MANAGEMENT CONCEPTS

Legal Entities

The major Legal Entities in the Construction Industry are the sole proprietorship, the partnership and the corporation. The *sole proprietorship* is a business owned by one person. The advantages of a sole proprietorship are the individual owns, operates, makes all decisions and they have personal control of the business. This is the simplest form of ownership because no legal documents are needed. One of the disadvantages is that the owner has unlimited liability for all loss which extends to their personal assets. Another disadvantage is you are taxed on the full earnings of the business whether or not they are withdrawn. A third disadvantage is the company ceases to exist when the owner dies or is injured and cannot conduct business. Finally, because only one person has all of the personal assets it is extremely difficult to generate new capital to expand the business.

A *partnership* is a business which consists of two or more persons pooling their assets such as cash, property, equipment and talent for a common goal. Each general partner has a voice in the daily management of the company. All of the partnerships assets are considered personal assets, but they are the sums of all partners, therefore, the credit line is greater than a sole proprietorship. Company profits or losses are normally allocated to each partner in the same proportion as the distribution of ownership. For tax purposes the partnership is not considered a legal entity, therefore, the partnership does not pay income taxes. But they must file an informational tax return and the individual partners must pay income taxes on their portion of the profits or losses. The primary disadvantage is unlimited liability and each partner is held individually responsibility for all contracts, debts and torts of the business and its employees. This means one partner can be personally liable for all debts incurred by the partnership if the other partner cannot pay. Then one partner is required to use their personal assets to satisfy all of the businesses' obligations. A *joint venture* is a form of partnership. It is an agreement between two or more construction companies to combine their resources to build a specific project. Legally there is little if any difference between a partnership and a joint venture. The joint venture is formed for a specific project and for a limited amount of time.

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

Management Systems

Partnering is normally initiated by the Owner during the conceptual phase of a project. The primary goal of partnering is to get commitment from the top management of all project participants and stakeholders to develop open communications and cooperation instead of the traditional adversarial relationships. Some of the typical project participants and stakeholders are the A/E firm, the Contractor, the Subcontractors, the major Vendors, and possibly the Public. Normally partnering involves a meeting with all stakeholders and a third-party facilitator who helps the parties discuss and agree to mutual goals and develop a charter for the project.

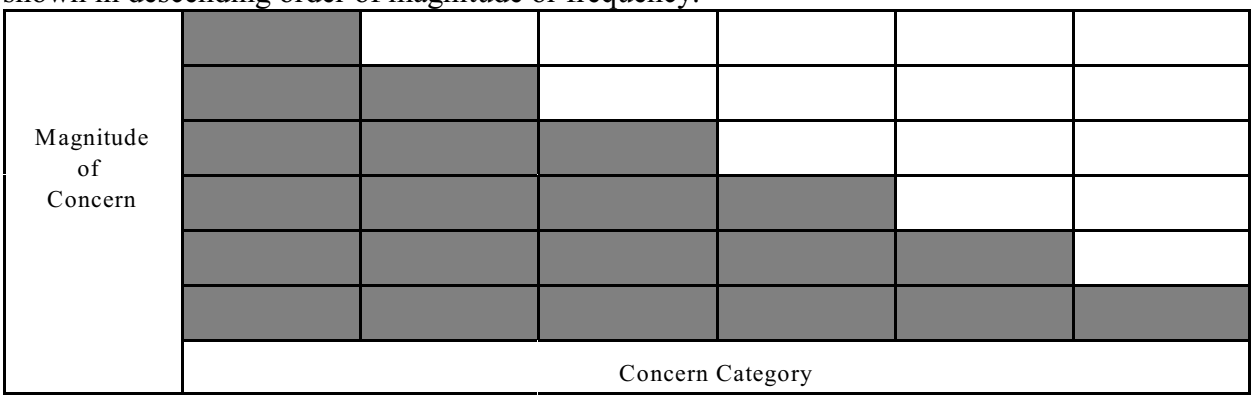
Total Quality Management (TQM) is a philosophy which was developed by Dr. W. Edwards Deming. TQM focuses on customer focus, customer satisfaction, continuous improvement, and total involvement. According to David Goetsch (2003) in his book, *Construction Safety and Health* he defines the concept of TQM as "an approach to doing business that maximizes the competitiveness of an organization through continuous improvement of its products, services, people, processes, and environments (p 449). He insists that there are ten characteristics that "describe how TQM achieves its purpose' (p 449). They are Customer Focus, Obsession with quality, a Scientific approach, Long term commitment, Teamwork, Continual process improvements, Education and Training, Freedom through control, Unity of purpose and Empowerment (p 450). The foundation of total quality is continuous improvement. Some methods to measure improvement are through participation with the International Organization of Standardization referred to in the U.S. as the International Standards Organization (ISO) 9000 series. These standards represent an international movement to establish world wide quality standards for manufactured products and services. Another guide utilized to improve an organization and evaluate their progress toward becoming the best in their field is the Malcolm Baldrige National Quality Award. The Baldrige Award consists of 18 criteria items and it describes the characteristics of excellence for each item.

Total Safety Management (TSM) was introduced to the safety profession by David Goetsch (1997) in his book, *Implementing Total Safety Management*. Goetsch insists that "TQM has proven itself to be an effective way to maximize an organization's long-term competitiveness" . . . by eliminating the problem of isolation and "making quality everybody's job and casting the quality manager in the role of facilitator and catalyst" (p 450). He suggests that the principles of TQM can solve the safety isolation problem by making "making safety everybody's job and casting the safety manager in the role of facilitator and catalyst." Therefore, Total Safety Management follows the same principles as TQM. David Goetsch (2003) defines TSM as

> "A performance and process-oriented approach to safety and health management that gives organizations a sustainable competitive advantage in the marketplace by establishing a safe and healthy work environment that is conducive to consistent peak performance and that is improved continually. It involves applying the principles of TQM to the management of safety and health" (p 452).

Statistical Process Control (SPC) the Tools of Quality

There are numerous graphical tools used by teams to assist them in studying processes. Below is a brief overview of these measurement tools. *Pareto Chart* is a bar graph of identified causes shown in descending order of magnitude or frequency.



A second graphical tool is the *Fishbone Chart* . This chart displays the causes and effects on a diagram for analyzing problems and the factors that contribute to them. The example below shows the categories of potential problems or Causes and the Effect

Environment Factor
Weather
→
Technology Factor
No Ergonomics

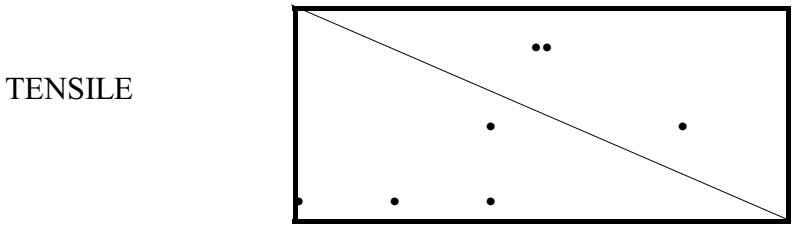
Methods
No Training
→
Materials
Bags

Workers
No Exercise
→
Machinery Factor
Throwing

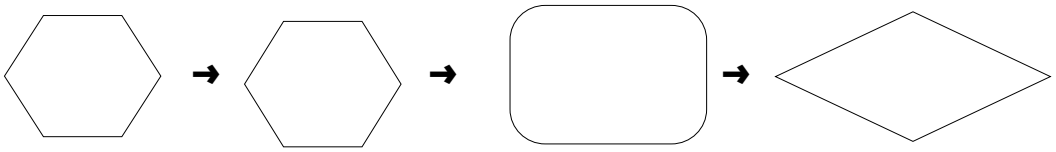
Effect
Soft Tissue Injuries

A third graphical tool used is the *Histogram*. The Histogram is a bar graph displaying a frequency distribution. The histogram below displays the frequency of responses for an item.

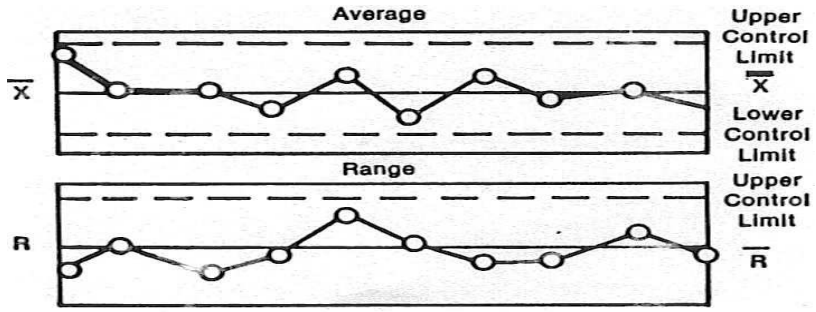
A fourth graphical tool is the *Scatter Diagram*. This is a graph displaying the correlation of two characteristics. For example, the scatter diagram below is used to compare the tensile strength of a wire versus its diameter.



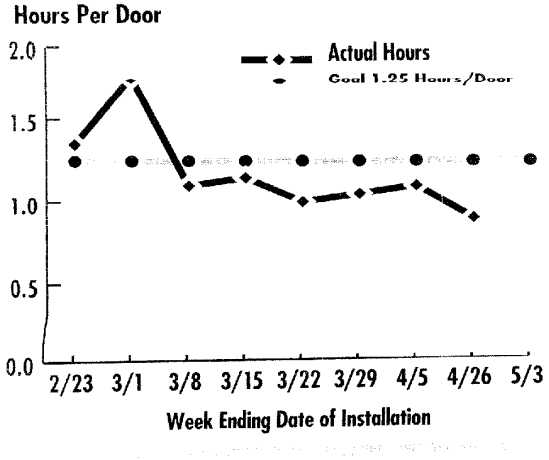
A fifth graphical tool is the *flowchart*. This is a pictorial representation of a process.



A sixth graphical tool is the *Control Chart*. Control Charts are line graphs that plot individual events over a period of time. It is a method of monitoring the output of a process or system through the sample measurement of a selected characteristics and the analysis of its performance over time. The control chart below is a chart that plots the percentage of aggregate passing the 3/8" sieve in a gradation test. Each point is the average of two samples. The first thirty points are used to calculate upper and lower control limits and an overall average. The overall average, 41.89%, is plotted as a solid line labeled x. The control limits are plotted as horizontal dashed lines. There are formulas that are used to calculate these control limits. The five points above the upper control limit indicate a problem area, and the cause should be investigated. control charts are used to show trends, variation about an average, and whether a process has too much variation.



The seventh graphical display tool is the *Run Chart*. Run charts are line graphs that show a trend over time. They are similar to control charts, except that control limits are not shown, and the average is not necessarily shown. The example below shows the reduction in time required to install hardware and hang doors in an office building. The results were achieved as a result of a study of the process. A contractor can do the same thing for virtually any process. Simply plot the workhours per unit over a period of time. It can be workhours or equipment hours per cubic yard of excavation, a cubic yard of concrete, a square yard of asphalt, a square foot of drywall, etc. The value of the run chart is that it shows positive and negative trends, and provides a better visualization of the level of process performance.



Project Delivery Methods

Owners have a variety of project delivery systems to choose from in the construction industry. The delivery method refers to the Owner's approach to developing the project team throughout the entire design, procurement, construction and commissioning process. The three most common project delivery methods are the tradition form, the design-build form and the Construction Management approach. These project delivery methods and their variations are discussed below.

The most common traditional project delivery method is the *Fixed Price* or commonly referred to as the Lump Sum Contract. The Fixed Firm Price contract is primarily used for projects that are completely designed and the scope is clearly defined. A fixed price contract is a guarantee by the contractor to perform the work and provide the necessary labor, material and equipment in a timely manner, no matter what the actual costs incurred. All financial risks are borne entirely by the Contractor in a Lump Sum contract. The Owner agrees to pay the Contractor, normally on a monthly basis, payments based upon progress.

A second traditional project delivery method is the *Unit Price Contract*. The Unit Price contract provides the Contractor with a list of items and the estimated quantities to be installed. The Contractor guarantees to perform an estimated quantity of work at a specified unit price. Conversely, the Owner agrees to pay the Contractor the agreed upon unit price for the actual quantity of work installed at the job site. Hence, the total contract amount will vary depending on the actual quantities installed. However, the unit price for each particular item listed will not change throughout the contract, unless there is a major variation in a particular line item. Normally, the Unit Price contract contains a quantity adjustment clause for these major variances which states that "if the Quantities of an item of work installed varies from the estimated quantities by more than 20 percent, then the price will be adjusted." A unit price contract is primarily utilized on civil projects such as roads, bridges and massive excavation projects.

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

A fourth traditional project delivery method is the *Turn Key Contract*. The Turn key contract is used mostly by developers. The Contractor/Developer agrees to design the project or build the project according to your design. They will also purchase the property and finance the project. The Owner agrees to make monthly payments on a long term lease.

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

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

Finally, on long term construction projects prices can fluctuate substantially from the time for submitting the bid until the time for delivery and installation because of the risk of inflation. Therefore, if the Contractor is forced to provide a fixed price they will often include in their bid price a contingency for anticipated cost increases. These anticipated cost increases may or may not actually materialize. Therefore, for the Owner to avoid paying for something not received, the Owner should use an *escalation* clause. The escalation clause is used for price changes in labor rates and material prices only from regularly published indexes.

Contract Formation Principles
The contract formation principles outlined below are required to form an enforceable contract or subcontract. They are:

1. *Meeting of the Minds*. This is the signed Agreement between the parties. The 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. The Agreement is Signed (executed) by both parties after the receipt of the Notice of Award. The agreement provides for the signing, or "execution of the contract." In construction, the Subcontract Agreements are written and signed by both parties after the signing of the Owner - Contractor Agreement. The major elements needed to form a valid contract are:

    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 contractor receives a Notice to Proceed which indicates that the site is free of any encumbrances, and that 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 allows the Contractor to perform certain functions for the project.

2. *Consideration is received*. In the prime contract, this is something that the contractor must lose of value. This is normally submitted with the offer such as a Bid Bond or certified check for a certain percentage of the total contract price. If the contractor decides not to sign the agreement then they will forfeit the value of their security to the owner. Consideration under the General-Subcontractor contract formation process must rely on the equitable doctrine of "promissory estoppel." 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. To ensure that this promise isn't indefinite or unreasonable, the subcontractor provides a time limit for acceptance of their bid.

3. The Contract must be for a *Legal Purpose*.

4. The parties have the *legal capacity* to enter into a Contract. This means they must have the legal authority to sign the proposal being submitted. Under most types of ownership, the sole proprietor, the legal partners or the corporate officers have the legal authority. This becomes a problem when the estimator signs the proposal and is not recognized as a legal authority for the company.

Management, Legal Entities & Delivery Methods Exercise

1. The Owner wants to Fast-Track a construction project, Which type of contract best supports this process?

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

2. A clause in the contract states that "if the Quantities of an item of work varies from the estimated quantities by more than 20 percent, then the price will be adjusted." Which type of contract will this clause be primarily used in?

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

3. A contract has been entered into whereby the Contractor agrees to design, build, purchase the land and finance the project. What is this type of contract called?

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

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

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

Management, Legal Entities & Delivery Methods Exercise

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

- A. Cost Plus.
- B. Turn Key.
- C. Unit Price.
- D. Fixed Price.

6. A contract is entered into whereby the Design and Scope are partially undefined, the Owner holds a contract with the A/E, the Owner holds the contracts with each trade and the Owner also holds a contract with a management service company to perform the trade coordination, cost control and scheduling services. What is this type of contract called?

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

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

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

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

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

Management, Legal Entities & Delivery Methods Exercise

9. What are the two FEE methods that an Agency CM firm may offer an Owner?

- A. Incentive or Target.
- B. Unit Price or Alternate Prices.
- C. Fixed Price or Guaranteed Maximum Price.
- D. Cost-Plus a Percentage or Cost Plus Fixed Price.

10. Which legal entity is considered perpetual?

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

11. Which legal entity affords an individual the most protection of individual assets from creditors of the business?

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

12. Which legal entity exposes the personal assets of a person to pay for actions of other people involved in the business?

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

13. Which legal entity makes it extremely difficult to generate new capital to expand the business?

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

Management, Legal Entities & Delivery Methods Exercise

14. Which legal entity is taxed twice?

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

15. Which type of legal entity allows the income and deductions of the corporation to flow through to the individual tax returns of the shareholders and it avoids federal taxes?

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

16. Which type of legal entity requires a charter?

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

17. Which law are corporations formed under?

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

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

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

Management, Legal Entities & Delivery Methods Exercise

19. The owner requests that you submit a proposal supplement titled, "Statement of Contractors' Qualifications - All Contracts" and under the officers/principals section it requests the names and titles of the vice president and the president. A proposal is submitted to the Owner with a bid bond, signed addenda, and the proposal form is attached and signed by the chief estimator. Have all of the contract formation principles been satisfied and your proposal would be considered responsive?

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

20. 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.

21. Which of the following Safety criteria that has the greatest potential for reducing the costs of accidents?

- A. Experience.
- B. Safety Meetings.
- C. Traditional Safety Program.
- D. Behavior-based Safety Process.

22. What management concept has as its primary goal to get commitment from top management of all project participants and stakeholders to develop open communications and cooperation on a project to?

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

Management, Legal Entities & Delivery Methods Exercise

23. What are the quality standards used internationally called?

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

24, What management philosophy tries to maximize the competitiveness of an organization through continuous improvement?

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

25. What is the name of the criteria that is utilized to improve an organization and evaluate their progress toward becoming the best in their field?

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

26. What management philosophy is defined as a performance and processed-oriented approach to safety and health that is improved continually and applies proven principles to maximize an organization's long-term competitiveness?

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

27. What makes TQM and TSM successful?

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

Management, Legal Entities & Delivery Methods Exercise

28. What graphical measurement tool is a bar graph displaying a frequency distribution?

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

29. What graphical measurement tool is a pictorial representation of a process?

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

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

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

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

- A. Bar Chart
- B. Histogram.
- C. Gantt Chart.
- D. Pareto Chart.

32. What graphical measurement tool is a graph displaying the correlation of two characteristics?

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

Management, Legal Entities & Delivery Methods Exercise

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

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

34. Which of the following principles of law states that if the prime contractor reasonably relies on the promise or price of the subcontractor to its detriment, then the subcontractor must be held to its promise in order to avoid harm to the prime contractor even though a signed contract between the contractor and subcontractor does not exist at the bidding phase of a project?

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

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

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

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

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

Financial Statements
The three distinct financial statements are the Balance Sheet, the Income Statement and the Cash Flow Statement and each serves a specific function as described below.

Balance Sheet
The *Balance Sheet* is a summary of the existing conditions of the company and it follows the standardized format for classifying and ordering the Assets, Liabilities and, and Ownership interests in the business. The balance sheet accounts are subdivided into the following basic groups in the following order for presentation:

Assets are subdivided into these groups:
Current Assets
Fixed Assets or Long Term Property, Plant & Equipment
Other Assets

Liabilities are subdivided into these groups:
Current Liabilities
Long-term Liabilities
Owner's Equity

Each separate asset, liability, and owner's equity reported in a Balance Sheet is called an account and every account has a title and a dollar amount which is called its balance. The Balance Sheet is prepared at the close of business on the last day of the income statement period and lists the assets, liabilities and net worth. Assets minus Liabilities equals Net Worth. The balance sheet will always be in balance because Total Assets = Total Liabilities plus Net Worth.

Current assets are cash on hand, Accounts receivable, Inventories, Prepaid Expenses, and Other current assets that will be converted into cash during one operating cycle. The *Fixed assets* or Long-term assets are Land and Buildings, and Equipment. The cost of a fixed asset is reduced by the depreciable amount allocable over the period.

Current Liabilities or short-term liabilities are accounts that will come due within one year. The accounts are Accounts Payable, Notes payable, and Billings in excess of costs on uncompleted contracts. *Long-term Liabilities* are those that maturity dates are more than one year such as a long-term loan. The Net Worth or Stock holders' Equity accounts in the Balance sheet is comprised of Capital stock and Retained Earnings.

Working Capital is the net amount of current assets available. It is computed as follows. Working Capital = Current Assets minus Current liabilities

$3,415,807 - $1,546,107 = $1,869,700 at End of Year.

BALANCE SHEET

Assets	End of Year	Start of Year
Cash	$ 565,807.00	$ 750,000.00
Contracts Receivable	1,000,000.00	825,000.00
Inventory	1,690,000.00	1,250,000.00
Prepaid expenses	160,000.00	185,000.00
Total Current Assets	$3,415,807.00	$3,010,000.00
Property, Plant, Equipment	3,000,000.00	2,250,000.00
Accumulated Depreciation	(800,000.00)	(540,000.00)
Total Assets	$5,615,807.00	$4,720,000.00

Liabilities and Owners' Equity	End of Year	Start of Year
Accounts Payable - Inventory	$ 520,000.00	$ 450,000.00
Accounts Payable - Operating	120,000.00	85,000.00
Total Accounts Payable	$ 640,000.00	$ 535,000.00
Accrued Operating Expenses	$ 240,000.00	$ 185,000.00
Accrued Interest Payable	17,167.00	12,500.00
Total Accrued Expenses	$ 257,167.00	$ 197,500.00
Income Tax Payable	23,940.00	36,000.00
Short-Term Notes Payable	625,000.00	600,000.00
Total Current Liabilities	$1,546,107.00	$1,368,500.00
Long-Term Notes Payable	750,000.00	600,000.00
Total Liabilities	$2,296,107.00	$1,968,500.00
Capital Stock	775,000.00	725,000.00
Retained Earnings	2,544,700.00	2,026,500.00
Total Owners' Equity	$3,319,700.00	$2,751,500.00
Total Liabilities and	$5,615,807.00	$4,720,000.00

INCOME STATEMENT FOR THE YEAR

Contract Revenues	$10,400,000.00
Cost of Contracts Completed	6,760,000.00
Gross Margin	$ 3,640,000.00
Operating Expenses	2,080,000.00
Depreciation Expense	260,000.00
Operating Earnings	$ 1,300,000.00
Interest Expense	103,000.00
Earnings before Taxes	$ 1,197,000.00
Income Tax Expense	487,800.00
Net Income	$ 718,200.00

Financial Ratios and the Construction Industry Average Table

Ratio	Formula for Calculation	Industry Average
Liquidity: Current Ratio	current assets / current liabilities	2.5 times
Quick Assets or Acid test	current assets - inventory - prepaid expenses / current liabilities	1.0 times
Leverage: Debt to total assets - high	total liabilities / total assets	33 percent
Times interest earned - low	operating earnings / interest expenses	8.0 times
Fixed charge coverage	income available for meeting fixed charges / fixed charges	5.5 times
Activity: Inventory turnover	sales / inventory	9 times
Average collection period	receivables / sales per day	20 days
Fixed assets turnover	sales / fixed assets	5.0 times
Total assets turnover	sales / total assets	2 times
Profitability: Return on Sales	net income after taxes / sales	5 percent
Return on total assets	net income after taxes / total assets	8 percent
Return on Equity	net income after taxes / Owners Equity	15 percent
Break even	G&A Overhead / Gross Profit Percent	20 percent
Days of Cash	(Cash & Cash Equivalents) x 360 / Revenue	
Working Capital	Current Assets minus Current Liabilities	
Working Capital Turnover	Revenue / Working Capital	

Some of the *Balance Sheet Ratios* consists of the following. The *Current ratio* is expressed as Current assets to Current liabilities. The current ratio is always expressed as x to 1. The current ratio is:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current Liabilities}} = \frac{\$3,415,807}{\$1,546,107} = 2.21$$

This ratio is favored by loan officers and creditors as an indicator of financial health. Generally, a 2 to 1 Current ratio is considered the satisfactory minimum. According to the Summary of Financial Ratios and the Construction Industry Average Table, the Current ratio in the example is 2.21 and the construction industry average is 2.50. This is slightly below the average.

The *Quick assets ratio*, sometimes called the "*Acid test*" is expressed as Current assets without inventories or Prepaid Expenses to Current Liabilities. The Quick assets ratio is as follows:

$$\text{Acid Test} = \frac{\text{Current Assets - Inventories - Prepaid}}{\text{Current Liabilities}} = \frac{\$3,415,807 - 1,690,000 - \$160,000}{\$1,546,107} = 1.01$$

($1,565,807 = Cash + Receivable)

The acid test measures the immediate ability to pay current debts. This is a more conservative approach since inventories are not necessarily available and may not be readily available. Generally, a 1 to1 minimum is considered a healthy. The example shows a satisfactory ratio.

The *Debt to Total Assets Ratio* is an indicator of the companies Leverage. Leverage refers to using the equity capital base to raise additional capital from nonowner sources. The Debt to Total Assets ratio is calculated as follows:

$$\text{Debt to Total Assets Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}} = \frac{\$1,546,107 + \$750,000}{\$5,615,807} = 40\%$$

($2,296,107)

According to the Construction Industry Average Table, the industry standard is 33 percent, The Debt to Total Assets Ratio in the example is 40% which is poor or high for this company.

The Debt to Equity Ratio is an indicator of whether a company is using debt prudently or are they overburdened with debt that may cause problems. The Debt to Equity ratio is as follows:

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Total Owners Equity}} = \frac{\$2,296,107}{\$3,319,700} = .69 \text{ Debt to Equity Ratio}$$

This ratio says that the company is using $.69 of liabilities in addition to each $1.00 of Owners' Equity in the business. This business with its .69 to 1.00 debt to equity would be considered as moderately leveraged.

Income Statement

The *Income Statement* summarizes sales revenue and expenses for a period of time which is one year for the example. The ending date of that period is always the same as the closing date given on the balance sheet and the period covered is always specified on the top of the report. For example Income Statement for the Year ending December 31. The income statement is broken down into these accounts. The Sales revenue is the top line and it is the total amount of income from contact sales. The bottom line is called net income or net earnings. Net income is the final profit after all expenses are deducted from sales revenue.

The income statement is designed to be read in a step-down process. Each step down is a deduction fo one or more expenses. The first step deducts the cost of goods sold from the sales revenue of goods sold or completed contracts, which gives the *Gross Margin* sometimes called the gross profit.

Next, operating expenses and depreciation expenses are deducted, giving *Operating Earnings* before interest and income tax expenses are deducted. Operating earnings is also called “Earnings before Income Taxes and is abbreviated EBIT.

Next, Interest expenses on debt is deducted which results in *Earning before Income Taxes*. The last step is to deduct income tax expenses which results in *Net Income*. Publicly owned business corporations report Earnings per Share which is net income divided by the number of stock shares. Privately owned business do not have to report the Earnings per share.

In the example income statement, you see five different expenses identified, but you may find more expense lines in an income statement. Sales revenue and expenses reported in income statements generally follow accepted accounting practices, which are summarized below.

Completed Contract sales or Sales revenue is the total amount received or to be received from contract sales. Contract sales revenue is net.

Cost of Completed contracts or Cost of Goods Sold Expense is the total cost sold during the period.

Operating Expenses is a broad category of expenses such as Contract overhead, Selling expenses, General and Administrative expenses and depreciation. This category excludes Cost of Completed Contracts, Interest, and Income Tax.

Some of the *Income Statement Ratios* are as follows. The *Times Interest Earned Ratio* is used to test the ability to pay interest from earnings. It is calculated below:

Operating Earnings / Interest Expenses = $1,300,000 / $103,000 = 12.6 Times Interest Earned Ratio

According to the construction industry, the low Time Interest Earned Ratio is 8.0 times, but the example indicates a 12.6 Times Interest Earned ratio which exceeds the average which is good.

The *Return on Sales Ratio* shows the margin of profit as a percentage. From the income statement, the company in this example earned $718,200 net income on its sales revenue of $10,400,000 for the year. The net income to contract sales is calculated as follows:

Net Income / Sales Revenue = $718,200 / $10,400,000 = 6.9% Return on Sales Ratio

According to the construction industry, the average percentage Return on Sales is 5 percent and the example indicates a 6.9 percent return on sales which is satisfactory.

The *Return on Equity Ratio (ROE)* shows this ratio as a percentage. It is calculated by dividing the annual net income from the Income Statement by the Owners' Equity from the Balance Sheet. The Return on Equity is calculated as follows:

Net Income / Owners' Equity = $718,200 / $3,319,700 = 21.6% Return on Equity Ratio

According to the construction industry, the average percentage Return on Equity is 15 percent and the examples indicates a 21.6% Return on equity which is good.

The *Return on Assets Ratio (ROA)* indicates what the business earned before interest and income tax expenses on the total assets employed during the year. The Return on Assets is calculated by dividing the Operating Earnings from the Income statement by the Total Assets from the Balance Sheet. The Return on Assets is calculated as follows:

Operating Earnings / Total Assets = $1,300,000 / $5,615,807 = 23.1% Return on Assets

The Return on Assets is compared to the annual interest rate on the company's borrowed money. According to the construction industry, the average percentage Return on Total Assets is 8 percent and the business earned 23.1 percent on the money borrowed, as a measure of Return of Assets. The difference between the two rates is a very favorable 15 percent.

The *Cash Flow Statement* is a summary of the sources of and uses of cash indicating where it came from and where it went to for the same period of time as the income statement. The cash flow statement example contains three sections. They are (1) Cash Flows from Operating Activities sometimes referred to as cash flow from profit, (2) Cash Flows from Investing Activities, and (3) Cash flows from Financing Activities.

From the Example Balance Sheet, if you compare the columns labeled End of Year and Start of Year, the result will be a change in assets, liabilities, and owner's equities. These increases and decreases from the balance sheet tie directly in with the cash flow statement. For example, the balance sheet Contracts Receivable line item indicates an increase of $175,000 and the heading Cash Flows from Operating Activities contains a line labeled Accounts Receivable and it shows a figure of ($175,000).

BALANCE SHEET

Assets	**End of Year**	**Start of Year**	Changes
Cash	$ 565,807.00	$ 750,000.00	($184,193.00)
Contracts Receivable	1,000,000.00	825,000.00	$175,000.00
Inventory	1,690,000.00	1,250,000.00	$440,000.00
Prepaid expenses	160,000.00	185,000.00	($25,000.00)
Total Current Assets	$3,415,807.00	$3,010,000.00	
Property, Plant, Equipment	3,000,000.00	2,250,000.00	$750,000.00
Accumulated Depreciation	(800,000.00)	(540,000.00)	($260,000)
Total Assets	$5,615,807.00	$4,720,000.00	
Liabilities and Owners' Equity	**End of Year**	**Start of Year**	
Accounts Payable - Inventory	$ 520,000.00	$ 450,000.00	
Accounts Payable - Operating	120,000.00	85,000.00	
Total Accounts Payable	$ 640,000.00	$ 535,000.00	$105,000.00
Accrued Operating Expenses	$ 240,000.00	$ 185,000.00	
Accrued Interest Payable	17,167.00	12,500.00	
Total Accrued Expenses	$ 257,167.00	$ 197,500.00	$59,667.00
Income Tax Payable	23,940.00	36,000.00	($12,060.00)
Short-Term Notes Payable	625,000.00	600,000.00	$25,000.00
Total Current Liabilities	$1,546,107.00	$1,368,500.00	
Long-Term Notes Payable	750,000.00	600,000.00	$150,000.00
Total Liabilities	$2,296,107.00	$1,968,500.00	
Capital Stock	775,000.00	725,000.00	$50,000.00
Retained Earnings	2,544,700.00	2,026,500.00	$518,000.00
Total Owners' Equity	$3,319,700.00	$2,751,500.00	
Total Liabilities and Owners' Equity	$5,615,807.00	$4,720,000.00	

Cash Flow Statement

The cash flow statement reveals increases and decreases or changes in funds and it is expressed as a change in the source and application of funds, and by the change in your working capital. In conclusion, a change in your cash flow is a result of a change in (1) Cash Flows from Operating Activities, (2) Cash flows from Investing, (3) and Cash flows from Financing Activities.

From the Cash Flow statement below, the business realized $540,807 from Operating Expenses for the year ended. The company spent $750,000 on capital expenditures. Its financing activities provided $$25,000 net of $200,000 cash dividends to stockholders. In summary, the three sources of income (1) Cash Flows from Operating Activities, (2) Cash flows from Investing Activities, (3) and Cash flows from Financing Activities, were less than the company's capital expenditures during the year. Therefore, the company's cash balance decreased by $184,193.

CASH FLOW STATEMENT FOR THE YEAR		
Cash Flows from Operating Activities		
Net Income from Income Statement		$718,200.00
Contracts Receivable Increase	($175,000.00)	
Inventory Increase	(440,000.00)	
Prepaid Expenses Decrease	25,000.00	
Depreciation Expense	260,000.00	
Accounts Payable Increase	105,000.00	
Accrued Expenses Increase	59,667.00	
Income Tax Payable Decrease	(12,060.00	
Cash Flow Adjustments to Net Income		($177,393.00)
Cash Flow from Operating Activities		$ 540,807.00
Cash Flows from Investing Activities		
Purchases of Property, Plant & Equipment		($750,000.00)
Cash Flows from Financing Activities		
Short-Term Debt Borrowing	$ 25,000.00	
Long-Term Debt Borrowing	150,000.00	
Capital Stock Issue	50,000.00	
Dividends Paid Stockholders	(200,000.00)	$ 25,000.00
Increase (Decrease in Cash during Year		($184,193.00)

Financial Analysis Exercise
Using the Balance Sheet, Income Statement and the Cash Flow Statement provided below and the Summary of Financial Ratios and the Construction Industry Average Table. Answer the following questions.

1. What is the Working Capital for this company at the End of the year?

- A. $0,176, 177
- B. $0,733,154
- C. $1,463,403
- D. $1,633,389

2. What is the Current ratio for this company at the end of the year?

- A. 0.47
- B. 1.97
- C. 2.07
- D. 4.36

3. What is the Acid Test Ratio for this company at the end of the year?

- A. 0.51
- B. 0.95
- C. 1.07
- D. 2.07

4. What is the Leverage Ratio of Total debt to total Assets for this company at the end of the year?

- A. 0.30
- B. 0.51
- C. 0.96
- D. 1.97

5. What is the Construction industry Average percentage for the leverage ratio?

- A. 5%
- B. 10%
- C. 20%
- D. 33%

Financial Analysis Exercise

6. What is the Debt to Equity Ratio for this company at the end of the year?

- A. 0.22
- B. 0.47
- C. 1.03
- D. 1.96

7. What is the Times Interest Earned Ratio for this company at the end of the year?

- A. 0.25
- B. 0.51
- C. 1.03
- D. 4.07

8. What is the Construction industry Average Times Interest Earned Ratio?

- A. 5.50 Times
- B. 8.00 Times
- C. 9.00 Times
- D. 33.0 Times

9. Assuming the Times Interest Earned Ratio fort his company was calculated to be 5.00, How does this compare to the Construction industry Average Times Interest Earned Ratio?

- A. This company exceeds the average.
- B. This company is equal to the average.
- C. This company is significantly below the average.
- D. Not enough information to make a comparison.

10. What is the return on Sales percentage for this company at the end of the year?

- A. 4.0%
- B. 6.2%
- C. 25.0%
- D. 37.1%

Financial Analysis Exercise Statements

BALANCE SHEET

Assets	End of Year	Start of Year
Cash	$ 260,631.00	$ 233,171.00
Contracts Receivable	423,731.00	385,259.00
Inventory	640,020.00	517,936.00
Prepaid expenses	91,433.00	85,559.00
Total Current Assets	$1,415,815.00	$1,221,925.00
Property, Plant, Equipment	2,317,500.00	2,089,336.00
Accumulated Depreciation	(753,917.00)	(764,900.00)
Cost Less Accumulated Depreciation	1,563,583.00	1,324,436.00
Total Assets	$2,979,398.00	$2,546,361.00

Liabilities and Owners' Equity	End of Year	Start of Year
Accounts Payable - Operating	281,915.00	242,294.00
Accrued Operating Expenses	142,246.00	126,264.00
Income Tax Payable	8,500.00	15,018.00
Short-Term Debt Payable	250,000.00	196,113.00
Total Current Liabilities	682,661.00	579,689.00
Long-Term Debt Payable	833,334.00	650,000.00
Total Liabilities	$1,515,995.00	$1,229,689.00
Capital Stock	509,722.00	489,167.00
Retained Earnings	953,681.00	827,505.00
Total Owners' Equity	$1,463,403.00	$1, 316,672.00
Total Liabilities & Owners' Equity	$2,979,398.00	$2,546,361.00

INCOME STATEMENT FOR THE YEAR

Contract Revenues	4,406,806.00
Cost of Contracts Completed	2,773,417.00
Gross Margin	1,633,389.00
Operating Expenses	1,263,032.00
Depreciation Expense	10,983.00
Operating Earnings	359,374.00
Interest Expense	88,333.00
Earnings before Taxes	271,041.00
Income Tax Expense	94,864.00
Net Income	176,177.00

Financial Analysis Exercise Statements

CASH FLOW STATEMENT FOR THE YEAR		
Cash Flows from Operating Activities		
Net Income from Income Statement		176,177.00
Contracts Receivable Increase	(38,472.00)	
Inventory Increase	(122,084.00)	
Prepaid Expenses Decrease	(5,874.00)	
Depreciation Expense	85,383.00	
Accounts Payable Increase	39,621.00	
Accrued Expenses Increase	15,982.00	
Income Tax Payable Decrease	(6,518.00)	
	(31,962.00)	
Cash Flow Adjustments to Net Income		
Cash Flow from Operating Activities		144,215.00
Cash Flows from Investing Activities		
Purchases of Property, Plant & Equipment		($354,028.00)
Proceeds from Disposals of Property, Plant & Equipment		29,498.00
Cash Used in Investing Activities		($324,530)
Cash Flows from Financing Activities		
Short-Term Debt Borrowing		53,887.00
Long-Term Debt Borrowing		183,334.00
Capital Stock Issue		20,554.00
Dividends Paid Stockholders		(50,000.00)
Cash from Financing Activities		207,775.00
Increase (Decrease)in Cash during Year		27,460.00

Depreciation Methods

Depreciation is an accounting charge that provides for recovery of the capital that purchased the physical asset. It is the process of allocating an amount of money over the recovery period (life) of a tangible capital asset. There are three methods that are approved by the U.S. Revenue Service (IRS). They are the straight-line, the double-declining balance or sum-of-the-year-digits.

Straight-line Example

Given the following information:

Purchase Price	= $20,000
Salvage Value	= $05,000
Service Life	= 5 Years.

The annual Depreciation Charge using the Straight Line is = $\frac{\$20,000 - \$5,000}{5 \text{ Years}}$ = $3,000

The table below indicates the depreciation annual expense over the full service life.

Year	Remaining Book Value	Yearly Depreciation	Book Value
0	$ 0	$ 0	$20,000
1	$20,000	$3,000	$17,000
2	$17,000	$3,000	$14,000
3	$14,000	$3,000	$11,000
4	$11,000	$3,000	$8,000
5	$8,000	$3,000	5,000

Declining Balance Example

The Declining Balance is also referred to as the double declining or 200% declining balance for new equipment and 150% declining balance for used equipment. This is a form of accelerated depreciation. In using this depreciation method, an item is depreciated until the estimated salvage value is reached.

The Declining Balance formula for equipment purchased new is = $2 \frac{\text{(Remaining Book Value)}}{\text{Service Life}}$

The Declining Balance formula for equipment purchased used is= $2 \frac{\text{(Remaining Book Value)}}{\text{Service Life}}$

Given the following information:

Purchase Price	= $20,000
Salvage Value	= $05,000
Service Life	= 5 Years.

Therefore, the first year depreciation using the Declining Balance is $2 \frac{(\$20,000)}{5} = \$8,000$.

The table below indicates the depreciation annual expense over the full service life using the Double Declining Method until the salvage value is reached.

Year	Remaining Book Value	Yearly Depreciation	Book Value Beginning
0	$ 0	$ 0	$20,000
1	$20,000	2($20,000)/5 = $8,000	$12,000
2	$12,000	2($12,000)/5 = $4,800	$7,200
3	$7,200	2($7,200)/5 = $2,880 max ($2,200) =	$5,000
4			
5			

Sum-of-the-Year-Digits Example

Given the following information:

Purchase Price	= $20,000
Salvage Value	= $05,000
Service Life	= 5 Years.

The denominator for Sum of the Digits is $\frac{N}{2}(N+1) = \frac{5}{2}(5 + 1) = 15$ or $= 5 + 4 + 3 + 2 + 1$

The depreciable amount is $20,000 - $5,000 = $15,000. For the first year the numerator is 5, for the second year it is 4, and so forth.

The table below indicates the annual depreciation expense over the full service life using the Sum-of-the-Year-Digits method.

Year	Remaining Book Value	Yearly Depreciation	Book Value Beginning
0	$ 0	$ 0	$20,000
1	$20,000	5/15 ($15,000) = $5,000	$15,000
2	$15,000	4/15 ($15,000) = $4,000	$11,000
3	$11,000	3/15 ($15,000) = $5,000	$8,000
4	$8,000	2/15 ($15,000) = $2,000	$6,000
5	$6,000	1/15 ($15,000) = $1,000	5,000

Depreciation Methods Exercise

Given the following information:

Purchase Price	= $100,000
Salvage Value	= $ 10,000
Service Life	= 3 Years.

1. What is the depreciation amount at the end of year one using the Double Declining Method?

- A. $30,000
- B. $45,000
- C. $66,667
- D. $90,000

2. What is the depreciation amount at the end of year one using the Sum-of-the-Year-Digits method?

- A. $15,000
- B. $16,667
- C. $45,000
- D. $50,000

3. What is the remaining book value amount at the beginning of year two using the Sum-of-the-Year-Digits method?

- A. $10,000
- B. $45,000
- C. $50,000
- D. $55,000

4. What is the depreciation amount at the end of year one using the Straight line method?

- A. $30,000
- B. $33,333
- C. $45,000
- D. $90,000

Depreciation Methods and Formulas

Straight Line

$$SL\ dep\ rate = \frac{1}{N}(P - S)$$

$$BV\ @\ end\ of\ Jth\ Year = P - \frac{J}{N}(P - S)$$

Sum-of-Year Digits

$$SOYD\ \text{in any year} = \frac{\text{Remaining Useful Life at Beginning of Year}}{\text{SOYD}}(\text{P} - \text{S})$$

$$SOYD = \frac{N}{2}(N+1)$$

Double Declining Balance

$$DDB\ \text{in any year} = \frac{2P}{N}(1-\frac{2}{N})^{n-1}$$

$$DDB\ \text{i n any year} = \frac{2}{\text{N}}(BV)$$

$$Total\ DDB = P\left[1-\left(1-\frac{2}{N}\right)^{n}\right]$$

Book Value of an assest and end of n years

$$BV = P - Total\ DDB\ depreciation\ at\ end\ of\ n\ years$$

$$BV = P\left(1-\frac{2}{N}\right)^{n}$$

Unit of Production

$$\text{UOP} = \frac{\text{Production for year}}{\text{Total Life Time Production}}(\text{P} - \text{S})$$

Constructor's Code of Ethics

The Constructor is an individual who commits to serve the construction industry in a professional and ethical manner and engages in the continued development of skills and further education to meet increasing industry challenges and changes. The Constructor's Code of Ethics sets forth the principles of professional conduct and standards to be observed by holders of certification conferred by the AIC Constructor Certification Commission. Certificants shall, in their professional activities, sustain and advance the integrity, honor and prestige of the profession of Constructor and the construction industry.

The construction profession relies upon a system of ethical competence, management excellence, and fair dealing in undertaking complex works to serve the public with safety, efficiency, and economy. The AIC Constructor Certification Commission's, Constructor's Code of Ethics sets forth the principles of professional conduct and standards to be observed by holders of certification conferred by the AIC Constructor Certification Commission. Certificants shall, in their professional activities, sustain and advance the integrity, honor and prestige of the profession of the Constructor and the construction industry. The Constructor Code of Ethics principles and standards are stated below.

I. The Constructor shall maintain full regard to the public interest in fulfilling their professional responsibilities to the construction industry.

II. Constructor shall not engage in any deceptive practice, or in any practice that creates an unfair advantage for the Constructor or another.

III A Constructor shall not maliciously or recklessly injure or attempt to injure the professional reputation of others.

IV. A Constructor shall insure that when providing a service that includes advice, such advice shall be fair and unbiased.

V. A Constructor shall not divulge to any person, firm or company, information of a confidential nature acquired during the course of professional activities.

VI. A Constructor shall carry out responsibilities in accordance with current professional practice.

VII. A Constructor shall keep informed of new concepts and developments in the construction process relative to his or her responsibilities.

Ethics Exercise

These situations were adapted from the Column Mr. Ethics presented in previous issues of the American Institute of Constructors (AIC) Newsletter. Read the situations below and circle the best response to the situation.

1. Contractor “A” was low bidder on a general-contacted project which has an extensive number of alternative during bidding and negotiations. Contractor “A” received a standard contract from Mary, the lead Architect, a source of business for several years, Ed the Estimator at Contractor “A”, discovers the contract value was erroneously issued at $365,000 instead of the $355,000. How should Ed handle this situation?

   - A. Ignore the error and sign the contract.
   - B. Call Mary, the lead architect, and inform her of your discovery.
   - C. Inform Mary, the lead architect, of the error but encourage them to leave the difference in the contract as a contingency.
   - D. Inform Mary, the lead, architect of the error and tell them to leave the amount in the contract to cover the potential errors in the numerous alternatives.

2. Constructor “Z” is building an addition to an existing pharmaceutical plant of approximately 20,000 square feet. There is space on the site for one more future addition. After installing foundations, Ed, the Constructors Superintendent, is verifying the dimensions with Jim the Bricklayer crew leader and they discover that the addition has been laid out 1' - 0" out of square. All work can still be performed with very minor field adjustments. The error will compound itself if the future addition ever takes place. Ed has worked on Mary the Architect’s, projects for over twenty years but never for this owner. What should Ed do?

   - A. Ignore the error and tell no one.
   - B. Inform Mary, the architect only.
   - C. Inform the Owner and Mary the Architect.
   - D. Have Ed, the superintendent, and Jim, the Bricklayer adjust as required.

Ethics Exercise

3. A city electrical inspector makes the following statement after discovering that the new condominium building # 13 of 25 buildings has been drywalled without an electrical inspection. The inspector says to you, the superintendent, "Gee"! It will be pretty expensive to remove all of the drywall. I'd bet it will cost you at least $5, 000. I'd like to have that kind of money myself! (You suspect that the inspector is asking for a bribe).

- ○ A. Contact the building department supervisor and ask to have hidden areas removed
- ○ B. Instruct your workers to remove all of the drywall for the electrical inspection.
- ○ C. Pay the inspector because you don't want to be bothered with the situation.
- ○ D. Contact the City Commissioners and the local newspaper and have the inspector relieved of his duties.

4. You as a Masonry Subcontractor recently submitted a bid of $450,000 to a General Contractor for the masonry portion of a new office building. You are invited to the General Contractor's office to discuss the project. In the midst of negotiations, the General Contractors representative is called out of the room. In his absence, you notice the spread sheet listing all the bids received including yours. It is apparent from the spread sheet that you are $22,000 higher than the low bidder. The next highest bidder is $8,000 above you. What action should you take?

- ○ A. Lower your price by $25,000 upon the General Contractor's return, giving the reason that you had a chance to re-examine your numbers.
- ○ B. Be concerned that the spread sheet may be a decoy with the intention of getting you to lower your price enough to become the lowest bidder.
- ○ C. Continue negotiating with the General Contractor over price upon the General Contractor's return to the meeting. Always knowing you have the upper hand.
- ○ D. Maintain your original price quotation, extol the virtues of your company to be able to meet the schedule, the high quality of your work and your relationship.

Ethics Exercise

5. After a $15,000,000 bid on a new pump house. You are publicly regarded as the apparent second low bidder. The following day one of the subcontractors for a $4,500,000 portion of the project calls and asks how he compared with his competitors. He is the low bidder with you. What do you tell the subcontractor?

- A. Divulge all and hope to put your competitor at a negotiating disadvantage.
- B. Maintain your silence in respect for the other subcontractors who provided quotes.
- C. Provide the subcontractor a ball park idea where they stood, but don't be specific.
- D. Tell him that it is none of his business and hang up on him for bothering you.

6. According to the Constructor's Code of Ethics, The Constructor shall insure that when providing a service or advice such advice shall be to treat all parties in a fair and unbiased way. What is the best way for a Constructor to achieve this?

- A. Fire someone for being considered unethical.
- B. Review your mission and goal statement on ethical behavior.
- C. Follow the guidelines provided in your employment contract.
- D. Don't engage in any practice which creates an unfair advantage for one party.

7. According to the Constructor's Code of Ethics, The Constructor shall not maliciously or recklessly injure or attempt to injure the professional reputation of others. You have just been notified in writing that you have not met the minimum score required to pass the Level 2 Advanced Construction Applications Examinations even though you have over twenty years of experience. What is the Best way to proceed?

- A. Call the Commission office and criticize the poor quality of the examination.
- B. Submit a written request to the Commission, postmarked no later than thirty days after the notice of failure according to the Appeals Process procedures.
- C. Obtain the e-mail addresses of all members and send a letter criticizing the quality of the test questions and that certain portions of the examination were wrong.
- D. Call the Commission office and ask for hints on how close you were to passing and what questions should be appealed. Then provide a solid grounds for appeal.