

## Estimating Labor Costs

Week 4  
Construction Estimation, Planning  
and Control

## Estimating Labor

- Estimates made in person-hours/labor-hours
- Employer pays for:
  - § Wages
  - § Fringe benefits
    - 10-20% of base rate
  - § Social security taxes
    - Both employer and employee pays 7.65% of employee's gross salary, capped by \$76,000, per annum
  - § Unemployment taxes
    - 3% of wages paid by the contractor period of employment
  - § Workers' compensation/employer's liability insurance
    - Protect contractor against work-site injury/ any related litigation
    - Varies state to state and nature of labor
  - § Public liability/property damage insurance
    - Protect contractor from costs arising out of property damage (2%-5%)

## Hourly Wage Rates

- Union Wage
  - § Wage rate decide by labor contract between labor union and contractor's management
  - § Fringe benefits directly paid to unions
- Open-shop Wage
  - § Wage rate agreed on by employer and employee
- Prevailing Wage
  - § Mostly for work on projects funded by state/federal monies

## Davis-Bacon Act

- All federal government construction contracts and most contracts for federally assisted construction over \$2,000 must include provisions for paying workers on-site no less than the locally prevailing wages and fringe benefits paid (ammended 1964) on similar projects.
- Last suspended during hurricane Andrew
  - § Reinstated by President Clinton (1993)
- Indefinitely suspended on 09/08 for the 4 states affected by Katarina
- Multiple efforts at repealing act! (latest: 2004)

## Estimating Production Rates

- Production Rate: Number of units installed/crew-hour
- Affected by:
  - § Weather
  - § Technology employed
  - § Level of supervision
  - § Worker skills
- Information: RS Means/historical contractor information

## Overtime

- Working overtime for an extended period of time adversely impacts productivity
- Guiding formula to calculate efficiency:
  - §  $\text{Eff.(\%)} = 100\% - 5[(\text{days} - 5) + (\text{hours} - 8)]$
- Benchmark: 100% Efficiency when working 8 hours a day for 5 days a week.
- 95% efficiency for 9 hours a day 5 days a week.

## Other Productivity Factors

- Increasing workforce: Crowding on site
- Impacts of learning on productivity
  - § Reduction in time of completion for Nth repetition of an activity
- Interrupting work on multiple units
  - § Lost learning

$$\begin{aligned}
 & \$16.20 + \$1.62 + \$1.24 + \$0.48 + \$1.62 \\
 & = \$21.17 \rightarrow \times 5 \times 8 \\
 & = \$846.80
 \end{aligned}$$
  

$$\begin{aligned}
 & \$16.20 - \$1.24 = \$14.96 \\
 & \text{Wage rate} = \$16.20/\text{hr.} \\
 & \text{Fringe} = 16.20 \times 0.1 = \$1.62 \quad \begin{array}{l} 5 \text{ h/day} \times \\ 5 \text{ days} \\ = \$58.60 \end{array} \\
 & \text{SS Tax} = 16.20 \times 0.0765 = \$1.24 \\
 & \text{Unemployment tax} = 16.20 \times 0.03 = \$0.486 \\
 & \text{Liability + Work Comp} = 2 \times 16.20 \times 0.05 = \$1.62
 \end{aligned}$$