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 pay 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
  - 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 (amended 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 Katrina
- 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:
  - Eff.(%) = 100% - 5[(days -5) + (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

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\begin{align*}
\text{Wage rate} &= \$16.20/\text{hr} \\
\text{Fringe} &= 16.20 \times 0.4 \\
&= \$6.48 \\
\text{SS Tax} &= 16.20 \times 0.0765 \\
&= \$1.24 \\
\text{Unemployment Tax} &= 16.20 \times 0.03 \\
&= \$0.486 \\
\text{Liability + Workers Comp} &= 16.20 \times 0.05 \\
&= \$0.81
\end{align*}
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