

WISCONSIN
**CONCRETE
PAVEMENT**
ASSOCIATION

Moving forward with concrete results

COST ESTIMATING PROCEDURES, TOOLS AND CONSIDERATIONS

**2015 Transportation Improvement Conference
Wisconsin Dells, WI**

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President

Wisconsin Concrete Pavement Association



Why Are We Here?

- Project estimates have been showing a trend of under estimation with WisDOT bids
- New WisDOT performance measurements are focusing on the issue.
- On behalf of WCPA members thank you for asking me
- Qualifier, my comments will be slanted towards concrete pavement
- Only thing I have done for 20 years

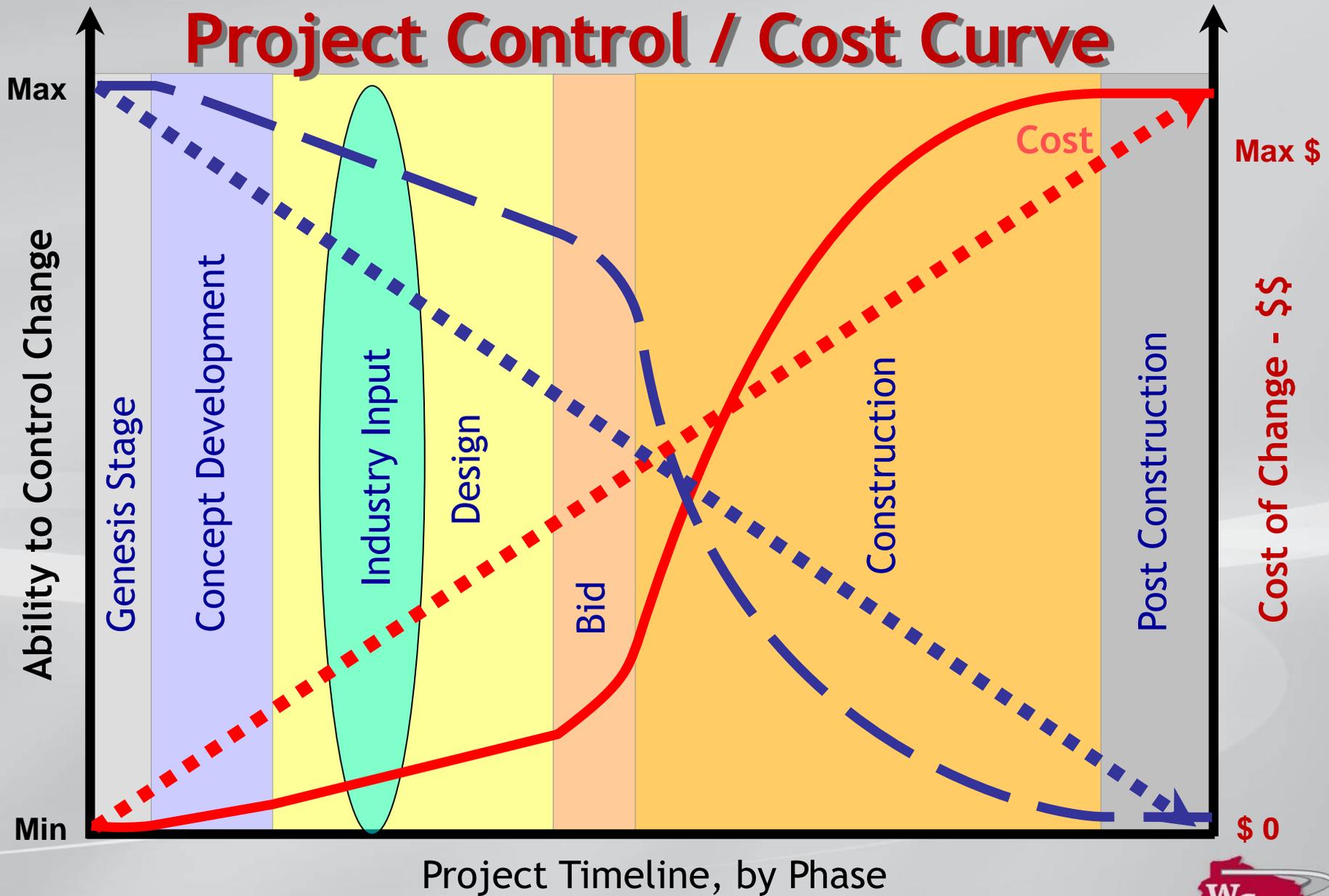


Goal

- My goal is to identify
 - Traditional cost estimation issues
 - Non-traditional cost estimation issues



Project Control / Cost Curve



Topics to Discuss

- Competition
- Materials
- Project Location
- Project Size
- Constructability
- Risk



COMPETITION

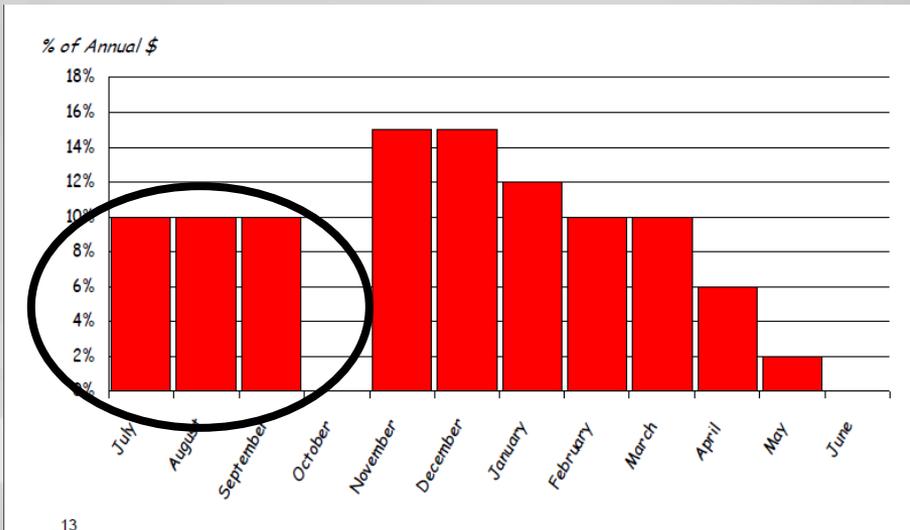


COMPETITION

- Project type –
 - Rural or Urban
 - Reconstruct or Rehab
- Project size – small and mega
 - Bonding
 - Equipment owned by contractor
- Project complexity
 - Personality of contractor
 - Equipment capabilities of contractor
 - Standard construction and specs
 - Multiple stages
- Time of year project is let



Goal for WisDOT Monthly Lets

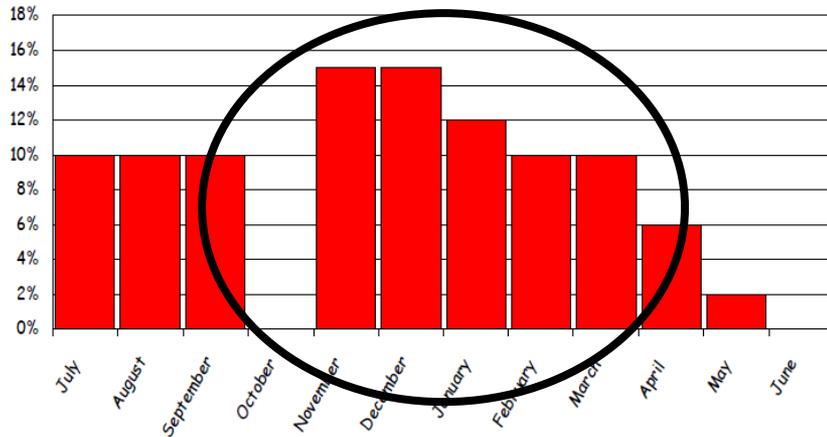


- July, August and September are not months contractors want to bid
- Concentrating on work at hand of construction
- Time in bidding is an issue

13

Goal for WisDOT Monthly Lets

% of Annual \$



13

- Months contractors want to bid
- Concentrating on bidding of work for the construction season
- Hungry for work
- Most time to understand plans and refine bids

MATERIALS



MATERIALS

- Project location and material availability
 - Research during design
 - Pavement Design
 - MRS



MRS System

http://www.atwoodsystems.com/iibv2/default.cfm Highway Quality Management...

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Duluth, Chequamegon National Forest, Minneapolis, Wausau, Green Bay, Appleton, Oshkosh, Milwaukee, Kenosha, Rochester, Madison, Kenosha

Map Satellite

Highway Quality Management System

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Project Materials Verification Structures QC Pavement QC Ride Quality Probing Thickness HMA QC eGuide Certifications **Agg Sources**

Certified Agg Sources used in project 1206-04-62

Click on the Aggt. Source name link to view all projects that use the selected source.

Name	Type	Certification Test
BUCKEYE	QRY	0 - 225 - 0027 - 2012
BUCKEYE	QRY	0 - 225 - 0035 - 2009
BUCKEYE	QRY	0 - 225 - 0179 - 2006

DANE County Aggregate Sources

Click on the Aggt. Source name link to view all projects that use the selected source.

Name	Type	Certification Test
BJOIN / STOUGHTON	QRY	0 - 225 - 0195 - 2012
BONG	QRY	0 - 225 - 0247 - 2012
BONG	QRY	0 - 225 - 0137 - 2009
BREUNIG	PIT	0 - 162 - 0006 - 2012
BREUNIG	PIT	0 - 225 - 0020 - 2012
BREUNIG	PIT	0 - 162 - 0004 - 2007
BREUNIG	PIT	0 - 225 - 0039 - 2007
BRUNNER	QRY	0 - 225 - 0254 - 2013
BRUNNER	QRY	0 - 225 - 0219 - 2009
BRUNNER	QRY	0 - 162 - 0057 - 2004
BUCKEYE	QRY	0 - 225 - 0027 - 2012
BUCKEYE	QRY	0 - 225 - 0035 - 2009
BUCKEYE	QRY	0 - 225 - 0179 - 2006
CAPITOL SAND & GRAVEL	PIT	0 - 162 - 0010 - 2012
CAPITOL SAND & GRAVEL	PIT	0 - 225 - 0039 - 2012
CAPITOL SAND & GRAVEL	PIT	0 - 225 - 0271 - 2012
CAPITOL SAND & GRAVEL	PIT	0 - 162 - 0014 - 2007
CAPITOL SAND & GRAVEL	PIT	0 - 225 - 0071 - 2007
CENTER ROAD	QRY	0 - 225 - 0125 - 2011
ENDRES (DANE)	QRY	0 - 225 - 0074 - 2009

Click on the map to get all projects in the selected county. Or [click here to enter Contract or Project ID.](#)

Found 201 projects for Dane County.

Year 2014

- [1001-01-62](#) JANESVILLE - MADISON (I 39)
- [1001-06-73](#) JANESVILLE - MADISON (I 39)
- [1007-10-71](#) ILLINOIS STATE LINE - MADISON (I 39)
- [1206-04-62](#) CITY MADISON, S MADISON BELTLINE (USH 12)
- [1206-07-84](#) MOUNT HOREB - MADISON (USH 18)
- [1206-07-85](#) MOUNT HOREB - MADISON (USH 18)
- [3070-00-72](#) I 39 - COLUMBUS (STH 73)
- [3070-00-75](#) I 39 - COLUMBUS (STH 73)
- [5290-01-72](#) MAIN ST, VILLAGE WAUNAKEE (STH 19)
- [5300-04-77](#) SAUK CITY - MADISON (USH 12)

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http://www.atwoodsystems.com/iibv2/showdata.cfm?contid=2014



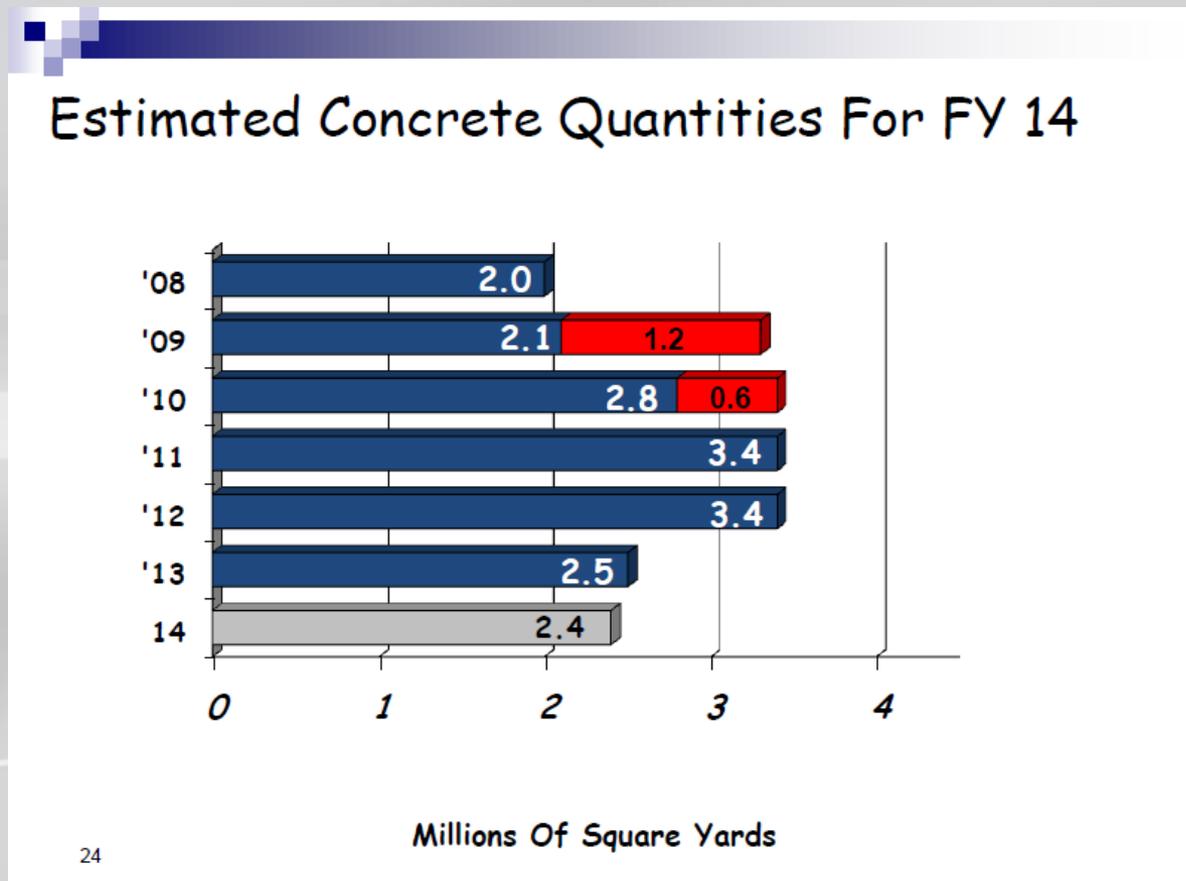
MATERIALS

- Standard material requirements
 - Dowel bar example
 - Curing compound example
- Material Costs



Material Costs

- WisDOT Annual Quantity Estimates



Material Costs

- WisDOT Annual Quantity Estimates
 - Annual production targets for an industry
 - Accuracy is essential
 - Control of volatility in prices over the year
 - 2014-2015 concern on Portland Cement prices as an example

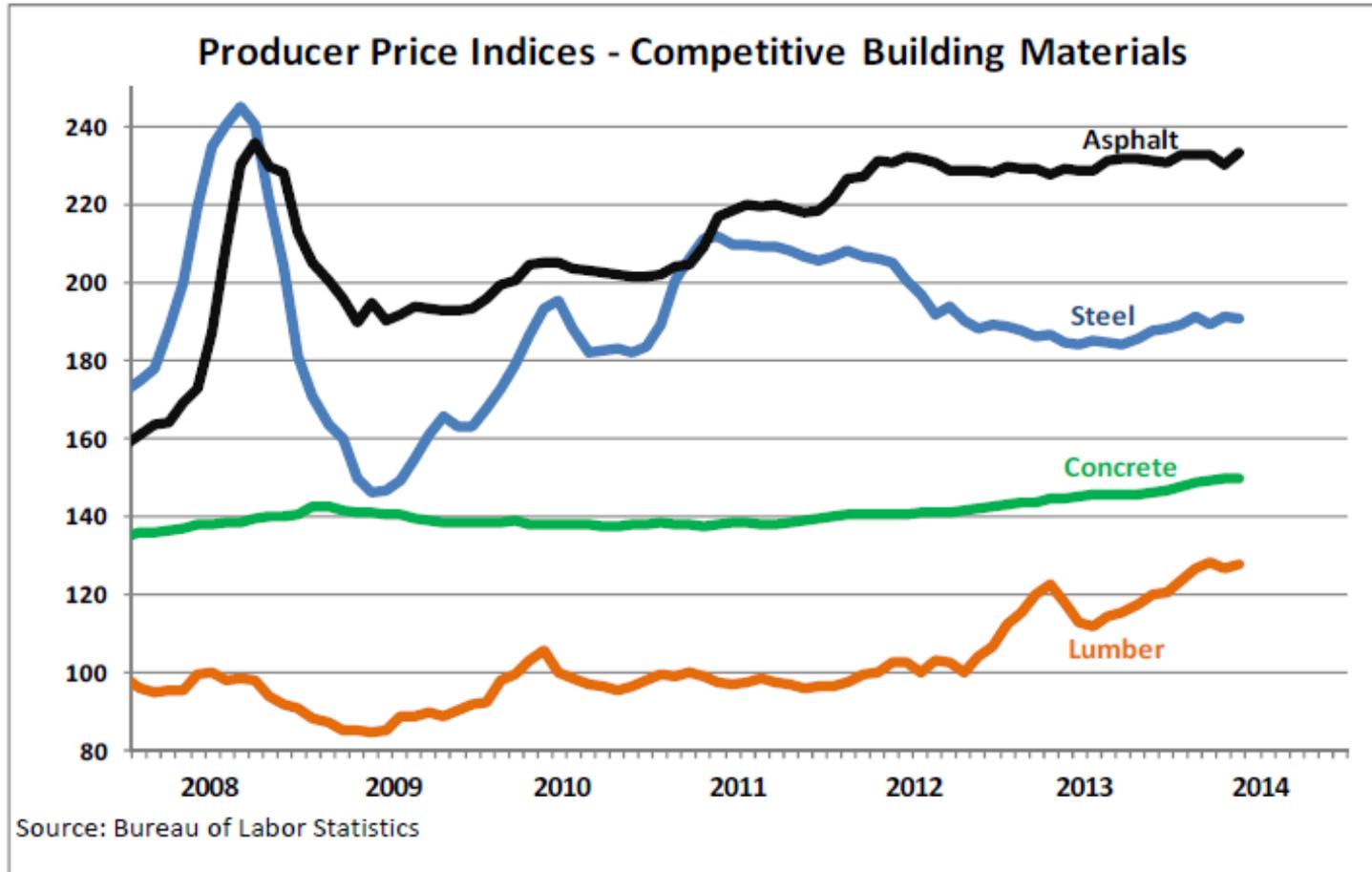


Material Costs

- WisDOT Annual Quantity Estimates
- Historical material costs
- Understanding cost trends



Materials Costs



PROJECT LOCATION



PROJECT LOCATION

- Local materials – aggregates are the biggest issue
- Regional shipping and transportation issues
- Adjacent projects
 - Contractor project
 - Material supplier
- Delivery of Materials



PROJECT SIZE



PROJECT SIZE

- Economies of scale
 - Mobilization, equipment, labor, etc. fixed costs
- Production rates
 - Ready mix vs. central mix concrete
- Hand work vs. machine work
 - Handform vs. slipform (pavement and barrier)



CONSTRUCTABILITY



CONSTRUCTABILITY

- Keep in mind that the price you get on a bid for any item is a blended price considering many factors



CONSTRUCTABILITY

- Optimize the design
 - Concrete Paving Examples
 - Uniform lane widths
 - Length of paving runs
 - Handwork vs. slipform
 - 2 to 2.5 times the cost for the reduced production and increased labor



CONSTRUCTABILITY

- Optimize the design
- Reduce staging
 - Long production runs vs. short bursts
- Number of mobilizations
 - Equipment, material and labor all part of this.
- Project access
- Work restrictions – contract requirements that limit production



NIGHT WORK

- Extra safety costs
 - Extra equipment costs
 - Experience shows production is less
 - Lane restrictions
-
- ALL ISSUES OF NIGHT WORK POINT TO HIGHER COSTS
 - Night time concrete repair example



RISK



RISK

- Clear and accurate plans
- Liquidated damages, lane closure penalties, interim completion dates, etc.
- Completion date vs. working day contract
- Single year vs. multi-year
- No excuse clauses



Clear and Accurate Plans

- We all strive for it
- Good plans equals good bids
- Use of standard details and specs need to have priority
- Approach your plan with the expectation that the contractor is not an engineer/designer (barrier wall example)
- More details, miscellaneous quantity sheets, etc. is better
- Incidental and lump sum must be avoided



LIQUIDATED DAMAGES, LANE CLOSURE PENALTIES, INTERIM COMPLETION DATES, ETC.

- Every one of these mean risk and the potential for penalty to the contractor.
- Contractors love every day and ordinary construction.
- Seriously evaluate every project in the need for the use of these tools.



LIQUIDATED DAMAGES, LANE CLOSURE PENALTIES, INTERIM COMPLETION DATES, ETC.

- Common consensus of the contracting industry:
 - These tools are over used
 - Unnecessary on many projects
 - Most reasons for using them are covered in the standard specifications



Calendar Day vs Working Day

- Again, seriously evaluate the merits of one or another on your project.
- Not every project is appropriate for calendar day.
- Don't let this provision restrict the number of bids you get.

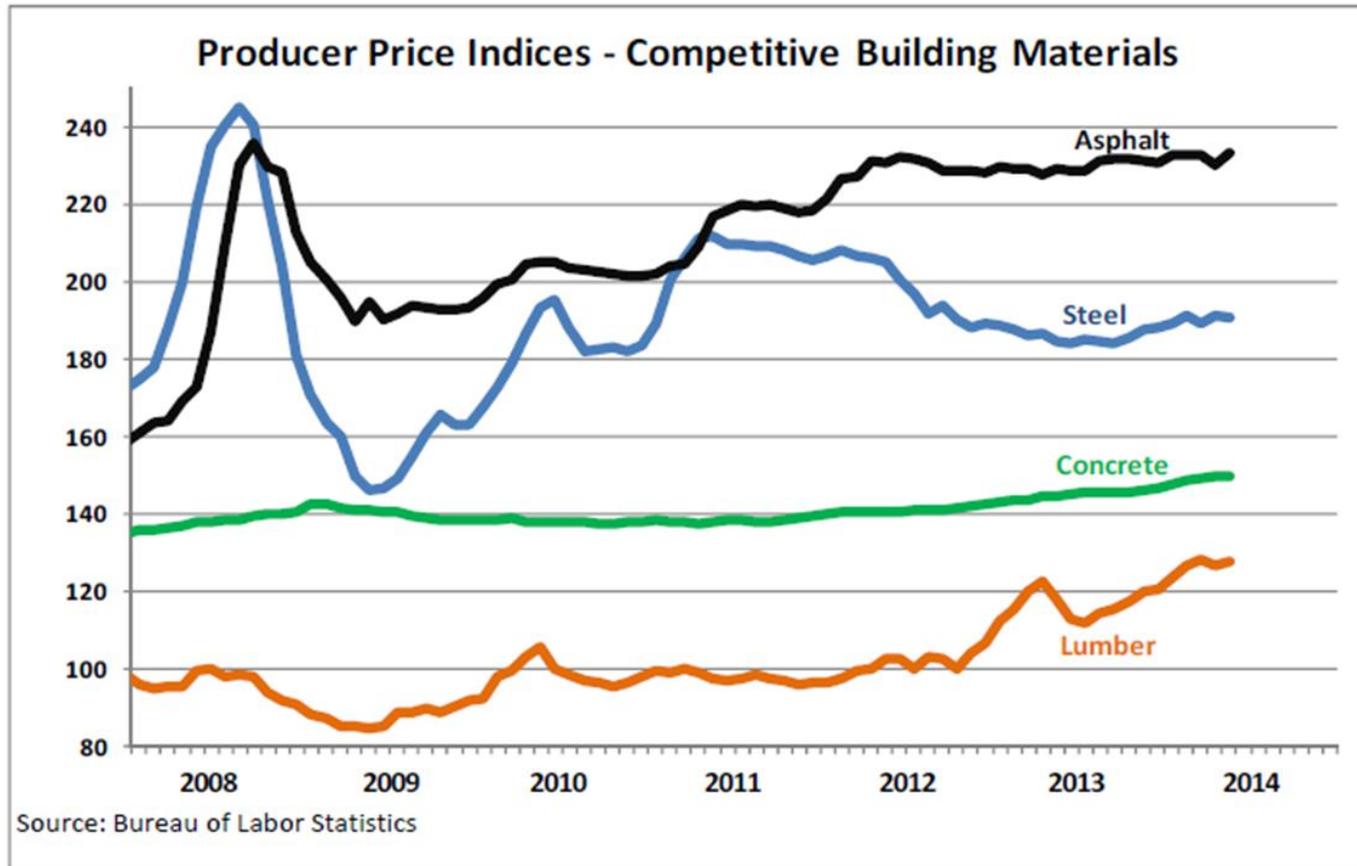


Multi-Year Contract

- Did you consider:
 - Inflation
 - Material cost volatility
 - Labor cost increases
 - Fuel costs
 - Equipment costs
 - Weather risks
- Were estimates revised to account for the work done over multiple years?



Remember this graph....



Fuel Costs

Crude Oil Price

104.93 USD/bbl

4 Aug '14



Multi-Year Contract

- Did you consider:
- Were estimates revised to account for the work done over multiple years?
- Steel quote example
 - Historical
 - Recent trend
 - Multi-year project quote
 - Steel producer, fabricator and contractor



No Excuse Clauses

- Things happen that are out of the contractors control
 - WEATHER
 - Other natural disasters/accidents
 - Labor disputes and shortage
 - Material shortage
 - Transportation/Trucking issues
- **RISK**



Final Thoughts....

- We are in the age of information.



- We can easily determine bid item history
- Adjust for current project and conditions
- May we never use average unit bid prices again



Discussion & Questions

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