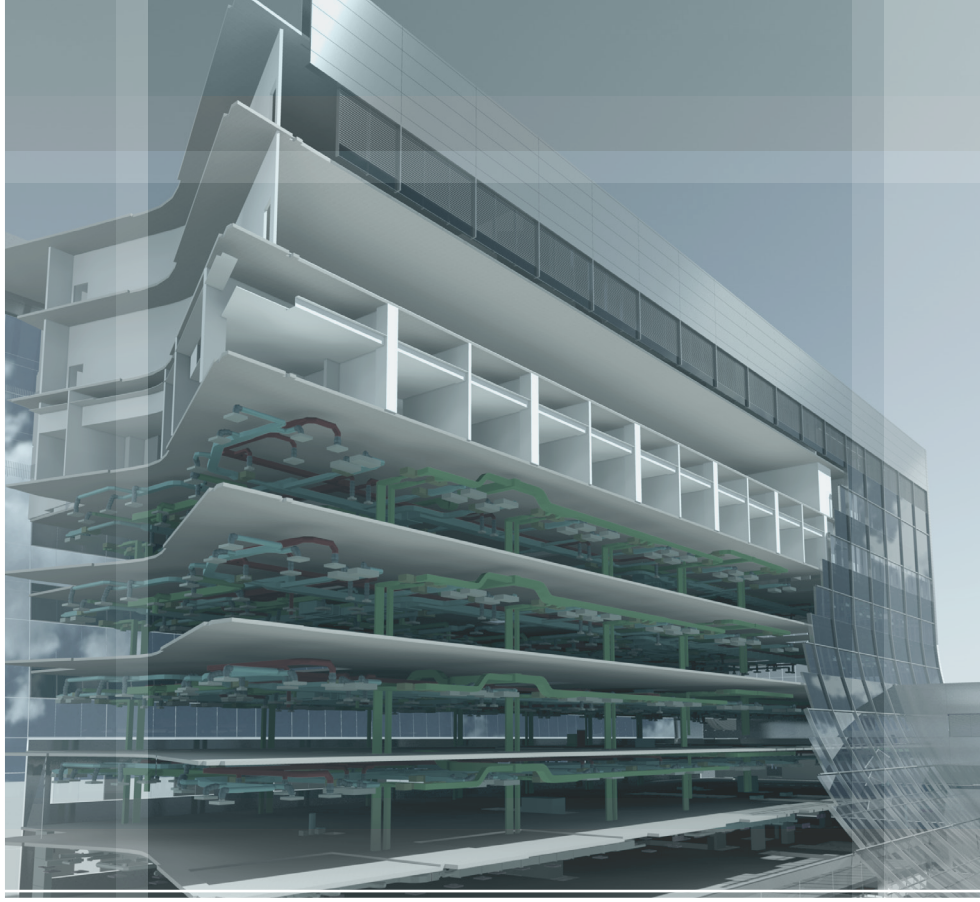

CONSTRUCTION ECONOMICS

MARKET CONDITIONS IN CONSTRUCTION

Gilbane Building Company

NOVEMBER 2012

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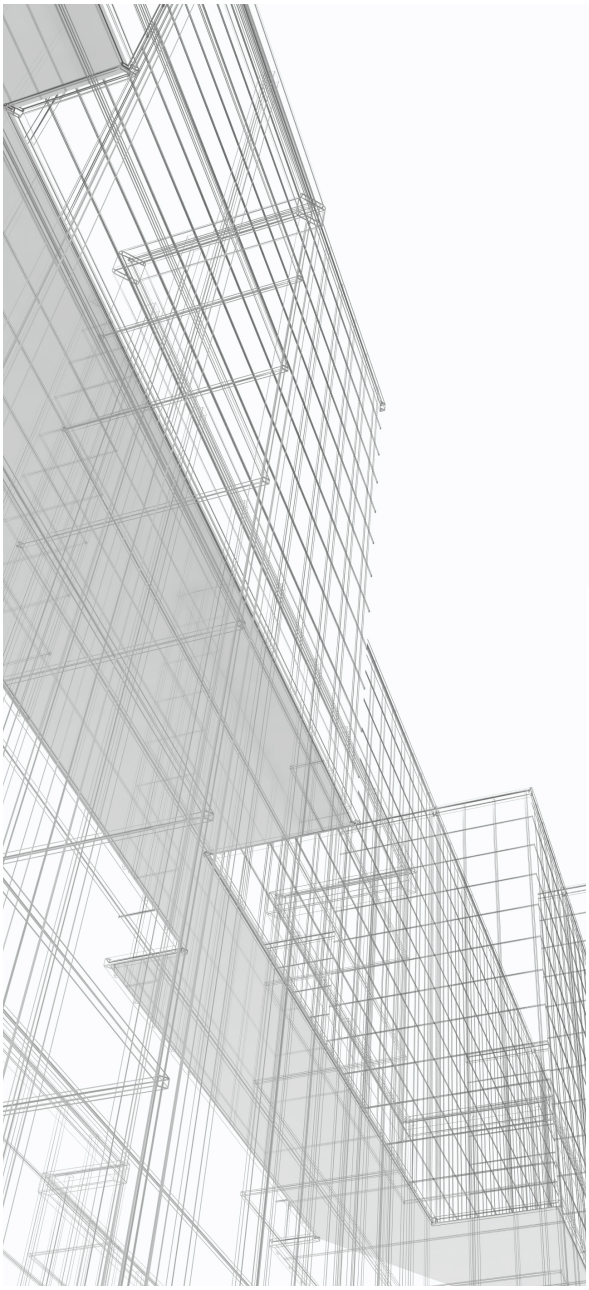


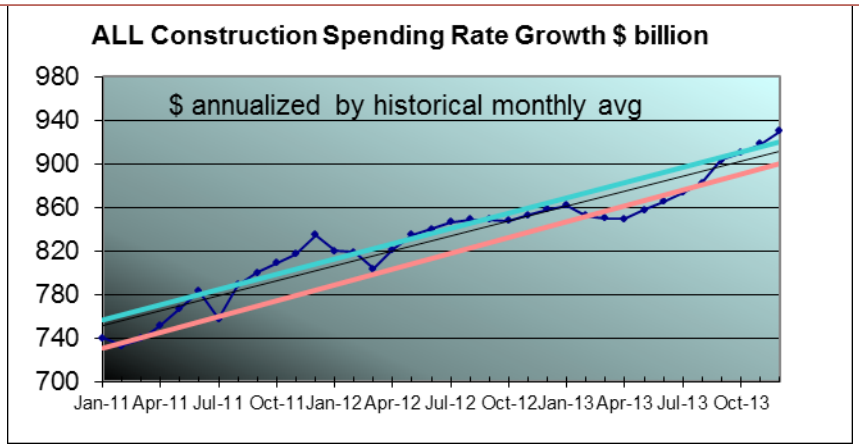
SUMMARY

CONSTRUCTION GROWTH LOOKING UP:

- Construction Spending for 2012 should finish almost 8% over 2011, 5% for non-residential buildings, 12% for residential.
- The current spending rate for all construction is 6.5% above a year ago while the current spending rate for residential construction is up 16%.
- If you haven't been watching, we've already started the next residential construction boom. New Housing Starts are up 30+% from last year and up 40+% from the bottom hit two years ago.
- Not only are Construction Starts increasing at a (slow) upward rate, but the Construction Backlog Indicator also shows backlog duration is increasing.
- Contractors' building costs "charged" in 2012 are above labor and material cost increases, signaling a movement towards recovery to more normalized margins.
- Construction spending for 2013 should increase 5%. Residential spending should increase 11%.
- Nine states that account for 50% of all construction jobs lost 137,000 jobs in the 4 months from September 2011 through January 2012. Now 12 months later, this same group shows a gain of 32,000 jobs since September 2011, a turnaround increase of 169,000 jobs in 8 months.
- The October Producer Price Index data shows recent material price declines holding year over year material costs on average to 2% or less after 5% increases in both 2010 and 2011.

Figure A

Total spending of ALL types of construction will grow just over 5% year over year from 2012 to 2013. We will start the year at an annual rate of spending near $860 billion and grow to a rate of $930 billion by year end. The ABI predicts a Q1-Q2 2013 slowdown, but then future growth. The Dodge Momentum Index, although down recently is still well up since the mid-2011 bottom indicating growth in 2013.



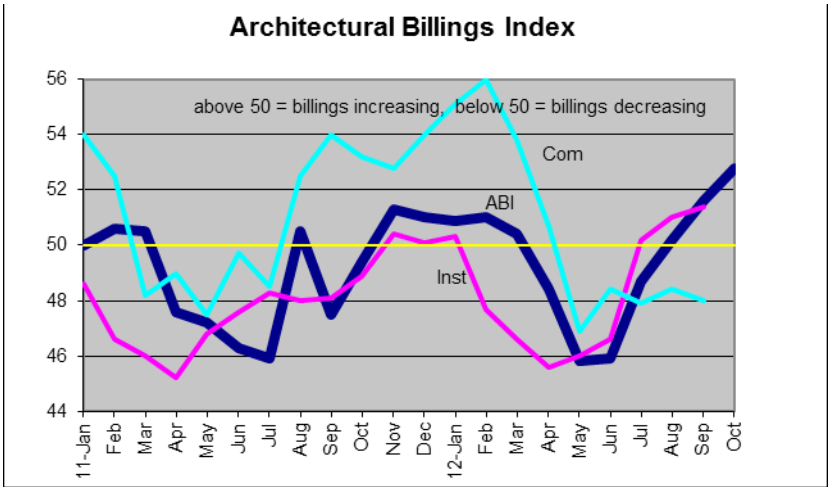
IMPACT OF RECENT EVENTS:

- According to the Associated General Contractors (AGC), Hurricane Sandy may not add any economic impact to the construction industry. For the most part any funds directed to reconstruction will be diverted from some other potential or previously planned construction project and will be spread over a long timespan.
- Bond issues considered in the recent elections amount to just over half ($30+ billion) of what was approved in 2008 elections ($60+ billion), signaling a reduction in publicly funded work.
- At the recent McGraw Hill Outlook conference, none of the economists expect the fiscal cliff to happen. However, sequestration or the compromises agreed upon will likely reduce funds available for federal and public projects.

SOME ECONOMIC FACTORS ARE STILL NEGATIVE:

- The Architectural Billing Index (ABI) is predicting a drop in nonresidential spending potentially from February through July 2013.
- The construction workforce has shrunk by 2.25 million workers (29%). It will be many years before the entire workforce grows back to its previous level. As workload expands in the next few years, a shortage of available workers may have a detrimental effect on cost, productivity and ability to increase construction volume.
- Public construction spending rate has dropped 5% since same period last year. It will finish 2012 12% below the 2009 peak and is expected to drop further in 2013 for the 4th consecutive year.

Figure B

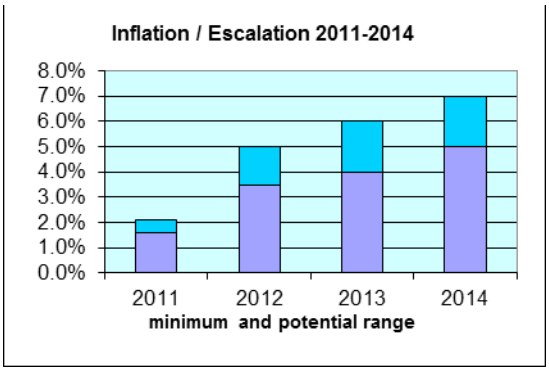


The Architectural Billings Index (ABI) has proven to be a reliable indicator. The ABI predicts non-residential activity 9 to 12 months out and correctly indicated both the downturn and upturn in 2012. Another downturn is indicated that gives caution for Q1 through Q2 2013. Indexes above 50 indicate increasing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

THE EFFECTS OF GROWTH:

- Contractors are passing along more material cost increases. As spending continues to increase, contractors gain more ability to pass along costs and increase margins.
- The most important cost to watch in construction is "What will the market bear?" quoted from Julian Anderson, President, Rider Levitt Bucknall at McGraw Hill Outlook 2013 Conference.
- FMI's 3rd quarter Construction Industry Round Table (CIRT) Sentiment Index in its Executive Summary says, "it appears we are in a period where owners will continue to expect lower prices and more bidders, but they might find fewer contractors willing to do the work for low prices or just fewer contractors – especially trade contractors – in the market and higher prices than expected."

Figure C



Future escalation, in order to capture increasing margins, will be higher than normal labor/material cost growth. Expect residential escalation near the upper end of the range.

We advise a range of
3.5% to 4% for remainder of 2012
4% to 6% for 2013
5% to 7% for 2014

SUPPORTED BY OVERALL POSITIVE GROWTH TRENDS FOR YEAR 2013, I EXPECT MARGINS AND OVERALL ESCALATION TO CLIMB MORE RAPIDLY THAN WE'VE SEEN IN 5 YEARS.

From 2006 to 2010, as work declined, we saw the largest decline of margins in recent history. A slight increase in late 2011 reversed that trend, although 2011 for the year still saw margins lower. Margins are up a slim 1% to 2% year over year for 2012. For 2013, during the first two quarters we may experience a dip in nonresidential spending and with that a further dip in margins. Work activity in nonresidential construction will pick up again in the second half. Residential work will remain very active. Once growth in non-residential picks up and both residential and non-residential are active, we may begin to see some 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 increase margins.

CONSTRUCTION STARTS

McGraw Hill Construction publishes monthly Construction Starts data. This information includes actual monthly data and a seasonal adjusted annual rate (SAAR) for each new monthly Starts value. But the monthly values for Starts can fluctuate wildly. Construction Starts data can be extremely variable from month to month, in part dependent on the exact date that any new project gets listed. This data volatility can skew the interpretation of the output.

SAAR based on any given month is far too volatile to predict the annual total. In the last two years of data there have been at least four occasions when consecutive months have varied by an average 20% and as high a difference as 25%. This causes unrealistic peaks and valleys in the data. Therefore, we cannot use month-to-month data to predict annual outcome. In addition, the monthly data is susceptible to revision even a year later.

Table 1

U.S. Construction Market Outlook

Billions of Dollars	2008	2009	2010	2011	2012	2013
Total Construction	558.6 -13%	426.3 -24%	433.7 +2%	437.7 +1%	457.9 +5%	483.7 +6%
Single Family Housing	122.4 -39%	94.3 -23%	100.0 +6%	97.3 -3%	123.5 +27%	153.1 +24%
Multifamily Housing	38.1 -37%	17.9 -53%	21.6 +20%	28.6 +32%	34.6 +21%	40.3 +16%
Commercial Bldgs.	81.4 -19%	47.3 -42%	41.8 -12%	47.7 +14%	50.1 +5%	55.9 +12%
Institutional Bldgs.	130.6 +11%	112.3 -14%	111.8 -0-	99.5 -11%	86.3 -13%	86.6 -0-
Manufacturing Bldgs.	31.0 +50%	9.7 -69%	9.5 -3%	17.1 +81%	11.8 -31%	12.8 +8%
Public Works	121.1 -0-	123.6 +2%	120.4 -3%	103.8 -14%	100.6 -3%	100.0 -1%
Electric Utilities	33.9 +79%	21.1 -38%	28.6 +36%	43.7 +53%	51.0 +17%	35.0 -31%

Outlook EXECUTIVE CONFERENCE

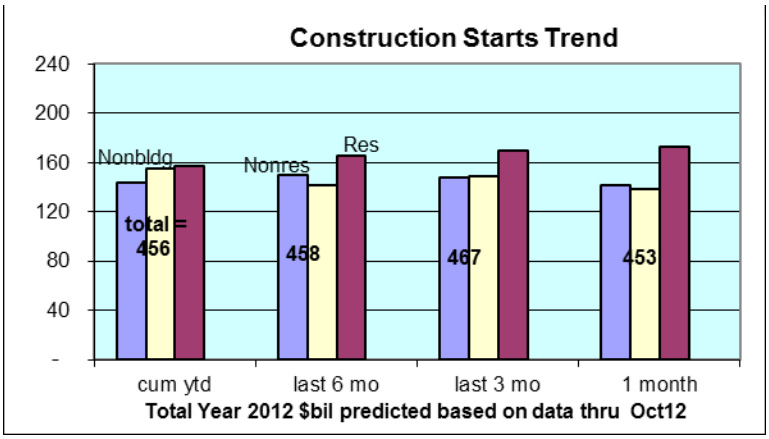
McGraw Hill CONSTRUCTION

U.S. Construction Market Outlook New Construction Starts courtesy McGraw Hill Construction Outlook Executive Conference – Robert Murray – Oct. 24, 2012

EXPECTATIONS FOR 2012 BASED ON DATA THROUGH SEPTEMBER:

- Nonresidential total Starts for the year will be held down by the low rate of Starts in the first 4 months. Previous upward movement in the Architectural Billings Index should lead to growth in nonresidential Starts. The annual total will finish near $145 Billion.
- Nonbuilding infrastructure Starts for the year will finish much higher than expected due to the extremely high Starts in April and May, which were skewed by two $8+ billion nuclear reactor projects and again in September driven by electrical utilities. The annual total will finish near $150 billion even though the annual rate near the end of Q4 2012 will be near $120 billion.
- Residential Starts have been climbing consistently all year. The monthly rate of Starts by year-end will be over $160 billion and due to minor monthly fluctuations the annual total will finish near $158 billion.

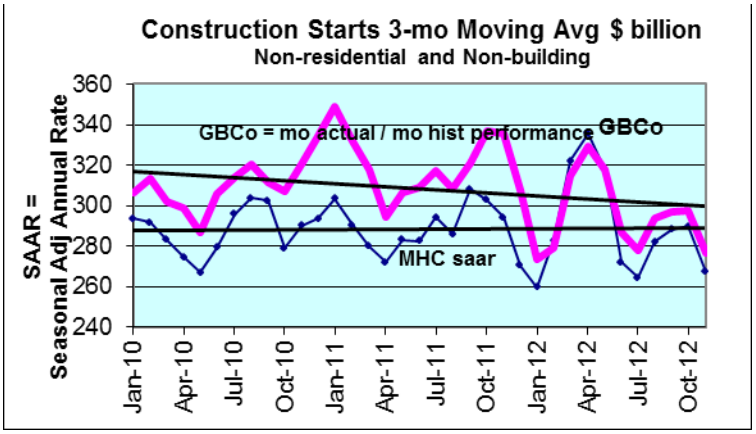
Figure 1



Non-building Starts have been the most erratic through the year. Again in September, nonbuilding starts were 33% above average, so the 3-month average is skewed. All categories have increased since January 2012. Residential has had only two minor dips this year and is now at a rate 25% higher than January. Expect to see some dips rather than a continuous upward trend, but this data looks good for future spending.

One way to look at the data is to calculate a forecast based on the latest month, last 3 months and last 6 months. One month data is sometimes too volatile to predict the year, but shows the current monthly trend; 3-month moving average trends smooth out the data and give a better near term prediction; and 6-month trends flatten the data even more and helps show the change from 6 months to the more current 3 months. The cumulative year to date prediction hasn't varied by more than 1% for the last 5 months.

Figure 2



We need to be less concerned about monthly fluctuations in Starts and more concerned about long term trends. A smoothed moving average shows the Gilbane Building Company trend graph of Starts Activity.

2011 and 2012 starts data shows the results when the strong influence of residential is removed. Without residential, starts actually are trending down since 2010.

EXPECTATIONS FOR 2013 BASED ON MCGRAW HILL CONSTRUCTION:

- New construction starts are expected to increase 6% in 2013
- Total non-residential new starts in 2013 will be down, but primarily because electric utility infrastructure work is expected to go down 30%.
- Non-residential commercial building starts are expected to be up 12% in 2013.

Inflationary influences have the effect of reducing the value of new Starts, and so, Starts growth at a rate lower than the real inflation rate would mean construction Starts in terms of building volume (not in terms of revenue) are actually falling. If inflation for the year comes in at 4%, then Starts need to be greater than 4% to realize any real volume growth.

CONSTRUCTION SPENDING

Based on year-to-date factors, I predict construction spending Will reach $838 billion for 2012, up 7.7% from 2011. We started the year with a rate of spending at $820 billion and we are finishing the year at a rate near $860 billion.

Construction Spending has been pushed higher by huge growth in residential construction at a rate of growth 20% to 25% higher than the rate in Q1 2012.

The best months for Residential Construction Spending for the last two years are November and December, so expect a very strong finish in 2012. This may push the year-end result slightly higher than I've predicted.

Even though the headline number for nonresidential buildings spending is indicating it will be up 5% for 2012, this is up only a fraction of a percent since July-August 2011.

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	296.7	299.6
% change year over year	12.5%	18.9%	8.5%	-14.3%	-22.7%	-2.6%	4.9%	1.0%
Nonbuilding Heavy Engr	207.9	248.3	271.8	273.3	265.1	249.7	266.4	277.6
	12.4%	19.4%	9.5%	0.6%	-3.0%	-5.8%	6.7%	4.2%
Residential	619.9	500.3	357.7	254.3	248.9	245.6	274.7	303.6
	0.4%	-19.3%	-28.5%	-28.9%	-2.1%	-1.3%	11.8%	10.5%
Total	1167.2	1152.3	1067.5	903.1	804.2	778.1	837.7	880.8
	5.7%	-1.3%	-7.4%	-15.4%	-11.0%	-3.2%	7.7%	5.1%

Residential includes new, remodeling, renovation and replacement work.

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

Forecast 2012 - GBCo

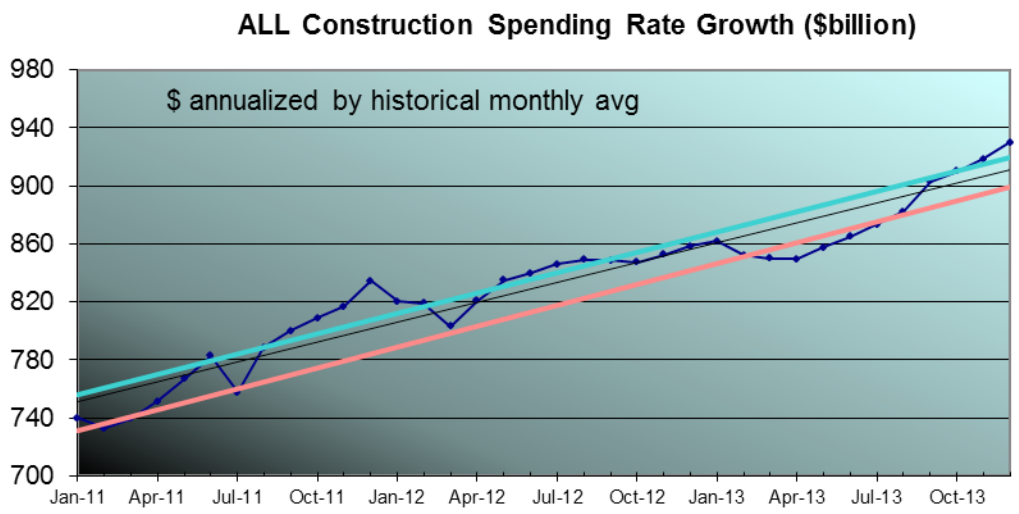
(Gilbane Building Company analysis uses in-house developed historical factors for individual monthly rates of spending. These historical rates vary from the US Census Bureau Seasonally Adjusted Annual Rate [SAAR] factors and give a somewhat different prediction of annual rates of spending than SAAR).

TOTAL SPENDING OF ALL TYPES OF CONSTRUCTION WILL GROW JUST OVER 5% YEAR OVER YEAR FROM 2012 TO 2013. WE WILL START THE YEAR WITH A RATE OF SPENDING AT $860 BILLION AND WE MAY FINISH THE YEAR AT A RATE OF SPENDING NEAR $930 BILLION.

Unfortunately that total will be driven mostly by residential construction and heavy engineering. Nonresidential buildings will contribute the least to 2013 total spending growth. That's because the architectural billings this year for commercial and institutional buildings took a big dip that spanned from Q1 2012 through Q2 2012. That will result in a commensurate drop in spending 9 to 12 months later, and both my spending rates graphics show that drop bottoming out around March-April 2013.

The good news is once we pass through that low point, spending accelerates to nearly a 10% annual rate of growth. Because of the early year 2013 dip, total spending on nonresidential buildings for 2013 will only grow 2% from 2012, but the rate of growth in the second half of 2013 will be 10% greater than the end of 2012, setting us up for very good future total growth.

Figure 3



The blue, black and red slope lines show the upper end, the data point average and the lower end statistical trend line growth rate. Even if we fall to the low end trend line in 2013, we should experience no less than a 4% growth rate.

If we experience a growth rate after April as predicted and shown by the plotted data points, it will be accompanied by growing inflation.

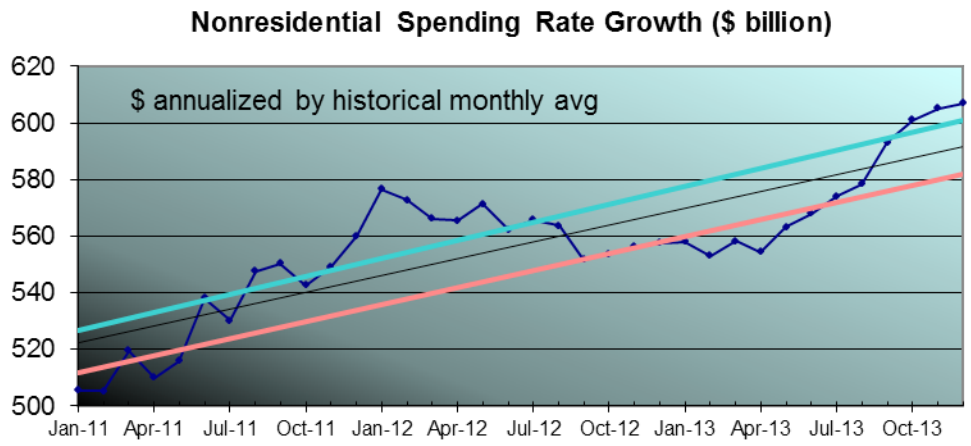
FMI predicts total all construction spending will increase 5% in 2012 and 7% in 2013.

Nonresidential Construction Spending

I PREDICT THAT 2012 SPENDING FOR ALL NONRESIDENTIAL CONSTRUCTION WILL BE $563 BILLION, A GROWTH OF 5.6%. WE STARTED THE YEAR WITH A RATE OF SPENDING NEAR $575 BILLION AND WE ARE FINISHING THE YEAR AT A SLOWER RATE BELOW $560 BILLION.

The AIA Consensus Construction Forecast August 2012 report forecasts 2012 non-residential construction spending will grow 4.4%, up from the Consensus of 2.1% reported in January. Individual predictions now range from +1.5% to +7.1%.

Figure 4

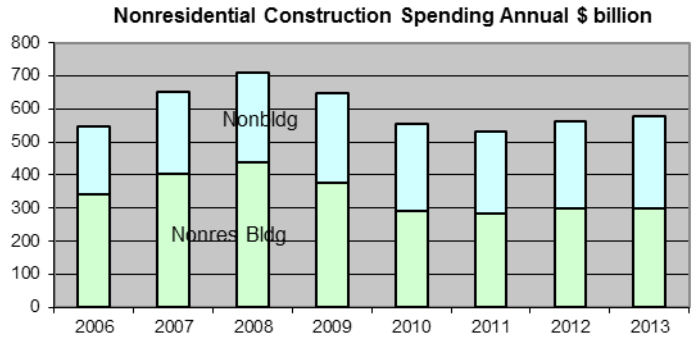


NONRESIDENTIAL CONSTRUCTION CONSISTS OF TWO MAIN CATEGORIES:

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 5



Nonresidential construction spending hit a two-year high in January 2012. Since January, non-residential spending declined slightly during the next four months, but the rate of spending remains higher than any time in 2010 through Oct. 2011. Cumulative total spending for the first six months of 2012 is 10% higher than 2011. We have growth since last year, but the rate of growth has diminished since May. The spring 2012 decline in the rate of non-residential spending can be tied back to the April-July 2011 decline in the Architectural Billings Index.

Overall nonresidential construction rate of spending is currently down entirely due to a drop in nonbuilding infrastructure work. Nonbuilding spending is down 8% since January while nonresidential "buildings" spending is up, but less than 1%. The largest components of nonbuilding infrastructure work are power and highway/street. This may soon be positively affected due to recently approved federal funding.

TOTAL SPENDING FOR NONRESIDENTIAL CONSTRUCTION WILL GROW ONLY 2.5% YEAR OVER YEAR FROM 2012 TO 2013. WE WILL START THE YEAR WITH A RATE OF SPENDING UNDER $560 BILLION BUT WE MAY FINISH THE YEAR AT A RATE OF SPENDING OVER $600 BILLION.

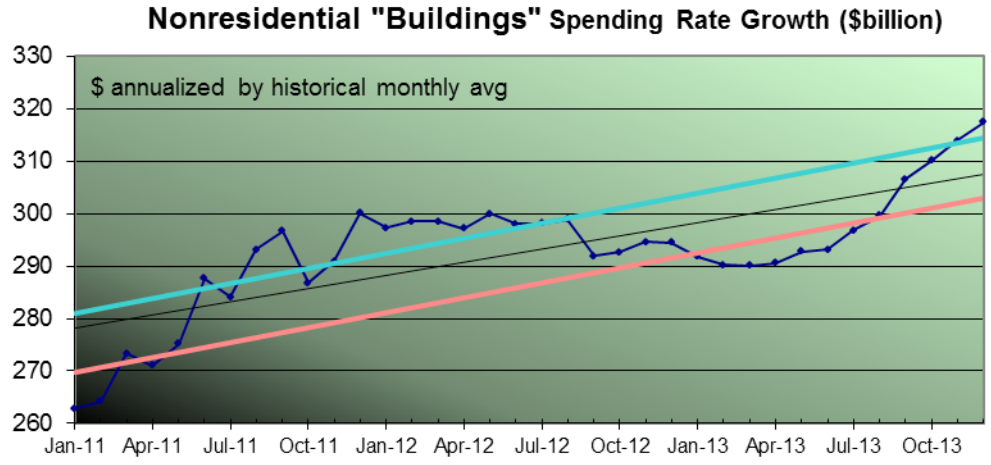
The AIA Consensus Construction Forecast August 2012 report forecasts 2013 growth of 6.2%.

Nonresidential Buildings

Nonresidential "buildings" construction spending reached a highpoint in 2008 at $438 billion, followed by $376 billion in 2009, and $283 billion for 2011.

2012 SPENDING PREDICTION FOR NONRESIDENTIAL BUILDINGS IS $297 BILLION, A GROWTH OF 4.9%. I EXPECT 2012 SPENDING ON NONRESIDENTIAL BUILDINGS TO FINISH UP 4.9, EVEN THOUGH I EXPECT A SLIGHT SLOWDOWN IN Q4 2012 CONTINUING INTO Q1 2013.

Figure 6



Until September, the nonresidential "buildings" rate of spending had increased every quarter since Q1 2011. The Architectural Billings Index, a non-residential indicator for work 9-12 months out, leads to expectations of a slowdown in Q4 2012-Q1 2013. Even with that, 2013 is predicted to go higher.

FMI predicts spending for nonresidential buildings will grow 3% in 2012 and 5% in 2013.

Healthcare and Educational, the two largest nonresidential "buildings" 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 predominantly public while healthcare is predominantly private.

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	84.3	83.7
% change year over year	6.5%	14.0%	8.4%	-1.6%	-14.1%	-4.8%	-0.1%	-0.7%
Healthcare	38.5	43.8	46.9	44.8	38.7	39.7	40.8	41.7
	12.2%	13.8%	7.1%	-4.4%	-13.6%	2.4%	2.9%	2.0%
Total	123.4	140.6	151.8	148.0	127.3	124.0	125.1	125.3
	8.2%	13.9%	8.0%	-2.5%	-14.0%	-2.6%	0.9%	0.2%

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

includes public and private

Forecast 2012 - GBCo

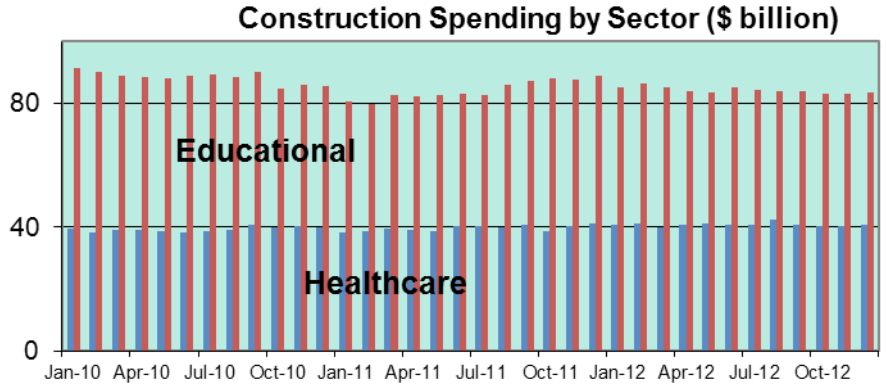
Educational spending in 2009 was $103 billion, and in 2011 was $84 billion. K-12 projects are generally municipally funded and municipalities lag states in reaction to economic movement. Therefore we should still expect further declines in K-12 due to municipal future economic reactions.

I PREDICT THAT 2012 SPENDING FOR ALL EDUCATIONAL CONSTRUCTION WILL BE $84 BILLION, ESSENTIALLY FLAT.

Healthcare spending in 2009 was $45 billion, in 2011 was $40 billion.

I PREDICT THAT 2012 SPENDING FOR ALL HEALTHCARE CONSTRUCTION WILL BE $41 BILLION, AN INCREASE OF 2.9%.

Figure 7



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.

Slight increases show up in Highway from September through January, and Waste Disposal from October through February. Transportation, after deep drops since 2010, has been flat since August.

Table 4

U.S. Total Construction Spending

totals in billions current U.S. dollars

	2006	2007	Actual 2008	2009	2010	2011	2012	Fore-cast 2013
Private	911.8	863.4	758.8	588.1	500.55	494.7	561.7	606.5
% change year over year	4.8%	-5.3%	-12.1%	-22.5%	-14.9%	-1.1%	13.5%	8.0%
Public	255.4	288.9	308.7	315.0	3037	283.4	276.0	274.3
	9.0%	13.1%	6.9%	2.0%	-3.5%	-6.7%	-2.7%	-0.6%
Total	1167.2	1152.3	1067.5	903.1	804.2	778.1	837.7	880.8
	5.7%	-1.3%	-7.4%	-15.4%	-11.0%	-3.2%	7.6%	5.1%

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

Forecast 2012 - GBCo

Public spending should end 2012 down 3%, but private spending should be up 12%. The volume of private spending is double that of public spending.

Public construction spending reached a highpoint in 2009 at $315 billion and in 2011 was $284 billion.

I predict that 2012 public construction spending will be $275 billion, a drop of 3%, 13% below the 2009 peak.

Private Construction spending reached a highpoint in 2006 at $912 billion and in 2011 was $506 billion.

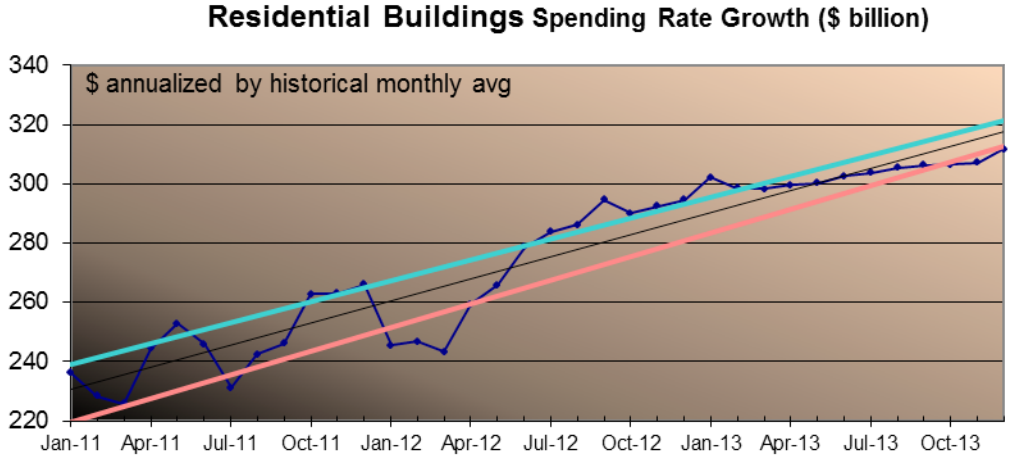
I predict that 2012 private construction spending will be $558 billion, an increase of 12.8%, but still nearly 40% below the peak achieved in 2006.

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

Residential buildings annual rate of spending in Q2 2012 is up 17% from Q1 2011, expanding 12% just since January 2012. I expect 2012 to finish at $275 billion, up 12% from 2011, but the key in this sector in 2012 was the rapid growth in the rate of spending.

Figure 8



There are a number of recent projections for future growth in residential construction activity. They range all the way from 10% annual growth up to 25% to 45% per year. Let's take a look at what is realistic and what's not and why the latest new housing growth projections may affect the entire construction industry.

National Association of Home Builders (NAHB) released their Fall Forecast and pointed out that homebuilding is growing again. That's the good news.

Housing starts have been more than 30% above the same month 2011 rate for the last four months according to data published by the U.S Department of Commerce. The October rise was widely unexpected since it follows on top of a recent surge. We are on track to start 780,000 ne 012, 170,000 more units than last year.

NAHB and numerous other organizations and economists have made projections for future growth in residential construction. It's the overly optimistic forecasts of what to expect in the next few years that raise some questions.

- NAHB expected 2012 new starts to come in at 750,000 and says new home starts will grow to 900,000 in 2013 and 1,140,000 in 2014, increases of 150,000 and 240,000 units, 20% and 27%.
- Moody's, the most optimistic forecast, has residential construction growing to 1.1 million in 2013 and 1.7 million new housing starts in 2014, volume growth of 46% and then 54%.
- Johns Manville projects 850,000 new starts in 2013 and as many as 1.6 million five years from now, volume up 13% in 2013 and growing 17% per year for the next four years.
- Bernard Markstein, Chief Economist of Reed Construction, recently projected 17% and 15% spending growth on new units for 2013 and 2014. Volume growth for new units after inflation might be in the range of 14% to 11%.
- FMI 3rd Quarter Outlook projects spending on new units to grow 24% in 2013 and 22% in 2014. After inflation that represents volume growth of approximately 20% to 18%
- In a joint AIA-AGC-Reed webcast Nov 8., Reed Construction presented data from the Joint Center for Housing Studies of Harvard University. In the JCHS data, of nine agencies predicting new housing starts, only three predict 900,000 or fewer starts for 2013. The consensus average is 962,000, volume growth of 200,000 units, 26%. For 2014, only one out of six predictions is below 1.1 million. The consensus for 2014 is 1,282,000 units or growth of 320,000 units, 33%.
- Projections range from 100,000 up to 350,000 new units in 2013, and for 2014 range from 200,000 up to 600,000 new units. To assess if predictions are realistic, I compared to history and looked at what it would require in labor to meet those projections.

First, I'll provide a little perspective.

The longest smoothest growth period for new home building was from 1991 to 2005. The new homes building rate 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 condos. The fastest rate of building growth during that period was 170,000 additional new units in a year. In the boom years from 2002 to 2005, growth only increased about 100,000 units per year.

In about half of the last 20 years, residential construction "spending" growth exceeded 10%, in some years more than 16%. To see volume growth, inflation must be factored out. In the last 20 years only three times has residential construction volume reached 10% growth; 1994-13%, 1996-10% and 2012-10%.

There were historical periods of extremely rapid housing growth prior to 1984However, the type of homes built then was much different than recent years. Today the ratio of larger homes to smaller homes is five times greater than prior to 1985. Therefore, it requires far more man hours to build the average home today than it did prior to 1985.

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 best 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.

Getting back to the consensus predictions:

We expect in 2012 to have started about 780,000 new homes, 170,000 more than last year. To add 150,000 more units in 2013 would mean the residential construction workforce would need to grow at an extremely fast clip of 20,000-25,000 jobs per month in 2013 and then, to add another 200,000 new units in 2014 would need to grow more than 35,000 jobs per month for a year. 35,000 jobs per month for a year 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 in the range of 350,000 next year and then an additional 600,000 units per year, we would need to grow the residential workforce at a rate of approximately 45,000 jobs per month in 2013 and then an astonishing 80,000 jobs per month for all of 2014, more than 2x faster than the ENTIRE construction industry workforce has ever grown during the most active periods. That's not realistic.

That growth would be so fast from current levels that by 2014, even after absorbing all practical from the currently unemployed, almost 50% of workers in residential construction would be a new hire. That's certainly possible, but not desirable. Labor demand would be so great that it would draw workers away from entering the nonresidential side of construction. The workforce would be so watered down, productivity would plummet and quality would suffer. But more important than that, analysis simply seems to indicate even in boom times the workforce doesn't expand that fast.

A more reasonable projection is that new housing starts may reach 900K to 930K in 2013 and 1.05 to 1.1 million in 2014, new home starts growth rates in the range of 15% to 19% or 120,000 to 150,000 in 2013 and 150,000 to 170,000 in 2014. That still has the workforce expanding rapidly, but at least at a not unheard of 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.

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

INFLATION ADJUSTED VOLUME

Spending is typically reported in unadjusted dollars, total revenue. 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 that clear comparison, we must look at inflation adjusted 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 at no-growth with the previous year.

The following table adjusts Total Construction Spending for construction inflation and the changes in margin costs over the last six years. All dollars are adjusted to 2012 equivalent dollars.

The most significant data we see from these inflation adjusted values is that 2009 and 2010 were NOT declines in volume of -15.4% and -11.0%, as shown in unadjusted data (Table 2). A major part of those declines was a drop in prices due to reduced margins. Total revenues decreased 15% and 11%, but workload volumes in 2008 and 2009 dropped only -9.9% and -8.6%.

Table 5

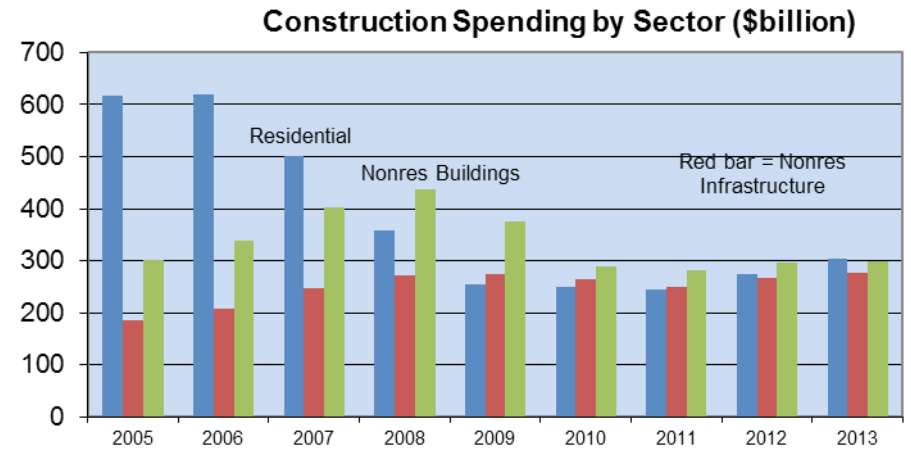
U.S. Total Construction Spending Summary
totals in billions U.S. dollars all ADJUSTED to 2012 $

			Actual					Forecast
	2006	2007	2008	2009	2010	2011	2012	2013
Nonresidential Buildings	361.1	403.7	421.2	379.3	308.8	291.5	296.7	289.5
% change year over year	5.4%	11.8%	4.3%	-9.9%	-18.6%	-5.6%	1.8%	-2.4%
Nonbuilding Heavy Engr	234.9	260.4	272.1	284.5	282.7	259.3	266.4	267.6
	11.7%	10.9%	4.5%	4.5%	-0.6%	-8.3%	2.7%	0.4%
Residential	492.3	405.1	325.8	254.8	247.8	250.7	274.7	293.0
	-6.1%	-17.7%	-19.6%	-21.8%	-2.8%	1.2%	9.6%	6.7%
Total	1088.3	1069.2	1019.0	918.6	839.3	801.5	837.7	850.0
	1.0%	-1.8%	-4.7%	-9.9%	-8.6%	-4.5%	4.5%	1.5%

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 WILL SHOW A 7.1% INCREASE IN REVENUE, BUT ONLY A 4.5% INCREASE IN VOLUME AFTER INFLATION ADJUSTED DOLLARS.
2013 REVENUE WILL INCREASE BY 5%, BUT 2013 VOLUME WILL INCREASE BY ONLY 1.5% AFTER INFLATION ADJUSTED DOLLARS.

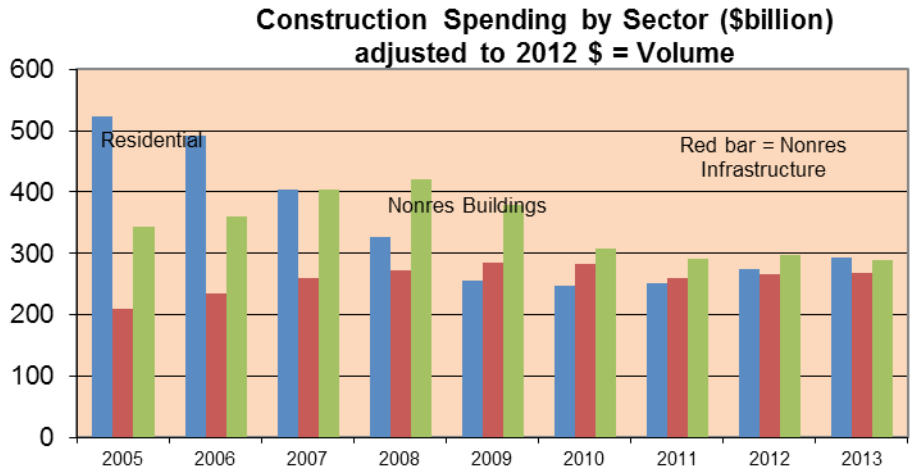
Figure 9



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.

Figure 10



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 lost employees. Real construction employment is far worse than the unemployment figures would lead you to believe.

The industry had been losing construction employees for 5 years, but we may have hit the low point in January 2011. Still, we are still not far above a 15-year low.

Table 6 - BLS 2012 October Construction Employment All Employee

Industry:	Construction												
Data Type:	ALL EMPLOYEES, THOUSANDS												
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Yr Avg**
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	7481	7435	7401	7331	7282	7216	7161	7115	7042	6965	6810	6705	7162
2009	6558	6448	6295	6151	6094	6007	5925	5846	5775	5717	5687	5654	6013
2010	5593	5529	5552	5559	5518	5507	5491	5511	5492	5499	5488	5477	5518
2011	5456	5489	5496	5495	5498	5495	5508	5498	5528	5519	5520	5546	5504
2012	5564	5563	5549	5542	5510	5514	5517	5520	5522	5539			

U.S. Bureau of labor Statistics

The table "Construction Employment - ALL EMPLOYEES" includes both residential and non-residential construction, and includes all trades and management personnel.

TOTAL OF ALL EMPLOYEES IN CONSTRUCTION

- 7,726,000 jobs = peak employment in April 2006, held fairly steady until September 2006
- 7,700,000 = average number of jobs in 2006
- 5,500,000 jobs = start of bottom hit by July 2010
- 5,456,000 jobs = 15-year low reached in January 2011
- 5,500,000 = average number of jobs in 2011
- 5.535,000 = average number of jobs year-to-date 2012

JOBS LOST AND JOBS REGAINED

- 2,270,000 jobs = 29% = jobs lost from peak in April 2006 to 15-year low in January 2011
- 83,000 = number of jobs gained back since 15-year. low in January 2011

Figure 11 (on page 17) shows employment has been essentially flat for three years.

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 is almost entirely due to workers dropping out of the construction workforce. That reduction in available workers may have a detrimental effect on cost and ability to increase potential volume in the future.

UNEMPLOYMENT RATE

- 7% unemployment rate at peak jobs in April 2006
- 27% peak unemployment rate in February 2010
- 22% unemployment rate when jobs hit 15-year low in 2011
- 13% unemployment rate July 2011
- 11% unemployment rate September 2012

The unemployment rate by itself tells us nothing about the direction jobs are moving. But the number of jobs plus the total number of unemployed is the size of the workforce. The changes in the size of the construction workforce have been dramatic.

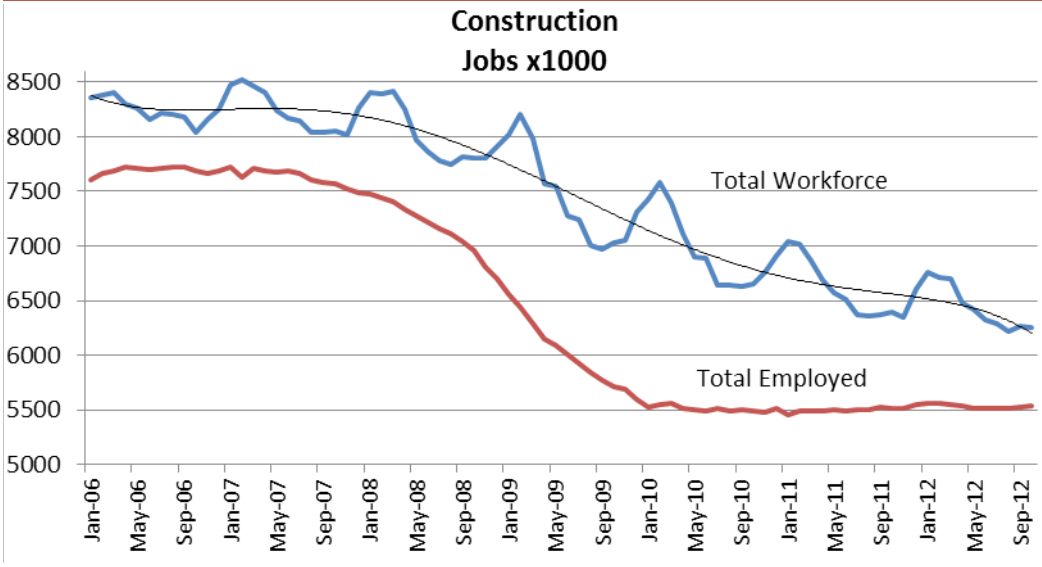
SIZE OF WORKFORCE

- 8,500,000 total workers at peak workforce April 2006 to February 2007
- 8,000,000 still in workforce through 2009
- 7,500,000 workforce at peak unemployment February 2010
- 7,000,000 workforce when jobs hit 15-year low in January 2011
- 6,500,000 workforce by July 2011
- 6,250,000 size of workforce in September 2012

As of September 2012, the workforce has dropped from 8,500,000 to 6,250,000. That means 2.25 million workers or 26% of all trained construction workers have left the workforce. The declines in the workforce have been increasing because more workers have either retired, been discourage from seeking work and no longer qualify for benefits or moved on to another profession.

The current unemployment rate of 11.3% indicates there are at least 700,000 workers waiting on the sidelines ready to jump back into a job on a moment's notice. So, in the short term we should be OK. But for the long term we've got a serious problem. If we are to see construction work volumes grow back even close to previous levels, we need the workforce to expand in tandem.

Figure 11



Expect Workforce Shortages

Some of the slack in the decreased workforce was taken up by a 9% increase in productivity since 2006. But that still leaves us short almost 1.3 million construction workers. These problems arise:

1. During the greatest construction expansion in the last 12 years the rate of jobs growth averaged 28,000 jobs/month. Once in 30 years jobs grew at a rate of 35,000/month for a year. It will take a long time to gain back the lost jobs. Workforce shortages may force extended work schedules.
2. During periods of large volume and workforce expansion, productivity declines.
3. During periods of expansion, prices escalate rapidly.

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.

The Bureau of Labor Statistics released a special report in July 2012 titled "BEYOND THE NUMBERS – Employment and Unemployment". As of May 2011, there were approximately 480,000 carpenters and 610,000 construction laborers, the two largest occupations in the industry. From May 2007 to May 2011, the number of carpenter jobs declined by 390,000 and laborers declined by 270,000 jobs. Carpenter jobs declined by 45% and laborer jobs declined by 31%.

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. 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.

Where are the jobs?

Together these top nine states make up nearly 50% of the national construction workforce. What's been difficult to overcome is this group of nine states lost 137,000 jobs in the four months from September 2011 through January 2012. The big drop most probably reflects the expected downturn that was previously signaled by the falling ABI "work on the boards" and construction Starts, among other indicators in the middle of last year. Now in the 12 months since September 2011 this same group shows a gain of 32,000 jobs, a turnaround of 169,000 jobs since January.

Table 7

State Construction Employment # of Jobs

Four states account for 32% of ALL construction jobs.

	current	12 mo	last 3 mo
Texas	603,400	47,000	7,000
California	579,200	28,000	1,500
Florida	317,700	(5,000)	4,500
New York	295,800	(13,000)	(2,700)
	1,796,100	57,000	10,300

current through September 2012

Only five other states have more than 150,000 construction jobs:

	current	12 mo	last 3 mo
Pennsylvania	214,300	(10,400)	(700)
Illinois	185,100	(6,900)	1,200
Ohio	178,000	1,100	(1,600)
Virginia	175,100	(3,400)	-
North Carolina	171,000	(5,900)	2,800
	923,500	(25,500)	1,700

current through September 2012

Construction Jobs Loss Imbalance

Nationally construction jobs hit a peak in April 2006 and hit bottom in January 2011.

We lost 29% of peak jobs. We've gained back only 3% of the 2.2 million jobs lost.

- Three out of six New England states, (CT, MA, ME) hit the post recession bottom for construction jobs only within the last three months. Collectively, New England has lost 30% of construction jobs. To date only 1% of those lost have come back.
- Boston, MA, jobs hit bottom in February 2010: 21,000 jobs and only 22% lower than the peak. Already 60% of those lost from the 2007 peak have been gained back.
- Springfield-Worcester, MA, jobs hit bottom in February 2012: 12,000 jobs (47%) below the peak. Only 30% of those lost from the peak have been gained back.
- New York City is expected to reach record spending on nonresidential building in 2012 and keep nearly the same level of activity in 2013.
- Texas, the state with the most construction jobs, reached peak jobs in April 2008, two years after the national average was already on the way down. Since the bottom they've gained back 35% of lost jobs.
- Houston/Sugar Land/Baytown, home to nearly 1/3 of all Texas construction jobs, peaked in November 2007 and bottomed in January 2011. They lost only 22% of construction jobs and have since gained back 40% of lost jobs. The Houston/Sugar Land/Baytown metro area leads the nation in residential building construction.
- Phoenix-Glendale-Mesa comprise 75% of all construction jobs in Arizona. Peak was reached in June 2006 and bottom in February 2011. They lost 107,000 jobs or 58% of all construction jobs. Since then they've gained back only 11% of the jobs lost.

Nobody said the recovery would be even.

Manpower Employment Outlook Q3 2012

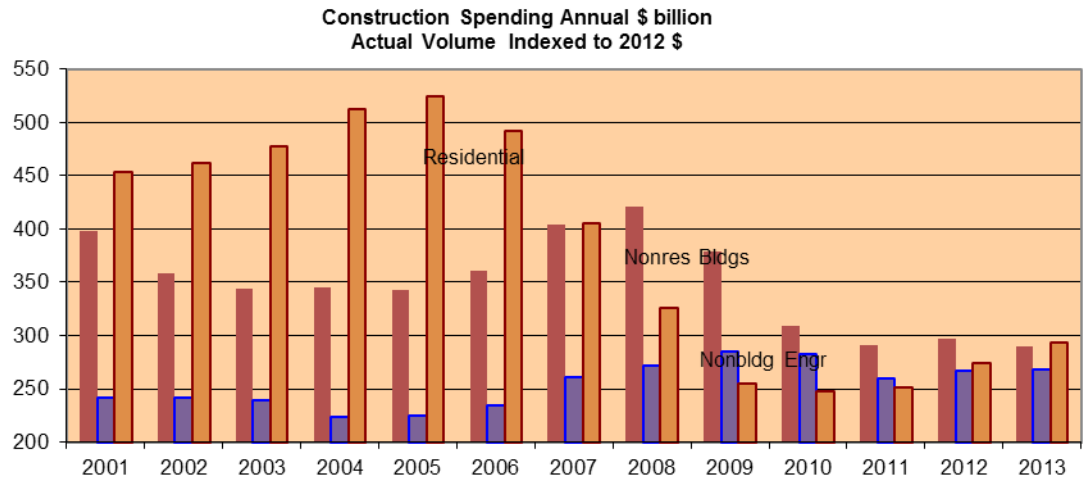
Manpower figures measure the percentage of firms planning to hire minus the percentage of firms planning to lay off and report the "net" percentage hiring outlook. The overall national employment (all jobs) picture is positive again for the Q4 2012 with a projected net +8% of firms planning to hire. Employers have had a positive outlook for 12 consecutive quarters.

Manpower reports hiring in the construction industry for Q4 2012 anticipated at a net +1%, still up but lower than the +12% in Q3 and +9% in Q2 2012.

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 $ put in place per worker. The inflation adjustment gives total spending in constant dollars rather than current dollars and allows a comparison to equal units volume. Therefore the following productivity analysis is based on put-in-place revenues, inflation adjusted to constant 2012 dollars, compared to actual manpower.

Figure 12



Of equal importance is the use of proper indices. Spending must be adjusted to eliminate changes due to material costs, wages and margin fluctuation from the equation. For example the ENR Index does not include selling price (does not account for fluctuating margins) and therefore cannot be used. An index adjusting for both inflation and margins must be used. Also, since the building type makeup and worker wages are so different, indexes must be developed separately for residential and non-residential construction. Numerous industry indices were referenced for input, then the indices used in this analysis were developed independently.

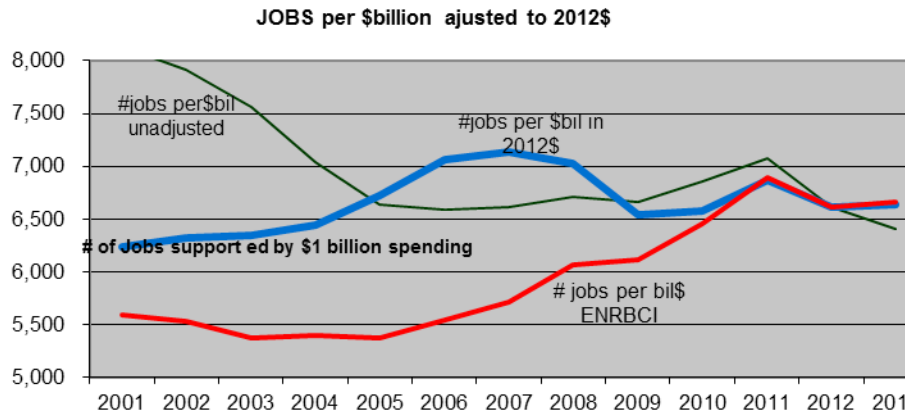
Table 8 (below) shows inflation adjusted spending indexed for labor, materials, margins and sector.

Table 8

Productivity Inflation Adjusted	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Unadjusted $ Spending	840	848	891	991	1,104	1,167	1,152	1,068	903	804	778	838	881
			5.1%	2%	4%	5.7%	-1.3%	-7.4%	-15%	-11%	-3.2%	7.7%	5.1%
Total Spending in 2012 $	1,094	1,061	1,062	1,082	1,091	1,088	1,069	1,019	919	839	802	838	850
		3.0%	0.1%	1.9%	0.9%	-0.3%	-1.8%	-4.7%	-10%	-9%	-4.5%	4.5%	1.5%
# jobs avg / yr (millions of jobs)	6,827	6,715	6,736	6,973	7,333	7,690	7,627	7,162	6,013	5,518	5,504	5,536	5,647
# jobs per billion 2012 $	6,241	6,328	6,342	6,445	6,720	7,066	7,133	7,028	6,546	6,575	6,867	6,609	6,643
productivity change		**0.3%**	**1.6%**	**-0.6%**	**-3.0%**	**-3.3%**	**-0.5%**	**1.5%**	**9.1%**	**0.6%**	**-4.3%**	**3.7%**	**-0.5%**

For sake of clarity in the above table, # of jobs per $1 billion "unadjusted" is not included, but in Figure 13 a line is plotted for that unadjusted value. At first glance, Figure 13 (the thin green line) seems to indicate the number of jobs supported by $1 billion dollars of spending declined from 2002 to 2006. That result is what we would get if using unadjusted dollars without considering inflation. It is incorrect. What's missing in the unadjusted analysis is that dollar volume of work put in place represent work $ value, not work unit volume. Also shown in Figure 13 is a line plotting # of jobs if spending were indexed solely using the ENRBCI. Since that index does not account for fluctuating margins it also produces an incorrect result.

Figure 13

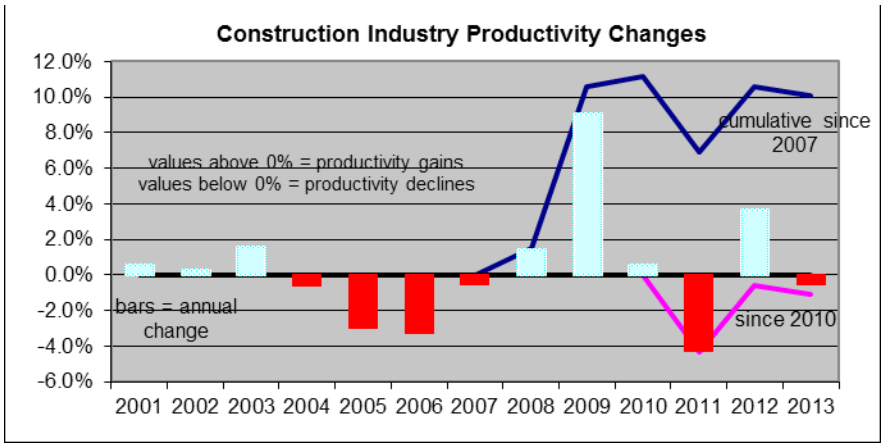


From 2002 to 2007 there was huge growth in the dollar value of work put in place, but the after-inflation change in volume put in place was less. The workers needed to perform the same unit volume of work climbed, as shown by the thick blue line, indicating a decrease in productivity

From 2003 through 2007, the number of workers needed to put in place $1 billion (adjusted) of 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 2004, $1 billion of spending supported just under 6,500 jobs. By the peak activity in 2006-2007, it required 7,300 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 6,600 jobs. Today $1 billion in spending supports about 6,700 jobs.

Figure 14



Productivity generally decreases in times of increasing activity. Productivity generally increases as available work declines. (Applied Cost Engineering, Chapter 5, Clark and Lorenzoni, Marcel Dekker, Inc., 1985). This graphic, Productivity Changes, portrays this concept almost perfectly.

As it did in 2008 through 2010, when spending and jobs are on the decline, productivity will be increasing. Out of necessity, and with diminished workload providing no other options, 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 reversed in 2011. After four years of mostly work output increases, the work output declined in 2011.

Since 2007 the cumulative net gain in productivity is 11%. Today it would take 11% less workforce to put in place the equivalent volume of work as it did in 2007. If we were to maintain that 11% productivity advantage, then at some point in the future, when work volume does return to previous peak levels, it would require 11% less total workforce to accomplish that workload.

However, 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). Even with the drop in 2011, fewer workers are needed currently to accomplish the same work volume as compared to any time since 2004, but that is already changing. 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.

As an example:

At the peak of construction cost, a building cost $12 million and took 100 men/yr to build. Today that same building could potentially cost as little as $10 million to build. Does it take 20% fewer men/yr 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. We do know we've had an improvement of 11% in productivity. Therefore the workforce today will be 11% lower to build the same building. Using revenue as a basis we might be led to think we need 20% fewer workers. This points to the 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 afterwards the average growth dropped considerably. 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 such high volume of activity 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 THE QUESTION OF HOW MANY JOBS GET CREATED FOR EVERY DOLLAR SPENT ON CONSTRUCTION. FOR FURTHER REFERENCE SEE THE SECTIONS ON JOBS/UNEMPLOYMENT/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 6,400 to 7,200 jobs. That calculates to one job for every $140,000 to $155,000 (in 2012 $) spent on construction, or if you prefer, 6.5 to 7.0 jobs per $1,000,000 spent. Direct construction jobs includes all AEC, but not for instance lumber or steel mill product manufacturing.
- The importance of correcting for inflation cannot be understated. That same rate of $140,000 to $155,000 (in 2012$) per job, at 3.5% inflation, 5 years ago was $18,000 to $130,000 and 5 years from now will require $166,000 to $184,000 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. The fact is productivity and work volume are inextricably tied and are cyclical. If work volume continues to grow for the next 5 years, I'd expect in that time we would lose our current 10% productivity advantage.
- The type of work also affects the # of jobs supported, with higher cost buildings supporting less 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 office 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 Dodge Momentum Index measures only non-residential projects in planning, excluding manufacturing and infrastructure. It is a leading indicator of specific non-residential construction spending by approximately 12 months. The Momentum Index 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.

There are numerous articles currently predicting the next housing boom on the horizon. Roger Altman, former U.S. Deputy Treasurer Secretary, writing for the *Financial Times* says, a surge in home building will be driven by improving housing prices, lower inventory and improving access to credit. The S&P/Case-Shiller composite home price index has increased 8 percent since March. A turn in the market is now occurring and it should become a boom by 2015. Expect annual growth of 15%-20% for the next five years.

The AIA Consensus Construction Forecast August 2012 report points to a 12% spike in demand for industrial facilities and predicts a 10% growth in 2013 for all commercial building.

The Institute for Supply Management (ISM) manufacturing report released November 1, 2012, shows the national Purchasing Manager's Index (PMI) at 51.7%. PMI values above 42.5 indicate overall GDP economic expansion. PMI values above 50 indicate expansion in the manufacturing sector. The PMI indicated three months of manufacturing contraction but has now shown two months of manufacturing growth. The PMI indicates overall economic growth for 41 consecutive months.

The ISM Non-Manufacturing Index (NMI) 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 November 5, 2012, the NMI for October is 54.2%, down slightly from September, but still above 50, indicating continued economic growth for 34 consecutive months. Of the 13 industries that make up this index, construction was near the lead in New Business activity and lead all others in New Orders and Backlog.

The Associated Builders and Contractors Construction Backlog Indicator (CBI) released November 13, 2012, is a quarterly forward-looking economic indicator that reflects 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, now near the highest level of backlog in the past four years and projecting non-residential construction spending will accelerate by mid-2013.

The Associated Builders and Contractors says pent-up demand continues to build in the educational market. Between 2012 and 2020, elementary and secondary school enrollment will increase over 6% according to the National Center for Educational Statistics. From 1995 to 2008 enrollment increased 8% and from 2000 to 2008 school construction averaged $20 billion annually. This year spending is expected to be $10 billion.

The AGC reports there were more than 500 bonding measures on the November ballot for public K through 12 education, higher education, infrastructure and environmental projects totaling approximately $35 billion. With most of the results in, about $30 billion was approved. That was down from 2008 when there were $67 billion in issues on the ballot.

The Conference Board Leading Economic Index (LEI) currently at 65.9, is up in July 2012 after four months of declines. Prior to that, it had been up 5 months in a row through February.

The Economic Cycle Research Institute (ECRI) U.S. Weekly Leading Index (WLI) of economic growth predicts economic activity two to three quarters out. The index retreated for several months in 2012 but has since resumed upward movement through October and is now at a level equal to early 2011.

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.

Manpower Q4 2012 report states 72% of employers anticipate no change in hiring and 17% expect to add workforce during Q4 2012. All 13 sectors expect hiring intentions to remain stable during Q4 2012. U. S. employers have now conveyed a positive outlook for 12 consecutive quarters. Hiring outlook in construction improved in the Northeast and South and outlook declined slightly, although is still positive, in the west and Midwest.

In its Executive Summary, FMI's 3rd Quarter Construction Industry Roundtable (CIRT) Sentiment Index says, "it appears we are in a period where owners will continue to expect lower prices and more bidders, but they might find fewer contractors willing to do the work for low prices or just fewer contractors – especially trade contractors – in the market and higher prices than expected."

FMI's Construction Outlook predicts healthcare construction, after slowing to near zero in 2011, will have growth of 3% in 2012, 7% in 2013 and will reach record highs by 2015, 25% above current levels.

The FMI second quarter Non-residential Construction Index (NRCI) is now 59.8, up almost 2 points from the previous quarter and the highest it's been since its inception in 2007.

In the News:

Hurricane Sandy caused approximately $50 billion in damage. By some recent accounts, it may provide $250 billion in stimulus from rebuilding, repairing homes and structures and refurnishing lost property. By other accounts there may be no more than $15 to $25 billion in rebuilding and there will be no stimulus effect since most all reconstruction will be diverted from some construction that would have taken place had the hurricane not caused any damage.

The National Association for Business Economics (NABE) held a teleconference on Nov. 6, 2012 to discuss the impact of hurricane Sandy. Ken Simonson, Chief Economist of the AGC, says there will be little to no affect felt from Sandy rebuilding. Rebuilding will be offset by construction that got halted or plans for future work that got canceled. In addition, it will take a long time to assess damages and release funds for rebuilding. Reconstruction work will be spread over a long time and there will be no impact felt on national construction labor and materials. The immediate impact on labor will absorb some of the excess capacity in NY and NJ. Rebuilding may spread as much as $20 billion of reconstruction over three years. That's less than 0.7% of annual construction spending, partially offset by canceled jobs.

In other news, the fiscal cliff has been in the forefront. At the recent Outlook 2013 Construction Economics Conference sponsored by McGraw Hill Construction, several noted construction experts offered opinions. None of those experts believed the government would allow lack of action to push us over the fiscal cliff. However, all agreed we can expect there will be a reduction in funds for future federal construction and infrastructure investment. Also in question are tax policy and tax credits for energy efficient buildings, both which could have some effect on plans for new building. Nevertheless, the outlook for future construction activity remains quite optimistic.

MATERIAL PRICE MOVEMENT

The overall Producer Price Index (PPI) for June 2012 shows cost for construction materials are up 2.0% in the last 12 months. Costs for material inputs to non-residential construction are up 1.8% in the last 12 months. Both of these have increased since the last report.

Table 9

US Construction Producer Price Indexes - October 2012

Markets Inputs PPI	Percent Change Versus to Oct 2012 from			annual for	
	Sep-12 1 month	Jul-12 3 months	Oct-11 12 month	12 months 2011 last yr	12 months 2010 prev yr
Inputs to ALL Construction	-0.4	1.5	2.0	5.2	5.3
Inputs to Nonresidential	-0.5	1.7	1.8	5.7	NA
Inputs to Commercial	-0.3	1.2	1.6	4.9	NA
Inputs to Industrial	-0.3	1.4	2.0	5.2	NA
Inputs to Hghwy/Hvy Engr	-0.5	2.0	2.0	6.1	NA
Inputs to Residential	-0.4	1.1	2.5	4.8	4.3

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

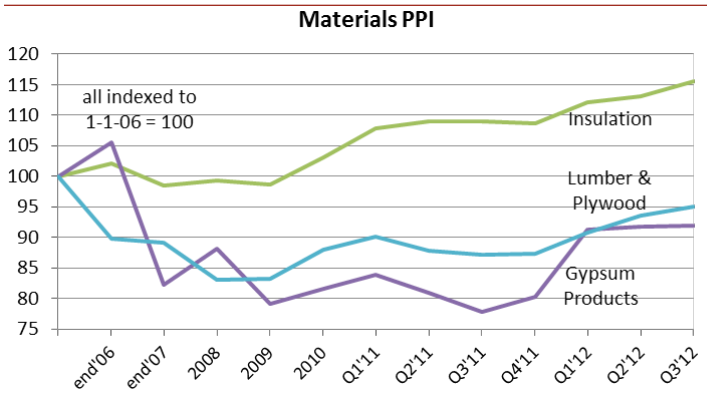
Cost of materials is highly variable. For 12 months fabricated structural steel is up 1.3% but steel pipe and tube is down 5%; diesel fuel is up 12.6%; asphalt paving is up 4.5%; gypsum products are up 14%. In the last three years, ready-mix concrete cost has moved up less than 1% but asphalt paving is up 17%. Steel pipe and tube is up 30% in 3 years, yet fabricated structural steel is up only 6%. Individual trades assessment requires individual material index data.

Pricing Letters

In October 2011, we received an announcement of a mandatory 35% price increase on gypsum products effective January 1, 2012, dictated by the gypsum board manufacturers. The price increase was to remain in effect for all pricing throughout 2012. Since then we have seen the PPI for gypsum products increase by less than 15%, far short of the advertised 35% increase. Gypsum product prices have increased less than 1% since March and are up only 13% year over year, possibly supported by the large increase in residential construction volume. We will not see the full 35% increase dictated for 2012.

In September 2012 we againreceived another pricing increase letter from the gypsum industry. In a recent construction economics conference sponsored by McGraw Hill Construction, this letter was a topic of discussion and the opinion is, it is very likely, if the price increase does even show up, that it will fall back to normal soon afterwards.

Figure 15

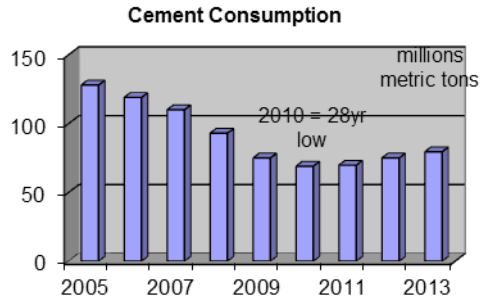


Cement / Concrete / Asphalt

Portland Cement Association (PCA) reports the volume of cement demand as an indicator of economic activity. It is a reliable coincident indicator.

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.

Figure 16

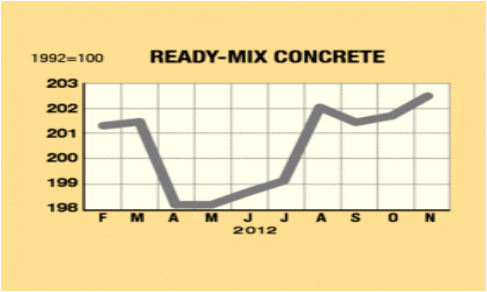


For 2010 and 2011, consumption was down 46% from peak 2008. PCA predicted consumption for 2012 at year start was expected to grow only 0.5% in 2012. PCA just released new 2012 projection of 7.5% growth. For 2013 growth is 6%.

Cement prices increased only 1% in 2011 after dropping 3 years in a row. Cement prices are 10% below 2007. Ready Mix Concrete prices are currently only 2% higher than 2007.

Cement prices increased 0.5% in June, their seventh increase over the past eight months. Prices were up 2.1% in the last 12 months. Cement prices may begin to advance more rapidly as residential construction and other commercial construction improve over coming months.

Figure 17



Asphalt, Concrete Prices Post Modest Gains

Ready-mix concrete prices increased an average of 0.2% this month and are 0.9% to 1.3% above a year ago. 3000psi ready-mix increased the most. ENR reports asphalt paving prices increased 0.4% for the month and 10.8% from a year ago.
Graphic by ENR used by permission

Click for full report [November 05, 2012]

Figure 18

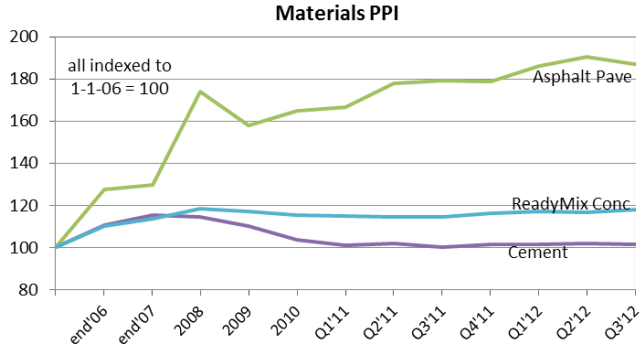
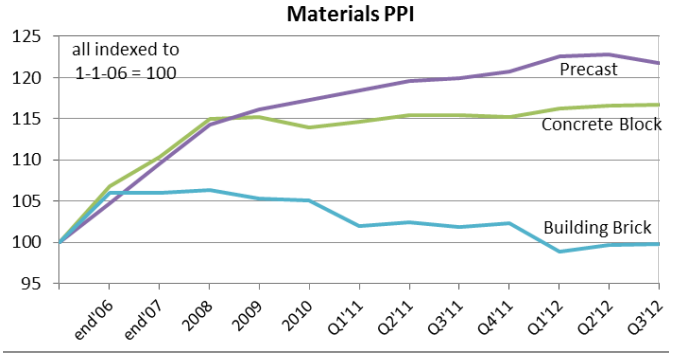


Figure 19



Structural Steel

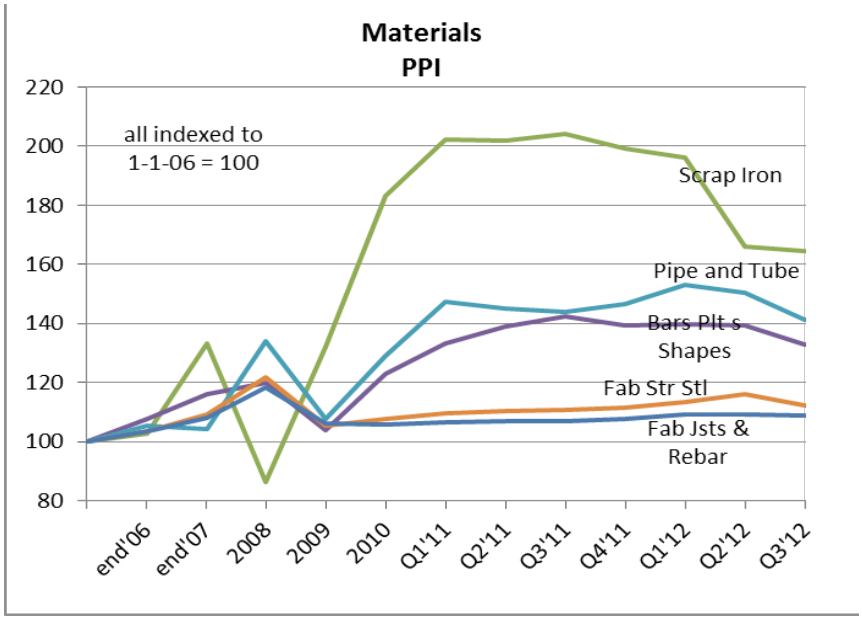
The construction industry represents the largest consumer of steel products worldwide. Approximately 100 million tons of steel is produced annually in the United States. More than 40 million tons of that is delivered to the construction industry. The next largest industries, automotive, equipment and 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 non-residential and multistory residential buildings, based on square footage built. The next closest framing material, concrete holds only 21% market share.

The American Iron and Steel Institute reports steel production capacity utilization in November 2012 at 71%% a decline from the post-recession high of 79% in March 2012. Year over year capacity utilization has increased but there is still excess production capacity available for steel.

Late last year we had steel production tonnage up, excess production capacity available and construction spending (demand) down. That combination kept steel prices in check. Now we see increased production, slightly less available additional capacity and demand volume on the increase. Although current prices are down, these conditions may soon lead to increasing prices.

Figure 20

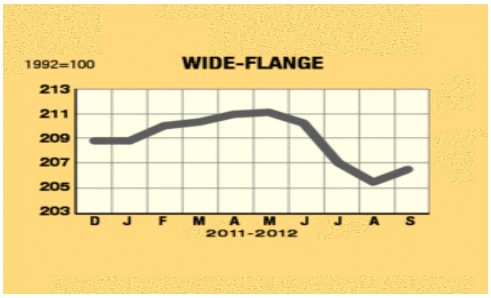


The graphic chart of steel mill products Producer Price Index (PPI) Starts at January 2006. The rapid rise in 2008 mirrors the rapid acceleration in bid pricing to the peak in Q3-Q4 2008, and the precipitous fall from that peak. By mid-2009 the mill price had experienced a 40% decline, retreating to 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.

In Q1 2011, the FOB mill price for wide flange products reached $925/ton, a 30-month high. It has since dropped back to a fairly constant price of $865/ton, and in July 2012 hit a 15-month low. Structural steel is very much dependent on recycled steel. Structural steel is 90% from scrap steel.

After surpluses in early 2012 caused an oversupply of scrap and price declines, prices were expected to rise, yet price was through October. A recent increase not shown in these graphics pushed scrap up $50 to $60/ton in early November. Expect steel product prices to soon follow suit.

Figure 21



Structural Steel Prices Start to Cool

Structural-steel prices slipped 0.1% in October, including a 0.8% decline for channel beams and a 0.1% dip for I-beams. Wide-flange prices increased by 0.6% this month. WF prices have rebounded after steep declines during the summer. Overall, ENR's average prices for all three structural-steel products are now just 0.2% above a year ago.

Graphic by ENR used by permission

Click for full report [October 29, 2012]

Nucor in July raised beam prices $40/ton. Recent bids increased much higher than producer pricing data would indicate. That could mean demand is strong and that structural steel contractors have accelerated the rate of increasing margin cost.

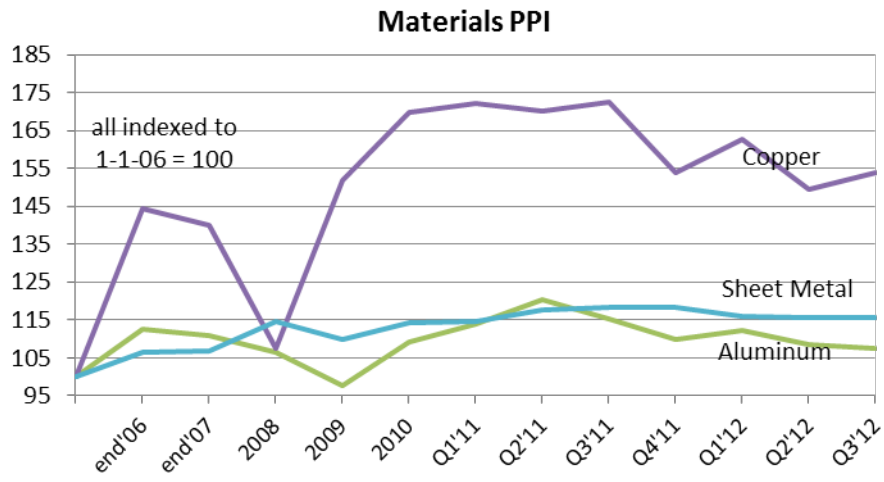
Rebar prices increased 5% from January through June, but have dropped 3% since June. The price is still up 2% above a year ago. Since the recent rise in scrap prices, Nucor has announced a $35/ton increase in rebar price.

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

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 as of November 2012 hovers near $3.50/lb., about equal with where it was a year ago. The price is expected to average just over $3.80/lb. in 2013.

Figure 22



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 prices 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. Analysts predicted copper would average $4.00/lb. in 2012, but so far it has average about $3.50/lb.

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 25% increase in the cost of copper will increase the cost of a project by 0.5%.

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 25% increase in the cost of copper increases the total cost of a data center by 1% to 1.5%. For a copper roof, material is 65% of total cost and can represent ~1% of typical project cost.

PRODUCER PRICE INDEX

THE OCTOBER 2012 PRODUCER PRICE INDEX (PPI) FOR MATERIAL INPUTS TO CONSTRUCTION:

- increased +1.5% over the last 3 months
- is up 2.0% over the past 12 months

THE OCTOBER 2012 PPI FOR MATERIAL INPUTS TO NONRESIDENTIAL CONSTRUCTION:

- increased 1.7% over the last 3 months
- is up 1.8% over the past 12 months

THE PPI FOR ITEMS THAT CONTRIBUTED THE MOST TO THE 3-MONTH AND YEARLY CHANGE INCLUDED:

- Diesel fuel prices increased -18% in 3 months and 13% over the last year
- Copper and Brass Mill Shapes increased 5.6% in 3 months and 4.7% over the year
- Gypsum products are down -1.7% in 3 months but increased 14% over the year

Table 10

US Construction Producer Price Indexes - October 2012					
Materials PPI	**Percent Change Versus to Oct 2012 from**			**annual for**	
	Sep-12 1 month	**Jul-12 3 months**	**Oct-11 12 month**	**12 months 2011 last yr**	**12 months 2010 prev yr**
Summary					
Inputs to ALL Construction	-0.4	1.5	2.0	5.2	5.3
Inputs to Nonresidential	-0.5	1.7	1.8	5.7	NA
Commodities					
Cement	0.4	-0.2	3.9	-1.8	-6.0
Iron & Steel Scrap	-11.4	-3.7	-27.3	8.7	38.9
Manufactured Materials					
Diesel Fuel	2.3	17.6	12.6	20.0	26.4
Asphalt Paving	0.0	-1.2	4.5	8.4	4.4
Asphalt Roofing/Coatings	0.7	-0.7	-1.7	4.2	1.9
Ready Mix Concrete	0.0	0.7	2.7	0.5	-1.2
Concrete Block & Brick	0.0	0.0	0.8	1.1	-1.1
Precast Conc Products	0.5	-0.5	1.9	2.9	1.0
Building Brick	-0.1	-0.1	-2.3	-2.6	-0.3
Copper & Brass Mill Shapes	2.8	5.6	4.7	-9.3	11.8
Aluminum Mill Shapes	1.4	1.8	-4.6	0.6	11.6
HR Bars Plt & Strct Shapes	-1.7	-4.3	-10.2	13.2	18.4
Steel Pipe and Tube	-0.9	-5.2	-5.0	13.7	19.6
Fab. Structural Steel	0.4	1.3	1.3	3.8	1.9
Fab. Bar Joists and Rebar	-0.3	1.1	1.2	1.6	-0.3
Gypsum Products	-0.7	-1.7	14.1	-1.6	3.2
Insulation Materials	-0.7	-2.0	5.5	5.4	4.6
Lumber and Plywood	-1.8	1.5	6.2	-0.7	5.7
Sheet Metal Products	-0.1	0.0	-0.8	3.7	4.0

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

The Producer Price Index (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 PREVENT MISINTERPRETING 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 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 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, it may be the normal trend. It certainly has been the trend since 1990.

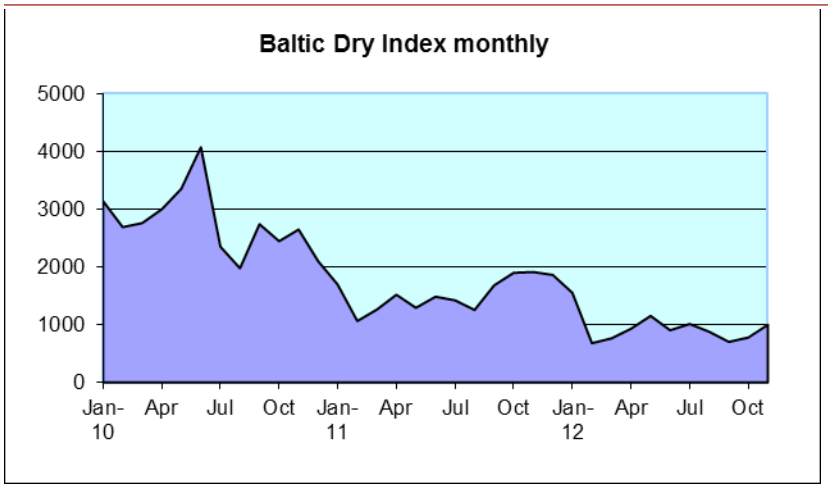
THE BALTIC DRY INDEX

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 23



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 all the worldwide dry product shipped in large cargo ships. The construction industry is the largest user of steel worldwide.

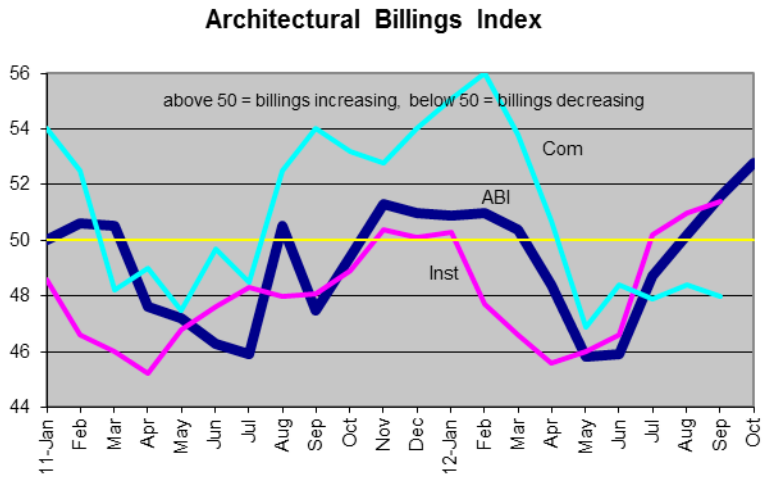
The BDI does not yet provide support for a pickup in future economic activity. Twice in 2012 the index dropped to the lowest post-recession values, indicating low demand for product and therefore leading to expectation of low growth or even potentially further recessionary conditions.

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 non-residential 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 non-residential building sector to recover from a downturn.

Figure 24



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 and recovery starting in Q2 2013. Index below 50 indicates declining workload. Institutional billings were declining from February to June, Commercial work from May to the present. So we should not expect non-residential spending to finish the year strong and we should expect Q1 2013 to be down.

From July 2011 to February 2012, all the indices were climbing. From this we expect growth in spending starting in the May-June period and continuing into Q4 2012. However, in February 2012 the institutional index turned down and in March both the commercial and the overall index turned down. This downward movement will lead to decreasing construction spending at year-end 2012 and into Q1 2013.

CONSUMER INFLATION / DEFLATION

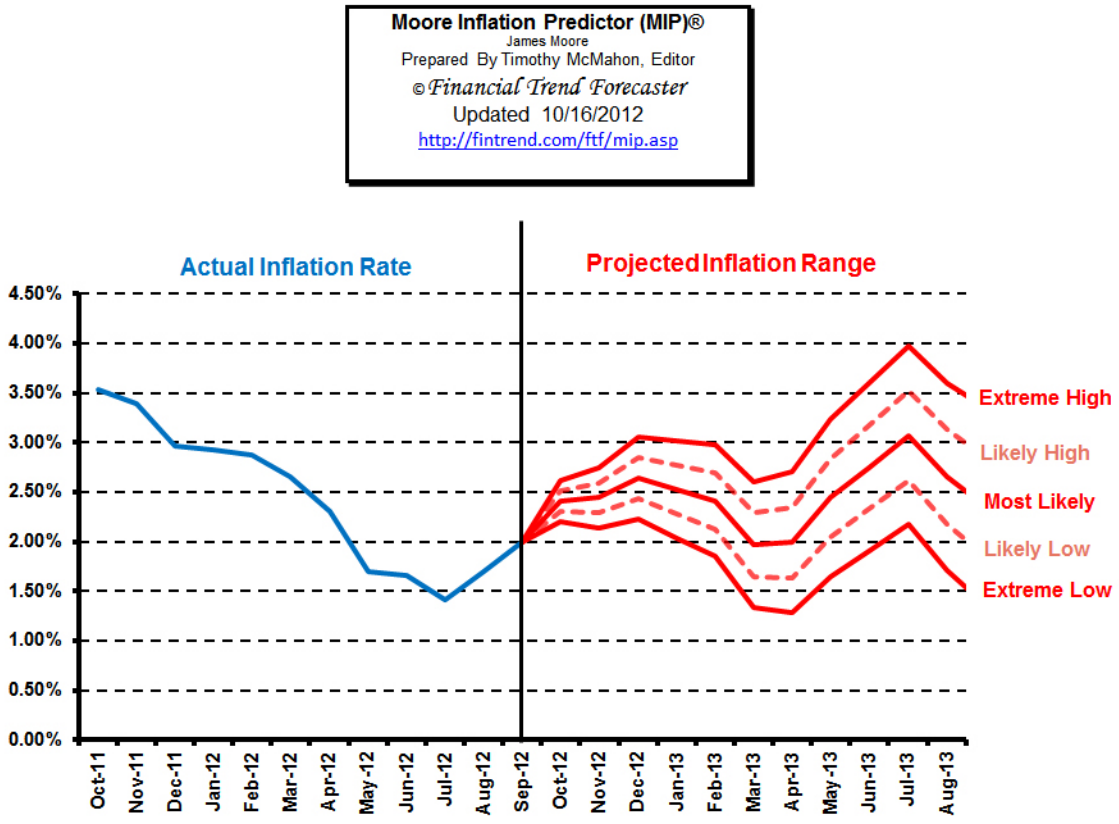
The Moore Inflation Predictor© (MIP) is a highly accurate graphical representation of the future direction of the inflation rate. It has a 97%+ accuracy rate forecasting inflation rate direction & turning points. And over 90% of the time the inflation rate falls within the projected "likely" range.

In March 2012, the MIP was projecting decreasing inflation through May 2012, but then increasing for the remainder of the year. What actually happened was an even larger decrease and it extended through June 2012. This could indicate increasing deflationary pressures or simply be the result of a drop in the price of oil. Typically oil prices fall due to a contracting worldwide economy.

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. Up until now the MIP has used annual metrics to create its projections but this left it susceptible to seasonal changes. The MIP data now incorporates a seasonal factor to increase its accuracy a bit.

Based on the current forecast, by November 2012 (election time), the extreme high takes the inflation rate to only 2.0% although by next June it may reach 2.8%.

Figure 25 - Current Consumer Inflation Rate Forecast for the next 12 months



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

The monthly rates of inflation for January and February were both over 0.4% which would be over 5% if annualized. Originally, QE2 results were expected to show up around May 2012. That may be showing up a bit earlier than predicted. However, it is possible that the full effects of QE2 have still not shown up and so if those effects begin to strengthen in it could add another 1% to 2% to the inflation rate by year-end.

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 expected 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%.

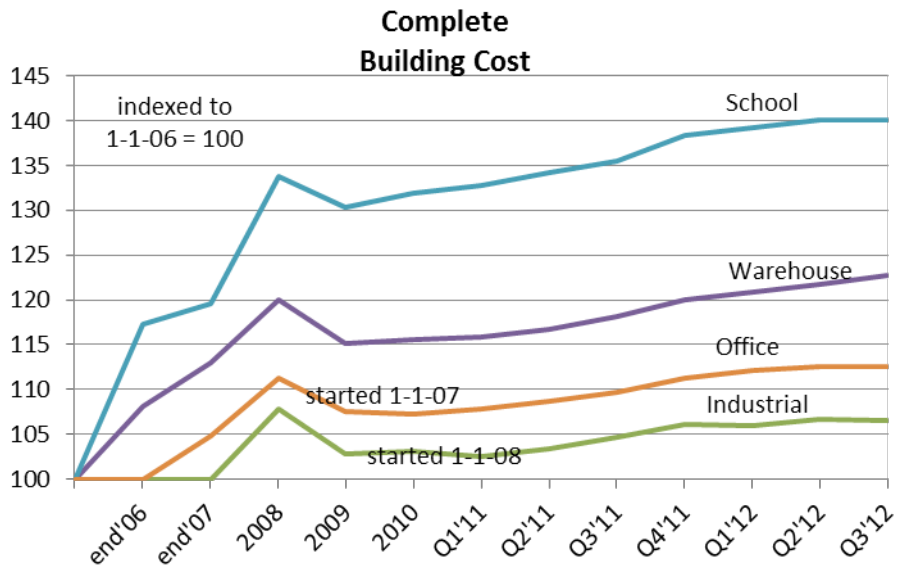
Keep in mind, construction inflation is historically much higher than consumer inflation.

CONSTRUCTION INFLATION

The US 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.

BUILDINGS TOTAL CONSTRUCTION COST INFLATION IS CURRENTLY AVERAGING ABOUT 4%.

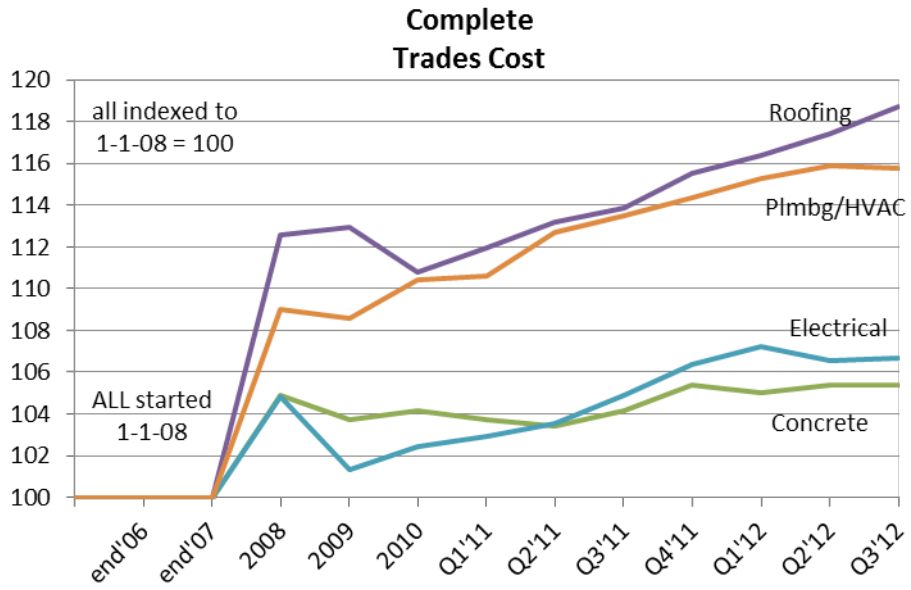
Figure 26



From January through to May 2011 consumer inflation shot up from 2% to 3.5%. At that time expectations were that consumer inflation would continue to climb through the year, potentially to just above 5% with a drop back to 3% expected by May 2012. We see now that it reached near 4% by September 2011 and returned to 3% by year end and went much lower by May 2012. But that downward trend in consumer inflation should turn upwards into year-end 2012 and could potentially hover near 3% a year from now.

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 low due to diminished work volume. Over the last 12 months that has changed. Work volume has increased and construction inflation increased now to more than double consumer inflation. If consumer inflation reacts to easy 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.

Figure 27



Increased construction volume caused both construction material prices and margins to move up.

Buildings total prices with margins increased significantly 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 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%/yr in 2005 and 2006 and 20%/yr in 2008 and 2009.

ENR BUILDING COST INDEX

The August 2012 Engineering News Record Building Cost Index (ENR-BCI) is 5184, up 1.3% year to date and up 2.2% year over year. Keep in mind summer months often show rapid growth. Since March 2012, the annual rate of growth in the index has been near 3%. The ENR-BCI index increased 3.7% in 2010 and 2.8% in 2011.

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 11

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		

Data reprinted by permission Engineering News-Record - ENR.com

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 CostAdvisor.

INDEXING BY LOCATION – CITY INDICES

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

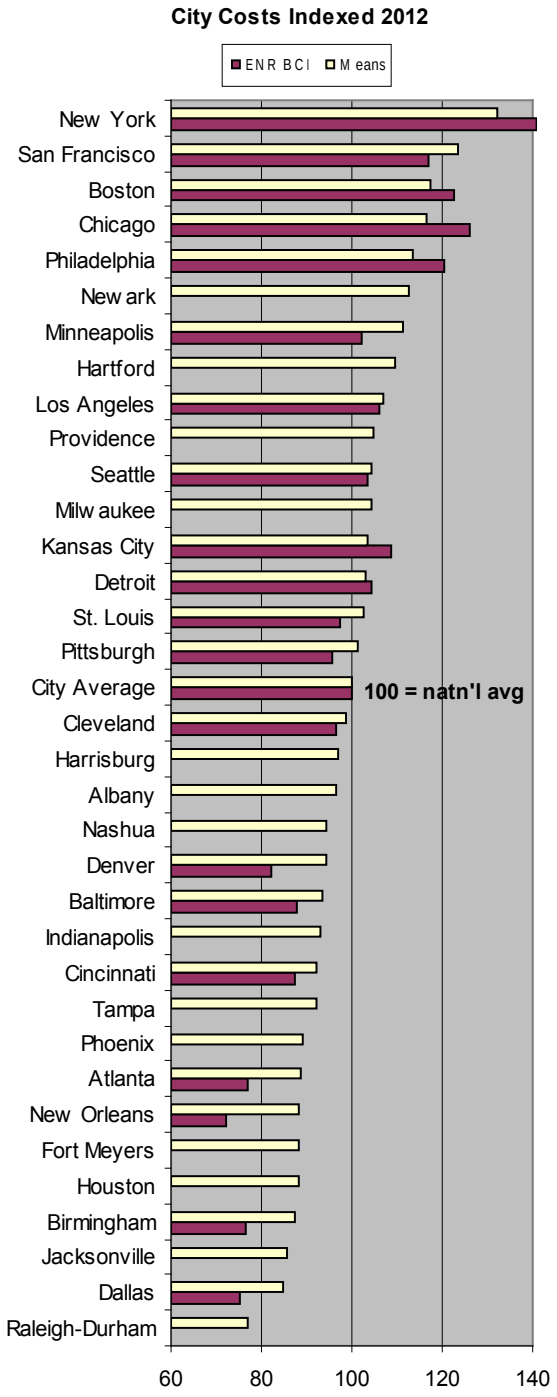
Multiply original cost by factor.

- 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 30+ major cities from highest to lowest RS Means index. The ENR index is shown for those available.

Figure 28



SELLING PRICE

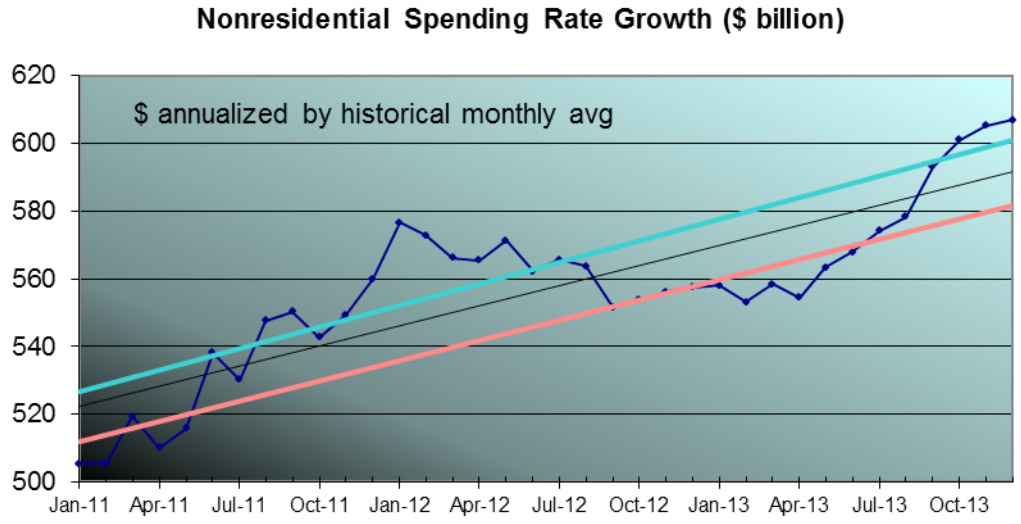
Selling price is the total price at which a contractor is willing to bid to win a project, even if that selling price eliminates all profit from the bid.

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 see margins increasing.

We are currently in a growth period as reflected in monthly construction spending. The monthly rate of spending is well above levels of the last 18 months and is projected to climb higher during the remainder of the year. 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 29



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. 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%/yr 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 12

US Construction Producer Price Indexes - October 2012

Markets Inputs PPI	Percent Change Versus to Oct 2012 from			annual for	
	Sep-12 1 month	Jul-12 3 months	Oct-11 12 month	12 months 2011 last yr	12 months 2010 prev yr
Inputs to ALL Construction	-0.4	1.5	2.0	5.2	5.3
Inputs to Nonresidential	-0.5	1.7	1.8	5.7	NA
Inputs to Commercial	-0.3	1.2	1.6	4.9	NA
Inputs to Industrial	-0.3	1.4	2.0	5.2	NA
Inputs to Hghwy/Hvy Engr	-0.5	2.0	2.0	6.1	NA
Inputs to Residential	-0.4	1.1	2.5	4.8	4.3

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

Compare the cost inputs in Table 12 to the completed costs for buildings in Table 13. Prices for completed buildings are up on average about 2%.

Table 13

US Construction Producer Price Indexes - October 2012

Buildings Completed whole building cost	Percent Change Versus to Oct 2012 from			annual for	
	Sep-12 1 month	Jul-12 3 months	Oct-11 12 month	12 months 2011 last yr	12 months 2010 prev yr
Inputs to Nonresidential	-0.5	1.7	1.8	5.7	NA
New Industrial Bldg	0.5	0.4	1.0	2.9	0.4
New Warehouse Bldg	0.4	0.7	2.6	3.8	0.4
New School Bldg	0.1	-0.1	1.5	4.8	1.3
New Office Bldg	0.1	0.1	1.4	3.8	-0.3

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 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 on average 2% over the last 12 months. Educational and Warehouse buildings command the highest margins right now.

Table 14

US Construction Producer Price Indexes - October 2012					
MARGINS Completed	Percent Change Versus			annual for	
	to Oct 2012 from			12 months	12 months
whole building cost	Sep-12	Jul-12	Oct-11	2011	2010
	1 month	3 months	12 month	last yr	prev yr
Inputs to Nonresidential					
New Industrial Bldg	0.48	-1.06	0.72	-2.03	-2.21
New Warehouse Bldg	0.38	-0.76	2.32	-1.13	-2.21
New School Bldg	0.08	-1.56	1.22	-0.13	-1.31
New Office Bldg	0.08	-1.36	1.12	-1.13	-2.91

(-) 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. That has changed.

We see in this latest data the strongest evidence since 2009 that contractors have been 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.

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.

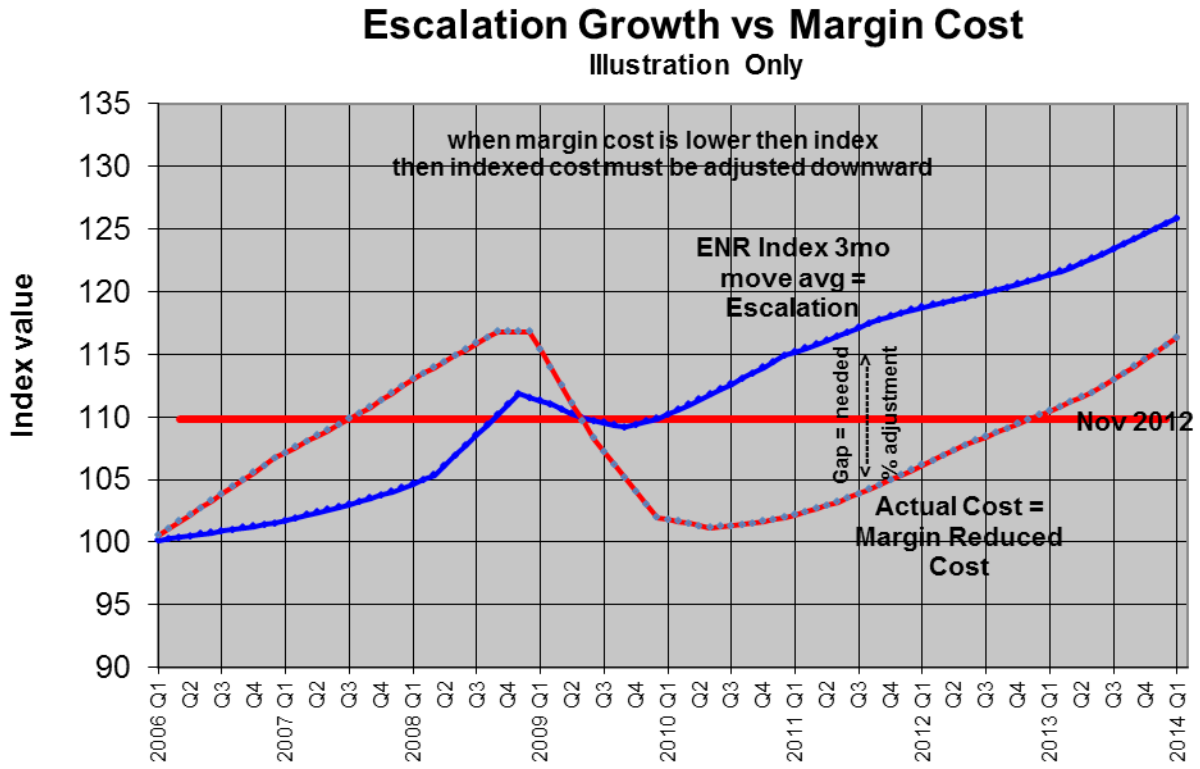
For all of 2009 and continuing through 2010, project bids came in at perhaps 10% to 20% under normal budget estimating. Average costs of buildings from Q2 2008 through Q4 2010 fell by 13% to 15%. However, normal indices increased by 4% during that time. Normal indices will not account for all changes 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 16 below, 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 30



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.

COSTADVISOR 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:

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

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

Total Escalation for 2012 = 3.5% to 4%

Even after a significant decrease in the last three months, margins will still increase this year by 1% to 2%. Material input costs are up 2% with the largest increase of the year occurring in the last 3 months. That probably accounts for why margins went down recently. What has helped contractors this year is an increase in productivity.

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.

Total Escalation for 2013 = 4% to 6%

An anticipated slowdown in non-residential 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 non-residential will pick up in the second half. Residential work will remain very active. Once growth in non-residential picks up and both residential and non-residential are active, we may begin to see some 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 = 5% to 7%

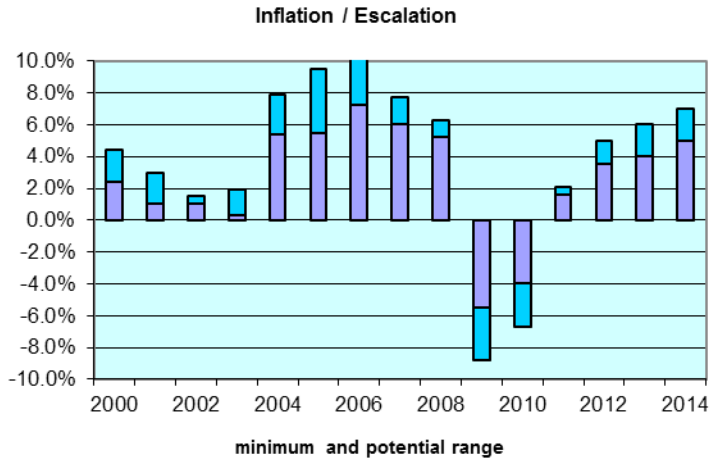
Assumes greater rate of growth in activity than 2013 which allows passing along all potentially inflationary labor and material costs and increasing margins 1% to 2%.

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.

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. In this specific condition, it would be reasonable to assume 5% annual 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%-10% in 2006 and 7%-8% in 2008.

Figure 31



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 2014 of no less than 4%.**

Gilbane Inc. is a full service construction and real estate development company, composed of Gilbane Building Company, Gilbane Development Company, and ITSI Gilbane. The company (www.gilbaneco.com) is one of the nation's largest construction and program managers providing a full slate of facilities related services for clients in educational, healthcare, life sciences, mission critical, corporate, sports and recreation, criminal justice, public and aviation markets. Gilbane has more than 60 offices worldwide, with corporate offices located in Providence, Rhode Island. The information in this report is not specific to any one region.

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