

## UNIT I - WORKING WITH PLANS

### Lesson 2: Understanding a Plan of Procedure

**Competency/Objective:** Develop a plan of procedure and a bill of materials for a construction project.

#### **Study Questions**

1. What are the steps in making a plan of procedure?
2. What is the importance of a bill of materials?
3. What is the difference between a cutting bill of materials and a purchasing bill of materials?

#### **References**

1. *Agriculture Structures (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1999, Unit I.
2. Activity Sheet
  - a) AS 2.1: Preparing a Plan of Procedure



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#### TEACHING PROCEDURES

##### B. *Review*

Having developed an understanding of basic construction plans in Lesson 1, it is now time to explore the planning process. A plan of procedure for a construction project involves determining the order in which to proceed as well as developing lists of the materials needed.

##### C. *Motivation*

Discuss the advantages of having and following a good plan of procedure. Describe a scenario involving pouring concrete before plumbing lines have been installed. This example creates a very good visual image of a situation that could have been avoided with proper planning.

##### D. *Assignment*

##### E. *Supervised Study*

##### F. *Discussion*

1. Ask students to list the steps in forming a plan of procedure. Discuss the four steps in developing a plan.

#### **What are the steps in making a plan of procedure?**

- a) A plan of procedure is the order in which everything concerning the eventual completion of a planned project is identified, listed, and then arranged in a logical order from the first step to the last step.
  - b) Developing a plan of procedure involves four steps.
    - 1) The first step in developing a plan of procedure is identifying every factor that may affect the project and then arranging all the identified elements in a logical order.
    - 2) From the information thus far assembled, a decision is made about the type and grade of materials that is appropriate for the project.
    - 3) A list of materials required will need to be developed from the information assembled so far and by studying the plan drawings.
    - 4) Materials must be purchased, cut, and assembled in a logical order.
2. Discuss the description of a bill of materials. Ask students why developing a material list is important.

#### **What is the importance of a bill of materials?**

- a) A bill of materials is a list of all the components needed to complete a proposed project, identifying the amount, size, and kind of materials needed. These lists are necessary for purchasing the correct amount of materials and for obtaining cost estimates.
3. Discuss a cutting bill of materials and a purchasing bill of materials, and explain the difference between the two. Have students complete AS 2.1.

#### **What is the difference between a cutting bill of materials and a purchasing bill of materials?**

- a) Many materials used in agricultural structures, such as plumbing supplies and lumber, are available for purchase in standard lengths and dimensions; as a result, more material will be purchased than used in the project, and the materials are then cut to the exact dimensions needed during construction.
- b) Cutting bill of materials
  - 1) This list is generally developed first to prevent waste when purchasing materials.
  - 2) It is a list of the materials needed to assemble the project, in their required dimensions.
- c) Purchasing bill of materials
  - 1) This list is developed from the information accumulated to this point.
  - 2) The list will include not just the materials identified from the cutting list in their standard sizes, but everything needed to construct the project, such as fasteners, hinges, wire, etc..

G. ***Other Activities***

Have students develop a project for an agricultural structure of their choice. They should produce a plan of procedure, including a cutting bill of materials and purchasing bill of materials.

H. ***Conclusion***

This lesson provides an understanding and appreciation of a plan of procedure. It also provides a working knowledge of how to apply the four-step procedure to develop a plan for an agricultural structure.

I. ***Answers to Activity Sheet***

- 1. Identify all the steps necessary to complete the project. Decide what materials should be used to construct the project. List the materials needed to complete the project, preparing a cutting and a purchasing bill of materials. Purchase the materials according to the purchasing bill of materials, make the cuts according to the cutting bill of materials, and assemble the project.
- 2. Top - Four 2" × 6" boards 4 feet in length and sixteen 3-inch wood screws  
 Side braces - Two 2" × 6" boards 18 inches in length, two 2" × 6" boards 39 inches in length, and 24 3-inch wood screws  
 Legs - Four 2" × 4" boards 2 feet in length
- 3. Eight 4-foot 2" × 6" boards  
 Two 18-inch 2" × 6" boards  
 Two 36-inch 2" × 6" boards  
 Four 2-foot 2" × 4" boards
- 4. Four 8-foot 2" × 6" boards  
 One 10-foot 2" × 6"  
 Forty 3-inch wood screws

J. ***Answers to Evaluation***

- 1. c
- 2. b
- 3. d
- 4. The steps are: identify every factor that may affect the project and then arrange all the identified elements in a logical order, decide what type and grade of materials will be used to construct the project, develop lists of materials required, and finally purchase, cut, and assemble materials.

5. A cutting bill of materials is a list of the materials needed to assemble the project in their required dimensions. A purchasing bill of materials is not just the materials identified from the cutting list in their standard sizes, but everything needed to construct the project.
6. Usually the cutting bill of materials needs to be developed first to prevent waste when purchasing materials.
7. The bill of materials is important because it is necessary for purchasing the correct amount of materials and for obtaining cost estimates.



EVALUATION

**Circle the letter that corresponds to the best answer.**

1. A bill of materials consists of:
  - a. The same information as the cutting bill of materials.
  - b. The same information as a purchase order.
  - c. A list of all materials needed for a project.
  - d. A list of the materials that have been purchased.
  
2. The cutting bill of materials is:
  - a. The same as the purchasing bill of materials.
  - b. A list of the materials for the project in required dimensions.
  - c. Not important until after materials have been purchased.
  - d. Determined after project completion.
  
3. A purchasing bill of materials:
  - a. Is the same as the cutting list.
  - b. Cannot be determined until project completion.
  - c. Is a list of lumber to be purchased.
  - d. Is a list of all materials to be purchased.

**Complete the following short answer questions.**

4. What are the steps in forming a plan of procedure?
  
  
  
  
  
  
  
  
  
  
5. What is the difference between a purchasing and a cutting bill of materials?



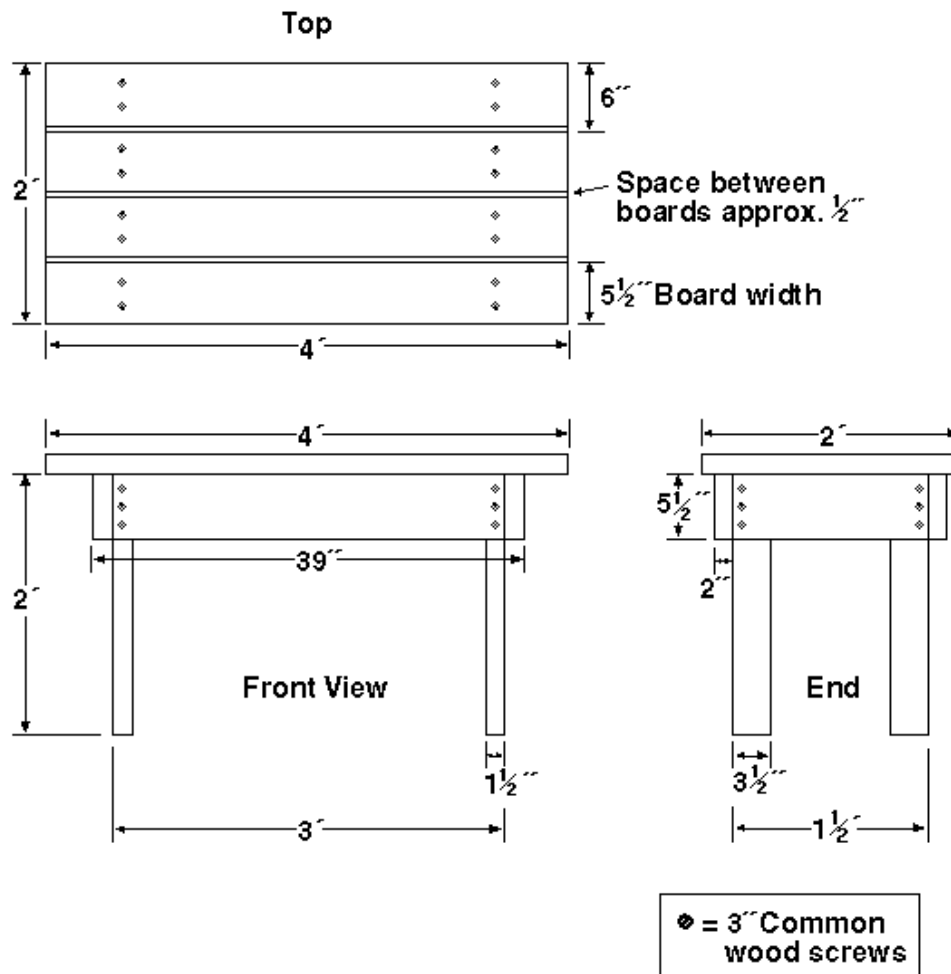


6. Would the purchasing bill of materials be prepared before or after the cutting bill of materials? Explain your answer.
  
7. Why is making a bill of materials important?

## Preparing a Plan of Procedure

**Objective:** Formulate a plan of procedure, including a cutting and a purchasing bill of materials.

Three elevation drawings of a pine workbench complete with dimension lines are shown below. Look at the three drawings of the workbench. Evaluate the drawings carefully. Then, answer the following questions.



1. What would be the steps in a plan of procedure for this project?

4. Develop a purchasing bill of materials. (Hint: Dimensional lumber from retailers most commonly starts at 8 feet and increases in length in 2-foot increments.)