

# Plan Interpretation and Cost Estimating (12-week course)

**PREREQUISITE:** Introduction to Public Works

**GRADING METHOD:** Instructor's choice Grade based on assignments, exams and attendance.

## COURSE DESCRIPTION

A course in developing the ability to read and interpret plans and estimate time, material, labor and equipment needed for public works projects.

## COURSE CONTENT

- I. Introduction
  - A. Outline of course content
  - B. Importance of accurate plan interpretation
  - C. Importance of preparing accurate estimates
- II. Mathematical Concepts
  - A. Addition, subtraction, multiplication, division, decimals, fractions
  - B. Areas, volumes
- III. Plan Interpretation
  - A. Highway plans
  - B. Storm drain plans
  - C. Traffic signal plans
- IV. Estimating Project Quantities
  - A. Sizes and lengths of curb, gutter, drainage, pipe
  - B. Areas of asphalt pavement, Portland Cement pavement
  - C. Volumes of excavation, embankment, base material, concrete
  - D. Type and number of catch basins, manholes, miscellaneous structures, traffic signal standards, traffic signal controllers
- V. Contract Documents
  - A. Notice to bidders
  - B. Bid opening and review of bids
  - C. Award of contract and issuance of "Notice to Proceed"
- VI. Estimating Manpower, Material and Equipment Hours

## Plan Interpretation and Cost Estimating (12-week course)

- A. Man-hour relationship to material usage
    - 1. asphalt and concrete pavements
    - 2. base
    - 3. sidewalks, curbs, gutters
    - 4. storm drains
    - 5. traffic signal standards
  - B. Man-hour relationship to equipment usage
    - 1. type for selected materials
    - 2. numbers required for various volumes of materials
- VII. Practical Problem Solving
- A. Portland Cement concrete
    - 1. removal and replacement of street pavement
    - 2. removal and replacement of walks, curb and gutters
    - 3. manholes, catch basins
  - B. Asphalt concrete
    - 1. preparation of subgrade and base
    - 2. asphalt concrete pavement
    - 3. asphalt channels and curbs

### **STUDENT LEARNING OUTCOMES**

Upon completion of this course, students will be able to do the following:

- 1. Technology Information competency
  - A. OUTCOME: demonstrate, through written assignment, the ability to read and interpret highway plans, storm drain plans, and traffic signal plans, as required in the public works industry
  - B. OUTCOME: develop a "project bid" based on plans for a public works project, through a comprehensive written exam, according to current industry standards

# Plan Interpretation and Cost Estimating (12-week course)

## 2. Computation

- A. OUTCOME: calculate the costs and identify the most economical materials needed for a given public works project, according to current industry standards, on written assignments and examinations
- B. OUTCOME: demonstrate through written assignments the ability to calculate the required quantities of materials needed on a public works project
- C. OUTCOME: calculate on written assignments the time, material, labor and equipment needed for public works projects

## 3. Communication (personal expression and information acquisition) Information competency

- A. OUTCOME: demonstrate the ability to explain the concept of advertising for construction bids according to current industry standards, through written assignments and tests

## OBJECTIVES

1. interpret highway plans, storm drain plans and traffic signal plans
2. identify the best materials for a given project
3. estimate quantities of materials needed for a public works project
4. calculate the time, material, labor and equipment needed for public works projects
5. explain the concept of advertising for construction bids
6. develop a "project bid" based on plans for a public works project

## METHODS OF EVALUATION/ASSESSMENT

Typical classroom assessment techniques

Required assignments