

**AACE International – North Florida Section  
Panel Discussion: Cost Escalation – What's  
Ahead and How to Handle It  
Orlando, Florida -- November 2008**

**Cost Escalation: Past, Present and Future**

**KSC Construction Cost Alert  
Labor and Materials Up 10% to 110%**

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Construction Cost Consultant Inc.**

October 2008  
PPT036848

Reference: JAB Cost Books Vol. 1, 6 & 15 & NASA Program Analysis Report, June 22, 2004, APB Vol. 16

**Cost Escalation and Labor Productivity Survey**

- What can we do about it?

HISTORICAL SUMMARY OF VOTES										
	Nov 01 FL	June 23 Montreal	Dec 23 FL	Jan 22 FL	Feb 19 FL	March 12 1997	March 5 1998	Total		
1. Education of the Consumers, Owners and Builders	54	108	61	48	8727**	34	9	29	319	
2. More Efficient Management and Methods & Communications	49	93	45	65	87	252	20	19	34	326
3. Political Activity for Legislative Action Right to Work, Regional Bargaining, Common Expiration of Labor Contracts, etc.	28	128	41	27	87	219	7	3	9	240
4. Improved Engineering Design	18	46	22	25	16	3	11	23	166	
5. Owner Education as started by Anti-Inflation Roundtable	18	67	11	20	3				138	
6. Stagnating Building Codes	4	31	21	6	2	0	1		66	
7. Industrial Consolidation/ All Contracting Companies Joining to Make one Unified Body for Negotiation, etc. (Not AEC, ABC, NCA, etc.)	0	78	26	9	2	0	1		120	
Total	171	551	237	105	64	42	102		1367	

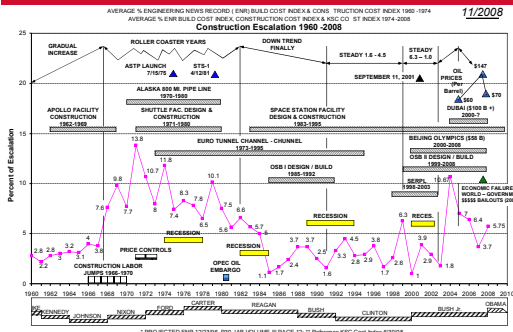
\* Added during discussion at Montreal presentation  
-- Highest total votes to date

Reference JAB Volume III – Page 21

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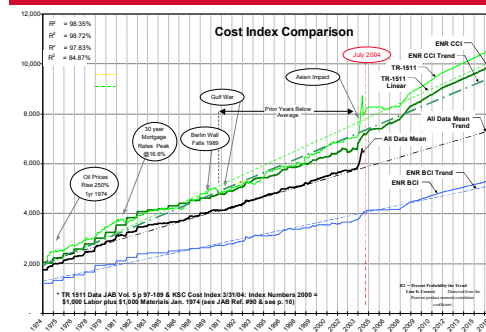
**Construction Cost Escalation Chart – 1960 thru 2008 (from JAB Vol III)**



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**Construction Economics (continued)**



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**Background – Time-line of Events (Labor and Material up 10 to 110%)**

- Dec. 15, 2003 Concrete going up for 2004 page 65
- Jan. 23, 2004 "Wow" 8 craft labor rates go up
- Feb. 2, 2004 USA Coff labor up 7% See J.A.B. for details\*
- March 31, 2004 KSC Cost Index Notes Big Jump in Material Prices and labor
- April 1, 2004 JAB Cost Alert Steel, Copper, Concrete, Aluminum, Lumber & Labor, etc., please consider 4-10% per year for escalation, and do a cost analysis on major multi-year projects.
- April 14, 2004 USA gets copy of March 25, 2004 letter\* to all distribution steel scrap up 60% in one year and 110% in 2 years – Pipe and fittings priced at delivery only. No more holding price 30 days to 6 months. Hard to bid projects. One comment some Government contracts may have to include Escalation clause.

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**Background – Time-line of Events (Labor and Material up 10 to 110%) (continued)**

- April 19, 2004 More trade labor increase electrical – 2<sup>nd</sup> time this year. Davis Bacon – April 2, 2004 new labor rates with PT&I from \$20.95/hr truck driver to \$47.97/hr for elevator construction. Ironworkers to \$44.52, electricians to \$41.18, sprinkler fitter to \$44.40, pipe fitter to \$41.91) (see APB Volume 16, page 39)
- April 2004 New Workman's Compensation Rates (WCR) go down but --- we should still use 53% for Budget PT&I due to new special 99% Premiums. (APB Volume page 37 – would raise WCR to 83% from 41.5% or PT&L of 94.73% for JUI rate with premium)
- May 6, 2004 Cost Engineering Comments – Some reasons for big cost increases – US Dollar down 30%, scrap prices up big, some commodities up big – copper, steel, aluminum, oil, gas, asphalt, and cement. China booming 9.7% growth, last quarter, causing big demand. US growth rate up – best in 3 years, Iraq Construction up, US housing market up big because of low interest rates, most types of insurance up – Medical, home, auto etc. also transportation up as oil prices rise. But some things down – computers, PC, blinds, access flooring, electronics, cell phones and long distance rates.

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## ENR July 2004 Construction Economics

### Cost Indexes

**Construction Cost Index**  
Despite intense materials price pressure, annual inflation measured by the CCI slipped from 6.4 to 6.2%.

JUNE 2004	% CHG. MONTH	% CHG. YEAR
20-CITY 1913=100 INDEX VALUE	7196.80	+0.6
CONSTRUCTION COST	14893.50	+0.3
SKILLED LABOR	28.38	+0.3
WAGE \$/HR.		+3.2

**Materials Cost Index**  
Lumber, steel and cement prices all increased this month, pushing the MCI 20% above a year ago.

JUNE 2004	% CHG. MONTH	% CHG. YEAR
20-CITY 1913=100 INDEX VALUE	2164.00	+2.7
WATERLOO	53.82	+0.7
CEMENT \$/TON	21.27	+1.9
STEEL \$/CWT	328.90	+2.7
LUMBER \$/MBF		+10.1

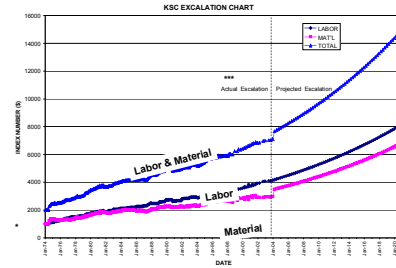
**Building Cost Index**  
Material price inflation has driven the BCI 8.7% above 2003's level. A year ago, annual escalation was just 1.5%.

JUNE 2004	% CHG. MONTH	% CHG. YEAR
20-CITY 1913=100 INDEX VALUE	5906.76	+1.0
WATERLOO COST	6998.41	+0.4
SKILLED LABOR	37.18	+0.4
WAGE \$/HR.		+3.3

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## KSC Annual Escalation 1974 – 2020\*\* (JAB Computerized Cost Escalation Program)



\*TR 1511 Data JAB Vol. 9 p. 91-109 & KSC Cost Index 331504; Index Numbers 2000 = \$1,000 Labor plus \$1,000 Materials Jan. 1974 (see JAB Ref. #99 & see p. 10)

\*\*The JAB/CH Cost Computerized Cost Escalation Program & Cost Data JAB Vol. V, p. 27-109; JAB Vol. IX & KSC Cost Index 331504\*\*

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- Oct. 2, 2006** - E mail alert update a recent REED (RS Means) report shows facility construction costs up an average of 10% and some materials cost up 12% to 24% (Remember our cost alert of 4/1/04 and update months before other report of pending cost escalation of 6/10% per year. This REED report confirms our early projection.
- Nov. 1, 2006** - Good News - Florida Today - State Approves Lower Workman's Compensation Rate (lower by nearly 16% (15.7%) to save employers 400 million)
- Nov. 11, 2006** - A mild hurricane season for 2006 should offer some relief to our current escalation problem.
- Dec. 1, 2006** - Christmas report, possible answers to cost escalation and U.S. economy problems. When high construction cost escalation should start stabilizing.
- Dec. 2, 2006** - How long will high construction cost escalation last?
  1. Until US dollar goes up 30% (to par)
  2. Until US recession/major depression in housing market (6/17/07 Housing)
  3. Until successful use of Helium 3 as a US electrical power source. This may take several years.
  4. Until Successful Solar Power Generation from Space, may take 2-10 years

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## KSC COST INDEX MARCH 30, 2007 NOW UP

E-mail from JAB April 13, 2007: KSC INDEX SAYS "Use 8% per year to mid point of construction".  
JAB Comments "per index" "costs up 9.95% for 2006 --7.53% for 2005 & 24.36% for 2004" therefore confirming jab cost alert of 4/1/04"

### SUMMARY

What should be used for cost escalation for the NASA KSC Space Program for Space, Moon & Mars?

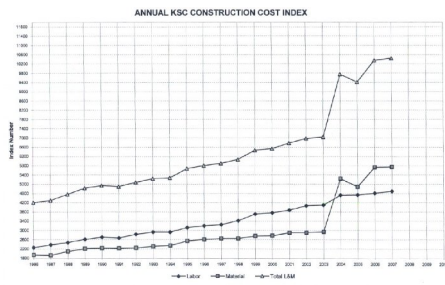
Consider using 5% to 10%\* per year, but on major multi-year that are heavy weighted in concrete, steel, rebar, copper, asphalt & aluminum do a cost analysis, get quotes on major cost items. Remember that impact, scheduling delays will cost extra for time extensions & change orders.

(\* wide variation for national and world economy, hurricanes, analysis, quotes, etc.)

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## Construction Cost Index



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September 2008 Change From Previous Quarter 4.22%  
See KSC Index for Changes Per Year

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## KSC Labor Cost Index

KSC Labor Cost Index  
September 2008

SPONSOR/ACTIVITY	CREW	June 2008 \$/HR.	July 2008 \$/HR.	Change \$/HR.	Cost Rate W/O PFI% \$/HR.	Cost Rate W/PFI% \$/HR.	Index
1 GEN. REG.	General Laborer & Truck Driver	28.45	0.20	28.65	20.70	3	63.37
2 GEN. REG.	EQUIP OPERATOR (CRANE)	29.81	0.10	29.91	23.93	3	71.42
3 STEWWORK	PLUMBING MECHANIC	27.87	0.50	28.37	23.85	3	70.65
4 CONCRETE	CONCRETE FORMWORK	33.94	0.13	34.07	24.66	10	248.07
5 MASONRY	1 Mason 1 Laborer	40.76	0.14	40.90	28.60	10	298.03
6 METAL	BLACK IRON/STEEL CROW	49.87	1.00	50.87	31.60	14	442.75
7 CARPENTRY	1 Mason 1 Laborer	37.03	0.02	37.05	28.42	3	76.23
8 MASONRY	CONCRETE CROW	36.69	0.06	36.75	28.01	3	86.00
9 MASONRY	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
10 FRAMING	CONCRETE CROW	37.87	1.48	39.35	31.98	3	96.88
11 SPECIALTIES	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
12 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
13 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
14 CONCRETE	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
15 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
16 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
17 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
18 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
19 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81
20 EQUIPMENT	CONCRETE CROW	36.71	0.13	36.84	28.27	3	78.81

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## Costs

- Material Cost** – Material prices for the third quarter of 2008 increased for diesel fuel, asphalt paving, concrete, concrete block, structural steel, steel stud, built-up roofing, fiberglass insulation, gypsum board, black iron pipe, and electrical metallic tubing. There were no decreases in material costs.
- Labor Cost** – The latest Davis-Bacon General Decision (FL20030017) was issued September 19, 2008. Davis-Bacon wage rates increased for Asbestos Workers, both insulator work and hazardous material, Bricklayers, Ironworkers, Glaziers, Painters, and Sprinkler Fitters. There were no decreases in labor rates.
- PT&I Cost** – Updates have been made to the PT&I information for estimated average markups for payroll taxes and Insurance for general contractors. See page 8 for updated information.

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## Material Costs

SPEC/CONTACT	MATERIAL	MATERIAL Price per Unit			Material Index Composite			Note	
		JUN 2008	Qtr3	SEP 2008	Quantity	Unit	Cost		
1	CONSTR EQUIP	50 Ton Crane (weekly rental rate)	3,798.00	0.03	3,798.00	1	WK	3,798.00	1
1	CONSTR EQUIP	Diesel Fuel per gallon	3.98	4.38		100	Gal	438.00	
2	SITE WORK	Asphalt Paving 1-1/2" Fine Type 3	9.87	0.15	9.82	100	SY	982.00	1
3	CONCRETE	3000 PSI Ready-Mix Concrete	111.80	1.00	112.80	10	CY	1,128.00	
3	CONCRETE	Rebar, #1 Grade 60	0.76	0.78		300	LB	300.00	
4	MASONRY	Concrete Block, 8x8x16	1.49	0.98	1.98	400	EA	832.00	
5	METALS	Structural Steel, Multi-story	1.44	0.90	1.74	200	LB	348.00	
5	METALS	Shop Fabrication	0.97	0.28	1.23				
5	METALS	Erection	0.87	0.10	0.87				
6	CARPENTRY	Steel Stud, 22 gauge, 3-5/8", 10' long	4.98	0.13	4.79	200	EA	958.00	
7	MOIST PROT	Walk-up Roofing 3-ply 90 (30/30)	82.00	1.38	83.38	5	SQ	218.95	
7	MOIST PROT	Fiberglass Insulation 3-1/2" R-13	0.41	0.03	0.44	1000	SF	440.00	
8	FINISHES	Vinyl Composition Tile 18"	0.88		0.88	100	SF	88.00	
9	FINISHES	5/8" Gypsum Board Type X (Sheetrock)	0.50	0.02	0.22	1000	SF	220.00	1
9	FINISHES	Ceiling, Acoustical Tile with suspension grid	0.91		0.91	150	SF	136.50	
15	MECHANICAL	8" DIP Slip Joint Clean 90	10.40		10.40	25	LF	260.00	
15	WELDING	2" Pipe, Sch. 40, A-53 Black	7.50	0.25	7.25	100	LF	725.00	
15	SHEET METAL	Galvanized Steel Ductwork, 22 gauge	0.90		0.90	400	LB	360.00	
16	ELECTRICAL	#12 THWN-1918N Solid Copper	0.11		0.11	5000	LF	550.00	1
16	ELECTRICAL	#10 Electrical Metallic Tubing (EMT)	0.93	0.03	0.98	1000	LF	980.00	1
							Gross Composite		12,211.43
Individual prices are not to be used for estimating. Prices are for index development only.							KSC base adjustment Factor		0.498
							Adjusted Material Index		6086

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## Summary – Cost Engineering Recommendations

- Based on previous charts and 50 years of estimating cost engineering experience
- June 7-27, 2004 For KSC construction projects use 10%\* for escalating for 2004, & 4% for 2005, and 2006 – but "Do a cost analysis and get quotes for major multi-year projects that are heavy weighted in concrete, steel Rebar (Reinforcing Steel), copper, asphalt, and aluminum". Also scheduling delays will cost extra for time escalation which must be considered.
- Some considerations in this percentage for escalation-labor up 7%, KSC materials up 18.8% 3/31/04, assuming 50% labor and 50% material would average 12.9%
- Other thoughts, concrete to go up 20%, rebar 20-40%, say 30%, steel 20-40%, say 30%
- However, past history shows 1971 increase of 13.8%, 1975 – up 11.8% and 1980 up 10.1%.
- This 10% for FY 2004 applies to previous construction estimates for future projects made prior to July 1, 2004

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## Cost Changes on Indexes

	ENR CCI		ENR BCI		TR-1511	
1996	5.823	2.77%	3.203	2.87%	5.817	2.78%
1997	5.825	3.48%	3.354	4.79%	5.894	1.30%
1998	5.920	1.61%	3.391	0.80%	6.014	2.00%
1999	6.060	2.30%	3.456	1.88%	6.314	4.75%
2000	6.221	2.60%	3.539	2.35%	6.531	3.32%
2001	6.342	1.91%	3.574	0.98%	6.780	3.67%
2002	6.538	3.00%	3.623	1.35%	6.895	1.67%
2003	6.695	2.34%	3.693	1.90%	7.027	1.89%
2004	7.129	6.10%	3.984	7.30%	8.176	14.05%
2005	7.444	4.23%	4.205	5.26%	9.054	9.70%
2006	7.751	3.96%	4.369	3.76%	9.959	9.09%
2007	7.971	2.75%	4.485	2.58%	10.446	4.66%
2008	8.318	4.18%	4.697	4.50%	10.860	3.82%

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KSC 9-08 Chg per Qtr 4.22%  
ENR 10-08 Annual Chg 7.3% Or Ave 5.75% Change