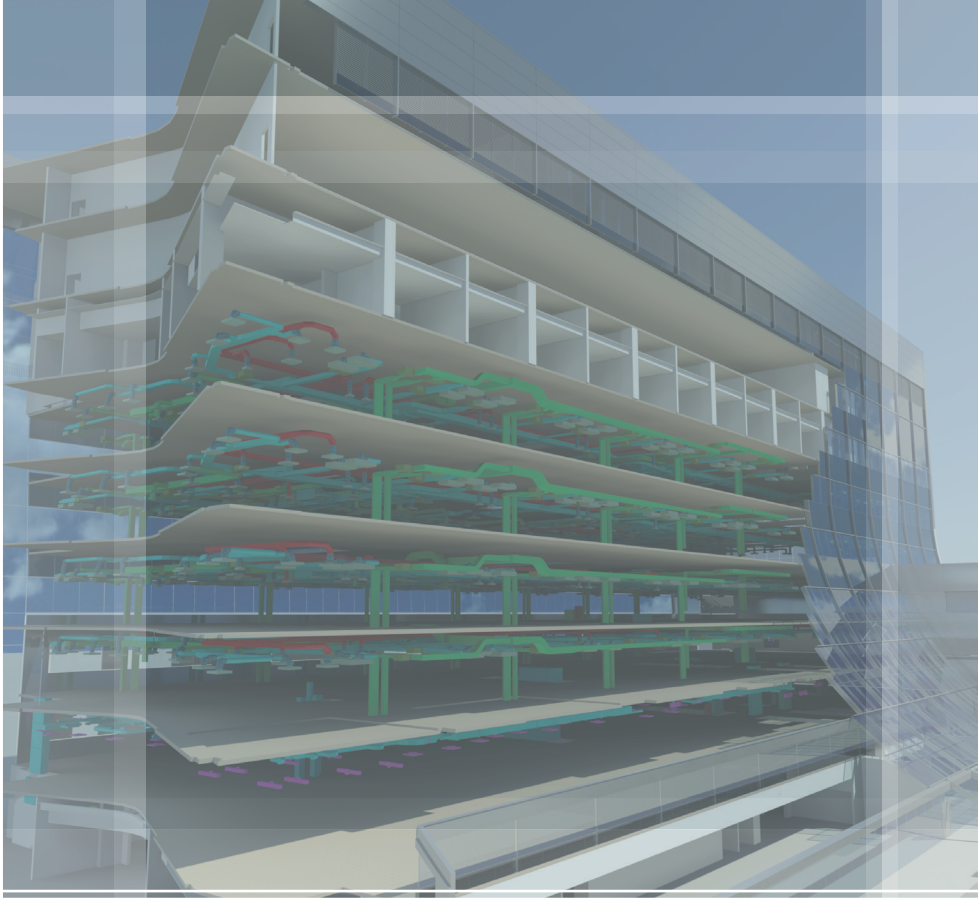
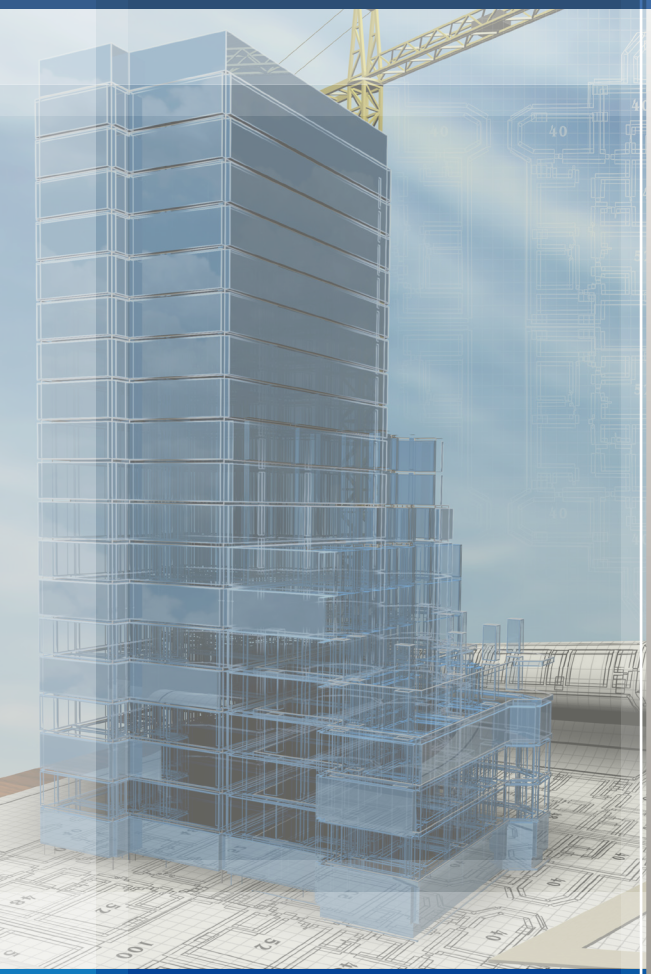


CONSTRUCTION ECONOMICS



MARKET CONDITIONS IN CONSTRUCTION

Gilbane Building Company

JULY 2013

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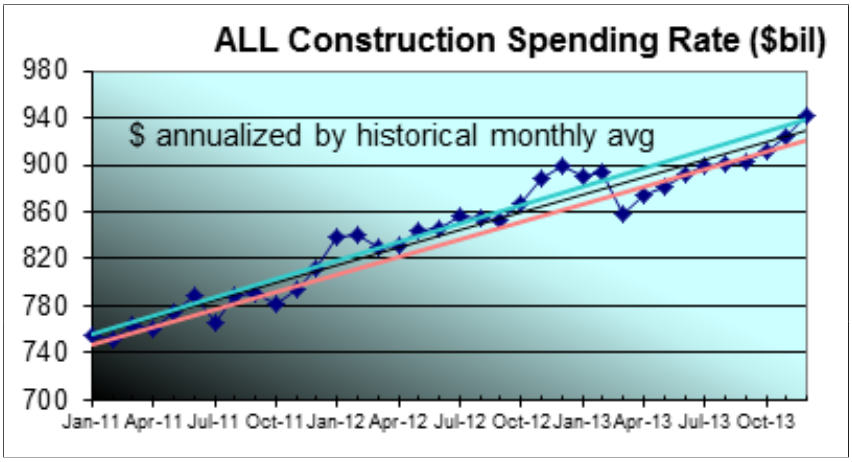
SUMMARY

CONSTRUCTION GROWTH LOOKING UP:

- Construction Spending for 2013 will finish the year 5% higher than 2012. All of the growth will be attributed to residential construction. (See Figure A)
- After eight increases in nine months, the Architecture Billings Index (ABI) dropped in March and April before increasing again in May (see Figure B). This is a very good leading indicator for new construction work starting in Q3-Q4 2013 and leading into 2014.
- The backlog of construction starts from the last two years indicates an upturn in nonresidential spending starting in May 2013.
- ENR published selling price data for 2013 that shows contractors adding to their margins.
- Construction gained 190,000 new jobs in the last 12 months. Although most of those jobs are supporting residential construction, recent months show an equal number added to nonresidential construction.

Figure A

Total spending of ALL types of construction will grow just over 5% year over year from 2012 to 2013. We started the year at an annual rate of spending near $890 billion and will grow to a rate of $940 billion by year end. We experienced a Q1-Q2 2013 slowdown, but now expect continued growth. The Dodge Momentum Index, although down recently, is still well up since the mid-2011 bottom indicating growth in 2013.



IMPACT OF RECENT EVENTS:

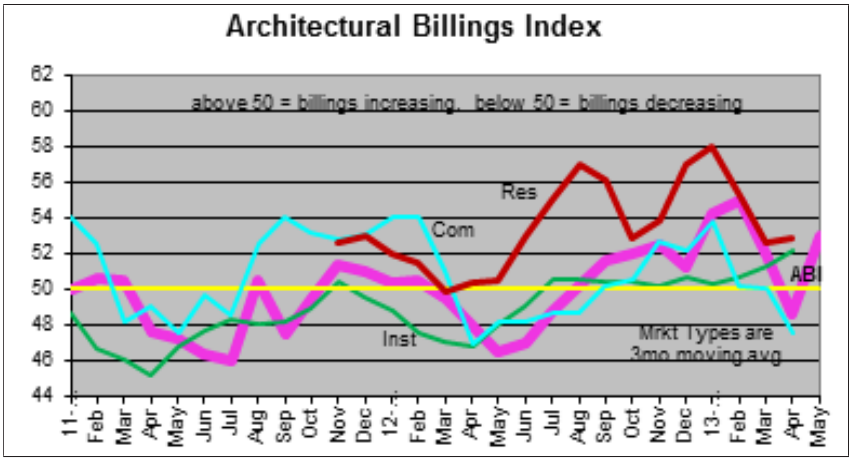
- FMI's Second Quarter 2013 Construction Outlook Report states 19% of contractors report sequestration reducing their public work by 4% to 6%. Only 6% of contractors say their private work has been affected and most say private work has declined by less than 1%.
- Comments regarding the outlook for economic stimulus have recently caused interest rates to increase rapidly. Lending criteria is still tight and borrowers are cautious about taking on new debt. Rates will continue to rise and borrowing costs will add potential cost to future funding of projects. The cheapest time to build is now behind us.

SOME ECONOMIC FACTORS ARE STILL NEGATIVE:

- The monthly rate of spending for nonresidential buildings declined four out of the last five months.
- The ABI, McGraw Hill Dodge new starts and the Dodge Momentum Index (DMI) all indicated a dip in nonresidential spending, potentially from February through May 2013. That dip did occur and will hold down total nonresidential spending for the year.
- The construction workforce is still 25% below the peak. It will take a minimum of five more years to return to peak levels.
- As workload expands in the next few years, a shortage of available skilled workers may have a detrimental effect on cost, productivity and the ability to readily increase construction volume.
- Since the end of 2008, the Producer Price Index (PPI) data shows material price inputs to construction increased by 13%. During that same period contractor's margins decreased by 6%.

Figure B

The Architectural Billings Index (ABI) has proven to be a reliable indicator. The ABI predicts nonresidential activity 9 to 12 months out and correctly indicated both the downturn and upturn in 2012 and again the downturn in Q1 through Q2 2013. Indexes above 50 indicate increasing billings. Spending generally follows a similar pattern 9 to 12 months later.



THE EFFECTS OF GROWTH:

- Construction spending during the first five months of 2013 declined from the rate of spending in Q4 2012. Growth has been inconsistent, even in the booming residential sector. We see more consistent growth for the second half of 2013.
- As spending continues to increase, contractors gain more ability to pass along costs and increase margins. However, contractors almost always are playing catch-up. In the most recent three-month period, contractors' costs began to climb faster than whole building costs went up, due to both increasing material costs and declining productivity.
- ENR's Second Quarter 2013 Cost Report states the Rider Levett Bucknall selling price index increased 1.1% for the second quarter, reflecting a 3% annual escalation, mostly caused by subcontractors adding to their margins, rather than higher material prices.

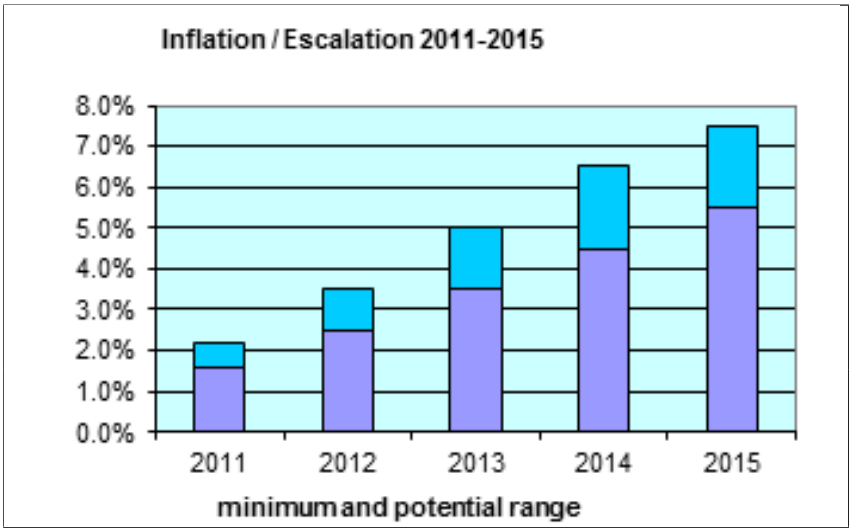
Figure C

Future escalation, in order to capture increasing margins, will be higher than normal labor/material cost growth. Lagging regions will take longer to experience high escalation. Residential escalation is near or even above the upper end of the range.

We advise a range of

3.5% to 5% for 2013

4.5% to 7.5% for 2014 and 2015



SUPPORTED BY OVERALL POSITIVE GROWTH TRENDS FOR YEAR 2013, I EXPECT MARGINS AND OVERALL ESCALATION TO CLIMB MORE RAPIDLY THAN WE'VE SEEN IN FIVE YEARS.

Work activity in nonresidential buildings construction slowed in the first five months but is expected to increase substantially in the second half of 2013. We will see a decline in nonbuilding infrastructure spending in 2013. Residential work will remain extremely active. Once growth in nonresidential construction picks up and both residential and nonresidential are active, we will begin to see more significant labor shortages and productivity losses. From 2006 to 2010, as work declined, we saw the largest decline of margins in recent history. Margins regained a positive footing in 2012. Even moderate growth in activity will allow contractors to pass along more material costs and increase margins. When activity picks up in all sectors, escalation will begin to advance rapidly.

CONSTRUCTION STARTS

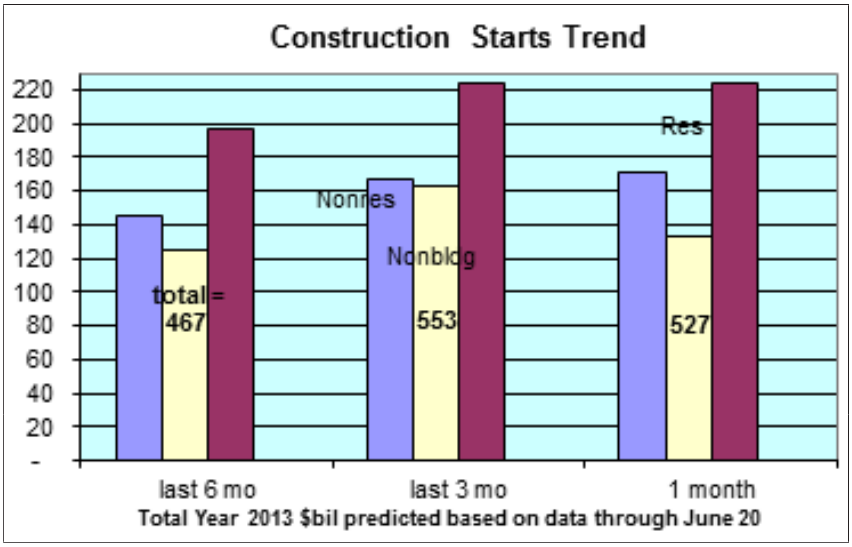
McGraw Hill Construction (MHC) publishes Construction Starts data, information that includes actual monthly data and a seasonal adjusted annual rate (SAAR) for each monthly starts value. Construction Starts data is volatile from month to month and this can skew the interpretation of the output. Over the last two years, totals for consecutive months have varied a dozen times by more than 10% and the nonbuilding data by more than 25%. This causes unusual peaks and valleys in the data. One way to look at the data is to calculate forecasts based on the latest month, last three months and last six months. One month data is sometimes too volatile to predict the year, but shows the current monthly trend; three-month moving average trends smooth out the data and give a better near term prediction; and six-month trends flatten the data even more and helps show the change from six months to the more current three months.

Figure 1

Nonbuilding starts have been the most erratic through last year, climbing as much as 60% above and dropping 35% below annual average, so the short term averages may often be skewed.

Residential starts show the most consistent growth, now at a rate 30% higher than Q1 2012.

Nonresidential buildings new starts were nearly flat since March 2012 and then shot up unexpectedly in December. Expect to see some dips rather than a continuous upward trend, but this data looks good for future spending.



EXPECTATIONS FOR 2013 BASED ON MCGRAW HILL CONSTRUCTION STARTS DATA:

- New construction starts are expected to increase approximately 6% in 2013, upward movement influenced entirely by residential starts.
- Nonresidential buildings starts averaged $129 billion in Q1 2012 and grew to an average of $140 billion in Q1 2013. In May it reached $156 billion. 2013 should finish the year with a rate near $170 billion, and an average for the year of $157 billion. Although the rate of starts will show good growth, I expect 2013 total nonresidential building starts will remain flat compared to 2012.
- Nonbuilding infrastructure starts averaged $153 billion in Q1 2012 and fell to $127 billion in both Q4 2012 and Q1 2013. May 2013 was $132 billion. I expect 2013 nonbuilding infrastructure starts will decline 9%.
- From Q1 2011 to Q1 2013, the rate of new residential starts has grown from $120 billion to $200 billion, 67% growth. May starts reached $206 billion and starts have been near $200 billion for five of the last six months. I expect 2013 residential starts will grow to a rate of $218 billion by year end and the total will average $210 billion for the year, 27% growth from 2012.
- McGraw Hill predicts electric utility infrastructure starts will be down 30% in 2013.
- McGraw Hill predicts nonresidential commercial building starts will be up 12% in 2013.

Table 1

TOTAL CONSTRUCTION STARTS					Forecast 2013 based on		
	Actual 2009	Actual 2010	Actual 2011	Actual 2012	3 month actuals	6 month actuals	trend prediction
Nonresidential Buildings	167,955	161,194	165,048	156,780	166,611	145,175	157,000
		-4.0%	2.4%	-5.0%	6.3%	-7.4%	0.1%
Residential Buildings	111,851	121,155	126,299	165,662	224,031	196,887	210,000
		8.3%	4.2%	31.2%	35.2%	18.8%	26.8%
Nonbuilding Construction	141,899	148,088	147,851	154,328	162,598	124,770	140,000
		4.4%	-0.2%	4.4%	5.4%	-19.2%	-9.3%
Total Construction	421,705	430,437	439,198	476,770	553,240	466,831	507,000
percent change yoy		2.1%	2.0%	8.6%	16.0%	-2.1%	6.3%
dollars in millions					M-A-M	Dec-May	
includes McGraw Hill data released June 20, 2013							
forecast based on GBCo historical cumulative factors							

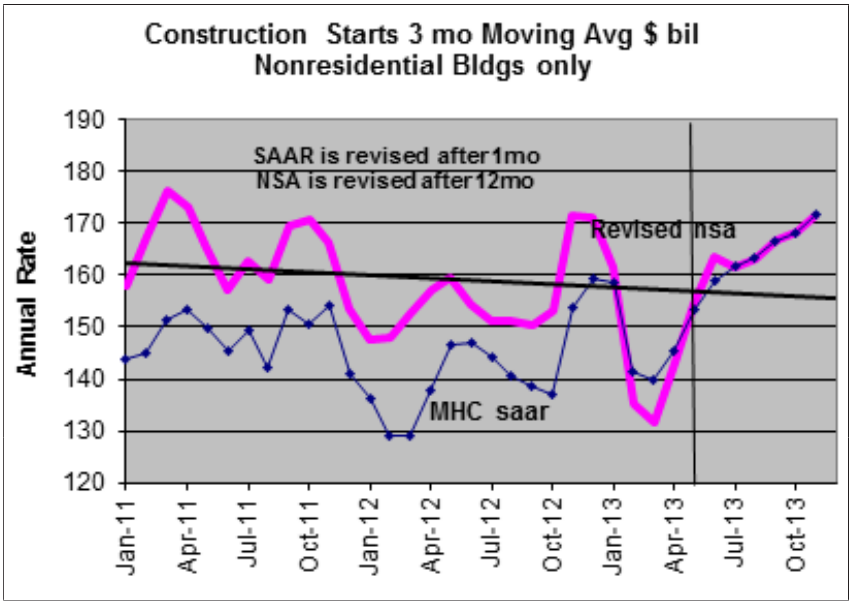
MHC Construction Starts can act like a leading indicator. Even though not all construction projects are captured in the starts data (only about 50% is captured), we have more than enough data to develop cash flows over time that will show the expected direction in construction activity. Starting with the 3-month moving average of actual starts, Figures 2 and 3 show this relationship for nonresidential buildings.

MHC measures new starts. To visualize expected trends in spending volume we need to create a cash flow of the value of new starts over the expected duration specific to the project type. Using an appropriate duration for each major market sector, it may take the previous 24 months of new starts to find the resultant cumulative cash flow in any given month. New starts can be used as a leading indicator of work 6 to 24 months out.

Figure 2

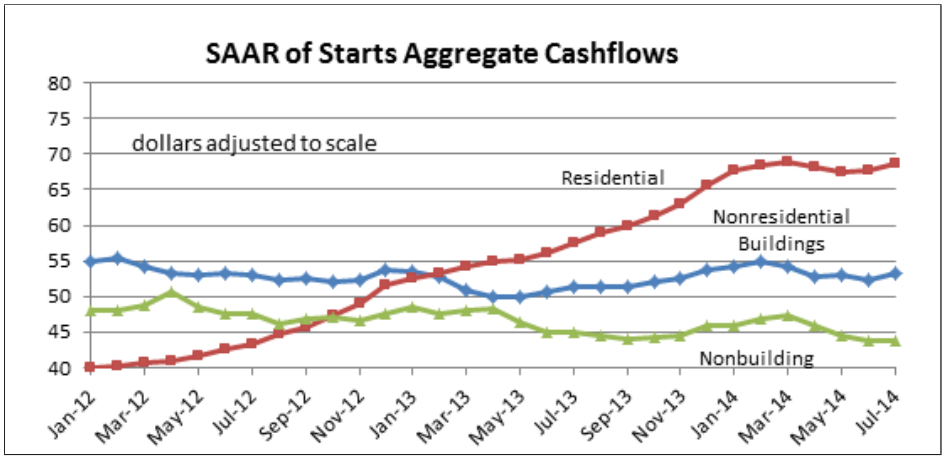
The bulk of nonresidential buildings starts that will be spent in early 2013 started in the 15 months prior. The 3-month moving average starts hit a multi-year low in January-February 2012. Those low starts may be the reason for below average spending in March and April 2013. In February-April 2013 starts went even lower. I expect this to depress spending in Q1-Q2 2014.

Note: All Starts SAAR data is revised 1 month later and NSA data is revised 12 months later. MHC SAAR includes 1-month adjustment. Revised NSA previous year values include 12-month adjustments.



Starts represent the value of project contracts signed. We can assume durations for the various major categories of projects and cash flow the starts. A cash flow spreads out the value of the new project starts over time, the expected duration from start to finish. Generally project durations can range from 6 to 9 months for small projects and up to 24 to 30 months for very large projects. Project duration and cash flow begins in the month the data gets posted.

Figure 3



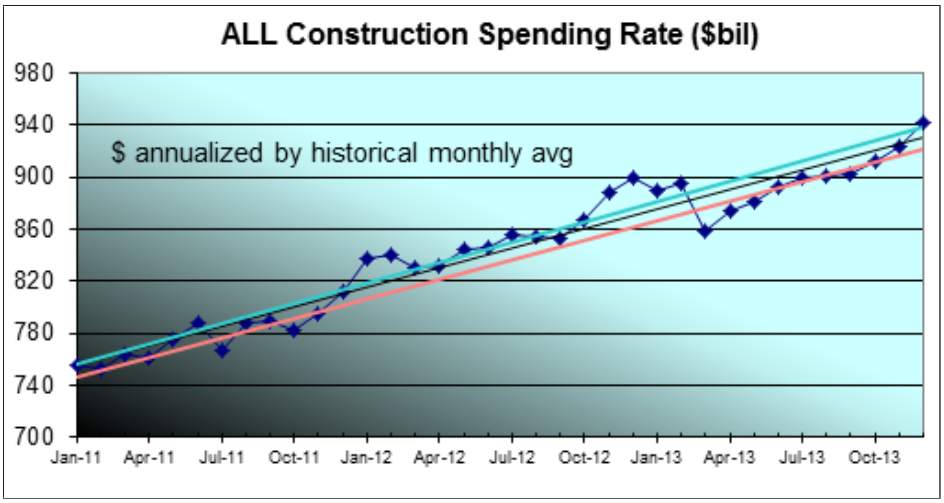
The cumulative cash flow total in the current month from all monthly starts over the last two years shows the relative change in spending caused by fluctuation in starts. The cash flow plot in Figure 3 shows a continued upward growth in residential construction and relatively flat spending for nonbuilding infrastructure work. For nonresidential building work we see a dip in Q1 2013 before it resumes upward growth through the end of 2013, until another dip in Q1-Q2 2014.

CONSTRUCTION SPENDING

TOTAL SPENDING FOR ALL TYPES OF CONSTRUCTION IN 2013 WILL REACH $898 BILLION, UP 5.1% YEAR OVER YEAR FROM 2012.

IN Q1 2012 THE MONTHLY RATE OF SPENDING WAS $824 BILLION AND FOR Q4 2012 IT REACHED $905 BILLION. FOR THE FIRST FIVE MONTHS OF 2013 THE MONTHLY RATE OF SPENDING WAS $879 BILLION WITH MAY AT $881 BILLION. WE SHOULD FINISH 2013 WITH A MONTHLY RATE OF SPENDING NEAR $940 BILLION.

Figure 4



If we experience a growth rate after April as predicted and shown by the plotted data points, not long after it will be accompanied by growing inflation. Even if we fall to the low end trend line in 2013, we should experience no less than a 4% growth rate.

Construction spending for 2013 will be pushed higher by growth in residential construction, a rate of spending growth that increased by 18% from Q1 to Q4 2012. The growth is 8% in the first five months of 2013, an annual growth rate near 20%. I anticipate total growth for residential spending will increase by 17% in 2013.

Both nonresidential buildings and nonresidential infrastructure spending are below 2012 levels. The rate of spending decreased from an average of $586 billion in Q4 2012 to $550 billion in the first five months of 2013. Nonresidential infrastructure spending hit an all-time high in Q4 2012. Since then it has dropped off more than 10%.

Total growth in nonresidential buildings spending will be held back by a dip early this year. The rate of spending decreased from an average of $300 billion in Q4 2012 to $284 billion in May. Spending on nonresidential buildings has decreased five out of the last six months. The rate of spending will increase 8% to 10% from April-May to December 2013, but due to the early year declines total spending will decrease slightly from 2012 total spending.

Table 2

U.S. Total Construction Spending Summary

totals in billions current U.S. dollars

	Actual							Forecast
	2006	2007	2008	2009	2010	2011	2012	2013
Nonresidential Buildings	339.4	403.7	438.0	375.5	290.2	282.8	299.1	298.1
% change year over year	12.5%	18.9%	8.5%	-14.3%	-22.7%	-2.6%	5.7%	-0.3%
Nonbuilding Heavy Engr	207.9	248.3	271.8	273.3	265.1	249.7	273.4	268.9
	12.4%	19.4%	9.5%	0.6%	-3.0%	-5.8%	9.5%	-1.6%
Residential	619.9	500.3	357.7	254.3	248.9	245.6	282.0	331.0
	0.4%	-19.3%	-28.5%	-28.9%	-2.1%	-1.3%	14.8%	17.3%
Total	1167.2	1152.3	1067.5	903.1	804.2	778.1	854.5	898.0
	5.7%	-1.3%	-7.4%	-15.4%	-11.0%	-3.2%	9.8%	5.1%

Residential includes new, remodeling, renovation and replacement work.
Source: U.S. Census Bureau, Department of Commerce.

Actual Spending data through January 2013
Forecast 2013 = GBCo

(Gilbane Building Company analysis uses in-house developed historical factors for individual monthly rates of spending. These historical rates vary from the US Census Bureau Seasonally Adjusted Annual Rate [SAAR] factors and give a somewhat different prediction of annual rates of spending than SAAR).

THE FMI SECOND QUARTERLY CONSTRUCTION OUTLOOK REPORT PROJECTS TOTAL CONSTRUCTION SPENDING FOR 2013 WILL REACH $913 BILLION, GROWTH OF 7% OVER 2012.

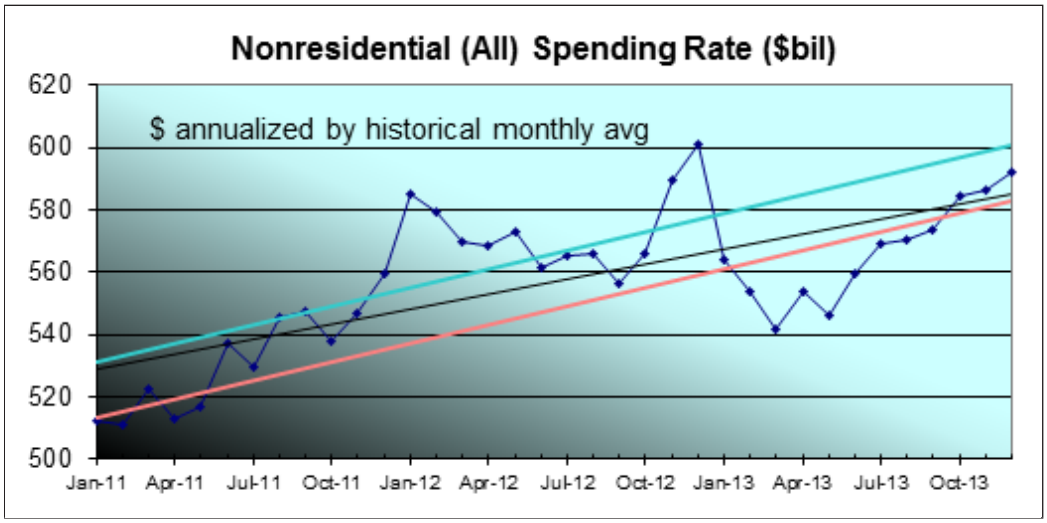
THE REED CONSTRUCTION DATA FORECAST MAY 2013 REPORT PROJECTS TOTAL CONSTRUCTION SPENDING FOR 2013 WILL REACH $890 BILLION, GROWTH OF 4.0%.

Nonresidential Construction Spending

TOTAL SPENDING FOR ALL NONRESIDENTIAL CONSTRUCTION IN 2013 WILL REACH $567 BILLION, DOWN 1% YEAR OVER YEAR FROM 2012.

The AIA Architectural Billings Index for commercial and institutional buildings shows a dip that spanned from Q1 through Q2 2012. That dip resulted in fewer new starts now 9 to 12 months later. In addition the cash flow of previous jobs reflected in MHC starts data produce lower spending in Q1 and Q2 2013. Figures 5 and 6 show that the drop bottomed out between March and May 2013.

Figure 5

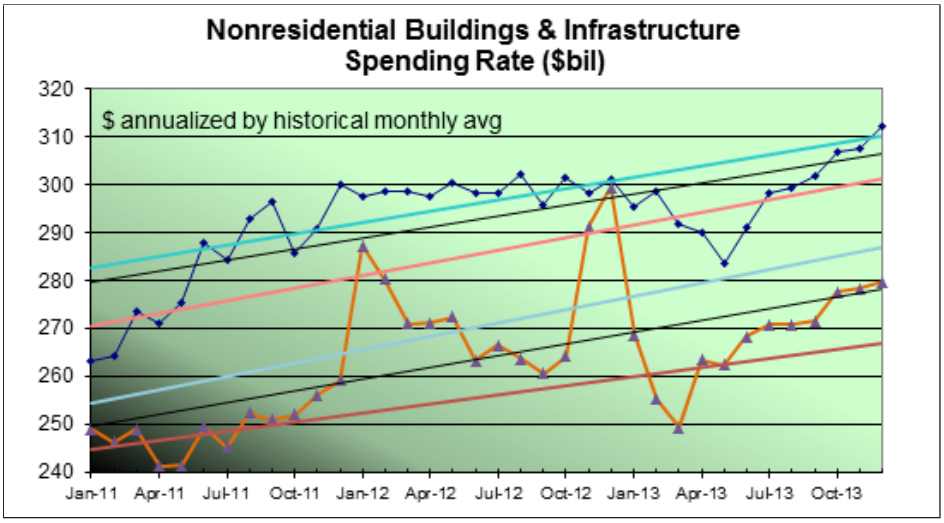


NONRESIDENTIAL CONSTRUCTION CONSISTS OF TWO MAIN CATEGORIES:

1. nonresidential buildings
2. nonbuilding infrastructure projects

Nonbuilding projects are composed of heavy engineering, heavy industrial and infrastructure projects. They include transportation, communication, power, highway and street, sewage and waste disposal, water supply and conservation and development. Almost 60% of non-building work is public work.

Figure 6



Since January 2012, nonresidential spending declined 3% to a low in September, primarily due to a drop in nonbuilding infrastructure work. The largest components of nonbuilding infrastructure work are power and highway/street. Unusual growth in power utilities work in November and December erased that decline and reversed it to annual growth. However, once again in the first quarter of 2013, nonbuilding infrastructure spending declined more than 5% in three months. Power construction declined 30% from December to March, an annual rate decline of over $30 billion.

Nonresidential Buildings Spending

TOTAL SPENDING FOR NONRESIDENTIAL BUILDINGS CONSTRUCTION IN 2013 WILL REACH $298 BILLION, DOWN SLIGHTLY FROM 2012.

IN Q1 2012 THE MONTHLY RATE OF SPENDING WAS $299 BILLION AND FOR Q4 2012 IT WAS $301 BILLION. IN Q1 2013 THE MONTHLY RATE OF SPENDING WAS $295 BILLION, BUT BY MAY 2013 THIS DROPPED TO $285 BILLION. WE SHOULD FINISH 2013 AT A RATE NEAR $312 BILLION.

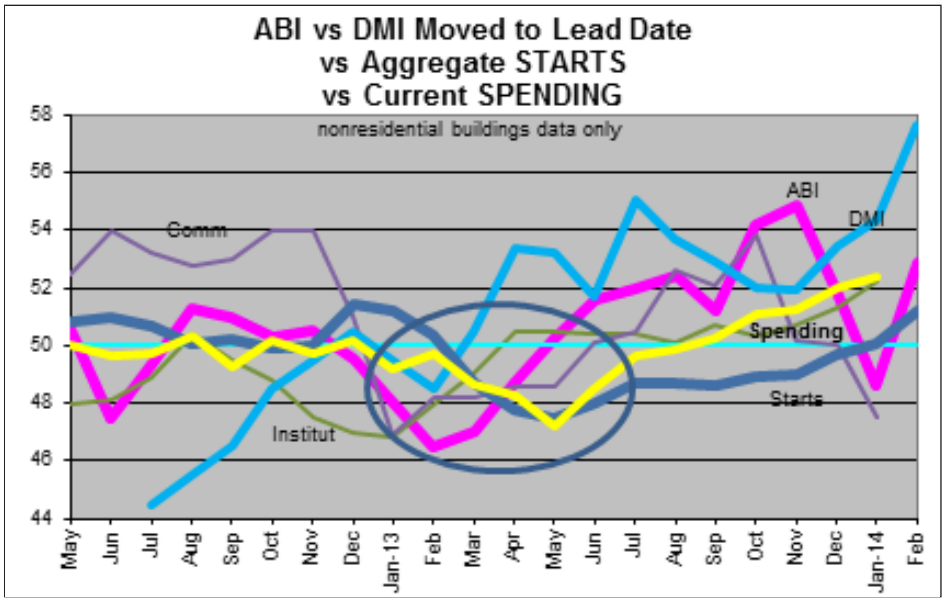
The FMI Second Quarterly Construction Outlook report projects nonresidential buildings spending will increase 4% for 2013.

The Reed Construction Data Forecast May 2013 report projects nonresidential buildings spending of $300 billion for 2013, growth of 0.2%.

Figure 7 shows an overlay created by moving leading indicators forward by each of their appropriate lead times to present time. The ABI is a nonresidential indicator for work 9-12 months out. Along with the composite ABI, the commercial and institutional ABI indices are shown. The cash flow of MHC nonresidential starts over the expected duration of the project type was developed in the Starts section of this report and captures cumulative cash flow. The Dodge Momentum Index (DMI) is roughly a 12-month leading indicator of nonresidential work.

On this overlay, I've plotted my monthly spending prediction, which seems to correlate well over the months shown. As expected, we did indeed experience a dip in nonresidential buildings spending from February to May 2013. Currently, all indicators point to sustained growth through year end.

Figure 7



Healthcare and Educational, the major institutional sectors, represent 23% of all nonresidential construction and ±40% of nonresidential "buildings" spending. Both peaked in 2008, educational at an annual rate of $105 billion and healthcare at $47 billion. Educational is 80% public while Healthcare is 80% private.

Commercial and Office represent 15% of all nonresidential construction and ±30% of nonresidential "buildings" spending. Commercial peaked in 2007 while Office peaked in 2008. Both declined 50% from their peaks. Commercial is 95% private and Office is 70% private.

These four market sector represent 70% of all nonresidential buildings spending.

Table 3

U.S. Total Construction Spending

totals in billions current U.S. dollars

	Actual							Forecast
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Educational	84.9	96.8	104.9	103.2	88.6	84.3	84.8	80.0
% change year over year	6.5%	14.0%	8.4%	-1.6%	-14.1%	-4.8%	0.6%	-5.7%
Healthcare	38.5	43.8	46.9	44.8	38.7	39.7	40.6	41.2
	12.2%	13.8%	7.1%	-4.4%	-13.6%	2.4%	2.4%	1.4%
Commercial	76.7	89.7	86.2	54.1	39.5	43.6	47.2	49.0
	9.2%	16.9%	-3.9%	-37.3%	-27.0%	10.4%	8.2%	4.0%
Office	54.2	65.3	68.6	51.9	37.9	34.6	36.5	37.9
	18.4%	20.4%	5.1%	-24.3%	-27.1%	-8.5%	5.2%	4.0%
Total	254.3	295.5	306.6	254.0	204.6	202.2	209.1	208.2
	10.6%	16.2%	3.7%	-17.1%	-19.4%	-1.2%	3.4%	-0.4%

Source: U.S. Census Bureau, Department of Commerce.

includes public and private

Forecast 2013 = GBCo

TOTAL SPENDING FOR EDUCATIONAL BUILDINGS CONSTRUCTION IN 2013 WILL REACH ONLY $80 BILLION, DOWN -5.7% YEAR OVER YEAR FROM 2012. ALTHOUGH THE MONTHLY RATE OF SPENDING WILL GROW NEARLY 10% FROM THE APRIL 2013 LOWPOINT TO DECEMBER, IT WILL STILL DECLINE 2% FROM Q4 2012 TO Q4 2013.

K-12 projects are often municipally funded (public spending) and municipalities lag states in reaction to economic movement. Therefore we should still expect further declines in K-12 spending due to future economic reactions. Private colleges and universities will generate higher rates of spending than the general education spending percentages would indicate. A recent article published in the New York Times, citing statistics from the US Census construction spending survey, states "spending on construction of primary and secondary education buildings is running 40% below peak levels, but spending on higher education buildings is down only 15%."

TOTAL SPENDING FOR HEALTHCARE BUILDINGS CONSTRUCTION IN 2013 WILL REACH $41 BILLION, UP ONLY 1.4% YEAR OVER YEAR FROM 2012. THE MONTHLY RATE OF SPENDING WILL INCREASE 6% FROM JANUARY TO DECEMBER 2013.

TOTAL SPENDING FOR COMMERCIAL BUILDINGS CONSTRUCTION IN 2013 WILL REACH $49 BILLION, UP 4.0% YEAR OVER YEAR FROM 2012. THE MONTHLY RATE OF SPENDING WILL INCREASE 13% FROM JANUARY TO DECEMBER 2013.

TOTAL SPENDING FOR OFFICE BUILDINGS CONSTRUCTION IN 2013 WILL REACH $38 BILLION, UP 4.0% YEAR OVER YEAR FROM 2012. THE MONTHLY RATE OF SPENDING WILL INCREASE 8% FROM JANUARY TO DECEMBER 2013.

YEAR TO DATE SPENDING ON:

- public educational buildings is down 10% from the same period last year
- public healthcare buildings is down 3.4%
- public commercial work is down 21%
- public office buildings is down 31%

- private educational is down only 1%
- private healthcare is down 3.5%
- private commercial buildings is up 4.3%
- private office buildings is up 9%.

The FMI Second Quarterly Construction Outlook report for 2013 predicts increased spending of 2% for educational and 5% for healthcare.

The Reed Construction Data Forecast May 2013 report predicts 3.7% and 0.9% decreases in spending in educational and healthcare, respectively.

Public/ Private

Total construction can be split into Public and Private spending.

The largest public construction markets are Highway and Educational. Those two markets alone represent more than half of all public construction, followed by Transportation, a distant third, and Waste Disposal fourth. All other markets together make up less than 30% of public work.

Table 4

U.S. Total Construction Spending

totals in billions current U.S. dollars

	Actual							Forecast
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Private	911.8	863.4	758.8	588.1	500.5	494.7	578.8	625.4
% change year over year	4.8%	-5.3%	-12.1%	-22.5%	-14.9%	-1.2%	17.0%	8.1%
Public	255.4	288.9	308.7	315.0	303.7	283.4	275.7	272.6
	9.0%	13.1%	6.9%	2.0%	-3.6%	-6.7%	-2.7%	-1.1%
Total	1167.2	1152.3	1067.5	903.1	804.2	778.1	854.5	898.0
	5.7%	-1.3%	-7.4%	-15.4%	-11.0%	-3.2%	9.8%	5.1%

Source: U.S. Census Bureau, Department of Commerce.

Forecast 2013 = GBCo

Public spending in 2012 was down 2.7%, but private spending was up 17%.

Private spending volume is almost two and a half times that of public spending. If we take out residential construction, private spending would be only 10% greater than public spending.

TOTAL PUBLIC CONSTRUCTION SPENDING IN 2013 WILL BE $273 BILLION, DOWN 1.1% YEAR OVER YEAR FROM 2012. THE MONTHLY RATE OF SPENDING WILL PEAK MIDYEAR BUT RETURN TO NO GROWTH BY YEAR END, 3% LOWER THAN Q1 2012.

TOTAL PRIVATE CONSTRUCTION SPENDING IN 2013 WILL BE $625 BILLION, AN INCREASE OF 8.1% YEAR OVER YEAR FROM 2012 BUT STILL MORE THAN 30% BELOW THE PEAK ACHIEVED IN 2006. THE MONTHLY RATE OF SPENDING WILL CLIMB STEADILY THROUGHOUT THE YEAR TO END 19% HIGHER.

Private construction is predominantly residential. 97% of all residential work is private and constitutes just under half of all private work. (A historical note: in 2005-2006, residential work constituted 70% of all private work and more than half of all construction spending. For the last three years residential comprises just less than 50% of private work and only 30% of all construction). Manufacturing (8%) and Commercial (7.5%) are the next largest private "buildings" sectors. Non-buildings make up a large portion of private work; all Power (17%) and Communication work (3.5%) is private work.

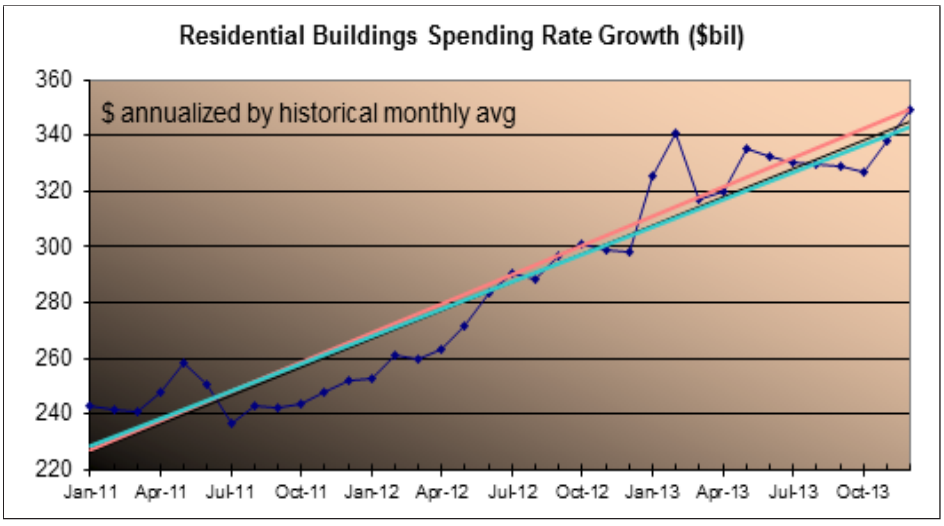
Residential Construction

TOTAL SPENDING FOR RESIDENTIAL CONSTRUCTION IN 2013 WILL REACH $331 BILLION, UP 17% YEAR OVER YEAR FROM 2012.

IN Q1 2012 THE MONTHLY RATE OF SPENDING WAS $258 BILLION AND FOR Q4 2012 IT WAS $300 BILLION, A GROWTH OF 16%. WE STARTED THE FIRST TWO MONTHS OF 2013 WITH A MONTHLY RATE OF SPENDING AT $333 BILLION, BUT THAT DROPPED TO $320 BILLION THE NEXT TWO MONTHS. WE SHOULD FINISH 2013 AT A RATE OF SPENDING OVER $340 BILLION.

Residential construction will account for ALL construction spending growth in 2013.

Figure 8



The rate of residential construction spending grew 16% from Q1 to Q4 2012.

Numerous organizations and economists have given projections for future growth in residential construction. One major published study from Joint Center for Housing Studies (JCHS) of Harvard University includes data from nine agencies predicting new housing starts. Only three predict 900,000 or less total starts for 2013. The consensus average is 962,000, volume growth of 190,000 units, 23%. For 2014, only one out of six predictions is below 1,100,000. The consensus for 2014 is 1,282,000 units or growth of 320,000 units, 33%.

Let's take a look at why new housing growth projections may affect the entire construction industry. A summary of the consensus information follows:

Projections range from 100,000 up to a high of 350,000 additional new units in 2013, and for 2014 range from 200,000 up to 600,000 additional new units. The consensus volume projection is 190,000 and 320,000 additional units respectively in 2013 and 2014. The consensus projection is 23% to 33% volume growth.

The longest smooth growth period for new home building was from 1991 to 2005. Total new homes built within a year went from 1.0 million units per year in 1991 to 2.0 million per year in 2005. Units include single and multifamily houses, apartments and condominiums. **The fastest rate of building growth during that period was 170,000 additional new units in 1994.** In the boom years from 2002 to 2005, growth only increased about 100,000 units per year. We duplicated that fastest growth in 2012 but we've never come close to growth rates of 350,000 to 600,000 new units per year. To reach 190,000 new additional units in 2013 over 2012 we would need to have the best year ever recorded.

Inflation must be factored out to see volume growth. In the last 20 years residential construction "volume" has reached 10% annual growth only 3 times; 1994 was 13%, 1996 was 10% and 2012 was 10%. We've never come close to growth rates of 23% to 33% new volume per year.

In 1994, the largest single volume growth in residential construction in 30 years, 340,000 new construction jobs, predominantly residential, were created in 12 months, an average of 28,000 jobs per month. That's the largest "residential" volume and workforce expansion in 30 years. The largest ever net annual gain in jobs was an average of 35,000 jobs per month over 14 months, but that's "ALL" construction, residential, nonresidential and heavy engineering, so not a realistic target.

We actually started a total of 780,000 new residential units in 2012, 170,000 more than 2011. We may potentially add 150,000 to 200,000 more new starts in 2013. To add 200,000 more units in 2013 would mean the residential construction workforce would need to grow at an extremely fast clip of approximately 25,000-30,000 jobs per month in 2013. Then if we add another 200,000 to 250,000 new units in 2014, the workforce would need to grow more than 35,000 jobs per month for a year. That would be as fast as the entire construction industry has ever grown at any time in the last 25 years. Imagine growing just one sector at that rate!

To reach levels of volume growth in the range of 350,000 to 600,000 units per year, we would need to grow the residential workforce at an astonishing rate, more than twice as fast as the ENTIRE construction industry workforce has ever grown during the most active periods. That is simply not realistic.

Labor demand would be so great that it would draw workers away from entering the nonresidential side of construction. Wage growth would accelerate. The workforce would be so watered down, productivity would plummet and quality would suffer. But more important, analysis simply seems to indicate even in boom times the workforce doesn't expand that fast.

MY MORE CONSERVATIVE PROJECTION IS FOR NEW HOME STARTS GROWTH RATES NEAR 20% PER YEAR FOR 2013 AND 2014. THAT STILL HAS THE WORKFORCE EXPANDING RAPIDLY, BUT AT LEAST NOT AT A UNREALISTIC RATE. MY MORE MODERATE PROJECTIONS ARE BELOW THE JOINT CENTER FOR HOUSING STUDIES CONSENSUS ESTIMATES.

The cautions that accompany such a fast growth rate are issues of productivity losses resulting in needing even more workers and profit losses, quality issues due to watered down workforce, rapid inflation, potential material shortages and finally labor shortages. None of those issues are good for the industry.

A recent survey by NAHB shows 15% to 20% of contractors and 25% to 35% of suppliers are experiencing shortages of oriented strand board, gypsum wallboard, framing lumber, plywood and roofing materials. Nearly 50% of residential contractors are experiencing labor shortages and also report delays in completing projects on time.

For residential construction, the good news is things are going to get very active in the next few years. Just watch how fast it grows back.

INFLATION ADJUSTED VOLUME

Spending is typically reported in unadjusted dollars, total revenue in current dollars. It is a true indication of current dollars spent within any given year, but does not give quite as clear a comparison of volume from year to year. To see a clear comparison of volume from year to year, we must look at inflation adjusted dollars, constant dollars. If spending increases by 2% from one year to the next, but inflation drove up the cost of products by 5% during that same time, then inflation adjusted dollars would show that net volume actually declined 3% during that time period. Dollars spent would have needed to grow by 5% just to keep pace with inflation at no volume growth compared to the previous year.

Table 5 adjusts Total Construction Spending for construction inflation and the changes in margin costs over the last six years. All dollars in this analysis are adjusted to 2012 equivalent dollars since we have not yet sufficient actual data on 2013 inflation. The rate of inflation each year is determined individually for nonresidential buildings, nonbuilding heavy engineering and residential.

Table 5

U.S. Total Construction Spending Summary
totals in billions U.S. dollars all ADJUSTED to 2013 $

	Actual							Forecast
	2006	2007	2008	2009	2010	2011	2012	2013
Nonresidential Buildings	360.4	399.8	413.9	375.5	313.0	298.8	308.0	298.1
% change year over year	5.2%	10.9%	3.5%	-9.3%	-16.6%	-4.6%	3.1%	-3.2%
Nonbuilding Heavy Engr	251.1	272.2	285.6	292.0	291.7	265.8	284.3	268.9
	19.4%	8.4%	4.9%	2.2%	-0.1%	-8.9%	7.0%	-5.4%
Residential	532.0	437.7	351.9	275.2	267.6	270.7	302.4	331.0
	0.7%	-17.7%	-19.6%	-21.8%	-2.8%	1.2%	11.7%	9.4%
Total	1143.5	1109.8	1051.3	942.7	872.4	835.2	894.7	898.0
	5.8%	-3.0%	-5.3%	-10.3%	-7.5%	-4.3%	7.1%	0.4%

Residential includes new, remodeling, renovation and replacement work.

Source $ Data: U.S. Census Bureau, Department of Commerce.

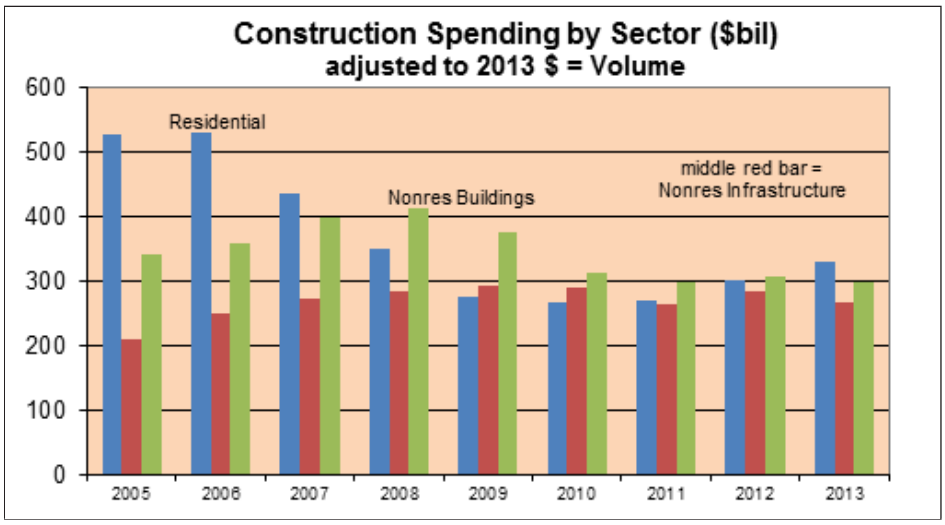
Indices references: GBCo Margin Index, S&P/Case-Shiller Home Price Index, BLS Residential PPI inputs

see Escalation Growth vs Margin Cost for GBCo inflation/deflation adjusted margin cost

2012 SHOWS 9.8% INCREASE IN REVENUE OVER 2011, BUT ONLY A 7.1% INCREASE IN VOLUME AS COMPARED TO 2011 AFTER ADJUSTING FOR INFLATION.

2013 REVENUE WILL INCREASE BY 5.1%, BUT 2013 VOLUME WILL INCREASE BY ONLY 0.4% AFTER INFLATION COMPARED TO 2012 WHEN 2012 DOLLARS ARE CONVERTED TO 2013 INFLATION ADJUSTED CONSTANT DOLLARS.

Figure 9



WHY IS IT SIGNIFICANT TO ANALYZE BOTH REVENUE AND VOLUME?

Contractor fees are generally determined as a percentage of revenue. However, workload volume determines the size of the workforce needed to accommodate the annual workload. It is valuable to know how many employees were required to accomplish the workload volume based on the past several years of data. From the standpoint of workforce planning, we are not so much concerned with the value of the revenue as we are with the volume of the work. There is a bit more to this analysis, so we will investigate this further in the Jobs/Productivity section of this report.

JOBS AND UNEMPLOYMENT

There is a significant difference in what is represented by the "unemployment" rate and the number of lost employees. Those who run out of unemployment benefits or drop completely out of the workforce are no longer counted as unemployed, but they most definitely are workers lost from the workforce. Unemployment by itself does not tell you much about the condition of the workforce. The real construction employment situation is far worse than the unemployment figures would lead you to believe. The construction industry had been losing employees for five years but we hit the low point in January 2011. Still, we are not far above a 15-year low.

If the unemployment rate goes down but there are few gains in the number of new jobs, that can only mean one thing: the number of people reported as still in the workforce has gone down. The drop in the construction unemployment rate would be almost entirely due to workers dropping out of the construction workforce. **The reduction in available workers in the workforce could have a detrimental effect on cost and ability to increase potential volume in the future.**

Table 6 includes both residential and nonresidential construction as well as all trades and management personnel.

Table 6 - BLS June 2013 Construction Employment All Employees

Industry:	Construction												
Data Type:	ALL EMPLOYEES, THOUSANDS												
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Yr Avg**
2004	6848	6838	6887	6901	6948	6962	6977	7003	7029	7077	7091	7117	6973
2005	7095	7153	7181	7266	7294	7333	7353	7394	7415	7460	7524	7533	7333
2006	7601	7664	7689	7726	7713	7699	7712	7720	7718	7682	7666	7685	7690
2007	7725	7626	7706	7686	7673	7687	7660	7610	7577	7565	7523	7490	7627
2008	7476	7453	7406	7327	7274	7213	7160	7114	7044	6967	6813	6701	7162
2009	6554	6453	6291	6149	6103	6008	5928	5851	5785	5724	5693	5650	6016
2010	5581	5522	5542	5554	5527	5512	5497	5519	5499	5501	5497	5468	5518
2011	5435	5478	5485	5497	5524	5530	5547	5546	5583	5576	5577	5612	5533
2012	5629	5644	5640	5636	5615	5622	5627	5630	5633	5649	5673	5711	5642
2013	5735	5783	5799	5792	5799	5812							5787

U.S. Bureau of Labor Statistics - 2009 through 2012 data was revised January 2, 2013.

The unemployment rate by itself tells us nothing about the direction jobs are moving, so by itself is not such a meaningful statistic. But the number of jobs plus the total number of unemployed indicates the size of the construction workforce. The size of the workforce is important because it tells us how many workers are available for future volume growth.

The construction workforce is still near a 15-year low, 2 million (~25%) below the 2006 peak.

At peak employment and peak workforce from April 2006 to April 2007, we averaged 7.70 million working and 6% to 7% unemployed, for a total workforce over 8.3 million.

At peak unemployment in February 2010, there were only 5.54 million working and 27% or more than 2.0 million unemployed, for a total workforce less than 8.0 million.

At jobs low point in January 2011 there were 5.44 million working but only 22.5% or only about 1.5 million reported as unemployed. The workforce totaled just over 7.0 million.

The latest June 2013 data shows there are 5.81 million working with 9.8% unemployed. For June 2013 the current workforce totals just over 6.5 million.

Over the long term, a falling unemployment rate without a matching increase in the numbers employed means the workforce reserve, those unemployed but available to work, is decreasing.

Construction Workforce, the total of employed plus unemployed is currently less than the total number of workers that were gainfully employed at any time from 2000 to 2008. This has significant implications for expansion. Without a large volume of available trained workers in the unemployment pool to draw from, the rate of expansion may be limited.

By August 2012, the workforce dropped to a 15-year low near 6.5 million. Approximately 2.0 million workers or near 25% of all trained construction workers have left the workforce. The workforce declined because workers have either retired, been discourage from seeking work and no longer qualify for benefits or moved on to another profession.

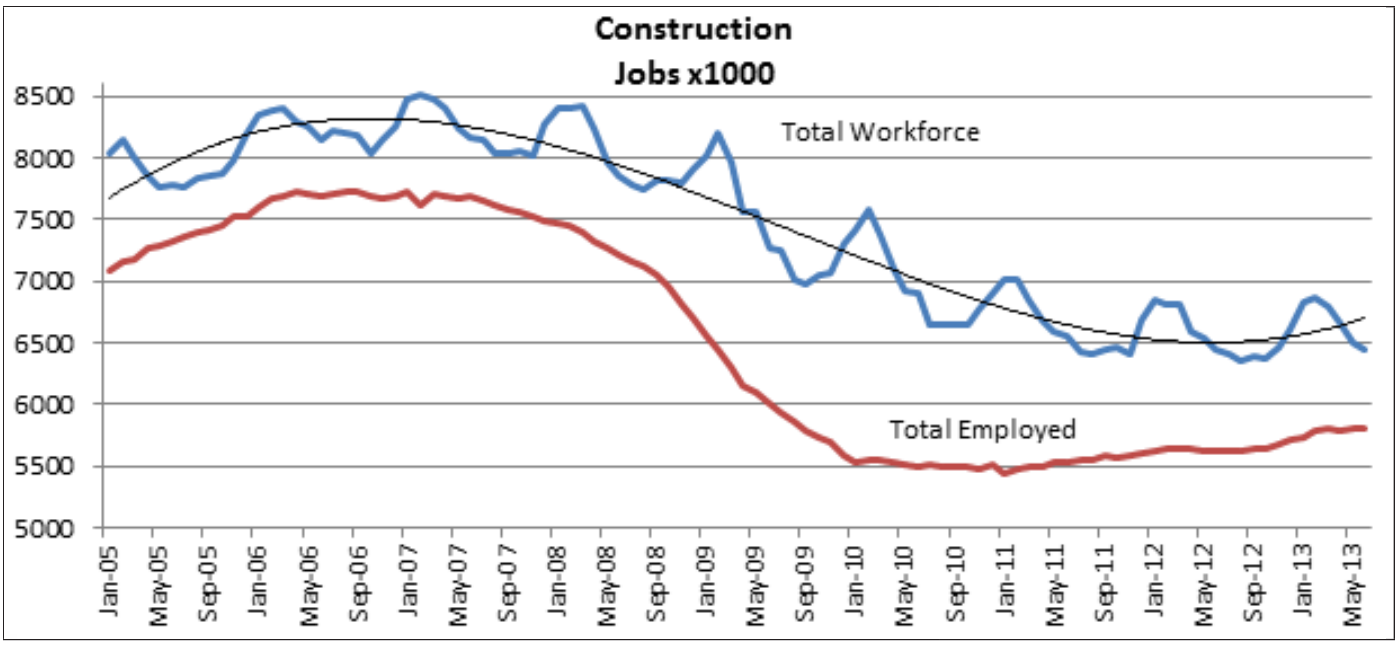
From February 2010 to June 2013 we've gained about 300,000 jobs but the unemployment total dropped by about 1.4 million. Therefore, in the last 30 months we've lost more than 1.0 million construction workers from the total workforce.

As long as jobs are growing, at this stage a growing unemployment rate may not be a bad sign. We need a large pool of unemployed to draw from as workload increases rapidly. However, even prior to the recession the long-term construction unemployment rate averaged 6% to 7%. Therefore we cannot count all of the currently unemployed as readily available for work.

For the long term, if we are to see construction work volume grow back even close to previous levels, we need the workforce to expand in tandem. Just to support residential construction volume at my predicted growth rates, which are lower than the consensus and only half of the high end consensus estimates, we would need to add 250,000 to 300,000 jobs in 2013 and 300,000 to 350,000 jobs in 2014, just about the highest rates of job growth ever experienced for the entire industry, let alone just residential. Without a pool of unemployed to draw from we could not possibly add that many new jobs, at least not with experienced workers.

The unemployment rate is not seasonally adjusted. This adds to the short-term fluctuation. The seasonal fluctuation can be seen in Figure 10 where the upper (blue) line shows a repeated annual rise and fall in the unemployment rate. Some of the short term fluctuations in the unemployment rate and the workforce might be explained by portions of workforce working under-the-table, as has recently been reported in California and Texas, particularly with respect to residential construction. A recent news article from southern California stated that as much as 50% of the residential construction workforce may be working under-the-table and not counted in the construction employment numbers.

Figure 10



Expect Workforce Shortages

Some of the slack in the decreased workforce was taken up by an increase in productivity since 2006. But that still leaves us short almost 1.3 million construction workers. These problems arise:

- Since 1970, only three times have jobs grown at more than 30,000/month for a full year. During the greatest construction expansions in the last 30 years the rate of jobs growth approached 35,000 jobs/month but did not maintain that growth rate for a year. At no time since records dating back to 1970 have jobs grown at 30,000/month for two years.
- Only once, from Q1 2005 to Q1 2006, jobs grew at an average rate over 40,000/month for 12 months, but then did not grow at all for the next 9 months and soon afterward started a rapid decline.
- During periods of high volume and workforce expansion, productivity declines.
- Workforce shortages may force extended work schedules.

The first workers to be lost or let go are typically those that represent the least value to an organization. However, not all of the lost workers are "wanted turnover." As the workload dwindled, some of the workers that were let go, moved on or dropped out of the workforce had many years of experience and were highly

trained. Unfortunately, some will never return. As a result, when work volume picks up there are going to be both general worker shortages as well as at least some shortage of these more valuable skilled and experienced workers. Over the next few years, when work volume does pick up, this industry is going to be faced with a lack of available workers and shortage of skilled, experienced workers. Both of those issues have the tendency to DRIVE COSTS UP and QUALITY DOWN due to the need to pay a premium for skilled workers and the necessity of training new workers in their job and company procedures.

A MAJOR CONCERN IN THE NEXT FEW YEARS IS THAT THE EXTREME GROWTH IN RESIDENTIAL CONSTRUCTION WILL REQUIRE SO MANY NEW WORKERS THAT IT WILL DRAW AVAILABLE WORKERS FROM ENTERING THE NONRESIDENTIAL SIDE OF CONSTRUCTION.

In a recent article from the AGC, Chief Economist Ken Simonson states, "The number of unemployed workers with construction experience has fallen to low enough levels that firms in a growing number of locations and segments are having trouble finding people with the needed skills."

A recently published NAHB survey states more than half of builders reported labor shortages over the past six months that have caused them to pay higher wages to secure labor. The BLS Job Openings and Labor Turnover Survey (JOLTS) for the construction sector indicates the number of unfilled positions stands at 108,000 for April. This is the fourth consecutive month the number of open positions is over 100,000 and the first time since 2007 this has occurred. The job openings rate has been climbing for nine months. This is a good indicator for future hiring, but highlights the importance of workers having the right skills.

OVER THE NEXT FIVE YEARS WE CAN EXPECT EVENTUAL LABOR SHORTAGES, DECLINING PRODUCTIVITY AND RAPIDLY INCREASING PRICES. IF YOU ARE IN A LOCATION WHERE A LARGE VOLUME OF PENT-UP WORK BREAKS LOOSE ALL AT ONCE, YOU MAY BE THE FIRST TO EXPERIENCE THESE THREE ISSUES. IT'S ON THE HORIZON, AND IT'S INESCAPABLE.

Manpower Employment Outlook Q2 2013

Manpower figures measure the percentage of firms planning to hire minus the percentage of firms planning to lay off and report the "net" percentage hiring outlook. The overall national employment (all jobs) picture is positive for the Q2 2013 with a projected net +11% of firms planning to hire. Employers have had a positive outlook for 14 consecutive quarters. 18% of employers surveyed expect to add to their workforce.

The Construction industry sector anticipates a considerable increase in hiring in Q2 2013 in the Northeast, Midwest and West. Manpower reports hiring in the construction industry for Q2 2013 anticipated at a net +10%. 18% of construction firms expect to add to their workforce, slightly more in the West and Midwest.

JOBS/PRODUCTIVITY

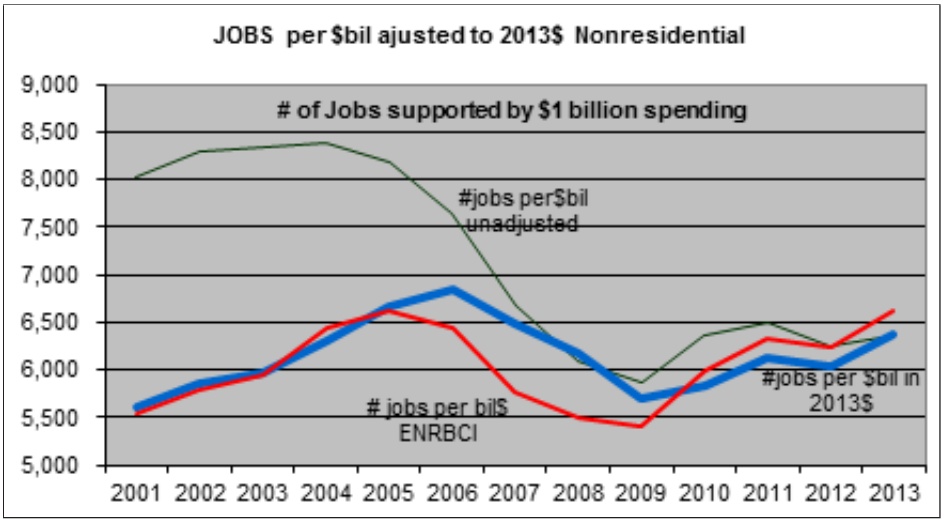
A long-term trend in productivity can be found by comparing the annual inflation adjusted volume to the annual average workforce. Volume is not given, but we have developed volume in a previous section by adjusting spending for inflation. Productivity is a measure of units volume per worker, not dollars put in place per worker. The inflation adjustment gives total spending in constant dollars rather than current dollars and allows a comparison to unit volume. Therefore the following productivity analysis is based on put-in-place revenues, inflation adjusted to constant 2013 dollars, compared to actual manpower at average man hours.

Of equal importance is the use of proper indices. An index adjusting for both inflation and margins must be used. Spending must be adjusted to eliminate changes due to material costs, wages and margin fluctuation. Also, since the building type makeup and worker wages are so different, indexes must be developed separately for residential, nonresidential buildings and infrastructure construction. Numerous industry indices were referenced for input, from which the indices used in this analysis were developed independently.

In Figure 11 a line is plotted for the number of jobs per $1 billion "unadjusted." The "unadjusted" line seems to indicate the number of jobs supported by $1 billion dollars of spending declined from 2002 to 2006. That incorrect result is what we would get if using unadjusted dollars without considering inflation. What's missing in the unadjusted analysis is that dollar volume of work put in place represents work dollar value, not work unit volume. Also shown in Figure 11 is a line plotting number of jobs if spending were indexed solely using the ENRBCI, the most common construction cost index. Since that index does not account for fluctuating margins it also produces an incorrect result.

The thick blue line in Figure 11 shows the only accurate result.

Figure 11



From 2002 to 2007 there was huge growth in the dollar value of work put in place, but the after-inflation change in volume put in place was less. The number of workers needed to put in place $1 billion (adjusted) spending increased. Productivity decreased during that period when spending and jobs were on the rapid growth trend. Spending has a strong influence on hiring, but its influence can sometimes be without regard to volume. If spending is increasing rapidly, but mostly due to inflation, volume may not be increasing and the need to add rapidly to the workforce may not be entirely warranted.

In 2002 through 2005, $1 billion of spending supported between 6,000 and 6,500 jobs. By the peak activity in 2006-2007, it required nearly 7,000 jobs to put-in-place $1 billion in spending, (less volume per employee). Productivity declined to its lowest point in 2007. But growth in new work volume reversed and by 2010 productivity increases were so significant that $1 billion of spending supported only 6,300 jobs.

Today $1 billion in spending supports about 6,500 jobs. Keep in mind these are national averages. In a location where the city cost index is 1.2, it would take $1.2 billion in spending to support 6,500 jobs and in a location where the city cost index is 0.85, only $850 million in spending would support 6,500 jobs. That means that an average revenue put-in-place of $155,000 supports one job, but it can range from $125,000 to $200,000 per job due to variations in location.

When spending and jobs are on the decline, and with diminished workload providing no other options, out of necessity, workers and management find ways to improve. But at some point, longer hours and additional work burden causes productivity to decline. Also, a return to volume growth results in an easing of performance. It appears the trend began to reverse in 2010. After two years of work output increases, the work output reversed and finally declined in 2011.

As workload begins to increase in coming years, net productivity gains will decline somewhat. This net affect cannot go unaddressed. The results of productivity declines are either decreased total output (if workforce remains constant) or increased workforce needed (if total workload remains constant). Realistically, I would expect that over the next few years, each year work volume increases we will experience some slight erosion from the productivity gains.

Jobs based on volume, not revenue

Contractor fees are often determined as a percentage of revenue. However, workload volume is used for planning the size of the workforce. It is valuable to know from the past several years of data how many employees were required to accomplish the workload volume. From the viewpoint of workforce determination, we should not be concerned with the value of the revenue, only the volume of the work. It is not uncommon to see early estimates of staff requirements based on a percentage of revenue. That is a false representation and cannot be accurately relied upon to project staff unless revenue is first converted to volume.

As an example:

At the peak of construction cost, a building cost $12 million and took 100 men per year to build. Today that same building could potentially cost as little as $10 million to build. Does it take 20% fewer men per year to build it? No, certainly not. That would be the fallacy of trying to determine jobs needed based on unadjusted revenue.

The building has not changed, only its cost has changed. It still has the same amount of steel and concrete, brick, windows, pipe and wire. Using revenue as a basis we might be led to think we need 20% fewer workers. However, there is a need to base workers on inflation adjusted volume and productivity, not simply on direct annual revenue.

Workforce Expansion

Twice in the last 30 years, once starting in 2005, the workforce grew by more than 35,000 jobs per month for a year. Both times the average growth dropped considerably afterwards. The most rapid sustained expansion in the workforce during the last 30 years was the period from mid-2003 to mid-2006. In that 36-month period, the construction labor workforce expanded by 1,000,000 jobs or 15%. Therefore, during

the strongest period of jobs expansion in the last 30 years, the workforce grew by only 15% over 3 years, an average of 28,000 jobs per month. What is significant is that while spending during that 36-month span increased 12%, inflation-adjusted volume increased by less than 6%. This was during a period when construction volume reached the all-time peak. Such a rapid workforce expansion during a period of a high level of spending led to measurably significant lost productivity.

Even if we could realize a similar rate of growth, which was associated with a high rate of economic expansion, it would take six years to recover more than two million lost jobs. At this accelerated rate the workforce would not return to previous levels before 2017. That is a very unlikely scenario, since it would require uninterrupted elevated economic expansion. It is highly unlikely we will see the workforce return to previous levels within six years. However, if we do experience uninterrupted economic expansion at this level for the next six years, productivity is going to decline, potentially erasing most or all of the gains realized in the last few years. In this scenario jobs growth will begin to outpace volume growth.

The rate of employment growth may be a valid concern for the following reason; if spending and jobs are to remain balanced and return to normal, then both the rate of expansion in construction spending and the rate of growth in the workforce needs to be approximately equal in the coming years. If the rate of spending growth exceeds a normal the rate of growth, it will produce an extremely active market, there will be worker shortages and productivity will drop. When that occurs, it leads to rapidly increasing prices and elevated margins.

How Many Jobs Get Created by Construction?

Here are some details regarding how many jobs get created for every dollar spent on construction. For further reference see "Jobs and Unemployment" and "Jobs/Productivity".

- Historical averages (adjusted for inflation) since year 2000 show the number of direct construction jobs supported by $1 billion in construction spending varies from 6,000 to 7,000 jobs. That calculates to one job for every $145,000 to $165,000 (in 2013 dollars) spent on construction, or if you prefer, 6.0 to 7.0 jobs per $1,000,000 spent. Direct construction jobs include all AEC, but not for instance lumber or steel mill product manufacturing.
- The importance of correcting for inflation cannot be understated. A rate of $140,000 to $160,000 (in 2013 dollars) per job, at 3.5% inflation, 5 years ago was $120,000 to $135,000 and 5 years from now will require $166,000 to $190,000 to support one job. The long-term historical average for construction inflation is 3.5%.
- The wide variation in the number of jobs created in part is a result of productivity. In times of increasing work volume activity, productivity declines. In times of decreasing activity, productivity climbs. In 2009, the worst decline in construction activity in my historical records, productivity increased by an average 8%. Because productivity increased it took fewer workers to put in place the same volume of work. The net result is that $1 billion in spending supported far less jobs than previous years.
- As work volume starts to increase over the next few years, expect productivity to decline. There are many reasons why this will occur, among them: working longer hours until new workers are brought on; working more days; crowding the work area; hiring less qualified workers; and acclimating new workers to the crew.
- The fact is productivity and work volume is inextricably tied and is cyclical. If work volume continues to grow for the next five years, I'd expect in that time we would lose our current productivity advantage.
- The type of work also affects the number of jobs supported, with higher cost buildings supporting fewer jobs than lower cost buildings. For example, $1 billion of Life Sciences or Hospital projects, because the materials costs are considerably higher and therefore a greater percentage of the total cost is allocated to materials, supports fewer workers than $1 billion of residential or general commercial projects.

There are several studies available, one by the federal government and one by the AGC that tell us for every construction job, there are three additional jobs created in the economy. So while $1 billion of building construction creates approximately 7,000 direct construction jobs, overall it generates approximately 28,000 jobs in the economy.

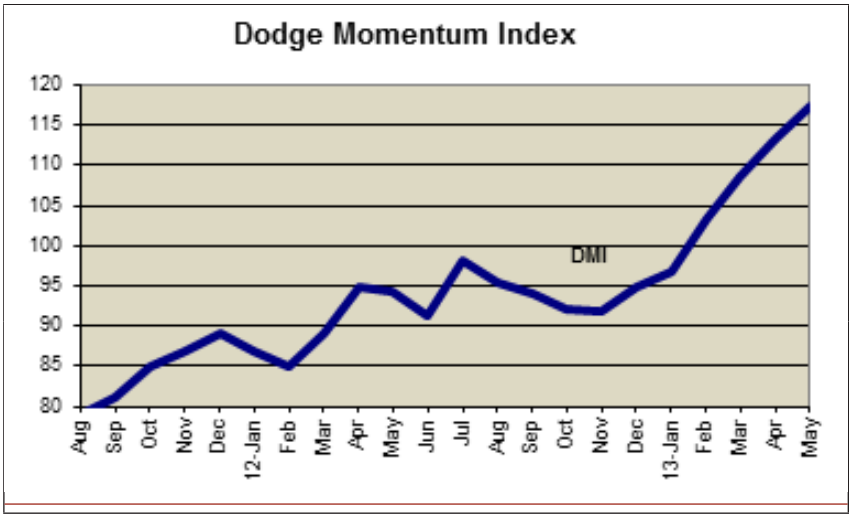
SOME SIGNS AHEAD

The following reports can be accessed by clicking on the hyperlinks provided.

The Dodge Momentum Index (DMI) is a monthly measure of nonresidential projects in planning, excluding manufacturing and infrastructure. It is a leading indicator of specific nonresidential construction spending by approximately 12 months. The momentum index has risen for six months, the longest string of increases since 2006.

Figure 12

The DMI had been moving upward from mid-2011 through July 2012. It moved down slightly in August, September and again in October. Commercial is down more while Institutional is up, but that upward move is driven by healthcare and not by educational building. The index shows the strongest correlation in the commercial sector at a nine month lag and the institutional sector, with still a strong correlation, at a 15-month lag.



The Architectural Billings Index (ABI) measures monthly work on the boards in architectural firms. It is a 9- to 12-month leading indicator to construction. The ABI Commercial construction index indicates work volume increasing from Q2 through Q4 2012, but both the commercial and institutional indices signal a Q1-Q2 2013 slowdown in spending. The Architectural Billings Index (ABI) for May returned to the ninth month of positive growth after a brief one-month decline in April.

The Associated Builders and Contractors Construction Backlog Indicator (CBI) is a quarterly forward-looking economic indicator reflecting the amount of work that will be performed by commercial and industrial contractors in the months ahead. The CBI is measured in months of backlog and reflects the amount of construction work under contract, but not yet completed. It increased for four quarters from Q4 2010 through Q3 2011, but then declined for two quarters. The CBI rose again in both Q2 and Q3 2012 to near the highest level of backlog in the past four years and projecting nonresidential construction spending will accelerate by mid-2013. Charts and Graphs for Q1 2013 show a slight decline from Q4 2012. Current backlog now stands at 7.9 months, but commercial and institutional sectors have risen gradually since Q1 2012 and now stand at 8.2 months.

The AIA Consensus Construction Forecast is a semi-annual survey of construction economists' projections for future spending. In the January 2013 report an average of expectations for nonresidential construction shows the largest expected growth of 8.6% in commercial construction, down from the 10.2% average in the previous report.

The AGC Construction Business Outlook, released January 14, 2013, includes over 1,300 firms in the survey. The survey summarized these results for 2013:

- 40% expect the public building market to decline, only 18% expect growth
- 37% expect K-12 markets to decline, only 20% expect growth
- Only 20% of firms in California expect an increase in healthcare / higher education construction spending
- Growth in healthcare / higher education spending is expected by 44% of firms in Massachusetts, 44% of firms in Texas and 45% of firms in Virginia.
- 33% of firms expect to pay 1-5% more for materials, 38% expect to pay 6-10% more
- Contractors are increasingly optimistic about their ability to pass along material costs and raise costs for work.
- In 2012, only 15% increased what they charged for work while 47% lowered their bids for work
- For 2013, 28% expect to increase the amount they charge, 14% intend to lower bids

The Fails Management Institute (FMI) second quarter 2013 Nonresidential Construction Index (NRCI) is now 60.1. The NCRI is a report based on a survey of opinions submitted by nonresidential construction executives. The NCRI had reached a 5-year high of 59.8 in Q2 2012, then receded to near 55 for Q3 and Q4. It has been climbing the last three quarters and is now at the highest on record since it started in 2008.

FMI's Construction Outlook, FMI's analysis of construction economic data and trends points to a decline in public construction while residential construction is the primary area of growth. The FMI report predicts residential construction will increase 14% in 2013, office construction 5%, commercial construction 6%, educational 2% and healthcare construction 5%. All are expected to grow 6% to 9% in 2014.

A McGraw Hill Construction report on Green Building says by 2015, half of all nonresidential building will be Green. From 2008 to 2011, the share of educational green building went from 15% to 45%. Only 10% of building cost and function is operational. Green investment is also social, improving the environment for employees.

The Institute for Supply Management (ISM) Report on Business - Manufacturing Report for May released June 3, 2013, shows the national Purchasing Manager's Index (PMI) for May at 49%. PMI values above 50 indicate expansion in the manufacturing sector. The PMI dropped below 50 in November for the first time in 40 months indicating a manufacturing contraction but has shown three months of recovery from that dip before this current report. PMI values above 42.5 indicate overall GDP economic expansion. The PMI indicates overall economic expansion for 48 consecutive months.

The ISM Non-Manufacturing Index (NMI) report for May released June 5, 2013, is a better indicator of activity in the construction industry. The NMI measures economic activity in thirteen industries (including construction) not covered in the manufacturing sector. In the report released June 5, the NMI for May is 53.7%, above 50 for 41 consecutive months, indicating continued economic growth. Construction is among the industries reporting increased business activity, growth in new orders and an increase in backlog.

PRODUCER PRICE INDEX

When the cost to the supplier goes up, it almost always gets immediately passed along in full to the consumer. When the cost to the supplier goes down, the savings trickles down to the consumer very slowly.

The U. S. Census Bureau Producer Price Index (PPI) data for May released on June 13th indicates the PPI for construction materials had no increase in May. The PPI for construction materials increased 1.3% in February, the highest rate in 22 months. The year to date price increase is 2%, but the largest increases of the year almost always occur early in the year with the fourth quarter often negative.

THE MAY 2013 PPI FOR MATERIAL INPUTS TO ALL CONSTRUCTION:

- increased 0.0% in the month, increased 0.0% over 3 months, and is up 0.8% over the past 12 months

THE MAY 2013 PPI FOR MATERIAL INPUTS TO NONRESIDENTIAL CONSTRUCTION:

- increased 0.2% in the month, decreased 0.1% over 3 months, and is up 0.3% over the past 12 months

THE PPI FOR ITEMS THAT CHANGED THE MOST:

- Diesel fuel prices decreased -3.5% this month, -9.9% in 3 months and -5.5% in a year.
- Lumber and Plywood, down -3.3% for the month, but still up +13% in a year.
- Gypsum products are up +1.5% this month and up +19% in a year.
- Copper shapes are down -3% this month and down -7.4% in a year.
- Concrete items are down slightly for the month but up +2.5% to +3.5% in a year.
- Structural steel and steel shapes down -2% this month and down from -7% to -13% in a year.

The relative implication of cost changes for several materials is a function of how much the material is used within a typical building. For example for a typical nonresidential building:

- 10% increase in gypsum wallboard material increases typical project cost by 0.05% to 0.08%.
- 10% increase in copper material increases typical project cost by 0.20% to 0.60%.
- 10% increase in concrete material increases typical project cost by 0.20% to 0.60%.
- 10% increase in structural steel material increases typical project cost by 0.50% to 1.00%.

Table 7

US Construction Producer Price Indexes - May 2013

Materials PPI	Percent Change Versus to May 2013 from Apr-13 1 month	Feb-13 3 months	May-12 12 month	annual for 12 months 2012 last yr	12 months 2011	12 months 2010
Summary						
Inputs to ALL Construction	0.0	0.0	0.8	1.3	5.2	5.3
Inputs to Nonresidential	0.2	-0.1	0.3	0.8	5.7	4.0
Commodities						
Cement	0.7	1.2	5.2	3.4	-1.8	-6.0
Iron & Steel Scrap	-6.0	-2.2	-17.9	-15.5	8.7	38.9
Manufactured Materials						
Diesel Fuel	-3.4	-9.9	-5.5	1.8	20.0	26.4
Asphalt Paving	0.8	-0.1	-0.8	4.4	8.4	4.4
Asphalt Roofing/Coatings	1.5	3.9	4.2	-0.5	4.2	1.9
Ready Mix Concrete	-0.4	1.0	3.4	2.3	0.5	-1.2
Concrete Block & Brick	0.7	1.9	2.2	1.5	1.1	-1.1
Precast Conc Products	0.0	0.0	1.4	2.5	2.9	1.0
Building Brick	-0.7	-0.2	-0.7	-2.6	-2.6	-0.3
Copper & Brass Mill Shapes	-2.9	-8.0	-7.4	1.0	-9.3	11.8
Aluminum Mill Shapes	-1.4	-4.0	-3.6	-1.6	0.6	11.6
HR Bars Plt & Strct Shapes	-1.8	0.8	-7.1	-9.6	13.2	18.4
Steel Pipe and Tube	-1.8	-3.0	-13.2	-6.1	13.7	19.6
Fab. Structural Steel	1.1	1.7	-1.5	1.1	3.8	1.9
Fab. Bar, Joists and Rebar	-0.1	0.5	-0.8	2.0	1.6	-0.3
Gypsum Products	0.5	1.5	19.3	14.0	-1.6	3.2
Insulation Materials	1.3	-0.1	5.3	5.1	5.4	4.6
Lumber and Plywood	-3.3	2.7	13.2	10.8	-0.7	5.7
Sheet Metal Products	0.2	-0.7	-2.4	-0.5	3.7	4.0

All data not seasonally adjusted. Source: Producer Price Index. Bureau of Labor Statistics

The PPI for construction materials gives us an indication whether costs for material inputs are going up or down. The PPI tracks producers cost to supply finished products. This tells us if contractors are paying more or less for materials and generally indicates what to expect in the trend for inflation.

BUT YOU NEED TO KNOW A BIT ABOUT PPI TRENDS TO HELP INTERPRETING THE DATA.

- 60% of the time the highest increase of the year in the PPI is in Q1
- 90% of the time the highest increase of the year is in the first six months.
- 75% of the time two-thirds of the annual increase occurs in the first six months.
- In 20 years the highest increase for the year has never been in Q4
- 60% of the time the lowest increase of the year is in Q4
- 50% of the time Q4 is negative, yet in 22 years the PPI was negative only twice

So when we see monthly news reports from the industry exclaiming "PPI is up strong for Q1" or "PPI dropped in the 4th Qtr.", it helps to have an understanding that this may not be unusual at all and instead may be the normal trend.

MATERIAL PRICE MOVEMENT

The overall PPI for May 2013 shows costs for all construction materials up 0.8% in the last 12 months. Costs for material inputs to nonresidential construction are up 0.3% in the last 12 months.

Hidden within this current report is the fact that cost for inputs to all construction and nonresidential construction in 2013 have risen 2.0% and 1.8% respectively year to date. Almost all of that occurred in January and February, which does not appear in either the one-month or the three-month values. The 12-month values are being reduced by negative data from last year. For the same reason, inputs to residential construction are up 2.0% year to date.

The largest increases of the year generally occur early in the year with the 4th quarter often negative. We have seen large material prices driven by residential demand. By some reports, prices for these materials are outpacing the prices that contractors can charge. The current year to date cost increases could lead to at least a minimum 3% materials input cost growth in 2013.

Table 8

US Construction Producer Price Indexes - May 2013

Markets Inputs PPI	Percent Change Versus to May 2013 from			annual for		
	Apr-13 1 month	Feb-13 3 months	May-12 12 month	12 months 2012 last yr	12 months 2011	12 months 2010
Inputs to ALL Construction	0.0	0.0	0.8	1.3	5.2	5.3
Inputs to Nonresidential	0.2	-0.1	0.3	0.8	5.7	4.0
Inputs to Commercial	0.2	0.2	0.6	1.1	4.9	NA
Inputs to Industrial	0.1	-0.2	0.1	0.8	5.2	NA
Inputs to Hghwy/Hvy Engr	0.1	-0.2	0.0	0.7	6.1	NA
Inputs to Residential	0.0	0.2	1.6	2.0	4.8	4.3

All data not seasonally adjusted

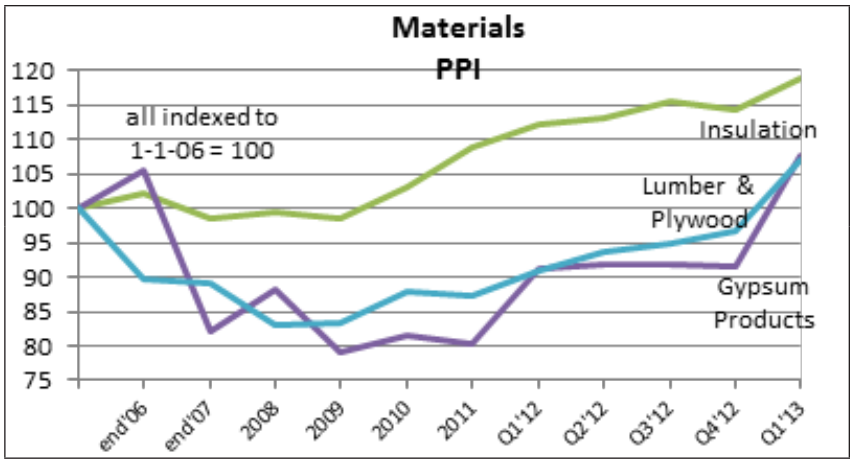
Data Source: Producer Price Index. Bureau of Labor Statistics

In the last three years, ready-mix concrete cost has moved up less than 2% but asphalt paving is up 18%. Steel pipe and tube is up nearly 30% in three years, yet fabricated structural steel is up only 7%. This extreme variability means individual trades assessment requires individual material index data.

Gypsum, Lumber and Plywood and Insulation are driven primarily by residential markets. In January 2013, the PPI for gypsum products increased 12% and in February another 4.4%. CertainTeed announced intent to raise insulation prices by 10% to 12% in June. Lumber prices just off of an eight-year high in April, settled back somewhat in May, but are already back on an upward trend.

Figure 13

Random Lengths, a lumber industry newsletter, recently reported the composite price index for 15 key framing lumber prices dropping 25% since reaching an eight-year high in April. That will show up in the PPI chart next quarter. 70% of lumber demand is driven by residential housing.

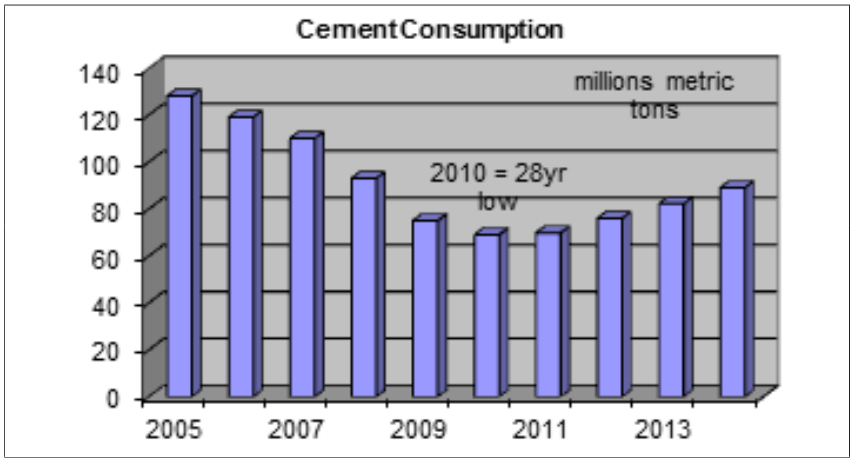


Cement / Concrete / Asphalt

Portland Cement Association (PCA) reports the volume of cement demand as an indicator of economic activity. It is a reliable coincident indicator. PCA in February released a final tally of an 8.9% rise in consumption in 2012. Due to uncertainty regarding sequestration, a potential 8% increase in 2013 cement demand could be significantly reduced.

Figure 14

For 2010 and 2011, cement consumption was down 46% from peak 2008. At the start of 2012, PCA predicted consumption for 2012 would grow only 0.5%. PCA latest revised data shows 8.9% growth in 2012. 2013 growth is projected at 8.1% and 2014 growth at 8.4%.



Nearly two-thirds of U.S. cement consumption occurs in the six months between May and October. Rising consumption and prices leading into summer can lead to large shifts in demand and seasonal pricing and is not an indicator of long-term growth but only reflects periodic seasonal fluctuating consumption rates. Look at total annual volumes for trends.

Cement prices increased 3.4% in 2012 after dropping four years in a row. Cement prices, up 5% year to date and up more than 8% since January 1, 2012, are still 4.5% below 2007. Ready Mix Concrete prices up 2% year to date are currently 8% higher than the end of 2007.

Cement prices increased 1.8% in January, 1.8% in February and 1.2% since February. Cement prices are advancing rapidly as residential construction improves. They will begin to climb more when other commercial construction improves over coming months. Precast products have increased 4% since Q3 2012.

Figure 15

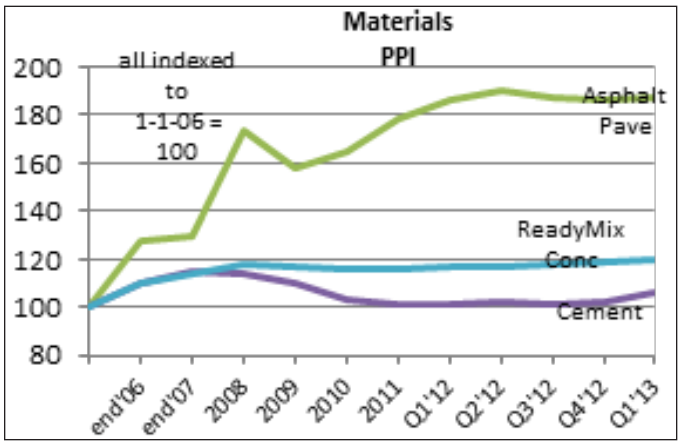
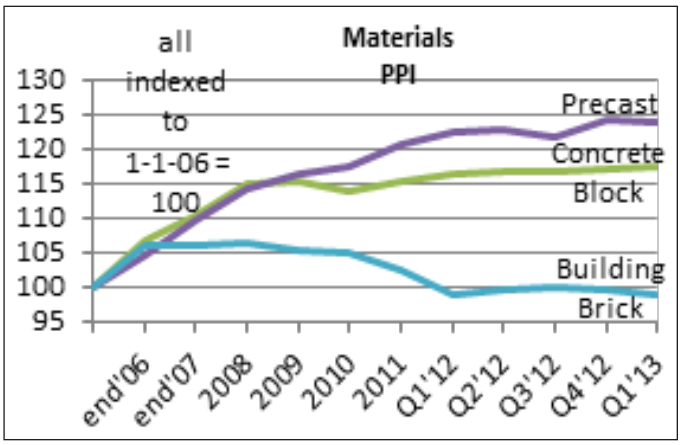


Figure 16



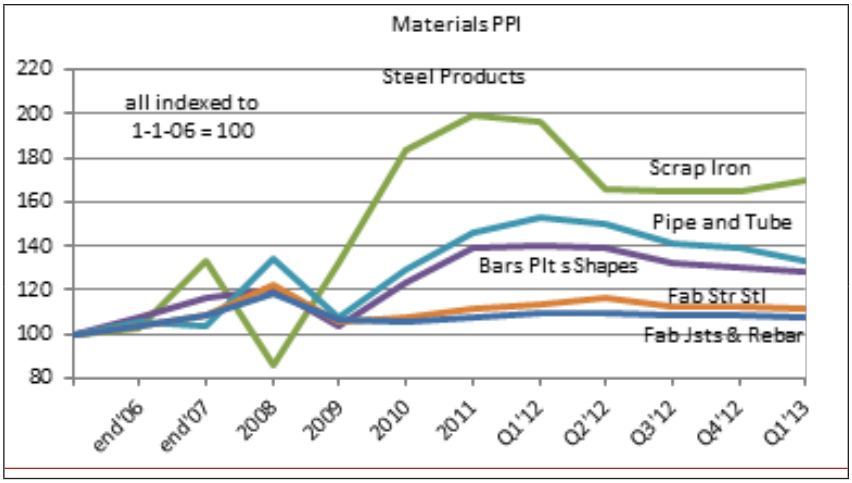
Structural Steel

The construction industry represents the largest consumer of steel products worldwide. Approximately 100 million tons of steel is produced annually in the United States. More than 40 million tons of that is delivered to the construction industry. The next largest industries, automotive, equipment and machinery, combined do not consume as much steel as construction.

Structural steel is the most used structural framing material in the United States, with a 58% of market share for nonresidential and multistory residential buildings, based on square footage built. The next closest framing material, concrete, holds only 21% market share.

Figure 17

Figure 17 charts steel mill products PPI beginning in January 2006. The rapid rise in 2008 mirrors the rapid acceleration in bid pricing to the peak in Q3-Q4 2008, and the precipitous fall from that peak. By mid-2009 the mill price had experienced a 40% decline, retreating to a 2004 low. Today the PPI for Pipe, Tube, Bars and Plates has recovered all of those losses, but not Fab Str Steel, Joists or rebar.



The American Iron and Steel Institute reports steel production capacity utilization at76% as of March 9, 2013. This is up 5% since November but still below the post-recession high of 79% in March 2012. However, most of the increase in capacity utilization is because capacity dropped, not because production increased. In the first quarter of 2013, U.S. steel mills cut output by nearly 8%.

Demand was strong during the last few months of 2012, but demand has slowed and it will slow more for the next few months. Current economic analysis indicates there is over-capacity in steel production. If this proves to be true in the structural steel industry, it will work to keep steel prices flat in 2013. The outlook for steel prices is to remain range bound in 2013.

In Q1 2011, the FOB mill price for wide flange products reached $925/ton, a 30-month high. With only minor fluctuation it soon dropped to a fairly constant price of $865/ton that held through June 2012. By August 2012 wide flange pricing hit a 24-month low at $765/ton. As of January the price is just back up to $805/ton, still near a 2-year low.

ENR's Second Quarterly Cost Report indicates wide flange has been increasing and is up 3% since November. They also report rebar prices up 3% since February.

Structural steel is very much dependent on recycled steel. Structural steel is made 90% from scrap steel. Scrap prices are down 18% in the last year.

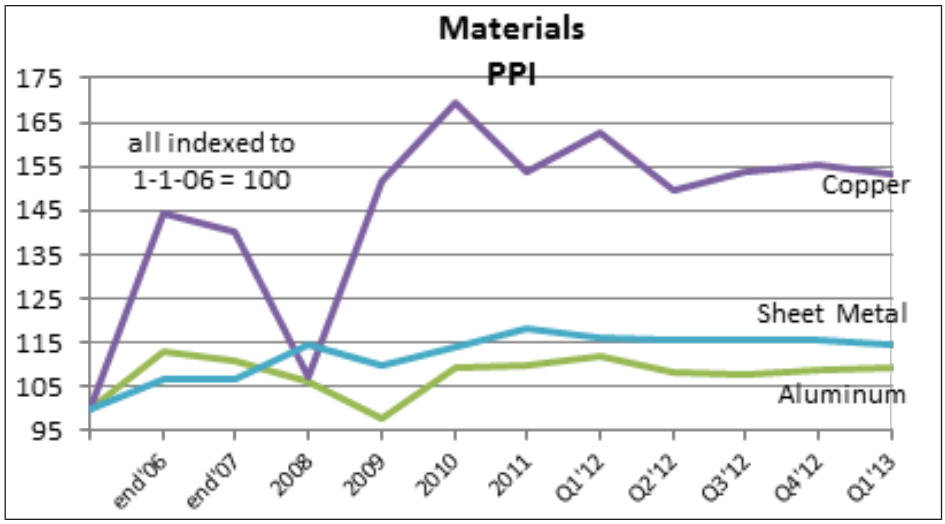
In October, all major steel producers raised the price of Hot Rolled Coil, flat sheet steel. The price increase raised producer's cost charged from $580/ton to $620/ton, a 7% increase. This has little to no effect on structural steel, the main steel component cost in buildings. However it has full effect on products such as steel panel siding and roofing.

Copper/Aluminum

Copper material prices hit an all-time high of $4.60/lb. in February 2011, up 25% from October 2010. By September 2011 the price dropped back to $3.10/lb. The price in November 2012 was $3.50/lb., about equal with where it was in November 2011.

Copper recently has been down near $3.00/lb., a drop of 20% from the January 2013 high of $3.70/lb. Alcoa reports expected 2013 growth of 4% to 5% in demand for building construction related aluminum products.

Figure 18



What makes copper so important to watch?

Copper is a leading economic indicator that has rarely (if ever) failed to indicate the direction of world economies. When copper rises in price, world economies are leading into expansion. When copper drops in price, a decline in world economies very quickly follows. Copper prices and the U.S. workforce move almost perfectly together. Also, because copper is so widely used in buildings, and manufacturing facilities must be built to see a big increase in production, copper demand precedes and is an excellent predictor of industrial production 12 months out.

Click here to view Copper price charts on metalprices.com

What drives copper prices up or down? Unlike some other metals, it is not speculation. Quite often it is demand. Increasing demand = increasing prices. When demand wanes, prices drop.

WHAT AFFECT DO COPPER PRICE CHANGES HAVE ON THE COST OF OUR PROJECTS?

ROUGHLY SPEAKING, COPPER MATERIAL IS ABOUT:

- 10% of an Electrical contract or 1% of cost of project
- 5% of an HVAC contract or 0.6% of cost of project
- 10% of a Plumbing contract or 0.3% of cost of project

So, for an average project, copper material can represent approximately 2% of the total cost of the project. Therefore, a 10% increase in the cost of copper will increase the cost of a project by 0.2%.

There are exceptions. For example, if copper is 2% of the total cost of the typical project, it is probably 4% to 5% of total cost on a heavy mechanical/electrical project, such as a data center. So a 10% increase in the cost of copper increases the total cost of a data center by 0.4% to 0.5%. For a copper roof, material is 65% of total cost and can represent ~1% of typical project cost.

THE BALTIC DRY INDEX

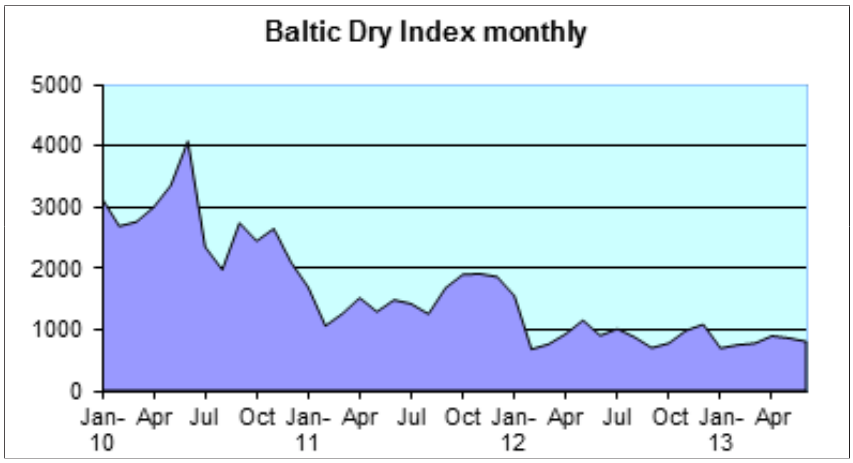
The Baltic Dry Index (BDI) provides an assessment of the price of moving major raw materials by sea. It indirectly measures global supply and demand for the commodities shipped aboard dry bulk carriers, such as building materials, coal, metallic ores, and grains. Because dry bulk primarily consists of materials that function as raw material inputs to the production of intermediate or finished goods, such as concrete, electricity, steel, and food, the index is also seen as an efficient economic indicator of future economic growth and production.

THE BDI IS TERMED A PURE LEADING ECONOMIC INDICATOR BECAUSE IT PREDICTS FUTURE ECONOMIC ACTIVITY AND IS NOT INFLUENCED BY SPECULATORS.

As demand increases, the BDI goes up. A rising BDI indicates an increase in future economic activity but also future rising prices for commodities and finally, materials. However as demand wanes, the BDI decreases and so eventually does the cost of raw materials.

Figure 19

In May 2008 the BDI was near 12,000. By December of 2008 it had dropped to 700. The index saw a few peaks throughout 2009 and 2010, but did not hold. The current index is lower than at any time in 2010 or 2011, now more than 11,000 points below the Q2 2008 peak, and falling.



More iron ore is shipped by seagoing dry bulk carriers than any other dry bulk commodity. Demand for iron ore has a dramatic effect on the BDI and further then on the price of iron ore and ultimately on the price of steel. Steel products, iron ore, billet steel, finish steel pipe and steel shapes account for more than 50% of the entire worldwide dry product shipped in large cargo ships. The construction industry is the largest user of steel worldwide.

The BDI does not yet provide support for a strong pickup in future economic activity. In February and September 2012 and in January 2013 the index dropped to the lowest post-recession values, indicating low demand for product and therefore leading to expectation of low growth or even potentially further recessionary conditions.

ARCHITECTURAL BILLINGS INDEX

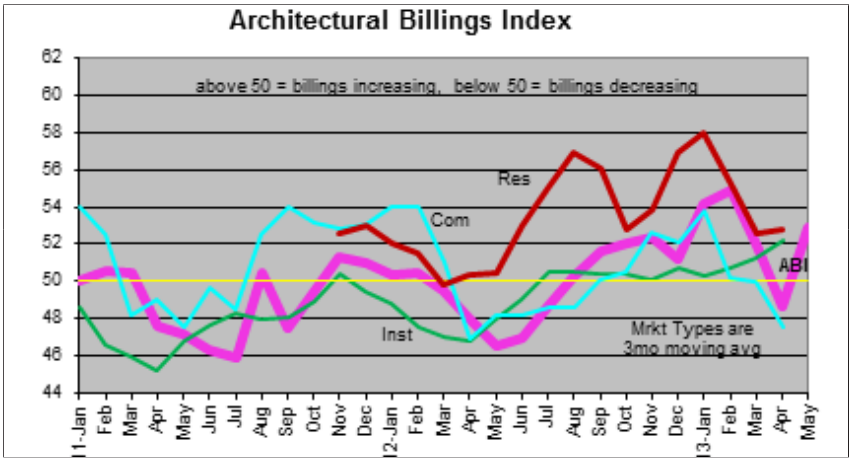
Architectural Billings Index (ABI) readings above 50 indicate more architectural firms reporting increasing billings than firms reporting decreasing billings.

The ABI is primarily a nonresidential indicator. Residential design projects account for only about 15% of the total index. Office buildings, hotels, shopping centers, banks, warehouses, manufacturing plants and other commercial properties represent 35-40% of the index. Institutional buildings account for 45-50% of the index. Typically, institutional facilities are the last nonresidential building sector to recover from a downturn.

Figure 20

The ABI is a leading indicator of construction spending 9 to 12 months out. Index values consistently below 50 indicate there will be a decrease in construction spending 9 to 12 months later.

The 2012 drop from February-March into May-June signals a Q4 2012-Q1 2013 slow-down in spending.



The Architectural Billings Index, a leading indicator for nonresidential work 9-12 months out, predicts nonresidential work will continue to be down through Q1 2013 with recovery starting in Q2 2013. Index below 50 indicates declining workload. Institutional billings were declining from January 2011 to June 2012, Commercial work from April to August 2012. So we should expect spending in Q1 and Q2 2013 to be down.

Since April-May 2012 all the indices were climbing. The institutional index turned positive in July 2012 and the commercial index turned positive in September 2012. From this we expect growth in spending starting in April to June 2013 period and continuing growth into Q4 2013.

CONSUMER INFLATION / DEFLATION

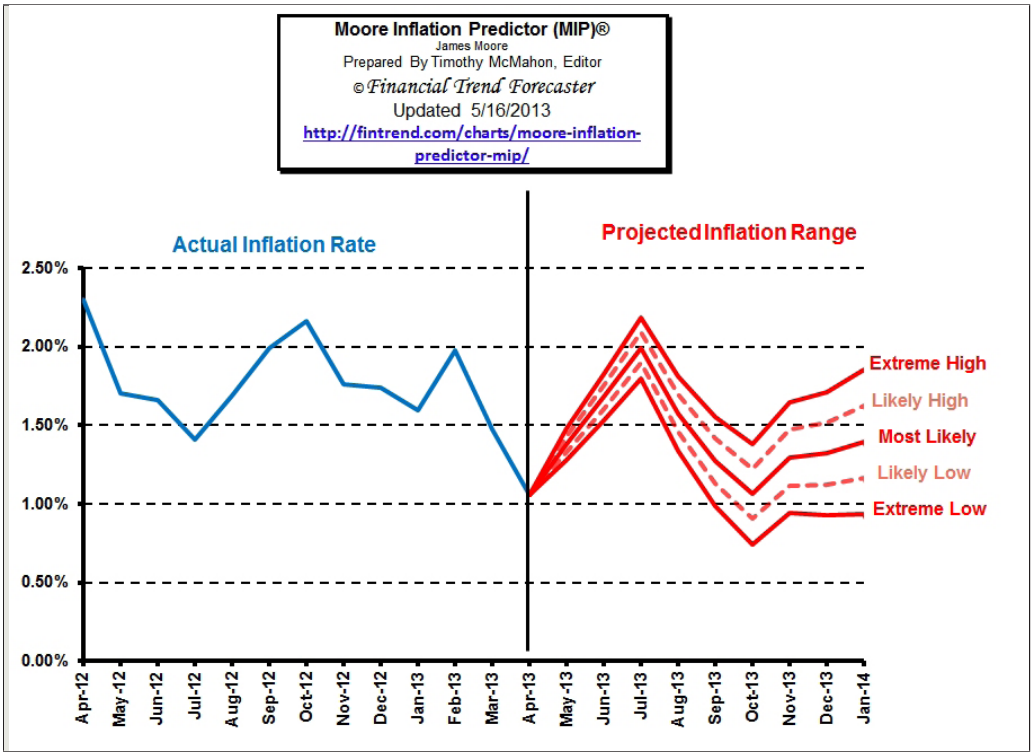
The Moore Inflation Predictor© (MIP) is a highly accurate graphical representation of the future direction of the inflation rate. It has a 97%+ accuracy rate forecasting inflation rate direction & turning points and over 90% of the time the inflation rate falls within the projected "likely" range.

For January, the annual inflation rate went down to 1.59%, not because we experienced deflation in January, but because January 2013 replaced January 2012 and January last year was at a higher monthly rate. Based on the current forecast, by mid-year 2013, consumer inflation should climb near 2.5%, but by year end may be back below 2%.

Being a mathematical forecast, the MIP has no way to factor in the massive monetary expansion, actions by China to remove "reserve status" from the U.S. dollar, natural disasters, stock market crashes, etc. until it starts showing up in the current numbers, so we must be alert for these type of events. Remember, it takes 1 to 2 years for monetary stimulus to result in inflation, depending on the money multiplier and other factors.

A review of long-term inflation data shows there are seasonal aspects of inflation with some fairly consistent trends. It appears that the majority of inflation occurs in the first half of the year and then moderates for the second half. Since 2001, there have been eight deflationary fourth quarters and only three inflationary fourth quarters, even though the overall trend is inflationary.

Figure 21



(MIP chart used by permission, Tim McMahon, Editor, Financial Trend Forecaster www.fintrend.com)

In 2012 we had six months of monthly deflation where prices went down and six months with very high inflation. The high inflation months were January, February, March, April, August, and September. The average monthly inflation during those six months was 0.45% for a total inflation of 2.7% in six months. If that continued for a year the annual inflation rate would have been over 5%. That is very high and would be destructive to the economy. So we were lucky to have the negative months to counteract them.

It is widely anticipated that several years of stimulus and easy money policy will eventually lead to strong inflation. There are however some analysts that question if that will occur. In the worst case scenario, a year from now we could potentially see inflation range between 4% and 5%.

The drop in Q1 2013 could act as a false indicator about the longer term direction of inflation. In a more tempered outlook for next year, we might expect inflation next year to range between 2.5% and 3.5%.

Keep in mind, construction inflation is historically much higher than consumer inflation.

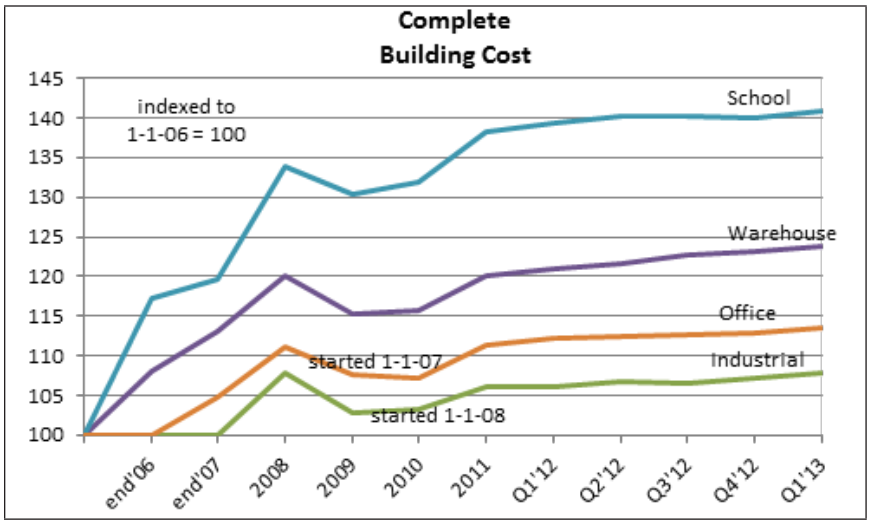
CONSTRUCTION INFLATION

Construction inflation, based on several decades of trends, is approximately double consumer inflation. From mid-2009 to late 2011 that long term trend did not hold up. During that period, construction inflation/deflation was primarily influenced by depressed bid margins, which had been driven lower due to diminished work volume. Over the last 12 months that has changed. Work volume has increased and short term construction inflation has increased now to more than double consumer inflation. If consumer inflation reacts to money policies by accelerating and if it holds true that long-term trends eventually return to the norm, we may soon be experiencing rapid acceleration in construction inflation.

The U.S. Construction Producer Price Index tables for Buildings Complete, which includes the cost complete as charged by the builder, actually represents the true inflation cost of buildings.

NONRESIDENTIAL BUILDINGS TOTAL CONSTRUCTION COST INFLATION, AS DEPICTED BY PPI DATA, HAD BEEN CLIMBING MORE RAPIDLY EARLIER THIS YEAR. IT IS CURRENTLY AVERAGING ABOUT 2.5% PER YEAR. ANOTHER INDUSTRY MEASURE SHOWS NONRESIDENTIAL BUILDING TOTAL COST INFLATION FOR THE FIRST SIX MONTHS OF 2013 AT AN ANNUAL RATE OF 4.8%. NEW RESIDENTIAL CONSTRUCTION INFLATION IS CURRENTLY CLOSER TO 10% PER YEAR.

Figure 22

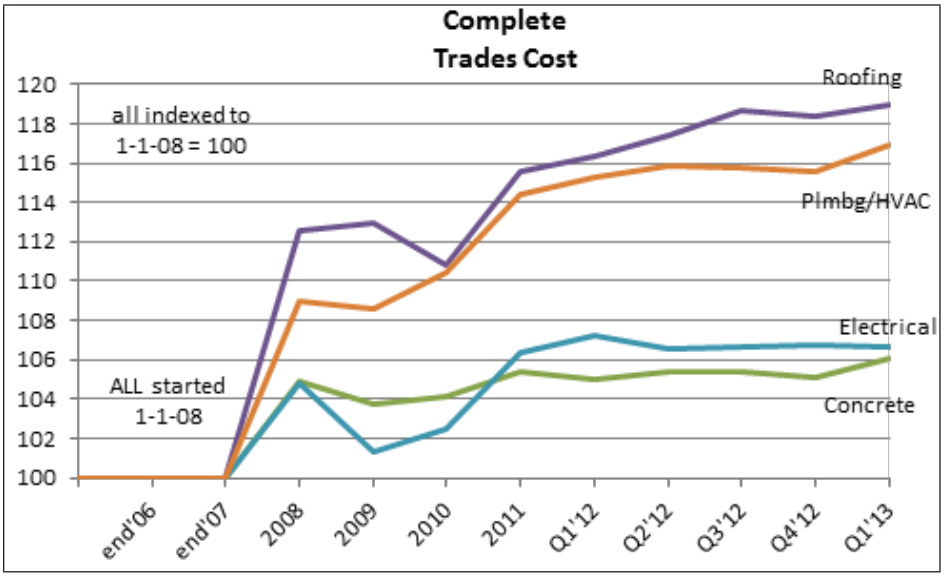


Buildings total prices including margins increased over the last year. We are predicting construction volume will continue to increase in coming months and that will continue to support increasing margins and therefore buildings total construction (final cost) inflation will outpace construction labor and materials inflation.

EXPECT NONRESIDENTIAL CONSTRUCTION COST INFLATION TO REMAIN NEAR OR ABOVE 4%.

These average values, useful for adjusting whole building costs, cannot be considered to adjust a unique contract type. Construction inflation with a historical average range from 3% to 8% would not be accurate to adjust asphalt paving or shingles. Asphalt products increased 10% per year in 2005 and 2006 and 20% per year in 2008 and 2009.

Figure 23



ENR BUILDING COST INDEX

The June 2013 Engineering News Record 20 Cities Average Building Cost Index (ENR-BCI) is 5286, up 1.5% year to date and up 2.2% year over year. Several cities (through May) recorded ENR Index year over year growth much higher than the 20 cities average; Baltimore 6.9%; Birmingham 4.2%; Dallas 3.9%; New York City 4.0% and Pittsburg 4.2%. Keep in mind winter months often show slower growth and yet, for the first two months of the year the index has risen at an annual rate of over 4%.

The ENR-BCI index increased 3.7% in 2010, 2.8% in 2011 and 1.9% in 2012.

THE ENR-BCI IS ONE OF THE MOST WELL-KNOWN AND MOST WIDELY USED BUILDING COST INDICES. HOWEVER, ITS LONG-TERM STRENGTHS CAN ALSO BE WEAKNESSES, PARTICULARLY IN TIMES OF FLUCTUATING SELLING PRICES BECAUSE:

- It is made up of a small shopping basket of labor and materials. Therefore it is not always the best representation of all building types, which can vary considerably in composition.
- That shopping basket includes no representation for any Mechanical, Electrical or Plumbing items, which can comprise 30%-50% of the cost of the building. In many cases the shopping basket comprises less than 20% of the building cost.
- Building materials differ widely in rate and timing of cost growth and can dramatically affect the cost of projects. In 2009 while structural steel products declined in price by 10% to 15%, copper products increased in price by 40%.
- ENR-BCI does not take into consideration bid prices, so it often does not represent the final cost of buildings. Bid prices are referred to as Selling Price, and this is not included in the ENR-BCI. Selling prices show increased or reduced margin bids due to market activity.

Table 9

ENR's Building Cost Index History (2000-2011)													
1913=100	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVERAGE
2000	3503	3523	3536	3534	3558	3553	3545	3546	3539	3547	3541	3548	3539
2001	3545	3536	3541	3541	3547	3572	3625	3605	3597	3602	3596	3577	3574
2002	3581	3581	3597	3583	3612	3624	3652	3648	3655	3651	3654	3640	3623
2003	3648	3655	3649	3652	3660	3677	3683	3712	3717	3745	3765	3757	3693
2004	3767	3802	3859	3908	3956	3996	4013	4027	4102	4129	4128	4123	3984
2005	4112	4116	4127	4168	4189	4195	4197	4210	4242	4265	4312	4329	4205
2006	4335	4337	4330	4335	4331	4340	4356	4359	4375	4431	4462	4441	4369
2007	4432	4432	4411	4416	4475	4471	4493	4512	4533	4535	4558	4556	4485
2008	4557	4556	4571	4574*	4599	4640	4723	4733	4827	4867	4847	4797	4691
2009	4782	4765	4767	4761	4773	4771	4762	4768	4764	4762	4757	4795	4769
2010	4800	4812	4811	4816	4858	4888	4910	4905	4910	4947	4968	4974	4884
2011	4969	5007	5010	5028	5035	5059	5074	5091	5098	5104	5113	5115	5059
2012	5115	5122	5144	5150	5167	5170	5184	5204	5195	5203	5213	5210	5174
2013	5226	5246	5249	5257	5272	5286							

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Using known historical projects to get an idea of cost of future projects is common practice. Time indices give us the means to move project costs from some point in time in the past to current time. A common method of indexing project cost from some point in time in the past to the current time is by using the ENR-BCI. Divide the current index value by the index value from the midpoint of construction of the historical reference project. That factor allows us to adjust cost from the past to today.

Since the complete procedure requires that we move cost out to the midpoint of construction, we must complete the process by applying anticipated inflation factors on today's cost to move that out to the future project midpoint. Inflation factors, referred to as escalation, are addressed elsewhere in this report.

There were several monthly declines in the ENR index from late 2008 through early 2010, but the annual average has gone up every year for 70 years. More importantly, from Q2 2008 through much of 2011, during the only recent period of true deflation, the ENR-BCI would indicate a 10% cost increase! The actual final cost of buildings, documented by several reliable measures, from Q2 2008 through Q4 2010 went down by anywhere from 8% to 13%. Since December 2010, while the ENR Index has increased by only 4.2%, cost of buildings has increased about 6.2%.

The ENR-BCI will give a good representation of growth when construction activity growth is fairly constant without steep up and down swings. During constant growth periods contractors' margins are relatively even and unchanged and the yearly change in the index values of even a small basket of materials and labor costs can be representative of the growth in the cost of buildings.

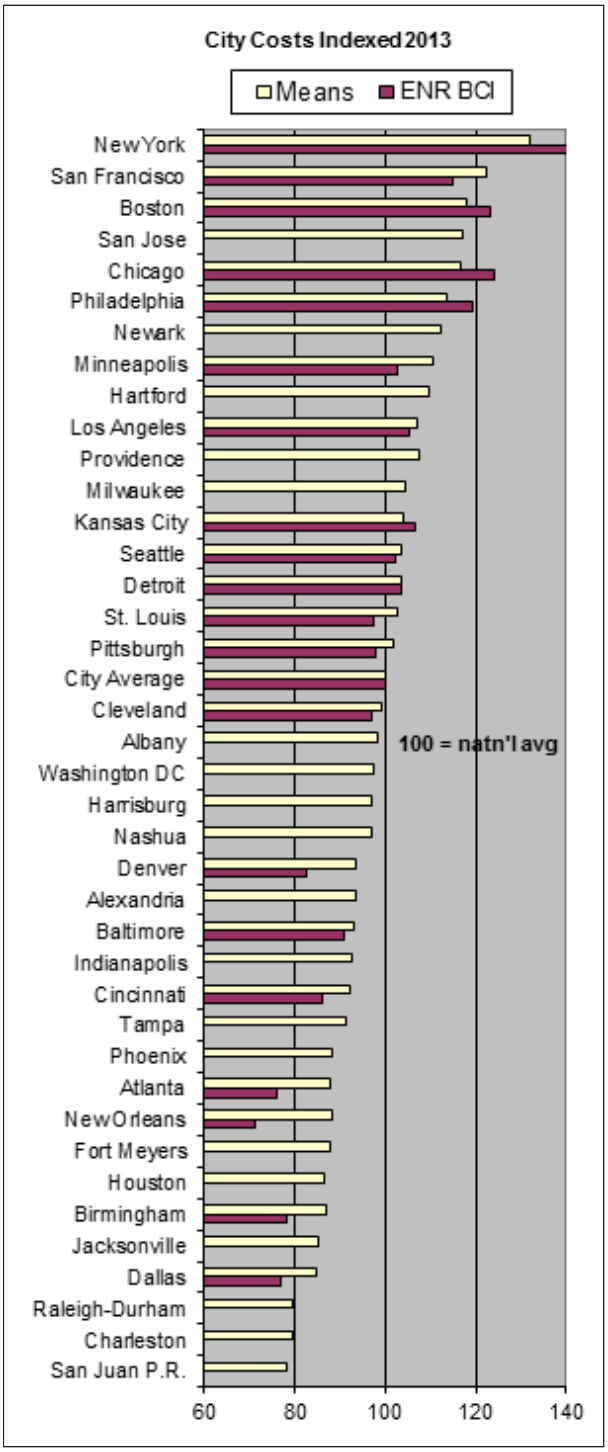
Whenever we have very active periods or very depressed periods of construction activity, contractor selling prices rise or fall accordingly and the ENR-BCI, since it does not track selling price, cannot reflect accurately what affect selling price had on the cost of buildings during those periods. Nonetheless, the ENR-BCI is often relied upon as an indicator of cost movement over time.

We've just gone through a period of three to four years during which margins were first inflated and then deeply depressed, transitioning dramatically from peak to trough. If you rely solely on the ENR-BCI to index the cost of buildings from, during or across that period of time, you may end up with indexed cost results that are grossly in error. If you were to select a time period between Q2 2008 and today, you could be overstating the future cost of a building by approximately 15% to 20%. You must at the very least take into consideration the selling price of buildings, past and present.

Selling prices are not captured in the ENR Index. For a procedure to adjust for actual selling prices see the Indexing – Addressing the Fluctuation in Margins section of this report, and refer to the graph Escalation Growth vs. Margin Cost. This is particularly important for those of you using conceptual cost modeling tools such as Gilbane's Cost Advisor.

INDEXING BY LOCATION – CITY INDICES

Figure 24



Equally important as indexing for time is the process of indexing for location. The practice of using historical projects, regardless of location, to get an idea of cost of future projects is quite common. Not only must we move project costs over time, but also we must move location. City indices provide the means to move project costs from one location to another.

Suppose our historical project was built in Phoenix and we wish to determine the cost of a similar project built in Boston.

ASSUME

- project cost as built = $10,000,000
- Boston index = 120
- Phoenix index = 90

MOVE COSTS TO BOSTON FROM PHOENIX;

DIVIDE "TO" CITY BY "FROM" CITY

MULTIPLY ORIGINAL COST BY FACTOR.

- Boston / Phoenix = 120/90 = 1.33x
- $10,000,000 x 1.33 = $13,300,000.

You can see by this example the danger of simply using unadjusted project costs from one location to determine costs in another location. Without adjusting for differences in cost due to location, it is possible to over or understate project costs by substantial amounts.

ENR provides city indices for 20 major metropolitan cities. RS Means annually updates tables for hundreds of cities. The chart here lists 40 major cities from highest to lowest RS Means index. The ENR index is shown for those available.

SELLING PRICE

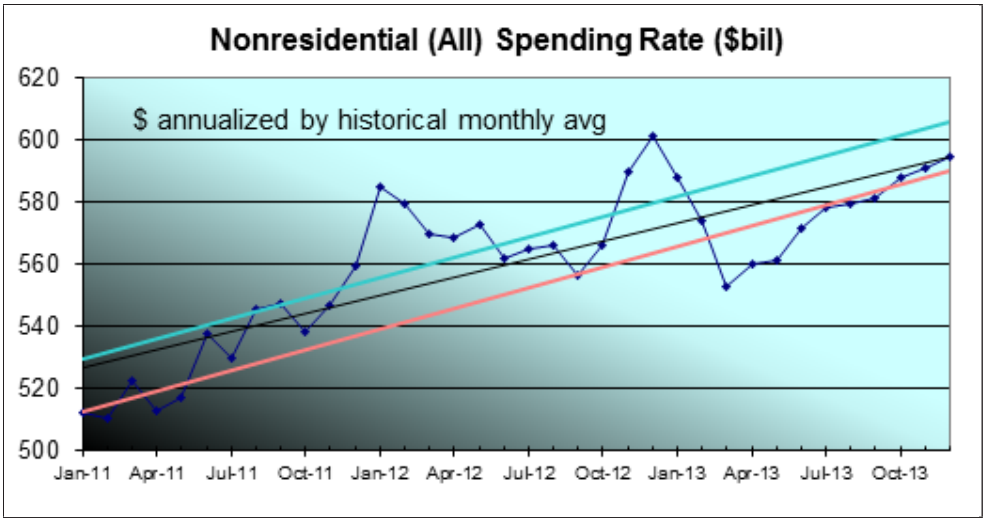
Selling price is the total price at which a contractor is willing to bid to win a project, even if that selling price eliminates all profit from the bid.

Few inflation or material/labor cost predictors address the issue of bidders lowering margins to win work and hence lowering what is known as Selling Price. Selling price is dramatically affected by economic conditions such as market volume and contractor booked revenue. When market volume is low, contractor's margin, or Selling Price, comes down. As business volume picks up, and once contractors secure more work, even if material prices stay low, contractors begin to increase their selling price.

Selling prices are still depressed and it will take time before workload volumes increase to a point that contractors see a return to normal margins. Nearly 75% of contractors lowered margins in 2010 bids. More than 75% kept margins the same in 2011 or lowered them even more. In 2012 we saw margins increasing. The AGC Business Outlook survey for 2013 indicates 28% of firms expect to increase margins. We might expect that rate to be doubled for residential work.

We are currently in a growth period as reflected in monthly construction spending. The monthly rate of spending, although it took a significant drop in Q1 2013, is expected to come right back to the normal trend line by Q4 2013. Residential markets are projected to grow by approximately 15% per year for the next several years. Although it may be several years before building market activity returns to pre-recession levels, there is clear and strong evidence the rate of activity is increasing.

Figure 25



Contractors need to recover the cost for all expenses that affect their cost to build. Any cost not recovered is taken as a reduction to margin or reduced selling price. Cost recovered over and above expenses raises selling price and is a growth to margins.

- Labor cost represents on average approximately 40% of building cost.
- Materials cost represents on average approximately 50% of building cost.
- Equipment and contractor services represent 10% of building cost
- Margins are applied on all 100% of building costs.

Labor wage cost growth is generally 2% to 3% per year. The labor wage cost long-term average is 3%. Changes in labor productivity either increase or decrease total labor cost. In growth periods, productivity generally declines, increasing overall labor cost.

Materials cost growth is tracked by several reports such as the PPI. Materials costs fluctuate widely, but in general, in times of higher demand material prices go up.

Equipment and services have the least effect on overall project cost. Contractor efficiencies or unusual project conditions may vary this cost.

Margins represent contractor overhead and profit. Selling price includes contractor margins and is market activity dependent. Competition will cause project bid margins to move lower. Increasing volume will allow margins to move higher.

- **If Labor wage costs go up by 3%, cost to project = 1.2%**
- **If Productivity decreases by 2%, cost to project = 0.8%**
- **If Material costs go up by 5%, cost to project = 2.5%**
- **If Services costs go up by 5%, cost to project = 0.5%**
- **If Margin increases by 1%, cost to project = 1%**

During a period of low volume and competitive pricing (assuming no room for margins to move lower) margins are not increasing. During a period of margin recovery, anticipate 1% to 1.5% per year. increase to margins until margins are fully recovered.

When we see substantial growth in the volume of projects coming to bid, the need to keep margins reduced will diminish and margins will return to normal. There is no room left for depressed market activity to move margins lower. Expect margins to increase slowly over time.

Margins vary considerably by market and activity within individual markets.

Margins Increasing or Decreasing?

Indices like the PPI MTRLS deal ONLY with materials costs or prices charged at the producer level. They do not include delivery, equipment, installation, or markups. Nor do they reflect the cost of services provided by the GC or CM.

Total project cost encompasses all of these other costs. Trade Contractor PPI and Whole Building PPI doesn't give us any details about the retail price of the materials used, but it does include all of the contractors costs incurred for delivery, labor for installation and markups on the final product delivered to the consumer, the building owner.

The PPI for construction materials IS NOT an indicator of construction inflation. It is missing the selling price. In 2010, the PPI for construction inputs was up 5.3% but the selling price was flat. In 2009 PPI for inputs was flat but construction inflation as measured by cost of buildings was down 8% to 10%.

For several years, we have had many construction firms competing for a very low volume of new work. Construction spending, adjusted for inflation to get real volume, in 2011 and 2012 reached a 20-year low. There is little work available for bidders forcing contractors to remain extremely competitive. As a result, contractors had been unable to pass on all cost increases to the owner. This had the effect of keeping selling price low, reducing both contractors and producers margins. In some cases margins may be reduced to a loss just to get work.

Table 10

US Construction Producer Price Indexes - May 2013						
Markets Inputs PPI	**Percent Change Versus to May 2013 from**			**annual for**		
	Apr-13 1 month	**Feb-13 3 months**	**May-12 12 month**	**12 months 2012 last yr**	**12 months 2011**	**12 months 2010**
Inputs to ALL Construction	0.0	0.0	0.8	1.3	5.2	5.3
Inputs to Nonresidential	0.2	-0.1	0.3	0.8	5.7	4.0
Inputs to Commercial	0.2	0.2	0.6	1.1	4.9	NA
Inputs to Industrial	0.1	-0.2	0.1	0.8	5.2	NA
Inputs to Hghwy/Hvy Engr	0.1	-0.2	0.0	0.7	6.1	NA
Inputs to Residential	0.0	0.2	1.6	2.0	4.8	4.3
All data not seasonally adjusted						
Data Source: Producer Price Index. Bureau of Labor Statistics						

Compare the cost inputs in Table 10 to the completed costs for buildings in Table 11. Prices for completed buildings are up on average about 1.5% to 2%.

Table 11

US Construction Producer Price Indexes - May 2013						
Buildings Completed whole building cost	**Percent Change Versus to May 2013 from**			**annual for**		
	Apr-13 1 month	**Feb-13 3 months**	**May-12 12 month**	**12 months 2012 last yr**	**12 months 2011**	**12 months 2010**
Inputs to Nonresidential	0.2	-0.1	0.3	0.8	5.7	4.0
New Industrial Bldg	0.0	0.6	1.5	1.4	2.9	0.4
New Warehouse Bldg	0.7	1.3	2.7	2.6	3.8	0.4
New School Bldg	0.0	0.1	0.4	1.1	4.8	1.3
New Office Bldg	0.3	0.5	1.1	1.4	3.8	-0.3
New Health Care Bldg	0.0	0.5	NA	NA	NA	NA
except inputs, includes labor, material overhead and profit						
All data not seasonally adjusted						
Source: Producer Price Index. Bureau of Labor Statistics						

I EXPECT WHOLE BUILDING COSTS TO RISE AND REMAIN ABOVE MATERIAL/LABOR INFLATION AS LONG AS WORK VOLUME CONTINUES TO INCREASE.

To analyze the trend in margin movement we need to combine data from several inputs. Spending data and jobs data provides what we need to determine productivity. Producer Price Index (PPI) gives the cost of materials from the producer, but not the cost the contractor charges for the material. Whole building cost gives us the price charged by the contractor to the client, the total cost for all labor, materials, equipment, overhead and profit.

Compare all these and we can determine the difference between the costs to the contractor and what the contractor charges. That difference is the margin added to get the selling price.

In the last three months margins have been decreasing again. Contractors have all taken a considerable hit to margins over the last three years. However, even with the drop (<1%) over the last 3 months, margins are still up slightly over the last 12 months.

Table 12

US Construction Producer Price Indexes - May 2013						
MARGINS	**Percent Change Versus**			**annual for**		
Completed	**to May 2013 from**			**12 months**	**12 months**	**12 months**
whole building cost	**Apr-13**	**Feb-13**	**May-12**	**2012**	**2011**	**2010**
	1 month	**3 months**	**12 month**	**last yr**		
New Industrial Bldg	-0.39	0.00	0.85	1.40	-2.15	-2.65
New Warehouse Bldg	0.31	0.70	2.05	2.60	-1.25	-2.65
New School Bldg	-0.39	-0.50	-0.25	1.10	-0.25	-1.75
New Office Bldg	-0.09	-0.10	0.45	1.40	-1.25	-3.35
(-) margins decreasing (+) margins increasing						
All data adjusted for inflation						
Source: Producer Price Index. Bureau of Labor Statistics						

From 2009 through most of 2011, the trend had been increasing materials costs that were difficult to pass on to the consumer. From the client's perspective building costs were not increasing as much as material costs. From the perspective of manufacturers, suppliers and constructors, costs were increasing but were being absorbed by a reduction to margins. In effect, this kept selling price to end users well below the level of material cost inflation, but also considerably reduced the profitability of all producers, suppliers and builders.

WE SEE IN 2012 DATA THE STRONGEST EVIDENCE SINCE 2009 THAT CONTRACTORS WERE ABLE TO INCREASE MARGINS AND PASS ALONG MATERIAL COST INCREASES. BUT IT WILL TAKE CONTINUED INCREASES IN THE LEVELS OF ACTIVITY TO NARROW THE GAP BETWEEN THE PRICE THE CONTRACTOR PAYS AND THE PRICE THE CONTRACTOR CHARGES.

Indicators are pointing to growth signs and that will eventually lead to a more normal bidding environment. That in turn will allow builders to pass along ever greater percentages of cost increases.

The flow of projects coming to bid during the coming months will strongly influence the cost movement of the bids. If the volume of projects coming to bid decreases, overall construction business will remain depressed and bids will remain low, strongly influenced by depressed margins. When we see a continued increase in the volume of projects coming to bid, the need to keep margins reduced will diminish and margins will continue a return to normal.

ENR, in its Second Quarterly Cost Report released June 24, published two Selling Price indices, 3.0% and 4.0%. These increased respectively by 1.1% and 1.2% in the most recent quarter, indicating a current growth rate that may take both indices higher.

INDEXING – ADDRESSING THE FLUCTUATION IN MARGINS

We often look at the cost of previously built buildings as a historical guide for what to expect in the future. Escalation indices allow us to move the cost of buildings over time. City indices allow us to move for location. To index accurately, we need also direct our attention to the baseline project cost upon which future escalation is applied and where that baseline cost stands with respect to normal baseline indices. Also we need to review margin and productivity movement to determine what effect they might have on current cost compared to current index.

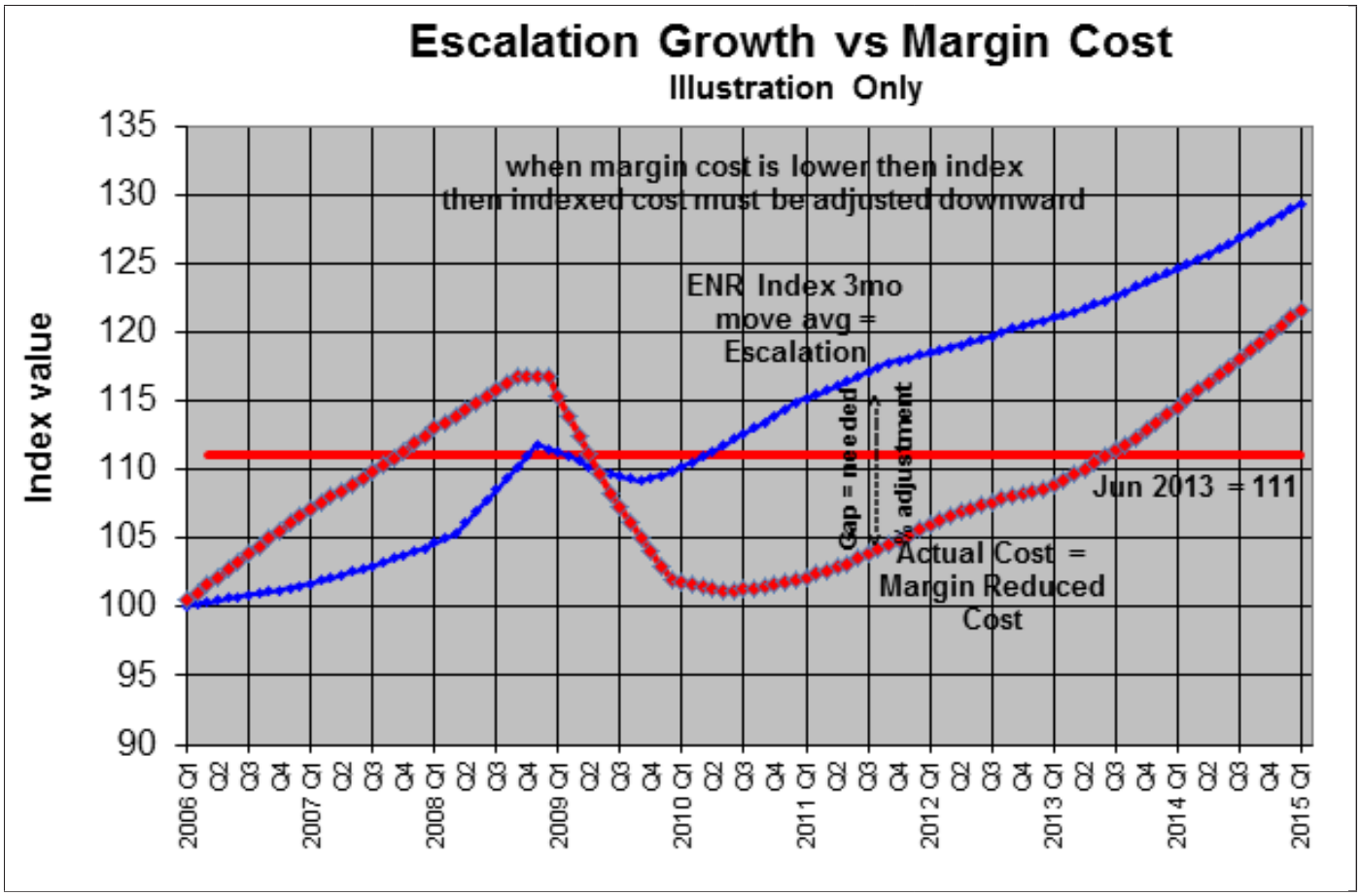
For all of 2009 and continuing through 2010, project bids came in at perhaps 10% to 20% under normal budget estimating. Average costs of buildings from Q2 2008 through Q4 2010 fell by 13% to 15%. However, normal indices increased by 4% during that time. Normal indices will not account for all changes in individual material costs, wages, productivity changes and margin fluctuations.

Standard labor and material index tables will not address the inflection points in this unusual time period, nor will standard labor and material inflation factors address productivity or margin fluctuation. Figure 26, "Escalation Growth vs. Margin Cost", illustrates this unusual period and provides a means to properly account for these unusual occurrences.

The Blue line = ENR BCI actual values through November 2011 and predicted escalation ranging from 3% to 6% over the next two years, increasing at a rate of 0.5% per quarter. The plotted values are three month moving average to smooth out the line.

The Red line = Contractor Bid Price Movement or Reduced Margin Cost representative of bids received. Very low margin cost in mid-2010 reflects contractor bids at low cost to secure a dramatically reduced amount of available work. Predicted future cost shows long term cost growth which accounts for both normal labor/material escalation equal to escalation outlined above AND a very slow but steady 0.5% per quarter recovery of margins over the next few years.

Figure 26



HOW TO USE THE ABOVE GRAPH:

- Pick the date for midpoint of the historical reference project.
- At that date, draw a vertical line so it passes through both curves.
- Now pick today's date.
- At that date, draw a vertical line so it passes through both curves.
- Record the ENR Index at the historical reference date and today
- Record the Margin Cost Index at the historical reference date and today.
- Subtract historical ENR index from today's ENR index. Label that value A
- Subtract historical Margin index from today's Margin index. Label that value B
- Pay attention to sign (+ or -).
- The difference between the movement due to the ENR index and the Margin Cost Index is the needed correction factor. Use the differences from the ENR Index (A) and the Margin Index (B) to develop an adjustment factor for your project. Since baseline is 100, all factors are the same as percentages.
- B minus A = Margin Adjustment factor. Pay attention to signs (+ or -).
- Cost Advisor users can record the Margin Adjustment value determined here into the Similarity Adjustment factor field. Treat all system indexing and future escalation as you would normally.

COST ADVISOR USERS MUST BE PARTICULARLY VIGILANT OF THIS POTENTIAL ESCALATION/ INDEXING ISSUE.

If you are preparing an estimate using historical data input or you are using CostAdvisor to conceptualize a future project budget several years out from now, AND if selecting any historical project with a cost midpoint occurring where ever the Red MARGIN line VARIES FROM The Blue ENR INDEX line, you should consider applying a percentage adjustment to the baseline cost to adjust for the difference (or some portion of the difference) between the two indices. The goal is to correct for any margin over/under compared to how the ENR index would have moved the costs. Then carry a normal prediction for future escalation.

ESCALATION – WHAT SHOULD WE CARRY?

We tend to think of Escalation as one simple value. An estimator typically prepares a budget in today's dollars, but then must escalate the total estimate to the midpoint of the project construction schedule. Escalation must account for all anticipated differences from today's cost to future cost. As explained in prior sections, when determining escalation there is more going on than just picking a simple value.

TO MOVE COSTS FROM TODAY'S DOLLARS INTO THE FUTURE, WE MUST ACCOUNT FOR THE CUMULATIVE EFFECT OF:

- Market Activity
- Labor wage rate changes
- Productivity changes
- Materials cost changes
- Equipment cost changes
- Margins fluctuations

The following escalation recommendations are based on the previous analysis of anticipated market activity, labor and material cost movement, productivity expectations and anticipated margin movement.

Activity, material cost increases and margins have all been increasing more rapidly in residential markets. This will remain the case for the next few years. In all cases future escalation in residential markets should be taken at the high end of the ranges stated here.

Total Escalation for 2013 = 3.5% to 5%

An anticipated slowdown in nonresidential work in the early part of the year will mute the overall escalation rate for 2013. We could potentially see only 3% to 4% escalation in the first two quarters, but then see 5% to 6% escalation before the end of the year. Material cost inflation is expected to accelerate slowly. Work activity in nonresidential will pick up in the second half. Residential work will remain very active and can expect escalation near the high end of the range. Once growth in nonresidential picks up and both residential and nonresidential are active, we may begin to see significant labor shortages and productivity losses. As it did in 2012, even a moderate growth in activity will allow contractors to pass along more material costs and increasing margins.

Total Escalation for 2014 = 4.5% to 6.5%

Assume a greater rate of growth in activity than 2013 which allows passing along all potentially inflationary labor and material costs and increasing margins 1% to 2%.

Looking out to 2014, we expect construction activity growth in all sectors and a continuation towards a return to normal margins. We may quickly approach the higher end of the escalation range. Pent-up demand, particularly in the public sector, may force a higher rate of activity. Residential construction, still trying to fill several years shortfall, will continue strong. Inflationary pressures may push the rate of material cost increases higher than the 2013 range. All material cost increases from the manufacturer through the supplier may be passed along to the owner. Increasing work volume will have the effect of reducing productivity. Contractors may again potentially increase margins 1% to 1.5%.

It's difficult to reach any conclusion that total costs within the year would not be escalated to at least 5% to 7% over the previous year. Any assumption that escalation growth would be less requires that market activity does not continue to grow. All expectations are that by 2014, total construction will increase nearly 10% from 2013, with some sectors growing by 15%, growth rates we haven't seen since 2005 to 2007.

Total Escalation for 2015 = 5.5% to 7.5%

Assume even greater rate of growth in activity than 2014 which allows passing along all potentially inflationary labor and material costs and increasing margins 1% to 2%.

We do not have detailed projections to rely on for 2015. We can expect construction activity growth in all sectors. Pent up demand, particularly in the public sector, may result in a higher rate of activity. Residential construction will continue strong for several more years. Material cost increases will result in higher inflation. All material cost increases from the manufacturer through the supplier may be passed along to the owner. Labor shortages may be significant resulting in much higher labor retention costs. Contractors will have freedom to increase margins.

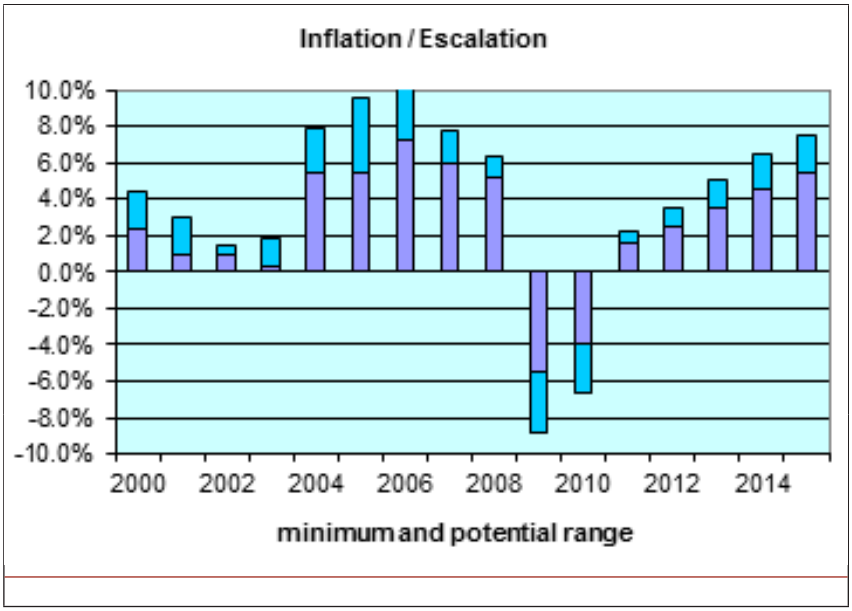
We may potentially see escalation similar to the growth years of 2005 through 2007 when escalation averaged 9% per year for three years. An assumption that escalation growth cannot reach those levels must also assume market activity will not continue to grow. All leading indicators point to continued growth. The rate of actual construction in 2012 and 2013 from the growth in starts each year was +8% per year. That is greater than the boom years of 2004 through 2008 and it is expected to accelerate. The Dodge Momentum Index up 7% in the latest quarter vs. one year ago, for most work has a 9 to 15 month lead time to start of construction, then a 12- to 24-month construction period. Ken Simonson, AGC Chief Economist predicts 2014-2017 construction spending to increase 6% to 10% per year.

For each year above, consider your market. If you are in a market area or sector that has expectations of a huge volume of work that may start within a narrow window of time, then market pricing can turn rapidly for you. For example, construction spending in Boston increased 37% in the last year, nearly four times the national average. In this specific condition, it would be reasonable to assume 5% annual future escalation as a conservative approach in a rapidly growing market. All labor and material cost will get passed along and margins will increase more rapidly. Let's not forget that building construction real cost escalation was 8% to 10% in 2006 and 7% to 8% in 2008.

Figure 27

Prior to economic expansion and then downturn, long term escalation averaged 3.5% for 20 years. I do not see any scenario which has us return to that long-term average at least for several years beyond the above noted predictions.

Potential inflationary periods, declining productivity and even slight continued margin growth for several years lead me to recommend a minimum long term escalation beyond 2015 of no less than 4%.



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Author Ed Zarenski, a 40-year construction veteran and a member of the Gilbane team for more than 33 years, is an Estimating Executive who has managed multimillion dollar project budgeting, owner capital plan cost control, value engineering and life cycle cost analysis. He compiles economic information and provides data analysis and opinion for this quarterly report.

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DATA SOURCES:

- Among countless news articles, these sources are used for data in this report
- American Institute of Architects – www.aia.org/practicing/economics/index.htm
- American Iron and Steel Institute - steel.org
- American Recycler - americanrecycler.com
- Associated Builders and Contractors - abc.org
- Associated General Contractors of America - agc.org
- Bloomberg L.P. Financial News - Bloomberg.com
- Bureau of Labor Statistics - Stats.BLS.gov
- Construction Industry Round Table – www.cirt.org
- Data Digest – agc.org/datadigest
- Economic Cycle Research Institute businesscycle.com
- Energy Information Administration - Eia.doe.gov
- Engineering News Record - ENR.com
- Financial Times - FT.com
- Financial Trend Forecaster - Fintrend.com
- FMI Management Consulting - FMINET.com
- IHS Global Insight - ihs.com
- Institute for Supply Management - ism.ws
- International Iron and Steel Institute - Worldsteel.org
- McGraw Hill – Dodge – construction.com/about-us/press
- Metal Miner - agmetalminer.com
- Metal Prices – metalprices.com
- Producer Price Indexes - bls.gov/ppi/
- Reed Construction Data - reedconstructiondata.com
- RS Means - rsmeans.reedconstructiondata.com
- U.S. Census Bureau - census.gov

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Celebrating 140

GILBANE BUILDING COMPANY

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