

Managing the Construction Process

Homework #1 (50 Points)

Historical Cost Study

This homework assignment looks at the cost of construction over time.

1. Using Engineering News Record (ENR), graph the construction cost index (CCI) (y-axis) vs. time from 2001-2011. 4 points per year - equally spaced. ENR is a weekly magazine. You will find the CCI in a section called Construction Economics and in the older issues a section called Market Trends. (Neatness Counts!)
2. Assume a project cost \$400,000 in February 2002 – How much would this project cost in :

Feb 2003

Mar 2005

May 2007

Jan 2009

Feb 2015 (projection)

3. List 5 reasons why the actual cost may vary from your estimate.

Conceptual/Square Foot Estimating

Homework #2 (50 Points) (Note: show all work – neatness counts!)

Problem:

The city of Tucson is experiencing rapid growth and must build a new High School. The projected student population for this school is 900 students.

- 1.** Price the project using the ROM approach (use cost per pupil). Adjust for size and location and include designer fee – assume median quality.
- 2.** Assume a 125,000 square foot school building, price the project using a reported square foot data. Make the same adjustments as in question 1 and again assume median quality.
- 3.** Compare and contrast the above estimating approaches. Provide some reasons why the 2 estimates might vary.

Square Foot Estimating

Estimating homework #3 (50 Points)

Complete the square foot estimate for the 3-Story office building as outlined in the attached case. (Courtesy of R.S. Means)

Make the following assumptions:

1. Use 390 square feet as the size for a typical parking stall
2. The building will be constructed in the current year
3. The building will be constructed in a national average city

Follow the work sheet and show work.

Case Three:

A developer requires that as much building as possible be constructed on a limited 40,000 sf site. What is the ideal dimension for the building footprint?

Also, what would be the total project cost of the building based on that ideal dimension, taking into account certain restrictions as outlined below?

Restrictions: Local Building Codes.

Height: 3 Floors above grade (or 45').

Parking: 0.667 stalls per occupant. (2 stalls per 3 occupants).

Landscaping: 20% of site.

Use odd bay number for building front.

Step One:

Develop total area available for the building and parking.

Site Area:		40,000 sf
Required Landscaping:	-	sf
Walks, Entrance, etc. (assume 2%)	-	sf
Available for building and parking		sf

Consult Table L1020-301, Occupancy Determination for an Office Building

SF per Person: _____sf net.

Consult Table L1020-101, for an Office Building to determine the gross to net ratio.

Ratio: _____%

Adjusted SF per Person: _____sf x _____% = _____sf gross

Parking Stalls: Use Table RG2020-500 and select an area per stall.

Square Feet per Stall: _____sf

Stalls per Occupant: _____

Square Feet per Occupant: _____sf

Case Three:

Step Two: Develop the area required for parking and building footprint. Then Sketch the building floor plan and elevation.

Let "U" equal the unknown number of persons per floor.

$$\begin{array}{rcl} \text{Parking Area} & + & \text{Footprint Area} & = & \text{Available Space} \\ (3 \text{ Floors} \times \underline{\hspace{1cm}} \text{ sf} \times U) & + & (\underline{\hspace{1cm}} \text{ sf} \times U) & = & \underline{\hspace{1cm}} \text{ sf} \end{array}$$

Solving for U: $\underline{\hspace{1cm}} U = \underline{\hspace{1cm}}$

$U = \underline{\hspace{1cm}}$ persons per floor

Parking Area: $3 \text{ Floors} \times \frac{\underline{\hspace{1cm}} \text{ persons}}{\text{Floor}} \times \frac{\underline{\hspace{1cm}} \text{ sf parking}}{\text{person}} = \underline{\hspace{1cm}} \text{ sf}$

Building Footprint: $\frac{\underline{\hspace{1cm}} \text{ persons}}{\text{Floor}} \times \frac{\underline{\hspace{1cm}} \text{ sf gross}}{\text{person}} = \underline{\hspace{1cm}} \text{ sf}$

Summary:

Building Footprint:	<u> </u> sf
Parking:	<u> </u> sf
Landscape:	<u> </u> sf
Walks and Miscellaneous:	<u> </u> sf
Total:	<u> </u> sf

Square Foot Costs: (System k101-61-0010)

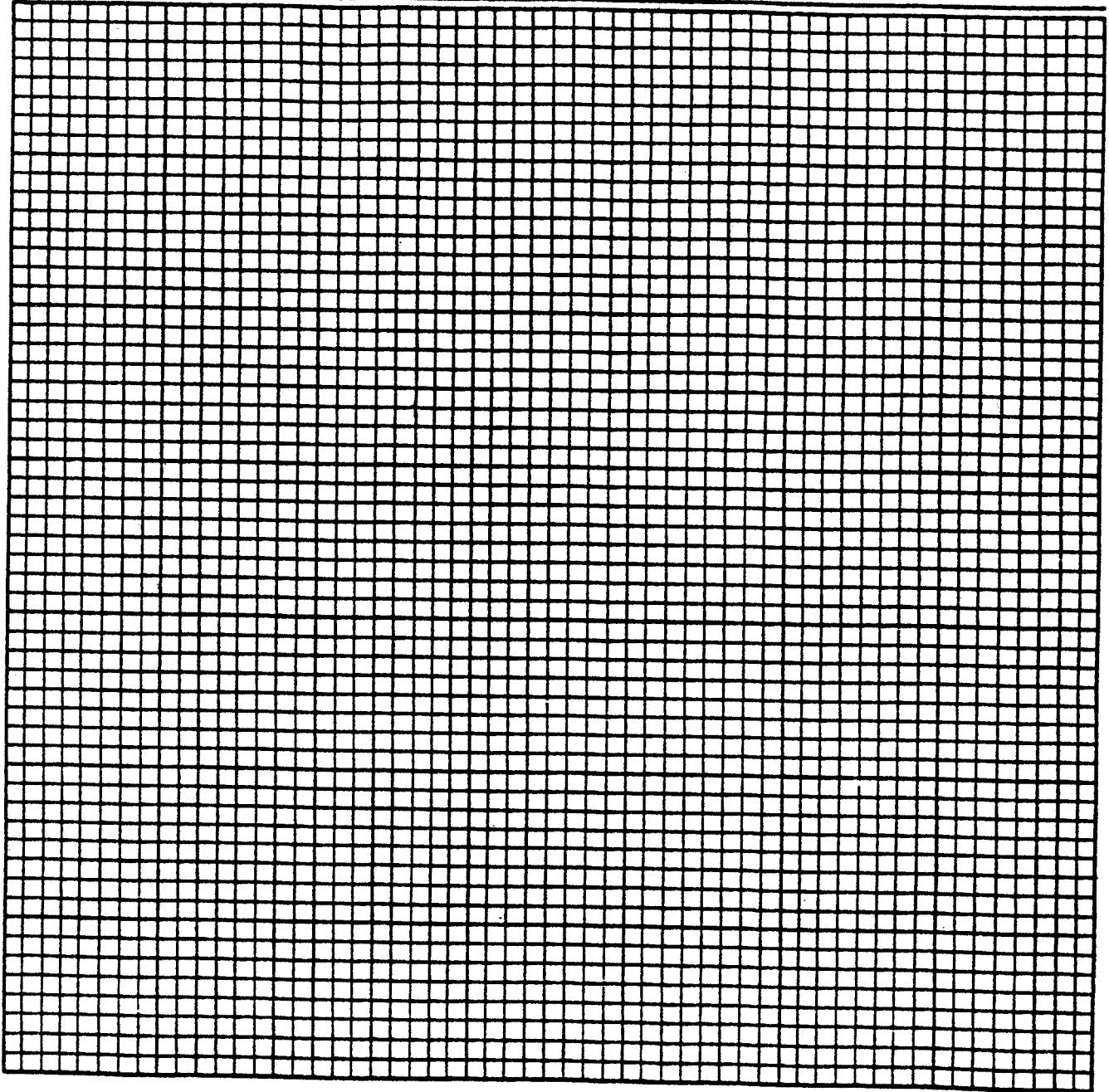
Building Cost:	\$ <u> </u>
Modified Cost:	<u> </u>
Architect's Fee (___%) (Table H1010-201)	+ <u> </u>
Total:	\$ <u> </u>

Cubic Foot Cost: 12' floor to floor. (K1010-61-0020)

Building Cost:	\$ <u> </u>
Modified Cost:	<u> </u>
Architect's Fee (___%)	+ <u> </u>
Total:	\$ <u> </u>

**PROJECT
DESCRIPTION**

SKETCH



Assemblies Estimating

Estimating homework #4 (50 Points)

Estimate division B-20 included in the 30,000 SF Office Building problem located in Appendix A. Use current year cost data.