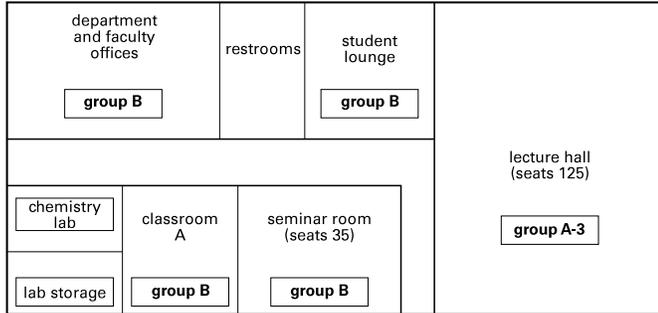


and Architect, allows the architect to request additional services compensation from the owner for “changing or editing previously prepared Instruments of Service necessitated by the enactment or revision of codes, laws, or regulations or official interpretations.”

The answer is (D).

130. The illustration shown contains the correct groups for each room.



Classroom buildings on college campuses are classified as Group B (business) occupancies rather than Group E (educational) occupancies. The majority of the spaces shown on this plan are Group B occupancies. The seminar room functions like an assembly space, but its occupant load is fewer than 50, so according to the exceptions in the code, it also is classified as Group B. Fire-rated separation is not required between occupancies of the same classification.

The corridor walls must have a 1-hour fire rating because they serve an occupant load greater than 30 (assumed because the capacity of the Seminar Room alone is 35) and the building is not sprinklered.

The lecture hall seats greater than 50 people and occupies about one third of the total floor area of this story. This space is classified as Group A-3 (assembly occupancy). In a nonsprinklered building, the code requires a 2-hour separation between A and B occupancies. If the building is sprinklered, the required separation between these spaces is one hour.

The chemistry lab is a space where hazards exceed those found in the rest of the building, but these hazards do not contribute significantly to the overall fire hazard. The chemistry lab is classified as an incidental accessory occupancy. According to IBC, this space must be separated from adjacent spaces with 1-hour-rated construction because the building is not sprinklered. If an automatic fire extinguishing system is present, this rating is not required.

The lab storage room is typically classified as a storage occupancy. Because the size of the space is less than 10% of the total area of the story and the function of the space supports the spaces in which it is located, it is considered

an accessory occupancy. No separation is required between Group B occupancies and accessory occupancies within.

131. Building code requirements represent the minimum standards that must be met to protect public health and welfare. The designer always has the option to exceed the code minimums. Building codes have undergone many revisions to reflect the introduction of new materials, building technologies, and challenges. The biggest changes to codes happen in response to disasters, when the shortcomings of the previous requirements become evident. The Chicago Fire of 1871, the 1906 San Francisco earthquake, the September 11, 2011 attacks on the United States, and other disasters have led to code requirement revisions that intend to make buildings safer and protect human life.

Anyone—contractors, architects, building code enforcement officers, lobbyist groups or manufacturer representatives, among others—may propose a change to the IBC according to the procedure available on the ICC website. The person making the proposal must complete forms identifying the text to be changed and explain the proposed modification and rationale for the change. State governments and some municipalities have the responsibility to decide which codes and which versions of codes are adopted for use in jurisdictions under their purview. A new edition of the code is not automatically adopted upon publication. There is usually a delay of a year or more to allow time for legislative approval. In some cases, provisions of the new edition are not acceptable to the legislature, and the new version is not adopted. Alternatively, the legislature may decide to adopt only parts of the code. The way to confirm which codes and which version of the codes are in effect in a specific jurisdiction is to contact that municipality’s code enforcement office.

The answer is (D).

132. A state’s statute of limitations establishes the amount of time that a party has to take legal action upon discovery of a design or construction defect. In contrast, a statute of repose establishes the time to take legal action once construction has completed. After the statute of repose period ends, an architect or contractor may be protected from third-party claims related to a project. However, some states include language that extends or modifies the length of time in cases of wrongful death or fraudulent activity. The statute of repose for a construction project usually begins at a fixed time (such as substantial completion, final inspection, or first use for the intended purpose, depending on the state), and the length of time varies by state. Current legislation sets the statute of repose in all states between 4 and 15 years.

Case Study 1

Problem 588 through Prob. 600 refer to the following case study. Refer to Resource 6.1 through Resource 6.8 to assist in answering the problems.

The owner of the Vermilion Building, which was built in the 1930s, has been working with Diazo Architects to upgrade the building's west elevator. The facility is within a block of Community Hospital and houses a number of outpatient clinics. The building has not undergone a comprehensive renovation since the 1980s, at which time the elevator was not modified.

Diazo Architects uses American Institute of Architects (AIA) Document B101, *Standard Form of Agreement Between Owner and Architect*, to prepare its contracts with clients. Compass Engineering is Diazo Architects' mechanical, electrical, and plumbing engineering consultant. Diazo Architects has engaged Trace Systems, a consultant that specializes in elevator design. The architect-consultant agreements are based on AIA Document ~~C141~~, *Standard Form of Agreement Between Architect and Consultant*.

C401

The existing elevator shaft is constructed of 12 in thick concrete masonry units and has a 2-hour fire-resistance rating, which the architect has determined complies with the current building code requirements. The existing elevator cab is large enough to comply with *Americans with Disabilities Act (ADA) Accessibility Guidelines* and state accessibility code requirements but is showing its age, so the owner has decided to replace it with a new cab. In addition, the owner wants to modernize the elevator machinery to take advantage of significant improvements in energy-efficient motor technology. Upgrades to the elevator controls and in-cab communications system are also required.

The project scope includes the following items.

- Remove the existing elevator cab and construct a new cab within the existing shaft.
- Remove the existing geared elevator equipment and replace with a gearless machine.
- Enlarge the existing elevator machine room; this space must be separated from other areas of the building with 2-hour fire-rated construction.
- Install new heating, cooling, and ventilation equipment serving the elevator machine room. (The elevator machine room is currently an unconditioned space.)
- Provide new access stairs to the elevator machine room from the third floor.
- Install new finishes, controls, handrails, and lighting in the elevator cab.
- Replace the existing hall controls and indicator lights with models that comply with *ADA Accessibility Guidelines*.

The building has two underground levels and three stories above grade, as well as the penthouse that houses the elevator machine room and the mechanical penthouse. The elevator machine room can be accessed from inside the building, but the only access to the mechanical penthouse is from the roof via stairs on the east side of the building. The west elevator services the sub-basement (SB) level through to the third floor. The building has a second elevator on the east side of the building; this elevator will remain in operation while the west elevator is under construction.

The current elevator machine room has unrated, uninsulated walls. The insulation in all of the exterior walls of the penthouse will be increased to R-19. Diazo Architects has completed a code analysis for this project and has determined that the elevator machine room must be separated from the mechanical penthouse with 2-hour fire-rated construction; the stair and elevator enclosures also must be 2-hour fire-rated. The floor of the penthouse is poured-in-place reinforced concrete that provides a 2-hour fire rating for the top of the elevator shaft. The ceiling of the penthouse has nominal R-20 ceiling insulation that will remain unchanged.

The owner invited four general contractors to prepare proposals for the construction work, which was awarded to a local firm, Bluecurve Construction Services (BCS). Bluecurve's subcontractors are Green Triangle Vertical Transportation (GTVT) and Straightedge Mechanical (SM), which provides mechanical, electrical, and plumbing construction services. The owner-contractor agreements are AIA Document A101, *Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum*, and AIA Document A201, *General Conditions of the Contract for Construction*.

Solutions

Multiple Choice

- 511. (A) (B) (C) (D)
- 512. (A) (B) (C) (D)
- 513. (A) (B) (C) (D)
- 514. (A) (B) (C) (D)
- 515. (A) (B) (C) (D) (E) (F)
- 516. (A) (B) (C) (D) (E) (F)
- 517. (A) (B) (C) (D) (E) (F)
- 518. (A) (B) (C) (D)
- 519. (A) (B) (C) (D)
- 520. (A) (B) (C) (D)
- 521. (A) (B) (C) (D)
- 522. (A) (B) (C) (D)
- 523. (A) (B) (C) (D) (E) (F)
- 524. (A) (B) (C) (D)
- 525. (A) (B) (C) (D)
- 526. (A) (B) (C) (D) (E) (F)
- 527. (A) (B) (C) (D)
- 528. (A) (B) (C) (D) (E) (F)
- 529. (A) (B) (C) (D)
- 530. (A) (B) (C) (D)
- 531. (A) (B) (C) (D)
- 532. (A) (B) (C) (D)
- 533. (A) (B) (C) (D)
- 534. _____ 10 days _____
- 535. (A) (B) (C) (D)
- 536. (A) (B) (C) (D)

Case Study 1

- 588. (A) (B) (C) (D)
- 589. (A) (B) (C) (D) (E) (F)
- 590. (A) (B) (C) (D) (E) (F)
- 591. (A) (B) (C) (D) (E) (F)
- 592. (A) (B) (C) (D)
- 593. (A) (B) (C) (D) (E) (F)
- 594. _____ See Sol. 594. _____
- 595. (A) (B) (C) (D)
- 596. (A) (B) (C) (D) (E) (F)
- 597. (A) (B) (C) (D) (E) (F)
- 598. (A) (B) (C) (D)
- 599. (A) (B) (C) (D)
- 600. (A) (B) (C) (D)

- 537. (A) (B) (C) (D)
- 538. (A) (B) (C) (D) (E) (F)
- 539. (A) (B) (C) (D)
- 540. (A) (B) (C) (D) (E) (F)
- 541. (A) (B) (C) (D)
- 542. _____ 10 days _____
- 543. (A) (B) (C) (D)
- 544. (A) (B) (C) (D)
- 545. (A) (B) (C) (D)
- 546. (A) (B) (C) (D)
- 547. (A) (B) (C) (D) (E) (F)
- 548. (A) (B) (C) (D)
- 549. (A) (B) (C) (D) (E) (F)
- 550. (A) (B) (C) (D)
- 551. (A) (B) (C) (D) (E) (F)
- 552. (A) (B) (C) (D)
- 553. (A) (B) (C) (D)
- 554. (A) (B) (C) (D)
- 555. (A) (B) (C) (D)
- 556. (A) (B) (C) (D)
- 557. (A) (B) (C) (D)
- 558. (A) (B) (C) (D)
- 559. (A) (B) (C) (D)
- 560. (A) (B) (C) (D) (E) (F)
- 561. (A) (B) (C) (D) (E) (F)
- 562. (A) (B) (C) (D)

Case Study 2

- 601. (A) (B) (C) (D)
- 602. (A) (B) (C) (D)
- 603. (A) (B) (C) (D)
- 604. (A) (B) (C) (D)
- 605. (A) (B) (C) (D) (E) (F)

- 563. (A) (B) (C) (D)
- 564. (A) (B) (C) (D)
- 565. (A) (B) (C) (D)
- 566. (A) (B) (C) (D)
- 567. (A) (B) (C) (D)
- 568. (A) (B) (C) (D)
- 569. (A) (B) (C) (D)
- 570. (A) (B) (C) (D)
- 571. (A) (B) (C) (D)
- 572. (A) (B) (C) (D)
- 573. (A) (B) (C) (D)
- 574. (A) (B) (C) (D)
- 575. (A) (B) (C) (D)
- 576. (A) (B) (C) (D)
- 577. (A) (B) (C) (D) (E) (F)
- 578. (A) (B) (C) (D) (E) (F)
- 579. (A) (B) (C) (D)
- 580. (A) (B) (C) (D)
- 581. (A) (B) (C) (D)
- 582. (A) (B) (C) (D)
- 583. (A) (B) (C) (D) (E) (F)
- 584. (A) (B) (C) (D)
- 585. (A) (B) (C) (D)
- 586. (A) (B) (C) (D)
- 587. (A) (B) (C) (D)

Fill (E) and unfill (F)