

SCHOOL CONSTRUCTION

A LOCAL SNAPSHOT

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About the Report

This school construction cost report is the result of a collaboration between members of the Associated General Contractors of America, Houston Chapter (AGC) and members of the Association for Learning Environments, Gulf Coast Chapter (A4LE).

The goal of this report is to provide information to assist local school districts in planning for their construction projects.

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Next Ring Suburban Growth Drives Future School District Demand in Houston

BY LAWRENCE DEAN, ZONDA (FORMERLY METROSTUDY)
BOB TEMPLETON, TEMPLETON DEMOGRAPHICS

Work from Home Drives a New Commuting Program

Houston, like the rest of the nation, has experienced a new paradigm since March 2020 as many of us are more frequently working (and schooling) from home. Homebuyers are making location decisions for their new home purchase that are increasingly commute agnostic. This is due to many employers allowing work from home to at least partially remain in place for the near future. As a result, demand has grown for new homes in locations that are geographically further out from employment centers. This demand is driven by a variety of factors ranging from more affordable homes to desire for more serene surroundings.

Impact on Local School Districts

Next ring, often smaller school districts, are poised to be impacted most by this homebuyer desire and ability to live further out and the response to that desire by local developers delivering new communities in these locations. This impact is both current and future state in nature.

Waller ISD and Willis ISD are two of the Houston area districts that are expected to see the most growth.

Within Waller ISD, Zonda currently identifies 31,810 planned future lots in the pipeline. Assuming a simplified average of three residents per household, the homes to be built on these lots could add over 95,000 people to Waller ISD's current total population of around 42,000 residents. While some of these 31,810 future planned lots will not actually be developed for ten or even fifteen years, this still portends a tremendous amount of growth for this once rural school district. In the last twelve months, construction started on 793 new homes. To put this in perspective, Metrostudy (since rebranded to Zonda) never observed triple digit annual new home starts volumes in Waller ISD until late 2012. And these 793 annual new home starts represents over double the number of annual starts observed in Waller ISD as recently as 2018. This trend is expected to only continue as multiple planned future new home communities within the District deliver their first home sites in late 2021, 2022, and 2023.

Similarly, Zonda currently identifies 10,238 planned future lots in the pipeline within Willis ISD. Assuming that same average of three residents per household, new homes ultimately built on these future planned lots could add nearly 31,000 residents to the Districts current estimated population of around 50,000 residents. It should be noted that the planned subdivisions making up this identified 10,238 future lots are generally smaller and nearer term in nature than some within Waller ISD. Therefore, delivery of these Willis ISD 10,238 additional future lots

and homes is anticipated to occur over a shorter time frame than the ten to fifteen year build out referenced for the future planned lots within Waller ISD.

Growth Also Occuring Within Suburban Ring School Districts

While demand trends are driving new development further and further out, the Houston region saw strong new home starts activity in all portions of the market. In the last twelve months, Zonda observed 38,300 new home starts across the Houston region. This represents year over year growth of over twenty percent. When looking at the top forty new home subdivisions ranked by annual new home starts volume, strong construction starts can be observed in many suburban school districts around the market. Of these top forty (actually forty three due to three ties) communities:

- Eight are at least partially within Lamar Consolidated ISD
- Six are within Conroe ISD
- Five are within Fort Bend ISD
- Five are within Katy ISD
- Four are within Alvin ISD
- Three are within Cy-Fair ISD
- Three are within Humble ISD
- Two are within New Caney ISD
- Two are at least partially within Waller ISD
- One is within Dickinson ISD
- One is within Goose Creek ISD
- One is within Pasadena ISD
- One is within Spring ISD
- One is within Tomball ISD
- One is within Willis ISD

Activity within these forty three highest volume new home subdivisions made up 40% of Houston's total annual new home starts. The fact that they are spread across fifteen different districts across the region illustrates just how great an impact new home and new roof top growth continues to have on the region's school districts. ◀

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The 2021 Word for School Construction: Supply Chain

BY ERIC TAYLOR, SEDALCO, INC.

In 2020, our school construction market was introduced to the new words “COVID-19” and “Social Distancing”. These new terms radically changed our world and the way we build schools in the greater Houston Market. This year, the word that will have the greatest impact on our construction market is “Supply Chain”. The supply chain continues to be impacted by the effects of the 2020 COVID-19 Pandemic. So how did we get here?

In 2020, steel, lumber and cement manufacturing facilities were closed at various times due to outbreaks of the coronavirus. As the essential work of the construction industry continued through 2020 material stockpiles were depleted by the closures. These closures, coupled with a shortage in international shipping traffic, have created a perfect storm in our supply chains. There simply has not been enough time between these impacts to our material inventories and the surge of construction projects.

As the construction surge across the country continues to develop there are nearly 350 million square feet (“SF”) of industrial projects under construction. Two of the largest projects are right here in Texas. The 4,000,000 SF Tesla “Giga Texas” facility in Austin Texas and the 3,800,000 SF Seefried Industrial Property also in Austin. Amazon has 5 of the top 10 largest industrial construction projects under construction in the United States at 17,587,858 SF.

The impact, iron and steel prices have increased 15.6% from January of 2020 to January of 2021. Lumber prices have skyrocketed 73% from January of 2020 to January of 2021. Finally, cement prices have gone up 10.1% from January of 2020 to January of 2021. The cement price increase represents the highest increase in cement prices since the increase of 14.5% in 1998. PVC prices have increased a whopping 270% from March of 2020 to March of 2021.

How will these supply chain impacts affect school construction this year? The most prominent challenge facing school construction this year is the availability of steel joists. The large industrial projects have consumed the steel joists manufacturing capacities for the foreseeable future. On a typical steel joist order the submittal process will run 4 weeks for drawing preparation followed by 4 weeks of review and approval of shop drawings. Once approved, steel joists will typically be delivered to your site in 3 months. The current lead times for steel joists are running 8 to 10 months once the shop drawings are approved. That is a 5 to 7 month delay on any project hoping to use steel joists. Essentially, you will be waiting an additional 5 to 7 months to roof your building. An additional complication to the steel joists shortage is the way the manufacturers process their orders. They do not build joists by the job order but rather by the depth of the joists.

The manufacturers will look across all current POs and fabricate the largest depth joists to the smallest depth joists back and forth in perpetuity. Where your project may land in their current cycle will determine the lead time for your joists.

In conclusion, we have not fully realized the impact of the global pandemic to the supply chain and our school construction industry. There will likely be additional shortages and prices increases on other materials critical to our industry. These impacts are projected through the first quarter of 2022. The best practice for now is early planning and communication with your design teams and general contractors. As a community we have overcome these challenges before and will do it again. We are an amazing community of educators, designers, and builders capable of doing great things. By working together through these challenges, we can all ensure these mission critical projects are built for the students in our community. ◀

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Commercial Construction Market Outlook

It All Depends: Vaccines and Variables

BY PAT KILEY, KILEY LITERARY LEGACIES, LLC

It is reasonable to expect the commercial construction market, this year, should be better than last year, despite a lingering COVID-19. The United States seems to be much more on top of this problem. However, there are still too many variables to make an improved market a certainty. Here are several reasons.

For many construction companies, 2020 turned out better than people thought at this time a year ago. These companies had decent backlogs, significantly better than the start of 2021. When the industry was declared “essential”, many of these projects moved forward. Some after a few months delay, but they generated revenue for the builders. Many projects, though, in the conceptual or pre-construction phases were abruptly halted. There was simply no clarity about the short-term future. Consequently, there was not the same volume of work for contractors to negotiate or bid and replace their backlog. Slowly, some of these are coming back to life.

Special Note: The declaration of this industry as “essential” is the single most important event of the last 100 years for the building community. It saved hundreds of companies and thousands of jobs. It required convincing two vastly different personalities, a ring-wise veteran mayor, and a newly-elected county judge. The industry is deeply indebted to the competent leaders who achieved this result. And the industry deserves kudos for complying with protocols and avoiding jobsite closures.

Four months into 2021, the percentage of people vaccinated continues to climb, and many services industries are bringing their people back. However, we are far from the 65-70% vaccination level the scientific community demands to relax requirements. At the time of writing this article, the US stands at about 48% fully vaccinated. In addition, there are new variants of COVID-19 and an absolute national crisis in India, a key US business partner. So, it is reasonable to think the US will remain under the COVID-19 cloud through 2021. Then there is the recent price volatility and shortages with lumber, steel, and concrete. Hopefully, this issue is

short lived. The inability to get microchips enters this mix too. A few large projects are on hold until prices stabilize.

However, there is some good news too. Some major medical work moves forward. Schools and university projects do too, if they have approved and funded bonds. Online purchasing also continues to grow. Consequently, the market for completion centers and “last mile” warehouses, already

The declaration of this industry as “essential” is the single most important event of the last 100 years for the building community.

stretching in every direction on Houston’s major highways, should continue to provide opportunities. The one wounded segment is general purpose office space. The energy sector, and others, can do the same volume with less people in the home offices. Work from Home’s (WFH) long-term impact remains a variable. Hybrid options are under discussion. People can elect certain days in the office, others at home.

Churches, retail, and restaurants need to see the return of their congregants and customers, before expanding. That said, there is a lot of money waiting to be spent; people have lived in isolation and self discipline. There is pent up demand for self-indulgence: travel, luxury goods, personal services, and expensive hobbies. With a COVID-19 “all clear”, sales could bounce back, then skyrocket quickly. The single family housing market was up 10% last year and is on that same path again. Apartment dwellers are buying, and existing homeowners are expanding. The consumer, 70% of the national economy, seems poised to spend. US Gross Domestic Product forecasts reflect this. Consensus for US GDP growth in 2021 is 6.5-7%, comparatively staggering. It has been consistently revised upward.

There is good news, too, with the unemployment picture, both locally and nationally. In March and April of 2020, Houston lost 352,000 jobs. Over 200,000 are now back. We will add another 32,000-62,000 jobs back in 2021, according to the Greater Houston Partnership, depending on timing and percentage of vaccinations. Nationally, the picture is improving rapidly. Ten million less people were working on March 1, 2021 than on the same date in 2020. By mid-April, that number is near 7 million. Also, about 750,000-800,000 people have been filing first-time unemployment claims each week. Now that number is under 600,000. And in March, 915,000 new jobs were added. These positive trends are expected to continue and accelerate.

These many uncertainties make it hard to be too specific about 2021. It would appear to be another tepid year with a chance for this picture to change radically for the better around September. Houston now puts at least \$30 billion of construction in-place each year. This number is the total for all three major segments: residential (single and multi-family), commercial/industrial, and non-building structures (streets, roads, highways, bridges, civil work). The commercial/industrial sector averages around \$10 billion annually. This level should allow companies to maintain the current path, but real growth is still a year or so away.

The longer-range picture is more bullish. Respected Texas economist, Ray Perryman, Ph.D., projects Houston to have major population and job growth over the next 25 years. By 2045, he forecasts Houston to have 10 million people and Gross Area Product of \$1.15 trillion, annually, up from our current level of about \$600 billion. Nothing is a more consistent driver of construction activity than population and job growth. According to historical records, construction put-in-place in any area is normally a minimum of 5% of the Gross Area Product. If we reach the \$1 trillion mark, our market will approach the \$50 billion mark. Optimism beyond the COVID-19 crisis is warranted.

In addition to the short-term challenge of the market, there are a few key issues that all firms will need to address. How you may be impacted will vary by your role in the process: Owner, Architect, Engineer, General Contractor or Specialty Contractor.

Pre-fabrication (offsite build, onsite install) is exploding. More specifications carry a requirement for this delivery method, as owners educate themselves and then require. Most specialty contractors have increased their capabilities to provide it by expanding their facilities. In addition to schedule and cost advantages, it has recruiting advantages over a field worker's role. A fan-equipped building is cooler than a Houston jobsite and minimizes lost pay days because of weather. Some owners, whose projects have modular units (apartments, hotels, hospitals) are leasing facilities to enable multi-craft, integrated prefab on larger projects. More recently, robotics is entering the picture, making

the offsite build portion more resemble manufacturing. New technology companies, with technology investor mindsets, are discovering this industry, as well. There is a new acronym circulating, DFMA. It stands for "Design for Manufacture and Assemble." This whole pre-fabrication process and its subsequent iterations could bring "disruptive innovation", defined as "change that dynamites the current value chain and reassembles it for the benefit of the disruptor."

Succession is impacting most construction companies. Baby Boomers (1946-1964) are exiting daily, from the executive suite and the jobsite. There are not enough Generation Xers to replace them, so the Millennials must take on responsibilities earlier than the traditional industry norms. Consequently, the entire human resources/talent management function is increasingly overseen by senior-level leaders. High potentials in all areas are identified and

groomed for more impactful roles at any earlier age. New experiential leadership training programs are available as are competency-based, not time-based, journeyman training programs. Even though technology will enable things to be done differently, faster, and perhaps better, it is Human Capital that will always provide the competitive advantage to firms in this industry.

The road ahead is rich with opportunity and excitement for those companies that "drive" all aspects of their business, the road ahead is rich with opportunity and excitement, even though it will be a bit foggy for the next 12-15 months. ◀

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Fall 2020 & Spring 2021 Approved K-12 School Bonds - Greater Houston Area School Districts			
District	Purpose	Bond Total Approved	Election
Katy ISD	Natatorium, Athletic Facilities Improvements, School Building & Security, School Building & Technology	\$676,226,420	May 1, 2021
Dickinson ISD	School Building, Buses & Technology	\$94,200,000	November 3, 2020
Friendswood ISD	Technology, School Building & Security	\$128,000,000	November 3, 2020
Lamar CISD	Technology, School Building & Security	\$666,810,864	November 3, 2020

Source: Texas Bond Review Board & Texas Comptroller

Fall 2020 Defeated/Cancelled K-12 School Bonds - Greater Houston Area School Districts			
District	Purpose	Bond Total	Result
Galveston ISD	Athletic Facilities Improvements, Baseball Park, Natatorium	\$217,500,000	Cancelled
Lamar CISD	Stadium, Aquatic Facilities	\$125,720,269	Defeated
Royal ISD	Land Purchase, Athletic Facilities Improvements, School Building & Buses	\$37,300,000	Defeated
Santa Fe ISD	School Building, Athletic Improvements	\$4,695,000	Cancelled
Sheldon ISD	School Building & Security	\$438,800,000	Cancelled

Source: Texas Bond Review Board & Texas Comptroller

2021-2022

Cost Trends Survey

BY BOB RICHARDSON, DUROTECH, INC.

As part of the AGC/A4LE Joint Committee, Durotech, Inc. conducts an annual survey of over 3,000 subcontractors and major design firms in the K-12 construction market within the Houston region. Respondents are asked to provide cost projections from their point of view based on how costs affect their specific trades. They are grouped into three categories: Labor Intensive (shell, concrete, masonry, earthwork, underground, etc.), Finish/Specialty (non-MEP interiors), and MEP (mechanical, electrical, plumbing, and data).

2020 was a difficult and unusual year. Even though construction was locally declared an essential industry and projects under construction and new projects continued, the volume of Houston MSA new, private sector work dramatically declined. Contractors began to work off their backlog and with less new work on the horizon, price increases mitigated, and in some cases fell. The average year over year cost increases in different K-12 facilities dropped. However, increasing materials supply chain issues began to appear in 2020 and are now apparent in 2021.

In last year's presentation, we predicted that the fall in local work created by national and local conditions would create an artificially low construction pricing market, which is dangerous to owners, designers, and contractors. That has occurred, but it is happening faster than we predicted. The US Bureau of Labor Statistics reported that from April 2020 to February 2021, the percentage increases in input costs and bid prices were 12.8% and 0.5%, respectively. Costs to contractors rose dramatically, but construction prices barely moved as contractors struggle to secure work. This creates a potential cost trap of artificially low prices and rapidly rising materials cost, which threatens project viability.

In 2020, the range of actual costs for greenfield projects increased at the highest and lowest range levels, but the gap between them tightened. This indicates the changes evolving in elementary schools seen over the last 3 years are becoming more widespread, which may also be the case for middle schools. This is also reflected in all building categories later in the survey in curriculum and design cost impacts.

These trends may be better expressed in the Design Professional Future Average Projections figure below. While costs are increasing, the lower-range number is moving up and the high-low spread tightens. It is difficult to secure a large enough sample of high schools to firmly establish a definitive high school trend since they are not built as frequently and their size allows the cost to be spread over a larger footprint, which can create an inaccurate picture if projects have disparate programs and design standards. The year over year cost increases are modest and actually pull down the over average trend line of cost increases.

Going forward, our design professionals have slightly lowered their prior forward cost projections. The deviation of projected from actual costs has traditionally created a fairly consistent safety zone above actual costs. The only instances of budget danger have been elementary schools in 2016 and 2018, otherwise there has been about a \$20 per square foot market-wide buffer. For the 2021-2023 elementary school and junior-high/middle school projections, we have concerns about what costs will actually be. Last year, we projected significant

potential cost escalation during that period and that escalation is presently appearing more rapidly in 2021, than projected. This intensity of increase has the potential to stress or exceed the projections.

The subcontractors in their survey responses show significant projected materials and labor increases. Productivity is projected to increase, but many subcontractor survey respondents are concerned about productivity and labor availability. The survey results show 2020 responses were more positive than projected, except in margins. Subcontractor concerns align with the design firms in several areas. Note the congruent concern for availability of labor in both design and construction disciplines in figures below. Design professionals presently show more concern with construction schedules, but by this time next year, it is likely that both groups will show significant construction schedule concern as materials costs and deliveries become an increasing issue.

Basic materials commodity prices are rising dramatically as countries attempt to pull away from coronavirus-restrictions and this becomes embedded in finish goods and deliveries, then appears in subcontractor pricing. Note the high projected local increase in materials - this is the coming price trap we forecasted last year, which is dangerous for all projects and participants. When overlaid on revenue projections, labor and materials cost increases outrun revenue increases by a significant margin. We have never seen this in the past. If a subcontractor, general contractor or project owner is boxed in with artificially low pricing in a rising market, this projected overrun indicates a market presence for potential significant financial and schedule issue or issues from a given project or projects. For subcontractors to simply break even, cost increases will have to be 12% or greater in this scenario.

Going forward due to dramatically rising costs, we are revising our cost projections for 2021 through 2023. For a 6.4% annualized GDP growth rate - which surprisingly happened to also be the higher than anticipated GDP growth rate in Q1 2021 - there will likely have to be a GDP rate surge in the third and fourth quarters. Economists seem to think GDP growth will fall off in 2022, but we believe economic growth and cost increases will continue onwards through 2023, based on momentum, spending and increasing cost. Our projections for annualized compound increases will run through 2023. ◀

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Specialty Contractor Surveys & Trends: Average* (%)															
	Labor Intensive Trades					Finish/Specialty Trades					MEP Trades				
	2018 Act.	2019 Act.	2020 Proj.	2020 Act.	2021 Proj.	2018 Act.	2019 Act.	2020 Proj.	2020 Act.	2021 Proj.	2018 Act.	2019 Act.	2020 Proj.	2020 Act.	2021 Proj.
Materials Cost Increases	6.0	3.5	3.9	4.9	11.6	3.6	2.98	5.36	7.86	14.07	3.1	6.17	5.72	10.15	16.08
Labor Cost Increase	7.0	4.1	3.8	4.3	6.4	3.3	3.5	4.4	5.6	6.8	3.0	4.56	6.56	4.38	5.65
Labor Production Rate Increase	6.0	0.29	0.79	0.16	2.95	2.3	-1.8	7.7	3.54	3.61	-0.63	0.44	1.56	2.08	5.54
Revenue Increase	7.0	7.5	6.9	-1.89	8.1	12.5	-2.2	1.9	11.0	5.6	5.5	14.89	2.83	12.85	4.85
Margin Increases	2.7	-1.2	0.2	1.8	3.1	2.8	0.6	1.55	0.2	-1.1	0**	27.22	1.72	0.04	1.65

*Percentages indicated are an average of all respondents overall.
 **Survey responses included both increases and decreases resulting in a zero net increase.
 Source: Annual Subcontractor Survey by Durotech, Inc.

Specialty Contractor Surveys & Trends: Average All Trades* (%)					
	2018 Act.	2019 Act.	2020 Proj.	2020 Act.	2021 Proj.
Materials Cost Increases	4.35	4.0	4.8	7.3	13.6
Labor Cost Increase	4.87	4.6	4.6	4.8	6.3
Labor Production Rate Increase	1.82	0.29	3.6	1.7	3.9
Revenue Increase	5.16	6.31	12.6	6.2	6.4
Margin Increases	2.09	0.02	0.02	0.8	1.4

*Percentages indicated are an average of all respondents overall.
 Source: Annual Subcontractor Survey by Durotech, Inc.

Specialty Contractor Market Summary			
	2019	2020	2021
Labor	Tightening	Uncertain*	Tightening
Labor Productivity	Flat	Flat	Rising
Materials	Slower Rise	Slower Rise	Fast Rise
Revenue	Rising	Rising*	Flat
Margins	Rising	Flat*	Small Increase

*There are large variations in the survey results. Division 9-13 revenue appears slightly higher, but margins are decreasing and are overall negative for those divisions indicating heavy price competition, possibly due to new company entrants. Division 3 also reports flatter number for the same reasons.
 Source: Annual Subcontractor Survey by Durotech, Inc.

Specialty Contractor Major Concerns																			
Economy				Labor Availability				Labor Productivity				Competition				Schedule			
2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
57%	32%	41%	40%	79%	28%	21%	19%	36%	13%	9%	7%	38%	18%	16%	23%	-	7%	8%	11%

Source: Annual Subcontractor Survey by Durotech, Inc.

Design Professional Major Concerns																			
Economy				Labor Availability				Labor Productivity				Competition				Schedule			
2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
-	20%	21%	37%	-	30%	31%	20%	-	22%	18%	15%	-	12%	16%	15%	-	13%	35%	50%

Source: Annual Subcontractor Survey by Durotech, Inc.

Design Professional Average Future Cost Projections*					
	2019	2020	2021	2022	2023
Elementary	\$200-258/sf (Avg. \$229/sf)	\$195-255/sf (Avg. \$222/sf)	\$180-270/sf (Avg. \$225/sf)	\$185-280/sf (Avg. \$232/sf)	\$190-285/sf (Avg. \$237/sf)
Middle/JHS	\$210-280/sf (Avg. \$250/sf)	\$225-245/sf (Avg. \$231/sf)	\$200-290/sf (Avg. \$245/sf)	\$210-300/sf (Avg. \$250/sf)	\$210-335/sf (Avg. \$272/sf)
High School	\$245-305/sf (Avg. \$280/sf)	\$245-290/sf (Avg. \$267/sf)	\$190-270/sf (Avg. \$203/sf)	\$220-335/sf (Avg. \$278/sf)	\$235-375/sf (Avg. \$305/sf)

*Costs vary in school types based on location, programs, scope, technology and finish requirements.
 Source: Annual Subcontractor Survey by Durotech, Inc.