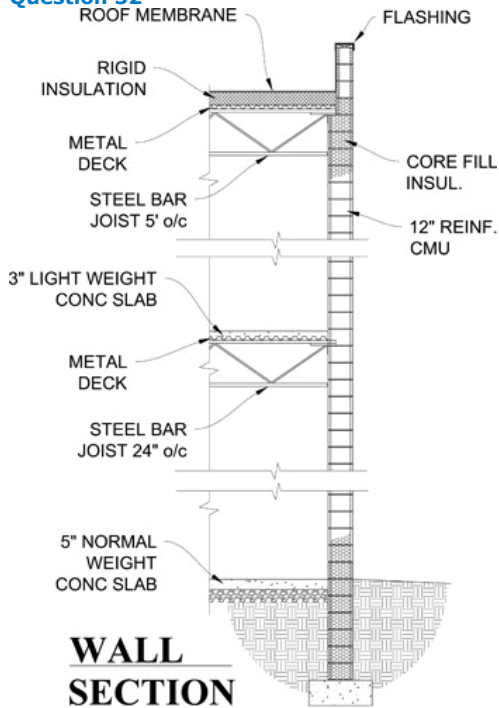
### CALCULATIONS

1. \$4,500,000 (contract amount) + \$150,000 (previously approved change orders) = \$4,650,000
2. \$4,650,000 + \$25,000 (new change order) = \$4,675,000 (new contract amount)

**Section:** Construction Observation

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### Question 52



Refer to the exhibit.

A contractor has submitted a proposed schedule of values for a new building that is about to begin construction. In order to accurately review future applications for payment, some line items in the schedule of values will need to be separated.

Click on the line item in the Schedule of Values that needs to be separated into two line items.

SCHEDULE OF VALUES		
1	12" CMU Walls	\$ 241,920.00
2	8" CMU Walls	\$ 55,700.00
3	Cavity Fill Insulation	\$ 33,600.00
4	Concrete Footings	\$ 22,000.00
5	Concrete Floor Slabs	\$ 54,000.00
6	Roof Insulation	\$ 30,000.00
7	Roof Membrane & Accessories	\$ 66,000.00
8	ACT Ceiling Grid	\$ 2,000.00
9	ACT Ceiling Tile	\$ 2,500.00

**CORRECT RESPONSE**

**5 - Concrete Floor Slabs**

This includes multiple tasks. Floor slabs on grade need to be separated from mezzanine slabs on metal deck. There should also be breakouts for parking slabs, plazas, and sidewalks. Once these breakouts are made, progress payments can be verified by measuring amount in place vs. total amount for the overall job, thereby determining a percent complete for each line item.

**Section:** Construction Observation

**Question 53**

During the early design phase of a new multifamily housing project, the architect hired a technology consultant to design low-voltage systems and provide full construction documents. To reduce costs, the owner chose to exclude construction administration scope for the technology consultant.

The project is now 30% into construction, and the architect receives a required product data submittal from the contractor for the security cameras and building entry intercom systems.

How should the architect proceed?

- A. Reject the submittal and void all technology work that is not in the scope.
- B. Forward the submittal to the owner and recommend a qualified third-party reviewer.
- C. Review the submittal using the consultant's drawings and specifications for reference.

**Correct answer:** B

**CORRECT RESPONSE**

**Forward the submittal to the owner and recommend a qualified third-party reviewer.**

The *Architect's Handbook of Professional Practice* states that the architect shouldn't review submittals that are the responsibility of other design professionals. In this situation, the architect cannot provide a complete review of the product data submittal without the technology consultant present to verify the design intent against the technology consultant's contract documents.

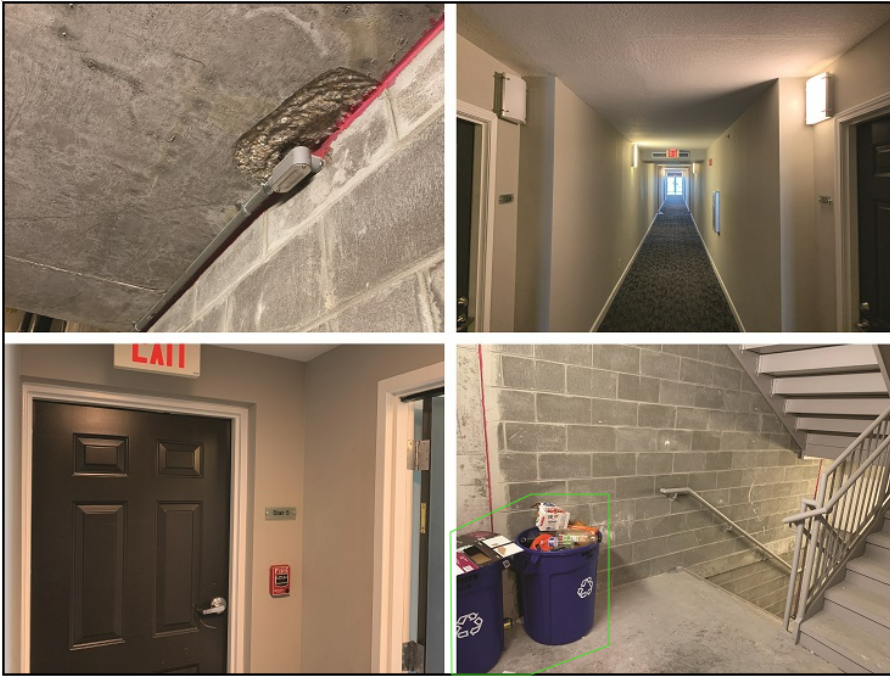
**Section:** Administrative Procedures & Protocols

**Question 54**

During a walkthrough for a 20-story residential tower project, an architect photographs items that need to be addressed.

Click on the area in the photographs that interferes with the egress path and must be resolved before issuing substantial completion.

**Correct answer:**



**CORRECT RESPONSE**

**Trash bins**

The trash bins must be removed before substantial completion as they interfere with the egress path.

**Section:** Construction Observation

**Question 55**

The steel framing on a building is complete, and the schedule of special inspections requires that all moment connections related to the lateral bracing system be inspected.

Drag the dots onto the connections in the photo that will need to be inspected.

**Correct answer:**



**CORRECT RESPONSES**

**Connection between column and beam - lower story of building**

**Connection between column and beam - upper story of building**

These locations show moment connections that provide a rigid connection between column and beam, serving as key components in a moment-frame lateral bracing system.

**Section:** Construction Observation

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**Question 56**

Construction is beginning on a previously developed property. During the pier excavation process, a drill hits an underground oil tank, exposing the soil and ground water to chemical contamination. The buried tank and potential contamination are unforeseen conditions not documented in the site survey or geotechnical report.

What steps must be taken to remediate the contamination and resume construction activities? **Check the three that apply.**

- A. The contractor must stop work in the area affected by the contamination.
- B. The contractor must promptly notify the owner and architect of the condition.
- C. The geotechnical engineer should assume costs associated with site remediation.
- D. The architect must provide recommendations for corrective remediation of the site.
- E. The contractor is required to remove the contamination due to their pier drilling activity.
- F. The owner should hire a qualified expert to investigate the contamination for corrective action.

**Correct answer:** ABF

**CORRECT RESPONSES**

**The contractor must stop work in the area affected by the contamination.**

According to AIA A201, the contractor must stop work in the area affected by suspected hazardous materials.

**The contractor must promptly notify the owner and architect of the condition.**

The party who observes the concealed or changed condition is required to promptly give formal notice of the situation to the owner and the architect.

**The owner should hire a qualified expert to investigate the contamination for corrective action.**

Special requirements and specialty contractors are involved when performing environmental restoration of contaminated sites. A separate specialty contractor is most appropriate for the removal or encapsulation of hazardous materials.

**Section:** Construction Observation

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**Question 57**

An architect finds items of nonconforming work during a construction site punch walk. Damaged ceiling tiles, malfunctioning light fixtures, and portions of the rubber wall base that have not adhered will all need to be corrected before substantial completion.

What next steps should the architect take to ensure substantial completion of the project? **Check the two that apply.**

- A. Advise the owner to hire a different contractor to correct the nonconforming work.
- B. Advise the contractor on construction means and methods for fixing the work.
- C. Issue a field observation report listing all the rejected work items immediately after the site visit.
- D. Issue a stop work order on the construction until the nonconforming work is fixed.
- E. Determine the cost and schedule impact of correcting the nonconforming work and notify the owner.
- F. Determine the source of the nonconforming work in coordination with the consultant team.

**Correct answer:** CF

**CORRECT RESPONSES**

**Issue a field observation report listing all the rejected work items immediately after the site visit.**

A field observation report must be completed that lists each nonconforming item based on the contract documents.

**Determine the source of the nonconforming work in coordination with the consultant team.**

The architect is responsible for determining the causes of nonconforming work and the contractor must provide access and uncover concealed work if necessary.

**Section:** Administrative Procedures & Protocols

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**Question 58**

During a site visit, an architect observes a materials installation system that does not meet specifications. The contractor states the installation system is less expensive and was included on the approved material submittal. The material installation is not on the critical path, but the owner has expressed a desire to avoid change orders and time delays.

What action should the architect take?



- A. Require the contractor to remove and reinstall the materials using the specified installation system.
- B. Monetize the difference in value of the two installation systems for a change order to adjust the contract price.
- C. Direct the contractor to obtain written approval of the installation from the material manufacturer.

**Correct answer:** A

**CORRECT RESPONSE**

**Require the contractor to remove and reinstall the materials using the specified installation system.**

Because the installation system does not comply with the specifications, it cannot be accepted. To do so would violate the contract documents.

**Section:** Administrative Procedures & Protocols

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**Question 59**

A project construction schedule has been delayed by 21 days due to the following:

- Construction errors: 14 days
- Owner-directed changes: 7 days

Through the provisions of the contract, the owner assesses liquidated damages at \$15,450 for each day past the completion date.

For what amount of liquidated damages is the contractor responsible?

- A. \$108,150
- B. \$216,300
- C. \$324,450

**Correct answer:** B

**CORRECT RESPONSE**

**\$216,300**

**CALCULATIONS**

1.  $\$15,450$  (daily liquidated damages)  $\times$  14 (additional days added to schedule due to construction errors) =  $\$216,300$

**Section:** Construction Observation

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**Question 60**



Refer to the exhibit.

During a site inspection by the architect, the contractor undermines a portion of the adjacent lot line building. However, the masonry above is stable and shows no sign of further deterioration. The contractor asks the architect for direction.

How should the architect proceed?

- A. Allow the contractor to proceed with the required remedial work.
- B. Direct the contractor to take steps to temporarily shore the foundation.
- C. Advise the contractor to contact emergency responders and inform occupants of adjacent building of the situation.

**Correct answer:** C

**CORRECT RESPONSE**

**Advise the contractor to contact emergency responders and inform occupants of adjacent building of the situation.**

"Advising" the contractor to immediately contact emergency responders is the proper action to take in a potential life-threatening situation. "Advising" the contractor to "inform" the inhabitants of the adjacent building of the situation is also a proper action to take in light of the potential imminent danger. Once first responders arrive, they will take over from the contractor all emergency safety precautions and operations at the site. The A201 gives the contractor the responsibility to ensure that the construction site maintains safe conditions. Also, A201 gives the contractor authority to act in an emergency in order to prevent damage or injury.

**Section:** Construction Observation

**Question 61**

Construction of a multifamily housing project is 40% complete and a series of open RFIs requires the architect's attention.

Drag the course of action labels into the boxes in the Open RFI Summary to indicate the most appropriate response to each RFI.

**Correct answer:**

Open RFI Summary		
RFI #164 - Owner request to revise the bathroom tile option by the smaller tile size. Owner takes no issue to material cost difference.	CHANGE ORDER	
RFI #166 - Contractor pending additional facade colors, color studies, request for facade colors, signs and facade Owner.	ADDITIONAL DESIGN SERVICE REQUEST	
RFI #175 - Contractor Brushed Finish finish concrete. Architect's request to proceed with place of smooth t.	ARCHITECT'S SUPPLEMENTAL INSTRUCTION	
RFI #178 - Owner request to add solar panels as separate scope. Request revised roof plan.	ADDITIONAL DESIGN SERVICE REQUEST	
RFI #192 - Abandoned utility found during construction. Request Confirmation to remove.	CHANGE ORDER	
RFI #193 - Request for material transition from masonry to concrete balconies. Architect's request to detail the exterior.	ARCHITECT'S SUPPLEMENTAL INSTRUCTION	

**CORRECT RESPONSES**  
**CHANGE ORDER**

RFI #164 presents a cost difference to the owner. There is no add-service design change associated with this RFI because only the size of the individual tile material is changing. No changes are made to the material or detailing. For RFI #192, the contractor uncovered an unforeseen site condition and is requesting confirmation from the owner to mitigate it. There is no design change associated with this situation.

### **ADDITIONAL DESIGN SERVICE REQUEST**

In RFI #166, the owner is requesting new additional facade color studies while the project is already 40% into construction.  
In RFI#178, added solar panels require redesign in the architectural drawings, redesign in the electrical drawings, and potential energy code analysis by the electrical engineer.

### **ARCHITECT'S SUPPLEMENTAL INSTRUCTION**

In RFI #175, there are no changes required to the construction documents and there are no cost changes to the owner.  
In RFI #193, there is no design change associated with this RFI drawing request, as the architect did not include the detail in the original construction documents.

**Section:** Construction Observation

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#### **Question 62**

A tenant purchases a first-floor condo unit and submits a request on November 21 to modify the ceramic tile finish at the unit's entry. RST Construction submits a change order to the developer for additional tile material & labor.

How should ABC Architects determine responsibility for the change order costs associated with the tenant's request?

- A. The tenant is responsible for RST Construction's installation rework costs and tile procurement costs.
- B. The tenant is responsible for RST Construction's additional tile procurement costs.
- C. The tenant is not responsible for any additional costs associated with the ceramic tile selection.

**Correct answer:** A

#### **CORRECT RESPONSE**

**The tenant is responsible for RST Construction's installation rework costs and tile procurement costs.**

Based on the construction schedule, RST Construction completed the first-floor tile installation on November 18. The tenant requests a tile material change on November 21, meaning that, at the time of this tenant request, the originally specified tile had already been installed.

#### **CASE STUDY RESOURCES USED**

**Scenario**  
**Construction Schedule**

**Section:** Construction Observation

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#### **Question 63**

On November 14th, temperatures are expected to drop below freezing at the multifamily condominium project site. Temperatures will return to above freezing by November 16th.

Which of the following suggestions should the architect make to the contractor to keep the project on schedule? **Check the three that apply.**

- A. Delay plumbing rough-in
- B. Reschedule cabinet installation
- C. Delay drywall taping and painting
- D. Provide temporary heating to interior spaces
- E. Continue with the floor underlayment installation
- F. Reschedule concrete sealing for November 16th or 17th

**Correct answer:** DEF

#### **CORRECT RESPONSES**

**Provide temporary heating to interior spaces**

Per the field report, generators for temporary heating are recommended.

**Continue with the floor underlayment installation**

The floor underlayment installation can continue as scheduled because freezing weather has no impact on this construction activity.

**Reschedule sealing of concrete for November 16th or 17th**

Per the field report, the weather needs to be above freezing. Rescheduling the start of concrete sealing for the 16th or 17th allows for enough time before the next critical path item.

#### **CASE STUDY RESOURCES USED**

**Scenario**  
**Construction Schedule**  
**Architect's Field Report**

**Section:** Construction Observation

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#### **Question 64**



The developer agrees to allow apartment owners to make changes to their units. The developer requests that the architect provide multiple preliminary designs for review.

How will the owner's request impact the architect's services?

- A. The original agreement between the owner and the architect will be invalidated.
- B. The architect is entitled to compensation for any additional services.
- C. The work is included in the architect's basic services.

**Correct answer:** B

**CORRECT RESPONSE**

**The architect is entitled to compensation for any additional services.**

According to AIA Document B101, the developer's request for multiple preliminary designs for changes requested by apartment unit owners is not included in basic services and would be an additional service. Additional services entitle the architect to compensation.

**CASE STUDY RESOURCES USED**

**Scenario**

**AIA Document B101-2017**

**Section:** Construction Observation

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**Question 65**

The Contractor's Application for Payment was submitted on October 31.

Which of the following line items are eligible for full approval based on the Architect's Field Report and Construction Schedule?

- A. Labor and material for drywall installation and taping - 50%
- B. Remainder of plumbing through rough-in
- C. Roofing, including installation

**Correct answer:** C

**CORRECT RESPONSE**

**Roofing, including installation**

The Architect's Field Report confirms that roofing work is complete. The application for payment request for roofing material is in agreement with the Architect's Field Report and the contractor is correct in requesting payment for this work.

**CASE STUDY RESOURCES USED**

**Scenario**

**Construction Schedule**

**AIA Document G702-1992**

**Architect's Field Report**

**Section:** Administrative Procedures & Protocols

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**Question 66**

After the architect submits the field report, the contractor submits a change order proposal for the increased cost of replacing gypsum board with moisture-resistant gypsum board in Unit 304.

How should the architect respond first to the change order proposal?

- A. Forward the change order proposal to developer
- B. Accept the change order proposal
- C. Reject the change order proposal

**Correct answer:** C

**CORRECT RESPONSE**

**Reject the change order proposal**

A change order for this work is not a valid request. In the architect's field report, it is noted that water-resistant gypsum board is needed in unit 304 per the construction documents.

**CASE STUDY RESOURCES USED**

**Scenario**

**Architect's Field Report**

**Section:** Construction Observation

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### Question 67

ABC Architects visits the condominium site for a second time on November 18 to review a casework mockup. While on site, ABC notices that the sheet vinyl at the first level has moist and warped surfaces. RST Construction tells ABC that the sheet vinyl was stored and installed in strict accordance with the manufacturer's instructions and that the vinyl has a long lead purchasing timeline.

How should the architect respond to the observed defective material?

- A. Direct the contractor to suspend the remaining vinyl sheet installation while the cause of the defect is investigated.
- B. Recommend that the owner withhold \$10,000 for the vinyl product while the cause of the defect is investigated.
- C. Propose to the owner an alternative vinyl product for contractor replacement at no cost to the owner.

**Correct answer:** B

#### **CORRECT RESPONSE**

**Recommend that the owner withhold \$10,000 for the vinyl product while the cause of the defect is investigated.**

The G702-1992 pay application shows a \$10,000 fee for the sheet vinyl work completed. The material may be defective and the owner should not pay for a product that does not meet the performance requirements of the contract documents.

#### **CASE STUDY RESOURCES USED**

##### **Scenario**

##### **Architect's Field Report**

##### **AIA Document G702-1992**

**Section:** Administrative Procedures & Protocols

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### Question 68

The owner accompanies the architect on a monthly observation visit of the new laboratory building addition after the interior walls have been framed. On the walkthrough, the owner decides that the main laboratory area is not large enough and insists that the contractor reframe the area, enlarging the laboratory and reducing other areas.

The architect works with the MEP engineer to determine an acceptable revision to the plans. The contractor prefers to continue working with the original plans, stating that their timeline is compressed and that the drywall will need to be installed soon to stay on schedule.

Which action should the architect take, per A201?

- A. Distribute a construction change directive asking the contractor to submit labor and material costs after work is completed.
- B. Document the change in the field observation report and include an attached sketch directing the changes in layout.
- C. Issue the revised drawings describing the change as part of G710 Architect's Supplemental Instructions.
- D. Notify the framing subcontractor of the upcoming changes and confirm whether there are expected cost implications.

**Correct answer:** A

#### **CORRECT RESPONSE**

**Distribute a construction change directive asking the contractor to submit labor and material costs after work is completed.**

Since the owner insists on the change regardless of the time or cost impacts, a construction change directive is the appropriate action to compel the contractor to carry out the work.

#### **CASE STUDY RESOURCES USED**

##### **Scenario**

##### **AIA Document A201-2017**

**Section:** Construction Observation

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### Question 69

<u>Adjusted Phasing Plan A</u>	<u>Adjusted Phasing Plan B</u>	<u>Adjusted Phasing Plan C</u>
<ol style="list-style-type: none"> <li>1. Complete the in-progress demolition of areas in the existing lab.</li> <li>2. Complete the renovations of areas where the demolition is complete.</li> <li>3. Move operations back to existing lab.</li> <li>4. Immediately mobilize for foundation excavation of new addition.</li> <li>5. Immediately prepare shop drawings for critical path items, such as structural steel, in new addition.</li> </ol>	<ol style="list-style-type: none"> <li>1. Complete all demolition in the existing lab.</li> <li>2. Complete all renovations in the existing lab when demolition is complete.</li> <li>3. Move operations back to existing lab.</li> <li>4. Immediately mobilize for foundation excavation of new addition.</li> <li>5. Immediately prepare shop drawings for critical path items, such as structural steel, in new addition.</li> </ol>	<ol style="list-style-type: none"> <li>1. Stop all demolition work in the existing lab.</li> <li>2. Allow operations to continue in areas of existing lab where demolition has not started.</li> <li>3. Immediately mobilize for foundation excavation of new addition.</li> <li>4. Immediately prepare shop drawings for critical path items, such as structural steel, in new addition.</li> </ol>

Refer to exhibit.

Desiring to get the project underway, the owner relocates some of the staff in the existing labs and authorizes demolition of select existing laboratory spaces. This creates unforeseen operational difficulties for the owner. Since the demolition has started before construction of the new addition, an adjustment is required to the phasing plan.

Which adjusted phasing plan should be selected?

- A. Adjusted Phasing Plan A
- B. Adjusted Phasing Plan B
- C. Adjusted Phasing Plan C

**Correct answer:** A

**CORRECT RESPONSE**  
**Adjusted Phasing Plan A**

To return to the objectives of the project's original phasing plan, the schedule must refocus on bringing the existing lab back into full operation as quickly as possible while simultaneously getting the construction of the new addition underway. Phasing Plan A accomplishes this.

**CASE STUDY RESOURCES USED**  
**Scenario**

**Section:** Construction Observation

**Question 70**

**McNICHOLS** since 1952

McNICHOLS® Quality Trench Drain Systems Kit 1 - 20 LF Run

**Item Specifications:**

Item Number : F38888820  
 Product Line : Trench Drain  
 Product Type : Kit  
 Weight : 450 #/EA  
 Class : Trench Drain Systems  
 Trade Name : McNICHOLS®  
 Major Material : Plastic  
 Minor Material : Polymer Concrete  
 Trench Drain System Kit : Kit 1 - 20 LF Run  
 SKU Type : Each  
 Trench Drain Locking Device : 20 each DA0642BH  
 Trench Drain End Cap Type 2 : 1 each DA0670M  
 Kit Channels Included : 1 ea Channel 601-605  
 Heavy Duty Frame Kits : Optional - Not Included in Kit 1 or Kit 2  
 Installation Chairs : 7 each DA0633  
 Trench Drain End Cap Type 1 : 1 each DA0670  
 HS Item Number : F38888820

CE Contractors

Submittal: 03 3120 2.01F

Review is for general conformance with contract documents. Sole responsibility for correctness of dimensions, details, quantities, and safety during fabrication and erection shall remain with the Subcontractor. Sub to notify GC if discrepancies arise and/or if coordination is required with other trades.

Reviewed by: Tom Lorem  
 Date: 10/1

Refer to the exhibit.

The contractor submits product data for a trench drain.

What response should the architect provide?

- A. Reviewed: No exceptions taken.

- B. No Action Taken: For information only.
- C. Rejected: Provide substitution request.
- D. Approved: Make corrections noted.

**Correct answer:** C

**CORRECT RESPONSE**

**Rejected: Provide substitution request.**

Because the trench drain submitted by the contractor is not listed as an "acceptable product" in the Specifications Sections resource, the architect should respond by rejecting the submittal and informing the contractor that a substitution request must be sent for this product.

**CASE STUDY RESOURCES USED**

**Scenario**

**Specification Sections**

**Section:** Administrative Procedures & Protocols

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**Question 71**

The addition is nearing the end of construction and the existing building renovation has just started. During a site visit, the architect observes laboratory employees moving into the offices in the new building. The architect notifies the owner that the new building has not yet been inspected and the contractor is still working on site. Citing delays to the construction schedule, the owner insists that the laboratory employees continue to occupy finished portions of the new building.

How should the architect respond to the owner's decision?

- A. Identify rooms for which the contractor may be absolved of responsibility.
- B. Conduct a substantial completion inspection for the new building office areas.
- C. Modify the contract to reduce the architect's project closeout responsibilities.

**Correct answer:** B

**CORRECT RESPONSE**

**Conduct a substantial completion inspection for the new building office areas.**

Although the owner has moved into part of the building before substantial completion, the architect is still responsible for making a determination about substantial completion. It is common to have multiple dates of substantial completion if a project is phased.

**CASE STUDY RESOURCES USED**

**Scenario**

**AIA Document A201-2017**

**Section:** Construction Observation

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**Question 72**

The contractor submits an approved laboratory test for soil classification of earthwork fill at the new building addition. The architect asks the contractor to also submit compaction test results when performing the work. However, the contractor argues that the compaction tests, as specified by the architect, are to be provided to the owner.

Which specification sections should the architect reference to resolve the issue? **Check the two that apply.**

- A. 310216 - Aggregates for Earthwork
- B. 312200 - Grading
- C. 312306 - Excavation
- D. 312319 - Dewatering
- E. 312323.13 - Backfill
- F. 312500 - Erosion and Sedimentation Controls

**Correct answer:** BE

**CORRECT RESPONSES**

**312200 - Grading**

Part 1.05, Submittals, lists compaction results as a submittal and delineates responsibilities of the contractor and owner. Part 3.08, Compaction / Density lists performance requirements for the compaction of soils.

**312323.13 - Backfill**

Part 3.05, Field Quality Control, lists the frequency and performance standards of the compaction testing required for the backfill.

**CASE STUDY RESOURCES USED**

**Scenario Specifications Sections**

**Section:** Administrative Procedures & Protocols

**Question 73**

**CONCRETE COMPRESSIVE STRENGTH TEST REPORT**

**Material Information**

Specified Strength: 4,500 psi @ 28 days

Mix ID: WA480-1-4.49 FA

Supplier:

Batch Time: 1151

Truck No.: 176

Plant:

Ticket No.: 327271

**Sample Information**

Sample Date: 12/10 Sample Time: 1300

Sampled By:

Weather Conditions: Overcast

Accumulative Yards: 10 Batch Size (cy): 10

Placement Method: Pump

Water Added Before (gal): 20

Water Added After (gal): Slump After (in): 3.5

Sample Location: Gridline A.5/ 1.0

Placement Location: D.0 to D.3/B.7 to A.0/ 1.0, 1.0 to 6.0/ A.0, A.0 to C.0/ 6.0, and 6.0 to 3.0/ C.0

**Field Test Data**

Test	Result	Specification
Slump (in):	3 1/2	Max 4
Air Content (%):	7.8	5 - 7
Concrete Temp. (F):	67	55 - 75
Ambient Temp. (F):	34	
Plastic Unit Wt. (pcf):	142.5	
Yield (Cu. Yds.):		

**Laboratory Test Data**

Set No.	Specimen ID	Avg Diam. (in)	Area (sq in)	Date Received	Specimen Weight (lbs)	Date Tested	Age at Test (days)	Maximum Load (lbs)	Compressive Strength (psi)	Fracture Type
1	1	4.01	12.63	12/12	8.29	12/17	7	52,800	4,580	5
1	2	4.01	12.63	12/12	8.31	12/17	7	54,580	4,520	5
Average (7 days)									4,550	
1	3	4.01	12.63	12/12	8.30	01/07	28			
1	4	4.01	12.63	12/12	8.30	01/07	28			
1	5	4.00	12.57	12/12		01/07	28 F			

Comments: F = Field Cured  
Air Entraining Agent, Superplasticizer, Fly Ash

Refer to the exhibit.

The architect has received a Concrete Compressive Strength Test Report for a portion of the concrete placed during the installation of the building grade beams and walls.

Which of the following test results meet the specification requirements for grade beams and walls? **Check the two that apply.**

- A. Compressive strength at 28 days
- B. Ambient temperature
- C. Plastic unit weight
- D. Concrete yield
- E. Air content
- F. Slump

**Correct answer:** AF

**CORRECT RESPONSES**

**Compressive strength at 28 days**

The specifications state that compressive strength at 28 days should be not less than 4500 psi, and the Test Report indicates that at 7 days the compressive strength is already greater than 4500 psi.

**Slump**

The specifications state that slump should be a maximum of 4", and the Test Report indicates that slump is at 3.5", which meets the specifications.

**CASE STUDY RESOURCES USED**

**Scenario**

**Specifications Sections**

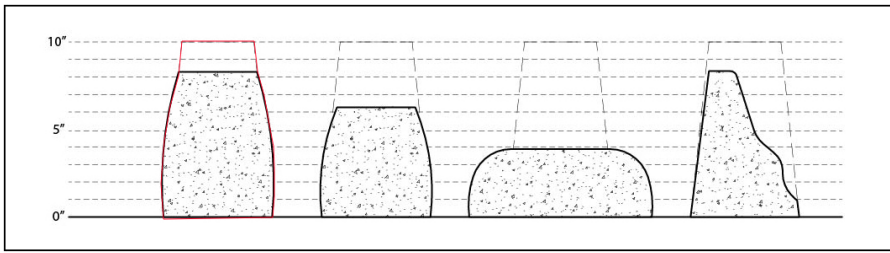
**Section:** Administrative Procedures & Protocols

**Question 74**

The architect is reviewing slump test results for the laboratory project. They need to determine the result that is acceptable for Cast-in-Place Concrete Type FS, as indicated in the specification.

Click on the result in the slump test that indicates acceptable performance.

**Correct answer:**



**CORRECT RESPONSE**

**The slump test result farthest to the left**

The specifications state that slump for Cast-in-Place Concrete can be no more than 3". The slump test result that is farthest to the left shows slump just under 2".

**CASE STUDY RESOURCES USED**

**Scenario**

**Specifications Sections**

**Section:** Construction Observation

**Question 75**

The night after a site visit, a fire causes extensive damage to the laboratory project site. The probable cause is an electrical spark that ignited sawdust. No one is hurt. The contract between the owner and contractor requires the owner to maintain property insurance throughout the construction of the project. The owner threatens to sue the contractor for faulty work and the architect for failing to instruct the contractor to keep the site "broom clean," as stated on the architect's general notes page.

Which insurance is contractually responsible to cover the loss?

- A. Electrical subcontractor's liability insurance
- B. Contractor's liability insurance
- C. Owner's property insurance

**Correct answer:** C

**CORRECT RESPONSE**

**Owner's property insurance**

According to A201, the owner's property insurance would cover damage caused by the fire.

**CASE STUDY RESOURCES USED**

**Scenario**

**AIA Document A201-2017**

**Section:** Administrative Procedures & Protocols

**Testing Resources**

For more information on test preparation references and resources, as well as testing policies and procedures, please refer to the ARE 5.0 Guidelines, available on [ncarb.org](http://ncarb.org).