

## Level 1 Construction Fundamentals Study Guide

### PROJECT ADMINISTRATION

#### Vendors and Suppliers and The Uniform Commercial Code

The terms and conditions for *Vendor or Supplier Agreements* with contractors fall under the Uniform Commercial Conditions. According to numerous feature articles in *Construction Claims Monthly* (CCM, June 2000, May 1994, August 1987, & August 1984), edited by Bruce Jervis, Esq., the book by Bruce Jervis and Paul Levin (1987) titled *Construction Law Principles and Practices*, and an article by Kristin McLaughlin and Donald A. Jensen, Jr. (December 1997) titled: *The UCC: It Effects Construction Contracts* published in the *American Professional Constructor* state that different laws govern the sale of good. Also, Jervis in CCM (August 1987) says that the Contractor - Supplier (Vendor) relationship creates legal issues unique within the construction process (p 1). McLaughlin and Jensen (1997) state that “there are two types of contracts” and a different set of laws apply to each (p 12).

The *Sale of Goods and the Purchaser of Those Goods* are governed by the Uniform Commercial Code (UCC). Under UCC rules, the only thing agreed upon being the prices and the merchant warranty provided. Therefore, a purchase order should be utilized for materials only. According to *Construction Claims Monthly* (June 2000, August 1987) their article states “that a purchase order form should never be used for the procurement of construction services” (p 1). A purchase order does not meet the first element of a contract which is a meeting of the minds. The Uniform Commercial Code applies to the sale of goods and in the CCC (June 2000) the Editor, Jervis states that “there are several legal complications in this process, however. Which party submitted the “offer?” and which party submitted the “acceptance?” At what point, if ever, was an agreement reached? And if the various documents contain additional or conflicting terms, which provisions govern?” He goes on to state that “Conflicting terms and conditions are the most difficult ramifications of this “battle of the forms.” Each party insists that its own preprinted “standard” conditions govern the transaction” (p 1). According to McLaughlin and Jensen (December 1977) they insist that a Purchase Order under “UCC Article 2-204(3) (1977) states that a contract will not fail due to lack of definite terms” (p 12). The feature article in CCM (June 200) titled *Supplier Relations: Which Terms Govern?* He states that “Section 2-207 of the UCC provides that acceptance of an offer can be binding even though the acceptance contains additional or different terms. The additional or deviating terms become part of the agreement unless: (1) the offer expressly required acceptance in accordance with the terms of the offer; (2) the additional terms materially alter the offer; or (3) the offeror gives a prompt objection to the additional terms” (p 1). The offering party accepts the differing terms unless they give 10 days notice of an objection. In conclusion, the only things agreed upon under UCC rules are (1) the prices and (2) the merchant warranty.

Jervis and Levin (1987) imply that under the UCC rules no meeting of the minds is necessary. In other words, **never put labor** on any form titled Purchase Order because the meeting of the mind’s element of a contract is difficult to establish and a different set of laws applies. This

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becomes more apparent when the hybrid contract calls for the contracting party to provide a mix of goods and services under the Uniform Commercial Code (UCC). The courts will apply numerous tests if a hybrid contract is involved as discussed below.

McLaughlin and Jensen (December 1994) insist that many construction contracts are “actually *Hybrid Contracts* - a mix of goods and services” and recognizing that an agreement is a hybrid is important because “the resolution of a dispute over a contract will differ depending on the nature of the agreement” (p 12). They also state that how a court interprets a hybrid contract as either for labor services or one for goods will alter the outcome in court. They insist that “the appellate system applies various tests to determine if a contract is predominantly for services or for the sale of goods. The most commonly used is the *predominate thrust* test. They refer to the *Bonebrake v. Cox (1974)* which outlined the theory of the mixed contract test as follows.

. . . whether their predominate factor, their thrust, their purpose, reasonably stated, is the rendition of service, with goods incidentally involved . . . or is a transaction of sales with labor incidentally involved . . . (p 13).

The second test, predominate service, reviews the evidence regarding the intent of the parties to the contract, the purpose for creation of the contract by the parties and which of the hybrid transaction aspects, the services or goods, forms the basis of the bargain between the parties” (p 14). The third test is the goods supplied test. This test focuses on the definition of goods as it applies to the UCC. The fourth test is the policy test. This test the courts apply by considering the circumstances surrounding the making of the transaction as more important than the goods or services mix. The fifth test is the divisibility test is where the UCC code applies to only that part of the contract that focuses on goods and general contract law applies to the services portion of the transaction. The divisibility test is used infrequently. The sixth test is the contract language test. This test relies upon the verbiage in the contract such as utilizing the word’s buyer and seller indicate a contract for the sale of goods, whereas, the word’s Owner or Contractor and Subcontractor indicate a contract for services. Finally, McLaughlin and Jensen (December 1997) states that “the gravamen test focuses on the action at the center of the case. If the case is because of a mechanical failure then it is a goods contract. If it is because of a failure of workmanship, then it is a service contract” (p 14).

McLaughlin and Jensen (December 1997) conclude that the contractor must determine the direction of the agreement then the character of the agreement itself must provide much of the defense as to the contract being primarily a services contract or a sale of goods contract. They also state that “the court system most often uses the predominate thrust test, although it is subjective. Therefore, contractors should use additional tests to advance their argument; such as the language test and the divisibility test” (p 15).

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### The Procurement Process

This process begins with preparing a list of materials required for the project by reading the blueprints and specifications. This list of materials is sometimes called a want list. After the list of materials, showing quantities required and complete item descriptions, is prepared, it is used to request price quotations from the supplier (vendors) or the list is sometimes sent to the purchasing department requesting them to obtain price quotations. The form sent to purchasing department requesting price quotations is called a *Purchase Requisition*.

After requesting price quotations and detailed terms and conditions from the vendors (suppliers), either by telephone or in writing, a vendor is selected and a formal purchase order is prepared. The buyer (contractor) prepares the formal purchase order, sends the original to the vendor, and distributes copies to keep all parties well informed.

The next step in the procurement process is to ensure that the required submittals and materials arrive on the project at the exact time they are needed. This step requires someone from the contractor's firm to follow up the orders arranged by delivery date by calling and visiting the vendors' offices to verify that submittals of shop drawings, product data and fabrication schedules are on schedule and they meet the specification requirements. The process of following up orders to ensure compliance with the specifications and schedules is called *Expediting* and the person who performs these duties is sometimes called an expeditor.

The next step requires the vendor to prepare a packing list of the quantity and description of the items being shipped and arranging for transportation, either by using their own trucks or by contracting with a freight company. The form used to contract with a freight company, common known as a Common Carrier for transportation of the items is called a *Bill of Lading*.

The final step in the procurement process is for the job site personnel to ensure that the proper quantity and materials have been received by counting the items, inspecting them for damage and comparing the packing list to the purchase order. The *Purchase Order* is under the Uniform Commercial Code (UCC) rules and the only thing agreed upon being the prices and a merchantability warranty. Therefore, a purchase order should be utilized for Materials only. When requesting quotations for a purchase order, the buyer must know the quantity required, item description, the name of the project, location of the project, project number, purchase order number, warranties required, delivery date, where the bill should be sent for payment, and the number of copies required. The buyer requests from the supplier unit prices, length of time the unit prices are good for, taxes, shipping terms, freight and insurance costs, and the accounting terms of the order.

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### Supplier Payment Request Form

An *Invoice* is a billing document from the supplier requesting payment for materials. The invoice will state the quantities, items and unit prices billed. It is the responsibility of the accounting department to verify the quantities with the receiving report and the unit prices with the purchase order.

### Shipping Terms on the Purchase Order

The *Shipping Terms* are normally arranged by the vendor for the shipment of materials to the job site, but the buyer must thoroughly understand whether the price quotation includes the cost of insurance and freight, the form of transportation, the point at which ownership changes hands, and the party paying the shipping charges. The FOB terms indicate the point at which ownership transfers from the supplier to the buyer. FOB means *Freight on Board*. There are several FOB terms generally used. First, is the *FOB Factory* which means the vendor is only responsible for loading the order on the shipper's vehicle (a common carrier) at the factory and ownership transfers from the supplier to the buyer at the factory. Another term is *Fob Supplier's Sales Location* which means the vendor is responsible for loading your order on the shipper's vehicle at the sales location and ownership transfers from the supplier to the buy at the sales location. Finally, the *Fob Job Site* which means the vendor is responsible for shipment of the order and ownership transfers from the supplier to the buyer at the job site.

The FOB location becomes a very important factor in the shipment of materials because it establishes the point at which ownership transfers from the supplier to the buyer. This ownership transfer determines the contractual parties on the shipping document. The shipping document is known as a Bill of Lading. The *Bill of Lading* is a contractual agreement between a shipper and a common carrier to move the material from location A to location B for specified price. If the shipping terms are FOB Factory, the bill of lading is between the buyer and the common carrier. If damage occurs during shipment of the materials, the buyer must seek damages from the common carrier. If the shipping terms are FOB Job Site, the bill of lading is between the supplier and the common carrier. If damage occurs during shipment, the supplier must replace the damaged goods and seek damages from the common carrier.

When requesting a shipping quotation and the vendor quotes you the abbreviation CIF, they are indicating to the buyer that the supplier will act as an agent for the buyer in arranging for shipment and they will add to the cost of the items the additional costs for the Insurance and the Freight. If the supplier quotes the buyer shipping terms of collect on delivery (COD), they are indicating that the shipment costs will be paid by the buyer at the time of delivery.

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### The Accounting Terms on the Purchase Order

*Accounting Terms* are sometimes offered to the buyer from the vendor as a payment incentive called material discounts. These material discounts are offered to the buyer as an incentive that the buyer is able to reduce their payment to the vendor if they pay within a specified amount of time after either the invoice date or the receipt of goods (ROG) date. The following material discount terminology is commonly seen on purchase orders. First, there is the term shown as 1/10 NET 30. This means a 1% discount can be deducted from the purchase order amount if the contractor pays within 10 days of the invoice date. The full payment is due in 30 days.

### Expediting Materials and Leadtime

The *Expediting of Materials* is defined as the process of following up on materials and vendor submittals to ensure that the proper materials and quantities are in compliance with the specifications and they arrive as scheduled. The person performing this function is sometimes called an expeditor. To perform this function effectively, the expeditor must be able to read and review all specifications and contract documents to ensure the vendor is in compliance. They must be able to compile a "material list" from the drawings and they must be able to follow up on shop drawings and product data submittals. Other responsibilities of the expeditor are for them to review production schedules and delivery dates, maintain files by delivery dates, inform construction personnel on material status, follow up on purchase orders by calling and visiting vendors to verify work in progress to ensure deliveries arrive on time, communicate effectively to maintain good vendor relations, troubleshoot delivery problems and determine the amount of time, normally referred to as Leadtime, required to deliver the materials on time

*Leadtime* refers to the amount of time required by vendors to deliver materials to the job site. When determining the amount of time required to deliver materials, the following steps must be reviewed to determine the amount of Leadtime required for an item. The Leadtime process requires the Contractor to consult the contract documents and prepare a material bid package to request quotations from the vendors. Also, Leadtime requires the Contractor to mail the bid package to vendors requesting price quotations and delivery dates. It also contains time for the vendors to submit a price quotation (bids). After the vendors' proposals are submitted to the Contractor, they review the bids and they select a vendor. Then the Contractor issues a purchase order and mails it to the vendor. Leadtime also includes the time it takes for the Vendor to submit shop drawings and product data to the Contractor. When the shop drawing or product data sheets are received, it is the Contractor's responsibility to review and approve shop drawings for field methods and means. After the Contractor's approval they stamp each shop drawing or product data sheet and forward them onto the Architect/engineer for approval. After the A/E reviews the shop drawings or make changes as noted, then the Contractor mails the approved drawings back to the vendor and request changes as noted. After all changes are made, the Vendor schedules the order into their fabrication schedule and the Vendor arranges a shipment of the materials to the job site.

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### Material Receiving Procedures

*Material Receiving* is the process of examining and verifying material deliveries at the job site prior to or during the unloading of the materials. It is generally seen as unimportant and often the deliveries are signed for before unloading. This type of procedure gives the suppliers an invitation to short delivery items and substitute unsatisfactory materials. To avoid this problem, a specific individual on each job site should be assigned the duties of examining and verifying all material orders and receiving procedures should be established. The following steps outline a good receiving procedure that all job sites should follow:

1. Count the quantities received and compare with the packing list or Bill of Lading for shortages or incorrect materials
2. Inspect all deliveries for damages. If visual damage occurs, have the driver sign for damaged cartons on the delivery receipt, contact the common carrier, request inspection before unpacking and file a claim immediately. If the damages are concealed, save the cartons and all packing material and contact the common carrier immediately.
3. Compare the packing list with the purchase order, noting the amount ordered versus the amount shipped.
4. Verify the items shipped meet the requirements outlined on the purchase order
5. Designate the lay down area where the materials are being stored
6. Prepare a receiving report indicating the condition of material, amount ordered and amount received and send copies to contractors' purchasing department. You should also notify them of any material shortages. Another copy should be sent to the contractor's accounting department for comparing the invoiced items to the items received. A third copy should be sent to the expeditors, informing them that the order has been received. Finally, a copy should be sent to the field construction personnel, informing them where the order is located.

*Stock Bins* are utilized on large projects because certain materials are purchased in "bulk" quantities for use throughout the project or projects. To control the use of materials, a *stock requisition* is filled out by the person requesting the materials. This stock requisition identifies the quantities requested, item description, the name of the project and project number and the intended use. This document is then sent to the accounting department where a record of the costs charged to a specific work item are kept. This record becomes a part of the cost control system.

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### The Subcontract Agreement

There are a number of contract law principles that govern *Subcontractors* which are unique to the construction industry. For instance, it should be understood that the subcontractor is a separate legal entity which does not form a contract with the Owner of the project, but instead they submit a subcontract proposal to the Contractor for performing construction services which is utilized by the Contractor. Hence, the issues arising out of the relationship between the contractor and subcontractor and the formation of a subcontract is extremely different from the formation of the Owner - Contractor contracts. First, at the bidding phase of a prime contract, the subcontractor submits a subcontractor proposal to the Contractor which is considered an offer or promise. This promise to the Contractor is based upon the contractor utilizing the subcontractors bid and submitting its bid to the Owner. Also, it is understood that the Contractor cannot request additional money from the Owner if the subcontractor claims that a mistake has been made in their bid proposal. This rule or doctrine is called *Promissory Estoppel*.

Therefore, if a subcontractor claims a mistake in its proposal, the law will rely on the principle of promissory estoppel. It is defined as “a promise which the promisor (subcontractor) provides to the contractor and it induces the promisee (Contractor) to rely on that promise (Sub’s Bid Proposal) in the Contractor’s bid to the Owner. This doctrine holds 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. This promise is binding if the Contractor can prove that they relied on the offer and it caused harm to the Contractor. The drawback of this legal principle is that the subcontractor is obligated to the prime contractor, but the prime contractor is not obligated to the subcontractor. Therefore, once the prime contractor executes the prime contract, the contractor is not obligated to the subcontractor to sign a subcontract agreement. This practice of finding another subcontractor at a lower price is called *bid shopping*. The American Society of Professional Estimators (ASPE) brochure (2003) defines bid shopping as “when, after the award of the contract, a contractor contacts several subcontractors of the same discipline in an effort to reduce the previously quoted price” (p 1). Bid shopping is considered unethical.

ASPE also states that “*Bid peddling*, . . . occurs when a sub-bidder approaches a general who has been awarded a project with the intent of voluntarily lowering the original price below the price level established on bid day. This action implies that the subcontractor’s original was either padded or incorrect” (p 2). Bid peddling is also considered unethical under the American Society of Professional Estimators Code of Ethics.

A *subcontract agreement* is governed by the common law of contracts for labor services. Therefore, when contracting for labor services and to protect your rights under the common law contract formation principles, it is essential that you utilize a form of agreement that is titled Subcontract Agreement for all labor services. Under the contract formation principles in construction, the Subcontract Agreements are written and signed by both parties after the signing

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of the Owner - Contractor Agreement. The Subcontract Agreement must be provided to each prospective bidder during the bidding phase of the project. This allows the prospective bidders time to review the terms and conditions and determine any unusual risk involved before the Agreement is signed. This process of providing the subcontract agreement during the bidding phase of the project can reduce the risk of the subcontractor not understanding the terms and conditions and trying to withdraw before the execution of the subcontract.. The major elements needed to form a valid contract are:

1. *Meeting of the Minds.* This is the signed Subcontract Agreement between the parties. The Subcontract Agreements are written and signed by both parties after the signing of the Owner - Contractor Agreement.
  - A. *An offer is made.* Normally the Contractor is required to submit a bid proposal on the forms provided by the A/E firm. It is also a good practice to standardize the Subcontractor Bid Proposal form which includes a Bid Breakdown Section.
  - B. *Acceptance of the Offer.* The subcontractor receives a letter from the contractor indicating that they have been awarded the contract and they will be executing the subcontract agreement.
2. *Consideration is received.* Consideration under the General-Subcontractor contract formation process must rely on the equitable doctrine of “promissory estoppel.” To ensure that this promise isn’t indefinite or unreasonable, the subcontractor provides a time limit for acceptance of their bid.

A Subcontract agreement may contain numerous clauses which the subcontract and the contractor must understand thoroughly. These are sometimes called killer clauses. First, is the *flown down* clause. A flow down clause is a contract clause in the prime contract causing certain duties between the owner and the contractor to be explicitly stated that they will flow down to the subcontractor or the supplier/vendor. The typical flow down clause says:

The Subcontractor agrees to be bound to the Contractor by the terms of the contract documents and assume toward the Contractor all of the obligations and responsibilities that the Contractor by aforesaid documents assumes toward the Owner.

Another killer clause is the *Pay when paid clause*. It states that the subcontractor will not be paid until the owner pays the contractor. The preceding clause makes payment by the owner a *condition precedent* to the contractor’s obligation to pay the subcontractor. Some courts require the words condition precedent in the clause before it is enforceable. Finally, many contracts require the owner and the contractor to submit claims to binding arbitration. The arbitration clause can flow down to the subcontractors.

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### Vendor and Subcontractor Agreement Exercise

1. What is the primary difference in contract formation between a Subcontract Agreement and a Purchase Order?
  - A. Meeting of the minds exists in a Subcontract but not in a Purchase Order.
  - B. Consideration exists in a Subcontract but not in a Purchase Order.
  - C. Legal purpose exists in a Subcontract but not in a Purchase Order.
  - D. There are not any contract differences between a Subcontract & a Purchase Order.
  
2. 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
  
3. Which of the following items must never be agreed upon utilizing a form titled Purchase Order?
  - A. Labor.
  - B. Materials.
  - C. Overhead.
  - D. Rental Equipment.
  
4. Which test is most commonly used to determine if a contract is predominantly for services or for the sale of goods?
  - A. Policy Test.
  - B. Goods Supplied Test
  - C. Predominate Thrust Test
  - D. Predominate Service Test.
  
5. Which test focuses primarily on that part of the contract that UCC applies to goods and general contract law applies to the services portion of the transaction?
  - A. Gravamen Test
  - B. Divisibility Test.
  - C. Predominate Thrust Test
  - D. Contract Language Test.

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### Vendor and Subcontractor Agreement Exercise

6. Assume that you are utilizing the verbiage Purchaser and Supplier in the terms and conditions of the contract. How will the courts interpret this type of contract?
- A. Services contract.
  - B. Agency Fee contract.
  - C. Sale of Goods contract.
  - D. Guaranteed Maximum Price contract.
7. Other than the most commonly utilized test, what other tests are suggested by McLaughlin and Jensen to prove your arguments for a specific type of contract?
- A. Language Test and the Divisibility Test.
  - B. Policy Test and the Goods Supplied Test.
  - C. Gravamen Test and the Predominate Service Test.
  - D. Predominate Thrust Test and the Predominate Service Test.
8. The terms on the purchase order indicate F.O.B. Factory, at which point does the responsibility for the goods change?
- A. Passes at the invoice date
  - B. Passes at the payment due date
  - C. Passes at time of pickup by carrier
  - D. Passes at time of receipt at the jobsite
9. If the Shipping terms are FOB JOBSITE, which parties is the Bill of Lading between?
- A. Vendor and the contractor.
  - B. Common carrier and the vendor.
  - C. Common carrier and the architect.
  - D. Common carrier and the contractor.
10. If Damages should occur during shipment of construction materials and the terms on the Bill of Lading are FOB Factory, who would be required to recover the loss from the common carrier?
- A. Vendor
  - B. Owner
  - C. Architect
  - D. Purchaser

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### Vendor and Subcontractor Agreement Exercise

11. Which of the following terms is used to refer to the process of following up on materials to ensure that the proper quantity and quality of materials arrive at the jobsite according to schedule?
- A. Leadtime
  - B. Expediting
  - C. Purchasing
  - D. Procurement
12. Which of the following terms is used to refer to the complete process of obtaining materials?
- A. Leadtime
  - B. Expediting
  - C. Purchasing
  - D. Procurement
13. Which document is used to request payment for materials?
- A. Invoice
  - B. Bill of lading
  - C. Purchase order
  - D. Stock requisition
14. Which of the following documents is a contractual agreement used to move (ship) the goods from the vendor to the jobsite?
- A. Invoice
  - B. Bill of lading
  - C. Packaging list
  - D. Purchase order.
15. Which of the following documents is used to request materials from the contractors storage bins?
- A. Purchase order
  - B. Receiving report
  - C. Stock requisition
  - D. Purchase requisition.

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### Vendor and Subcontractor Agreement Exercise

16. The Vendor has quoted you a price of \$9,270 CIF for an item. Which of the following is this price quote telling you?
- A. The \$9,270 is the total to be paid and it includes freight and insurance.
  - B. The \$9,270 is the total item cost plus the freight and insurance will be added.
  - C. The \$9,270 will be collected on delivery and it includes freight and insurance .
  - D. The \$9,270 will be collected on delivery in cash or certified check.
17. Which of the following descriptions defines the term 2/10 Net 30?
- A. 2% Discount can be deducted if paid within 10 days of the arrival of goods. Full payment Due in thirty days.
  - B. 2% discount can be deducted if paid within 10 days of the invoice date. Full payment due in thirty days.
  - C. 2% discount is available for thirty days.
  - D. 2% discount is available through the tenth of the month following the receipt of goods. Full payment due in thirty days.
18. Which of the following documents is used internally to request the contractor's purchasing department to obtain the prices for the materials needed for a project?
- A. Invoice.
  - B. Purchase order.
  - C. Stock Requisition.
  - D. Purchase Requisition.
19. Which of the following are the best steps of a good material receiving procedure?
- A. Inspect delivery, note damages, count items and compare to the bill of lading.
  - B. Inspect delivery, note damages, count items and compare to the accounting terms.
  - C. Review specifications, follow up on materials orders and call for delivery date.
  - D. Award contract, vendor prepare shop drawings, reviews, fabricate and deliver.

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### Vendor and Subcontractor Agreement Exercise

20. A clause in the Subcontract Agreement reads that “a Subcontractor binds themselves to the Contractor for the performance of the Subcontractor’s Work in the Same manner as the Contractor is bound to the Owner for such performance under Contractor’s contract with the Owner”. What is the name of this clause?
- A. Flow down.
  - B. Arbitration.
  - C. Pay when paid.
  - D. Condition Precedent.
21. For labor services to be considered under the formation principles, which form shall they be placed on?
- A. Purchase Order.
  - B. Vendor Agreement.
  - C. Subcontract Agreement.
  - D. Owner-Contractor Agreement.
22. Which of the clauses below is considered a Condition Precedent?
- A. Submit a claim within the time frame stated.
  - B. The Sub will be paid when the Contractor is paid.
  - C. Install street one-block at a time and only close the block.
  - D. The Soil Report states “For Informational Purposes Only.”
23. What is the term called when a sub-bidder approaches a general who has been awarded a project with the intent of voluntarily lowering the original price below the price level established on bid day.
- A. Bid Peddling.
  - B. Bid Shopping.
  - C. Condition Precedent.
  - D. Promissory Estoppel.

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### Vendor and Subcontractor Agreement Exercise

24. What is the name of the law principle that allows the Contractor to receive an oral or a printed quotation and then incorporate this price quotation into their bid proposal to the Owner and if awarded the prime contract they can hold the subcontractor to their quotation?
- A. Flow Down.
  - B. Condition Precedent.
  - C. Promissory Estoppel.
  - D. Incorporated by Reference.
25. During what phase of a project must the Contractor provide the Subcontractor Agreement to the Subcontractor to avoid the subcontractor from refusing to sign an agreement that they have not seen?
- A. At the bid opening.
  - B. During the bidding phase of the project.
  - C. After the Owner-Contractor Agreement is signed.
  - D. At the signing of the Contractor-Subcontractor Agreement.
26. A clause in the specifications states under 15333 1.3 A. Design and installation of an engineered fire detection and INERGEN total flooding, gaseous agent, fire suppression system shall be solely responsible for the performance of the fire suppression systems as specified and shall modify, add to, or alter the equipment as necessary, without any additional cost to Owner to provide satisfactory performance. Which party has the responsibility for the design of this system?
- A. Owner.
  - B. Contractor.
  - C. Subcontractor.
  - D. Architect/Engineer.
27. What are the agreed upon terms and conditions on a purchase order?
- A. Freight and Insurance costs.
  - B. Delivery date of the materials.
  - C. Material prices and merchant warranty.
  - D. Subcontracted labor and material prices.

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### Organization and Job Descriptions

An *Organizational Chart* is a pictorial form showing all positions and lines of communication. The horizontal Lines or positions indicate that these positions communicate with each other and the Vertical Lines or positions indicate that the lower position reports to the upper positions.

The Duties are the specifically assigned tasks and the Job Description is a complete list of specifically assigned duties for each position on the organizational chart. Many times the descriptions imply a certain amount of decision making. For example, a person may have a level of authority. Authority gives the person the ability to implement their decisions without the approval of superiors. Other times, a person may have a level of responsibility. Responsibility indicates that the person is burdened with the duties specified in the job description and they must answer for all causes and effects.

The Organizational Plan is a formalized analysis of the necessary tasks, how they relate to the company and it creates a clear understanding of the who, what, when and how. An organizational plan is intended to remove confusion, indecision, duplication of efforts and neglected duties.

An effective organizational plan should:

1. Be put in writing in the form of a procedure manual.
2. List all duties for each individual.
3. Include an organizational chart for the company and each project establishing the lines of communication.
4. Be discussed with everyone concerned.

The establishment of an effective operating organization requires the company to focus five (5) management functions. The following two management functions that *Establish the Team* through the process of *Organizing* which is the process of 1) determining what positions must be created 2) defining the responsibilities of each position and write job descriptions. 3) establishing the relationship between positions and draw an Organizational Chart.. *Staffing* is the process of selecting the right person for each position created.

The following three management functions that *Manage the Project* through *Planning* which is the process of determining what and how things will be done, and draw a construction logic network showing the interrelationship of the design, procurement and construction activities. *Directing* is the process of providing clear instructions and solving problems. *Controlling* is the process of monitoring the project through cost control and scheduling which compares the actual cost and schedule to the planned cost and schedule.

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### Project Management Team

The typical duties and responsibilities for specific construction positions are outlined below. The *Project Manager* has the authority and responsibility for the successful completion of the project(s) within the contract time and costs considerations. The project Manager devotes their energy and expertise to the overall management of the project. The essential skills of a Project Manager are:

1. Writes the subcontract agreements.
2. Write the purchase orders.
3. Develop the overall project plan and schedule including design, procurement, subcontracted and construction activities.
4. Develops the Schedule of Values for the project.
5. Produce the Progress Payment submittals.
6. Approve payments to suppliers and subcontractors.
7. Develops Contract Change Order Proposals.
8. Prepares and negotiates claims.
9. Manages safety.
10. Arranges for permits.
11. Travels between the home office and the job site.

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The *Superintendent* supervises and coordinates the daily activities of foremen. They plan and schedule the work force, the materials and equipment and they coordinate the subcontracts to promote an efficient construction of the structure at a profit. The essential skills of a Superintendent are:

1. Plans the sequence of daily construction operations.
2. Schedules daily labor, materials, equipment and tools required.
3. Interpret the plans and specifications.
4. Coordinates the subcontractors;
5. Maintains the Daily Job Diary and the Construction Reports.
6. Identifies and coordinates field changes.
7. Conducts safety inspections.
8. Conducts planning meetings on construction problems and solutions.

The *Crew Leaders or Supervisors* instructs the crew of skilled craftsmen and apprentices in the actual erection or fabrication of a structure. The Essential skills of a Crew Leader are:

1. Provides instructions to the crew about equipment and material needed.
2. Prepares the daily time cards.
3. Trains new personnel in proper safety and methods.

The *Field Engineer* or the *Project Engineer* assists the superintendent in solving engineering-related problems. The essential skills of a Project Engineer are:

1. Reviews and approves shop drawings from the subcontractors and vendors.
2. Performs surveying and dimensional layouts for the structure.
3. Performs design calculations for vertical and horizontal formwork, and slip forms.
4. Performs design calculations for temporary structures such as cofferdams and scaffolds.

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The *Planning and Scheduling Engineer* collects the field material delivery information and they develop the look ahead schedule for design, procurement and construction activities on large complex construction projects. They verify that the materials have been received and coordinate the efforts for obtaining the materials. The essential skills of a Planning/Scheduling Engineer are:

1. Develops the project logic network.
2. Determines sequences for design, procurement & construction.
3. Develops project activity list for design, procurement and construction.
4. Calculates activity durations for design, procurement and construction activities.

The *Cost Engineer* collects field data and compares, analyzes and forecasts the final costs at completion. The essential skills of a Cost Engineer are:

1. Develops and analyzes the weekly cost and productivity reports.
2. Forecasts the productivity and costs at completion.
3. Produces the variance analysis report.
4. Maintains in-place quantity records.

The *Estimator* prices the contractor's portion of the estimate and develops the contractor's overhead costs and reviews and selects the subcontractor proposal bids to be incorporated into the Contractors' proposal. The essential skills of an Estimator are:

1. Develops labor, material & equipment unit costs.
2. Analyzes the costs forecast data and predicts the future costs of the project.
3. Utilizes cost adjustment factors to determining costs.
4. Develops the overhead costs.
5. Interprets the construction documents and sometimes performs quantity takeoffs.
6. Gathers, reviews and selects the subcontract bids.

## Level 1 Construction Fundamentals Study Guide

### Construction Crafts

The *Acoustical Tile Setter* performs the layout and assembles the acoustical tile suspension system and mounts the tile on the wall and ceilings to reduce the reflection of sound.

The *Insulators*, sometimes still referred to as the Asbestos Workers, pastes, staples, wires, tapes or sprays insulation to pipes, walls, ceilings and boilers.

The *Bricklayers* place brick, block and structural tile in walls, floors, partitions, fireplaces. They also install fire brick linings in industrial furnaces sometimes called boilers.

The *Stonemasons* cut and build stone walls using field stone, natural cut stone such as marble, granite and limestone or artificial stone.

The *Boilermakers* fabricates and assembles structural steel for boilers, tanks, vats and pressure vessels. In addition, they connect piping, valves, pumps, tubes and equipment inside the boiler.

The *Carpenters* layout, cut and erect concrete formwork for bridges, piers, tunnels, cofferdams and wood framework. They also install manufactured windows, doors and finish materials.

The *Cement Masons* or Finishers will screed and trowel exposed concrete surfaces for floors, highways, bridge decks and concrete sidewalks.

The *Communications Electrician* assembles, installs, connects and tests electronic communication equipment for low power data communications systems, intercom systems, sound systems, telephone systems, security systems and emergency signaling systems.

The *Drywallers* fasten drywall or gypsum board to the framework inside commercial buildings, houses and other structures.

The *Tapers* or Joints seals the joints between gypsum board or other wall board normally in commercial buildings.

The *Electricians* assemble and install all fixtures, wiring, conduit, junction boxes and connect all wiring for the high power electrical and lighting systems.

The *Elevator Operators* assemble, install and align all frameworks, counterbalances, pumps and cylinders for electric elevators, hydraulic elevators and escalators.

The *Fireproofers* apply fire resistant materials to structural steel and they apply fire resistance refractory material to the inside of boilers and tanks.

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The *Floor Covering Installers* install and replace carpet or resilient floor covering material such as vinyl tile, linoleum or vinyl flooring.

The *Glaziers* select, cut and install stationary pane glass, plastic materials or mirrors including all hardware used in curtain walls, window walls or store front windows.

The *Instrumentation Fitters* connect, mount and install all pressure and flow instruments, valves, tubing and panel boards associated with monitoring and controlling the process.

The *Ironworkers* shakeout and erect the structural steel framework, stairs, handrail and platforms on buildings, process plants, power plants and bridges.

The *Laborers* perform many activities such as air and power tool operator, a mason tender, concrete vibrator operator, carpenters assistant and they drive the motorized concrete buggies.

The *Lathers* fasten wooden, metal or rock board laths to walls and ceilings of buildings to provide supporting base for plaster, fireproofing or acoustical material.

The *Mechanics* repair and maintain the construction equipment.

The *Millwrights* assemble and align rotating machines and equipment such as shafts, conveyors, pumps and turbines.

The *Oilers* check the oil levels and lubricate the construction equipment.

The *Operators* run construction equipment such as air compressors, pumps, hoists, cranes, loaders, backhoes, power shovels, sheepsfoot rollers, rubber tired rollers, drag lines, bull dozers and concrete batching plants.

The *Painters* apply coats of paint, varnish and other finishes to interior and exterior surfaces.

The *Paperhangers* apply coverings to walls and ceilings made of fabric, vinyl or paper.

The *Pile Drivers* operates the pile driver mounted on skids or on the crane to drive permanent wood, steel or concrete piles. They also drive and extract sheet piles made of wood or steel.

The *Pipefitters*, sometimes referred to as the *Fitters*, lay out, cut, align and install all high pressure bolted and welded metallic piping on refineries, processing plants, water treatment plants and power plants.

## Level 1 Construction Fundamentals Study Guide

The *Pipelayers* place and align underground pipe for sanitary sewer, storm sewer and water distribution systems outside the structure.

The *Plasterers* apply coats of plaster to interior walls and ceilings with many types of plaster materials that form fire resistant and sound proof surfaces. Also, they apply stucco to exterior surfaces.

The *Plumbers* fabricate and install domestic water, waste disposal and sanitary piping and fixtures such as bath tubs, sinks, water closets and dishwashers in residential, commercial and industrial buildings.

The *Riggers* assemble cranes, select and connect slings to the crane for lifting machinery, Structural steel and equipment. They also erect jin pole lifting systems designed to lift an unusually long piece of equipment which is shipped horizontally. The jin pole system allows the extremely long piece of equipment to be lifted into its permanent vertical position.

The *Rodbusters* fabricate and install reinforcing bars and wire mesh to reinforce concrete floors, columns, footings, beams and girders.

The *Roofers* apply various types of materials such as tar and gravel, rubber, asphalt or fiberglass shingles to commercial, residential and industrial projects.

The *Sheet Metal Workers* layout, cut and install round and rectangular duct work for heating, ventilating, air conditioning, pollution control systems, kitchen equipment, and sheet metal work for roofs, siding, rain gutters, skylights and outdoor signs.

The *Sprinkler Fitters* layout, fabricate, assemble and install all piping, sprinkler heads and equipment associated with the Fire protection System.

The *Teamsters* drive a variety of construction equipment such as dump trucks, low boys, flat bed trucks, transit mixers, tank trucks or pickup trucks to haul materials.

The *Terrazzo Workers* mix, pour, finish and polish mixture of cement, sand, pigment and marble chips for floors and stairs.

The *Tile Setters* cut, apply an adhesive base and install tiles to floors and walls.

## Level 1 Construction Fundamentals Study Guide

The *Welders* adjoin together metal components for structural steel, process metal pipe, heavy rebar with cad welds, and heavy gage sheet metal using a variety of welding processes such as arc or gas. The welders are commonly associated with the following crafts 1) Ironworkers 2) Boilermakers and 3) Pipefitters and to a lesser degree Sheet Metal Welders and Rod Buster Welders. They will take on the name of the craft that they are affiliated with such as Boilermaker Welder, Pipefitter Welder, etc.

Traditionally within each craft listed above, there are at least four skill levels. The skill levels are described below. The *General Foreman* is normally described under a union agreement and a General Foremen is required after a specified number of Crew Leaders (Foreman) are on the job. The *Crew Leader* generally referred to as the Foreman provides instructions to the workers and many times they work with the craft worker. The *Skilled Trade Person* generally referred to as the Journeyman is a trained and skilled craft or trade person. Finally, the *Apprentice* is a specific craft or trade trainee.

## Level 1 Construction Fundamentals Study Guide

### Organization and Job Description Exercise

1. What do the horizontal lines on an organizational chart with various positions indicate?
  - A. Communication
  - B. Responsibility
  - C. Promotion
  - D. Authority
  
2. Which duties change as a person moves up an organizational chart?
  - A. Analysis skills increase and their communication skills increase
  - B. Technical skills increase and their negotiation skills decrease
  - C. Administration skills decrease and their Technical skills increase.
  - D. Communication skills decrease and their Administration skills decrease
  
3. Which position typically writes the subcontract agreements?
  - A. Superintendent
  - B. Project Engineer
  - C. Project Manager
  - D. Planning Engineer.
  
4. Which position typically forecasts the cost at completion for field activities?
  - A. Estimator
  - B. Cost Engineer
  - D. Superintendent
  - C. Project Engineer
  
5. Which position typically performs the Formwork design calculations?
  - A. Superintendent
  - B. Safety Engineer.
  - C. Project Engineer.
  - D. Project Manager.

## Level 1 Construction Fundamentals Study Guide

### Organization and Job Description Exercise

6. Which position typically draws the logical sequences and calculates the activity days?
- A. Cost Engineer
  - B. Superintendent.
  - C. Project Engineer
  - D. Planning Engineer
7. Which position typically assigns the crews, maintains a job diary and schedules subcontractors?
- A. Cost Engineer
  - B. Superintendent.
  - C. Project Engineer
  - D. Project Manager.
8. Which position typically completes the time card?
- A. Accountant
  - B. Crew Leader
  - C. Craft person
  - D. Superintendent
9. Which party typically obtains the building permits?
- A. Owner.
  - B. Subcontractor.
  - C. Project Manager.
  - D. Architect/Engineer.
10. Which position typically develops the overall project logic network and schedule?
- A. Estimator.
  - B. Cost Engineer.
  - C. Project Manager.
  - D. Planning Engineer.

## Level 1 Construction Fundamentals Study Guide

### Organization and Job Description Exercise

11. Which of the following activities does a Millwright perform?
- A. Cuts and installs trim and cabinets.
  - B. Assembles and aligns rotating equipment.
  - C. Fits and aligns high pressure process piping.
  - D. Fabricates and assembles sheet metal for duct work.
12. Which trade operates equipment to place the Steel Sheet Piling?
- A. Rigger.
  - B. Excavator.
  - C. Ironworker.
  - D. Pile Driver.
13. Which trade assembles and aligns the underground pipe outside the structure?
- A. Plumber.
  - B. Pipe Fitter.
  - C. Pipe Layer.
  - D. Building Laborer.
14. Which trade applies stucco to the outside of the building?
- A. Plasterer.
  - B. Insulator.
  - C. Carpenter.
  - D. Drywaller.
15. Which trade installs piping and equipment for the fire protection system?
- A. Plumber.
  - B. Pipe Fitter.
  - C. Fireprooffer.
  - D. Sprinkler Fitter.

## Level 1 Construction Fundamentals Study Guide

### Organization and Job Description Exercise

16. Which trade applies heat resistant materials to structural steel and sprays refractory material on the inside of steel Boilers and High Pressure Vessels or Tanks?
- A. Insulator.
  - B. Fireprooffer.
  - C. Boilermaker.
  - D. Asbestos Worker.
17. Which trade ties and places the rebar?
- A. Rigger
  - B. Rod busters.
  - C. Pile Driver.
  - D. Iron worker.
18. Which of the following trades Fits, Aligns & Installs Drain, Waste and Vent Piping?
- A. Plumber.
  - B. Pipe Fitter.
  - C. Pipe layers.
  - D. Sprinkler Fitter.
19. Which of the following trades Fabricates and Erects Air Distribution Duct work?
- A. Glaziers.
  - B. Iron worker.
  - C. Terrazzo workers.
  - D. Sheet Metal Workers.
20. Which of the following trades installs and calibrates pressure and flow gauges?
- A. Plumber.
  - B. Pipe Fitter.
  - C. Sprinkler fitter
  - D. Instrumentation Fitter.

## Level 1 Construction Fundamentals Study Guide

### Organization and Job Description Exercise

21. Which trade Installs low voltage intercom & security systems?
- A. Electrician.
  - B. Instrumentation Fitter.
  - C. Security Systems Engineer.
  - D. Communications Electrician.
22. Which trade wraps the high pressure process piping and equipment?
- A. Insulator.
  - B. Plasterer.
  - C. Fireproofer.
  - D. Boiler Maker.
23. Which trade erects jin poles for making heavy lifts, assembles cranes and attaches slings to the loads for the crane to lift?
- A. Rigger.
  - B. Operator.
  - C. Millwright.
  - D. Ironworker.
24. Which trade Pours, finishes and polishes floors to bring out the marble chips?
- A. Tile Setter.
  - B. Terrazzo Worker.
  - C. Cement Finisher.
  - D. Flooring Installer.
25. Which trade cuts and installs panes of glass in store fronts and glass curtain walls?
- A. Glazier.
  - B. Lathers.
  - C. Carpenter.
  - D. Iron worker.

## Level 1 Construction Fundamentals Study Guide

### Organization and Job Description Exercise

26. Which trade seals the head and butt joints for the drywall on a commercial project?
- A. Taper.
  - B. Lather.
  - C. Plaster.
  - D. Drywaller.
27. Which trade operates the motorized concrete buggies?
- A. Oiler.
  - B. Laborer.
  - C. Operator.
  - D. Millwright.
28. Which trade welds the high pressure process piping?
- A. Plumber.
  - B. Pipe Fitter Welder.
  - C. Ironworker Welder.
  - D. Sheet Metal Welder.
29. What are the components of a job-built boiler that the Boilermaker will assemble together?
- A. Assembles the turbine and fits and aligns the rotating equipment.
  - B. Sets steel sheet piling, fabricates and assembles sheet metal and places piping.
  - C. Sets structural steel sides, assembles piping, welds water tubes, and sets pumps.
  - D. Assembles sheet metal, applies refractory material to boiler and paints the boiler.
30. The welders have associated themselves with numerous trades and they have taken on their trade name. Which of the following crafts are the welders associated with?
- A. Millwrights, Pile Drivers and Operators.
  - B. Ironworkers, Boilermakers and Pipe fitters.
  - C. Plumbers, Sprinkler fitters and Pipe Layers.
  - D. Instrumentation fitters, plumbers and Jointers.

## Level 1 Construction Fundamentals Study Guide

### Employment Laws and Regulations

There are numerous hiring information and employment law regulations that the supervisor must be in compliance with since they may be the first contact for the new employees. Therefore, your actions in labor matters can have a major effect on an employee's perception of the company and your concern for their well being. It is the supervisor's responsibility to abide by the labor laws and/or to abide by the collective bargaining agreements (union) negotiated by the contractor. This requires the supervisor to have a basic knowledge of the following labor laws.

### Hiring Requirements

The *Fair Labor Standards (Wages and Hours Law)* act requires a poster to be posted in clear view for all employees. This poster must be posted at the job site at the employee bulletin board. This law regulates methods of wage payment and hours of work for all industries engaged in construction between two or more states. The law restricts the employment of children more than fourteen and less than sixteen to non construction jobs. Also, the employment of children under the age of 18 in hazardous construction jobs is prohibited. They can be employed in construction between sixteen and eighteen only in nonhazardous jobs. It is the contractor's responsibility to verify their age. The Fair Labor Standards law says that you cannot work nonexempt employees for more than forty hours per week unless you pay them at least time and a half their regular rate of pay for the overtime. Also, this Act specifies that you cannot use gender as basis for discriminating in wages, except where wages are based on a seniority system, a merit system, a piecework system, a commission or a bonus system. The law also specifies that you cannot simply lower the wage rate of any employee just to settle a wage disparity. The Fair Labor Standards Act does allow a manager to create a class of employees called exempt employees. This allows you not to pay overtime to some people if they work more than forty hours per week. This class normally consists of executives, managers, and first-line supervisors, and other employees whose jobs require making decisions and using personal judgment, creativity, or innovativeness but they are not classified as managers.

The *Illegal Immigration Reform and Immigrant Responsibility Act* requires that the supervisor ask for detailed proof of an applicant's eligibility to work in the United States. This is called the I-9 form requiring all non U.S. citizens employed in the United States to complete this form and it must be submitted to the federal government within three days of hiring. This form must be completed at the time of hiring. Penalties exist to supervisors and companies for a noncompliance. You can ask for proof of employment eligibility such as an alien registration card, U.S. passport, or a U.S. Social Security card. It is illegal for you to ask an applicant where they come from or which country they come from.

The *Employee Withholding Exemption Certificate (W-4)* for Federal and State Tax Withholdings requires that this form be completed at the time of hiring for each employee hired. This form requests the employee's name, address, social security number, marital status, the number of exemptions claimed and it is signed by the employee..

## Level 1 Construction Fundamentals Study Guide

### Employment Law Legislation

*Employment law* covers numerous situations where managers and supervisor's actions or inappropriate actions may have severe legal ramifications on the individual and the company. There are numerous possible actions which can be taken against an organization or its individuals if they do not take appropriate actions concerning employment issues. You or your company could face claims of breach of a contract for firing someone without just cause, retaliatory discharge for firing someone after they made a claim, slander or defamation of character for telling someone the reason for discharging an employee, sexual harassment for failure to take immediate action to remedy a hostile situation, wrongful discharge because you did not follow all of the progressive disciplinary steps and the list is extensive.

This section will focus on the daily activities concerning hiring, managing and discharging personnel. It will outline what activities you cannot do and what activities you can do concerning these numerous employment laws such as the civil rights laws, equal employment opportunity laws, Americans with disabilities laws, labor laws, safety liability law, sexual harassment, and due diligence under criminal law. The *Civil Rights legislation* was enacted in 1964 and it defined discrimination, but it still exists today and it is still illegal today. The primary reason for enacting numerous civil rights laws is prejudice against a group of people which cannot be erased by laws.

Prejudice means forming opinions or having feelings about a group of people on the basis of special characteristics, such as race, color, religion, ethnicity, sex, age, disability, or making a judgment in advance on the basis of stories, implications, or limited experience about people from a particular place or background. Ignorance in the form of what you don't know about people can also lead to prejudice. Ignorance and prejudice have prevented many productive groups of people from taking full advantage of economic employment opportunities. Therefore, laws have been enacted to protect people whose opportunities have been limited because they do not hold the "right" characteristics by people making the hiring decisions. These laws are designed to identify protected classes, or groups of people who have been identified as having suffered from economic discrimination in the past.

Employment legislation defines a protected class as a group of people distinguished by the special characteristic(s) that have inhibited their progress. These protected classes consist of race, color, ethnic identification, national origin, religion, sex, age, disability, and veteran status. Under the law, you cannot discriminate on the basis of a characteristic specific to any protected class, unless the characteristic is a bona fide occupational qualification. A bona fide occupational qualification is a trait that is integral or essential to the proper performance of the job. The federal government defines *discrimination* with respect to hiring practices, the decisions and actions that deny individuals in protected classes access to employment, advancement, benefits, training, and compensation permitted to other people in the organization.

## Level 1 Construction Fundamentals Study Guide

### Employment Law Discrimination

Employment Discrimination can take many forms in the workplace. Some examples are Sex Discrimination, Sexual harassment, Promotion discrimination, Hostile work environment, Improper termination, Racial harassment, Recruitment discrimination of women and minorities.

Under the Civil Rights Act, the Federal District Court for the Western District of Missouri has ruled that individual employees in a position of authority can be sued, held accountable for and required to pay punitive damages for acts of discrimination. Recent cases that Supervisors have been held liable for Intentional Infliction of Emotional Distress, Defamation Assault and Battery, Malicious Interference with employment, Invasion of Privacy and other common law theories. Also, the *Civil Rights Act of 1991*, expanded employment discrimination claims to allow for recovery of compensatory damages for Emotional Pain, Suffering, Inconvenience, Mental Anguish, and Loss of Enjoyment of Life. The act also allows for recovery of punitive damages if the jury finds that the employer acted with malice or reckless indifference. If compensatory and/or punitive are awarded, they are not covered by business liability insurance. The 1991 act also provides for employee jury trial and it caps the compensatory and punitive damages.

A 1989 U.S. Supreme Court decision now allows plaintiffs to sue in court for an employer's intent to discriminate in employment. The result has been that these cases can be tried by a jury where punitive damages and severe penalties can be assessed against the company and managers. The plaintiff is required only to show that the company's or its representatives reckless disregard for the consequences of an action is sufficient to prove intent to discriminate intended to produce the outcomes. Therefore, the *Equal Employment Opportunity* (EEO) laws which are enforced by the Commission (EEOC) have identified guidelines for what a manager cannot do as follows.

1. Failure to hire or to discriminate against any person in a protected group.
2. Limit, segregate, or classify applicants which have an adverse effect on their status.
3. Failure to provide training because they are members of a protected group.
4. Retaliation against any person because they made a claim or participated in an action.
5. Print any employment notices that may adversely affect members of a protected group.
6. Discharge any person because they are members of a protected group.
7. Failure to maintain and post, in a conspicuous place, the contents of a civil rights law.

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The *American with Disabilities Act (ADA)* of 1992 administered by the EEOC has expanded the list of ADA-covered disabilities. ADA defines disabled individuals as persons with a physical impairment, mental disorders, impaired or disabled person including individuals with AIDS, epilepsy, obesity or diabetes which may affect the human biological system creates a disability, alcoholics and drug abusers who have successfully undergone treatment. The ADA specifically excludes any employee or applicant who currently, knowingly uses a controlled substance. It also excludes homosexuals, bisexuals, transvestites, and persons whose sexual behaviors do not stem from physical impairments. Below is a list of things a manager cannot do to a qualified disabled person under the ADA guidelines.

1. Limit, segregate, or classify applicants solely on the basis of the person's disability.
2. Participates in an arrangement with employment agencies, labor unions, benefit providers or training programs that subjects the qualified person to prohibited discrimination.
3. Uses criteria, or employment tests that are not bona fide occupational qualifications.
4. Excludes or denies equal employment or benefits to a qualified person solely because the qualified individual has a relationship with a disabled spouse.
5. Fails to make reasonable accommodations for a known physical or mental limitation.
6. Requires medical examinations or ask a person whether they have a disability.

The *Sexual Harassment Regulation* according to the Equal Employment Opportunity Commission's (EEOC) policy it states that an employer is liable for sexual harassment if it knew or should have known upon reasonable diligent inquiry about a situation which created a hostile work environment. The policy also insists that each company must have policy that has been "clearly and regularly" communicated to all employees. Second, it must affirmatively raise the subject with all employees. Third, it must express strong disapproval and it must explain the consequences to all employees. Fourth, the company must have a sexual harassment complaint procedure that ensures confidentiality and provides effective remedies including protection of victims/witnesses. Fifth, the company must Investigate charges promptly and thoroughly. Sixth, it must take immediate and appropriate corrective action. Finally, the company must provide training on sexual harassment.

The courts have identified the situations below that created a *Hostile Work Environment* and they are things that supervisors cannot do. First, a hostile environment is created when a supervisor's conduct had the purpose or effect of unreasonably interfering with the employee's work performance. Second, evidence can be submitted that a supervisor had sexually harassed others. Third, evidence can be submitted of racial and sexual hostility created a hostile environment.

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Fourth, a hostile environment is created by name calling or slurs. Fifth, offensive pictures or jokes create a hostile environment. Sixth, an invasion of privacy by a supervisor is a hostile environment. Seventh, a supervisor's intentional infliction of emotional distress creates a hostile environment. Supervisors can be held individually liable for sexual harassment claims and punitive damages for pain and suffering have been awarded.

Affirmative Action plans have been established to ensure equal employment opportunities on public projects. Many contracts with federal or state funds will establish goals and timetables for minority and female participation expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work. The Contractor must comply by executing and submitting with their bid proposal, certifications relating to the following.

*Minority Business Enterprises* (MBE) on government projects require a dollar value or percentage as a goal of the contract to be supplied by a registered MBE. *Women Minority Business Enterprises* (WBE) on government projects require a dollar value or percentage goal of the contract to be supplied by a registered WBE. *Disadvantaged Business Enterprises* (DBE) on government projects require a dollar value or percentage overall goal of the contract to be supplied by a registered DBE. If these goals cannot be met, then the contractor must provide complete documentation of the names of the contacts with times and dates each MBE or WBE or DBE was contacted. Without proper documentation a Contractor can be considered a non-responsive bidder.

Another form of employment documentation is the *Disciplinary Memorandum*. It is imperative that all disciplinary memorandums contain three sections. They are the format, vocabulary, and the tone. Whenever you are required to write a disciplinary memo or letter, the memorandum should *never start or contain praise*, it sends a Contradictory Message to the Employee. When sending a Disciplinary memorandum, you must focus on three items. First, focus on the Format. Second, focus on the Vocabulary. Third, focus on the Tone. Below you will find some advice on the proper technique for writing each section of a disciplinary memorandum.

The Format section should contain these items: an introduction that should state what action is being taken and what caused the need for the disciplinary action; a supporting paragraph documenting the incident causing the action; a direct quotation from the company policy; a conclusion which focuses on the future; and the Format should include specific review periods and how they will be dealt within the future. The Vocabulary section should contain words that are easily understood. Finally, the Tone section should state the facts only and the Tone should not be harsh, exaggerated or judgmental. In summary, an improperly written disciplinary memo can send a contradictory message to an employee. Therefore, the writer must be aware of the format, vocabulary and tone.

## Level 1 Construction Fundamentals Study Guide

### Management and Union Labor Laws

There are numerous *Labor Laws* that apply to the construction industry which supervisor must be aware of to comply with the requirements. Also, these Labor Laws apply to all contractors' whether you are a union or merit shop contractor. Managers and supervisor's must be aware of these labor laws. For example, the Davis-Bacon Act, the Norris LaGuardia Act, the National Labor Relations Act, the Labor-Management Relations Act, the Fair Labor Standards Act, and the Labor-Management Reporting and Disclosure Act applies to all contractors. Each of these laws protects nonunion as well as union employees on the job and extends employees' rights to organize on their own behalf, including the right to form unions. These labor laws affect management practices with regard to pay including prevailing wages and overtime, concerted action, disciplinary procedures, and discharge policies. Therefore, they are defined below.

The *Davis-Bacon Act* was enacted in 1931, this act requires that in a contract for construction work for the United States government there shall be stated the wage rates and benefits for workers that the contractor and subcontractors must undertake to pay and they shall not be less than those prevailing in the locality. It established prevailing wage rates for each craft classification on all federally funded projects. This same act has been passed by many states and it establishes prevailing wage rates on state-funded projects. This form is normally provided in the Bidding Requirements section of the project. It identifies the name of the construction project site, the County, the Date Issued, and the basic hourly rate, the hourly fringe benefit rate, the total prevailing, and the overtime provisions. A contractor must ensure that all contractor employees and subcontractor employees are in compliance with this requirement.

The *Norris-LaGuardia Act* of 1932 (1) restricted the court's use of injunctions against union activities, (2) protected the right of workers to strike and picket peaceably, (3) prohibited Yellow Dog Contracts which is defined as a pre-hiring agreement requiring the job applicant not to join a union or to renounce their membership while employed.

The *National Labor Relations Act* of 1935 (NIRA) (Wagner Act) put into law protects employees' rights to take concerted action, that is, work together, to alter work conditions by (1) using bulletin boards that publish general community information, (2) holding meetings during work hours, with no loss pay or threat of retaliation, to discuss safety or other working conditions. It allows all workers to engage in other concerted activities for the purpose of collective bargaining through their own representatives. This includes forming, joining or assisting labor organizations, but at the same time, it prevents nonunion employees from being forced or coerced into joining a labor organization or engaging in collective bargaining except where membership in a labor organization is a condition of employment created by contract. The National Labor Relations Act created the National Labor Relations Board (NLRB) which is a decision making board established to resolve conflicts between management and employees.

The National Labor Relations Board also defined unfair labor practices by employers. It states

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that as a manager you cannot interfere with, restrain or coerce employees exercising their rights. Second, you cannot discriminate against an employee in order to encourage or discourage union membership. Third, you cannot discharge an employee because of membership or nonmembership. Fourth, you cannot refuse to bargain collectively with the employees' representatives and you must bargain in good faith. Fifth, you cannot enter into a Hot-Cargo Agreement. A *Hot Cargo Agreement* is where the employer agrees not to do business with or purchase the products of another employer. Sixth, you cannot discriminate in hiring or tenure on the basis of union or nonunion membership. The Wagner Act outlawed a closed shop. A *closed shop* is an agreement requiring a worker to be a member of the appropriate union at the time of hiring. Seventh, you cannot fire or otherwise discriminate against an employee for filing charges or giving testimony under this act.

The things below are activities you can do as a manager as long as you do not interfere with your employees' rights to take collective action or form a union. As a manager under the National Labor Relations Act you can freely express your own viewpoints, arguments, or opinions in writing, print, graphics, or visuals about unions or collective bargaining while ensuring that what you say does not threaten reprisal or force someone from forming or joining a collective bargaining unit or promise benefits for not forming or joining. Second, you can counter aggressive union recruiting tactics such as non-employee labor organizers. Third, you can hear employee grievances and adjust them without union representation.

The *Labor-Management Relations Act* of 1947 (Taft-Hartley Act) is primarily focused against unfair Union management Practices against its members or nonmembers while trying to organize. Under this amendment to the NLRA, a manager cannot conduct unwarranted or sudden lockouts against employees. Second, you cannot pay, lend, or deliver money or other assets to a union, union official, union welfare fund, or an employee involved in a labor dispute. The Labor Management Relations Act also included the following provisions against unions and union officials. It prohibits featherbedding. *Featherbedding* is defined as paying for services not performed. Second, it made secondary boycotts illegal. A *Secondary boycott* is a boycott using a third party to put pressure on one of the other parties to conform. The Labor Management Relations Act allows you the right to make every reasonable effort to reach an agreement with your employees on rates of pay, hours, and working conditions including notice of changes, and to arrange promptly to hold a conference to settle any differences. If the conference is unsuccessful, the law requires that both of you participate fully in meetings by the Federal Mediation Service.

The *Labor-Management Disclosure Act* of 1959 (Landrum-Griffin Act) has language similar to that used in the NLRA which says that you cannot interfere with employees' rights to work, to organize, to choose representatives, bargain collectively, or engage in concerted action for their mutual aid or protection. This act also requires the union officials to submit a personal financial statement and union financial statements to the government each year.

## Level 1 Construction Fundamentals Study Guide

The *Collective Bargaining Agreement* established the terms and working conditions agreed upon between the contractor and the union are described in this document. These collective bargaining agreements are usually negotiated by a contractor association such as the Associated General Contractors (AGC) and they are signed by the contractor members. The supervisor should attain a copy of the local agreements in effect before starting or assigning work. Each trade and local have negotiated their own agreement.

The *Doctrine of "Separate Gates"* has established the rules for contractors to following in designating gates on a union construction project so that the owner's employees, the subcontractor's employees, the contractor's employees and the material deliveries are separated. Separate gates for each employer or each trade and they are in a different location from the job site deliveries. Also, the owner's employees entrance, and the owner's deliveries are usually away from the construction gates. Another clause is the *Subcontract Clause* which is under the Wagner Act in Section 8e and it states that Contractor's can agree to restrictions on subcontracting if the owner requests restrictions. Also, there are rules established for a construction company with a union arm and non-union arm. This is referred to as a *Double-breasted Operation*, but it must have separate management of the daily activities.

Another term unique to the construction industry is a *Merit Shop Contractor*. This term was coined by John Trimmer when nonunion firms were struggling for a market share with union contractors. John Trimmer was the executive vice president from 1952 until 1976 and later he was the assistant to the ABC president's. These are also referred to as Open Shop Contractors. Merit shop Contractor's have the right to establish the crew size, the right to select the trade that will perform each work activity and the right to select the installation methods for installing the materials. Many Merit shop contractors belong to the Associated Builders and Contractors (ABC).

Unions are under the Union Shops guidelines. A *Union Shop* requires employees to join within stipulated time after employment. A *Jurisdictional Dispute* is a disagreement of the work rules between two unions. Under a jurisdictional dispute the contractor must assign the work FIRST. If not resolved the contractor must:

1. File with the National Labor Relations Board in the Region.
2. NLRB schedules a hearing within 10 days. Seek an injunction to stop.
3. If not resolved within 10 days, NLRB has a hearing and assigns work.
4. If not obeyed, fined. Taft Hatley Act. Private parties can sue.

## Level 1 Construction Fundamentals Study Guide

Common Situs Picketing is used on a multiple employer job site and it has established these rules.

1. Picketing is limited to working hours
2. Signs must indicate clearly
3. Picketing must be close to the work

Other labor law terms are a *Lockout*. A lockout is a contractor who withholds employment from the workers. Also, there are *Primary boycotts* which are legal and they are a dispute between the contractor and a specific union such as the painter. This dispute is primary if the painters' union strikes only the painting contractor. A *Secondary Boycott* which utilizes a third party to influence another party, such as the contractor or the union to settle a dispute, is illegal.

*Work Preservation* is a clause that the union can negotiate for in the labor agreement which bars the use of prefab products in construction. *Product Boycott* is a clause that the union can negotiate with an employer to prohibit the use of a product to preserve work. If the product is specified by the Architect or Engineer then it cannot be boycotted.

The *Grievance Procedure* is an internal step by step process up the organizational chart to resolve employee complaints. Below is the grievance procedure flow for an individual.

### Step 1 (Immediate supervisor)

Within twenty (20) days of the time a grievance might reasonably be known to exist, the affected member of the bargaining unit shall present the grievance in writing to his or her immediate supervisor with a copy to HRD.

The immediate supervisor shall respond in writing to the grievant no later than ten (10) days after the grievance has been received. Any withdrawal of a grievance at this Step shall not constitute a binding precedent in the disposition of similar grievances.

Step 2 Department level, unless the department head is the immediate supervisor, then advance to Step 3. If the grievance is not resolved at step 1, it shall be presented in writing to the Department manager or, where appropriate, the equivalent supervisory level, with a copy to HRD, within seven (7) days after the response of the immediate supervisor or the date the response was due, whichever is sooner. The grievance shall state the reasons the step 1 response is unsatisfactory. The Department manager or appropriate supervisor shall meet with the grievant within seven (7) days and, if the grievant wishes, with a representative of the Association. A written response shall be made not later than seven (7) days after the meeting at which the grievance was discussed.

## Level 1 Construction Fundamentals Study Guide

### Step 3 (HRD level)

If the grievance is not resolved at the above steps, it shall be presented in writing to HRD within seven (7) days after the decision at step 1 or 2, whichever applies, or the date the response was due, whichever is sooner. The grievance must be signed by an authorized representative of the Association and shall be part of the original grievance form. It must include the reason the grievant considers the prior response unsatisfactory.

Following receipt, a meeting must be held between the representative of the Association and the Director of HRD, or his/her designee, within ten (10) days. The Director of HRD, or his/her designee, shall respond in writing within seven (7) days from the date of the meeting.

### Step 4 (Arbitration)

If the Association is not satisfied with the response at step 3, the grievance may be submitted to arbitration by so notifying the Director of HRD in writing within two (2) weeks of the step 3 response, or the date such response was due, whichever is sooner.

Once notified, the University and the Association will agree to an arbitrator within two (2) weeks. If the parties cannot agree, the arbitrator shall be selected by alternately striking one name from the following list. Determination of who strikes the first name will be by a flip of a coin. The name remaining is selected as the arbitrator.

The American Institute of Architects (1997), General Conditions of the Contract A201-1997 edition has established a claims procedure which requires mediation before arbitration.

*Mediation* is defined as a third party using their influence to force two parties to negotiate. Normally, the Contractor must conduct this dispute resolution method after they have perfected the claim and it has been rejected. The next step is Arbitration. *Arbitration* is defined as a third party establishing a binding decision as outlined in the contract. Finally, if the previous methods have been exhausted and there is a legal flaw within the case then either party can file a law suit called *Litigation* which is a court decision.

## Level 1 Construction Fundamentals Study Guide

### Employment Law Exercise

1. When hiring employees, Which form must they fill out requesting their marital status, number of exemptions and their social security number?
  - A. I-9
  - B. W-2
  - C. W-4
  - D. 1099
  
2. Which form must be completed by all non United States citizens?
  - A. I-9
  - B. W 2
  - C. W 3
  - D. W 4
  
3. According to the Federal government regulations, What is the maximum number of days that a company has to submit the non United States Citizens form to the federal government?
  - A. 1
  - B. 3
  - C. 14
  - D. 21
  
4. Which of the following posters describes the regulations for wage payment and hours of work for all industries and must be posted at the job site?
  - A. Fair Labor Standards.
  - B. Prevailing Wage Rates.
  - C. Material Safety Data Sheet.
  - D. Safety and Health Protection.
  
5. What is the correct name for the acronym EEOC?
  - A. Enterprise of Equal Occupational Council
  - B. Enterprise of Equal Opportunity Coalition
  - C. Equal Employment Opportunity Companies.
  - D. Equal Employment Opportunity Commission.

## Level 1 Construction Fundamentals Study Guide

### Employment Law Exercise

6. What is the purpose of the EEOC law?
- A. Prohibit discrimination against individuals with disabilities.
  - B. Protect companies from discrimination from their employees.
  - C. Prohibit discrimination against individuals due to race, sex, age.
  - D. Protect individuals from discrimination from sexual harassment.
7. What is the correct name for the acronym ADA?
- A. American with Disabilities Act.
  - B. Association of Disabled Americans.
  - C. American with Disabilities Association.
  - D. Association of Discriminatory Americans.
8. What is the purpose of the ADA law?
- A. Prohibit discrimination against individuals with disabilities.
  - B. Protect companies from discrimination from their employees.
  - C. Prohibit discrimination against individuals due to race, sex, age.
  - D. Protect individuals from discrimination from sexual harassment.
9. What is the correct name for the acronym DBE?
- A. Disabled Business Enterprises.
  - B. Department of Business Enterprises.
  - C. Disadvantaged Business Enterprises.
  - D. Department of Business Employment.
10. What do the EEO, ADA and DBE laws have in Common?
- A. Protection of unions from employment discrimination.
  - B. Protection of individuals from employment discrimination.
  - C. Protection of construction companies from discrimination.
  - D. Protection of individuals from disciplinary action from employers.

## Level 1 Construction Fundamentals Study Guide

### Employment Law Exercise

11. What are the additional provisions that were **ADDED** by the 1991 Civil Rights Act to the existing employment discrimination law that allows employees to recover compensatory and punitive damages?
- A. ,MBE, DBE, WBE, and ADA discrimination.
  - B. Disability, Gender, Sex changes, Veteran and Obesity.
  - C. Race, Color, Ethnic identification, sexual orientation and Age Discrimination.
  - D. Emotional Pain, suffering, inconvenience, mental anguish, and loss of enjoyment.
12. What can be recovered by an individual from the officers or Managers of a company under the Civil Rights Act of 1991 if a manager is found guilty?
- A. No damages can be recovered.
  - B. Business insurance will cover the damages awarded.
  - C. The company can be for awarded damages and lawyer fees.
  - D. The manager can be held personally for awarded damages and lawyer fees.
13. Which of the following activities creates a hostile work environment under the Sexual Harassment provisions?
- A. Using humor in the work place.
  - B. Consenting verbal flirtations with co-workers.
  - C. Talking with co-workers about social activities.
  - D. Conduct which interferes with work performance.
14. What are the content areas that a supervisor must take into consideration when writing a disciplinary memorandum?
- A. Format, Tone and Vocabulary.
  - B. Praising Introduction, Body and Conclusions.
  - C. Opening Question, Highlights, Specific Clauses and Recommendations.
  - D. Topic, Purpose, Specific Objective, Executive Summary and Lead-in with praise.

## Level 1 Construction Fundamentals Study Guide

### Employment Law Exercise

15. In 1935 the Wagner act was enacted and the National Labor Relations Board (NLRB) was formed, What type of disputes is the NLRB empowered to resolve?
- A. Owner- Contractor disputes.
  - B. Architect- Contractor disputes.
  - C. Contractor- Subcontractor disputes
  - D. Organized Labor-Contractor disputes.
16. In 1959 the Landrum-Griffin act was enacted, which party and what rules were enacted?
- A. Union officials must follow established rules for picketing a job site.
  - B. Management must not coerce employees and they must bargain in good faith.
  - C. Management must pay employees on federal projects the prevailing wage rate.
  - D. Union officials must report organization activities and finances to congress yearly.
17. In 1947 the Taft-Hartley act was enacted, Which party were unfair practices established against?
- A. Union's management.
  - B. Owner's management.
  - C. Contractor's management.
  - D. Subcontractor's management.
18. In 1932 the Norris-LaGuardia act was enacted, and it prohibited the use of a Yellow Dog Contract. What is a Yellow Dog contract?
- A. It outlawed secondary boycotts that required a contractor to put pressure on another party to conform under the agreement.
  - B. It outlawed union-employer agreements that require the contractor to refrain from handling the products of another contractor or supplier.
  - C. It outlawed the use of a pre-hiring agreement that requires employees to agree that they will not join a union while employed with the company.
  - D. It prohibited the use of pre-hiring agreements requiring a job applicant not to join a union or to renounce their union membership while employed.

## Level 1 Construction Fundamentals Study Guide

### Employment Law Exercise

19. What is the name of the act that requires the contractor to pay prevailing wage rates on all federally funded projects?
- A. Wagner act.
  - B. Taft-Hartley act.
  - C. Davis-Bacon act.
  - D. Norris-LaGuardia act.
20. In 1935 the Wagner Act was enacted and it made it unlawful to enter into a Hot-Cargo Agreement. What is a Hot-Cargo Agreement?
- A. It outlawed the practice that requires employees to agree that they will not join a union while employed.
  - B. It outlawed the practice that requires a worker to be a member of the appropriate union at the time of hiring.
  - C. It outlawed secondary boycotts that required a contractor to put pressure on another party to conform under the agreement.
  - D. It outlawed union-employer agreement that requires the contractor to refrain from handling the products of another contractor or supplier.
21. The 1947 Taft-Hartley act prohibited Featherbedding. What is featherbedding?
- A. The practice of refusing to bargain in good faith.
  - B. The practice of paying the union for services not performed.
  - C. The practice of discharging an employee for union membership.
  - D. The practice of requiring a job applicant to sign a pre-hiring agreement.
22. What is a court order called that prohibits a union or contractor to stop certain activities?
- A. Strike
  - B. Lockout
  - C. Directive
  - D. Injunction
23. What is the name of the illegal dispute between a contractor and a union that causes the employees of a neutral party to exert pressure on the contractor to settle called?
- A. Lockout
  - B. Primary boycott
  - C. Secondary boycott
  - D. Jurisdictional dispute

## Level 1 Construction Fundamentals Study Guide

### Employment Law Exercise

24. What is a dispute between two unions over work activities requiring the contractor to assign the work to one of the unions involved called?
- A. Primary boycott
  - B. Secondary boycott
  - C. Jurisdictional dispute
  - D. Subcontractor dispute
25. What is a contractor referred to as that defends the concept of the right of each contractor to decide the crew size, the job activities assigned and established their wages according to each individual's ability and performance?
- A. Merit shop contractor
  - B. Union shop contractor
  - C. Agent shop contractor
  - D. Closed shop contractor
26. What is the procedure established in the labor agreement that provides for meetings between successively higher levels of union-contractor management to resolve employee disputes without work stoppage called?
- A. Grievance procedure
  - B. Mediation procedure
  - C. Arbitration procedure
  - D. Jurisdictional dispute
27. The EEO clause on a project states that "on this project a total of 13 percent of the contract award value shall be for DBE's." What is this DBE hiring percentage considered according to the law?
- A. Goal.
  - B. Obligation.
  - C. Minimum Requirement.
  - D. Maximum Requirement.

## Level 1 Construction Fundamentals Study Guide

### Job Site Administration and the Contract Administration Documents

The *Notice of Award* is an acceptance of the contractor's offer from the owner. This notice is normally accomplished by a letter indicating their selection and directing the contractor to obtain necessary contract bonds, and insurance together with information concerning arrangements for the signing of the contract. The *Letter of Intent* is a slightly different version which indicates selection and acceptance of a proposal and states intent of entering into a suitable contract at a later date because of certain activities not being met at the notification time such as encumbrances at the site that have not been reconciled. The Notice of Award is prepared by the Owner and Sent to the Contractor. It is the contractor's responsibility to acknowledge receipt, keep copy and send an original back to the owner within the specified amount of time, obtain bonds. If the notification is a Letter of Intent you should determine how long you will guarantee prices and verify with your subcontractors before notifying the owner. The *Notice to Proceed* implies that the site is free of encumbrances and the contractor can occupy the site. The date of the notice to proceed establishes the reference date from which the beginning of the project is calculated. The Notice to Proceed is prepared by the Owner and sent to the Contractor. It is the contractor's responsibility to acknowledge by signing, keep copy, return original to the owner, commence work within the specified amount of time.

The *Stop Work Order* is a document prepared by the Owner and used to notify the contractor to stop work on the project for a variety of reasons such as Owner financial conditions, Owners changed needs, labor disputes, unsatisfied liens, failure to perform according to the specifications. Also, See the Termination clause in the General Conditions contains additional reasons for the owner to stop work.

The *Schedule of Value Forms* are normally bound into the documents and they require the Contractor to provide a cost breakdown for each category listed. These forms are normally required to be submitted by the Contractor within fourteen days after the Notice of Award as stated in the Instructions to Bidders. They are reviewed and accepted by the A/E firm prior to first payment request. The *Application and Certificate for Payment Forms* are the same form as the Schedule of Values which the Contractor has placed a Scheduled Value upon previously. This form is completed and submitted by the Contractor to request all progress payments and final payment. Also, *Lien Waivers* are submitted with each request for payment and attached to the Schedule of Values form. These must be attached from all vendors and subcontractors.

The *Construction Schedule* is normally required to be submitted within fourteen days of the Notice to Proceed and it is reviewed and accepted by the A/E firm prior to the first payment request. Normally, the Contractor is required to prepare and submit a logic diagram indicating the interrelationship of procurement and construction activities. Under a Design-Build contract the organization is also responsibility for the design sequence. Sometimes the Owner will specify a specific software package and the necessary schedule updates.

## Level 1 Construction Fundamentals Study Guide

The *Permits* are typically obtained by the Project Manager after the signing of the agreement and before commencement of the work. The contractor is responsible for obtaining the building permit and the soil erosion permit. The mechanical, electrical and plumbing permits are normally obtained by the specific trade.

The *Soil erosion permit* is required whenever any excavation is going to be performed within 500 feet of anybody of water such as a creek, stream, wetland, a lake, a river or drainage easement. The Soil Erosion and Sedimentation Permit is required to be completed by anyone disturbing the existing soil. This is to ensure the public that all runoff water and soil will be captured before causing any harm to adjacent bodies of water. Some of the acts that the contractor shall be in compliance with are Act 347 - Soil Erosion and Sedimentation Act, Act 346 - Inland Lakes and Streams Act, Act 203 - Goemaere-Anderson Wetland Protection Act. This information is normally found in the General Requirements and Division 02 Site Work.

The *Stop Work Notice* is a document used to notify the owner that the work on the project is being stopped for non payment. The AIA General Conditions under the payments clause states that if the contractor is not paid within seven days after the date stated in the contract or within seven days after receipt of Application or Payment or Sworn Statement then the contractor may, upon seven additional days written notice to the owner, Stop the Work until payment is received. The Stop Work Notice is prepared by the General Contractor. It is the contractor's responsibility to Sign the form and sends it to the owner by certified or registered mail.

The *Certificate of Substantial Completion* is the substantial acceptance of the project which is implemented by a joint inspection on the part of the owner's representative and the contractor. The contractor and the owner's representative compile a list of items, called a "punch list" containing the corrections to be completed. The punch list becomes the basis for accepting the work as completed and releasing the final payment to the contractor. Substantial performance may be defined as an accomplishment by the contractor of all things essential to the fulfillment of the purpose of the contract, although there may be inconsequential deviations from certain terms. It is the contractor's responsibility to "walk the job" and compile a "punch list" for final acceptance of subcontractors work. A completion date should be set for correction of deficiencies by the prime contractor and subcontractors. An example of a punch list is shown below.

1. Caulking is required between the stucco and brick on the lower level
2. Streaks and cracking on stucco must be remedied.
3. Submit the Operation and Maintenance Manuals for the Mechanical Equipment
4. Install the Fire door stops in the Northeast end of corridor of hall #2
5. Balance the Air Conditioning System and submit records for the balancing.
6. Submit the "as built" construction drawings.

## Level 1 Construction Fundamentals Study Guide

The *Certificate of Occupancy* involves the Fire Marshall, the Plumbing Inspector, the Heating or Mechanical Inspector, the Electrical Inspector and the Building Inspector. Each inspector must verify and sign off before owner occupancy. Finally, sometimes a *maintenance bond* is required to be submitted to the owner at a project closeout.

The *Requests for information* (RFI) are sent to the A/E for clarification of an item during construction. Some of these may become contract change orders.

### Shop Drawings, Product Data Sheets and Reference Standards

The *Shop Drawings* are defined in the American Institute of Architects, General Conditions, A201-1997, as drawings or diagrams which illustrate the fabrication and erection procedures for some portion of the work. It continues and says that shop drawings, product data and samples must be submitted after the signing of the Agreement and prior to fabrication or erection of the item. In article 3.12.7 it states that the "Contractor shall perform no portion of the Work... requiring Submittals... until the submittals have been approved by the Architect" ( p 8). It is the contractor's responsibility is to verify materials, field dimensions and field construction criteria with the requirements of the Contract Documents and Approve each Shop Drawing or Product Data Sheet by affixing a Professional Engineers stamp to each drawing. Furthermore, the Contractor must: 1.) Maintain a Submittal Schedule and 2.) Inform the Architect of any Deviations. 3.) Inform by specific reference using a Letter of Transmittal.

The Supplementary Conditions states that "the Contractor shall not be relieved of responsibility for any deviation, unless the Contractor has informed the Architect by specific reference in the accompanying Transmittal Letter of such deviation at the time of submission and the Architect has commented in writing on the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, by the Architect's review thereof" (p SC-4). Under this clause the contractor must:

The *Letter of Transmittal* is a cover form addressed to the receiver and attached to each package of information being sent to inform the receiver what information is being sent. The letter of transmittal provides the reader with a complete list of the items being sent and instructions to the receiver outlining "what action is to be taken by the receiver." The letter of transmittal is prepared by anyone transmitting data such as the contractor, architect, engineer, owner or subcontractor.

The General Requirements states that "all Submittals shall be clearly identified with project Name and location, and manufacturers' name...and the Contractor shall indicate their approval by means of their stamp." Furthermore, the Contractor must submit a specific number of copies as of each submittal to the Architect/Engineer for their approval as stated in the General Requirements.

## Level 1 Construction Fundamentals Study Guide

The specific Shop Drawings required are stated at the beginning of each Section within each Division of the Technical Specifications under Part 1. For example, Division 5 is Metals, Section 200 is Steel Joists, PART 1.04 is Submittals and the B refers to the Shop Drawings required to be submitted. The CSI number is shown below.

05200            JOISTS  
  
PART 1           GENERAL  
    1.04            Submittals  
                    B.      Shop Drawings

The *Product Data* Sheets are defined as Performance Charts, Standard Schedules or Brochures which illustrate a Manufactured Material or Product that will be installed. The AIA General Conditions states that the Product Data must be submitted prior to installation of the item for Approval and Review by the Contractor and the Architect. The specific Product Data Sheets required are stated at the beginning of each Section within each Division of the Technical Specifications under Part 1. For example, Division 5 is Metals and Section 300 is Steel Roof Deck, PART 1.04 is Submittals and the C refers to the Product Data information required. The CSI number is shown below.

05300            STEEL ROOF DECK  
  
PART 1           GENERAL  
    1.04            Submittals  
                    C.      Product Data

*The Reference Standards* are documents that are not physically attached with the Documents, but are referenced too in the documents and they may be part of the contract. This is the doctrine of Incorporation by Reference. The most common clause used to incorporate an item by reference is to state in the documents that the Reference Standards are "herewith made a part of the Specifications." This normally requires the Contractor to have these available at the job site. Some common construction reference manuals that are incorporated by reference and they should be at the job site is the Riggers Manual for selecting slings under various lifting configurations. Another reference standard is the Crane Lifting Tables showing the various angles, distances and their lifting capacity. The Formwork for Concrete reference standard for designing the concrete forms. Finally, the OSHA Construction Safety Standards are incorporated by reference.

The *Record (As-built) Drawings* must be maintained at the job site and marked currently to record field changes and selections made during construction. This record set is given to the owner upon completion. There should be only one master set where all changes are made.

## Level 1 Construction Fundamentals Study Guide

### Contract Changes

*Change Orders or Contract Modifications* are defined in the American Institute of Architects (AIA) General Conditions as a written order, prepared by the A/E, to the Contractor issued after execution of the Contract Agreement. It is signed in agreement by the Owner, Architect/Engineer and Contractor. A Contract Change Order authorizes a change in the scope of work and/or an adjustment in the Contract Sum and/or in the Contract Time. After a contract change order is issued, the contractor must notify 1) All vendors effected by issuing a Purchase Order Change Number and they must notify 2) All subcontractors effected by issuing a Subcontract Change Order Number.

### Example Contract Change Order Form

PROJECT: <u>  JOBSITE, USA  </u> OWNER: <u>  Owner, Inc  </u> <u>  261 Wash Ave.  </u> <u>  Houston, TX  </u>	CHANGE ORDER NO. _____ DATE <u>  August 29,  </u> A/E PROJECT NO.: <u>  99-116  </u> CONTRACT FOR: <u>  JOBSITE, USA  </u>
--	---

TO:   Contractor, Inc.    
  345 Michigan Ave.    
  Houston, TX  

The contract is changed as follows:

---

**Not valid until signed by the Owner, A/E and Contractor**

---

ORIGINAL CONTRACT SUM	\$ _____
NET CHANGE BY PREVIOUSLY AUTHORIZED CONTRACT CHANGES	\$ _____
CONTRACT SUM PRIOR TO THIS CHANGE ORDER	\$ _____
CONTRACT SUM WILL INCREASE/DECREASE BY THIS CHANGE ORDER	\$ _____
NEW CONTRACT SUM INCLUDING THIS CHANGE ORDER WILL BE	\$ _____
CHANGE IN CONTRACT TIME WILL BE _____ (DAYS)	
NEW DATE OF SUBSTANTIAL COMPLETION IS _____	

_____	_____	_____
Owner's Signature	Architect's/Engineers Signature	Contractors Signature

Level 1 Construction Fundamentals Study Guide

Changes Ordered by the Architect/Engineer are called Extra Work Orders and they are frequently used to authorize the contractor's field personnel (superintendent) to proceed with a change immediately, with the sum and time extension to be settled later. The *Extra Work Order* is issued by the Architect/Engineer to the superintendent, indicating the work order number, a full description of the scope of work and the method for determining the total cost. It should be very clear that an Extra Work Order **does not** change the Contract Scope, Price or Time until it is converted to an executed Contract Change Order.

The *Extra Work Orders* place the contractor at an extreme disadvantage in settling the work order fairly because the work has already been completed. Therefore, it is required that the field personnel and subcontractors document all time, equipment and materials used daily by Extra Work activity. The field supervisor should also require the Architect/Engineer to approve these charges daily if possible. Immediately after completion of the extra work order, the contractor should prepare a change order proposal and submit it to the owner requesting that a contract change order be issued.

---

Extra Work Order

PROJECT: \_\_\_\_\_

EXTRA WORK ORDER NO. \_\_\_\_\_

OWNER: \_\_\_\_\_

DATE: \_\_\_\_\_

\_\_\_\_\_

A/E PROJECT NO:   99-116  

TO CONTRACTOR:

CONTRACT FOR: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The scope is changed as follows: (Describe scope)

\_\_\_\_\_  
Architect's/Engineer's Signature

\_\_\_\_\_  
Superintendent's Signature

Level 1 Construction Fundamentals Study Guide

The Architect can issue a *Construction Change Directive* which is defined in the American Institute of Architects (AIA) General Conditions as a written order, prepared by the A/E, to the Contractor issued after execution of the Contract Agreement. It is signed in agreement by the Owner and Architect/Engineer authorizing a change in the scope of work and/or an adjustment in the Contract Sum and/or an adjustment in the Contract Time. If the contractor disagrees, they must:

1. Proceed with the directive
2. Maintain all cost records
3. Negotiate approval into change order or file a claim.

If the contractor agrees, they must:

1. Proceed with the directive
2. Sign and execute a contract change order

Construction Change Directive Form

PROJECT: JOBSITE, USA OWNER: Owner, Inc _____ 261 Wash Ave. _____ Houston, TX _____	DIRECTIVE NO. _____  DATE August 22, __ A/E PROJECT NO.: _99-116 _____
TO: Contractor, Inc. _____ 345 Michigan Ave. _____ Houston, TX _____	CONTRACT FOR: JOBSITE, USA _____

You are hereby directed to make the following change(s) in this Contract:

PROPOSAL ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum is:

\_\_\_ Lump Sum (increase) (Decrease) of \$ \_\_\_\_\_  
 \_\_\_ Unit Price of \$ \_\_\_\_\_ per \_\_\_\_\_

2. The Contract Time is Proposed to be (an increase or decrease of: \_\_\_\_\_ (days)

\_\_\_\_\_  
 Owner's Signature

\_\_\_\_\_  
 Architect's/Engineers Signature

\_\_\_\_\_  
 Contractors Signature  
 Signature indicates Contractor's Agreement

Level 1 Construction Fundamentals Study Guide

Another change form is the Minor Change in the Work request from the A/E. A *Minor Change* in the Work is defined in the American Institute of Architects (AIA) General Conditions as a written order of the Architects/Engineers’ supplemental instructions to the Contractor and issued after execution of the Contract Agreement. It is signed in agreement by the Architect/Engineer authorizing a change in the scope of work but it indicates that there will be no modification and/or an adjustment in the Contract Sum and/or an adjustment in the Contract Time.

Minor Change in the Work Form

PROJECT: JOBSITE, USA	SUPPLEMENTAL INSTRUCTION NO. __8__
OWNER: _____ Owner, Inc _____ 261 Wash Ave. Houston, TX _____	DATE SEPTEMBER 14
TO: _____ Contractor, Inc. _____ 345 Michigan Ave. Houston, TX _____	A/E PROJECT NO.: __99-116_____
	CONTRACT FOR: JOBSITE, USA _____
	A/E FIRM: _____

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Prior to proceeding in accordance with these instructions, indicate your acceptance of these instructions for minor change to the Work as consistent with the Contract Documents and return a copy to the Architect/ Engineer.

Description:

*As discussed in our telephone conversation at 10:15 A.M. on September 13, install Acme “Desert Beige” ceramic tile, mfg. #701, in lieu of Star “Chatum Tan” ceramic tile in the mens’s and women’s bathrooms.*

*You reported that Star Manufacturing Company’s “Chatum Tan” ceramic tile is currently out of stock and unavailable for delivery.*

Attachments:

Issued By \_\_\_\_\_  
Architect’s/Engineer’s

Accepted By \_\_\_\_\_  
Superintendent



## Level 1 Construction Fundamentals Study Guide

There are two types of Change Order Proposals that the Contractor can submit depending upon the circumstances of the Proposal. Upon receiving a change order request memo from the owner, the Contractor must first determine if the proposal is a New Change or a Net Change. A New Change Order Proposal requires the contractor to provide a Change Order Proposal Summary Cover Page indicating the Change in Scope, Price, Time and the Time Limit for Acceptance. Second, the Contractor must prepare and submit to the owner a Change Order Proposal Backup or Breakdown page showing a detailed cost breakdown, including all direct job costs, indirect job costs, overhead and profit. The New Change for the Change Request Memo #1 is shown below with a Summary Page and the Backup Page. The Supplementary Conditions will determine the direct and indirect cost items that can be included in the Proposal, the percentage for overhead and profit. The Prevailing Rate Table if they apply will specify the minimum wage rates and benefits that must be paid on federal projects. The AIA General Conditions indicates that the Contractor has 21 days from first occurrence to submit a Change Order Proposal.

FROM: Contractor, Inc.	CHANGE ORDER NUMBER
345 Michigan Ave.	CHANGE REQUEST (E.W.O) NUMBER 2
Houston, TX	CHANGE ORDER PROPOSAL NO. 47
TO: Owner, Inc.	
261 Wash Ave., Houston TX	PROJECT NAME Jobsite, U.S.A., Houston, TX

**SCOPE:** We submit the following quotation to cover the addition of brown Chippewa brick 4" x 2-2/3" x 8" to the north exposed basement wall.

<b>PRICE:</b>	Direct Job Costs	
	Material	\$113.50
	Labor	104.13
	Subcontracts	0.00
	Total direct costs	217.63
	Indirect costs	68.91
	Subtotal	286.54
	Main Office 7%	20.06
	Subtotal	306.60
	Profit 10%	30.66
	Total Price	337.26

**TIME EXTENSION:** We request a time extension of one (1) working day for this change.

**ACCEPTANCE TIME:** Please issue a contract change order if you wish to proceed with this change. We will not proceed without further written instructions. This change order proposal is good for three days from the date above.

## Level 1 Construction Fundamentals Study Guide

A *Change Order Proposal Bid Breakdown Support Page* will be submitted as backup with the change order proposal summary page to the owner. The bid breakdown shows how the Direct Costs and Indirect Costs on the Change Order Proposal Summary page were arrived at by the contractor. This Change Order Proposal Backup or Breakdown page is for New Changes to the Scope and it must follow the Crew Sizes, Prevailing Wages established on public projects, Crew Costs per day, Total Costs for Materials, Labor and Equipment by Type of Work/Locations and Operations. The direct and indirect itemized costs that a Contractor can change on a Change Order Proposal are stated in the Supplementary Conditions and the

### Change Order Proposal Breakdown

Example of Direct Costs by Type of Work/Locations And Operations

Masonry Face Brick

Material 500 Brick @ \$227/1000	=	\$113.50
Labor 2-2/3 hr. 3 BL 8.01 Whr x \$9.00/hr		72.09
2-2/3 hr. 2 BLH 5.34 Whr x \$6.00/hr		<u>32.04</u>
JOB COSTS		\$217.63

Example of Itemized Indirect Costs

Indirect Labor (1 hr.)	20.00
Insurance 1% Job Cost	2.18
Small Tool 1% Labor	1.00
Job Truck 1% Labor	1.00
Job Office 2% of Labor	2.00
Sales Tax 4% of Material	4.54
Taxes: FICA 6.5% of Labor	6.77
Unemployment 4.5% of Labor	4.69
Insurance: Workers Compensation \$8.87/\$100	
	Labor 9.23
Public Liability \$.37/\$100 Labor	.38
Property Damage \$.30/\$100 Labor	.30
Fringes: Health & Welfare \$.60/hr. 13.35 hrs.	8.01
Pension \$.65/hr. 13.35 hrs.	8.68
Apprentice .01/hr. 13.35 hrs.	<u>.13</u>
	TOTAL \$68.91

Level 1 Construction Fundamentals Study Guide

The Net Change Order Proposal is for an item that currently exists in the original estimate, and the change will result in either an increase or decrease in the contract price. The effect of the change request must be determined by the contractor by comparing the original estimated cost of the item with the new estimated cost of the item. This results in a net change in price. Normally, the contractor does not charge the owner for overhead items. A *Net Change* requires the contractor to provide a Change Order Proposal Summary Cover Page indicating the Change in Scope, Price, Time and the Time Limit for Acceptance. The net change should reflect the difference between the Original Direct Costs and the New Direct Costs. The Net change for the Change Request Memo #2 is shown below.

FROM: Contractor, Inc.	CHANGE ORDER NUMBER
345 Michigan Ave.	CHANGE REQUEST (E.W.O) NUMBER 2
Houston, TX	CHANGE ORDER PROPOSAL NO. 47
TO: Owner, Inc.	
261 Wash Ave. , Houston, TX.	Jobsite, U.S.A., Houston, TX

**SCOPE:** In reference to your change order request No. 2, we submit the following quotation to cover the relocation of the Domestic water line as shown on drawing DW001 Revision No. 4

<b>PRICE:</b>	Direct Job Cost - Original	
	Material	\$1500
	Labor	\$ 978
	Equipment	\$ 0
	Subcontractor	\$ 0
	Total	\$2478
	Direct Job Costs - New	
	Material	\$1000
	Labor	\$ 652
	Equipment	\$ 0
	Subcontractor	\$ 0
	Total	\$1652
	Net Change in Price	\$(826) Decrease

**TIME EXTENSION:** We request a time extension of one (0) working day on this change.

**ACCEPTANCE TIME:** Please issue a contract change order if you wish to proceed with this change. We will not proceed without further written instructions. This change order proposal is good for three days from the date above.

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

1. Which document informs the contractor that their proposal has been accepted?
  - A. Contract Bonds.
  - B. Notice of Award.
  - C. Notice to Proceed.
  - D. Contract Change Order.
  
2. Which document informs the owner that the work on a project will be stopped for failure of the owner to make a progress payment?
  - A. Stop Work Order.
  - B. Change Directive.
  - C. Stop Work Notice.
  - D. Contract Change Order.
  
3. Which document is used to allocate the estimated costs for the items listed and for requesting progress payments?
  - A. Schedule of Values.
  - B. Construction Schedule.
  - C. Contract Change Order.
  - D. Labor and Material Bond.
  
4. Which document is issued to the contractor for failure to perform according to the specifications?
  - A. Stop Work Order.
  - B. Change Directive.
  - C. Stop Work Notice.
  - D. Performance Bond.
  
5. Which document is signed in agreement by the Owner, A/E and the Contractor informing the contractor to modify the agreements terms and conditions?
  - A. Addenda.
  - B. Change Directive.
  - C. Contract Change Order.
  - D. Contract Change Order Proposal.

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

6. Which document is signed in agreement by the Owner and the A/E and instructing the Contractor to make a change prior to agreeing on the adjustment in scope or price?
- A. Change Directive.
  - B. Extra Work Order.
  - C. Contract Change Order.
  - D. Contract Change Order Proposal.
7. Which document establishes the actual start date from which the beginning of the project is calculated?
- A. Notice of Award
  - B. Notice to Proceed
  - C. Contractor's Proposal
  - D. Supplementary Conditions
8. Which document terminates any liquidated damages from being assessed any further?
- A. Notice of Award.
  - B. Stop Work Notice.
  - C. Contract Change Order.
  - D. Certificate of Substantial Completion.
9. According to the AIA documents, assume that the Owner through the A/E has rejected a claim that the Contractor has submitted. What action must the Contractor request in writing next?
- A. Lawsuit.
  - B. Mediation.
  - C. Arbitration.
  - D. Negotiation.
10. When is the Certificate of Substantial Completion prepared?
- A. bid opening
  - B. signing of the agreement
  - C. end of the construction process
  - D. beginning of the bidding process

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

11. Which of the following items is contained in the Certificate of Substantial Completion?
- A. process payment schedule
  - B. starting date of the project
  - C. a list of items to be completed
  - D. a list of contract documents to be submitted
12. What is an amount withheld from progress payments to ensure satisfactory completion of the work called?
- A. Lien
  - B. Retainage.
  - C. Cost Plus Expenses.
  - D. Liquidated damages.
13. Assume that the Contractor has not been paid according to the contract payment due date. According to the contract documents, which document must the contractor complete and submit to the owner to inform them that they will be leaving the job site if the late progress payment is not received?
- A. Sworn Statement.
  - B. Stop Work Order.
  - C. Stop Work Notice.
  - D. Schedule of Values.
14. According to the project documents, which document lists the itemized content required for submitting a Contract Change Order Proposal?
- A. General Conditions.
  - B. General Requirements.
  - C. Instructions to Bidders.
  - D. Supplementary Conditions.
15. According to the project documents, after the signing of the Agreement which documents must be submitted by the contractor within fourteen days of executing the Agreement?
- A. Performance Bond and Labor/Material Bond.
  - B. Extra Work Order and Contract Change Order.
  - C. Construction Schedule and Schedule of Values.
  - D. Stop Work Notice and Contract Change Order Proposal

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

16. Which document lists the Contract Documents that shall be utilized to interpret the contract?
- A. General Conditions.
  - B. Technical Specifications.
  - C. Supplementary Conditions.
  - D. Owner/Contractor Agreement.
17. According to the construction documents, What is the procedure and the name of the document that you must use to inform the Architect/Engineer of a change notation you would like to make to a shop drawing?
- A. Inform the A/E using a Contract Change Order.
  - B. Inform the A/E using a Letter of Intent to change a shop drawing.
  - C. Make the change on the shop drawing and Specify on the Change Directive.
  - D. Make the change on the shop drawing and specify on the Letter of Transmittal.
18. Which position is typically responsible for verification of all materials, field measurements and field construction criteria on the shop drawings?
- A. Architect.
  - B. Subcontractor.
  - C. Project Engineer.
  - D. Project Manager.
19. Which party is the primary developer of the shop drawings?
- A. Owner.
  - B. Architect.
  - C. Contractor.
  - D. Subs and Vendors.
20. Which document explicitly tells the reader the specific shop drawings, product data, and reference standards required on a project?
- A. In Part 1 of each Section of the General Requirements.
  - B. In Part 1 of each Section of a Technical Specification Division.
  - C. In Part 2 of each Section of a Technical Specification Division.
  - D. At the beginning of the first Section of each Technical Specification Division

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

21. During what phase of the project are Shop drawings submitted and approved?
- A. during the bidding phase of the project.
  - B. prior to fabrication or erection of the item.
  - C. after erection of the item and after the punch list.
  - D. after erection of the item and before project completion.
22. What is the name of the document that must be submitted which illustrates the Fabrication and Erection Procedures for some portion of the Work?
- A. Shop Drawings
  - B. Specifications
  - C. Working Drawings
  - D. Product Data Sheets.
23. Which of the following words specifically distinguishes shop drawings from product data sheets?
- A. Schematic drawings.
  - B. Schedules or Diagrams.
  - C. Isometrics or Assembly plans.
  - D. Architect/Engineer Working drawings.
24. Which of the following items that must be submitted show the Fabrication and Erection Process?
- A. Pella Windows, Kitchen Cabinets, Furniture and Pre-hung Doors.
  - B. Structural Steel, Rebar, Formwork Design, Glazing and Frames for Store Fronts.
  - C. Plumbing Fixtures, Heating Fixtures, Electrical Fixtures and Prepackaged Equip.
  - D. Prepackaged Equipment, Brick Block, Roofing Membrane, and Kitchen Cabinets.
25. Which of the following items that must be submitted show the Fabrication and Erection Process?
- A. Sheet Metal Isometrics, Plumbing Isometrics, and Electrical Isometrics.
  - B. Acoustical tile, Paint Colors, Plumbing Fixtures and Prepackaged Equipment.
  - C. Kitchen Cabinets, Pella Windows, Prehung Doors and Interior Trim.
  - D. Plumbing Fixtures, Heating Fixtures, Electrical Fixtures and Prepackaged Equipment, Piping Isometrics, Plumbing Isometrics, and Electrical Isometrics.

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

26. Under what conditions are a Soil Erosion Permit Required?
- A. Whenever general permits are required on a project.
  - B. If any excavation is within 500 feet of a body of water.
  - C. Only if it is stated in the permit article number of the General Conditions.
  - D. Only if it is stated in the permit article number of the General Requirements.
27. What are the names of the parties signing an Extra Work Order?
- A. Owner and Contractor
  - B. Surety and the Owner
  - C. Architect and the Subcontractor
  - D. Architect and the Superintendent
28. Which item (s) is changed in the Contract Agreement using an Extra Work Order?
- A. Time
  - B. Scope and Price
  - C. All of the above
  - D. None of the above
29. A Contract Change Order has been issued, Which parties may the Contractor have to issue changes to because of the contract change order being issued?
- A. Owner and the Architect
  - B. Suppliers and the Architect
  - C. Subcontractor and the Suppliers
  - D. Subcontractor and the Architect
30. According to CSI and AIA, Which Document contains the definitions for Shop Drawings, Product Data and Samples?
- A. Instructions to Bidders
  - B. General Conditions
  - C. General Requirements
  - D. Supplementary Conditions

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

31. According to CSI and AIA, Which Document states the procedures for submitting Shop Drawings?
- A. Instructions to Bidders
  - B. General Conditions
  - C. General Requirements
  - D. Supplementary Conditions
32. According to CSI and AIA, Which Document states the number of copies of the Shop Drawings and Product Data Sheets that must be submitted?
- A. Instructions to Bidders
  - B. General Conditions
  - C. General Requirements
  - D. Supplementary Conditions
33. According to CSI and AIA, Which Document states the time frame for Submitting the Shop Drawings?
- A. Instructions to Bidders
  - B. General Conditions
  - C. General Requirements
  - D. Supplementary Conditions.
34. According to CSI and AIA, Which document specifies the number of copies of Owner installation and operating manuals that must be submitted at a project closeout?
- A. Instructions to Bidders
  - B. General Conditions
  - C. General Requirements
  - D. Supplementary Conditions
35. You are To price a New Contract Change Order Proposal, for a Road and Bridge Project, Which of the following items must be Consulted to properly price the proposal?
- A. General Conditions and General Requirements.
  - B. Detailed Estimate and the Condensed Estimate Summary.
  - C. Supplementary Conditions and Prevailing Wage Rate Table.
  - D. Project Overhead Summary sheet and the Original Estimate.

## Level 1 Construction Fundamentals Study Guide

### Site Administration and Contract Documents Exercise

36. Which of the following parties issues the Certificate of Occupancy?
- A. Contractor, Architect and the Owner.
  - B. Banker, Surety, and the Title company.
  - C. Contractor, Mechanical Subcontractors, and the Electrical Subcontractor.
  - D. Fire Marshall, Mechanical Inspector, Electrical Inspector and Building Inspector.
37. Which document do you extract the ORIGINAL PRICES from for calculating a NET CHANGE?
- A. Estimate
  - B. Detail Cost Ledger
  - C. Contract Change Order Proposal
  - D. Project Overhead Summary Sheet

Given the following information, DETERMINE THE NET CHANGE AMOUNT that would be shown on the Change Order PROPOSAL for a change to an existing item on the project.

#### Original Costs

Material	\$1000
Labor	\$2200
Subcontract	<u>\$ 600</u>
SUB	\$3800

#### New Costs

Material	\$2000
Labor	\$1200
Subcontract	<u>0</u>
Subtotal	\$3200

Overhead	<u>\$ 900</u>
Total	\$4100

38. What is the correct Net Change Amount using the information provided above?
- A. \$300 Increase
  - B. \$300 Decrease
  - C. \$600 Decrease
  - D. \$600 Increase

## Level 1 Construction Fundamentals Study Guide

### Project Documentation

#### Daily Job Diary

The *Daily Job Diary* is the primary source of information about the construction job site is the construction supervisor. Therefore, it is vitally important that the Supervisor/Foreman be aware of their responsibility to maintain an accurate and complete account of each days activities. The document used to record this information is called Daily Job Diary. The Daily Job Diary is used to record Conversations, Technical Problems/Solutions and Safety Recommendations with Subcontractors, Suppliers or the Architect. The content will describe information concerning arrival dates, material delivery dates, design and contract changes. The supervisor should maintain an accurate record of the material quantities and workhours spent. This information is very important because this is the basis for requesting contract changes in time and money. The Daily Job Diary Content is described in more detail below.

The *Conversations* describe any conversations or conflict concerning coordination with other crews and personal conversations, observations or conflicts within your own crew.

The *technical problems/solutions* describe changes in drawings, elevations or construction erection problems and how they were resolved. The *safety problems and solutions* describe all potential Hazards that you feel exist in the lab and your recommended Plan of Action. Identify, by NAME all individuals that are not wearing the proper safety Equipment such as heavy shoes, hard hat and safety glasses. Also, state the action that you took to resolve the unsafe practice such as asked employees to please put on their safety glasses. The *signature/title & date* of the person completing the report must be signed each day in ink.

An example of a completed Daily Job Diary is shown below.



## Level 1 Construction Fundamentals Study Guide

### Rules for Keeping a Job Diary or Daily Log

The general rules required for entering the job diary as court evidence is described below:

1. Use only a BOUND book such as used by surveyors for their note keeping.
2. Pages should be consecutively numbered in ink, and NO numbers should be skipped.
3. No erasures should be made. In case of error, simply cross out the incorrect information and enter the correct data next to it.
4. No pages should be torn out of the book at any time. If a page is to be voided, place a large "X" through the page, and mark "void."
5. Every day should be reported, and every calendar date should be accounted for. If there is no work performed on a given date, the date should be entered on the page followed by the words "no work" or similar wording. It is still desirable to record the weather on "no work" days, as it may have later bearing on WHY no work was performed in a case involving a claim for liquidated damages.

According to the legal system, admissible evidence must meet the following criteria:

1. All entries' must be made on the same day as they actually occurred. If notes are kept on separate scratch paper and later transcribed into the diary and this fact is disclosed during a trial, the credibility of the entire diary comes into question.
2. The documentation must have originated with the event. Therefore, you must record the event as near to the actual event as possible. Recording the time and date of the event may be extremely important.
3. The recording must be based upon direct knowledge of the event. Therefore, the diary cannot be written by someone else.
4. The diary must be maintained as a regular business record. This means that if you only record when you believe you are going to have a dispute the court will not allow the diary to be admissible evidence.
5. The diary must be detailed enough to permit reconstruction of all events.

## Level 1 Construction Fundamentals Study Guide

The content of the diary or log is described below.

1. Telephone calls made or received, and a substantial outline of the nature of such calls, including any statements or commitments made during the call. Identify the parties calling.
2. Record any work or material in place that does not correspond with the drawings or specifications, as well as the action taken. List any other problems or abnormal occurrences that arose during each day, including notations of any particular lack of activity on the part of the contractor. Note corrective actions taken.
3. Record time and the name of the contractor's representative to whom field orders are delivered, and the nature of the contents of the field order.
4. Note unforeseen conditions observed by the inspector that may cause a slowdown by the contractor.
5. Where a contractor is performing extra work because of an unforeseen underground obstruction, make a careful field count of all personnel and equipment at the site and how they are occupied. Log the number and craft of each person idled by such work, as well as any idle equipment that would otherwise be capable of working.
6. Record the content of all substantive conversations held with the contractor at the site, as well as any tradeoffs, deals, or commitments made by either party.
7. Record all field errors made by any party at the site. Identify in detail and indicate probable effect.
8. Show the name of the job at the head of every page.
9. SIGN every diary entry and indicate job title immediately under the last line of entry on each day's report. This will preclude claims that additional wording was added later.

## Level 1 Construction Fundamentals Study Guide

### Daily Construction Report

The primary source of information about the construction activities being performed at the job site is the construction supervisor. Therefore, it is vitally important that the superintendent be aware of their responsibility to maintain an accurate and complete account of each days activities. The document used to record this information is called the Daily Construction Report.

The *Daily Construction Report* is a report sent to the contractor's home office describing the progress at the job site each day. This report contains the number of Workers Present, Weather conditions, Construction Activities Completed and In Progress, Quantities Placed, Materials Delivered, Construction Equipment, Visitors and meetings. The function and content are described below.

*Report No.* should be Numbered Consecutively. The *Workers Present* section records the number of workers present by craft and within each craft by craft classification. Each craft should also indicate whether there are any employees that were Absent, Hired or Terminated during the day. This section should include all of the contractor's employees and Subcontractor employees. The *Weather Conditions* section must record the Morning and Afternoon Conditions for the day. These could be used to verify your claim for a time extension. The *Construction Activities* describe the activities completed that day for your crew. You should reference exact locations. The *Materials Used* section should state the number of materials placed such as number of bricks, bags of mortar, cubic feet of Sand. The *Construction Equipment* used that day such as Masonry Saw, Fork Lifts, Saw Buck, Radial Arm, Power Hand Saw, Chisels, Hammers, Trowels, Mixers, Mixing Box. The *Visitors* section should indicate all visitors that arrived at the site such as the Architect, the Owner, material suppliers or an inspector. The *Meetings* section should describe any meetings that took place such as a tool box meeting, a crew meeting, a planning meeting or a safety meeting. An example of a Daily Construction Report is shown below.

## Level 1 Construction Fundamentals Study Guide

### Daily Construction Report Example

PROJECT	Jobsite, U.S.A.	REPORT NO.	262						
JOB NO.:	001	DATE	AUGUST 5						
CLIENT:	Owner, Inc.	DAY	M	T	W	T	F	S	S
CONTRACTOR	Contractor, Inc	DEGREES	_50 F AM		_75 F PM				
SUPERINTENDENT	Jim Bow	WEATHER AM/PM	SUN NY	PARTLY CLOUDY	OVER CAST	FOG/ RAIN			
SAFETY ENGINEER	John Cap	WIND SPEED	_5 MPH AM		20 MPH PM				
INSPECTOR	Ken Overature	HUMIDITY	DRY	MODERATE		HUMID			
	<b>CONTRACTORS WORKERS</b>				<b>SUBCONTRACTORS WORKERS</b>				
CRAFT	CREW LEADER	APPREN	JOURNEY	TOTAL	CREW LEADER	APPREN	JOURNEY	TOTAL	
Boilermakers					1		2	3	
Carpenters	1	3	4	8					
Electricians					1	2	2	5	
Finishers									
Instrument Fitters									
Insulators									
Iron Workers	1	2	7	10					
Laborers	1	1	4	6					
Masons									
Operators					1	1	1	3	
Pipe Fitters									
Plumbers					1	1	2	4	
Riggers									
Rod Busters	1	1	3	5					
Sheet Metal									
Sprinkler Fitters									
Teamsters									
<b>TOTALS</b>	4	7	18	29	4	4	7	15	

## Level 1 Construction Fundamentals Study Guide

### Daily Construction Report Example Continuation

#### CONSTRUCTION ACTIVITIES:

Prefabricated wall forms @ Col. Line D Tied column rebar for Col A & B @ Col. Line B-B; Placed Forms for Col C & D Stripped Wall Forms @ Col line B-B; Placed 100 Ft of 24" RCP Drainage Pipe from Manhole #30 to #31; Subcontractor Excavated and Hauled 400 Cy of Dirt south Lane of the Roadway from Sta 00 to Sta 1 + 01.

#### MATERIALS USED:

400 SF forms wall; 1.5 tons rebar columns; 100 lf reinforced concrete pipe; 400 PCS - 8" wall ties

#### MATERIALS RECEIVED:

10 tons rebar; 4000 LF electrical conduit.

#### CONST. EQUIPMENT AT SITE:

Cat D-7; Cat 955K; Cat D-3; Gradall; Manitowoc 3000B; 2 Front End Loaders H90 & 570A; 2 Clamshell Buckets; 2 Backhoes H2254 & Koring; 2 Sets of Cutting Torches; Generator; 1 Pump.

#### VISITORS TO THE SITE:

City Inspector; Architect Jim Shane; Inland Steel.

#### MEETINGS THAT TOOK PLACE:

Steel Fabrication Problems; Tool box Talk Monthly Safety Meeting; Progress Meeting.

## Level 1 Construction Fundamentals Study Guide

### Job Site Records

The *Field Records* are the vital link between the home office and the job site. These records are utilized to calculate the percentage complete, develop monthly progress payment requests, identify materials delivered to the site, determine productivity rates, estimate a change order proposal, calculate the payroll, compare actual progress to planned progress, establish a claim, and document problems or potential problems. The field supervisor is required to maintain some daily construction records pertaining to the job site activities. Some examples are a site storage location, delivery gates, site layout plan, a daily job diary, a daily construction report, a daily time card and a field one week look-ahead plan. Some additional records are the material delivery status report, purchase orders, stock bin requisitions, changes - Contract Change Order Proposals and Extra Work orders, construction equipment status report, subcontract agreements, collective bargaining agreements, permits, project schedule, standard references, emergency safety plan, OSHA safety manual, safety poster, Material Safety Data Sheet Location poster, Material Safety Data Sheets, emergency numbers, hiring records, progress inspections, progress payments, shop drawings, product data, samples, submittal log, planning meeting agendas and minutes, safety meeting agendas and minutes, training records and certificates, warranties, owner manuals, operating manuals, as-built drawings and certificate of occupancy.

Field correspondence can be a problem unless we have an effective and efficient method of dealing with the different types of correspondence. Time management suggests that correspondence accumulates for two reasons (1) we fail to make decisions about it immediately, and (2) we don't have a systematic process for handling all of the correspondence. One of the key concepts about correspondence and paperwork is that there are four things that we can do with it. We can dump it, delegate it, do it or delay it. Which option gets us in the most trouble?

Some of the best recommendations for handling paperwork are: First, handle only once. either do it, read it, trash it, or file it. Second, resist reading junk mail or junk e-mail and discard immediately. Third, write an answer on the bottom of the letter and return. Fourth, you may want to just telephone the person or e-mail them. Fifth, schedule a specific time for handling correspondence each day. Sixth, use an electronic reminder file too follow-up on time. Finally, always remember that many people find that at least eighty-percent of their mail and e-mail could be answered immediately when they read it.

One of the most efficient methods to organize the project records is to utilize the Construction Specifications Institutes Master Format. The Master Format facilitates construction communication, promotes standardization in the industry, and facilitates the retrieval of information. It is used for the organization of project manuals, detailed cost estimates, and product data filing. The Master Format with its Divisions and Sections is also an effective filing system for the field records listed above. Some of the best filing methods will be described below. Also, the complete Master Format is provided later.

## Level 1 Construction Fundamentals Study Guide

The *Construction Reports* must be completed Daily. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 Coordination under Construction Report. Also, the Construction Reports inside the folder should be filed with the latest date on top. The *Job Diary*. This must be completed twice daily if it is going to become a legal document admissible in court. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 Coordination under Job Diary. The Job Diary is numbered consecutively, dated and signed. The *Time Cards* must be completed twice daily and the hours must be allocated by construction activities. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 Coordination under Time Cards. Time cards are dated and signed. Also, the Time Cards inside the folder should be filed with the latest date on top. To save writing time, it is advisable to preprint the time cards with the Activity Descriptions and their associated cost codes on the Time cards. This requires less writing and they can be easily reproduced requiring the field person too only have to identify the hours worked for each worker. You should have some blank spaces on the time card to allow for construction activities not listed or work that is identified as Extra work or a Contract Change Order.

The *Equipment Status Report* is an internal report identifying the construction equipment on the job site or the time and date it was returned. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 Coordination under Equipment Status Report. Also, the Equipment Status Reports inside the folder should be filed with the latest date on top. The *Material Delivery Status Report*. This is also an internal report identifying the materials delivered to the job site identifying the time, date it was delivered and any visible damage to the shipment. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 Coordination under Material Delivery Status Report. Also, the Material Delivery Status Reports inside the folder should be filed with the latest date on top. The *Field Purchase Orders*. This is also an internal report identifying items purchased at or near the job site. These should state the intended use of the items. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 Coordination under Field Purchase Orders. Also, the Orders inside the folder should be filed with the latest date on top.

The *Stock Requisition* is also an internal report which identifies the job number and quantity of materials taken out of the warehouse for a specific project. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 Coordination under Stock Requisitions. The Stock Requisitions inside the folder should be filed with the latest date on top. The *Look Ahead Plan* is another internal planning form. This is an internal form which identifies the planned daily output, crew size, materials needed, tools and equipment needed, technical information, safety plan, sequence plan, quality requirements, and sketches. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 under Look ahead Plans. Finally, the look-Ahead Plans inside the folder should be filed with the latest date on top.

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*Visitors Log.* This for requires each person not assigned to this project to state the date and time of arrival, company name, their name printed, signatures and their departure time. This should be filed under Division 01, Section 040 Coordination. Then file alphabetically within 01040 under Visitors Log. Finally, the latest visitors log should be placed on top by date.

The *Permits, Prevailing Wages, Minority Hiring Procedures and Goals* can be filed under Division 01, Section 060 Regulatory Requirements and then, alphabetically within 01060 such as Minority, Permits - Building, Soil Erosion, Regulations - Prevailing Wages, Streams/Wetlands.

The *Union Collective Bargaining Agreements* can be filed under Division 01, Section 100 Special Project Procedures. Then file alphabetically within 01100 Special Project Procedures by Craft name. An alternative is to file under the Subcontractor Division and/or Section.

The *Project Meetings* consists of Working agendas and Meeting Minutes. This can be filed under Division 01, Section 200 Project Meetings. Then file alphabetically within 01200 Project Meetings by type of meeting such as Planning, Safety, etc. Also, place the latest date on top with the agendas on the left-hand side of the folder and the minutes of the meeting on the right.

The *Submittal Log or Time Table* can be filed under Division 01, Section 300 Submittals.

The *Contractor's Progress Payments* can be filed under Division 01, Section 025 Measurement and Payment.

The *Change Requests, Change Order Proposals, Approved Contract Change Orders* should be filed under Division 00, Section 900 Modifications. Then file alphabetically by Approved Contract Change Orders, Extra Work Orders, Proposals, and Requests and then within the folder place the latest item on top. The *Requests for information (RFI)* can also be filed under Division 00, Section 900 Modifications. Then file alphabetically by RFI and then within the folder place the latest number or date on top. Keep the A/E responses in the left side of the folder.

The *Formal Purchase Orders and Purchase Order Changes* can be filed under the Division and/or Section number that pertain to their portion of the work. Then file alphabetically by types of materials, then within the folder place the approved Purchase Change with the latest on top.

The *Subcontract Agreements and Subcontract Change Orders* can be filed under the Division and/or Section number that pertain to their portion of the work. Then file alphabetically within that Division/Section number. Then file Subcontract Agreement first and then within the folder place the approved Subcontract Change Orders with the latest on top. An alternative method is to have a separate folder for Subcontract Change Orders.

## Level 1 Construction Fundamentals Study Guide

The *Subcontract Extra Work requests* can be filed under the Division and/or Section number that pertain to their portion of the work. Then file alphabetically within that Division/Section number. Also, the Progress Payment quantities inside the folder should be filed with latest on top. The *Subcontractor Progress Payment Requests* can be filed under the Division and/or Section number that pertains to their portion of the work. Then file alphabetically within that Division/Section number. If you are collecting quantities for each subcontractor, then you might want to maintain a folder of quantities placed by month. Also, the Progress Payment quantities inside the folder should be filed with latest on top.

The *Shop Drawings, Product Data and Samples* can be filed under the Division and/or Section number that pertain to their portion of the work. Then file alphabetically within.

The *Owner Installation and Operating Manuals* can be filed under the Division and/or Section number that pertain to their portion of the work. Then file alphabetically within.

The Record (*As-Built*) Drawings must be maintained at the job site and marked currently to record field changes and selections made during construction. This record set is given to the owner upon completion. There should be only one master set where all changes are made.

The *Warranties* can be filed under the Division and/or Section number that pertains to their portion of the work. Then file alphabetically within that Division/Section number.

The *Certificate of Substantial Completion* can be filed under Division 01, Section 700 Contract Closeout. The *Certificate of Occupancy* can also be filed under Division 01, Section 700 Contract Closeout.

In Conclusion, assume you have received the following items for the Drywall: a Drywall Subcontract agreement, product data sheets, the Drywall Progress payment Requests, Change request, installation instructions, warranty, a record of the drywall quantities installed and the union Bargaining Agreement. The info is filed as follows: Division 09 Finishes and Section 250 Gypsum - Drywall and alphabetically as follows.

Agreement with Approved Sub Changes, Change Requests, Quantities Installed Drywall, Owner Installation Manuals and Owner Operating Manuals, Progress Payment Request, Product Data, Shop Drawings, and Warranties.

## Level 1 Construction Fundamentals Study Guide

### Job Site Records Filed According to the CSI Master Format

The CSI Master Format number system categorizes the Bidding Requirements and Forms, Contract Forms and Conditions of the Contract into Division 0 - Bidding Requirements. Second, the MasterFormat uses a series of numbers associated with the sixteen divisions which address detailed construction specifications associated with products and systems. Division 1 - General Requirements outlines the specific administrative and procedural requirements that apply to all of the Technical Specification sections. Division's 02 through 16 - Technical Specifications contain a written description of the specific requirements relating to a specific product or system. The Construction Specifications Institute (CSI) has developed the following Standard Master Format numbering system consisting of the following Divisions.

### **CSI MASTER FORMAT DIVISIONS**

DIVISION 00 - BIDDING REQUIREMENTS  
DIVISION 01 - GENERAL REQUIREMENTS  
DIVISION 02 - SITE WORK  
DIVISION 03 - CONCRETE  
DIVISION 04 - MASONRY  
DIVISION 05 - METALS  
DIVISION 06 - WOOD AND PLASTICS  
DIVISION 07 - THERMAL AND MOISTURE PROTECTION  
DIVISION 08 - DOORS AND WINDOWS  
DIVISION 09 - FINISHES  
DIVISION 10 - SPECIALTIES  
DIVISION 11 - EQUIPMENT  
DIVISION 12 - FURNISHINGS  
DIVISION 13 - SPECIAL CONSTRUCTION  
DIVISION 14 - CONVEYING SYSTEMS  
DIVISION 15 - MECHANICAL  
DIVISION 16 - ELECTRICAL

# Level 1 Construction Fundamentals Study Guide

## MASTER FORMAT- Divisions & Sections

00010 PRE-BID INFORMATION  
 00100 INSTRUCTIONS TO BIDDERS  
 00200 INFORMATION AVAILABLE TO BIDDERS  
 00300 BID FORMS  
 00400 SUPPLEMENTS TO BID FORMS  
 00500 AGREEMENT FORMS  
 00600 BONDS AND CERTIFICATES  
 00700 GENERAL CONDITIONS  
 00800 DRAWINGS AND SCHEDULES  
 00900 ADDENDA AND MODIFICATIONS

### DIVISION 0 1 - GENERAL REQUIREMENTS

01010 SUMMARY OF WORK  
 01020 ALLOWANCES  
 01025 MEASUREMENT AND PAYMENT  
 01030 ALTERNATES/ALTERNATIVES  
 01040 COORDINATION  
 01050 FIELD ENGINEERING  
 01060 REGULATORY REQUIREMENTS  
 01070 ABBREVIATIONS AND SYMBOLS  
 01080 IDENTIFICATION SYSTEMS  
 01090 REFERENCE STANDARDS  
 01100 SPECIAL PROJECT PROCEDURES  
 01200 PROJECT MEETINGS  
 01300 SUBMITTALS  
 01400 QUALITY CONTROL  
 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS  
 01600 MATERIALS AND EQUIPMENT  
 01700 CONTRACT CLOSEOUT  
 01800 MAINTENANCE

### TECHNICAL SPECIFICATIONS

#### DIVISION 2 - SITEWORK

02010 SUBSURFACE INVESTIGATION  
 02050 DEMOLITION  
 02100 SITE PREPARATION  
 02140 DEWATERING  
 02150 SHORING AND UNDERPINNING  
 02160 EXCAVATION AND SUPPORT SYSTEMS  
 02170 COFFERDAMS  
 02200 EARTHWORK  
 02300 TUNNELING  
 02350 PILES AND CAISSONS  
 02450 RAILROAD WORK  
 02480 MARINE WORK  
 02500 PAVING AND SURFACING  
 02600 PIPED UTILITY MATERIALS  
 02660 WATER DISTRIBUTION  
 02680 FUEL DISTRIBUTION  
 02700 SEWERAGE AND DRAINAGE  
 02760 RESTORATION AND UNDERGROUND PIPELINES  
 02770 PONDS AND RESERVOIRS  
 02780 POWER AND COMMUNICATIONS  
 02800 SITE IMPROVEMENTS  
 02900 LANDSCAPING

#### DIVISION 3 - CONCRETE

03100 CONCRETE FORMWORK  
 03200 CONCRETE REINFORCEMENT  
 03250 CONCRETE ACCESSORIES  
 03300 CAST-IN-PLACE CONCRETE  
 03370 CONCRETE CURING  
 03400 PRECAST CONCRETE  
 03500 CEMENTITIOUS DECKS  
 03600 GROUT  
 03700 CONCRETE RESTORATION AND CLEANING  
 03800 MASS CONCRETE

#### DIVISION 4 - MASONRY

04100 MORTAR  
 04150 MASONRY ACCESSORIES  
 04200 UNIT MASONRY

04400 STONE  
 04500 MASONRY RESTORATION AND CLEANING  
 04550 REFRACTORIES  
 04600 CORROSION RESISTANT MASONRY

#### DIVISION 5 - METALS

05010 METAL MATERIALS  
 05030 METAL FINISHES  
 05050 METAL FASTENING  
 05100 STRUCTURAL METAL FRAMING  
 05200 METAL JOISTS  
 05300 METAL DECKING  
 05400 COLD-FORMED METAL FRAMING  
 05500 METAL FABRICATIONS  
 05580 SHEET METAL FABRICATIONS  
 05700 ORNAMENTAL METAL  
 05800 EXPANSION CONTROL  
 05900 HYDRAULIC STRUCTURES

#### DIVISION 6 - WOOD AND PLASTICS

06050 FASTENERS AND ADHESIVES  
 06100 ROUGH CARPENTRY  
 06130 HEAVY TIMBER CONSTRUCTION  
 06150 WOOD-METAL SYSTEMS  
 06170 PREFABRICATED STRUCTURAL WOOD  
 06200 FINISH CARPENTRY  
 06300 WOOD TREATMENT  
 06400 ARCHITECTURAL WOODWORK  
 06500 PREFABRICATED STRUCTURAL PLASTICS  
 06600 PLASTICS FABRICATIONS

#### DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07100 WATERPROOFING  
 07150 DAMPROOFING  
 07190 VAPOR AND AIR RETARDERS  
 07200 INSULATION  
 07250 FIREPROOFING  
 07300 SHINGLES AND ROOFING TILES  
 07400 PREFORMED ROOFING AND CLADDING/ SIDING  
 07500 MEMBRANE ROOFING  
 07570 TRAFFIC TOPPING  
 07600 FLASHING AND SHEET METAL  
 07700 ROOF SPECIALTIES AND ACCESSORIES  
 07800 SKYLIGHTS  
 07900 JOINT SEALERS

#### DIVISION 8 - DOOR AND WINDOWS

08100 METAL DOORS AND FRAMES  
 08200 WOOD AND PLASTIC DOORS  
 08250 DOOR OPENING ASSEMBLIES  
 08300 SPECIAL DOORS  
 08400 ENTRANCES AND STOREFRONTS  
 08500 METAL WINDOWS  
 08600 WOOD AND PLASTIC WINDOWS  
 08650 SPECIAL WINDOWS  
 08700 HARDWARE  
 08800 GLAZING  
 08900 GLAZED CURTAIN WALLS

#### DIVISION 9 - FINISHES

09100 METAL SUPPORT SYSTEMS  
 09200 LATH AND PLASTER  
 09230 AGGREGATE COATINGS  
 09250 GYPSUM BOARD  
 09300 TILE  
 09400 TERRAZZO  
 09500 ACOUSTICAL TREATMENT  
 09540 SPECIAL SURFACES  
 09550 WOOD FLOORING  
 09600 STONE FLOORING  
 09630 UNIT MASONRY FLOORING  
 09650 RESILIENT FLOORING  
 09680 CARPET  
 09700 SPECIAL FLOORING  
 09780 FLOOR TREATMENT  
 09800 SPECIAL COATINGS  
 09900 PAINTING  
 09950 WALL COVERING

# Level 1 Construction Fundamentals Study Guide

## MASTER FORMAT- CONTINUED

### TECHNICAL SPECIFICATIONS

#### DIVISION 10 - SPECIALTIES

10100 CHALKBOARDS AND TACKBOARDS  
10150 COMPARTMENTS AND CUBICLES  
10200 LOUVERS AND VENTS  
10240 GRILLES AND SCREENS  
10250 SERVICE WALL SYSTEMS  
10260 WALL AND CORNER GUARDS  
10270 ACCESS FLOORING  
10280 SPECIALTY MODULES  
10290 PEST CONTROL  
10300 FIREPLACES AND STOVES  
10340 PREFABRICATED EXTERIOR SPECIALTIES  
10350 FLAGPOLES  
10400 IDENTIFYING DEVICES  
10450 PEDESTRIAN CONTROL DEVICES  
10500 LOCKERS  
10520 FIRE PROTECTION SPECIALTIES  
10530 PROTECTIVE COVERS  
10550 POSTAL SPECIALTIES  
10690 PARTITIONS  
10650 OPERABLE PARTITIONS  
10670 STORAGE SHELVING  
10700 EXTERIOR SUN CONTROL DEVICES  
10750 TELEPHONE SPECIALTIES  
10800 TOILET AND BATH ACCESSORIES  
10880 SCALES  
10900 WARDROBE AND CLOSET SPECIALTIES

#### DIVISION 11 - EQUIPMENT

11010 MAINTENANCE EQUIPMENT  
11020 SECURITY AND VAULT EQUIPMENT  
11030 TELLER AND SERVICE EQUIPMENT  
11040 ECCLESIASTICAL EQUIPMENT  
11050 LIBRARY EQUIPMENT  
11060 THEATER AND STAGE EQUIPMENT  
11070 INSTRUMENTAL EQUIPMENT  
11080 REGISTRATION EQUIPMENT  
11090 CHECKROOM EQUIPMENT  
11100 MERCANTILE EQUIPMENT  
11110 COMMERCIAL LAUNDRY AND DRY CLEANING EQUIPMENT  
11120 VENDING EQUIPMENT  
11130 AUDIO-VISUAL EQUIPMENT  
11140 SERVICE STATION EQUIPMENT  
11150 PARKING CONTROL EQUIPMENT  
11160 LOADING DOCK EQUIPMENT  
11170 SOLID WASTE HANDLING EQUIPMENT  
11190 DETENTION EQUIPMENT  
11200 WATER SUPPLY AND TREATMENT EQUIPMENT  
11280 HYDRAULIC GATES AND VALVES  
11300 FLUID WASTE TREATMENT AND DISPOSAL EQUIPMENT  
11400 FOOD SERVICE EQUIPMENT  
11450 RESIDENTIAL EQUIPMENT  
11460 UNIT KITCHENS  
11470 DARKROOM EQUIPMENT  
11480 ATHLETIC, RECREATIONAL AND THERAPEUTIC EQUIPMENT  
11500 INDUSTRIAL AND PROCESS EQUIPMENT  
11600 LABORATORY EQUIPMENT  
11650 PLANETARIUM EQUIPMENT  
11660 OBSERVATORY EQUIPMENT  
11700 MEDICAL EQUIPMENT  
11780 MORTUARY EQUIPMENT  
11850 NAVIGATION EQUIPMENT

#### DIVISION 12 - FURNISHINGS

12050 FABRICS  
12100 ARTWORK  
12300 MANUFACTURED CASEWORK  
12500 WINDOW TREATMENT  
12600 FURNITURE AND ACCESSORIES  
12670 RUGS AND MATS  
12700 MULTIPLE SEATING  
12800 INTERIOR PLANTS AND PLANTERS

#### DIVISION 13 - SPECIAL CONSTRUCTION

13010 AIR SUPPORTED STRUCTURES  
13020 INTEGRATED ASSEMBLIES  
13030 SPECIAL PURPOSE ROOMS  
13080 SOUND, VIBRATION, AND SEISMIC CONTROL  
13090 RADIATION PROTECTION  
13100 NUCLEAR REACTORS  
13120 PRE-ENGINEERED STRUCTURES  
13150 POOLS  
13160 ICE RINKS  
13170 KENNELS AND ANIMAL SHELTERS  
13180 SITE CONSTRUCTED INCINERATORS  
13200 LIQUID AND GAS STORAGE TANKS  
13220 FILTER UNDERDRAINS AND MEDIA  
13230 DIGESTION TANK COVERS AND APPURTENANCES  
13240 OXYGENATION SYSTEMS  
13260 SLUDGE CONDITIONING SYSTEMS  
13300 UTILITY CONTROL SYSTEMS  
13400 INDUSTRIAL AND PROCESS CONTROL SYSTEMS  
13500 RECORDING INSTRUMENTATION  
13550 TRANSPORTATION CONTROL INSTRUMENTATION  
13600 SOLAR ENERGY SYSTEMS  
13700 WIND ENERGY SYSTEMS  
13800 BUILDING AUTOMATION SYSTEMS  
13900 FIRE SUPPRESSION AND SUPERVISORY SYSTEMS

#### DIVISION 14 - CONVEYING SYSTEMS

14100 DUMBWAITERS  
14200 ELEVATORS  
14300 MOVING STAIRS AND WALKS  
14400 LIFTS  
14500 MATERIAL HANDLING SYSTEMS  
14600 HOISTS AND CRANES  
14700 TURNTABLES  
14800 SCAFFOLDING  
14900 TRANSPORTATION SYSTEMS

#### DIVISION 15 - MECHANICAL

15050 BASIC MECHANICAL MATERIALS AND METHODS  
15250 MECHANICAL INSULATION  
15300 FIRE PROTECTION  
15400 PLUMBING  
15500 HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)  
15550 HEAT GENERATION  
15650 REFRIGERATION  
15750 HEAT TRANSFER  
15850 AIR HANDLING  
15880 AIR DISTRIBUTION  
15950 CONTROLS  
15990 TESTING, ADJUSTING, AND BALANCING

#### DIVISION 16 - ELECTRICAL

16050 BASIC ELECTRICAL MATERIALS AND METHODS  
16200 POWER GENERATION  
16300 HIGH VOLTAGE DISTRIBUTION (ABOVE 600-VOLT)  
16400 SERVICE AND DISTRIBUTION (600-VOLT AND BELOW)  
16500 LIGHTING  
16600 SPECIAL SYSTEMS  
16700 COMMUNICATIONS  
16850 ELECTRIC RESISTANCE HEATING  
16900 CONTROLS  
16950 TESTING

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Exercise

1. What are the GENERAL RULES the courts require for considering the JOB DIARY to be considered Admissible evidence in a court of law?
  - A. Place in a three-ring Binder, Completed closest to the event as possible by the home office, Place entries only when problems arise and Signed/Dated each day.
  - B. Place in a Bound book, Pages Numbered randomly, Completed closest to the event as possible by the secretary, Erase entries that are wrong and make change.
  - C. Place in a Bound book, Pages Numbered consecutively, Completed closest to the event as possible by Person with direct knowledge, and Signed/Dated each day.
  - D. Place in a three-ring Binder, Pages Numbered consecutively, Completed closest to the event as possible by Person with direct knowledge Signed/Dated each day.
  
2. Which of the following statements would be considered admissible evidence?
  - A. At 7:30 AM, Ed was drunk. He was coming from the bar.
  - B. At 7:30 AM, Ed's breath smelled of alcohol and his clothes of marijuana.
  - C. At 8:00 AM, Ed was carrying a bag of crack cocaine and he was swaying.
  - D. At 8:00 AM, Ed was staggering and he arrived at the job site drunk again.
  
3. Which of the following descriptions provides the BEST example of how to report progress on the job site?
  - A. Poured Concrete for the Columns
  - B. Installed Rebar and Poured Concrete
  - C. Poured 75 CY Concrete Placed Rebar, Stripped Forms for Columns D1 -D4.
  - D. Poured 75 CY Concrete, Placed Rebar and Stripped Forms for the Building.
  
4. Which of the following items must be on an equipment time card for it to be admissible evidence in a court of law?
  - A. Fuel Consumption and quantity moved.
  - B. Estimated durations, weight of the materials and Idle Time.
  - C. Total hours worked for each employee by day and their total hours for the week.
  - D. Hours distributed by Work activities performed and Idle time and Extra Work.

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Exercise

5. Which of the following Categories are contained in the Daily Construction Report?
- A. Weather Conditions, Construction Activities Completed and Conversations.
  - B. Weather Conditions, Construction Activities Completed, Technical and Safety Problems/Solutions, Equipment on Site, Meetings at Site, and Visitors at Job Site.
  - C. Weather Conditions, Construction Activities Completed, Equipment on Site, Meetings at Job Site, Workers Present, Visitors at Job Site, and Materials Placed.
  - D. Weather Conditions, Construction Activities Completed, Technical and Safety Problems/Solutions, Equipment on Site, Meetings at Job Site, Conversations, Workers Present, Visitors at Job Site & Materials Placed.
6. Which of the following Categories are contained in the Daily Job Diary?
- A. Weather Conditions, Construction Activities Completed and Conversations.
  - B. Weather Conditions, Meeting Agendas/Minutes and Time on activities.
  - C. Weather Conditions, Time on activities and Extra Work Orders.
  - D. Weather Conditions, Technical and Safety Problems/Solutions and Conversations.
7. How often should you distribute time to construction activities on the time cards to ensure admissible evidence in court?
- A. Daily.
  - B. Hourly.
  - C. Weekly.
  - D. Twice per day.
8. How should conversations with solutions be recorded to ensure admissible evidence in court?
- A. Daily.
  - B. Weekly.
  - C. Hour and minutes of the event.
  - D. Only when a controversial event occurs.
9. How often should you record the weather conditions to ensure proper evidence?
- A. Daily
  - B. Hourly
  - C. Weekly
  - D. Twice per day

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Exercise

10. Which of the following reports would be considered admissible evidence in a court of law?
- A. National Weather Station Report.
  - B. Local Radio Station Weather Report.
  - C. Contractor's Job Site Weather Report.
  - D. Contractor's Home Office Weather Report.
11. Which of the following construction activities can be impacted by the wind?
- A. Drywall installation.
  - B. Masonry wall placement.
  - C. Quarry tile installation.
  - D. Interior plumbing installation.
12. Which of the following construction activities can be impacted by the humidity?
- A. Drywall installation.
  - B. Masonry wall placement.
  - C. Quarry tile installation.
  - D. Interior plumbing installation.
13. Which of the following items must be on a Time Card for it to be admissible evidence in a court of law?
- A. Total hours worked for each employee for each day.
  - B. Hours worked for each employee by work activity description or EWO each day.
  - C. Hours worked for each employee by cost code and completed at end of each week.
  - D. Total hours worked for each employee for the week and completed at end of week
14. Which of the following items is contained in the Job Diary?
- A. Your observations and solutions.
  - B. Your opinion about people and events.
  - C. Conversations concerning coordination, technical problems and solutions.
  - D. A record of workers present, construction activities, and materials placed.

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Exercise

15. Which of the following diary entries is considered admissible evidence in a court of law?
- A. Make entries when you foresee a potential problem.
  - B. Have your Assistant in the office record your site observations.
  - C. Record the time and date of the conversation and make entries every day.
  - D. Make entries concerning your opinion as certain problems arise at the site.
16. Which of the following documents has the primary purpose of recording progress at the job site?
- A. Job Diary.
  - B. Memorandum.
  - C. Construction Report.
  - D. Formal Business Letter.
17. Which document specifies the conditions for requesting a weather time extension?
- A. General Conditions
  - B. General Requirements
  - C. Instructions to Bidders
  - D. Supplementary Conditions

Questions 18 and 19 refer to the following information.

You are required to file the safety agenda for April 15 and Safety minutes for April 8 and the Planning Agenda for April 17 and Planning minutes for April 10.

18. What Division and Section number is these agendas and minutes filed under?
- A. 00700
  - B. 01010
  - C. 01040
  - D. 01200
19. Within the Division and Section number how are the Safety Agenda, the Safety minutes, the Planning Agenda and the Planning minutes filed?
- A. In Alphabetical order with a Planning folder and Safety folder.
  - B. The Safety agenda and minutes under 01060 and the planning under 01100.
  - C. By Topic with the Safety agenda and minutes, then Planning agenda and minutes.
  - D. By date with Safety minutes, and Planning minutes, Safety, and Planning agenda.

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Exercise

20. Within a folder, How are the agendas and minutes filed?

- A. Latest on the Top, Agenda left side, Minutes Right Side.
- B. Latest on the bottom, Agenda left side, Minutes on Right Side.
- C. Latest on the Bottom, a folder for the Agenda and a folder for the minutes.
- D. Latest on the Top, a Safety & Planning agendas folder and a Minutes folder.

You are required to files these documents. Purchaser Order - Heat Exchanger dated 8/3, Shop Drawing - Heat Exchanger dated 8/5, Warranty - Heat Exchanger dated 8/6, Operating Manual - Heat Exchanger dated 9/2 and a Subcontract Agreement dated 8/1 for installation of the Heat Exchanger. Answer questions.

21. What Division & Section number is these heat exchanger documents filed under?

- A. 00800
- B. 01025
- C. 01300
- D. 15750

22. Using the Heat Exchanger documents provided above and a Division & Section number. State the order you would place these within a Division and Section Number?

- A. One folder with the latest date on top as Operate, Warranty, Shop, P.O., and Sub
- B. Separate folder for each item in this order Operate, P.O., Shop, Sub, & Warranty
- C. Separate folder for each item with latest date on top as Op, Wa, Sh, PO and Sub
- D. One folder with each item placed in alphabetical order as Op, PO, Sh, Sub, & Wa

23. You receive a Purchase Order Change for the Heat Exchanger. How should this be filed?

- A. Under 00900 label folder Purchase Order Changes - Heat Exchanger.
- B. Under 01010 label folder Purchase Order Changes - Heat Exchanger.
- C. Under 01030 label Folder Purchase Order Changes - Heat Exchanger.
- D. Under CSI number for Heat Exchanger in folder labeled P.O. on top of original

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Exercise

24. You are required to file these documents. Job Diary, Construction Report, Time cards, Equipment Status Report, Material Delivery Status Report, Visitors Log, and Look Ahead Planning forms. What Division & Section number are all of these documents filed under?
- A. 00900
  - B. 01040
  - C. 01090
  - D. 01900
25. You are required to file the Contractor's Progress Payment requests. What Division & Section number is this document filed under?
- A. 00500
  - B. 01020
  - C. 01025
  - D. 01300
26. You are required to file the submittal log. What Division & Section number is this document filed under?
- A. 00600
  - B. 00800
  - C. 01040
  - D. 01300
27. You are filing the Collective Bargaining Agreements for the Millwrights, Boilermakers, Pipefitters, Carpenters and Operators. How should these documents be filed?
- A. 00500 and each item in one folder and alphabetical order.
  - B. 01040 and each item in separate folder and alphabetical order.
  - C. 01060 and each item in separate folder and alphabetical order.
  - D. 01100 and each item in separate folder and alphabetical order.
28. You are required to file the Prevailing Wage Rate Tables and Minority Contractors Affidavits for the project, How should these documents be filed?
- A. 01060 and one folder in alphabetical order.
  - B. 01060 and each item in separate folder and alphabetical order.
  - C. 01100 and one folder in alphabetical order.
  - D. 01100 and each item in separate folder and alphabetical order.

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Instructions for Project Documentation Situations

All of these case incidents utilize this general information concerning the Taggart Building project and the construction company. This is Project Number: 234

<b>Client:</b> Offices International	<b>Architect:</b> Pro Design	<b>Constructor:</b> Ruse Const.
Contact: Keith Corbeil	Mary Bockstahler	Ernest Meyer
676 Bell Street	775 Riverfront ST.	345 Michigan Avenue
Big Rapids, MI 49307	Cadillac, MI 49601	Mount Pleasant, MI 48858

The superintendent at the job site is Rick Fornsorg. The phone number at the Taggart job site is (517) 555-1213. The job site is located seventy-five miles from the home office.

**ORGANIZATION** - Four employees report directly to Ruse: Jeff Skala, Comptroller; Ernest Meyer, V.P., Sales/Estimating; Carol Pery, Office manager; and John Fryberger, General Superintendent.

**OFFICERS** - Bruce Ruse, President; Jeff Skala, Comptroller and Treasurer; Ernest Meyer, Vice President; Carol Percy, Office Manager and Secretary.

**BOARD OF DIRECTORS** - Bruce Ruse, Chairperson; Jeff Skala; Ernest Meyer; John Fryberger, Harley Wallace, Attorney; and Claude Cook, President of Commercial Bank.

**PROPERTY** - The company owns an office building located outside Manton, Michigan. Ruse Construction also owns a yard where all company equipment is stored. The yard is located across the street from the office. Finally, the company owns or leases considerable equipment including four office trailers for use by its field employees.

**INSTRUCTIONS:** The Crew Size Discrepancy Case and the Gimpy Case incidents occurred on the same day at the job site. Complete the requested documentation for each incident.

## Level 1 Construction Fundamentals Study Guide

### Project Documentation Instructions for the Crew Size Discrepancy Case

First Case: Crew Size Discrepancy  
Case Participants: Rick Fornsorg, Job Superintendent  
Jim Agee, Plumbing Subcontractor Foreman  
Your Position: Job Superintendent - Rick Fornsorg

It's Wednesday, August 13 at 7:00 A.M. and you (Rick Fornsorg) have arrived. On the drive into work the current weather was 57 degrees and foggy. The forecast for the afternoon is for 87 degrees, humid and sunny and you are wondering how today's progress will turn out. At 7:30 A.M., the plumbing subcontractor foreman, Jim Agee, arrives on the job site three days after you had requested they start the mechanical rough-in. Furthermore, you noticed that the total crew consists of three plumbers and you scheduled the plumbers work based on a crew of eight and an output per day rate of 280 feet. Therefore, you ask, "Jim, how many plumbers will be on the job?" and he replies, "Just the three of us." Hence, you ask Jim how many days will it take your crew to complete the entire rough-in including an inspection and Jim replies, "three days." You reply, "Thank You," and then you instruct the plumbing crew leader where to start and you indicate the location of the materials.

At 7:30 A.M., these workers arrive at the job site. Roy Stokes, a laborer, Jon Adams, a Carpenter Apprentice, Stan Jackson, a Carpenter, and Mike Wards, the Carpenter Crew Leader, Hal Linsey, Rod Buster Apprentice, Ken Peters, Rod Buster, Paul Boon, Rod Buster Crew Leader, Shari Wes, a rigger, Lisa Wolverton, an Operator, Laura Stein, a rigger, and Janie Alton, the Rigger Crew Leader on the job site today. Dave Vaun, a rodbuster, and Ed Crace, a rigger are absent today. You've placed the interior wall forms on the north side (100 feet) and on the east side (75 feet) each wall is 18 feet high, the rebar is a #5 in the north wall at 9 inches on center horizontal, and 12-inches vertical. The riggers have been lifting the forms and rebar to the crews. You have received concrete tickets for six, 10CY pours, and you are missing three tickets for today's pours for the South and West Foundation Walls. In addition to the 50-ton crane, you have a welder and cutting torches. The Project Manager conducted the monthly planning meeting from 7 - 8 AM. with the Architect in attendance. An OSHA safety inspector unexpectedly stopped because of a routine inspection and the County inspector was there to see the concrete pours and LA Testing company was taking samples for the pours. Finally, at just about quitting time the Owner stopped by. You also, have 3 Bill of Ladings from the trucking company for 17 tons of rebar, 3 bundles of electrical conduit, 100 feet per bundle, and 14 Roof Vents.

1. The subcontractors were selected and the subcontract agreements were written by Ernest Meyer. This has been the policy since the company was formed.
2. The estimate called for 840 total feet to be installed.

## Level 1 Construction Fundamentals Study Guide

### Daily Construction Report Exercise for the Crew Size Discrepancy Case

**Correspondence Instructions:** Given the Crew Size Discrepancy Case information provided, complete the Daily Construction Report provided below.

PROJECT		REPORT NO.						
JOB NO.:		DATE						
CLIENT:		DAY	M	T	W	Th	F	S
CONTRACTOR		DEGREES	_____ AM		_____ PM			
SUPERINTENDENT		WEATHER AM/PM	SUNNY	CLOUDY	OVERCAST	RAIN/FOG		
SAFETY ENGINEER		WIND SPEED AM/PM	STILL	MODERATE		HIGH		
INSPECTOR		HUMIDITY AM/PM	DRY	MODERATE		HUMID		
	<b>CONTRACTORS WORKERS</b>				<b>SUBCONTRACTORS WORKERS</b>			
CRAFT	CREW LEADER	APPREN	JOURNEY	TOTAL	CREW LEADER	APPREN	JOURNEY	TOTAL
Boilermakers								
Carpenters								
Electricians								
Finishers								
Instrument Fitters								
Insulators								
Iron Workers								
Laborers								
Masons								
Operators								
Pipe Fitters								
Plumbers								
Riggers								
Rod Busters								
Sheet Metal								
Sprinkler Fitters								
<b>TOTALS</b>								

Level 1 Construction Fundamentals Study Guide

Daily Construction Report Exercise for the Crew Size Discrepancy Case

CONSTRUCTION ACTIVITIES: \_\_\_\_\_

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MATERIALS USED: \_\_\_\_\_

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MATERIALS RECEIVED: \_\_\_\_\_

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CONSTRUCTION EQUIPMENT AT THE SITE: \_\_\_\_\_

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VISITORS TO THE SITE: \_\_\_\_\_

---

MEETINGS THAT TOOK PLACE: \_\_\_\_\_

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## Level 1 Construction Fundamentals Study Guide

### Project Documentation Instructions for the Gimpy Case

Second Case: Gimpy

Participants: Roy Stokes, Laborer (Gimpy)  
Stan Jackson, Carpenter  
Mike Wards, Carpenter Foreman

Your Position: Job Superintendent - Rick Fornsorg

#### Incident:

It's Wednesday at 10:45 A.M. and everything had been going great until you heard the clatter of shattering glass. You ran to the door to see what had happened. Roy saw you just as you spotted him, and he slowly dropped his raised arm. But he knew you had seen him, and he knew too that you hadn't missed noticing that the front window on the truck was smashed. You didn't even have to tell him to come to the trailer, but as he entered the door his first words were, "It's all Stan Jackson's fault." So you went back to the door and called Stan to come into the trailer.

Almost as soon as Jackson joined you and Roy Stokes, Roy launched into his tale of woe. "I just can't take it anymore, Rick. Sure, I threw the rock at Jackson, but a man can just take so much. Everybody's got a breaking point. He won't leave me alone. Gimpy this, Gimpy that. Gotcha, Gimpy. Hey, Gimpy the eighth dwarf, where's Snow White? I mean, he just doesn't let up."

Before you could get a work out, Stan piped up with his side, "Hey, can't a guy kid a pal? He takes everything so seriously. He can't even take a joke. He's getting dangerous! Hell, if I got mad at everybody that kidded me, I'd . . . "

#### Additional Information:

1. Roy Stokes hurt his leg in an auto accident about two years ago and ever since has had a noticeable limp.
2. The above incident represents the first time company equipment has been broken as a result of a fight.
3. Neither Stokes nor Jackson has been involved in any fights on the job before.
4. The company has a written policy which says that employees who engage in fighting are subject to dismissal.

## Level 1 Construction Fundamentals Study Guide

### Daily Job Diary Exercise for the Gimpy Case

Correspondence: Given the Gimpy Case information provided, complete the Job Diary provided below. Briefly describe this incident in the daily log and indicate the decision(s) and the action that you have taken.

CASE NAME     Gimpy    

#### DAILY JOB DIARY

PROJECT NAME: _____				PROJECT NUMBER: _____			
DATE: _____				PAGE NUMBER _____			
M	T	W	Th	F	S	Su	

WEATHER: 

BRIGHT SUN	CLEAR	OVERCAST	FOG	RAIN	P.CLOUDY
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TEMPERATURE: 

AM	PM	COMMENTS
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WIND: 

STILL	MODERATE	HIGH
-------	----------	------

HUMIDITY: 

DRY	MODERATE	HUMID
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TIME: Describe the Conversation & State the Time and Your Solution


SIGNATURE \_\_\_\_\_ Date \_\_\_\_\_  
 Title: \_\_\_\_\_