

Quality in Construction (QIC)

Microsoft Teams Meeting

May 18, 2022

9:00 am - 12:00 pm

Attendees:

- Ann McGauran, OSA
- Chris Byerly, OSA
- Alan Robertson, OSA
- Andrew Beeler, OSA
- Stokey Bourque, OSA
- Patti Miller, THEC
- Paul Marshall, THEC
- Lanette Phillips, STREAM
- Austin Oakes, UT
- Michelle Crowder, UT
- Philip Zoch, APSU
- Bill Waits, MTSU
- Jim Cobb, TTU
- Tony Poteet, UM
- Mark Longfellow, UM
- Jim Prillaman, ACEC
- Kurt Boyd, ACEC
- Kasey Anderson, ACEC
- Greg Campbell, AIA
- Trey Wheeler, AIA
- Ashley Cates, AIA
- Rich McNeil, AIA
- Tom Lampe, ABC
- Clay Crownover, ABC
- Bob Pitts, ABC
- Grace Rogers, AGC
- Jason Madeiros, AGC
- Thomas Weaver, Johns Manville (JM)

Discussion:

- I. Each attendee was identified by the MS Teams attendee list.
- II. Alan Robertson provided an introduction for Thomas Weaver's presentation noting a summary of current roofing industry challenges facing the State including supply chain, product allocation and budgeting.
- III. Thomas Weaver, (JM) provided a presentation: *State of Tennessee Update*. (see attached)
 - a. Alan Robertson asked what Johns Manville's price volatility outlook is over the next year.
 - i. Thomas stated that demand has outpaced supply noting that fasteners, membranes and poly-iso is in good supply. Thomas stated that price escalation is likely to continue at the rate of inflation.
 - b. Tom Lampe asked if purchase allocations of up to 18 months in advance for cases such as Amazon is impacting material allocation for projects looking out 6-12 months in advance.
 - i. Thomas responded that in some cases it can impact the ability of industry to supply projects under a shorter procurement timeframe.
 - c. Tom Lampe asked if there were new plants opening or if industry plans to meet demand using existing plants.
 - i. Thomas noted that industry is constructing poly-iso plants to meet new IECC requirements.
 - d. Alan Robertson asked if industry movement toward adhered systems was related to a lack of metal fastener availability.
 - i. Thomas responded that a shortage of high-quality, domestically manufactured metal fasteners has been a driver toward adhered systems.

- e. Alan Robertson asked if it is common in the current market to see alternative fasteners being used in roofing system installations.
 - i. Thomas stated that it is common to see roofing systems that use domestically-sourced fasteners from different manufacturers and that this is typically acceptable as long as the roofing manufacturer is aware that an alternative fastener is being used and that it is acceptable to the roof manufacturer as it relates to the roofing system guarantee.
- f. Ann McGauran asked that, given State challenges relating to increasing project budgets during construction, what is recommended in determining an additional contingency in preparation for potential price escalation.
 - i. Thomas responded that a contingency may be treated as an alternative bid and that budgeting may be set as the alternative bid while that the installation may be set at the base bid.
 - ii. Ann stated that, in summary, Thomas Weaver's suggestion was that a project may be bid where a portion of the work has a GMP so that the invoice shows actual cost opposed to percent complete.
 - iii. Thomas concurred.
 - iv. Alan Robertson noted that he has seen circumstances where such situations may be managed as an allowance.
 - v. Tom Lampe stated that allowances may provide a mechanism to return unused funds back to the State.
- g. Ann McGauran noted that market volatility and price escalation raises the question as to if it can be in the best interest of the State to wait and evaluate funding a project during a future budget cycle.
 - i. Thomas noted that there is no current indication that prices are going to reduce over the next 18 months and that waiting to fund a project in hopes of market stabilization will incur risk.
 - ii. Tom Lampe noted that industry analysts (AGC and ABC) are not predicting any reduction in pricing escalation through 2022.
- h. Ann McGauran asked if it would be possible for the State to negotiate pricing based on volume and scheduling.
 - i. Thomas' response was that there are currently no pricing negotiations since higher volume is not currently a leverage point due to market conditions. He continued that in some circumstances, scheduled planning may open potential opportunities.
 - ii. Tom Lampe noted that early design packages, as a solution to market volatility, can apply pressure to the industry, specifically designers, when design sequencing is altered and/or accelerated.

IV. Construction Industry Market Update, Tom Lampe, ABC (see attached)

- a. Alan Robertson asked if wood pricing had stabilized.
 - i. Tom responded that wood pricing continues to move up and down and that the latest trend was downward.

V. HPBr, BIM and Project Team Evaluations – Chris Byerly (OSA)

- 1. Chris noted that HPBr tracking sheets would be provided to SPA's at the end of the current week and that SPA's should provide comments within the tracking sheet for documents that are anticipated to be delayed or not required and return those to OSA.
- 2. Chris noted that Team Evaluation Tracking sheets will be sent out by June. Chris also noted OSA will be reviewing the status of the Team Evaluations in anticipation of publishing the overall tracking workbook for use by the SPA's.

3. Chris requested that SPAs provide any BIM updates relating to projects during the project update portion of the meeting.

VI. FY 22/23 Proposed Budget – Ann McGauran (OSA)

1. Ann noted the significant increase in projects in the FY 22/23 budget that are over \$10 million dollars as compared to the previous fiscal year's budget.
2. Ann stated the intensive efforts amongst SPA's in bringing forward the current projects to SBC between July and October as well as preparing projects for next year's budget between April and October.
3. Ann summarized a comparison of 2021 and 2022 capital projects citing increases in the number of new projects, early design phase approvals, designer selections, CM/GC contractors selected and demolition projects.
4. Ann noted increases in leases including new leases, total square footage and the number of counties.
5. Ann provided a summary of land transactions citing increases in acquisitions, overall acreage and the number of counties as well as increases in the number of disposal transactions, total acreage and the number of counties.
6. Ann noted that given the volume of projects ahead, strategies to manage project lifecycles given anticipated ongoing market volatility will continue to be a priority for SPA's in cooperation with the design and construction industries.
 - a. Alan Robertson asked if through Ann's involvement with NASFA, if there have been strategies identified amongst other states for dealing with market volatility.
 - b. Ann responded that the State of Tennessee is unique in comparison to most states regarding the volume of capital projects and infrastructure work but all states are working through the volatility and it was a challenge for almost every state. She reiterated the value of the strategies for managing market volatility being discussed amongst industry professionals throughout the meeting.

VII. SPA Projects Update – Tony Poteet (UM)

1. Tony stated that UM is expecting substantial completion in May on the conversion of a residence hall to a nursing facility at Lambuth.
2. Tony stated that the new music building is expected to reach substantial completion in late July.
3. Tony noted chiller, boiler and HVAC work that was recently completed.
4. Tony stated that some conversion projects were experiencing budget issues. Tony stated that they are expecting scope reduction on these conversion projects.
5. Tony stated that the STEM facility received trade bids at 23% over budget. Tony stated that in order to get the project within budget that they expect scope will be reduced, including a round of VE and that additional funding will be provided by the campus.
 - a. Alan Robertson asked if the chiller rebuilding was cost efficient and improved lead times.
 - b. Tony noted that it was beneficial in terms of lead times and cost efficiency.
 - c. Chris Byerly asked what type of warranty was provided with the chiller rebuilds.
 - d. Tony stated that the manufacturer provides a 5-year warranty including contractual annual inspections and testing and that the value proposition is feasible.

VIII. SPA Projects Update – Bill Waits (MTSU)

1. Bill stated that the School of Concrete and Construction Management should be completed in late Fall 2022 noting few issues regarding delays or cost escalation issues.

2. Bill noted that the Applied Engineering Building is in design development and that this is a CM/GC project.
 3. Bill stated that the Student Athletics Performance Center is also in design development and is a CM/GC project.
 4. Bill indicated that the tennis facility project will be advertising for bid in the coming months.
 5. Bill stated that MTSU has RFQ's out for design services for 5 capital maintenance projects.
 6. Bill noted that MTSU has two outlay projects including the MTSU Aerospace Campus and renovations to both Rutledge Hall and Kirksey Old Main. Bill stated that the RFQ's for design services on the renovation projects will be issued soon.
- IX. SPA Projects Update – Jim Cobb (TTU)
1. Jim stated that TTU currently has 20 projects in various stages of design and construction.
 2. Jim noted that TTU had recently received RFQ responses for a designer on the TTU stadium project and is expecting this project to be brought before the SBC in July.
 3. Jim stated that RFQ's are expected to be posted in July for Johnson Hall and Foster Hall renovations which will include substantial utility infrastructure changes.
 4. Jim stated that an RFQ is expected to be posted in August for the Advanced Construction Manufacturing and Engineering Building.
 5. Jim noted that two capital maintenance projects are anticipated for the TTU Craft Center.
 6. Jim stated that Innovation Residence Hall is in the design phase and is requiring some scope changes in order to fall within budget.
- X. SPA Projects Update – Austin Oakes (UT)
1. Austin stated that a phase of the Neyland Stadium renovation will be completed this summer.
 2. Austin noted that the STEM building at UT Martin will be completed soon.
 3. Austin stated that the completion of the new dentistry addition at the Health Sciences Center is expected at the end of the year.
 4. Austin indicated that the nursing project is in design at the UT Knoxville campus and that additional Neyland Stadium renovation phases will continue over the coming years.
 5. Austin noted future projects, including lab renovations at the Health Sciences Center and the build out of the top floor of the Cancer Research Center.
 6. Austin stated that a new college of business building at the Knoxville campus will be initiating later this year.
- XI. SPA Projects Update – Dick Tracey (TBR)
1. Dick Tracey of TBR was not present at the meeting.
- XII. SPA Projects Update – Laura Bailey (ETSU)
1. Laura Bailey of ETSU was not present at the meeting.
- XIII. SPA Projects Update – Marc Brunner (APSU)
1. Marc Brunner of APSU was not present at the meeting.
- XIV. SPA Projects Update – Brian Wilson (STREAM)
1. Brian Wilson of STREAM was not present
- XV. Open Discussion:
1. Alan Robertson stated that in June he will be sitting in with the State Fire Marshal's Office regarding code adoption and that he will keep the group posted.
 2. Ann McGauran noted that AIA will have representation at the code adoption meeting.

3. Rich McNeil stated that he appreciated the roofing presentation and asked if it might be possible to bring other disciplines to present as well.
4. Alan Robertson stated that he will keep the group updated on the potential of bringing in Firestone and Carlisle to present as well as other potential disciplines.
5. Alan Roberson noted that there is an effort to resume in-person meetings and that he will keep the group updated.

XVI. Closing Remarks

1. Alan Robertson thanked the members for their participation, welcomed continued suggestions from the members and adjourned the meeting.

Action Items:

- Tom Lampe to provide Construction Market Update (See Attached)

Next Meeting: August 17, 2022
Ed Jones Conference Center
Ellington Agricultural Center
440 Hogan Rd, Nashville, TN 37220

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State of Tennessee Update

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Agenda for Today

- Overview of Available Systems
 - Thermoplastics
 - Thermoset
 - Bituminous Systems
 - Insulation/Cover Boards
 - Accessories/Alternative Attachments
- Supply Chain Difficulties With Origins
 - Pandemic Response
 - TX/LA Freeze
 - E-Commerce, Stimulus, Interest Rates
- Recommendations on Navigating the Crisis
 - Hold Your Specification to the Truly Important Standards
 - Factor Increases in “Today’s Pricing” Bids

Johns Manville Available Roofing Systems

Thermoplastics – Single Ply, Heat Welded Seams, Reinforced, White, Gray, or Tan:

- TPO (Thermoplastic Polyolefin).
 - 60 years of history. First Introduced as a roofing material in the 1960's.
- PVC (Polyvinylchloride).
 - Over 50 years in use (30+ in the US).

Thermoset – Single Ply, Taped Seams, Black, Ideal for Ballast Roofs:

- EPDM (Ethylene Propylene Diene Monomer).
 - Introduced in 1962 and gained popularity due to Oil Embargo in the 70's.

Bituminous Systems – Multi-Ply/Redundant, Asphaltic, Reinforced:

- SBS, APP, BUR
 - Hot Asphalt, Cold Adhesive, Torch Applied, Hybrid Attached.

Insulation/Cover Boards

- Insulation (Polyisocyanurate)
- High Density Iso
- Perlite
- Gypsum and Concrete based Cover Boards

Accessories and/or Alternative Attachments

- Wind Vented, Skylights/Daylighting, Paver Systems, Solar

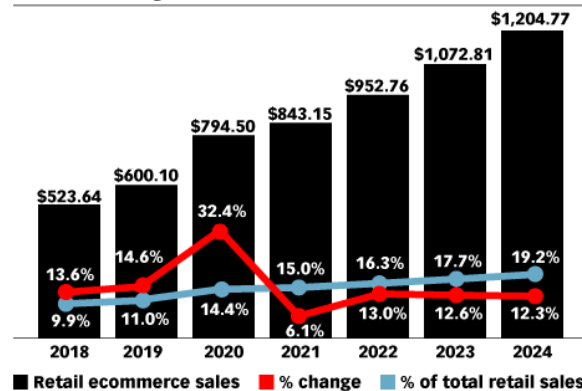
Supply Chain Difficulties With Origins

COVID 19 Pandemic Response coupled with an economic surge and need for massive distribution centers/warehousing:



Average R-Values went from R-15 to R-25 40% Increase	Restriction left Container Ships stranded at ports	Manufacturers braced for a slow down in demand.	Americans stayed home. 70% reduction in travel	The beginning of what would be \$5T in stimulus/relief	Economic surge within 150 days	MDI plants for Dow and BASF were crippled for as long as 6 months causing Force Majeure declarations.
2018-2020	1/31/2020	3/11/2020	3/15/2020	3/27/2020	12/11/2020	2/17/2021
ASCE-7 16 Ratified and Adopted	US Restricts All Travel	US Declares Pandemic	US Issues Lockdown Orders	Beginning of Pandemic Relief	Vaccine Rollout Opens Economy	Texas & Louisiana Ice Storm

US Retail Ecommerce Sales, 2018-2024
billions, % change, and % of total retail sales



Note: includes products or services ordered using the internet, regardless of the method of payment or fulfillment; excludes travel and event tickets, payments such as bill pay, taxes or money transfers, food services and drinking place sales, gambling and other vice goods sales
Source: eMarketer, Oct 2020

- R-Value increases reduce the square footage efficiency for transportation. Only 24 bundles fit on a truck regardless of size.
- Most roofing materials are derived from Petrochemicals. Since fewer people were traveling, less oil was refined and the supply for raw materials began to shrink. 30M Gallons per day is the estimated decrease in demand during the lockdown.
- The Longshoremen strike has kept our ports inefficient. Most US steel used for buckets, termination bar, fasteners and plates, etc... is imported.
- The growth in E-Commerce led to significant investment in warehousing and distribution.
- The COVID vaccines came a year earlier than expected. The impact on the economy was dramatic.
- Extraordinarily low interest rates have also fueled commercial growth.

*Dates, numbers, and percentages pulled from multiple sources and may be averaged. Information contained on this slide is intended to be directional. Individual sources are not listed.



Recommendations on Navigating the Crisis

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State projects are an institutional investment. Allowing untested and/or unproven assemblies should not be allowed. While the situation has changed the industry for the foreseeable future, the specific demands on today's market won't last forever. However, the roofs installed will need to last for 20-30 years reliably for the State of Tennessee.

- Develop or maintain performance standards and ensure that the specification meets the standards you deem necessary.
 - Guarantee duration, resistance to foot traffic and hail, walk-pad placement, membrane thickness, reflectivity, R-Value.
 - Consider Modified Bitumen systems or adhered assemblies.
- Require that substitutions in system components are accompanied by a letter of acceptance from the roofing manufacturer. These letters should be job specific.

Recommendations on Navigating the Crisis

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- Alternative bid practice to consider:
 - Bid at “Today’s Price” with a line item for proposed escalation costs.
 - Use the sum of the two to determine the maximum contract value.
 - The baseline contract value is “Today’s Price” and any escalation must be supported by a manufacturers price increase document, not to exceed maximum contract value.
 - Guaranteed cost contracts are not possible in this environment. If they are agreed to, the cost will be exorbitant.

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Questions?

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QIC Construction Industry Market Update - 5/18/22

Overview: Sharp, Climbing Cost Escalation Continues

- ENR Building Cost Index is already up more than 5% through April and is on pace for a 15% increase in 2022, exceeding the 12.5% increase in 2021
- High demand is driving up lead times significantly for electrical equipment due to large entities buying up capacity into 2025. This is affecting future projects as well as projects with committed dates of delivery that have been extended out significantly beyond the original dates.
- Labor availability continues to be a persistent problem. Unemployment is at a near 50-year low, and the construction industry is short over 650,000 workers.
- The all items Consumer Price Index increased 1.2% in March after rising 0.8% in February. Over the past 12 months, the all items index increased 8.5% before seasonal adjustment. This is the largest 12-month increase since the period ending Dec 1981.

Local Construction Costs: Significant/Abnormal Construction Price Inflation

- Nashville continues to receive a steady flow of local, national and international investment fueling the construction industry.
- The tremendous demand in the Nashville market has resulted in significant shortages in the available workforce, escalated labor premiums and local material shortages, forcing some suppliers to be on raw material allocations.
- We anticipate above-normal wage increase trends going forward through this inflationary period.

Architecture Billings Index

- The March 2022 ABI score of 58.0 shows continued growth and one of the highest scores since economic recovery from March 2020 began. Firms in the Midwest, West and South are seeing robust levels of work.

Commodities Pricing

- From a low of \$1.87/gallon of unleaded gas in May 2020 to a record avg price of 4.22/gallon through the end of Q1, fuel prices are impacting everyone. The cost of a barrel of oil is 90% greater than at this same time one year ago.

Materials Pricing

- Asphalt prices have risen 20% from March 2021 to 2022 because it's historical impact by fuel pricing and seasonal/regional conditions.
- Cement is in short supply in some markets with demand at historically high levels. Rationing of concrete to contractors has started in the Nashville market.
- World steel production is down 5.7% compared to Feb. 2021. Structural steel pricing has started to climb after a relatively stable period from Dec to March. From March to April 2022, structural steel pricing per ton is up 8-15%. Lead times are holding steady for now.
- Bar Joist and metal decking lead times are in the 40 to 50 week time frame.
- Aluminum prices remain 30% higher year over year, down from a record high in March 2022 as reduced demand from China (lockdowns) and Japan (weak demand in automotive sector).
- PVC Pipe avg prices jumped 12% since last quarter driven primarily by higher oil prices.
- Copper Pipe avg prices were up 3-4% over the past three months, as the cost of copper continues to climb.
- Wood Products – the up and down lumber market is pointing downward once again. Both dimensional lumber and panels are declining quickly. Dimensional lumber is down 25% since it peaked in early March. Panels are also down 21% since the March peak.
- Drywall pricing continues to climb with USG announcing an increase of 30% effective Jan 1, 2022. Demand continues to outstrip supply as both commercial and residential markets remain strong.
- Interior materials continue to escalate. Armstrong announced a 10 percent increase on ceiling suspension systems effective January 31 and a 12 percent increase on suspended ceiling panels effective January 3. USG announced a 30 percent increase on drywall effective January 3. Metal studs have been quiet, but with steel on the rise again, there is some risk going forward.
- Mineral wool insulation products also continue to rise as Johns Manville has announced an increase of 25% effective May 1 and Rockwool has announced a 15% increase effective May 16.
- Most of the major elevator manufacturers are communicating annual material cost increases in the range of 7–10 percent, which will translate to 3–5 percent price increases on the total scope for the full year.
- HVAC equipment pricing is expected to increase across all product lines and manufacturers in the range of 15–20 percent for the full year.
- Lab Casework and fume hood pricing is up in the 25–35 percent range, mostly driven by escalating steel and resins. Now that steel is escalating once again, there is risk of further price escalation going forward.

Supply Chain Trends

- **Roofing products** supply chains remain constrained as record demand continues. Polyiso insulation is the most challenging material to secure with lead times at 52 weeks. Many projects are substituting EPS and XPS in place of polyiso so lead times are rising for these forms are being extended as well. Glass mat coverboard supply chains are being stretched thin. Expect lead times of 5-6 months.
- **Doors and Hardware** - lead times continue to extend, with electronic access hardware being the most troublesome category. Semiconductor shortages are causing lead times to extend out to at least 20–25 weeks.
- **Elevators, Escalators. Moving Walks** - Standard lead times have increased two to four weeks on average because of material and component supply chain challenges ranging from metals to electrical components and semiconductors.
- **Plumbing and Drainage** - below-grade drainage pipe and materials—including PVC, ductile iron pipe (DIP), reinforced concrete pipe (RCP) and precast concrete drainage structures. Due to reduced manufacturing capacity, there is a national shortage of these materials. PVC and DIP lead times have increased significantly and are currently in the range of eight to 12 months. RCP lead times are a minimum of three months, and specialty items like fire hydrants are running six to 12 months.
- **HVAC Equipment** - Lead times for HVAC equipment are highly dependent on which type of equipment is procured, as well as unique specifications and manufacturers. In general, air-cooled chillers, which are in high demand to support new data centers, certain RTUs and full custom air handlers are all running 30–45 weeks. If ECMs are required, lead times are pushing 70+ weeks. Lennox has announced to all its distributors that they are no longer taking orders for delivery in 2022.
Electrical Gear - Lead times for switchgear, switchboards, panelboards and transformers continue to rise as demand hits historic levels. Manufacturers have delayed shipments by five to six months due to material and component shortages. Markets driving demand are data centers, automotive, warehousing and crypto currency mining. Gear supply chains are being constrained by PVC resin, semiconductors, panel lugs, metal, copper and other items. Lead times for the longest lead items may increase beyond the current 60–70 weeks. Panel boards, which are typically four- to six-week items, are now running up to 24+ weeks. Barring any new crisis, manufacturers are not expecting lead times for electrical gears to get back to normal until late Q3 2023 at the earliest.
- **Generators** - Generator lead times stabilized between 45 and 52 weeks in the first quarter of 2022. At least two major manufacturers are reporting major supply chain constraints, which have caused late deliveries to commitments.
- **Lab Casework and Fume Hoods** - Material inputs to lab casework (steel and resins) have stabilized from an availability point of view. Lead times have receded from 26 weeks to 18 weeks.

Special Considerations

- **Transportation** - Domestic transportation costs will continue to rise in the short term driven by high fuel costs and increased drivers' wages. However, spot pricing is trending downward, which is an indication of declining demand for trucking. This may indicate a downward trend of pricing in the longer term.

Remedies/Solutions

- The entire project team, owner, designer and all tiers of construction contractors and suppliers need to be engaged in the supply chain. There should be a clear recognition from all parties that the current supply chain delays will very likely impact project schedules with varying degrees of severity.
 - A robust procurement strategy is essential – leads times are emphasis and should be accounted for in the overall project schedule.
 - Contractors need to place orders product orders early and closely monitor commitments for shipment dates.
 - Early release of materials and warehousing of stored material is an important strategy to consider. Owners should pay for stored materials and for insurance on the same as needed.
 - Reasonable substitutions need to be allowed by designer and owner entities when specified products are unavailable in the time frame needed.
 - Cost benefit of escalation clauses – leverage allowances – talk with trade partners about allowances in lieu of trade partner taking all the risk to keep from paying worse-case scenario all the time.

SUPPLY-CHAIN FORECAST

We are pleased to release the 32nd edition of Turner's Supply-Chain Forecast (SCF). This SCF generally indicates increases in pricing, lead times, and supply constraints across many categories due to demand, transportation, labor shortages, natural disasters/severe weather, pandemics, and war, as detailed below:

- Aside from the humanitarian impacts of the war in Ukraine, the conflict is also negatively affecting the global economy, resulting in uncertainty in the marketplace, supply-chain delays, and increased pricing.
- Prime scrap shortages and increased demand continue to impact all steel pricing and lead times. As the automotive industry begins to recover, scrap supply manufacturers cannot meet demand because the competition for scrap steel is too strong.
- The residential market is still causing allocations/shortages of drywall, insulation, roofing, and related products.
- Chemical facilities are online and rebuilding inventory thru Q2 2022. Impacts remain to PVC, resilient floor, carpet, epoxy, paint/

- pigments (including PVDF needed for curtainwall), insulation, and resinous floor. Generally, the chemical industry appears to be stabilizing.
- Rising commodity costs for copper, aluminum, and nickel continue to impact products ranging from curtainwall to doors, frames, and hardware.
- In terms of transportation, a considerable number of ships are still sitting off ports; there is a continued shortage of trucks and drivers; and port congestion is exacerbated by empty containers. Ports have imposed daily fees for empty containers in an effort to reduce congestion. Additionally, the war in Ukraine has impacted the availability and cost of both ocean and air freight.

TRADE-SPECIFIC DETAILS OF THIS SUPPLY-CHAIN FORECAST (SCF) INCLUDE:

- **Structural Steel/Rebar:** This update indicates price increases related to scrap shortages, transportation shortages, and increased demand.
 - Increases in the range of: rebar 12%; sheet/plate/shapes 2-12%; and decking and joists 0% due to uncertainty of raw material inputs (scrap, iron ore, nickel, and other raw materials).
 - Scrap is at a record high due to shortages and the conflict between Ukraine and Russia, which are the prime suppliers of pig iron and other raw material.
 - The American Iron and Steel Institute reported U.S. steel mills shipments in January were down 1.6% (m/m) and +4.5% (y/y). Year-to-date production through March 5, 2022 increased +2.6% at a capability utilization rate of 81.1% (versus 76.8% over the same time period last year).
 - Fuel prices are at an all-time high. The Department of Energy's fuel guidelines imposed increased carrier fuel surcharges.
- **Curtainwall/Glass:** The major trade partners still remain full through 2022 and well into 2023, though there is some regional availability depending on size and timing. This SCF indicates additional system pricing of 10% (14% on glass and 40% on aluminum) and extended lead times across most materials due to raw material shortages in glass, aluminum, paint/pigment (PVDF), gasketing, and continued rising aluminum and transportation costs.
- **Drywall, Steel Studs, and Related Products:** Pricing in this SCF indicates no change following Q1 price increases, however the forecast through Q2 is for increases in the range of: gypsum wall board 30-50%; metal framing 10%, ceilings 15%; and accessories 30%. The forecast continues to project stable lead times with continued pricing pressure related to excessive residential demand.
- **Roofing:** This SCF indicates increases of 10-15% since last quarter and forecasts more

through 2022 due to continued raw material escalation and shortages due to unprecedented demand, transportation shortages/interruptions (global/domestic), and a secondary wave of inflationary pressure due to rising oil prices. Lead times can approach 10-14 months driven mainly by fastener shortages and ISO insulation availability. Firestone is continuing a managed availability process for 2022, focusing on their ability to ship full projects in lieu of first-in, first-out orders. The risk is significant and qualifications to bids should be expected. Improvements are not anticipated until late 2022.

- **Heating, Ventilation, and Air Conditioning/Electrical Equipment:** SourceBlue has increased its Cost Index and is now forecasting a 9.3% increase across 2022 due to continued increases in raw material costs (steel, aluminum, fuel, and chip shortage). Lead times have not improved from last quarter's SCF. For some manufacturers, lead times have increased for larger or custom air-handling units and generators. Supply-chain constraints/shortages continue to impact factory operations, causing delays in production and limiting factory capacity in North America and overseas. Global shipping issues continue to impact the availability of equipment.
- **Oil:** This SCF indicates an increase of 30% to \$103.00/bbl and a generally flat forecast in Q2 2022 to \$102/bbl related to the war in Ukraine. This commodity remains volatile. Proceed with caution.
- **Cement:** Current pricing is unchanged at \$129/ton since last SCF and a forecast to \$131/ton in Q2 2022. The market is forecasting shortages which may drive pricing and allocations.
- **Doors, Frames, and Hardware:** This SCF indicates no changes with exception of a 5% surcharge increase in steel doors/frames. Of the total 2021 surcharges of 55%, approximately 15% have now been rolled into list pricing and the balance remains as a surcharge. Surcharges and increases are related to volatility of aluminum, copper, and nickel (affects stainless). Lead times appear to be stabilizing.

INNOVATION:

It's how we create the future

We are committed to accelerating the pace of innovation within the construction industry and the broader built environment. Our passion lies in helping our people and partners explore beyond WHAT IS and discover what COULD BE.



See a video on Turner's use of spot!

<https://bit.ly/3w1qEPj>



ADVANCING ROBOTICS:

From drywall-finishing robots to robots that perform layout and robots for overhead drilling, our explorations into robotics have ramped up in recent years. With Spot, we are pairing one of the world's most advanced mobile robots with the latest reality capture technologies to bring the future of automated workflows to the jobsites of today.



ADVANCING AI:

We are working to expand the use of artificial intelligence (AI) on our projects. Through the use of AI-powered solutions like CraneView, we capture and analyze thousands of data points collected throughout the workday that yield actionable insights to improve jobsite performance.



See a video on Turner's use of CraneView's AI-Powered Sensor!

<https://bit.ly/39eHdys>



NURTURING A CULTURE OF INNOVATION:

We respond to the enthusiasm of employees for developing better ways to do things by providing a structure and mechanisms to accelerate innovation. We accomplish this through programs like our Innovation Summit, an annual event that brings employees together with thought leaders across disciplines to exchange ideas; Innovation Town Halls, recurring webinars that pair Turner innovators with industry experts to discuss emerging trends; and the Innovation Challenge, an open ideation program that cultivates and shepherds great ideas from concept to company-wide adoption.



Turner

MARKET CONDITIONS

MEMPHIS

Q1 2022

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NATIONAL

WHAT IS IN THIS REPORT? Among the information included in this publication and of special importance is Turner's Building Cost Index. The Turner Cost Index, an industry-recognized index now for over half a century, is determined by several factors considered on a nationwide basis, including labor rates and productivity, material prices, and the competitive condition of the marketplace. The index does not necessarily conform to other published indices because others do not generally take all of these factors into account.

Our mission in publishing this report is to share thoughtful insight with professionals we engage with in our industry regarding trends and their potential impacts.

MATERIAL

Material Producer Price Index*. The selling price in processed goods used or bought for construction.

In Mar 2022, total material inputs to construction increased +7.5% since Dec 2021 and +21.3% since Mar 2021.

Material PPI - 12/21	Qtr	Yr
Inputs to Construction	+7.5%	+21.3%
Ready Mix Concrete	+2.3%	+7.1%
Steel Mill Products	-15.3%	+42.9%
Flat Glass	+1.8%	+9.5%
Aluminum Mill Shapes	+17.9%	+43.7%
Sheet Metal Products	+4.7%	+33.0%
Gypsum Products	+5.1%	+20.8%
Diesel Fuel	+43.8%	+63.8%
Construction Machinery	+1.1%	+9.1%

LABOR

Construction Employment Cost Index*. The cost to employers for wages and salaries, employer share of benefits, and legally required payments such as unemployment and workers' compensation.

Through Dec 2021, construction wages and salaries increased +1.0% for the quarter and +3.8% for the year.

Construction Employment Cost Index	Qtr	Yr
Total Compensation	+0.9%	+3.5%
Wages & Salary	+1.0%	+3.8%

Construction Employment*. The employment rate in construction, not seasonally adjusted.

Through Mar 2022, construction employment increased by 82,000 jobs (+1.09%) since Dec 2021.

Construction Employment	Jobs	%
3-month change	82,000	1.09%

CONSTRUCTION PRICE

Construction Producer Price Index*. Change in the PPI for Final Demand Construction for all nonresidential construction and key subcategories. Includes material costs, labor costs, and contractor overhead and profits.

In Mar 2022, final demand pricing for all new non-residential construction increased +4.8% from Dec 2021 and +17.0% since Mar 2021.

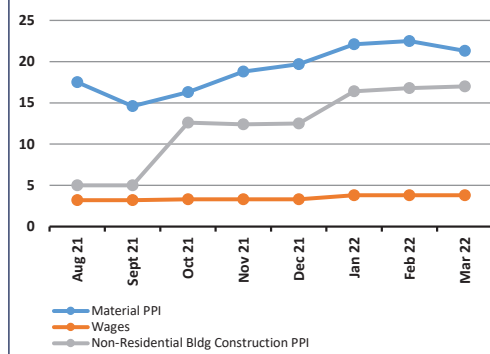
Construction PPI - 12/21	Qtr	Yr
Non-Residential	+4.8%	+17.0%
Office Building	+5.8%	+17.2%
School Building	+3.4%	+12.6%
Healthcare Building	+3.9%	+15.4%

MATERIAL, LABOR, & CONSTRUCTION PRICING

Graphic representation of tables to the left:

- MATERIAL** - Total Inputs to Construction Material PPI
- LABOR** - Construction Employment Cost Index
- CONSTRUCTION PRICE** - Final Demand Construction PPI

Over the 12 month period from Mar 2021 to Mar 2022, the Total Inputs to Construction Material PPI increased +21.3%, the Employment Cost Index increased +3.8%, and the Final Demand Construction PPI increased +17.0%

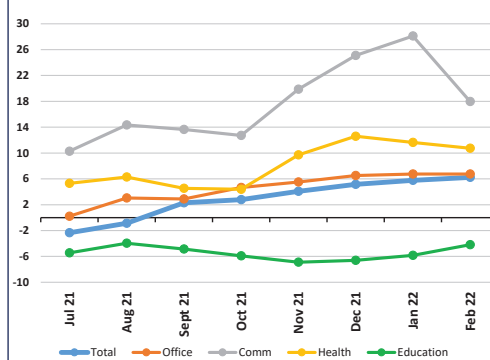


CONSTRUCTION SPENDING

Construction Spending - Value of Work in Place³. Percentage change in private, nonresidential work in place in the last one-month and 12-month periods.

Over the 12 month period from Feb 2021 to Feb 2022, total non-residential construction spending increased 6.2%.

Non-Residential - 2/22	Mo	Yr
Total	-0.1%	+6.2%
Office Building	-0.2%	+6.7%
Commercial	-1.2%	+18.0%
Healthcare	-0.6%	+10.7%
Educational	-1.0%	-4.2%



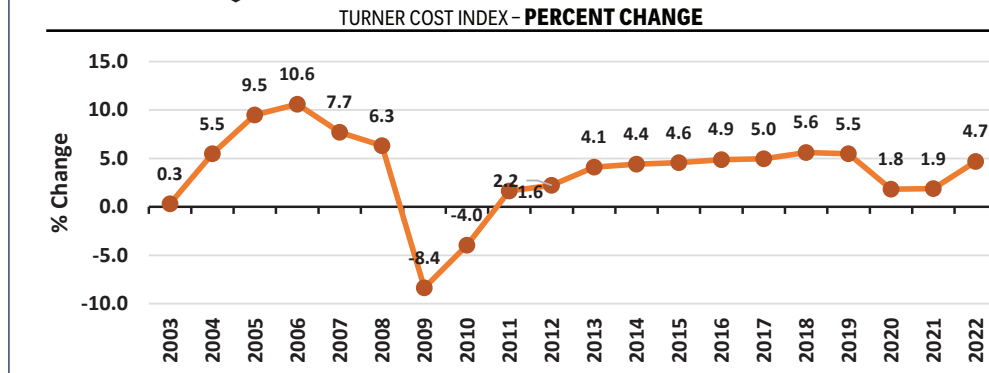
TURNER BUILDING COST INDEX ¹

The Turner Building Cost Index. Determined by the following factors considered on a nationwide basis: labor rates and productivity, material prices, and the competitive condition of the marketplace.

The 1st Qtr 2022 index value of 1255 is a +2.03% change from the 4th Qtr 2021. The last four quarters indicate a cumulative +6.9% increase.

Quarter	Index	Δ%
1st Quarter 2022	1255	2.03
4th Quarter 2021	1230	1.91
3rd Quarter 2021	1207	1.68
2nd Quarter 2021	1187	1.28

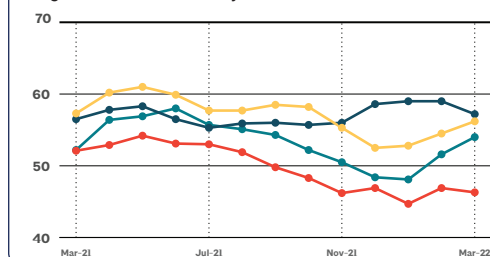
Year	Avg Index	Δ%
2022	1255	4.7
2021	1199	1.9
2020	1177	1.8
2019	1156	5.5
2018	1096	5.6
2017	1038	5.0
2016	989	4.9
2015	943	4.6
2014	902	4.4
2013	864	4.1
2012	830	2.2
2011	812	1.6
2010	799	-4.0



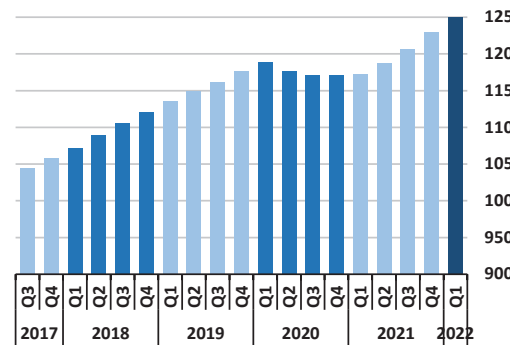
AIA ARCHITECTURAL BILLINGS INDEX

The Architecture Billings Index (ABI) is a leading economic indicator that leads nonresidential construction activity by approximately 9-12 months. A score of 50 equals no change from the previous month. Above 50 indicates an increase and below 50 demonstrates a decrease. The ABI is based on a three-month moving average.

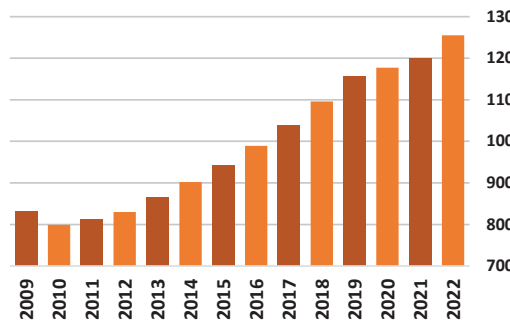
The Feb 2022 Architecture Billings Index score is 51.3. The majority of firms are still reporting steady growth. Regional conditions vary.



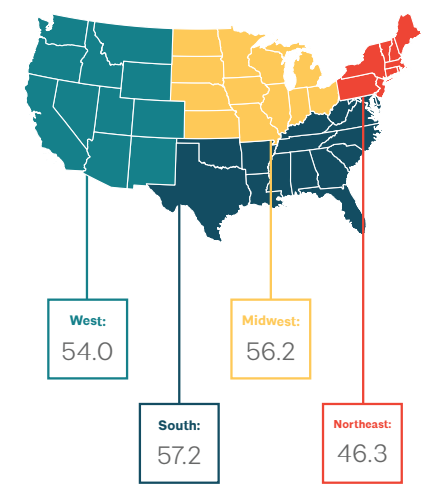
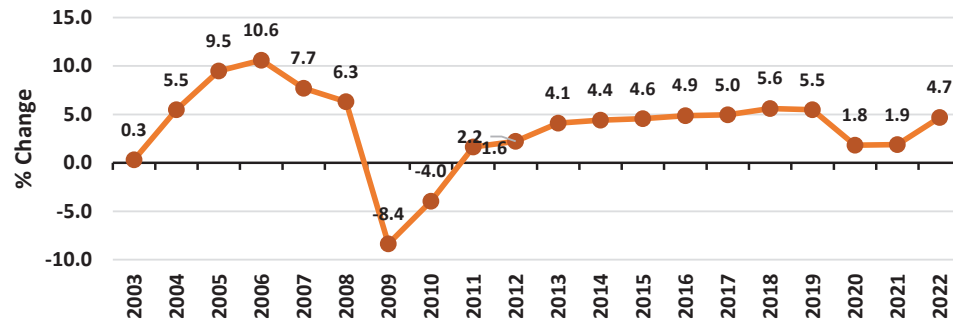
TURNER COST INDEX - QUARTERLY INDEX



TURNER COST INDEX - AVERAGE INDEX



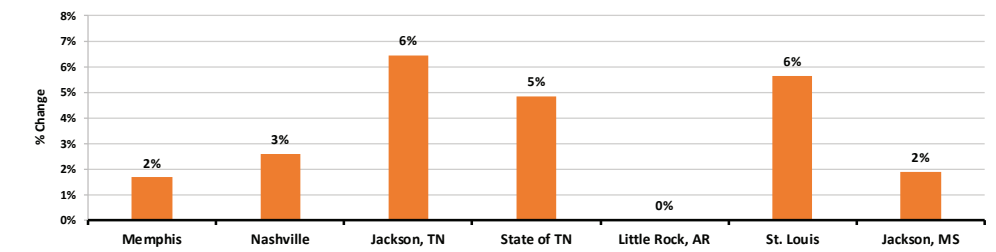
TURNER COST INDEX - PERCENT CHANGE



MEMPHIS

CONSTRUCTION EMPLOYMENT

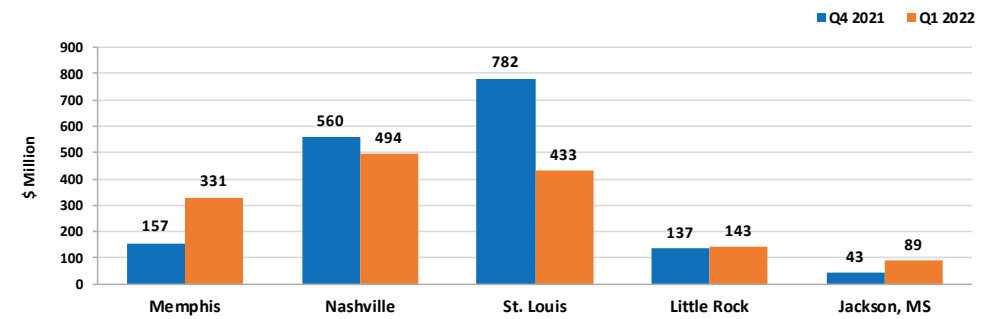
Construction Employment Jan 2021 vs. Jan 2022



Construction employment for the region was up from January 2021 to January 2022.

QUARTERLY CONSTRUCTION ACTIVITY ²

Non-Residential Construction Market Q4 2021 - Q1 2022



Through April 2022, total Non-Residential construction in Memphis was up from Q4 of 2021.

QUARTERLY SUBCONTRACTOR SURVEY

	Wages	Labor Need	Material	Market	Price Impact
Excavation/Deep Foundations	↔	↔	↔	↑	0.95% to 1.10%
Concrete	↑	↔	↑	↑	5.13% to 5.94%
Steel/Metals	↗	↔	↗	↑	1.52% to 1.76%
Roofing & Waterproofing	↑	↓	↑	↓	1.50% to 1.73%
Exterior Wall	↑	↑	↑	↑	3.41% to 3.95%
Interior Finishes & Construction	↑	↔	↑	↑	4.54% to 5.26%
Specialties, Equipment, Furnishings	↑	↔	↑	↑	4.18% to 4.84%
Conveying Equipment	↔	↑	↔	↑	0.57% to 0.66%
Fire Protection	↑	↔	↑	↑	3.68% to 4.26%
Plumbing	↔	↔	↔	↑	1.90% to 2.20%
Mechanical	↔	↔	↔	↑	1.90% to 2.20%
Electrical	↔	↔	↔	↑	1.90% to 2.20%
Sitework	↑	↔	↑	↑	4.18% to 4.84%

↑ > 1.00% ↗ +0.5% to +0.99% ↔ = -0.49 to 0.49% ↘ -0.5% to -0.99% ↓ < -1.00%

QUARTERLY LOCAL ESCALATION

	Trend		Weighted Impact	
	Low	High	Low	High
Material	1.60%	1.85%	0.64%	0.74%
Labor	1.48%	1.71%	0.55%	0.64%
Market Conditions	7.42%	8.59%	1.60%	1.85%
Overall	2.79%		3.23%	

In the 1st Qtr 2022, the local market construction prices continued to increase at a high rate following the close of 2021 and the highest rate increase in more than two years in response to increased demand, increased labor costs, reduced labor availability and ongoing material price increases and volatility.

* Bureau of Labor Statistics ¹ Turner Construction Company

² Dodge Report ³ Census Bureau