

6. INFLATION ADJUSTMENT FACTORS

Using inflation adjustment factors is a simplified method to account for future increases or decreases in construction cost for material and labor increases only. Inflation adjustment factors can, if properly used, be a reliable tool to predict future fluctuations in construction costs. There are many indicators used today for making economic predictions. Some weigh information using criteria not related to the construction market and, therefore, are not appropriate for construction costing. The Consumer Price Index (CPI) is not a good indicator for construction proposed because construction cycles swing more widely than the more general cycles measured by the CPI.

The inflation adjustment factors are for material and labor only and **do not** include **code** escalation or **technological** escalation. Both have a major influence on the cost of construction. Inflation alone from 1989 to 2000 cumulative, accounts for approximately 42% increase. The reader should consider the effect of codes and technology which may account for more than the total material and labor inflation in the past eleven years. The code changes for structural issues have affected wood, concrete and steel structures for a more conservative view of wind and earthquake loading. Not surprisingly, the same codes affect mechanical, plumbing, electrical, ceiling/grid and machinery attachment.

Technology has led to smarter buildings and together with energy codes and ADA compliance has led to increased cost for mechanical systems, insulation, sash and glass, increased size of bathrooms, ramps, lifts, elevators and signage. Many public and private structures now have LANS, WANS, audio, security and fire control. Monitoring systems have given way to addressable systems and remote controls.

Code and technology issues are not normally thought of as inflation elements but as increased weight or systems in the structure. When extrapolating costs for a new structure the user must recognize that code and technology issues exist and they should be given due consideration. Since there are so many different types and uses of structures, it is not possible to render a code or technology escalation percentage without knowing for what purpose the structure will be used. Even the most simple structures, such as parking structures are materially affected.

The accuracy of construction cost inflation adjustment factors is more dependable when growth is consistent. New conservation issues are now being espoused by many institutions. The so called green building technologies, if used, adds a small percentage to the cost of a structure by using recyclable materials. So far the cost adds between 2 and 4% to a typical structure. When the economy is influenced by radical fluctuations (oil embargoes, changes in government policies, droughts, recessions or depressions, etc.) The adjustment factors can become obsolete and must be re-evaluated. Nonetheless, inflation adjustment factors are necessary. They are recommended here for use with these Construction Cost Control Guidelines.

Revised April 29, 2002

The following are the Historical Inflation Factors for Calendar years 1997-2001 and Projections to 2008:

Historical	1967 = 100
1997 - 3.3 %	522.0
1998 - 2.1 %	533.0
1999 - 3.6 %	552.1
2000 - 4.2 %	575.5
2001 - 2.0 %	587.1
Projections	
2002 - 3.0 %	604.7
2003 - 3.1 %	623.5
2004 - 3.2 %	664.1
2005 - 3.0 %	684.0
2006 - 3.1 %	705.2
2007 - 3.2 %	727.8
2008 - 3.2 %	751.1

The following examples illustrate how to apply these rates to an actual project.

The midpoint of construction is the date to which inflation is figured, starting with the date of the most recent revision of the Construction Cost Control Guidelines.

Please note that these rates are compounded.

Revised April 29, 2002

EXAMPLE A

Project Construction Cost:	\$1,000,000
Project Construction Duration:	12 Months
Project Start Date:	September, 2002
Project Completion Date:	September, 2003
Mid-Point is therefore:	February, 2003

Escalation:

2002 - 6 months (July thru December)	
Escalation per month:	3.0% / 12 = 0.250% per month
Escalation for 2002:	0.250% x 6 = 1.500%
2003 - 2 months (January thru February)	
Escalation per month:	3.1% / 12 = 0.26% per month
Escalation for 2003:	0.26% x 2 = 0.52%

Adjustment:

Base Cost	\$1,000,000
Inflation for 2002	
1.50% of 1,000,000	<u>15,000</u>
Subtotal	\$1,015,000
Inflation for 2003	
0.52% of 1,015,000	<u>5,278</u>
TOTAL ADJUSTED COST	\$1,020,278

The adjustment can also be calculated as follows:

Using a base of 100:

2002: 100 x 1.500%	1.500
Adjustment 100 + 1.500%	101.500
2003: 101.500 x 0.52%	0.5278
Adjustment 101.500 + 0.5278	
The total % increase 102.508 - 100	2.20578%

Adjustment:

Base Cost	\$1,000,000
Adjustment 1,000,000 x 2.20578%	<u>22,058</u>
TOTAL ADJUSTED COST	\$1,022,058

Revised April 29, 2002

EXAMPLE B

Project Construction Cost	\$8,524,300
Project Construction Duration:	24 Months
Project Start Date:	April, 2002
Project Completion Date:	April, 2004
Mid-Point is therefore:	April, 2003

Escalation:

2002 - 6 months (July thru December)	
Escalation per month:	$3.0\% / 12 = 0.252\%$ per month
Escalation for 2002:	$0.250\% \times 6 = 1.500\%$

2003 - 12 months (All Year)	
Escalation for 2003:	3.1%

2004 - 4 months (January thru April)	
Escalation per month:	$3.2\% / 12 = 0.267\%$ per month
Escalation for 2004:	$0.267\% \times 4 = 1.068\%$

Adjustment:

Base Cost	\$8,524,300
Inflation for 2002 @ 1.500%	<u>127,865</u>
Subtotal	\$8,652,065

Inflation for 2003	
3.1% of \$8,652,065	<u>268,214</u>
Subtotal	\$8,920,279

Inflation for 2004	
1.060% of \$8,920,279	<u>106,000</u>
TOTAL ADJUSTED COST	\$9,026,279

This adjustment can be calculated as follows:

Using a base of 100:

2002: $100 \times 1.500\%$	1.500	
Adjustment $100 + 1.500\%$	101.500	
2003 : $101.500 \times 3.1\%$	3.1619	
Adjustment $101.500 + 3.162$	104.662	
2004 $104.662 \times 1.060\%$	1.109	
Adjustment $105.200 + 1.060$	106.120	Revised April 29, 2002

EXAMPLE B
(Continued)

The total % increase 106.260 - 100 6.120%

Adjustment

Base Cost	\$8,524,300
Adjustment $\$8,524,300 \times 6.001\%$	<u>521,687</u>
* TOTAL ADJUSTED COST	\$9,045,134

Note that the results using the two methods are not identical but are sufficiently accurate for estimating purposes. It can be shown that identical results are obtained if carried to a sufficient number of significant figures.

* Error due to round off

Revised April 29, 2002