

Quick Start

2000RS Means Building Construction Cost Data

If you feel you are ready to use this book and don't think you need the detailed instructions that begin on the following page, this Quick Start section is for you.

These steps will allow you to get started estimating in a matter of minutes.

1 Find each cost data section you need in the Unit Price Section Table of Contents.

The cost data has been divided into 16 divisions according to the CSI MasterFormat.

2 Turn to the indicated section and locate the line item you need for your estimate. Portions of a sample page layout appear here.

- If there is a reference number listed at the beginning of a section, for example, R03110-050, it refers to additional information you may find useful. See the Reference Section for detailed information.
- Note the crew code designation. You'll find full descriptions of crews in the Crews Section, including labor-hour and equipment costs.

3 Determine the total number of units your job will require. Note that the unit of measure for the material you're using is listed under "UNIT."

- Bare Costs: These figures show unit costs for materials and installation. Labor and equipment costs are calculated according to crew costs and average daily output. Bare costs do not contain allowances for overhead, profit, or taxes.
- "Labor-hours" allows you to calculate the total labor-hours to complete that task. Just multiply the quantity of work by this figure for an estimate of activity duration.

4 Then multiply the total units by the "Total Incl. O&P," which stands for the total cost including the installing contractor's overhead and profit. (See the next pages for a complete explanation.)

- If the work is to be subcontracted, add the general contractor's markup, approximately 10%.

5 The price you calculate will be an estimate for a completed item of work.

6 Compile a list of all items included in the total project. Summarize cost information, and add project overhead.

Localize costs by using the City Cost Indexes or Location Factors found in the Reference Section.

For a more complete explanation of the way costs are derived, please see the following section.

Commonly Used Abbreviations

R.S. Means utilizes standard industry abbreviations. There is a complete glossary of abbreviations in the reference section. The following are a few of the most commonly used abbreviations you'll find in the book:

B.F.	Board Feet
C	Hundred; Centigrade
C.Y.	Cubic Yard (27 Cubic Feet)
Cwt	100 Pounds
Ea.	Each
Flr.	Floor
L.F.	Linear Foot
Lb.	Pound
MBF	Thousand Board Feet
Opng.	Opening
S.F.	Square Foot
SFCA	Square Foot Contact Area
S.Y.	Square Yard
Sq.	Square; 100 Square Feet
Sty.	Story
Surf.	Surface
V.L.F.	Vertical Linear Foot

Editors' Note: We urge you to spend time reading and understanding the supporting material. An accurate estimate requires experience, knowledge, and careful calculation. The more you know about how we at R.S. Means developed the data, the more accurate your estimate will be. In addition, it's important to take into consideration some of the reference material such as Crews Listing and the "reference numbers."

03400 | Precast Concrete

03410 Plant Precast		CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	2000 BARE COSTS				TOTAL INCL O&P	
						MAT.	LABOR	EQUIP.	TOTAL		
400	0010 JOISTS 40 psf L.L., 6" deep for 12' spans	G-12	600	.080	L.F.	5.70	2.22	.76	8.68	10.55	400
	0050 8" deep for 16' spans		575	.083		6.70	2.32	.79	9.81	11.85	
620	0010 SLABS Prestressed roof/floor members, solid, grouted, 4" thick	C-11	3,600	.020	S.F.	4.65	.62	.43	5.70	6.70	620
	0050 6" thick		4,500	.016		4.48	.50	.35	5.33	6.20	
	0100 8" thick, hollow		5,600	.013		5	.40	.28	5.68	6.50	
	0150 10" thick		8,800	.008		5.70	.25	.18	6.13	6.90	
	0200 12" thick		8,000	.009		6.15	.28	.20	6.63	7.45	
650	0010 PRESTRESSED CONCRETE pretensioned, see division 03400										650
	0020 See also division 03230-600										
	0100 Post-tensioned in place, small job	C-17B	8.50	9.647	C.Y.	215	281	34	530	720	
	0200 Large job		10	8.200		161	239	29	429	585	

How to Use the Unit Price Pages

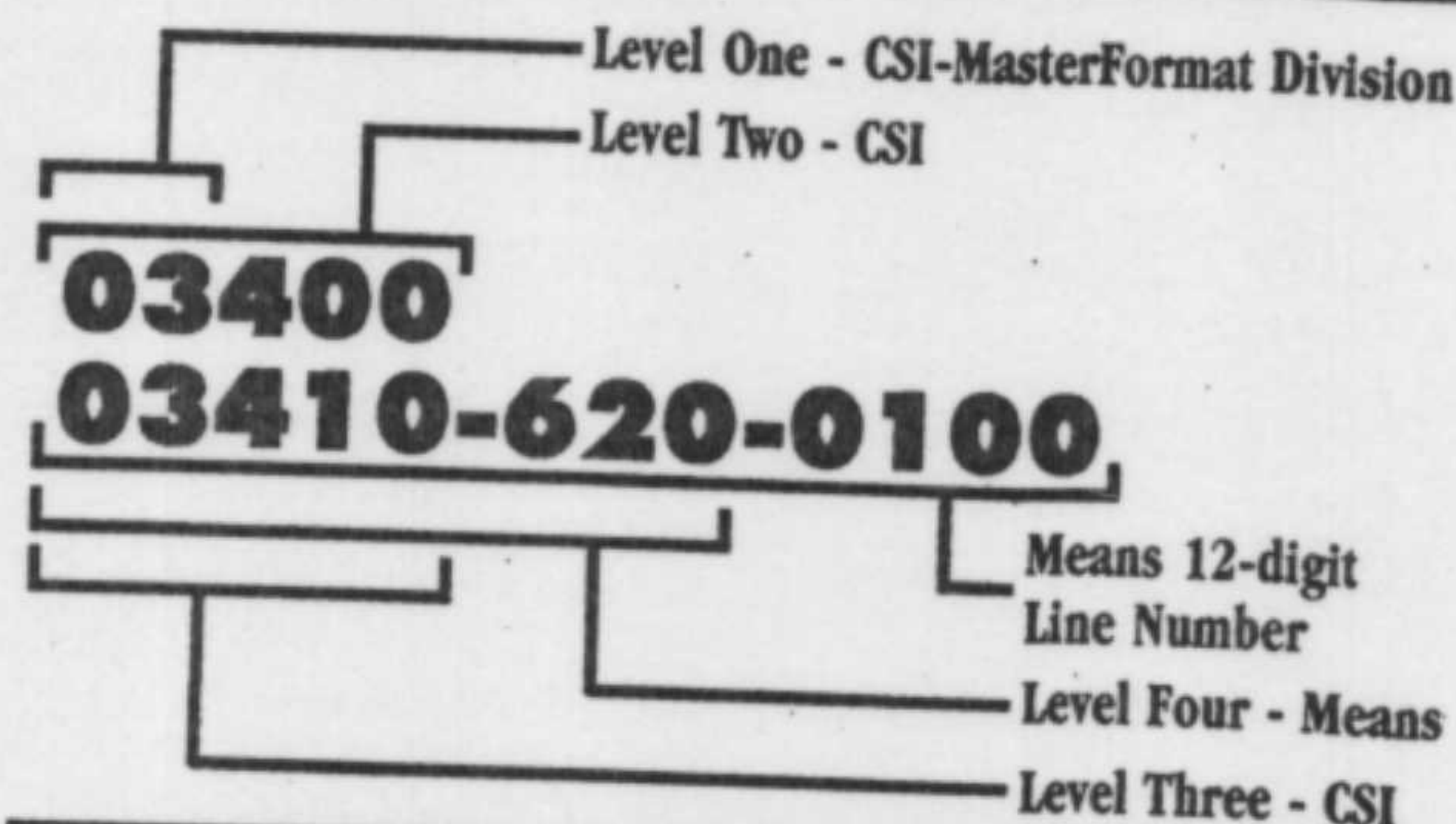
The following is a detailed explanation of a sample entry in the Unit Price Section. Next to each bold number below is the item being described with appropriate component of the sample entry following in parenthesis. Some prices are listed as bare costs, others as costs that include overhead and profit of the installing contractor. In most cases, if the work is to be subcontracted, the general contractor will need to add an additional markup (R.S. Means suggests using 10%) to the figures in the column "Total Incl. O&P."

1 Division Number/Title (03400/Precast Concrete)

Use the Unit Price Section Table of Contents to locate specific items. The sections are classified according to the CSI MasterFormat (1995 Edition).

2 Line Numbers (03410 620 0100)

Each unit price line item has been assigned a unique 12-digit code based on the CSI MasterFormat classification.



3 Description (SLABS, etc.)

Each line item is described in detail. Sub-items and additional sizes are indented beneath the appropriate line items. The first line or two after the main item (in boldface) may contain descriptive information that pertains to all line items beneath this boldface listing.

Items which include the symbol **CN** are updated in the Key Material Price Section of the *DesignBuildIntelligence* quarterly publication.

4 Reference Number Information

R03410-030

You'll see reference numbers shown in bold rectangles at the beginning of some sections. These refer to related items in the Reference Section, visually identified by a vertical gray bar on the edge of pages.

The relation may be: (1) an estimating procedure that should be read before estimating, (2) an alternate pricing method, or (3) technical information.

The "R" designates the Reference Section. The numbers refer to the MasterFormat classification system.

It is strongly recommended that you review all reference numbers that appear within the section in which you are working.

Example: The rectangle number above is directing you to refer to the reference number R03410-030. This particular reference number shows delivered and erected costs for standard prestressed, precast concrete shapes and other detail information.

03400 Precast Concrete											
03410 Plant Precast											
400	0010	JOISTS 40 psf L.L., 6" deep for 12' spans	C-12	600	080	L.F.	2000 BARE COSTS				TOTAL INCL O&P
							MAT.	LABOR	EQUIP.	TOTAL	
	0050	8" deep for 16' spans		575	.083		5.70	2.22	.76	8.68	10.55
620	0010	SLABS Prestressed roof/floor slabs, solid, grouted, 4" thick	C-11	3,600	.020	S.F.	6.70	2.32	.99	9.81	11.85
	0050	6" thick		4,500	.016		4.65	.62	.35	5.70	6.70
	0100	8" thick, hollow		5,600	.013		4.48	.50	.28	5.33	6.20
	0150	10" thick		8,000	.008		6.00	.40	.28	6.68	6.50
	0200	12" thick		8,000	.009		5.70	.25	.18	6.13	6.90
							6.15	.28	.20	6.63	7.45
650	0010	PRESTRESSED CONCRETE pretensioned, see division 03400									650
	0020	See also division 03230-600									
	0100	Post-tensioned in place, small job									
	0200	Large job									
			C-17B	8.50	9.647	C.Y.	215	281	34	530	720
				10	8.200	"	161	239	29	429	585

5 Crew (C-11)

The "Crew" column designates the typical trade or crew used to install the item. If an installation can be accomplished by one trade and requires no power equipment, that trade and the number of workers are listed (for example, "2 Struc. Steel Workers"). If an installation requires a composite crew, a crew code designation is listed (for example, "C-11"). You'll find full details on all composite crews in the Crew Listings.

- For a complete list of all trades utilized in this book and their abbreviations, see the inside back cover.

Crews

Crew No.	Bare Costs		Incl. Subs O & P		Cost Per Labor-Hour	
	Hr.	Daily	Hr.	Daily	Bare Costs	Incl. O&P
Crew C-11						
1 Struc. Steel Foreman	\$33.70	\$269.60	\$61.70	\$493.60	\$30.94	\$54.76
6 Struc. Steel Workers	31.70	1521.60	58.05	2786.40		
1 Equip. Oper. (crane)	29.90	239.20	45.40	363.20		
1 Equip. Oper. Oiler	24.65	197.20	37.45	299.60		
1 Truck Crane, 150 Ton		1563.00		1719.30	21.71	23.88
72 L.H., Daily Totals		\$3790.60		\$5662.10	\$52.65	\$78.64

6 Productivity: Daily Output (5600)/Labor-Hours (.013)

The "Daily Output" represents the typical number of units the designated crew will install in a normal 8-hour day. To find out the number of days the given crew would require to complete the installation, divide your quantity by the daily output. For example:

Quantity	÷	Daily Output	=	Duration
15,000 S.F.	÷	5600 S.F./Crew Day	=	2.68 Crew Days

The "Labor-Hours" figure represents the number of labor-hours required to install one unit of work. To find out the number of labor-hours required for your particular task, multiply the quantity of the item times the number of labor-hours shown. For example:

Quantity	x	Productivity Rate	=	Duration
15,000 S.F.	x	.013 Labor-Hours/S.F.	=	195 Labor-Hours

7 Unit (S.F.)

The abbreviated designation indicates the unit of measure upon which the price, production, and crew are based (S.F. = Square Foot). For a complete listing of abbreviations refer to the Abbreviations Listing in the Reference Section of this book.

8 Bare Costs:

Mat. (Bare Material Cost) (5.00)

The unit material cost is the "bare" material cost with no overhead and profit included. Costs shown reflect national average material prices for January of the current year and include delivery to the job site. No sales taxes are included.

Labor (.40)

The unit labor cost is derived by multiplying bare labor-hour costs for Crew C-11 by labor-hour units. The bare labor-hour cost is found in the Crew Section under C-11. (If a trade is listed, the hourly labor cost—the wage rate—is found on the inside back cover.)

Labor-Hour Cost Crew C-11	x	Labor-Hour Units	=	Labor
\$30.94	x	.013	=	\$.40

Equip. (Equipment) (.28)

Equipment costs for each crew are listed in the description of each crew. Tools or equipment whose value justifies purchase or ownership by a contractor are considered overhead as shown on the inside back cover. The unit equipment cost is derived by multiplying the bare equipment hourly cost by the labor-hour units.

Equipment Cost Crew C-11	x	Labor-Hour Units	=	Equip.
\$21.71	x	.013	=	\$.28

Total (5.68)

The total of the bare costs is the arithmetic total of the three previous columns: mat., labor, and equip.

Material	+	Labor	+	Equip.	=	Total
\$5.00	+	\$.40	+	\$.28	=	\$5.68

9 Total Costs Including O&P

This figure is the sum of the bare material cost plus 10% for profit; the bare labor cost plus total overhead and profit (per the inside back cover or, if a crew is listed, from the crew listings); and the bare equipment cost plus 10% for profit.

Material is Bare Material Cost + 10% = 5.00 + .50	=	\$5.50
Labor for Crew C-11 = Labor-Hour Cost (54.76) x Labor-Hour Units (.013)	=	\$.71
Equip. is Bare Equip. Cost + 10% = .28 + .03	=	\$.31
Total	=	\$6.52

03300 | Cast-In-Place Concrete

03370 Specially Placed Concrete					2000 BARE COSTS				TOTAL INCL O&P
		CREW	DAILY OUTPUT	LABOR- HOURS	UNIT	MAT.	LABOR	EQUIP.	
300	0300	C-16 ↓	1,000	.072	S.F.	1.75	1.90	.66	5.65
	0350		500	.144		2.71	3.79	1.31	10.40
	0500		750	.096		2.59	2.53	.87	7.80
	0550		350	.206		4.03	5.40	1.87	15.10
	0900	C-10 "	1,000	.024		.58	.61		1.19
	0950		275	.087		1.85	2.22		4.07
	1100						50%		
	1150						110%		
03390 Concrete Curing									
200	0010	2 Clab ↓	55	.291	C.S.F.	3.47	6.45		9.92
	0100		55	.291		5.65	6.45		12.10
	0200		70	.229		4.89	5.10		9.99
	0300		95	.168		3.52	3.75		7.27
	0400				S.F.	1.10			1.10
	0450					2.75			2.75
	0500					4.50			4.50
	0600					6			6
	0710					.16			.16
	0800					.27			.27

03400 | Precast Concrete

03410 Plant Precast					2000 BARE COSTS				TOTAL INCL O&P
		CREW	DAILY OUTPUT	LABOR- HOURS	UNIT	MAT.	LABOR	EQUIP.	
100	0011	C-11	32	2.250	Ea.	1,350	69.50	49	1,468.50
	1000				L.F.	15%			1,675
	1050				"	5.55			6.10
	1200	C-11	32	2.250	Ea.	925	69.50	49	1,043.50
	1250		24	3		1,700	93	65	2,100
	1300		22	3.273		2,450	101	71	2,950
	1400		24	3		2,175	93	65	2,600
	1450		20	3.600		3,050	111	78	3,625
	1500		16	4.500		4,325	139	97.50	5,100
	1600		20	3.600		4,025	111	78	4,700
	1650		16	4.500		4,900	139	97.50	5,750
	1700		12	6		6,000	186	130	7,075
	2000		32	2.250		1,600	69.50	49	1,718.50
	2050		24	3		2,550	93	65	3,050
	2100		22	3.273		3,600	101	71	4,200
	2200		24	3		3,650	93	65	4,225
	2250		20	3.600		4,975	111	78	5,750
	2300		16	4.500		5,150	139	97.50	6,000
	2500		20	3.600		6,850	111	78	7,825
	2550		16	4.500		7,500	139	97.50	8,600
	2600		12	6		9,150	186	130	10,600
210	0010	C-11	120	.600	L.F.	66.50	18.55	13.05	98.10
	0050		96	.750		105	23	16.30	175
	0300		192	.375		99	11.60	8.15	138
	0350		144	.500		132	15.45	10.85	184

Crews

Crew No.	Bare Costs		Incl. Subs O & P		Cost Per Labor-Hour	
	Hr.	Daily	Hr.	Daily	Bare Costs	Incl. O&P
Crew C-8E						
1 Labor Foreman (outside)	\$24.25	\$194.00	\$38.15	\$305.20	\$25.29	\$38.85
1 Laborers	22.25	178.00	35.00	280.00		
1 Cement Finisher	27.00	216.00	40.25	322.00		
1 Equipment Operator (light)	27.65	221.20	42.00	336.00		
1 Compressor, 250 CFM		127.00		139.70		
2 Hoses, 1", 50'		10.40		11.45		
1 Concrete Pump (small)		656.00		721.60	24.79	27.27
32 L.H., Daily Totals		\$1602.60		\$2115.95	\$50.08	\$66.12
Crew C-10						
1 Laborer	\$22.25	\$178.00	\$35.00	\$280.00	\$25.42	\$38.50
2 Cement Finishers	27.00	432.00	40.25	644.00		
24 L.H., Daily Totals		\$610.00		\$924.00	\$25.42	\$38.50
Crew C-11						
1 Struc. Steel Foreman	\$33.70	\$269.60	\$61.70	\$493.60	\$30.94	\$54.76
6 Struc. Steel Workers	31.70	1521.60	58.05	2786.40		
1 Equip. Oper. (crane)	29.90	239.20	45.40	363.20		
1 Equip. Oper. Oiler	24.65	197.20	37.45	299.60		
1 Truck Crane, 150 Ton		1563.00		1719.30	21.71	23.88
72 L.H., Daily Totals		\$3790.60		\$5662.10	\$52.65	\$78.64
Crew C-12						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$27.79	\$43.46
3 Carpenters	28.15	675.60	44.30	1063.20		
1 Laborer	22.25	178.00	35.00	280.00		
1 Equip. Oper. (crane)	29.90	239.20	45.40	363.20		
1 Hyd. Crane, 12 Ton		453.45		498.80	9.45	10.39
48 L.H., Daily Totals		\$1787.45		\$2584.80	\$37.24	\$53.85
Crew C-13						
1 Struc. Steel Worker	\$31.70	\$253.60	\$58.05	\$464.40	\$30.52	\$53.47
1 Welder	31.70	253.60	58.05	464.40		
1 Carpenter	28.15	225.20	44.30	354.40		
1 Gas Welding Machine		84.00		92.40	3.50	3.85
24 L.H., Daily Totals		\$816.40		\$1375.60	\$34.02	\$57.32
Crew C-14						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$27.47	\$43.84
5 Carpenters	28.15	1126.00	44.30	1772.00		
4 Laborers	22.25	712.00	35.00	1120.00		
4 Rodmen (reinf.)	31.50	1008.00	54.20	1734.40		
2 Cement Finishers	27.00	432.00	40.25	644.00		
1 Equip. Oper. (crane)	29.90	239.20	45.40	363.20		
1 Equip. Oper. Oiler	24.65	197.20	37.45	299.60		
1 Crane, 80 Ton, & Tools		1098.00		1207.80	7.63	8.39
144 L.H., Daily Totals		\$5053.60		\$7520.60	\$35.10	\$52.23
Crew C-14A						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$28.28	\$45.08
16 Carpenters	28.15	3603.20	44.30	5670.40		
4 Rodmen (reinf.)	31.50	1008.00	54.20	1734.40		
2 Laborers	22.25	356.00	35.00	560.00		
1 Cement Finisher	27.00	216.00	40.25	322.00		
1 Equip. Oper. (med)	28.85	230.80	43.80	350.40		
1 Gas Engine Vibrator		38.00		41.80		
1 Concrete Pump (small)		656.00		721.60	3.47	3.82
200 L.H., Daily Totals		\$6349.20		\$9780.20	\$31.75	\$48.90

Crew No.	Bare Costs		Incl. Subs O & P		Cost Per Labor-Hour	
	Hr.	Daily	Hr.	Daily	Bare Costs	Incl. O&P
Crew C-14B						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$28.23	\$44.90
16 Carpenters	28.15	3603.20	44.30	5670.40		
4 Rodmen (reinf.)	31.50	1008.00	54.20	1734.40		
2 Laborers	22.25	356.00	35.00	560.00		
2 Cement Finishers	27.00	432.00	40.25	644.00		
1 Equip. Oper. (med)	28.85	230.80	43.80	350.40		
1 Gas Engine Vibrator		38.00		41.80		
1 Concrete Pump (small)		656.00		721.60	3.34	3.67
208 L.H., Daily Totals		\$6565.20		\$10102.20	\$31.57	\$48.57
Crew C-14C						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$27.00	\$42.99
6 Carpenters	28.15	1351.20	44.30	2126.40		
2 Rodmen (reinf.)	31.50	504.00	54.20	867.20		
4 Laborers	22.25	712.00	35.00	1120.00		
1 Cement Finisher	27.00	216.00	40.25	322.00		
1 Gas Engine Vibrator		38.00		41.80	.34	.37
112 L.H., Daily Totals		\$3062.40		\$4857.00	\$27.34	\$43.36
Crew C-14D						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$28.01	\$44.29
18 Carpenters	28.15	4053.60	44.30	6379.20		
2 Rodmen (reinf.)	31.50	504.00	54.20	867.20		
2 Laborers	22.25	356.00	35.00	560.00		
1 Cement Finisher	27.00	216.00	40.25	322.00		
1 Equip. Oper. (med.)	28.85	230.80	43.80	350.40		
1 Gas Engine Vibrator		38.00		41.80		
1 Concrete Pump (small)		656.00		721.60	3.47	3.82
200 L.H., Daily Totals		\$6295.60		\$9621.80	\$31.48	\$48.11
Crew C-14E						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$27.84	\$45.28
2 Carpenters	28.15	450.40	44.30	708.80		
4 Rodmen (reinf.)	31.50	1008.00	54.20	1734.40		
3 Laborers	22.25	534.00	35.00	840.00		
1 Cement Finisher	27.00	216.00	40.25	322.00		
1 Gas Engine Vibrator		38.00		41.80	.43	.48
88 L.H., Daily Totals		\$2487.60		\$4026.60	\$28.27	\$45.76
Crew C-14F						
1 Laborer Foreman (out)	\$24.25	\$194.00	\$38.15	\$305.20	\$25.64	\$38.85
2 Laborers	22.25	356.00	35.00	560.00		
6 Cement Finishers	27.00	1296.00	40.25	1932.00		
1 Gas Engine Vibrator		38.00		41.80	.53	.58
72 L.H., Daily Totals		\$1884.00		\$2839.00	\$26.17	\$39.43
Crew C-14G						
1 Laborer Foreman (out)	\$24.25	\$194.00	\$38.15	\$305.20	\$25.25	\$38.45
2 Laborers	22.25	356.00	35.00	560.00		
4 Cement Finishers	27.00	864.00	40.25	1288.00		
1 Gas Engine Vibrator		38.00		41.80	.68	.75
56 L.H., Daily Totals		\$1452.00		\$2195.00	\$25.93	\$39.20
Crew C-14H						
1 Carpenter Foreman (out)	\$30.15	\$241.20	\$47.45	\$379.60	\$27.87	\$44.25
2 Carpenters	28.15	450.40	44.30	708.80		
1 Rodman (reinf.)	31.50	252.00	54.20	433.60		
1 Laborer	22.25	178.00	35.00	280.00		
1 Cement Finisher	27.00	216.00	40.25	322.00		
1 Gas Engine Vibrator		38.00		41.80	.79	.87
48 L.H., Daily Totals		\$1375.60		\$2165.80	\$28.66	\$45.12

How to Use the City Cost Indexes

What you should know before you begin

Means City Cost Indexes (CCI) are an extremely useful tool to use when you want to compare costs from city to city and region to region.

This publication contains average construction cost indexes for 718 U.S. and Canadian cities covering over 930 three-digit zip code locations, as listed directly under each city.

Keep in mind that a City Cost Index number is a *percentage ratio* of a specific city's cost to the national average cost of the same item at a stated time period.

In other words, these index figures represent relative construction *factors* (or, if you prefer, multipliers) for Material and Installation costs, as well as the weighted average for Total In Place costs for each CSI MasterFormat division. Installation costs include both labor and equipment rental costs.

The 30 City Average Index is the average of 30 major U.S. cities and serves as a National Average.

Index figures for both material and installation are based on the 30 major city average of 100 and represent the cost relationship as of July 1, 1999. The index for each division is computed from representative material and labor quantities for that division. The weighted average for each city is a weighted total of the components listed above it, but does not include relative productivity between trades or cities.

As changes occur in local material prices, labor rates and equipment rental rates, the impact of these changes should be accurately measured by the change in the City Cost Index for each particular city (as compared to the 30 City Average).

Therefore, if you know (or have estimated) building costs in one city today, you can easily convert those costs to expected building costs in another city.

In addition, by using the Historical Cost Index, you can easily convert National Average building costs at a particular time to the approximate building costs for some other time. The City Cost Indexes can then be applied to calculate the costs for a particular city.

Quick Calculations

Location Adjustment Using the City Cost Indexes:

$$\frac{\text{Index for City A}}{\text{Index for City B}} \times \text{Cost in City B} = \text{Cost in City A}$$

Time Adjustment for the National Average Using the Historical Cost Index:

$$\frac{\text{Index for Year A}}{\text{Index for Year B}} \times \text{Cost in Year B} = \text{Cost in Year A}$$

Adjustment from the National Average:

$$\frac{\text{Index for City A}}{100} \times \text{National Average Cost} = \text{Cost in City A}$$

Since each of the other R.S. Means publications contains many different items, any *one* item multiplied by the particular city index may give incorrect results. However, the larger the number of items compiled, the closer the results should be to actual costs for that particular city.

The City Cost Indexes for Canadian cities are calculated using Canadian material and equipment prices and labor rates, in Canadian dollars. Therefore, indexes for Canadian cities can be used to convert U.S. National Average prices to local costs in Canadian dollars.

How to use this section

1. Compare costs from city to city.

In using the Means Indexes, remember that an index number is not a fixed number but a *ratio*. It's a percentage ratio of a building component's cost at any stated time to the National Average cost of same component at the same time period. Put in the form of an equation:

$$\frac{\text{Specific City Cost}}{\text{National Average Cost}} \times 100 = \text{City Index Number}$$

Therefore, when making cost comparisons between cities, do not subtract one city's index number from the index number of another, and read the result as a percentage difference. Instead, divide one city's index number by that of the other city. The resulting number may then be used as a multiplier to calculate cost differences from city to city.

The formula used to find cost differences between cities for the purpose of comparison is as follows:

$$\frac{\text{City A Index}}{\text{City B Index}} \times \text{City B Cost (Known)} = \text{City A Cost (Unknown)}$$

In addition, you can use *Means CCI* to calculate and compare costs division by division between cities using the same basic formula. (Just be sure that you're comparing similar divisions.)

2. Compare a specific city's construction costs with the National Average.

When you're studying construction location feasibility, it's advisable to compare a prospective project's cost index with an index of the National Average cost.

For example, divide the weighted average index of construction costs for a specific city by that of the 30 City Average, which = 100.

$$\frac{\text{City Index}}{100} = \% \text{ of National Average}$$

As a result, you get a ratio that indicates the relative cost of construction in that city in comparison with the National Average.

3. Convert U.S. National Average to actual costs in Canadian City.

$$\frac{\text{Index for Canadian City}}{100} \times \text{National Average Cost} = \text{Cost in Canadian City in \$ CAN}$$

The 30 major U.S. cities used to calculate the National Average are:

Atlanta, GA	Memphis, TN
Baltimore, MD	Milwaukee, WI
Boston, MA	Minneapolis, MN
Buffalo, NY	Nashville, TN
Chicago, IL	New Orleans, LA
Cincinnati, OH	New York, NY
Cleveland, OH	Philadelphia, PA
Columbus, OH	Phoenix, AZ
Dallas, TX	Pittsburgh, PA
Denver, CO	St. Louis, MO
Detroit, MI	San Antonio, TX
Houston, TX	San Diego, CA
Indianapolis, IN	San Francisco, CA
Kansas City, MO	Seattle, WA
Los Angeles, CA	Washington, DC

F.Y.I.: The CSI MasterFormat Divisions

1. General Requirements
2. Site Work
3. Concrete
4. Masonry
5. Metals
6. Wood & Plastics
7. Thermal & Moisture Protection
8. Doors & Windows
9. Finishes
10. Specialties
11. Equipment
12. Furnishings
13. Special Construction
14. Conveying Systems
15. Mechanical
16. Electrical

The information presented in the CCI is organized according to the Construction Specifications Institute (CSI) MasterFormat.

What the CCI does not indicate

The weighted average for each city is a total of the components listed above weighted to reflect typical usage, but it does *not* include the productivity variations between trades or cities. In addition, the CCI does not take into consideration factors such as the following:

- managerial efficiency
- competitive conditions
- automation
- restrictive union practices
- unique local requirements
- regional variations due to specific building codes

4. Adjust construction cost data based on a National Average. When you use a source of construction cost data which is based on a National Average (such as *Means cost data publications*), it is necessary to adjust those costs to a specific location.

$$\frac{\text{City Index}}{100} \times \text{National Average Costs} = \text{City Cost (Unknown)}$$

5. When applying the City Cost Indexes to demolition projects, use the appropriate division installation index. For example, for removal of existing doors and windows, use the Division 8 index.

What you might like to know about how we developed the Indexes

To create a reliable index, R.S. Means researched the building type most often constructed in the United States and Canada. Because it was concluded that no one type of building completely represented the building construction industry, nine different types of buildings were combined to create a composite model.

The exact material, labor and equipment quantities are based on detailed analysis of these nine building types, then each quantity is weighted in proportion to expected usage. These various material items, labor hours, and equipment rental rates are thus combined to form a composite building representing as closely as possible the actual usage of materials, labor and equipment used in the North American Building Construction Industry.

The following structures were chosen to make up that composite model:

1. Factory, 1 story
2. Office, 2-4 story
3. Store, Retail
4. Town Hall, 2-3 story
5. High School, 2-3 story
6. Hospital, 4-8 story
7. Garage, Parking
8. Apartment, 1-3 story
9. Hotel/Motel, 2-3 story

For the purposes of ensuring the timeliness of the data, the components of the index for the composite model have been streamlined. They currently consist of:

- specific quantities of 66 commonly used construction materials;
- specific labor-hours for 21 building construction trades; and
- specific days of equipment rental for 6 types of construction equipment (normally used to install the 66 material items by the 21 trades.)

A sophisticated computer program handles the updating of all costs for each city on a quarterly basis. Material and equipment price quotations are gathered quarterly from 718 cities in the United States and Canada. These prices and the latest negotiated labor wage rates for 21 different building trades are used to compile the quarterly update of the City Cost Index.

City Cost Indexes

DIVISION		SOUTH DAKOTA												TENNESSEE					
		MOBRIDGE			PIERRE			RAPID CITY			SIOUX FALLS			WATERTOWN			CHATTANOOGA		
		576			575			577			570 - 571			572			373 - 374		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
2	SITE CONSTRUCTION	77.1	95.8	91.4	77.8	95.7	91.6	78.1	95.5	91.4	79.1	97.7	93.4	77.0	95.8	91.4	106.0	98.0	99.9
3100	CONCRETE FORMS & ACCESSORIES	81.3	46.7	51.6	92.1	49.2	55.2	105.3	44.8	53.3	92.1	47.1	53.5	76.8	46.7	51.0	96.4	53.9	59.9
3200	CONCRETE REINFORCEMENT	106.6	64.2	82.6	104.0	72.9	86.4	97.7	73.1	83.8	97.7	73.7	84.1	101.1	64.2	80.2	93.8	50.4	69.2
3300	CAST-IN-PLACE CONCRETE	96.0	58.2	80.3	96.0	53.8	78.4	95.3	50.6	76.7	99.3	58.4	82.3	96.0	58.2	80.3	103.6	55.7	83.6
3	CONCRETE	91.9	55.2	73.4	92.3	56.4	74.2	92.1	53.3	72.6	93.1	57.2	75.0	90.8	55.2	72.9	93.4	55.8	74.5
4	MASONRY	106.7	61.4	78.5	106.7	51.8	72.5	106.9	48.8	70.7	103.9	64.3	79.2	130.4	61.4	87.5	95.7	53.4	69.4
5	METALS	105.1	74.1	94.0	105.6	76.8	95.3	107.7	77.1	96.7	108.2	78.3	97.5	104.9	74.1	93.8	97.4	83.9	92.6
6	WOOD & PLASTICS	82.9	44.4	63.0	94.5	48.0	70.5	105.6	44.9	74.2	94.5	44.4	68.6	78.0	44.4	60.6	96.1	55.0	74.9
7	THERMAL & MOISTURE PROTECTION	96.0	55.6	77.0	96.3	53.3	76.2	96.8	52.1	75.9	96.3	58.4	78.5	95.6	55.6	76.9	102.9	55.8	80.9
8	DOORS & WINDOWS	100.6	48.1	87.8	102.6	52.5	90.4	103.6	50.8	90.7	103.6	50.5	90.7	97.3	48.1	85.3	100.1	54.3	89.0
200	PLASTER & GYPSUM BOARD	93.6	43.2	62.4	97.4	46.9	66.1	98.5	43.7	64.6	98.5	43.2	64.3	91.5	43.2	61.6	92.4	54.2	68.7
500	CEILINGS	109.5	43.2	66.0	108.2	46.9	67.9	113.7	43.7	67.7	113.7	43.2	67.4	108.2	43.2	65.5	93.4	54.2	67.6
600	FLOORING	106.3	72.3	98.0	111.4	51.5	96.8	111.4	60.5	99.0	111.4	77.3	103.1	104.4	72.3	96.5	98.1	60.8	89.0
900	PAINTS & COATINGS	104.7	42.5	68.3	104.7	42.5	68.3	104.7	42.5	68.3	104.7	42.5	68.3	104.7	42.5	68.3	105.8	51.6	74.1
	FINISHES	103.0	50.7	76.3	105.0	48.6	76.2	106.2	47.1	76.0	106.2	51.8	78.4	101.8	50.7	75.7	97.5	55.0	75.8
- 14	TOTAL DIV. 10000 - 14000	100.0	62.1	92.0	100.0	62.6	92.1	100.0	59.8	91.5	100.0	62.2	92.0	100.0	62.1	92.0	100.0	67.7	93.2
	MECHANICAL	96.9	43.6	72.8	100.1	43.7	74.5	100.1	40.5	73.1	100.1	43.8	74.6	96.9	43.6	72.8	100.2	52.4	78.6
	ELECTRICAL	100.2	50.1	66.1	94.0	54.6	67.2	94.7	54.6	67.4	93.7	68.9	76.8	96.4	50.1	64.9	102.8	66.6	78.1
- 16	WEIGHTED AVERAGE	98.9	57.7	79.0	99.9	57.9	79.5	100.7	56.2	79.1	100.5	62.3	82.0	99.2	57.7	79.1	98.8	63.6	81.7
DIVISION		TENNESSEE																	
		COLUMBIA			COOKEVILLE			JACKSON			JOHNSON CITY			KNOXVILLE			MCKENZIE		
		384			385			383			376			377 - 379			382		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
	SITE CONSTRUCTION	98.7	84.8	88.0	105.7	85.3	90.0	106.9	96.0	98.5	116.0	86.7	93.5	93.3	86.7	88.2	104.9	85.5	90.0
00	CONCRETE FORMS & ACCESSORIES	78.1	52.1	55.8	78.3	29.9	36.7	86.7	39.0	45.7	79.8	56.1	59.5	95.3	56.3	61.8	88.8	29.5	37.9
00	CONCRETE REINFORCEMENT	99.3	52.3	72.6	99.3	23.8	56.5	99.6	49.8	71.4	97.8	50.6	71.0	93.8	50.6	69.3	100.3	23.5	56.7
00	CAST-IN-PLACE CONCRETE	93.9	56.8	78.4	106.4	37.6	77.7	103.8	39.4	76.9	83.3	62.2	74.5	97.3	57.0	80.5	104.0	38.1	76.5
	CONCRETE	92.9	55.7	74.2	102.8	34.0	68.2	94.7	43.5	68.9	98.1	59.1	78.5	90.5	57.3	73.8	101.8	34.0	67.7
	MASONRY	106.6	49.4	71.0	101.2	26.8	54.9	107.0	32.1	60.3	103.8	53.2	72.3	72.9	53.2	60.6	104.3	43.9	66.6
	METALS	94.0	83.2	90.1	94.1	69.1	85.1	95.9	80.4	90.4	95.1	83.5	91.0	97.7	83.7	92.7	94.1	70.5	85.6
	WOOD & PLASTICS	68.8	57.8	63.2	69.1	30.8	49.3	83.7	41.3	61.8	71.6	58.4	64.8	87.9	58.4	72.6	80.5	29.9	54.4
	THERMAL & MOISTURE PROTECTION	93.7	51.8	74.1	94.2	34.4	66.2	101.2	41.1	73.0	97.0	56.7	78.1	94.7	56.1	76.6	94.3	37.0	67.5
	DOORS & WINDOWS	92.2	54.1	82.9	92.2	28.7	76.7	100.7	45.3	87.2	96.4	57.9	87.0	93.1	57.9	84.5	92.2	28.5	76.7
10	PLASTER & GYPSUM BOARD	100.2	57.0	73.5	100.2	29.2	56.2	98.8	40.0	62.4	102.8	57.6	74.8	109.2	57.6	77.3	103.9	28.2	57.1
10	CEILINGS	88.0	57.0	67.7	88.0	29.2	49.4	96.9	40.0	59.6	83.4	57.6	66.5	90.3	57.6	68.8	88.0	28.2	48.8
10	FLOORING	88.2	31.6	74.4	88.3	29.4	74.0	89.6	29.4	75.0	91.9	62.5	84.7	97.2	62.5	88.7	91.9	60.5	84.2
10	PAINTS & COATINGS	94.1	30.4	56.8	94.1	28.3	55.6	95.4	33.7	59.4	103.6	66.1	81.7	103.6	66.1	81.7	94.1	32.3	58.0
	FINISHES	96.7	47.1	71.4	97.1	29.7	62.7	96.3	37.3	66.2	98.4	58.6	78.1	92.9	58.6	75.4	98.7	35.8	66.6
14	TOTAL DIV. 10000 - 14000	100.0	63.2	92.2	100.0	29.3	85.0	100.0	61.1	91.8	100.0	69.2	93.5	100.0	69.4	93.5	100.0	27.8	84.7
	MECHANICAL	98.2	47.9	75.4	98.2	28.1	66.4	100.1	46.2	75.7	99.8	55.6	79.8	99.8	59.6	81.6	98.2	25.6	65.3
	ELECTRICAL	90.4	34.9	52.6	93.2	26.7	47.8	98.4	38.1	57.3	90.4	40.7	56.5	99.7	65.4	76.3	92.8	22.1	44.6
16	WEIGHTED AVERAGE	95.6	54.6	75.7	97.0	38.4	68.6	98.8	50.3	75.3	98.0	59.8	79.5	94.9	64.5	80.2	97.3	39.7	69.4
DIVISION		TENNESSEE						TEXAS											
		MEMPHIS			NASHVILLE			ABILENE			AMARILLO			AUSTIN			BEAUMONT		
		375,380 - 381			370 - 372			795 - 796			790 - 791			786 - 787			776 - 777		
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL
	SITE CONSTRUCTION	100.6	92.5	94.4	96.1	100.7	99.7	103.1	84.4	88.8	103.2	85.5	89.6	90.3	86.5	87.4	98.5	82.8	86.4
1	CONCRETE FORMS & ACCESSORIES	96.3	61.3	66.2	96.0	68.6	72.4	96.6	54.3	60.3	100.3	60.8	66.4	99.0	65.5	70.2	106.0	71.6	76.5
1	CONCRETE REINFORCEMENT	93.6	61.0	75.1	93.4	61.7	75.4	95.7	63.3	77.3	95.7	56.9	73.7	93.6	64.9	77.3	93.8	59.3	74.2
1	CAST-IN-PLACE CONCRETE	97.4	67.7	85.0	91.0	66.7	80.9	99.1	50.9	79.0	102.8	60.2	85.0	89.2	62.5	78.1	92.8	68.5	82.7
	CONCRETE	90.8	65.4	78.0	87.7	68.3	77.9	90.7	55.8	73.1	92.7	60.6	76.6	81.2	64.9	73.0	88.7	68.6	78.6
	MASONRY	82.5	64.3	71.2	84.6	62.6	70.9	99.8	54.4	71.5	103.5	52.6	71.8	100.0	59.3	74.7	103.0	71.3	83.2

Quick Start

2003 RS Means Assemblies Cost Data

If you feel you are ready to use this book and don't think you need the detailed instructions that begin on the following page, this Quick Start section is for you.

These steps will allow you to get started estimating in a matter of minutes.

1 Find each cost data section you need in the Assemblies Table of Contents. The cost data for Assemblies has been divided into 7 divisions according to the UNIFORMAT II System.

2 Turn to the indicated section and locate the assemblies table you need for your estimate. Portions of a sample page layout from the Assemblies Cost Tables appear below.

The Assemblies (not shown in full here) are generally separated into three parts: 1) an illustration of the system to be estimated; 2) the components and related costs of a typical system; and 3) the costs for similar systems with dimensional and/or size variations.

- If there is a reference number listed, for example, RB1010-100, it refers to additional information you may find useful. See the Reference Section for detailed information.

3 Determine the total number of units your job will require. Note the unit of measure for the assembly or system you're estimating is listed in the System Components section.

4 Then multiply the total units by the "Total" in the right-hand column, which is the total cost including the installing contractor's overhead and profit. (See the "How To Use the Assemblies Cost Tables" section for a complete explanation.)

Material and equipment cost figures include a 10% markup. For labor markups, see the inside back cover of this book. If the work is to be subcontracted, add the general contractor's markup, approximately 10%.

5 The price you calculate will be an estimate for a completed assembly or system.

6 Compile a list of all assemblies included in the total project. Summarize cost information, and add project overhead.

Localize costs by using the City Cost Indexes or Location Factors found in the Reference Section.

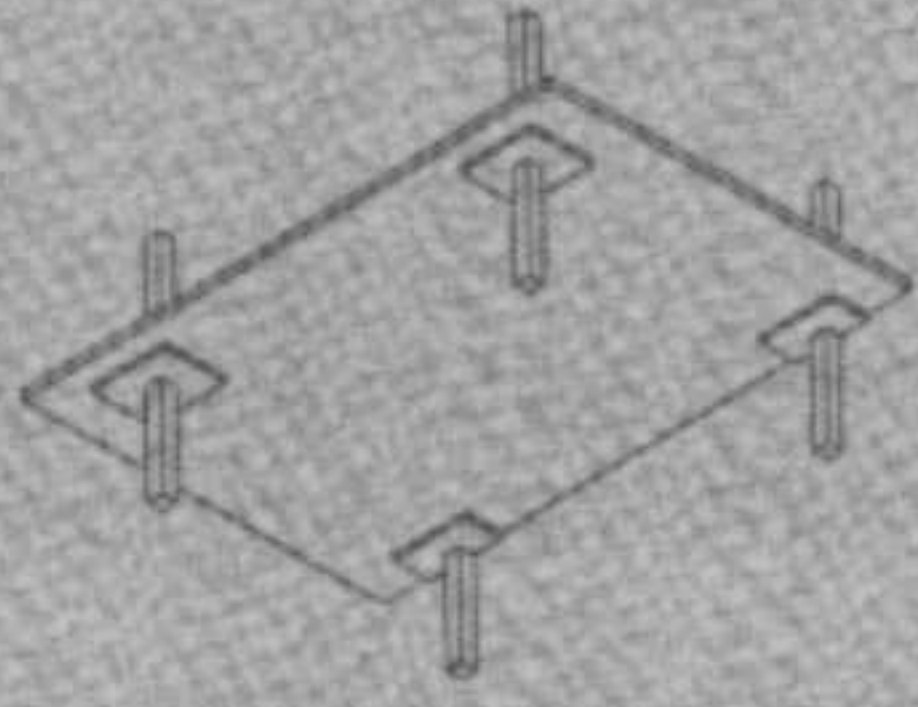
For a more complete explanation of the way costs are derived, please see the following section.

Commonly Used Abbreviations

R.S. Means utilizes standard industry abbreviations. There is a complete glossary of abbreviations in the reference section. The following are a few of the most commonly used abbreviations you'll find in the book:

B.F.	Board Feet
C	Hundred; Centigrade
C.Y.	Cubic Yard (27 Cubic Feet)
Cwt	100 Pounds
Ea.	Each
Flr.	Floor
L.F.	Linear Foot
Lb.	Pound
MBF	Thousand Board Feet
Opng.	Opening
S.F.	Square Foot
SFCA	Square Foot Contact Area
S.Y.	Square Yard
Sq.	Square; 100 Square Feet
Sty.	Story
Surf.	Surface
V.L.F.	Vertical Linear Foot

Editors' Note: We urge you to spend time reading and understanding the supporting material. An accurate estimate requires experience, knowledge, and careful calculation. The more you know about how we at R.S. Means developed the data, the more accurate your estimate will be. In addition, it's important to take into consideration some of the reference material such as City Cost Indexes and the "reference numbers."

B10 Superstructure						
B1010 Floor Construction						
			<p>General: Flat Slab: Solid uniform depth concrete two-way slabs with drop panels at columns and no column capitals.</p> <p>Design and Pricing Assumptions: Concrete f'c = 3 KSI, placed by concrete pump. Reinforcement, fy = 60 KSI. Forms, four use. Finish, steel trowel. Curing, spray on membrane. Based on 4 bay x 4 bay structure.</p>			
			QUANTITY	UNIT	COST PER S.F.	
System Components					MAT.	TOTAL
SYSTEM B1010 222 1700 15'X15' BAY 40 PSF S. LOAD, 12" MIN. COL. 6" SLAB, 1-1/2" DROP, 117 PSF						
Forms in place, flat slab with drop panels, to 15' high, 4 uses			.393	S.F.	1.02	5.23
Forms in place, exterior spandrel, 12" wide, 4 uses			.034	SFCA	.03	.28
Reinforcing in place, elevated slabs #3 to #7			1.586	Lb.	.51	1.03
Concrete ready mix, regular weight, 3000 psi			.513	C.F.	1.46	1.46
Place and vibrate concrete, elevated slab, 6" to 10" pump			.513	C.F.	.61	.51
Finish floor, monolithic steel trowel finish for finish floor			1.000	S.F.	.65	.65
Cure with sprayed membrane curing compound			.010	C.S.T.	.06	.13
TOTAL					3.08	9.23
B1010 222 Cast in Place Flat Slab with Drop Panels						
BAY SIZE (FT.)	SUPERIMPOSED LOAD (P.S.F.)	MINIMUM COL. SIZE (IN.)	SLAB & DROP (IN.)	TOTAL LOAD (P.S.F.)	COST PER S.F.	
					MAT.	TOTAL
1700	15 x 15	40	12	6-1-1/2	3.08	9.23
1750		75	12	6-1-1/2	2.15	6.30

How to Use the Assemblies Cost Tables

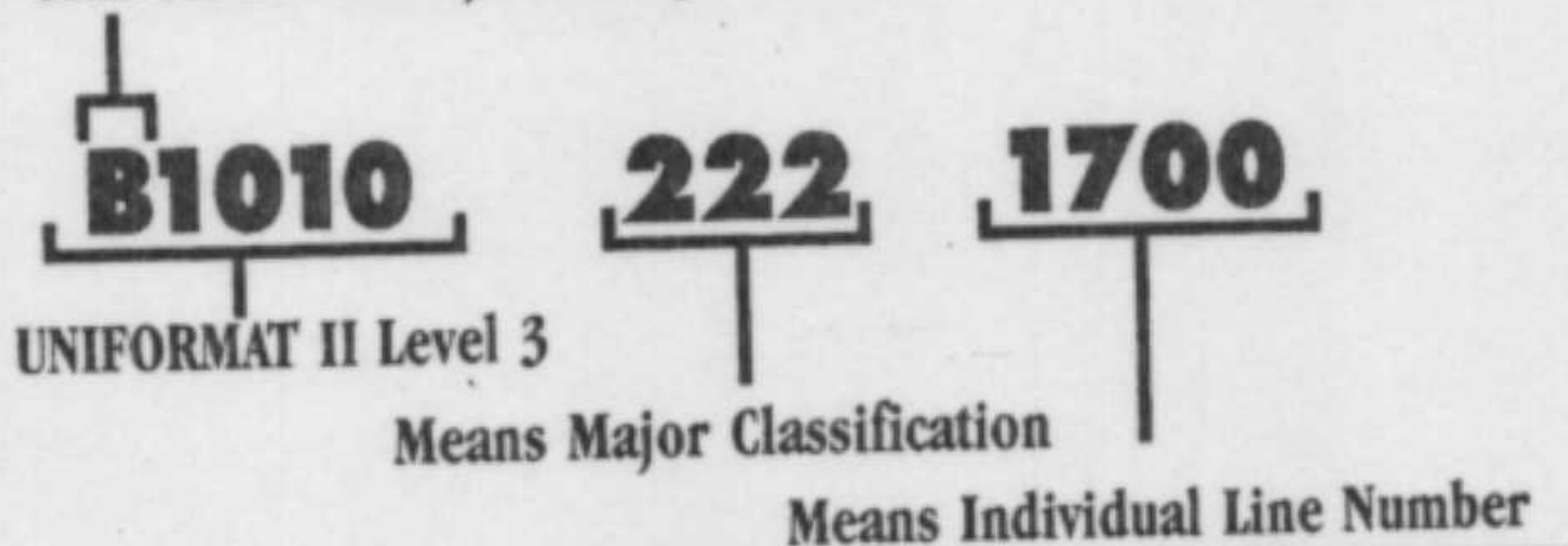
The following is a detailed explanation of a sample Assemblies Cost Table. Most Assembly Tables are separated into three parts:

1) an illustration of the system to be estimated; 2) the components and related costs of a typical system; and 3) the costs for similar systems with dimensional and/or size variations. Next to each bold number below is the item being described with the appropriate component of the sample entry following in parenthesis. In most cases, if the work is to be subcontracted, the general contractor will need to add an additional markup (R.S. Means suggests using 10%) to the "Total" figures.

System/Line Numbers (B1010-222-1700)

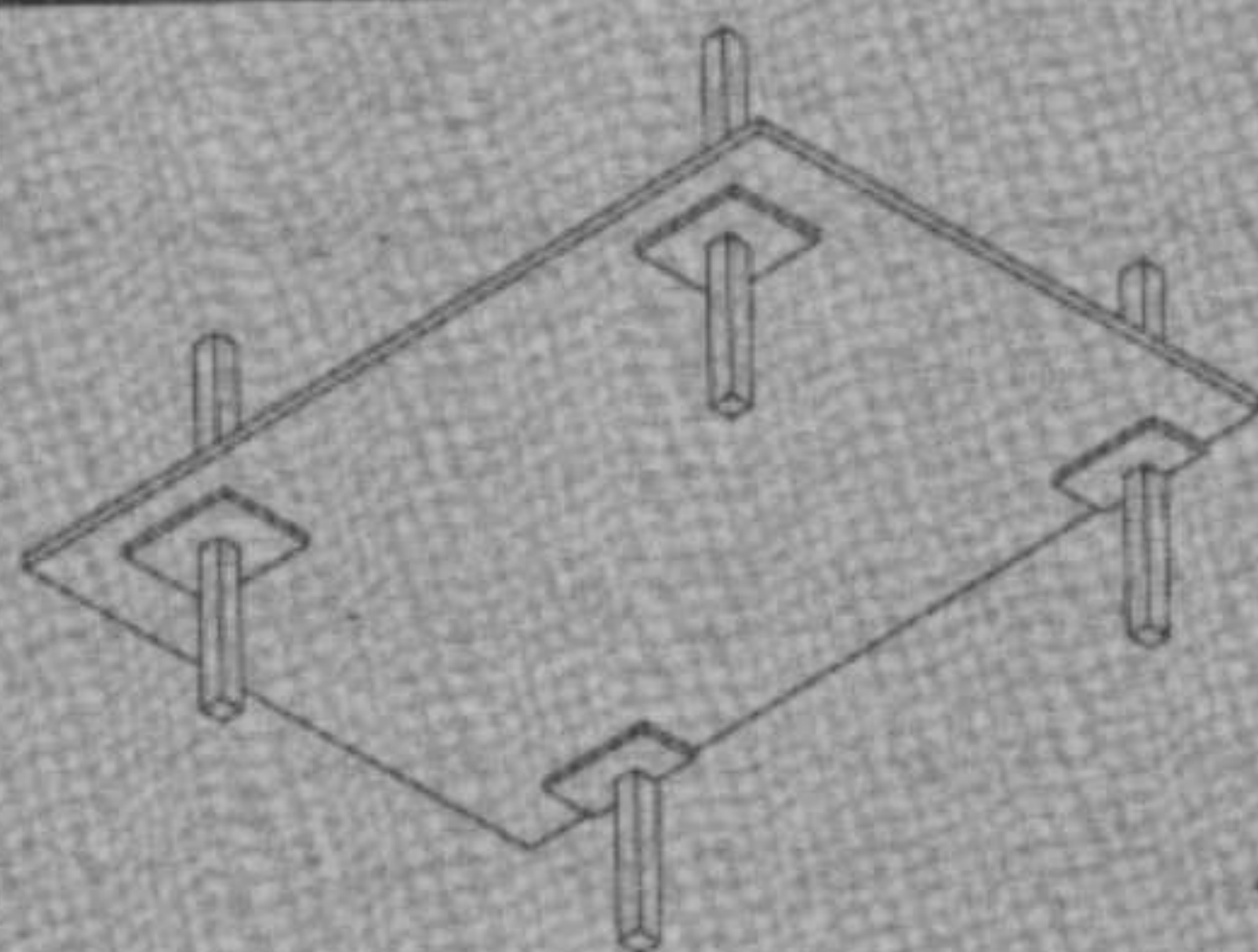
Each Assemblies Cost Line has been assigned a unique identification number based on the UNIFORMAT II classification system.

UNIFORMAT II Major Group



B10 Superstructure

B1010 Floor Construction



General: Flat Slab: Solid uniform depth concrete two-way slabs with drop panels at columns and no column capitals.

Design and Pricing Assumptions:

Concrete $f_c = 3$ KSI, placed by concrete pump.
Reinforcement, $f_y = 60$ KSI.
Forms, four use.
Finish, steel trowel.
Curing, spray on membrane.
Based on 4 bay x 4 bay structure.

System Components

SYSTEM B1010 222 1700

15'X15' BAY 40 PSF S. LOAD, 12" MIN. COL. 6" SLAB, 1-1/2" DROP, 117 PSF

Forms in place, flat slab with drop panels, to 15' high, 4 uses
Forms in place, exterior spandrel, 12" wide, 4 uses
Reinforcing in place, elevated slabs #4 to #7
Concrete ready mix, regular weight, 3000 psi
Place and vibrate concrete, elevated slab, 6" to 10" pump
Finish floor, monolithic steel trowel finish for finish floor
Cure with sprayed membrane curing compound

QUANTITY	UNIT	COST PER S.F.		
		MAT.	INST.	TOTAL
.993	S.F.	1.02	4.21	5.23
.034	S.F.C.A.	.03	.25	.28
1.588	Lb.	.51	.52	1.03
.513	C.F.	1.46		1.46
.513	C.F.		.51	.51
1.000	S.F.		.65	.65
.010	C.S.F.	.06	.07	.13
		3.08	6.21	9.29

TOTAL

B1010 222

Cast in Place Flat Slab with Drop Panels

	BAY SIZE (FT.)	SUPERIMPOSED LOAD (P.S.F.)	MINIMUM COL. SIZE (IN.)	SLAB & DROP (IN.)	TOTAL LOAD (P.S.F.)	COST PER S.F.		
						MAT.	INST.	TOTAL
1700	15 x 15	40	12	6-1-1/2	117	3.08	6.25	9.33
1720	15 x 15	75	12	6-2-1/2	153	3.15	6.30	9.45
1760	15 x 15	125	14	6-3-1/2	205	3.29	6.40	9.69
1780	15 x 15	200	16	6-4-1/2	281	3.45	6.60	10.05
1840	15 x 20	40	12	6-1/2-2	124	3.30	6.35	9.65
1860	15 x 20	75	14	6-1/2-4	162	3.44	6.45	9.89
1880	15 x 20	125	16	6-1/2-5	213	3.65	6.60	10.25
1900	15 x 20	200	18	6-1/2-6	293	3.74	6.70	10.44
1960	20 x 20	40	12	7-3	132	3.48	6.40	9.88
1980	20 x 20	75	16	7-4	168	3.67	6.60	10.27

2 Illustration

At the top of most assembly tables is an illustration, a brief description, and the design criteria used to develop the cost.

3 System Components

The components of a typical system are listed separately to show what has been included in the development of the total system price. The table below contains prices for other similar systems with dimensional and/or size variations.

4 Quantity

This is the number of line item units required for one system unit. For example, we assume that it will take 1.588 pounds of reinforcing on a square foot basis.

5 Unit of Measure for Each Item

The abbreviated designation indicates the unit of measure, as defined by industry standards, upon which the price of the component is based. For example, reinforcing is priced by lb. (pound) while concrete is priced by C.F. (cubic foot).

6 Unit of Measure for Each System (Cost per S.F.)

Costs shown in the three right hand columns have been adjusted by the component quantity and unit of measure for the entire system. In this example, "Cost per S.F." is the unit of measure for this system or "assembly."

7 Reference Number Information

**RB1010
-100**

You'll see reference numbers shown in bold rectangles at the beginning of some sections. These refer to related items in the Reference Section, visually identified by a vertical gray bar on the edge of pages.

The relation may be: (1) an estimating procedure that should be read before estimating, (2) an alternate pricing method, or (3) technical information.

The "R" designates the Reference Section. The letters and numbers refer to the UNIFORMAT II classification system.

Example: The rectangle number above is directing you to refer to the reference number RB1010-100. This particular reference number shows comparative costs of floor systems.

8 Materials (3.08)

This column contains the Materials Cost of each component. These cost figures are bare costs plus 10% for profit.

9 Installation (6.21)

Installation includes labor and equipment plus the installing contractor's overhead and profit. Equipment costs are the bare rental costs plus 10% for profit. The labor overhead and profit is defined on the inside back cover of this book.

10 Total (9.29)

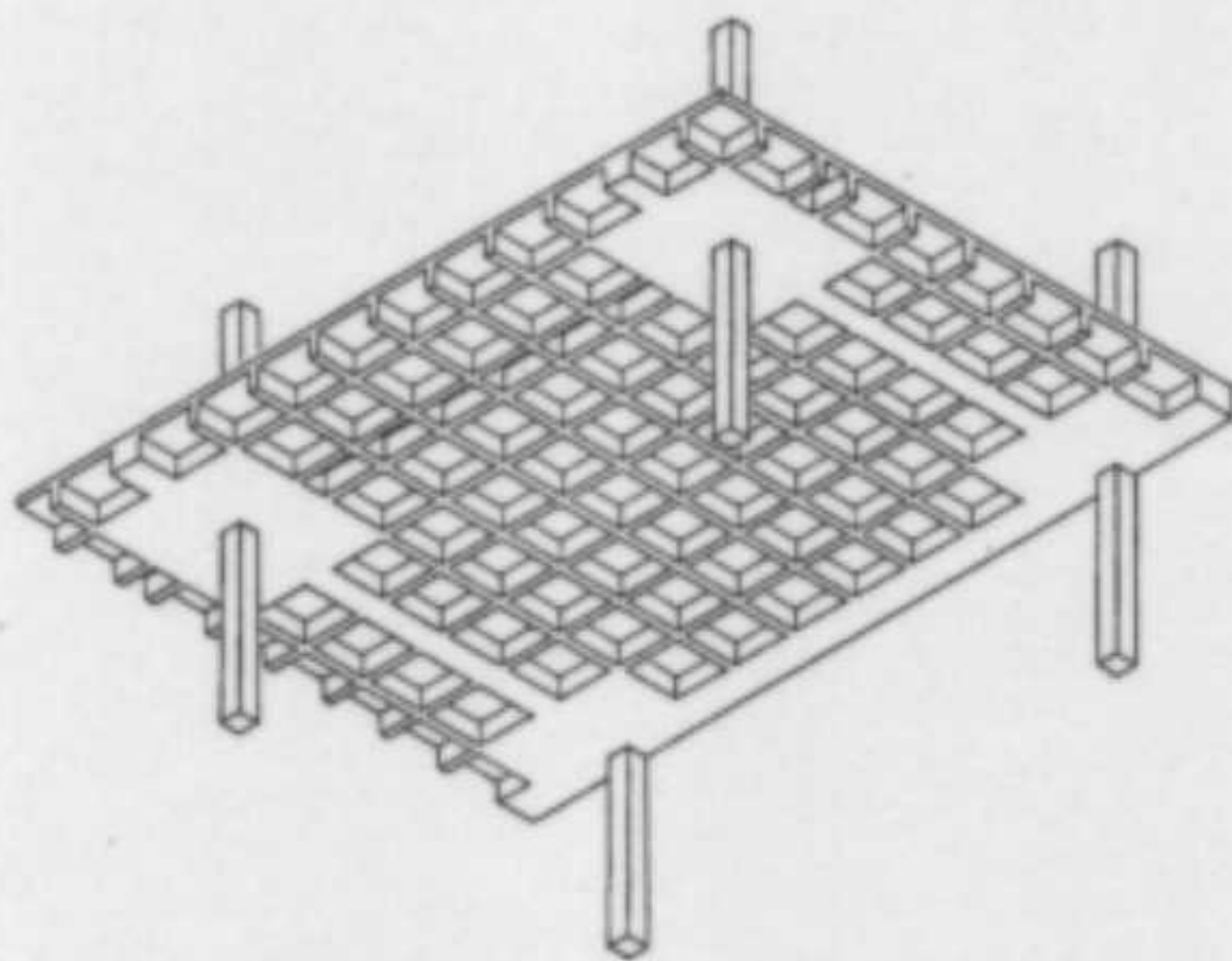
The figure in this column is the sum of the material and installation costs.

Material Cost	+	Installation Cost	=	Total
\$3.08	+	\$6.21	=	\$9.29

B10 Superstructure

B1010 Floor Construction

B
SHELL



General: Waffle slabs are basically flat slabs with hollowed out domes on bottom side to reduce weight. Solid concrete heads at columns function as drops without increasing depth. The concrete ribs function as two-way right angle joist. Joists are formed with standard sized domes. Thin slabs cover domes and are usually reinforced with welded wire fabric. Ribs have bottom steel and may have stirrups for shear.

Design and Pricing Assumptions:

Concrete $f'c = 4$ KSI, normal weight placed by concrete pump.
Reinforcement, $f_y = 60$ KSI.
Forms, four use.
4-1/2" slab.
30" x 30" voids.
6" wide ribs.
(ribs @ 36" O.C.).
Rib depth filler beams as required.
Solid concrete heads at columns.
Finish, steel trowel.
Curing, spray on membrane.
Based on 4 bay x 4 bay structure.

System Components	QUANTITY	UNIT	COST PER S.F.		
			MAT.	INST.	TOTAL
SYSTEM B1010 227 3900					
20X20' BAY, 40 PSF S. LOAD, 12" MIN. COLUMN					
Formwork, floor slab with 30" fiberglass domes, 4 uses	1.000	S.F.	3.27	5.50	8.77
Edge forms, 7"-12" high on elevated slab, 4 uses	.052	SFCA	.02	.24	.26
Forms in place, bulkhead for slab with keyway, 1 use, 3 piece	.010	L.F.	.02	.05	.07
Reinforcing in place, elevated slabs #4 to #7	1.580	Lb.	.51	.52	1.03
Welded wire fabric rolls, 6 x 6 - W4 x W4 (4 x 4) 58 lb./c.s.f	1.000	S.F.	.19	.36	.55
Concrete ready mix, regular weight, 4000 psi	.690	C.F.	2.14		2.14
Place and vibrate concrete, elevated slab, over 10", pump	.690	C.F.		.73	.73
Finish floor, monolithic steel trowel finish for finish floor	1.000	S.F.		.65	.65
Cure with sprayed membrane curing compound	.010	C.S.F.	.06	.07	.13
TOTAL			6.21	8.12	14.33

B1010 227		Cast in Place Waffle Slab						
	BAY SIZE (FT.)	SUPERIMPOSED LOAD (P.S.F.)	MINIMUM COL. SIZE (IN.)	RIB DEPTH (IN.)	TOTAL LOAD (P.S.F.)	COST PER S.F.		
						MAT.	INST.	TOTAL
3900	20 x 20	40	12	8	144	6.20	8.15	14.35
4000	RB1010-010	75	12	8	179	6.30	8.25	14.55
4100		125	16	8	229	6.40	8.35	14.75
4200		200	18	8	304	6.65	8.60	15.25
4400	20 x 25	40	12	8	146	6.30	8.20	14.50
4500	RB1010-100	75	14	8	181	6.45	8.30	14.75
4600		125	16	8	231	6.55	8.40	14.95
4700		200	18	8	306	6.75	8.65	15.40
4900	25 x 25	40	12	10	150	6.45	8.25	14.70
5000		75	16	10	185	6.60	8.45	15.05
5300		125	18	10	235	6.75	8.60	15.35
5500		200	20	10	310	6.90	8.75	15.65
5700	25 x 30	40	14	10	154	6.60	8.30	14.90
5800		75	16	10	189	6.70	8.45	15.15
5900		125	18	10	239	6.85	8.60	15.45
6000		200	20	12	329	7.45	9.05	16.50
6400	30 x 30	40	14	12	169	7	8.55	15.55
6500		75	18	12	204	7.10	8.65	15.75
6600		125	20	12	254	7.20	8.75	15.95
6700		200	24	12	329	7.70	9.20	16.90

How to Use the Commercial/Industrial/Institutional Section

The following is a detailed explanation of a sample entry in the Commercial/Industrial/Institutional Square Foot Cost Section. Each bold number below corresponds to the item being described on the following page with the appropriate component or cost of the sample entry following in parenthesis.

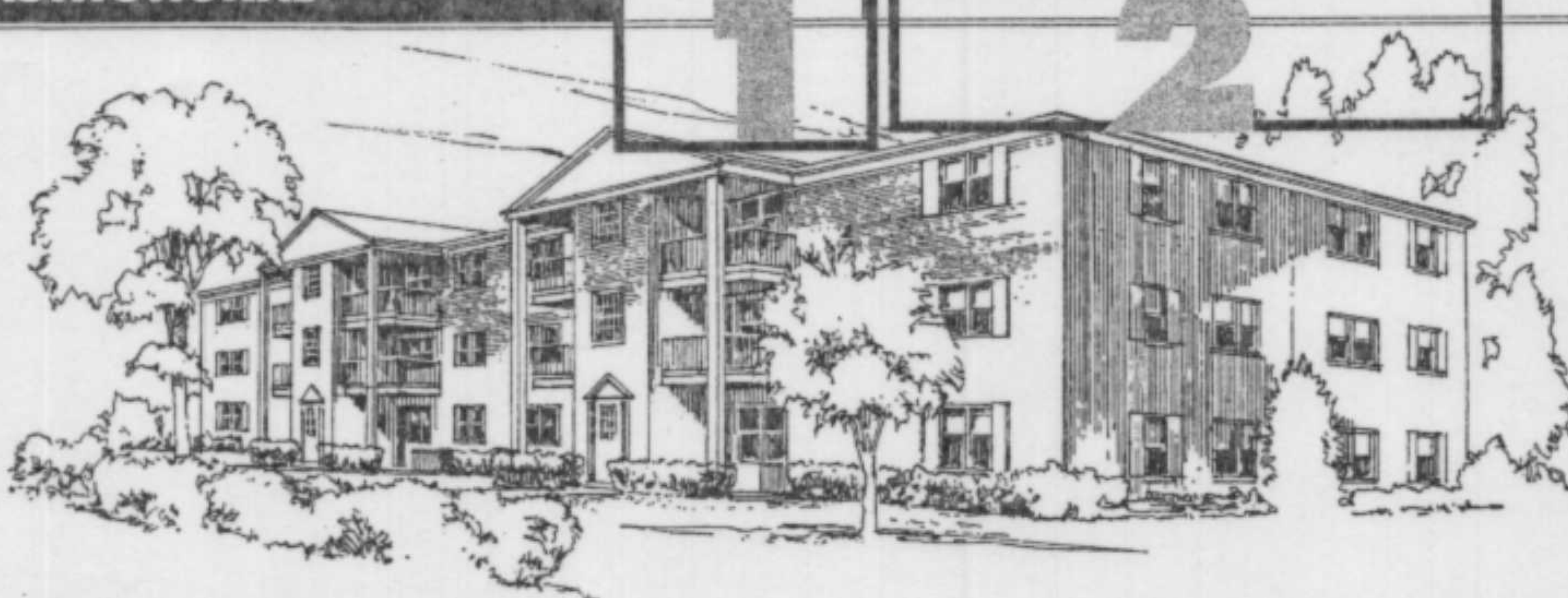
Prices listed are costs that include overhead and profit of the installing contractor and additional mark-ups for General Conditions and Architects' Fees.

INTRODUCTION

COMMERCIAL/INDUSTRIAL/INSTITUTIONAL

M.010

Apartment, 1-3 Story



2001
RS Means
Sq. Ft. Costs

Costs per square foot of floor area

Exterior Wall	S.F. Area	8000	12000	15000	19000	22500	29000	32000	36000
	L.F. Perimeter	213	280	330	350	400	442	480	520
Face Brick with Concrete Block Back-up	Wood Joists	128.40	115.40	110.15	103.05	100.45	98.95	95.4	93.00
	Steel Joists	127.40	115.15	110.20	103.85	101.45	100.00	96.9	94.75
Stucco on Concrete Block	Wood Joists	113.50	101.90	97.25	91.60	89.30	88.00	85.3	83.30
	Steel Joists	120.15	108.45	103.80	98.05	95.75	94.50	91.7	89.65
Wood Siding	Wood Frame	112.15	100.70	96.10	90.70	88.45	87.25	83.70	82.55
Brick Veneer	Wood Frame	119.40	107.05	102.05	95.65	93.20	91.80	88.6	86.40
Perimeter Adj., Add or Deduct	Per 100 L.F.	14.05	9.35	7.50	5.95	5.00	4.80	3.85	3.10
Story Hgt. Adj., Add or Deduct	Per 1 Ft.	2.15	2.30	2.20	1.80	1.80	1.75	1.55	1.45

For Basement, add \$20.90 per square foot of basement area

The above costs were calculated using the basic specifications shown on the facing page. Costs should be adjusted where necessary for design alternatives and owner's requirements. Reported completed project costs, for this type of construction, range from \$35.40 to \$132.25 per S.F.

Common additives

Description	Unit	\$ Cost	Description	Unit	\$ Cost
Appliances			Closed Circuit Surveillance, One station		
Cooking range, 30" free standing			Camera and monitor	Each	1375
1 oven	Each	330 - 1475	For additional camera stations, add	Each	745
2 oven	Each	1475 - 1600	Elevators, Hydraulic passenger, 2 stops		
30" built-in			2000# capacity	Each	42,725
1 oven	Each	415 - 1550	2500# capacity	Each	43,425
2 oven	Each	1200 - 2050	3500# capacity	Each	47,225
Counter top cook tops, 4 burner	Each	277 - 610	Additional stop, add	Each	3650
Microwave oven	Each	196 - 630	Emergency Lighting, 25 watt, battery operated		
Combination range, refrig. & sink, 30" wide	Each	1175 - 2375	Lead battery	Each	289
72" wide	Each	3575	Nickel cadmium	Each	655
Combination range, refrigerator, sink, microwave oven & icemaker	Each	5275	Laundry Equipment		
Compactor, residential, 4-1 compaction	Each	460 - 540	Dryer, gas, 16 lb. capacity	Each	710
Dishwasher, built-in, 2 cycles	Each	475 - 715	30 lb. capacity	Each	2775
4 cycles	Each	475 - 975	Washer, 4 cycle	Each	795
Garbage disposer, sink type	Each	124 - 279	Commercial	Each	1200
Hood for range, 2 speed, vented, 30" wide	Each	194 - 750	Smoke Detectors		
42" wide	Each	340 - 1050	Ceiling type	Each	149
Refrigerator, no frost 10-12 C.F.	Each	520 - 830	Duct type	Each	405
18-20 C.F.	Each	615 - 930			

1 ***Model Number (M.010)***
"M" distinguishes this section of the book and stands for model. The number designation is a sequential number.

2 ***Type of Building (Apartment, 1-3 Story)***
There are 43 different types of commercial/industrial/institutional buildings highlighted in this section.

3 ***Exterior Wall Construction and Building Framing Options (Face Brick with Concrete Block Back-up and Open Web Steel Bar Joists)***
Three or more commonly used exterior walls, and in most cases, two typical building framing systems are presented for each type of building. The model selected should be based on the actual characteristics of the building being estimated.

4 ***Total Square Foot of Floor Area and Base Perimeter Used to Compute Base Costs (22,500 Square Feet and 400 Linear Feet)***
Square foot of floor area is the total gross area of all floors at grade, and above, and does not include a basement. The perimeter in linear feet used for the base cost is for a generally rectangular economical building shape.

5 ***Cost per Square Foot of Floor Area (\$101.45)***
The highlighted cost is for a building of the selected exterior wall and framing system and floor area. Costs for buildings with floor areas other than those calculated may be interpolated between the costs shown.

6 ***Building Perimeter and Story Height Adjustments***
Square foot costs for a building with a perimeter or floor to floor story height significantly different from the model used to calculate the base cost may be adjusted, add or deduct, to reflect the actual building geometry.

7 ***Cost per Square Foot of Floor Area for the Perimeter and/or Height Adjustment (\$5.00 for Perimeter Difference and \$1.80 for Story Height Difference)***
Add (or deduct) \$5.00 to the base square foot cost for each 100 feet of perimeter difference between the model and the actual building. Add (or deduct) \$1.80 to the base square foot cost for each 1 foot of story height difference between the model and the actual building.

8 ***Optional Cost per Square Foot of Basement Floor Area (\$20.90)***
The cost of an unfinished basement for the building being estimated is \$20.90 times the gross floor area of the basement.

9 ***Range of Cost per Square Foot of Floor Area for Similar Buildings (\$35.40 to \$132.25)***
Many different buildings of the same type have been built using similar materials and systems. Means historical cost data of actual construction projects indicates a range of \$35.40 to \$132.25 for this type of building.

10 ***Common Additives***
Common components and/or systems used in this type of building are listed. These costs should be added to the total building cost. Additional selections may be found in the Assemblies Section.

How to Use the Commercial/Industrial/Institutional Section *(Continued)*

The following is a detailed explanation of a specification and costs for a model building in the Commercial/Industrial/Institutional Square Foot Cost Section. Each bold number below corresponds to the item being described on the following page with the appropriate component of the sample entry following in parenthesis.

Prices listed are costs that include overhead and profit of the installing contractor.

Model costs calculated for a 3 story building with 10' story height and 22,500 square feet of floor area

Apartment, 1-3 Story

			Unit	Unit Cost	Cost Per S.F.	% Of Sub-Total
1.0 Foundations						
.1	Footings & Foundations	Poured concrete, strip and spread footings and 4' foundation wall	S.F. Ground	7.08	2.36	
.4	Piles & Caissons	N/A	—	—	—	3.6%
.9	Excavation & Backfill	Site preparation for slab and trench for foundation wall and footing	S.F. Ground	1.08	.36	
2.0 Substructure						
.1	Slab on Grade	4" reinforced concrete with vapor barrier and granular base	S.F. Slab	3.32	1.11	1.5%
.2	Special Substructures	N/A	—	—	—	
3.0 Superstructure						
.1	Columns & Beams	Gypsum board fireproofing on columns; steel columns in 3.5 and 3.7	S.F. Floor	.87	.87	
.4	Structural Walls	N/A	—	—	—	
.5	Elevated Floors	Open web steel joists, slab form, concrete, interior steel columns	S.F. Floor	10.54	7.03	14.4%
.7	Roof	Open web steel joists with rib metal deck, interior steel columns	S.F. Roof	5.42	1.81	
.9	Stairs	Concrete filled metal pan	Flight	5025	1.12	
4.0 Exterior Closure						
.1	Walls	Face brick with concrete block backup	S.F. Wall	15.81	7.42	
.5	Exterior Wall Finishes	N/A	—	—	—	11.9%
.6	Doors	Aluminum and glass	Each	1131	.20	
.7	Windows & Glazed Walls	Aluminum horizontal sliding	Each	304		
5.0 Roofing						
.1	Roof Coverings	Build-up tar and gravel with flashing	S.F. Roof	2.79		
.7	Insulation	Perlite/EPS composite	S.F. Roof	1.32		1.8%
6.0 Interior Construction						
.1	Partitions	Gypsum board and sound deadening board on metal studs	S.F. Partition	3.16	2.81	
.4	Interior Doors	1 1/2" solid core wood, 85% hollow core wood	Each	390	4.88	
.5	Wall Finishes	70% paint, 25% vinyl wall covering, 5% ceramic tile	S.F. Surface	1.03	1.83	
.6	Floor Finishes	60% carpet, 30% vinyl composition tile, 10% tile	S.F. Floor	4.42	4.42	23.8%
.7	Ceiling Finishes	Painted gypsum board on resilient channels	S.F. Ceiling	2.63		
.9	Interior Surface/Exterior Wall	Painted gypsum board on furring	S.F. Wall	3.00	1.29	
7.0 Conveying						
.1	Elevators	One hydraulic passenger elevator	Each	285	2.85	3.8%
.2	Special Conveyors	N/A	—	—	—	
8.0 Mechanical						
.1	Plumbing	Kitchen, bathroom and service fixtures, supply and drainage	Each	1762	8.81	
.2	Fire Protection	Wet pipe sprinkler system	S.F. Floor	1.74	1.74	
.3	Heating	Oil fired hot water, baseboard radiation	S.F. Floor	4.53	4.53	27.9%
.4	Cooling	Chilled water, air cooled condenser system	S.F. Floor	5.91	5.91	
.5	Special Systems	N/A	—	—	—	
9.0 Electrical						
.1	Service & Distribution	600 ampere service, panel board and feeders	S.F. Floor	1.56	1.56	
.2	Lighting & Power	Incandescent fixtures, receptacles, switches, A.C. and misc. power	S.F. Floor	4.59	4.59	9.0%
.4	Special Electrical	Alarm systems and emergency lighting	S.F. Floor	.65	.65	
11.0 Special Construction						
.1	Specialties	Kitchen cabinets	Flt	171	1.71	2.3%
12.0 Site Work						
.1	Earthwork	N/A	—	—	—	
.3	Utilities	N/A	—	—	—	
.5	Roads & Parking	N/A	—	—	—	0.0%
.7	Site Improvements	N/A	—	—	—	
Sub-Total				75.16	100%	
CONTRACTOR FEES (General Requirements: 10%, Overhead: 5%, Profit: 10%)				25%	18.79	
ARCHITECT FEES				8%	7.50	
Total Building Cost					101.45	

1 **Building Description**
(Model costs are calculated for a three-story apartment building with 10' story height and 22,500 square feet of floor area)

The model highlighted is described in terms of building type, number of stories, typical story height and square footage.

2 **Type of Building**
(Apartment, 1-3 Story)

3 **Division 6.0 Interior Construction**
(6.4 Interior Doors)

System costs are presented in divisions according to the 12-division UniFormat classifications. Each of the component systems are listed.

4 **Specification Highlights**
(15% solid core wood; 85% hollow core wood)

All systems in each subdivision are described with the material and proportions used.

5 **Quality Criteria**
(80 S.F. Floor/Door)

The criteria used in determining quantities for the calculations are shown.

6 **Unit (Each)**

The unit of measure shown in this column is the unit of measure of the particular system shown that corresponds to the unit cost.

7 **Unit Cost (\$390)**

The cost per unit of measure of each system subdivision.

8 **Cost per Square Foot (\$4.88)**

The cost per square foot for each system is the unit cost of the system times the total number of units divided by the total square feet of building area.

9 **% of Sub-Total (23.8%)**

The percent of sub-total is the total cost per square foot of all systems in the division divided by the sub-total cost per square foot of the building.

10 **Sub-Total (\$75.16)**

The sub-total is the total of all the system costs per square foot.

11 **Project Fees**
(Contractor Fees) (25%)
(Architect Fees) (8%)

Contractor Fees to cover the general requirements, overhead and profit of the General Contractor are added as a percentage of the sub-total. Architect Fees, also as a percentage of the sub-total, are also added. These values vary with the building type.

12 **Total Building Cost (\$101.45)**

The total building cost per square foot of building area is the sum of the square foot costs of all the systems plus the General Contractor's general requirements, overhead and profit, and the Architect fees. The total building cost is the amount which appears shaded in the Cost per Square Foot of Floor Area table shown previously.


Costs per square foot of floor area

Exterior Wall	S.F. Area	40000	45000	50000	55000	60000	70000	80000	90000	100000
	L.F. Perimeter	366	400	433	466	500	566	505	550	594
Face Brick with Concrete Block Back-up	Steel Frame	105.90	104.90	104.20	103.60	103.15	102.30	98.90	98.40	97.90
	R/Conc. Frame	111.65	110.65	109.80	109.15	108.60	107.75	103.80	103.20	102.60
Decorative Concrete Block	Steel Frame	100.60	99.75	99.15	98.60	98.15	97.45	94.75	94.25	93.80
	R/Conc. Frame	102.80	101.95	101.30	100.75	100.30	99.60	96.85	96.35	95.90
Precast Concrete Panels	Steel Frame	102.70	101.80	101.10	100.55	100.05	99.30	96.15	95.65	95.20
	R/Conc. Frame	104.70	103.80	103.10	102.55	102.05	101.30	98.15	97.65	97.15
Perimeter Adj., Add or Deduct	Per 100 L.F.	4.35	3.90	3.50	3.20	2.90	2.50	2.20	1.95	1.75
Story Hgt. Adj., Add or Deduct	Per 1 Ft.	1.45	1.45	1.40	1.35	1.35	1.30	1.00	.95	.95
For Basement, add \$21.00 per square foot of basement area										

The above costs were calculated using the basic specifications shown on the facing page. These costs should be adjusted where necessary for design alternatives and owner's requirements. Reported completed project costs, for this type of structure, range from \$41.85 to \$121.35 per S.F.

Common additives

Description	Unit	\$ Cost	Description	Unit	\$ Cost
Appliances			Closed Circuit Surveillance, One station	Each	1375
Cooking range, 30" free standing			Camera and monitor	Each	745
1 oven	Each	330 - 1475	For additional camera stations, add		
2 oven	Each	1475 - 1600	Elevators, Electric passenger, 5 stops		
30" built-in			2000# capacity	Each	97,700
1 oven	Each	415 - 1550	3500# capacity	Each	103,700
2 oven	Each	1200 - 2050	5000# capacity	Each	108,200
Counter top cook tops, 4 burner	Each	277 - 610	Additional stop, add	Each	5500
Microwave oven	Each	196 - 630	Emergency Lighting, 25 watt, battery operated		
Combination range, refrig. & sink, 30" wide	Each	1175 - 2375	Lead battery	Each	289
72" wide	Each	3575	Nickel cadmium	Each	655
Combination range, refrigerator, sink,			Laundry Equipment		
microwave oven & icemaker	Each	5275	Dryer, gas, 16 lb. capacity	Each	710
Compactor, residential, 4-1 compaction	Each	460 - 540	30 lb. capacity	Each	2775
Dishwasher, built-in, 2 cycles	Each	475 - 715	Washer, 4 cycle	Each	795
4 cycles	Each	475 - 975	Commercial	Each	1200
Garbage disposer, sink type	Each	124 - 279	Smoke Detectors		
Hood for range, 2 speed, vented, 30" wide	Each	194 - 750	Ceiling type	Each	149
42" wide	Each	340 - 1050	Duct type	Each	405
Refrigerator, no frost 10-12 C.F.	Each	520 - 830			
18-20 C.F.	Each	615 - 930			

**Model costs calculated for a 6 story building
with 10'-4" story height and 60,000 square feet
of floor area**

Apartment, 4-7 Story

				Unit	Unit Cost	Cost Per S.F.	% Of Sub-Total
1.0 Foundations							
.1	Footings & Foundations	Poured concrete; strip and spread footings and 4' foundation wall		S.F. Ground	7.20	1.20	1.8%
.4	Piles & Caissons	N/A		—	—	—	
.9	Excavation & Backfill	Site preparation for slab and trench for foundation wall and footing		S.F. Ground	1.02	.17	
2.0 Substructure							
.1	Slab on Grade	4" reinforced concrete with vapor barrier and granular base		S.F. Slab	3.32	.55	0.7%
.2	Special Substructures	N/A		—	—	—	
3.0 Superstructure							
.1	Columns & Beams	Gypsum board fireproofing on columns, steel columns in 3.5 and 3.7		S.F. Floor	1.61	1.61	18.1%
.4	Structural Walls	N/A		—	—	—	
.5	Elevated Floors	Open web steel joists, slab form, concrete, steel columns		S.F. Floor	12.49	10.41	
.7	Roof	Open web steel joists with rib metal deck, steel columns		S.F. Roof	5.08	.85	
.9	Stairs	Concrete filled metal pan		Flight	4070	1.09	
4.0 Exterior Closure							
.1	Walls	Face brick with concrete block backup	86% of wall	S.F. Wall	15.30	6.80	10.9%
.5	Exterior Wall Finishes	N/A		—	—	—	
.6	Doors	Aluminum and glass		Each	2637	.18	
.7	Windows & Glazed Walls	Aluminum horizontal sliding	14% of wall	Each	304	1.42	
5.0 Roofing							
.1	Roof Coverings	Built-up tar and gravel with flashing		S.F. Roof	2.70	.45	0.9%
.7	Insulation	Perlite/EPS composite		S.F. Roof	1.32	.22	
.8	Openings & Specialties	N/A		—	—	—	
6.0 Interior Construction							
.1	Partitions	Gypsum board and sound deadening board on metal studs	8 S.F. Floor/L.F. Partitions	S.F. Partition	3.62	3.62	26.1%
.4	Interior Doors	15% solid core wood, 85% hollow core wood	80 S.F. Floor/Door	Each	467	5.84	
.5	Wall Finishes	70% paint, 25% vinyl wall covering, 5% ceramic tile		S.F. Surface	1.13	2.26	
.6	Floor Finishes	60% carpet, 30% vinyl composition tile, 10% ceramic tile		S.F. Floor	4.42	4.42	
.7	Ceiling Finishes	Painted gypsum board on resilient channels		S.F. Ceiling	2.80	2.80	
.9	Interior Surface/Exterior Wall	Painted gypsum board on furring	80% of wall	S.F. Wall	3.02	1.21	
7.0 Conveying							
.1	Elevators	Two geared passenger elevators		Each	131,400	4.38	5.7%
.2	Special Conveyors	N/A		—	—	—	
8.0 Mechanical							
.1	Plumbing	Kitchen, bathroom and service fixtures, supply and drainage	1 Fixture/215 S.F. Floor	Each	1728	8.04	24.8%
.2	Fire Protection	Standpipe and wet pipe sprinkler system		S.F. Floor	1.69	1.69	
.3	Heating	Oil fired hot water, baseboard radiation		S.F. Floor	3.91	3.91	
.4	Cooling	Chilled water, air cooled condenser system		S.F. Floor	5.53	5.53	
.5	Special Systems	N/A		—	—	—	
9.0 Electrical							
.1	Service & Distribution	1600 ampere service, panel board and feeders		S.F. Floor	1.47	1.47	8.3%
.2	Lighting & Power	Incandescent fixtures, receptacles, switches, A.C. and misc. power		S.F. Floor	4.56	4.56	
.4	Special Electrical	Alarm systems, emergency lighting, and intercom		S.F. Floor	.36	.36	
11.0 Special Construction							
.1	Specialties	Kitchen cabinets		S.F. Floor	2.06	2.06	2.7%
12.0 Site Work							
.1	Earthwork	N/A		—	—	—	0.0%
.3	Utilities	N/A		—	—	—	
.5	Roads & Parking	N/A		—	—	—	
.7	Site Improvements	N/A		—	—	—	
Sub-Total						77.10	100%
CONTRACTOR FEES (General Requirements: 10%, Overhead: 5%, Profit: 10%)					25%	19.28	
ARCHITECT FEES					7%	6.77	
Total Building Cost						103.15	