Construction Documents Flashcards

Preparatory for the Architectural Record Examinations
Methods to minimize/contain asbestos fibers during removal:

- Wet methods
- HEPA vacuuming
- Area isolation
- Use of Personal Protective Equipment
- Avoid sawing, sanding and drilling
On Construction Tolerances

• Rarely approach those of manufacturing or even the prefabricated construction elements

• Some architects regard field-created tolerances of less than \( \frac{1}{8} \)" or even \( \frac{1}{4} \)" as unrealistic
Methods to minimize/contain lead during removal:

If disturbing more than 6 sf of lead paint in homes, child care facilities, or a school built before 1978, the work must be done by contractors certified by the EPA to follow procedures for safe removal

• Contain work area
• Minimize dust
• Clean up thoroughly
Loop Road:

a collector/distributor road into a shopping center
What percentage of exits can discharge through a lobby space on the level of exit discharge if it is protected and it has a sprinkler system?

50%
Name the 5 parameters that zoning regulates:

- The uses allowed on a parcel of land
- The area of the land that may be covered
- The bulk of the structures
- The distances of setbacks from property lines
- Parking and loading space requirements
The restriction where an imaginary inclined plane beginning at the lot line or the street center, sloping at a prescribed angle over the lot, and the building can not extend beyond it is called:

Bulk Plane Restriction
The purpose of the bulk plane restriction is to ...

Ensure adequate light and air to neighboring properties and to open space and surrounding streets
Can zoning ordinances set limits of maximum height or number of stories above grade?

Yes
The right of one party (including govt. admin.) to use portion of the land of another party in a particular way is called:

**Easement**

Examples would be for:

- Utilities – i.e. utility easement
- Access – i.e. access easement
- Support for construction – support easement
- Joint Use – e.g. shared driveway
- Scenic easement to protect views
- Conservation easement that limits land use
The legal right to traverse land that belongs to another party is called:

Right of way
The Construction Documents include:

- Bidding Requirements
- Contract Forms
- Conditions of Contract
- Specifications
- Drawings
- Addenda
- Contract Modifications
The Project Manual includes:

• **Bidding Requirements**
  • Invitation to bid, prequalification forms, instructions to bidders, information available to bidders, bid forms.

• **Supplements to Bid Forms**
  • Bid security form, subcontractor list, substitution list.

• **Contract Forms**
  • Agreement (owner contractor), Performance bond, Labor and materials payment bond, Certificates of insurance.

• **General and Supplementary Conditions**
  • General conditions such as the A201, and the Supplementary conditions based on the AIA A503 Guide.

• **Technical Specifications**
The Pre-bid Conference

A pre-bid conference gives potential bidders the opportunity to ask questions and learn more about the contract documents. The Project Manager, Contract Management staff, and Owner's Representative convey important bidding and other administrative requirements to the bidders and receive questions regarding any ambiguities in the contract documents, plans, or drawings.

Any document changes discussed at the meeting are not final until/unless they are addressed in a formal written addendum. Pre-bid conferences are mandatory for all projects subject to the "Large Projects" Construction Bid Advertisement procedure (i.e. estimated construction budget ≥ $2.0 million). The Project Manager should strongly consider making attendance mandatory for smaller dollar value projects as well to ensure new bidders have a clear understanding of the project requirements. Each interested firm should send an authorized agent to a mandatory pre-bid conference to be considered an eligible bidder.
The architect may establish certain criteria for the contractor’s scheduling requirements (found in Division 01 of the specifications), to contribute to a project’s timely completion:

1) All dates be established for ordering and delivery of materials, for submittals, and for testing;
2) Scheduling to be done according to the CPM method;
3) Schedule to show time allotted for each activity as well as cost, crew size, and equipment requirements for each activity;
4) Subcontractors provide input related to their scope of work;
5) Schedule to be updated monthly by the contractor to reflect the actual progress and current status.
Contained provisions in legal deeds that restrict the use of the property by the owner are called: 

**Restrictive covenants.** They are legal and enforceable, stated in the deed, and they have to be reasonable and in the public interest.

Example would be the limitations such as setbacks, minimum square footage of developed residences, types of construction materials etc., and they are generally established for up to 30 years.
AIA Document A101 is:

A standard form of agreement between:
Owner – Contractor

For construction of projects of Stipulated Sum

Standard form of agreement between owner and contractor for use where the basis of payment is a stipulated sum (fixed price). A101 adopts by reference, and is designed for use with, AIA Document A201™–2007, General Conditions of the Contract for Construction. A101 is suitable for large or complex projects. For projects of a more limited scope, use of AIA Document A107™–2007, Agreement Between Owner and Contractor for a Project of Limited Scope, should be considered. For even smaller projects, consider AIA Document A105™–2007, Agreement Between Owner and Contractor for a Residential or Small Commercial Project.
AIA Document A101 SP is:

A Standard Form of Agreement Between Owner and Contractor, for use on a **Sustainable Project** where the basis of payment is a Stipulated Sum

Standard form of agreement between owner and contractor for use on sustainable projects where the basis of payment is a stipulated sum (fixed price). A101–2007 SP is based on AIA Document A101™–2007, Standard Form of Agreement Between Owner and Contractor, where the basis of payment is a Stipulated Sum, with modifications that address the risks, responsibilities and opportunities unique to projects involving substantial elements of sustainable design and construction (sustainable projects). A101–2007 SP adopts by reference, and is designed for use with, AIA Document A201™–2007 SP, General Conditions of the Contract for Construction for use on a Sustainable Project.
AIA Document A102 is:

A standard form of agreement between: Owner – Contractor, for construction of projects of Cost of Work Plus Fee, with Guaranteed Maximum Price (GMP.)

This standard form of agreement between owner and contractor is appropriate for use on large projects requiring a guaranteed maximum price, when the basis of payment to the contractor is the cost of the work plus a fee. AIA Document A102™–2007 is not intended for use in competitive bidding. AIA Document A102–2007 adopts by reference and is intended for use with AIA Document A201™–2007, General Conditions of the Contract for Construction. NOTE: A111–1997 expired in 2009.
AIA Document A103 is:

A standard form of agreement between: Owner – Contractor

For construction of projects of **Cost of Work Plus Fee**, with No GMP.

AIA Document A107 is:

A standard form of agreement between: Owner – Contractor

For construction of projects of limited scope when the A101 is not necessary

Note: A101 is Standard form of agreement between Owner and contractor, not to be confused with A201 which is a document of the General conditions of the contract, an integral part of the contract for construction for a large project and the conditions are incorporated by reference into the owner/contractor agreement A101.

According to AIA Documents A101 and A107, Mediation and Arbitration differ in...

Both Mediation and Arbitration are mandatory but only Arbitration is binding in most states under the Federal Arbitration Act.

In some states, arbitration provisions relating to future disputes may or may not be enforceable under the Federal Arbitration Act.
AIA Document A201 is:

A document that defines the general conditions of the contract for construction:

Only Owner and Contractor are involved in this although it is set in parallel and quoted by other AIA documents that may involve other parties. For construction of projects

The general conditions are an integral part of the contract for construction for a large project and they are incorporated by reference into the owner/contractor agreement. They set forth the rights, responsibilities, and relationships of the owner, contractor, and architect. Though not a party to the contract for construction between owner and contractor, the architect participates in the preparation of the contract documents and performs construction phase duties and responsibilities described in detail in the general conditions. AIA Document A201™–2007 is adopted by reference in owner/architect, owner/contractor, and contractor/subcontractor agreements in the Conventional (A201) family of documents; thus, it is often called the “keystone” document.
AIA Document A201 SP is:

A document that defines the general conditions of the contract for construction of a Sustainable Project: Only Owner and Contractor are involved in this although it is set in parallel and quoted by other AIA documents that may involve other parties. For construction of projects

General Conditions of the Contract for Construction, for use on a Sustainable Project, sets forth the rights, responsibilities, and relationships of the owner, contractor and architect. The general conditions are an integral part of the contract for construction for a sustainable project, and A201–2007 SP is incorporated by reference into AIA Document A101™—2007 SP, Standard Form of Agreement Between Owner and Contractor, for use on a Sustainable Project where the basis of payment is a Stipulated Sum. A201–2007 SP is based on AIA Document A201™—2007, General Conditions of the Contract for Construction, with modifications that address the risks, responsibilities and opportunities unique to projects involving substantial elements of sustainable design and construction (sustainable projects). Though not a party to the contract for construction between owner and contractor, the architect participates in the preparation of the Contract Documents and performs construction phase duties and responsibilities described in detail in the General Conditions.
AIA Document A401–2007 is:

A Standard Form of Agreement Between Contractor and Subcontractor

AIA Document A401™–2007 establishes the contractual relationship between the contractor and subcontractor. It sets forth the responsibilities of both parties and lists their respective obligations, which are written to parallel AIA Document A201™–2007, General Conditions of the Contract for Construction, which A401–2007 incorporates by reference. AIA Document A401–2007 may be modified for use as an agreement between the subcontractor and a sub-subcontractor, and must be modified if used where AIA Document A107™–2007 or A105™–2007 serves as the owner/contractor agreement.
AIA Document A401–2007 SP is:

Standard Form of Agreement Between Contractor and Subcontractor, for use on a Sustainable Project

AIA Document A401™–2007 SP, Standard Form of Agreement Between Contractor and Subcontractor, for use on a Sustainable Project, establishes the contractual relationship between the contractor and subcontractor on a sustainable project. A401–2007 SP is based on AIA Document A401™–2007, Standard Form of Agreement Between Contractor and Subcontractor, with modifications to coordinate its use with the other Sustainable Projects documents in the Conventional (A201) family of AIA Contract Documents. It sets forth the responsibilities of both parties and lists their respective obligations, which are written to parallel AIA Document A201™–2007 SP, General Conditions of the Contract for Construction, for use on a Sustainable Project. A401–2007 SP incorporates A201–2007 SP by reference. A401–2007 SP may be modified for use as an agreement between the subcontractor and a sub-subcontractor on a sustainable project.
AIA Document A503–2007 (formerly A511–1999) is:

Guide for Supplementary Conditions

AIA Document A503™–2007 is not an agreement, but is a guide containing model provisions for modifying and supplementing AIA Document A201™–2007, General Conditions of the Contract for Construction. It provides model language with explanatory notes to assist users in adapting AIA Document A201–2007 to specific circumstances. A201–2007, as a standard form document, cannot cover all the particulars of a project. Thus, AIA Document A503–2007 is provided to assist A201–2007 users either in modifying it, or developing a separate supplementary conditions document to attach to it. NOTE: A511–1999 expired in 2009.
AIA Document A521–2012 is:

Uniform Location of Subject Matter

AIA Document A521™–2012 provides general guidance to users preparing bidding and construction contract documents for determining the proper location of information to be included in bidding documents, the contract for construction, General Conditions, Supplementary Conditions, and Division 01 General Requirements and Divisions 02-49 Specifications.
AIA Document A701–1997 is:

Instructions to Bidders

AIA Document A701™–1997 is used when competitive bids are to be solicited for construction of the project. Coordinated with AIA Document A201™, General Conditions of the Contract for Construction, and its related documents, AIA Document A701–1997 provides instructions on procedures, including bonding requirements, for bidders to follow in preparing and submitting their bids. Specific instructions or special requirements, such as the amount and type of bonding, are to be attached to, or inserted into, A701.
AIA Document A501 is:

A recommended guide for competitive bidding procedures for building construction. It is jointly prepared by the AIA and Associated General Contractors of America.
AIA Document B101 is:

A standard form of agreement between:
Owner – Architect, For construction of projects.

AIA Document B101™–2007 is a one-part standard form of agreement between owner and architect for building design and construction contract administration. AIA Document B101–2007 was developed to replace AIA Documents B141™–1997 Parts 1 and 2, and B151–1997 (expired 2009), but it more closely follows the format of B151–1997. Services are divided traditionally into basic and additional services. Basic services are performed in five phases: schematic design, design development, construction documents, bidding or negotiation, and construction. This agreement may be used with a variety of compensation methods, including percentage of construction cost and stipulated sum. B101–2007 is intended to be used in conjunction with AIA Document A201™–2007, General Conditions of the Contract for Construction, which it incorporates by reference.
AIA Document B101-2007 SP is:

A standard form of agreement between: Owner – Architect, for use on a Sustainable Project.

AIA Document B101™–2007 SP is a one-part standard form of agreement between owner and architect for sustainable building design and construction contract administration. B101–2007 SP is based on AIA Document B101™–2007, Standard Form of Agreement Between Owner and Architect, with modifications that address the risks, responsibilities and opportunities unique to projects involving substantial elements of sustainable design and construction (sustainable projects). B101–2007 SP follows B101–2007 in the division of services into Basic and Additional Services. B101–2007 SP also includes a new scope of services section that sets forth services unique to sustainable projects.
AIA Document B102-2007 SP (formerly B141–1997 Part 1) is:

A standard Form of Agreement Between Owner and Architect without a Predefined Scope of Architect’s Services

AIA Document B106-2010 is:

A standard Form of Agreement Between Owner and Architect for Pro Bono Services

AIA Document B106™–2010 is a standard form of agreement between owner and architect for building design, construction contract administration, or other professional services provided on a pro bono basis. The architect’s pro bono services are professional services for which the architect receives no financial compensation other than compensation for reimbursable expenses. A table format is provided which the parties use to designate the scope of the architect’s pro bono services and the maximum number of hours to be provided by the architect for each designated pro bono service. If the architect is providing construction phase services, B106–2010 is intended to be used in conjunction with AIA Document A201™–2007, General Conditions of the Contract for Construction, which it incorporates by reference. NOTE: B106–2010 is available in AIA Contract Documents® software, but not in paper. An interactive B106 form is available free of charge from AIA Documents on Demand®.
AIA Document B107–2010 (formerly B188–1996) is:

A Standard Form of Agreement Between Developer-Builder and Architect for Prototype(s) for Single Family Residential Project

AIA Document B107™–2010 is a standard form of agreement between developer-builder and architect for design of one or more prototype(s) for a single family residential project. AIA Document B107–2010 is intended for use in situations where the architect will provide limited architectural services in connection with a single family residential project. Under B107–2010, the architect’s services consist of development of Permit Set Documents and limited construction phase services for the first residence of each prototype design constructed by the developer-builder in the development. This document anticipates that the developer-builder will have extensive control over the management of the project, acting in a capacity similar to that of a developer or speculative builder of a housing project, and that the developer-builder is an entity that has experience with applicable residential building codes, selection of materials and systems, and methods of installation and construction. NOTE: B188–1996 expired on April 30, 2012.
AIA Document B108–2009 (formerly B181–1994) is:

A Standard Form of Agreement Between Owner and Architect for a Federally Funded or Federally Insured Project

AIA Document B108™–2009 is a standard form of agreement between Owner and Architect for building design and construction contract administration that is intended for use on federally funded or federally insured projects. AIA Document B108–2009 was developed with the assistance of several federal agencies and contains terms and conditions that are unique to federally funded or federally insured projects. B108 sets forth five traditional phases of basic services: schematic design, design development, construction documents, bidding or negotiation, and construction. Two other types of services are delineated in the document: optional services and additional services. B108 is structured so that either the owner or the architect may be the entity providing cost estimates. NOTE: B181–1994 expired in May 2011.
AIA Document B109–2010 is:

A Standard Form of Agreement Between Owner and Architect for a Multi-Family Residential or Mixed Use Residential Project

AIA Document B109™–2010 is a standard form of agreement between owner and architect for building design and construction contract administration for a multi-family residential or mixed use residential project. B109–2010 contains terms and conditions that are unique to these types of projects. B109–2010 is based on AIA Document B103™–2007, Standard Form of Agreement Between Owner and Architect for a Large or Complex Project. AIA Document B109–2010 uses the traditional division of services into Basic and Additional Services but adds a new Pre-Design Services article that includes items such as assessment of project feasibility, layout, and regulatory requirements.
AIA Document B201–2007 (formerly B141–1997 Part 2) is:

A Standard Form of Architect’s Services: Design and Construction Contract Administration

AIA Document B201™–2007 replaces B141–1997 Part 2 (expired 2009). AIA Document B201–2007 defines the architect’s traditional scope of services for design and construction contract administration in a standard form that the owner and architect can modify to suit the needs of the project. The services set forth in B201–2007 parallel those set forth in AIA Document B101™–2007: the traditional division of services into basic and additional services, with five phases of basic services. B201–2007 may be used in two ways: (1) incorporated into the owner/architect agreement as the architect’s sole scope of services or in conjunction with other scope of services documents, or (2) attached to AIA Document G802™–2007, Amendment to the Professional Services Agreement, to create a modification to an existing owner/architect agreement. B201–2007 is a scope of services document only and may not be used as a stand-alone owner/architect agreement.
AIA Document B103™–2007 SP is:

A standard Form of Agreement Between Owner and Architect for a Large or Complex Sustainable Project

AIA Document B103™–2007 SP is a standard form of agreement between owner and architect intended for use on large or complex sustainable projects. B103–2007 SP is based on AIA Document B103™–2007, Standard Form of Agreement Between Owner and Architect for a Large or Complex Project, with modifications that address the risks, responsibilities and opportunities unique to projects involving substantial elements of sustainable design and construction (sustainable projects). B103–2007 SP assumes that the owner will retain third parties to provide cost estimates and project schedules, and may implement fast-track, phased or accelerated scheduling. Services are divided along the traditional lines of basic and additional services. B103–2007 SP also includes a new scope of services section that sets forth services unique to sustainable projects. This document may be used with a variety of compensation methods. B103–2007 SP is intended to be used in conjunction with AIA Document A201™–2007 SP, General Conditions of the Contract for Construction, for use on a Sustainable Project, which it incorporates by reference.
AIA Document G612 is:

A set of instructions for the owner, regarding the Construction Contract, Insurance bonds, and Bidding and Procedures
AIA Series List

A series – O/C
A101 – Standard Form of Agreement between Owner and Contractor - Stipulated Sum
A201 – General Conditions of the Contract for Constructions
A305 – Contractor’s Qualification Statement
A310 – Bid Bond
A312 – Performance and Payment Bond
A511 – Guide for Supplementary Conditions
A701 – Instruction to Bidders

B series – O/A
B101 – Standard Form of Agreement between Owner and Architect
B101 exhibit A – Initial Information

C series – A/Ct
C 401- Standard Form of Agreement between Architect and Consultant

D series – A/industry
D101- Methods of Calculations the Area and Volume of buildings
Can the owner and the contractor communicate directly about issues pertaining to the project?

NO

According to AIA A201, 4.2.4: Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.
Is it the architect's duty to reject work that does not conform to the Contract Documents?

NO, it is an authority, not a duty

According to AIA A201, 4.2.6: The Architect will have authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.
Would reviewing of Shop Drawings by Architect make him/her responsible of the quality of materials and methods of building?  NO

According to AIA A201, 4.2.7: Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures.
How long can an architect take to respond to a written request on performance requirements...?

Reasonable promptness, but if agreement on time limit is made, no delay will be recognized until 15 days after written request is made.

According to AIA A201, 4.2.11: The Architect will interpret and decide matters concerning performance under and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made.
In resolutions of claims, can the architect make decision about disputes involving the contractor and the subcontractors?

NO

According to AIA A201, 4.4.1: Claims, including those alleging an error or omission by the Architect but excluding those arising under Sections 10.3 through 10.5, shall be referred initially to the Architect for decision. An initial decision by the Architect shall be required as a condition precedent to mediation, arbitration or litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered by the Architect. The Architect will not decide disputes between the Contractor and persons or entities other than the Owner.
In how many days does the architect have to respond to a claim?

10 days

According to AIA A201, 4.4.2: The Architect will review Claims and within ten days of the receipt of the Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Architect is unable to resolve the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Architect concludes that, in the Architect's sole discretion, it would be inappropriate for the Architect to resolve the Claim.
Can the architect consult experts in the process of evaluating a claim?

Yes although it is not an obligatory condition

According to AIA A201, 4.4.3: In evaluating Claims, the Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Architect in rendering a decision. The Architect may request the Owner to authorize retention of such persons at the Owner's expense.
If the architect requests a party to provide a response on a claim or furnish additional data, how long does the party have to respond?

10 days

According to AIA A201, 4.4.4: If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either provide a response on the requested supporting data, advise the Architect when the response or supporting data will be furnished or advise the Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part.
Is the decision by the architect on any claim final and binding?

Yes, but.. it is subject to mediation and arbitration if a demand for mediation or arbitration is filed within 30 days after the architect's decision.

According to AIA A201, 4.4.5 & 6:
Is the decision by the architect on any claim final and binding?

Yes, but.. it is subject to mediation and arbitration if a demand for mediation or arbitration is filed within 30 days after the architect's decision.

According to AIA A201, 4.4.5 & 6:
What is the difference between mediation and arbitration?

They are alternatives to traditional litigation, and sometimes they are used in conjunction with litigation (opposing parties may first try to negotiate, and if that fails, move forward to trial). Both arbitration and mediation employ a neutral third party to oversee the process, and they both can be binding. However, it is common to employ mediation as a non-binding process and arbitration as a binding process. In simpler terms, binding arbitration replaces the trial process with the arbitration process.
Can a request for mediation and one for arbitration be filed concurrently?

Yes

According to AIA A201, 4.5.2: The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Request for mediation shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.
If the owner hires another contractor to do the work that was not done by the pre-existing contractor, who will have to compensate the new contractor?

The pre-existing contractor

According to AIA A201, 6.2.3: The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor
In case of dispute about cleaning up the site, who determines the responsible parties and allocates the costs?

The Architect

According to AIA A201, 6.3.1: If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.
How many days does the Contractor have to notify the Owner in writing about commencing the work if a date of commencement is not established?

5 days minimum

According to AIA A201, 8.2.2: The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.
Who is responsible for Boiler and Machinery insurance?

The Owner

According to AIA A201, 11.4.2: The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.
In case of fire negligently caused by the Contractor, can the Owner take action against the Contractor for loss of use?

NO, the Owner may purchase insurance

According to AIA A201, 11.4.3: The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.
If the Contractor requests additional insurance coverage, who will assume the charges?

The Owner will provide the Insurance but the Contractor will be charged.

According to AIA A201, 11.4.4: If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.
A piece of property that is not developed in a way that yields the highest ROI is considered:

Underdeveloped
Agreement between owner and contractor, enumerating the contract documents, addressing time of performance, and stating the contractors compensation is:

Contract form
Documentation of rights, duties, and responsibilities of owner and contractor as well as other parties involved, such as architect, subcontractors, owner's representative, etc, is:

Contract conditions (Document A201)
What is the advantage of separating the contract form from the conditions (A101 through 107 which are forms of agreement, separated from A201 which is General Conditions)?

Contractor can keep contract sum and other conditions that may remain privately held between architect, owner, and contractor, undisclosed to subcontractors, suppliers etc.
Is the architect required to prepare legal and contractual information?

No. The architect is only required to assist in preparation, but is not in the practice of law. It is common for architects to assemble the bidding and contractual documents, providing them for review and approval by the owner. (Architect's Handbook 3.81)
The three basic approaches in evaluating land are:

• **Market Approach**
  Based on similar recently sold properties in the area

• **Income Approach**
  Based on the potential of the property to yield a profit

• **Cost Approach**
  Value of land is estimated at its highest and best use and then cost to replace building or cost for improvements is calculated
Intersection on roof, w/ cant strip, drainage, etc.
There should be min _____ ft between curves in opposite directions and _____ ft between curves in identical direction

100 & 200
The 4 basic categories of roads are:

- Local streets
- Collector streets
- Arterial streets
- Expressways
A topographic map should include:

- Contours
- Property boundaries
- Existing buildings
- Utility poles
- Roads and other manufactured features
- Trees and vegetation
Public facilities include:

- Schools
- Shops
- Fire stations
- Churches
- Post offices
- Recreational centers
Which eight transportation considerations should be examined when analyzing a site?

- Adequate highway system
- Adequate traffic counts
- Potential overload of the existing road system
- Adequate truck access
- Negative effects of surrounding transportation
- Safe and adequate pedestrian access
- Proximity to public transportation
- Rail lines available for industrial projects
The net area for a space to be designed for a particular use may be determined through the following 3 ways:

- Number of people that must be accommodated (guidelines)
- Objects or pieces of equipment
- Specific activity to be housed (set of rules or customs – e.g. a tennis court has standard dimensions)
The net-to-gross ratio of area of a building is also referred to as:

The efficiency of the building

Generally the ratio ranges between 60% - 80% with hospitals going as low as 50% and museums as high as 90%
Mechanical rooms should be centrally located in order to...

Minimize duct runs and pipes
What utility areas need common plumbing wall?

Toilet rooms
What are the parking stall sizes?

10x18 is average parking stall = 180sf

350sf/car is used with a parking lot with no pedestrian circulation

400sf/car if pedestrian circulation added to parking lot
The process of assessing and reviewing if the same function can be accomplished in a less expensive way is called:

Value Engineering
Some standard timing for project contracts:

<table>
<thead>
<tr>
<th>Days</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 5 days</td>
<td>Minimum time frame for addenda to be issued and sent to all registered bidders before the receipt of bids. The Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.</td>
</tr>
<tr>
<td>7 days</td>
<td>Warning from Architect toward cancellation of all services due to suspension of work for 90+ days from owner. Warning after which the owner can terminate the agreement based on substantial non-performance. Written notice by Architect to owner before suspension of services due to payment failure.</td>
</tr>
<tr>
<td>10 days</td>
<td>Usual time frame for Owner (with help from Architect) to make decision on bids. Announcement must be made by the Architect. Time frame for change of owner’s or contractors requirements. Time allotted to Architect to review claims, and another 10 days for parties to respond to Architect’s request for response or provision of more data. Time before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values.</td>
</tr>
<tr>
<td>14 days</td>
<td>Time allowed to Architect to review certificates requested by owner before executing them.</td>
</tr>
<tr>
<td>15 days</td>
<td>Owner furnishes requested info by Architect. Owner furnishes to the Contractor a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.</td>
</tr>
<tr>
<td>21 days</td>
<td>Claims by Owner or Contractor must be initiated within 21 days after occurrence or identification of an event (includes the 'no sandbagging' and 'injury' conditions).</td>
</tr>
<tr>
<td>30 days</td>
<td>Owner pays within this time frame after final certification of payment. If project is suspended for more than this amount of time by the Owner, the Architect is entitled to all due compensation for all services rendered prior to suspension. Time allotted to parties to request arbitration after Architect's written decision on a dispute. If no arbitration or mediation is requested the Architect's decision becomes final and binding.</td>
</tr>
<tr>
<td>60 days</td>
<td>Architect is entitled to extra compensation if construction administration extends beyond this time frame. Pending mediations stay for this time frame unless otherwise agreed by the parties involved. If bidding or negotiation does not start within this time frame after the submission of CDs the work cost will be adjusted for applicable construction market.</td>
</tr>
<tr>
<td>90 days</td>
<td></td>
</tr>
</tbody>
</table>

79
A long term interest that may not be included in the project budget as it is an ongoing cost, like maintenance costs, is called:

Debt Service
The Total Budget Line Items are:

- **A** – Site Acquisition
- **B** – Building Costs
- **C** – Site Development *(usually 10% - 20% of building cost)*
- **D** – Total Construction Costs *(B+C)*
- **E** – Moveable Equipment *(usually 5% - 10% of building cost)*
- **F** – Furnishings
- **G** – Total Construction and Furnishings *(D+E+F)*
- **H** – Professional Services *(5% - 10% of D)*
- **I** – Inspection and Testing
- **J** – Escalation Estimate *(2% - 10% of G per year)*
- **K** – Contingencies *(5% - 10% of G)*
- **M** – Moving Expenses *(G + H through M)*
Costs to run a contracting business, such as office rent, secretarial help, heat, and other recurring costs are called:

General Overhead
The money that it takes to complete a job, such as temporary offices, sanitary facilities, trash removal etc., are called Project Overhead
Profit, the last item a contractor adds to the estimate, listed as a percentage, is based on which four items?

- Labor
- Materials
- Equipment
- & Overhead

It usually runs between 5% and 20%
Overall, overhead and profit of the contractor together may run between what percentages of construction cost?

15% - 40% depending
Two major factors to be accounted for in developing any project budget are:

Geographical location
&
Inflation
Blanket loan is:

used by developers to purchase land that they intend to subdivide and resell. When it’s sold, the lot is released from the loan, and debt is repaid as part of the selling price.
Bridge loan is:

quickly granted and used to close on a property/start construction while waiting for the official (long term) loan to be approved.
Mezzanine loan is:

used by a developer to pay a variable amount of interest during project development (starts low and gets really a high % rate at the end). Is considered a gamble, the stock in the company is collateral if revenue isn’t produced by sale or lease at the end to repay the loan.
Conventional mortgage is:

When you borrow money at a fixed or adjustable interest rate, and when it’s paid off, the borrower has clear title to what was purchased.
Define Deed of Trust:

Title is held by a trustee, foreclosure can happen under power of sale.
If the cost index in your city is 1250 and for the city where you will design is 1345, a project of $2.0 mil in your city will cost how much in the other city?

$ 2,152,000.00
The two major scheduling methods are:

The bar chart

The Critical Path Method
What are the advantages of the Design-Bid-Build delivery method:

1. Contractors bid competitively, based on complete design documents to maximize the built product for the price.
2. The owner selects the architect on the basis of qualifications or ability. The architect’s role is that of owner’s advocate.
3. The architect is active in construction administration so design intentions are followed.
4. Design and construction roles are clearly defined, and responsibilities and liabilities clear.
5. Owner is an active participant in design process.
What are the disadvantages of the Design-Bid-Build delivery method:

1. Design-Bid-Build construction phases are sequential and may require more time.

2. Owner is at risk for final construction cost. Actual construction costs are not known until design and bidding are complete.
Who should participate in a pre-bid conference?

The Architect
The interested Contractors and Subcontractors
Design team
Owner
Where is procedural and administrative information found in the Construction Documents?

- In the conditions of the contract,
- In Division 1 of the specs, and
- In the opening articles (Part 1) of all other divisions
Specifications

- Written requirements for materials, equipment, and construction systems as well as standards for products, workmanship, and the required construction services
- Often presented in the project manual, along with the bidding requirements, contract forms, and conditions of the contract.
Division 1 of the specifications expands on information in the general conditions and often includes:

- Standard office procedures, such as required format of shop drawing submittals, numbers of sets of submittals required, and procedures for certification of substantial completion

- Procedures required by Owners, such as forms of payment requests and waivers of lien

- Procedures that govern the specific project, such as applicable codes, requirements for record documents, temporary facilities, and testing laboratory methods
Part 1 of the remaining divisions includes:

- Definitions
- References
- Allowances and unit price items,
- Alternates
- Submittal requirements
- Quality assurance requirements
- Delivery, storage, and handling requirements
- Site condition requirements
- Warranty requirements
- Maintenance requirements
CSI Format for organization of Specifications and materials

- Division 00 — Procurement and Contracting Requirements
- Division 01 — General Requirements
- Division 02 — Existing Conditions (natural conditions)
- Division 03 — Concrete (including footings)
- Division 04 — Masonry (concrete block/brick)
- Division 05 — Metals (main structural)
- Division 06 — Wood, Plastics, and Composites (framing)
- Division 07 — Thermal and Moisture Protection (insulation water barrier)
- Division 08 — Openings (door ways/windows)
- Division 09 — Finishes
- Division 10 — Specialties
- Division 11 — Equipment
- Division 12 — Furnishings
- Division 13 — Special Construction
- Division 14 — Conveying Equipment
• Division 21 — Fire Suppression
• Division 22 — Plumbing
• Division 23 — Heating Ventilating and Air Conditioning
• Division 25 — Integrated Automation
• Division 26 — Electrical
• Division 27 — Communications
• Division 28 — Electronic Safety and Security
• Division 31 — Earthwork
• Division 32 — Exterior Improvements
• Division 33 — Utilities
• Division 34 — Transportation
• Division 35 — Waterway and Marine
• Division 40 — Process Integration
• Division 41 — Material Processing and Handling Equipment
• Division 42 — Process Heating, Cooling, and Drying Equipment
• Division 43 — Process Gas and Liquid Handling, Purification and Storage Equipment
• Division 44 — Pollution and Waste Control Equipment
• Division 45 — Industry-Specific Manufacturing Equipment
• Division 46 — Water and Wastewater Equipment
• Division 48 — Electrical Power Generation
Architectural and Construction Information

- Encompasses the qualities and relationships of the work required for the project.

- Quantities and relationships are usually best indicated on the drawings.

- Quality and standards of workmanship are best represented in the specifications.
What CSI Division contains technical information on the Conveyor System?
A. 11
B. 13
C. 14
D. 15

C
What CSI Division contains technical information on Soil Compaction requirements?
A. 01
B. 02
C. 04
D. 16

B

Note: Earthwork is in section 31 but that was not an option presented. Soil compaction is briefly addressed in 02 but 31 is the division dedicated to earthwork.
What CSI Division contains technical information on Plumbing?
A. 05
B. 10
C. 14
D. 22

D
What CSI Division contains technical information on Painting?
A. 02
B. 06
C. 09
D. 16

C
Types of Occupancy per IBC

- Assembly
- Business
- Educational
- Factory / Industrial
- Hazardous
- Institutional
- Mercantile
- Residential
- Storage
- Utility
IBC Construction Type I & II

are all the types of construction in which the building elements listed in Table 601 are of noncombustible materials (i.e., concrete and steel)

A = Protected  -  Protected means that all structural members of a building or structure has an additional fire rated coating or cover by means of sheetrock, spray on, or other approved method. This additional fire rated coating or cover extends the fire resistance rating of structural members at least 1 hour.

B = Unprotected – Unprotected means that all structural members of a building or structure has no additional fire rated coating or cover. Exposed members are only fire resistant according to their natural ability and characteristics.
IBC Construction Type III

is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies of a 2-hour rating or less.

A = Protected - Protected means that all structural members of a building or structure has an additional fire rated coating or cover by means of Sheetrock, spray on, or other approved method. This additional fire rated coating or cover extends the fire resistance rating of structural members at least 1 hour.

B = Unprotected – Unprotected means that all structural members of a building or structure has no additional fire rated coating or cover. Exposed members are only fire resistant according to their natural ability and characteristics.
IBC Construction Type IV

is that type of construction (Heavy Timber, HT) in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type 4 construction shall comply with the provisions of 602.4.1 through 602.4.7. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies with a 2-hour rating or less

A = Protected - Protected means that all structural members of a building or structure has an additional fire rated coating or cover by means of sheetrock, spray on, or other approved method. This additional fire rated coating or cover extends the fire resistance rating of structural members at least 1 hour.

B = Unprotected – Unprotected means that all structural members of a building or structure has no additional fire rated coating or cover. Exposed members are only fire resistant according to their natural ability and characteristics.
IBC Construction Type V

is that type of construction in which the structural elements, exterior walls and interior walls are of any material permitted by code. (Most One and Two Family Dwellings are of this type of construction)

A = Protected - Protected means that all structural members of a building or structure has an additional fire rated coating or cover by means of sheetrock, spray on, or other approved method. This additional fire rated coating or cover extends the fire resistance rating of structural members at least 1 hour.

B = Unprotected – Unprotected means that all structural members of a building or structure has no additional fire rated coating or cover. Exposed members are only fire resistant according to their natural ability and characteristics.
Angles of Parking:

• 90° parking is most efficient = 11 cars/100 linear feet of curb makes for easy two-way traffic and can accommodate most cars. The only disadvantage is that it can be difficult to maneuver.

• 60° parking is pretty efficient = 9 cars/100 linear feet of curb. Relatively economical and allows easy access to and from parking spaces.

• 45° parking is pretty efficient = 8 cars/100 linear feet of curb. Relatively economical and allows easy access to and from parking spaces.

• 30° parking is least efficient = 5 cars/100 linear feet of curb. Uneconomical.

• Slopes in parking lots should be 5% max.
• In multiple story lots, ramps should be 15% max, with 8’ transitions.
(a) pull side

(b) push side

(c) push side, door provided with both closer and latch
(a) front approach, pull side

(b) front approach, push side

(c) front approach, push side, door provided with both closer and latch

(d) hinge approach, pull side

(e) hinge approach, pull side

(f) hinge approach, push side
Determine “x”

a. 50”
b. 52”
c. 56”
d. 60”
Determine “x”

a. 30”
b. 32”
c. 34”
d. 36”

b. 32”
Determine "x"

a. 30”
b. 32”
c. 34”
d. 36”

a. 30”
Which of the following elements is considered most potentially hazardous for children in a renovation project?

a. Asbestos  
b. Germs  
c. PCB  
d. Lead

d. Lead
A court or yard that provides access to a public way for one or more exits is considered a(n) ,

a. exit accessway  
b. egress court  
c. public way  
d. horizontal exit

b. egress court

IBC 1002.1
Which of the following elements is not a distinct and separate part of the means of egress?

a. exit discharge
b. exit access
c. exit
d. exit convergence

IBC 1002.1

d. exit convergence
That portion of the exit access that occupants must traverse before two separate and distinct paths of egress travel to two exits are available is defined as a.

a. means of egress
b. single egress path
c. common path of egress travel
d. limited egress travel distance

c. common path of egress travel
Panic hardware that is listed for use on fire door assemblies is considered to be ____ hardware.

a. fire egress
b. fire exit
c. panic
d. panic and fire

IBC 1002.1

b. fire exit
An alternating tread device has a series of steps that are positioned a minimum of _____ degrees and maximum of___ degrees from horizontal.

a. 30, 45  
b. 45, 60  
c. 50, 70  
d. 60, 75

IBC 1002.1

c. 50, 70
In a dining room without fixed seating, the calculated occupant load is determined by dividing the floor area by a factor of one occupant per _____ square feet.

a. 7 net
b. 15 net
c. 15 gross
d. 20 net

b. 15 net

IBC Table 1004.1.1 – (15ft^2/person in unconcentrated assembly w/o fixed seats)
In a Concentrated assembly space the space required is one occupant per _____ square feet.

a. 7 net  
b. 15 net  
c. 15 gross  
d. 20 net

IBC Table 1004.1.1

a. 7 net
In a Bowling center the space required is one occupant per _____ square feet.

a. 7 net  
b. 15 net  
c. 15 gross  
d. 20 net

a. 7 net

IBC Table 1004.1.1
In a Classroom the space required is one occupant per _____ square feet.

a. 7 net
b. 15 net
c. 15 gross
d. 20 net

IBC Table 1004.1.1
In an agricultural facility the space required is one occupant per _____ square feet.

a. 7 net  
b. 50 net  
c. 200 gross  
d. 300 gross

the correct answer is:

 d. 300 gross

IBC Table 1004.1.1
In a Parking garage the space required is one occupant per _____ square feet.

a. 50 net
b. 50 gross
c. 100 gross
d. 200 gross

IBC Table 1004.1.1

d. 200 gross
In a Baggage claim area the space required is one occupant per _____ square feet.

a. 20 net  
b. 20 gross  
c. 50 gross  
d. 100 gross

b. 20 gross

IBC Table 1004.1.1
In an outpatient area the space required is one occupant per _____ square feet.

a. 20 net
b. 20 gross
c. 50 gross
d. 100 gross

IBC Table 1004.1.1

d. 100 gross
A 1,500-square-foot (net) woodworking shop classroom in a high school is considered to have a design occupant load of ______persons,

a. 25  
b. 30  
c. 75  
d. 100  

b. 30  

IBC Table 1004.1.1 – (50ft^2/person in shop and vocational rooms)
For areas having fixed seats and aisles, the occupant load for bench seating without armrests is based on one occupant for each ___ inches of seating length.

a. 15
b. 18
c. 24
d. 30

b. 18

IBC Sec 1004.7
In a fully-sprinklered Group B office building having an occupant load of 3,200 occupants, the minimum total calculated means of egress width for egress other than stairways shall be ____ inches.

a. 960”
b. 640”
c. 480”
d. 320”

IBC par 1005.1 - (.2” per occupant, but 1028.6.2 applies to smoke protected seating & gives .15” per occupant)
An non fully sprinkled office has an occupant load of 170. What is the minimum width of the exit corridor?

a. 60”
b. 48”
c. 44”
d. 34”

IBC par 1005.1 - (.2” per occupant would give 34”, but any occupancy above 50 the minimum given is 44” which governs)
How many occupants can be in a restaurant of 3000 ft$^2$?

a. 80  
b. 150  
c. 180  
d. 200

d. 200

IBC TABLE 1004.1.1 – Unconcentrated assembly area (tables & chairs) indicates 15 net sq. ft per occupant
A stairway that is considered as part of accessible means of egress should have a minimum width of:

a. 36"

b. 40"

c. 44"

d. 48"

IBC 1007.3
A stairway that is **not** considered as part of accessible means of egress and that is anticipated to serve an occupant load more than 50 should have a minimum width of:

a. 36”
b. 40”
c. 44”
d. 48”

IBC 1009.1. If less than 50 then 36” would be the accepted minimum.
A stairway **not** considered as part of accessible means of egress and that is anticipated to serve an occupant load less than 50 should have a minimum width of:

a. 36”
b. 40”
c. 44”
d. 48”

IBC 1009.1

a. 36”
Exceptions to the rule of 44” for 50+ occupants and 36” for 49- occupants for minimum corridor width:

24”  Access to MEP equipment
36”  Within a dwelling
72”  E occupancy for 100 occupant load or I occupancy for ambulatory patients
92”  I-2 occupancy for bed movement
A stairway serving 400 occupants in a fully-sprinklered Group I-2 hospital shall be a minimum of ____ inches in width.

a. 60
b. 80
c. 120
d. 160

c. 120

IBC Table 1005.1
Multiple means of egress shall be sized so that the loss of any one means of egress shall not reduce the available capacity to less than _____ of the required capacity.

a. 10 percent
b. 25 percent
c. 33.3 percent
d. 50 percent

IBC Sec 1005.1

d. 50%
When fully open, a door is permitted to project into the required width of the path of egress travel a maximum of:

a. one-half the required width  
b. one-half the actual width  
c. 3.5 inches  
d. 7 inches

IBC Sec 1005.2
The means of egress shall have a ceiling height of not less than:

90” (7'-6”)

Exceptions can be sloped ceilings, ceilings of dwelling units and sleeping units within residential occupancies, allowable projections, stair headroom, door and ramp headroom, clear height of floor levels in vehicular and pedestrian traffic areas in parking garages, and areas above and below mezzanine floors, all according to specific sections of the IBC.
Up to 50 percent of the ceiling area of a means of egress may have a minimum ceiling height of ______where reduced by protruding objects.

a. 78 inches  
   b. 80 inches  
   c. 84 inches  
   d. 90 inches

b. 80" (6'-10")

IBC Sec 1003.3.1
Site Work includes:

- Demolition and clearing of land
- Earthwork
- Installation of piles
- Paving and other surfacing
- Drainage
- Site improvements
- Landscaping
Sequence of sheet formats:

- Architectural
- Structural
- Mechanical
- Plumbing
- Electrical
- Any Special Disciplines
Standard Penetration Test (SPT) is:

A measure of the density of granular soils and of the consistency of some clays.

Process: A 2” diameter sampled is driven to the bottom of a borehole by a 140 lb hammer falling 30”. The number of blows (N) required to drive the cylinder 12” is recorded
Auger Borings are being used to...

Raise samples of soil by using a standard auger bit.
Escalation of cost per year can range approximately between...  

2% - 10%
What is a Labor bond?

Guaranty or security provided by a bonding or surety company to the owner (principal) of a construction project on behalf of a contractor.

These bonds are issued usually with (and for the same amount as) performance bonds, and cover payment for all equipment, labor, materials, and services in the event the contractor fails to pay for them under to the terms of the contract.
What is a Performance bond?

A performance bond is a surety bond issued by an insurance company or a bank to guarantee satisfactory completion of a project by a contractor.
What is a Bid bond?

A debt secured by a bidder for a construction job or similar type of bid-based selection process for the purpose of providing a guarantee to the project owner that the bidder will take on the job if selected. The existence of a bid bond provides the owner with assurance that the bidder has the financial means to accept the job for the price quoted in the bid.
A payment bond is a surety bond posted by a contractor to guarantee that his subcontractors and material suppliers on the project will be paid. They are required in contracts over $30,000 with the Federal Government and must be 100% of the contract value. They are often required in conjunction with performance bonds.
What is a Completion bond?

A financial contract that insures a given project will be completed even if the producer runs out of money, or any measure of financial or other impediment occurs during the production of the project. Completion bonds are used in many industries, including major films and construction projects.

They may be part of a mortgage financing deal, and serve to protect both the mortgagor and mortgagee. A third party financier, a completion guarantor company, is typically brought in to provide the financial backstop in the event that original financing is insufficient to complete the project. Also known as a completion guarantee.
What is the Eichleay Formula?

A method of calculating home office overhead damages suffered by the contractor due to construction delay caused by the owner or the design team.
What is the Spearin Doctrine?

A 1918 United States Supreme Court decision. The owner impliedly warrants the information, plans and specifications which an owner provides to a general contractor. The contractor will not be liable to the owner for loss or damage which results solely from insufficiencies or defects in such information, plans and specifications.
Bidding Documents include...

ok, just name as many as you can think!

- Advertisement to bid
- Instructions to bidders
- Supplementary instructions (if any)
- Bid forms
- Bid security info
- Performance bond (if required)
- Labor & Material bond (if required)
- Qualification forms
- Subcontractor list form
- Certification for compliance to laws and regulations
- Information for bidders (anything applicable, such as geotechnical studies)
- Drawings
- Specifications
- General and supplementary conditions
- Special conditions
- Addenda
- Owner contractor agreement (try the A201 for that)
Construction Documents include...

- Drawings, documenting the architectural, structural, mechanical, electrical, civil, landscape, and interior design of the project

- Specifications, outlining the levels of quality and the standards to be met in the construction of the project

- Contract forms and conditions, including the form of agreement to be used between owner and contractor; forms for any bonds and certificates; and general conditions outlining the rights, responsibilities, and duties of owner and contractor as well as others involved in the construction process (including the architect)

- Bidding requirements, including the information and forms for bidding

- During the bidding or negotiation process, the architect may issue addenda to any of these documents. Once the owner-contractor agreement is signed, there may be contract modifications in the form of construction change directives and change orders. These, too, become part of the contract documents.
Wash Borings are:

Made of a 2”-4” diameter pipe through which a water jet is maintained to force up the soil material. This is only providing information about the material and used only when the soils are too hard for an auger test.
Site development cost is approximately how much compared to the building cost?

10% - 20%
Movable equipment cost is approximately how much compared to the building cost?

5% - 10%
Front or Side Yard Setback Exception

Front or Street Side Yard Setback – building must be less than 4 feet high within the setback, and not encroaching more than 40 square feet into the setback.
Side Yard Setback Exception

Side Yard Setback – building must be less than 10 feet high within the setback, and not encroaching more than 65 square feet into the setback.
Rear Yard Setback Exception

Rear Yard Setback – building must be less than 12 feet high within the setback, and not encroaching more than 120 square feet into the setback
Porches, Decks, Terraces, and Patios (§49.25.430(4)(D & E)):

Uncovered porches, terraces, or patios extending no more than 30 inches above the finished grade may be no closer than 3 feet to a side lot line and no closer than 10 feet to a front, street side or rear lot line.

Unenclosed FIRST STORY porches or decks with or without roof and with or without non-sight obscuring safety rails less than 44 inches in height, may project no more than 6 feet into any yard setback, provided, however, such projection is no closer than 5 feet to a lot line. Eaves may project a maximum of 3 feet from these structures.
Compared to the construction and furnishings cost what percentage should be considered for contingencies?

5% - 10%
Setback exceptions...

1. Any enclosed structures that do not increase the building's floor area (bay windows, garden windows, chimney and ventilation shafts.)

2. Unenclosed balconies, connecting deck stairways, walkways, ramps and landings

3. Arctic entries (cannot exceed 65 gsf)

4. Temporary boat or recreational vehicle shelters (consisting of a plastic, canvas or similar cover material applied to a frame for winter storage)

5. Accessory buildings (enclosures for outdoor fuel tanks, detached storage sheds, greenhouses, playhouses, refuse containers, woodsheds, and similar buildings)
Dry sample borings

Extrude material by driving a pipe with a split sampling pile on the leading edge about 5” into the soil. The pipe is lifted and the samples are removed for analysis.
What is the longest distance between manholes for large sewer systems?

500 ft
Project Delivery Methods

- Fixed Price or commonly referred to as the Lump Sum
- Unit Price
- Cost Plus
- Turn Key
- Design-Build
- Construction Management
A contract that is primarily used for projects that are completely designed and the scope is clearly defined. It is a guarantee by the contractor to perform the work and provide the necessary labor, material and equipment in a timely manner, no matter what the actual costs incurred. All financial risks are borne entirely by the Contractor. The Owner agrees to pay the Contractor, normally on a monthly basis, payments based upon progress.

Lump Sum Contract
OR
Stipulated Sum Contract
OR
Fixed Price Contract

A "stipulated sum" is the specific amount set forth as the total payment for performance of the contract. A stipulated sum is sometimes also referred to as a "lump sum" or a "fixed price."
A contract that provides the Contractor with a list of items and the estimated quantities to be installed. The Contractor guarantees to perform an estimated quantity of work at a specified unit price. Conversely, the Owner agrees to pay the Contractor the agreed upon unit price for the actual quantity of work installed at the job site. Hence, the total contract amount will vary depending on the actual quantities installed. However, the unit price for each particular item listed will not change throughout the contract, unless there is a major variation in a particular line item.

Normally, this contract contains a quantity adjustment clause for these major variances which states that if the quantities of an item of work installed varies from the estimated quantities by more than 20 percent, then the price will be adjusted. This type of contract is primarily utilized on civil projects such as roads, bridges, and massive excavation projects.

Unit Price Contract
A type of contract that is used for projects that contain a substantial amount of undefined design, undefined scope, complex procurement system, and unstable or uncertain labor, material and equipment prices. In this type of contract the Owner agrees to pay the Contractor for all actual direct costs of labor, materials and equipment incurred on the project, and a fee for the Contractor’s services. There are numerous methods used to calculate the Contractor’s fee on this type of contract such as the Cost Plus a Percentage of Project Costs, a Cost Plus a Fixed Fee, a Cost Plus Fixed Fee with a Target or Incentive Fee, and Cost Plus a Fixed Fee with a Guaranteed Maximum Price (GMP).

Cost Plus Contract
This type of contract is used mostly by developers. The Contractor / Developer agrees to design the project or build the project according to your design. They will also purchase the property and finance the project. The Owner agrees to make monthly payments on a longterm lease.

Turnkey Contract
On Fast-track

- Various packages are not bid or negotiated at the same time, and therefore the need for coordination among construction document packages is particularly important.

- Fast-track is often applied on projects involving Construction Management.

- A strong working relationship amongst CM, architect and owner is necessary.

- Design/build firms that routinely use the same subcontractors may use standard details and less detailed specifications.
Architect of Record

is the architect or architecture firm whose name appears on a building permit issued for a specific project on which that architect or firm performed services.
This project delivery method sometimes referred to as Engineer-Construct project is a contract that the Owner enters into one contract with a company to provide all design, procurement and construction on the project. The firm then enters into contracts with designers, contractors, subcontractors, vendors and suppliers to complete the project. One of the advantages for an Owner in selecting this method is from the better communication that can occur between the design professionals and the construction professionals during the early design phases of the project. This collaboration allows the project to be fast-tracked which can reduce the overall time of a project from schematic drawing to Owner occupancy. Fast-tracking is defined as the overlapping accomplishment of design, procurement, construction and commissioning of a project. How is this project delivery called?

Design Build
With this project delivery method the Owner hires both a design firm and a construction management firm during the pre-design phase of a project. Under this Contract, the Construction Manager firm is hired as an Agent for the Owner similar to hiring the Architect/Engineer as an Agent. Under this traditional CM contract the Owner holds separate contracts with the A/E, the CM and each individual Trade Contractor. The CM’s responsibility provides advice during the design phase and they provide overall scheduling, trade coordination, cost control and management services during construction of the project. The CM receives a management fee for their services similar to the A/E receiving a design fee for their services. This fee is called an agency fee and the two methods that an Agency CM may offer an Owner is a Fixed price Fee or a Guarantee Maximum Price Fee.
Multiple prime contracts

• When the construction contract is divided into multiple prime contracts, there will be multiple construction document packages, or at least carefully delineated packages of work within a single set of documents.

• Each package must clearly spell out requirements for that portion of the work, including relationships with other packages within the project.

• The summary of each work and the article on related work (Part 1 of each specification section) are major vehicles for clarifying the relationships amongst packages.
If there is conflict of information between written specifications and drawings which of the two is binding?

Specifications

(This is debatable because CDs are complementary and no information should be crossed but that's the best answer for an unorthodox scenario)
Should specifications contain requirements for ALL of the materials and the construction indicated in the drawings?

YES!
Can dimensions and thicknesses be indicated on multiple types of documents

NO. Construction Documents are complementary, e.g. if thicknesses of flashing are indicated in the specifications, they should not be added in the drawings too.

Sometimes order of precedence may be established but it is very dangerous as such approach may lead to lesser attention paid in the preparation of specific documentation that is set to be lower in the hierarchy.
Should notes of installation or material qualities be included on drawings?

NO! These pieces of information belong to the specifications.
How many main types of specifications exist?

Two, the “Prescriptive” or “closed”, and the “performance” or “open.”

Closed are:
• Proprietary, Base bid with alternates.

Open are:
• Descriptive, Performance, Reference standard, and Cash-allowance.
A pre-written set of specifications that includes the majority of requirements for a particular specification section, and can be edited accordingly is called:

Master specifications
Specifications that are most restrictive calling for a specific product by its manufacturer are called:

Proprietary. They are as Closed Specifications as they can be!
For brevity, simplicity, and familiarity with intended application of materials an architect would opt for which type of specification?

Proprietary. These specifications are frequently augmented with reference to standards, narrative descriptions of material's qualities and performance requirements. Proprietary specs usually include the option of “approved equal” and sometimes architects include requirement that the contractor pay for the architect's evaluation of proposed equal.
A type of closed specification that calls out a proprietary product but allows for the substitution of other products that the contractor thinks are equal to the one stated is called:

“Base bid with alternates specification.”

It still is a closed specification. This is divided into two subcategories:

- The 1st lists several approved manufacturers
- The 2nd uses the term “approved equal” where the contractor may propose another product subject to review before incorporated to bid.
An open specification that gives detailed written requirements for the material or product and the workmanship required for fabrication and installation is called:

Descriptive specification
An open specification that describes the material, product, or process, based on requirements set by an accepted authority or test method is called:

Reference Standard Specification
If specifying the end result, allowing the contractors, manufacturers, and fabricators, and having the most flexibility and creativity in meeting the requirements is the priority, which type of specification would be best?

**Performance.** These specifications may be providing the most flexibility although in practice performance specification is complicated by the number of qualities that affect the finished result and the level of uncertainty that the architect has to address before these parts are installed or the activity is executed.
What is the difficulty in writing performance specifications?

The author has to know all the criteria, state the method for testing, and be prepared for the cost consequences.
About Reference Standards Specifications

These incorporate references to standards published by industry associations and testing organizations. The most widely known standards associations are the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), and the Underwriters Laboratories.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), the National Fire Protection Association (NFPA), and the Illuminating Engineering Society (IES), focus on specific aspects of building performance.

The American Iron and Steel Institute, (AISI), the American Plywood Association (APA), and the American Architectural Manufacturer's Association, write standards for their products and systems produced by their own members.
Level of Restrictiveness in Specifications

The Architect determines how restrictive the specifications are to be – whether they will permit only one manufacturer’s product, several products, or any product that meets specific criteria.

Publicly funded projects often require specifications of several brands of products under the logic that qualified manufacturers should be eligible to compete equitably for the work. In private work, courts have upheld architect's right to specify restrictively. If there is a choice, the architect should determine which approach serves best the owner's interests.
In which division is there any Sustainability issues to be addressed?

In Division 01 “General Requirements” and in every technical section that covers specific materials and construction elements.
If hazardous materials were found on site during construction phase, the contractor will stop work, notify the owner and the architect, and get lab testing of the material. BUT who is responsible for paying for the testing?

All stops.
The owner is responsible for everything.
GC does nothing until instructed.
The propagation of flame over a surface is called:

FLAME SPREAD
A comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E 84 or UL 723 is called:

FLAME SPREAD INDEX
A material that has Flame spread index 0-25 and smoke-developed index 0-450 is situated in which of the classes of Interior Wall and Ceiling Finish Materials?

Class A
A material that has Flame spread index 76-200 and smoke-developed index 0-450 is situated in which of the classes of Interior Wall and Ceiling Finish Materials?

Class C
A material that has Flame spread index 26-75 and smoke-developed index 0-450 is situated in which of the classes of Interior Wall and Ceiling Finish Materials?

Class B
Should materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings be required to be tested?

No! 803.2 Thickness exemption
Should exposed portions of structural members complying with the requirements for buildings of Type IV construction in Section 602.4 be subject to interior finish requirements?

No! 803.3 Heavy timber exemption.
A door equipped with double-pivoted hardware so designed as to cause a semicounter balanced swing action when opening is defined as...

BALANCED DOOR
A court or yard which provides access to a public way for one or more exits.

EGRESS COURT
An operable window, door or other similar device that provides a means of escape and access for rescue in the event of an emergency, is considered:

EMERGENCY ESCAPE AND RESCUE OPENING
That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge. It includes exterior doors at the level of exit discharge, vertical exit enclosures, exit passageways, exterior exit stairways, exterior exit ramps and horizontal exits.
Egress Requirements

Typical common path of travel = 75'-0" max per path
Typical distance to an exit = 250'-0" max
Exits cannot pass through...

- Kitchens
- Storerooms
- Closets (or spaces used for similar purposes)
- Through rooms that can be locked to prevent egress
Other Considerations for egress:

- One Fire Tower is required in buildings over 75'-0” (one exit, minimum)
- Non combustible construction that is connected with mechanically vented vestibules on backup power or balconies
- Doors must swing in the direction of travel
- The number of exits is based on the number of occupants
- Typically spaces with more than 50 occupants must have 2 exits
- Required width of exits is determined by occupants on the floor plus an allowance for occupants from floors above
- Elevators are not a means of egress
- Escalators provide a conduit for smoke and are not an approved exit
- Ramps may constitute a portion of the required legal exits
- Revolving doors must collapse to be part of required legal exit
How many doors out of a series in a large building entry need to meet ADA standards? (Ratio and Min number)

At least one
That portion of a means of egress system that leads from any occupied portion of a building or structure to an exit.

EXIT ACCESS
A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, corridor, unenclosed exit access stair or unenclosed exit access ramp.

EXIT ACCESS DOORWAY
That portion of a means of egress system between the termination of an exit and a public way.

EXIT DISCHARGE
The story at the point at which an exit terminates and an exit discharge begins.

EXIT DISCHARGE, LEVEL OF
An exit component that is separated from other interior spaces of a building or structure by tire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a vertical or horizontal direction to the exit discharge or the public way is called:

EXIT ENCLOSURE
A path of egress travel from one building to an area in another building on approximately the same level, or a path of egress travel through or around a wall or partition to an area on approximately the same level in the same building, which affords safety from fire and smoke from the area of incidence and areas communicating therewith.
An exit component that is separated from other interior spaces of a building or structure by tire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to the exit discharge or the public way.

EXIT PASSAGEWAY
Panic hardware that is listed for use on fire door assemblies.
A continuous and unobstructed way of egress travel from any accessible point in a building or facility to a public way.

ACCESSIBLE MEANS OF EGRESS
An unenclosed exit access component that defines and provides a path of egress travel.

AISLE
That portion of an exit access that leads to an aisle.

AISLE ACCESSWAY
An area where persons unable to use stairways can remain temporarily to await instructions or assistance during emergency evacuation.

AREA OF REFUGE
The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above. This area shall not include shafts with no openings or interior courts.

Per IBC 1002.1  FLOOR AREA, GROSS

Note: Per IBC 1002.1 also, FLOOR AREA, NET: The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.
The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets is called NET FLOOR AREA.
Tiered seating having an overall shape and size that is capable of being reduced for purposes of moving or storing and is not a building element.

FOLDING AND TELESCOPIC SEATING.
Tiered seating supported on a dedicated structural system and two or more rows high and is not a building element (see “Bleachers”).
A continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. A means of egress consists of three separate and distinct parts: the exit access, the exit and the exit discharge.

MEANS OF EGRESS
A merchandise pad is an area for display of merchandise surrounded by aisles, permanent fixtures or walls. Merchandise pads contain elements such as nonfixed and moveable fixtures, cases, racks, counters and partitions as indicated in Section 105.2 from which customers browse or shop.
The number of persons for which the means of egress of a building or portion thereof is designed.

OCCUPANT LOAD
Seating served by means of egress that is not subject to smoke accumulation within or under a structure.

SMOKE-PROTECTED ASSEMBLY SEATING
A group of patient treatment rooms or patient sleeping rooms within Group I-2 occupancies where staff are in attendance within the suite, for supervision of all patients within the suite and the suite is in compliance with the requirements of Sections 1014.2.2 through 1014.2.7.
A tread with nonparallel edges.
Minimum number of exits per story per occupant loads of:

- 1 – 500
- 501 – 1000
- > 1000

• 2
• 3
• & 4
Handrails shall be designed to take a load of ___ per linear foot and a load of ___ of concentrated load:

50 lbs & 200 lbs
What should be the height of handrails according to ADA?

A) 32in
B) 32in – 34in
C) 32in – 36in
D) 34in – 38in
Standard minimum corridor width is:

44”

Exceptions may bring it down to 24” for MEP system access, 36” for capacity <50 or within a dwelling unit, 72” in group E of req. capacity >100 or in areas serving gunrey traffic of outpatient medical care, and 96” in group I-2 areas where required for bed movement.
The Owner wants to Fast-Track a construction project, Which type of contract best supports this process?

A. Cost Plus.
B. Unit Price.
C. Fixed Price.
D. Design-Build.

D. Design-Build.
A clause in the contract states that if the Quantities of an item of work vary from the estimated quantities by more than 20 percent, then the price will be adjusted.” Which type of contract will this clause be primarily used in?

A. Cost Plus.
B. Unit Price.
C. Fixed Price.
D. Design-Build.

B. Unit Price.
A contract has been entered into where by the Contractor agrees to design, build, and purchase the land. This type of contract is called:

A. Cost Plus.
B. Turn Key.
C. Partnering.
D. Design-Build.

B. Turn Key.
A contract is entered into whereby the design and scope are undefined and the Owner agrees to pay for all Direct Labor, Materials, Equipment plus some agreed upon allowance to the Contractor for their services. What is this type of contract called?

A. Cost Plus.
B. Partnering.
C. Design-Build.
D. Construction Management.

A. Cost Plus.
A contract is entered into whereby the Design, Scope and Bid quantities are established and payment for the work is to be made upon the basis of the actual quantity placed. What is this type of contract called?

A. Cost Plus.
B. Turn Key.
C. Unit Price.
D. Fixed Price
A contract is entered into whereby the Design and Scope are partially undefined, the Owner holds a contract with the A/E, the Owner holds the contracts with each trade and the Owner also holds a contract with a management service company to perform the trade coordination, cost control and scheduling services. What is this type of contract called?

A. Cost Plus.
B. Joint Venture.
C. Design-Build
D. Construction Management.

D. Construction Management.
A contract is entered into whereby two Contractors agree to combine their resources to bid and build a specific project. What is this type of contract called?

A. Cost Plus.
B. Joint Venture.
C. Design-Build.
D. Construction Management.

B. Joint Venture.
What is the name of the clause that is sometimes used if the contract has the potential of an uncertainty in either labor or material prices?

A. Incentive.
B. Escalation.
C. Contingency.
D. Equitable Adjustment.

B. Escalation.
Which legal entity is taxed twice?

A. Partnership.
B. Corporation.
C. Sole Proprietorship.
D. Subchapter S Corporation.

B. Corporation

A corporation is considered a separate legal entity created by state law through a charter which is filed with the secretary of state. The corporation is separate and apart from the officers who operate it and/or the shareholders who own it. A corporation can own property, issue stock and it can sue or be sued. Some of the advantages are that the corporation can sell stock to generate capital to expand the company. The sale of stock is not subject to repayment. The corporation’s liability is limited to the assets in the corporation and the corporation is perpetual. The major disadvantage is that the corporation is taxed twice.
Which type of legal entity allows the income and deductions of the corporation to flow through to the individual tax returns of the shareholders and it avoids federal taxes?

A. Partnership.
B. Corporation.
C. Sole Proprietorship.
D. Subchapter S Corporation.

D. Subchapter S Corporation.

A special form of a corporation is a Subchapter S corporation. A Subchapter S is used for federal government taxation purposes only. A Subchapter S corporation’s income and deductions flow through to the individual tax returns of the shareholders and it avoids federal income taxes as a corporation.
Which type of legal entity requires a charter?

A. Partnership.
B. Corporation.
C. Joint Venture.
D. Sole Proprietorship.

B. Corporation.

A *corporation* is considered a separate legal entity created by state law through a charter which is filed with the secretary of state. The corporation is separate and apart from the officers who operate it and/or the shareholders who own it. A corporation can own property, issue stock and it can sue or be sued. Some of the advantages are that the corporation can sell stock to generate capital to expand the company. The sale of stock is not subject to repayment. The corporation’s liability is limited to the assets in the corporation and the corporation is perpetual. The major disadvantage is that the corporation is taxed twice.
Which law are corporations formed under?

A. City.
B. State.
C. Federal.
D. Municipal.

B. State.
Which of the following contract formation principles are needed to form a valid contract?

A. Offer, Acceptance, Meeting of the Minds and Consideration.
B. Performance, Technical Specifications and Consideration.
C. General Conditions, Supplementary Conditions and a Proposal.
D. Plans, Technical Specifications, General and Supplementary Conditions.

A. Offer, Acceptance, Meeting of the Minds and Consideration.
Which of the following contract formation principles are needed to form a valid contract?

A. Offer, Acceptance, Meeting of the Minds and Consideration.

- Offer that specifically details exactly what will be provided
- Acceptance (the agreement by the other party to the offer presented)
- Consideration (the money or something of interest being exchanged between the parties)
- Capacity of the parties in terms of age and mental ability
- Intent of both parties to carry out their promise
- Object of the contract is legal and not against public policy or in violation of law
The owner requests that you submit a proposal supplement titled, “Statement of Contractors’ Qualifications - All Contracts” and under the officers/principals section it requests the names and titles of the vice president and the president. A proposal is submitted to the Owner with a bid bond, signed addenda, and the proposal form is attached and signed by the chief estimator. Have all of the contract formation principles been satisfied and your proposal would be considered responsive?

A. The principle of Consideration has been met, therefore, responsive bid.  
B. The principle of Legal Capacity has been met, therefore, responsive bid.  
C. The principle of the meeting of the minds has been met, therefore, responsive bid.  
D. The principle of Legal Capacity has not been met, therefore, a non-responsive bid.

D. The principle of Legal Capacity has not been met, therefore, a non-responsive bid.

Under most types of ownership, the sole proprietor, the legal partners or the corporate officers have the legal authority. This becomes a problem when an estimator signs the proposal and is not recognized as a legal authority for the company.
Which law establishes basic rules governing the sale of goods, used to establish a Purchase Order?

A. Davis Bacon Act.
B. Uniform Commercial Code.
C. National Labor Relations Act.
D. Uniform Transportation Code.

B. Uniform Commercial Code.
Which of the following Safety criteria has the greatest potential for reducing the costs of accidents?

A. Experience.
B. Safety Meetings.
C. Traditional Safety Program.

What manager goal to get commitment from top management of all project participants and stakeholders to develop open communications and cooperation on a project to?

A. Partnering.
B. Total Safety Management.
C. Statistical Process Control.
D. Total Quality Management.

A. Partnering.
What are the quality standards used internationally called?

A. ISO 9000.
B. Statistical Process Control.
C. Total Quality Management.
D. Baldrige Award of Excellence.

A. ISO 9000.
What management philosophy tries to maximize the competitiveness of an organization through continuous improvement?

A. Partnering.
B. Statistical Process Control.
C. Total Quality Management.
D. Baldrige Award of Excellence.

C. Total Quality Management.
What is the name of the criterion that is utilized to improve an organization and evaluate their progress toward becoming the best in their field?

A. Total Safety Management.
B. Statistical Process Control.
C. Total Quality Management.
D. Baldrige Award of Excellence.

D. Baldrige Award of Excellence.
What management philosophy is defined as a performance and process-oriented approach to safety and health that is improved continually and applies proven principles to maximize an organization’s long-term competitiveness?

A. Total Safety Management.
B. Statistical Process Control.
C. Total Quality Management.
D. Baldrige Award of Excellence.

A. Total Safety Management.
What makes TQM and TSM successful?

A. Applying the partnering process to an organization
B. Applying the TQM and TSM principles to an organization.
C. Adding more Quality Control and Safety Managers to oversee the workers.
D. Eliminating the isolation problem and making quality and safety everybody’s role.

D. Eliminating the isolation problem and making quality and safety everybody’s role.
What graphical measurement tool is a bar graph displaying a frequency distribution?

A. Histogram.
B. Pareto Chart
C. Control Chart.
D. Fishbone Chart.

D. Fishbone Chart.
What graphical measurement tool is a pictorial representation of a process?

A. Run Chart.
B. Flow Chart
C. Control Chart.
D. Scatter Diagram.

B. Flow Chart.
What graphical measurement tool displays the causes and effects on a diagram for analyzing problems?

A. Histogram
B. Pareto Chart
C. Control Chart.
D. Fishbone Chart.

D. Fishbone Chart.
What graphical measurement tool is a bar graph of identified causes shown in descending order of magnitude?

A. Bar Chart  
B. Histogram.  
C. Gantt Chart.  
D. Pareto Chart
What graphical measurement tool is a graph displaying the correlation of two characteristics?

A. Run Chart.
B. Flow Chart
C. Control Chart
D. Scatter Diagram.

D. Scatter Diagram.
What graphical display tool contain line graphs that show a trend over time such as the workhours per square yard of asphalt over a period of time?

A. Bar Chart
B. Run Chart.
C. Flow Chart.
D. Control Chart.

B. Run Chart.
Also known as “Run-Sequence Plot”
Which of the following principles of law states that if the prime contractor reasonably relies on the promise or price of the subcontractor to its detriment, then the subcontractor must be held to its promise in order to avoid harm to the prime contractor even though a signed contract between the contractor and subcontractor does not exist at the bidding phase of a project?

A. Consideration.
B. Legal Purpose.
C. Promissory Estoppel.
D. Equitable Adjustment.

C. Promissory Estoppel.
At which point in time must the Agreement be provided to each prospective bidder?

A. At the bid opening.
B. During the bidding phase of the project.
C. At the signing of the Owner-Contractor Agreement.
D. Just before the signing of the Owner-Contractor Agreement.

B. During the bidding phase of the project.
Which document establishes the reference date from which the beginning of the project is calculated and that the contractor can occupy the site?

A. Notice of Award.
B. Notice to Proceed.
C. Instructions to Bidders.
D. Advertisement to Bidders.

B. Notice to Proceed.
Which conditions need to be met in the building in order to receive Occupancy permit?

A. Complies with fire, safety, and health regulations.
B. Substantial completion certification.
C. Receiving the keys and closing the bonds.
D. Project completion.

A. Complies with fire, safety, and health regulations.
Which type of law is the most difficult to change?

A. Civil Law.
B. Statute Law.
C. Constitutional Law.
D. Administrative Law.

C. Constitutional Law.
How are most U.S. government contract disputes initially handled?

A. U.S. Supreme Court.
B. Federal District Court.
C. Federal Circuit Court of Appeals.
D. Armed Services Board of Contract Appeals.

D. Armed Services Board of Contract Appeals.
Which type of law governs the sales and purchase of goods?

A. Tort Law.
B. Civil Law.
C. Transportation Code.
D. Uniform Commercial Code.

D. Uniform Commercial Code.
Which type of law governs agencies set up to carry out specific laws passed by the legislature?

A. Civil Law.
B. Statute Law.
C. Constitutional Law.
D. Administrative Law.

D. Administrative Law.
The Preamble to the OSHA Construction Safety Standards states that “the company representative must provide a place of employment free from known and recognized hazards.” What is the name of this clause?

A. OSHA Act
B. Indemnification.
C. Contractual Liability.
D. General Duty Clause.
The action of compensation to an entity for incurred hurt, loss, or damage is called:

Indemnification
According to the Construction Safety Standards, what is the name of the wrongful act if a person who is informed of a wrongful act and they indicate that they understand the safety rules, but they proceed wrongfully anyway?

A. Disclaimer.
B. Due Diligence.
C. Willful Violation.
D. Promissory Estoppel.

C. Willful Violation.
Which type of law case requires you to prove due diligence?

A. Civil case.
B. Criminal case.
C. Statutory case.
D. OSHA Administrative case.

B. Criminal case.
In a court case that requires the person to prove “due Diligence.” Which of the following would be an example of due diligence?

A. Report Violations.
B. Tell employees to be careful.
C. Correct hazards immediately.
D. Scream and threaten the workers.

C. Correct hazards immediately.
Which party has all of the liability for a performance specification?

A. Owner.
B. Contractor.
C. Architect/Engineer.
D. Separate Contractor.

B. Contractor.
Which party has all of the liability for a descriptive specification?

A. Owner.
B. Contractor.
C. Architect/Engineer.
D. Separate Contractor.

C. Architect/Engineer.
Which party has liability for a proprietary specification if it does not perform as stated?

A. Owner.
B. Contractor.
C. Architect/Engineer.
D. Separate Contractor.

C. Architect/Engineer.
Which party has liability for a proprietary specification if an approved substitution does not perform?

A. Owner.
B. Contractor.
C. Architect/Engineer.
D. Separate Contractor.

B. Contractor.
A specification read as follows:
11305 STEP/STED SYSTEM EQUIPMENT
PART 2 PRODUCTS
2.05 STEP SYSTEM COMPONENTS

A. Screened Pump Vaults:
1. For Low Profile Concrete Tank:
   a) 15 inches in diameter by 48 inches long with 4 inch flow inducer. Model SVI548Fi, as manufactured by Orenco.

What type of specification is this called?

A. Proprietary Specification.
B. Performance Specification.
C. Combination Specification.
D. Descriptive or Design Specification.

A. Proprietary Specification.
A specification reads as follows:
10105 VISUAL DISPLAY BOARDS
PART 2 PRODUCTS
  2.02 Marker Board Material
    A. White DCB Writing surface or equal with 24-gauge porcelain enameled steel face on 3/8-inch foil-backed particle board.

What type of specification is this called?
A. Proprietary Specification.
B. Performance Specification.
C. Combination Specification.
D. Descriptive or Design Specification.

A. Proprietary Specification.
A specification reads as follows:
07530 ELASTOMERIC ROOFING - BOARD INSULATION
PART 3 EXECUTION

3.03 INSTALLATION - INSULATION

D. Pitch new roof surfaces to provide continuous
drainage to roof drain locations. Set drains at 2 inches
above deck level of the new roof. Gradually taper
insulation at roof drains approximately 16 inch radius
from roof drains using factory-tapered edge strips down
to minimum 1 inch thick at drain rings.

What type of specification is this called?

A. Proprietary Specification.
B. Performance Specification.
C. Combination Specification.
D. Descriptive or Design Specification.

C. Combination Specification.
A specification reads as follows:
03200 CONCRETE REINFORCEMENT
PART 2 PRODUCTS
2.02 Reinforcing Steel
   C. Provide deformed reinforcement prefabricated straight bars and bent bars according to the CRSI Manual of standard Practice of not less than 10 feet with concrete coverage of at least 3 inches on exterior exposures and 2 inches elsewhere. Place bars at the on-center spacings shown on the plans.

What type of specification is this called?

A. Proprietary Specification.
B. Performance Specification.
C. Combination Specification.
D. Descriptive or Design Specification.

D. Descriptive Specification.
A specification read as follows:
02140 DEWATERING
PART 3 EXECUTION
3.01 Dewatering
   I. Furnish, install, operate, and maintain all necessary pumping equipment for dewatering the various parts of the work and for maintaining free of water the foundations and trenches as required for construction operations.

What type of specification is this called?

A. Proprietary Specification.
B. Performance Specification.
C. Combination Specification.
D. Descriptive or Design Specification.

B. Performance Specification.
A Covenant is:

An agreement made by two or more parties to do or not do something.
Ordinances are a type of law that are passed by

The city, ...or in general a local government
Statutes are enactments made by Legislature
The Spearin Doctrine states that

When a contractor follows the plans and specifications furnished by the owner, and those plans and specifications turn out to be defective or insufficient, the contractor is not liable to the owner for any loss or damage resulting from the defective plans and specifications.
What are laws passed by the legislature called?

A. Statutes.
B. Covenants.
C. Ordinances.
D. Judicial Decisions.

A. Statutes.
Which type of law passes worker’s compensation rates or mechanic’s lien laws?

A. Statutes.
B. Covenants.
C. Ordinances.
D. Judicial Decisions.

A. Statutes.
Which type of law uses the Spearin Doctrine or the Eichleay Formula?

A. Statutes.
B. Covenants.
C. Ordinances.
D. Judicial Decisions.

D. Judicial Decisions.
What are laws passed by a local government called?

A. Statutes.
B. Covenants.
C. Ordinances.
D. Judicial Decisions.

C. Ordinances
Which type of law establishes restrictions or protective restrictions to a piece of property?

A. Statutes.
B. Covenants.
C. Ordinances.
D. Judicial Decisions.

B. Covenants.
A Primer on Construction Delivery Methods

COMPETITIVE BID (DESIGN/BID/BUILD)

Often referred to as Design/Bid/Build, this method is the one with which most owners are familiar. It is a linear process where one task follows completion of another with no overlap. Plans and specifications are completed, and then advertised for bids. Contractors bid the project exactly as it is designed with the lowest bidder awarded the work.

SCHEDULE

ADVANTAGES
- Familiar delivery method
- Easy process to manage
- Defined scope
- Single point of accountability
- Lowest price accepted
- Good for uncomplicated projects that are budget sensitive, but are not schedule sensitive and not subject to change

DISADVANTAGES
- Linear process means longer schedule
- May require re-design or re-bid to meet budget after bid
- No control over contractor selection
- No control over subcontractor selection
- No budget or design input from contractor
- Not suited for projects that are schedule or change sensitive

H.U.B. PARTICIPATION
- No input or control over subcontractor selection
- H.U.B. plan required

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COMPETITIVE SEALED PROPOSALS

Many aspects of this delivery process are similar to competitive bid, with two major exceptions. First, proposals are evaluated against published criteria, one of which is price. An award is made to the firm providing the best value. Second, Competitive Sealed Proposals allow modifications to the proposals before the bid is accepted, which allows the owner to negotiate a change of scope before accepting the bid.

SCHEDULE

ADVANTAGES
- Flexibility in contractor selection
- Enables the scope to be refined to fit the budget without having to re-bid
- Single point of accountability
- Allows award based on value rather than price alone: lowest price usually accepted
- Good for uncomplicated projects that are budget sensitive, but are not schedule sensitive

DISADVANTAGES
- Linear process means longer schedule
- May require re-design or re-bid to meet budget after bid
- No control over contractor selection
- No control over subcontractor selection
- No budget or design input from contractor
- Not suited for projects that are sequence, schedule or change sensitive

H.U.B. PARTICIPATION
- No input or control over subcontractor selection
- H.U.B. plan required

CONSTRUCTION MANAGER AT-RISK

CM at-Risk allows the Owner to interview and select a fee-based firm to manage construction before design is complete. The construction manager and the architect work together to develop and estimate the design. A guaranteed maximum price (GMP) is provided by the CM, who then receives proposals from and awards contracts to subcontractors. The final construction price is the sum of the CM’s fee, the subcontractors’ bids and allowances. The Owner will not pay more than the GMP, and retains a portion of savings.

SCHEDULE

ADVANTAGES
- Construction firm selected by interview based on quality rather than low bid
- Early CM involvement in estimating and constructability
- Owner selects architect, CM and subcontractors
- Good for large, complex projects

DISADVANTAGES
- No control over subcontractor selection
- Final price is not established until all packages are bid
- No guaranteed maximum price
- Owner manages multiple contracts
- Cost may be higher with multiple prime contractors

H.U.B. PARTICIPATION
- H.U.B. plan required

CONSTRUCTION MANAGER-AGENT

CM Agency differs from CM at Risk in the lack of a guaranteed maximum price. Here, the Owner contracts with both a construction manager and an architect, but signs separate contracts with each subcontractor who will actually perform the work.

SCHEDULE

ADVANTAGES
- CM selected on quality rather than low bid
- Early CM involvement in estimating and constructability
- Owner selects architect, CM and subcontractors
- CM responsible for delivery of project in budget and on schedule
- Enables fast-track delivery (construction begins before design is complete), saving time

DISADVANTAGES
- CM has no contractual responsibility with subcontractors
- Final price is not established until all packages are bid
- No guaranteed maximum price
- Owner manages multiple contracts
- Cost may be higher with multiple prime contractors

H.U.B. PARTICIPATION
- H.U.B. plan required

H.U.B. PARTICIPATION
- H.U.B. plan required

DESIGN/BUILD (POSSIBLE LEASEBACK)

Under the design/build delivery system, the owner builds on land owned by the developer. The developer is usually a large, well-financed entity that provides the design and construction services. The owner pays a leaseback fee to the developer, who builds the project to the owner's specifications.

SCHEDULE

ADVANTAGES
- Single point of accountability for design and construction
- Enables fast-track delivery (construction begins before design is complete), saving time
- CM eliminates Owner concern with cost overruns

DISADVANTAGES
- No check and balance between designer and builder
- CM/build team only meets minimum criteria for cost
- Potential for conflict between architect and builder
- Not suitable for small projects or those subject to change

H.U.B. PARTICIPATION
- No input or control over subcontractor selection
- H.U.B. plan required

BRIDGING

Bridging combines the traditional design process with design/build delivery. The Owner selects an architect who develops the design to the 50%-50% document stage. The Owner then selects a design/build team to complete design and construction of the building. This process is best suited to larger, new or renovation projects that are schedule sensitive and difficult to define.