

CONSTRUCTION COST NOTE

# PHILADELPHIA, PA

June 2022



This note assesses the Philadelphia, PA construction market, including economic and sector activity, as well as input cost trends impacting construction prices. We provide Dharam Consulting's view on the outlook for local contractor bid submission price inflation.

# DHARAM CONSULTING VIEW

Construction activity in the Philadelphia market has been fairly steady, but not overly buoyant over the past year. Contractor bid submission price escalation has been more tempered than we had expected so far given the sharp increases in building cost over the past 18 months, suggesting that the supply chain has absorbed a significant proportion of higher costs.

We now expect that higher prices will increasingly be passed on to clients, which will test the strength of the market to proceed with planned projects. The project pipeline has risen significantly over the past year, spurred by a flurry of residential mixed-use building permits issued in 2021.

In addition to residential mixed-use projects, there are a number of higher education, healthcare & life sciences projects, which, if they all proceed as planned, would significantly increase resource and capacity demand in the local market.

To maintain a healthy project pipeline, clients and contractors need to prepare for an extended period of price uncertainty and volatility. A balanced risk allocation throughout the procurement and contract period will be key.

## CONTENTS

DHARAM CONSULTING VIEW	1
CONSTRUCTION COST DRIVERS	2
Economic Backdrop	2
National Construction Sector Activity	3
Philadelphia Construction Trends	4
Current Local Pipeline	5
BUILDING COST + SUPPLY CHAIN ACTIVITY	8
National Building costs	8
Philadelphia Building + Labor Cost	8
Building Materials	10
BID SUBMISSION PRICE INFLATION	12



# CONSTRUCTION COST DRIVERS

## Economic Backdrop

Geopolitical events, inflation, rising interest rates, volatile commodity and equity markets, as well as persisting supply-chain disruptions are all increasingly testing the economy's resilience.

Globally, the Russia-Ukraine war – together with China's no-Covid-19 policy and consequent enduring lockdown of Shanghai – has exacerbated supply chain disruptions and has fueled sharply higher inflation, both of which had been expected to recede over the course of this year.

Russia and Ukraine account for a small share of global GDP, but both play a large role in the supply of key energy, food and industrial products, such as oil & gas, fertilizer, lumber, aluminum, iron and steel, as well as wheat, corn and other agricultural products. As such, energy, commodity and food prices are the main transmission channel through which the war is impacting global economies and inflation.

Given close energy ties to Russia, the European economies are much more heavily exposed than the US. Nevertheless, increases in energy and commodity prices will not only add to the inflationary pressures already in place, but also weigh on business and consumer sentiment.

However, despite a noticeable more pessimistic turn in market sentiment, the US economy is still performing solidly.

The pace of growth has certainly slowed, but business activity is firmly in positive territory, with both the manufacturing and services sector purchasing managers' indices (PMI) recording an expansion (chart 1). The trends seen over the past year continue: Demand continues to expand, across the economy businesses are facing labor shortages, and input costs are still rising. Businesses' financial position is generally firm, benefiting investments.

Despite the pace of current price increases and the squeeze on real incomes, consumer spending is proving resilient so far, perhaps due to jobs growth, low unemployment and savings accumulated during the pandemic.

Labor markets are very tight, with unemployment low (3.6%), employment rising and labor force participation not increasing fast enough.

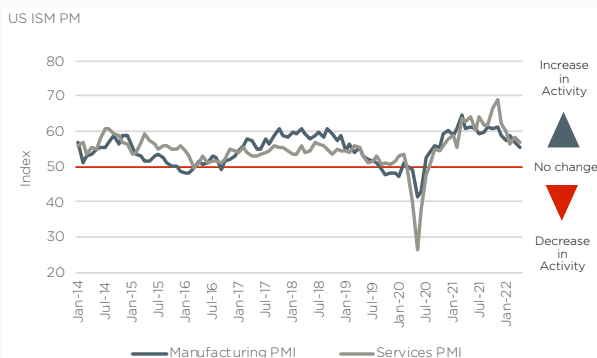
Yet, fears over a looming recession have grown in recent months. It is the path of inflation and the Fed's actions to slow it that are the main factors driving perception over the US economic outlook. The Fed not long ago described the supply disruption induced inflationary pressures as "transitory", but the narrative now focusses on inflation being much stronger, higher and persistent than expected.

In May, consumer price inflation rose to an annual 8.6%. Fuel, food and shelter prices are rising particularly fast. To combat inflation, the Fed raised interest rates by 0.75 percentage points in June to a target rate of 1.5 - 1.75%. This is the largest increase in interest rates since 1994. At the same time, the Fed signalled that it would continue to raise rates this year to 3.0 – 3.375%.

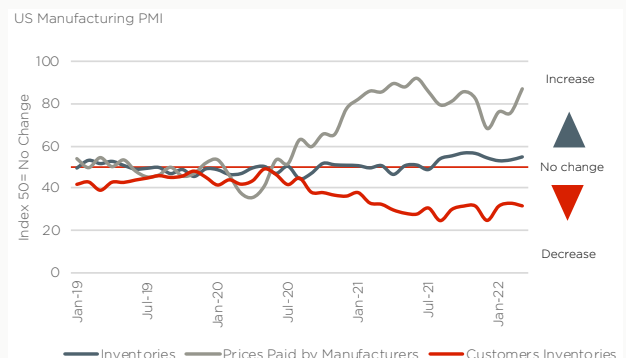
For the Fed it will be a challenging task to lift interest rates and to achieve a 'soft landing' – to slow inflation without instigating an economic downturn. So far, opinion is not only divided over the question whether the US is headed for a recession this year or next, but also over the potential depth, duration, and its impact on the construction industry. Whilst there is a high dose of speculation, there are a number of best-to-worst case scenarios that could play out.

Only few have called a recession in 2022, but the odds have increased for 2023. Considering the uncertainty over the Ukraine conflict and its impact on the US economy, to higher inflation expectations, more aggressive monetary policy growth to slow to 3% in 2022 and 2.2% in 2023. At present, the Conference Board do not believe that a US recession is likely in 2022. The International Monetary Fund shares that optimism with an estimate of 3.7% GDP growth this year for the U.S.

CHART 1: US BUSINESS ACTIVITY



Source: ISM



Source: ISM

Against this challenging backdrop, economic forecasts should be treated with caution. Volatile market conditions cause forecasts to be updated and changed frequently, negatively impacting business planning. Dealing with uncertainty through scenario planning is likely to be a better option until volatility moderates, allowing businesses to remain flexible as events unfold.

The wider Philadelphia-Camden-Wilmington metro area has largely mirrored the US economic and employment growth over the past year. In Philadelphia City, the impact of the Covid-19 pandemic on local labor markets had been steeper, but since mid-2021 employment growth has outpaced that seen in the wider metro area and the US average.

### National construction sector activity

Construction data paints a mixed picture of industry activity. Construction spending in April 2022 stood at an annualized \$1,745 billion, 12% higher in value terms than during the same period last year. Adjusting for output price inflation, construction volumes have declined since late 2021.

Demand for life sciences, data centers, manufacturing and logistics facilities has soared and multi-family and student accommodation projects are also seeing a firm flow of new projects commencing on site. In contrast, many non-residential projects are struggling to regain momentum, including commercial hospitality and retail projects. Whilst the need for infrastructure development is being addressed by the Infrastructure Act, we are yet to see a consistent uplift in infrastructure spending.

Most architects recorded strong business conditions in recent months, with new project activity (design contracts), backlogs and billings increasing firmly in April, according to the AIA survey of architects. Firms report plenty of projects in the pipeline, with finding employees to deliver the work an increasing challenge. This overall positive picture is driven by strong activity particularly in the South, West and the Midwest. Positively, after six months of slower industry activity, architects in the North East reported that billings increased in April.

Despite the firm growth rates, to date (May 2022), employment levels remain 2.5% lower than January 2020 pre-pandemic level. The Professional & Business Services sector has recovered most of its losses, but in other sectors, including leisure & hospitality, financial services and IT, employment levels are still significantly lower than two years ago.

Construction employment in the first five months of 2022 is up 3.3% year-on-year. So far this year, the residential sector continued to see the strongest employment, with 5.1% more jobs than during the same period last year. In the first five months of 2022, there were also 2.6% more jobs in the non-residential building sector compared to a year ago. Jobs also rose for speciality trades contractors, with employment in the five months to May 3.3% higher year-on-year, while those in the infrastructure sector increased by 3.1%.

In the first four months of 2022, new construction starts totalled \$303 billion, 6% more than during the same period a year ago. Non-residential starts increased by 19%, and whilst this was mainly driven by three large industrial project starts, the underlying positive trend will be welcomed by the industry. Positively, commercial project starts also increased, rising 11% compared to a year ago. Pent-up demand is high and the pipeline strong for non-residential buildings. However, markedly higher prices are impacting viability, which is likely to slow the flow of projects through the design and planning stages to work on site. The flow of residential starts slowed to 3% year-on-year in the three months to March. The infrastructure sector is yet to see a meaningful uplift, with the value of starts down 2% in 1Q 2022.

CHART 3: US CONSTRUCTION SPENDING

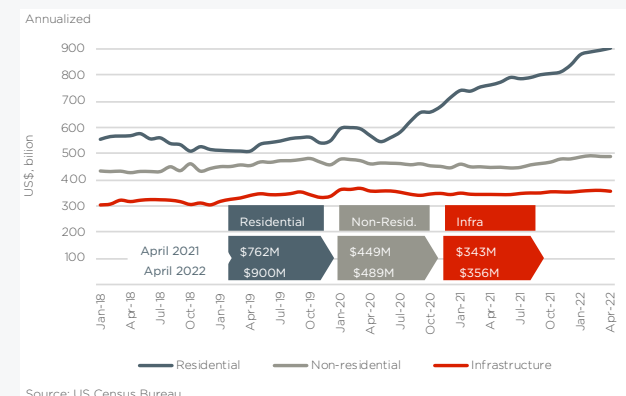
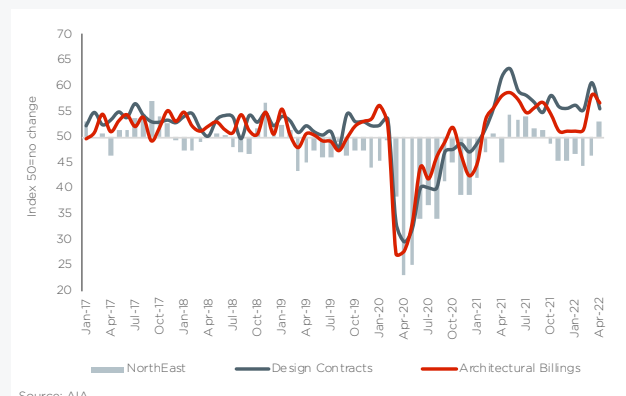


CHART 4: ARCHITECTS' BILLINGS



## Philadelphia Construction Trends

Construction starts in the Philadelphia metro area totalled \$12.2 billion in 2021, the highest value since 2017. Even accounting for construction inflation, this is a solid increase in workload. Dodge Analytics forecasts the value of construction starts to hold stable this year and next at around \$12.2 billion per annum. Taking into account price increases this would translate into a decline in new work volumes.

The market was dominated in recent years by large healthcare and education related construction programs, but residential mixed-use construction has taken the lead over the past year. The market is also seeing improvements to public places, parks, and connecting neighbourhood projects, as well as developments within the \$4bn Navy Yards. Higher education institutions are also continuing to roll out significant investment programs aimed at retaining students and creating self-sustained neighbourhoods enticing people to live, study and work in the city.

The volume of residential construction permits surged in 2021, as the expiration in the city's residential development tax abatement program spurred a flurry of multi-family residential permitting. Before the change, developers were exempted from paying real estate taxes for 10 years. The new bill, which took effect on January 1, 2022, decreases the value of the 10-year abatement for new residential properties by 10% per annum, starting after the first year.

In addition, Philadelphia's 1% development impact tax on residential construction also went into effect at the start of 2022.

Developers are required to pay half of the tax when the building permit is issued and the other half at final inspection. Whether all of these schemes that have been given a construction permit in 2021 will start on site remains to be seen, given the current building cost trends.

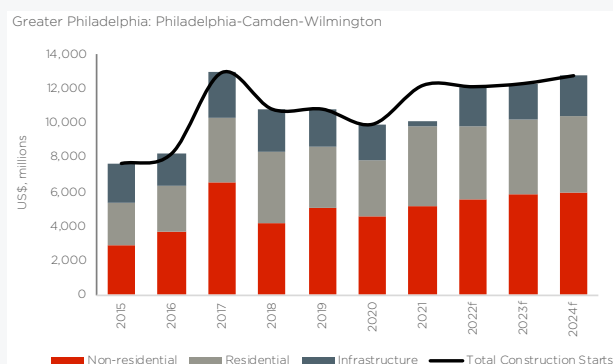
The pipeline of non-residential construction projects is also increasing, but most projects are in early design phases and are expected to start over the next 18-24 months, at which point the market will be hoping for a more stable business environment.

So far, in the first four months of 2022, \$4.6 billion worth of construction projects started in the metro area, an increase of 7% compared to a year ago. Unsurprisingly, there was a jump in residential starts, totalling \$2.3 billion, up 21% year-on-year. Infrastructure starts also increased in the first four months of 2022, totalling \$878 million, compared to \$772 million during the same period last year. In contrast, the value of non-residential starts had a weak start to the year, with just \$1.5 billion worth of projects starting on site, compared to \$1.7 billion a year ago.

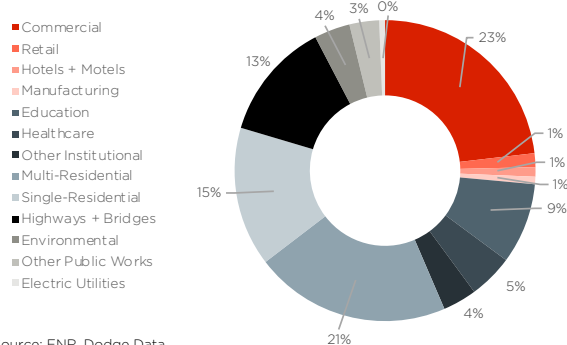
Construction employment in the metro area has steadily recovered from the shock sustained in early 2020. In the three months to May 2022 construction employment was 1.5% higher than a year ago. In Philadelphia City, employment had peaked a few years back in 2018 at nearly 14,000 construction workers. In May 2022, there were 12,200 people employed in the construction industry, 3% more than during the previous year, but still fewer than in recent times.

### CHART 5: CONSTRUCTION STARTS

Residential project permitting has increased sharply in 2021, ahead of the expiration of the tax abatement program. This is expected to feed through to an increase in residential project starts this year.

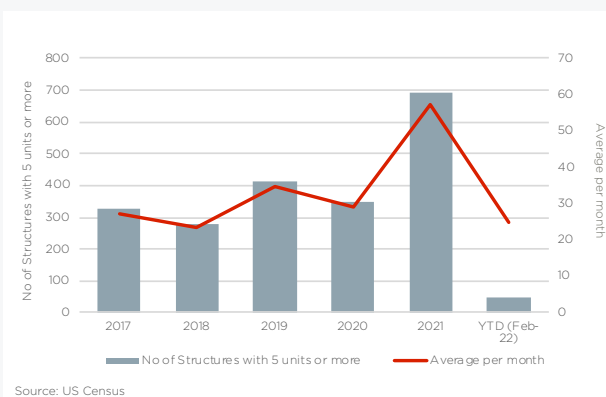


Greater Philadelphia: Philadelphia-Camden-Wilmington  
Construction starts by sector: 2-year average (2020-21)



### CHART 6: RESIDENTIAL CONSTRUCTION PERMITS

Residential mixed-use, as well as healthcare and academic project starts are expected to lead an uplift in the construction market this year. At the same time, the return of commercial non-residential projects is expected to be delayed as financial viability will be tested by higher construction cost.



## Current construction pipeline

Our Philadelphia active major projects pipeline (projects worth more than \$100m) contains around 60 projects (table 1). The pipeline contains active projects on site and those expected to start in the near future, with the main focus on non-residential and residential projects.

The pipeline excludes projects in early planning or those where the construction timeline is unknown.

TABLE 1: PHILADELPHIA - LARGE PROJECTS PIPELINE

LARGE-SCALE PROJECTS UNDERWAY	Sector	Project Cost US\$, million	Start	Completion	Developer/ Owner
<b>University City District</b>	<b>Mixed-use</b>				
3.0 University Place I 4101 Market Street	Life Sciences/Lab/Office	56	Q2 2021	Q4 2022	University Place Associates, Silverstein Properties
One uCity Square	Mixed-use	280	Q1 2020	Q3 2022	University City Science Center, Wexford S&T, Ventas
Drexel Academic Tower (Health Sciences Building)	Academic	N/A	Q3 2020	Q2 2022	Wexford Science + Technology, Ventas Inc.
Kelly Hall Renovation and Expansion	Student Housing	N/A	Q3 2021	2023	Drexel, American Campus Communities (ACC)
Vagelos Laboratory for Energy Science and Technology	Academic/ Lab	173	Q1 2022	Q3 2024	UPenn
3101 Market   Schuylkill Yards	Mixed-use	N/A	Proposed		Drexel University, Brandywine Realty Trust
JFK West Tower I 3025 JFK   Schuylkill Yards	Mixed-use	287	Q1 2021	Q4 2023	Brandywine Realty Trust
JFK East Tower I 3001 JFK   Schuylkill Yards	Office/Lab	N/A	Proposed		Brandywine Realty Trust
3151 Market Street   Schuylkill Yards	Lab	300	Q1 2022	Q2 2023	Brandywine Realty Trust
4.0 University Place I 4055-89 Market Street	Mixed-use	N/A	Proposed		University Place Associates
Sansom Place East Renovation	Student Housing	94	2022	Q3 2023	UPenn
Garden Court Plaza I 4701 Pine Street	Residential MU	35	2021	2022	Infinity Collective
Metroplex II   Schuylkill Yards	Life Sciences	N/A	2020	Q4 2022	Brandywine Realty Trust
155 Radnor	Life Sciences	N/A	2020	Q2 2022	Brandywine Realty Trust
3201 Cuthbert St.	Life Sciences	400	Q4 2022	2024	Drexel University, Gatusso Development Partners
CHOP Hub for Clinical Collaboration	Healthcare	492	Q1 2020	Q2 2023	Children Hospital of Philadelphia
CHOP - New Patient Tower	Healthcare	1900	proposed	2028	Children Hospital of Philadelphia
CHOP - services and logistics center	Logistics	N/A	2021	Q3 2022	Children Hospital of Philadelphia
CHOP Expansion (690 Schuylkill Avenue)	Healthcare	600	Proposed (2024 completion)		Children Hospital of Philadelphia
<b>Navy Yard Developments</b>	<b>Mixed-use</b>	<b>2600</b>			<b>PDIC, Ensemble, Mosaic</b>
Navy Yard Phase I - 1201 Normandy Place	Life Sciences	N/A	2022	2023	Ensemble, Mosaic
Navy Yard Phase I - 333 Rouse Boulevard	Office/Lab/Warehousing	N/A	2022	2024	Ensemble, Mosaic
Navy Yard Phase I - Chapel Block	Residential MU	N/A	2023	2025	Ensemble Real Estate Investment, Mosaic Development Partners
<b>Camden Waterfront</b>	<b>Mixed-use</b>	<b>1,000</b>	<b>2015</b>	<b>2025</b>	<b>Conner Strong &amp; Buckelew, NFI, and the Michaels Organization</b>
Camden Waterfront - Phase 4	Mixed-use	250	2021	2023	Conner Strong & Buckelew, NFI, and the Michaels Organization
Camden Waterfront - Phase 5	Mixed-use	250	2023	2025	Conner Strong & Buckelew, NFI, and the Michaels Organization
<b>East Market</b>	<b>Mixed-use</b>	<b>1,000</b>	<b>2016</b>	<b>2024</b>	<b>NRED</b>
Jefferson Speciality Care Pavilion	Healthcare	762	Q1 2021	Q2 2024	Thomas Jefferson University, Jefferson Health, NREA
East Market - Phase 2	Mixed-use	150	2021	2024	NRED
Keystone Trade Center Phase 2	Industrial	1500	2021	tbc	NorthPoint Development
Bellwether District	Industrial	1,000+	2022	2037	Hilco Redevelopment Partners
Broad and Washington I 1001 S. Broad Street	Mixed-use	750	2022	2026	Tower Investments, Post Brothers
Spark Therapeutics Inc. Manufacturing Plant	Life Sciences	575	Q4 2022	2024	Spark Therapeutics
Piazza	Residential MU	500	2019	Q4 2022	Post Brothers
Broad Street and Washington Avenue	Residential MU	500	Q4 2021	2023	Post Brothers
Chestnut Run Innovation & Science Park	Mixed-use	500	2022	N/A	MRA Group Inc.
Justice Center	Public	415	2021	2024	Montgomery county
30th Street Station Renovation	Transport	400	Q2 2022	Q4 2024	PIP
Cathedral Square	Residential MU	400	Q4 2020	2024	Exeter Property Group, Archdiocese of Philadelphia
One Cathedral Square	Residential MU	N/A	Q1 2021	Q4 2022	EQT Exeter
Two Cathedral Square	Residential MU	N/A	2023	2024	EQT Exeter
Riddle Hospital campus upgrade	Healthcare	327	Q4 2020	Q3 2023	Main Line Health
Sora West I Conshohocken	Mixed-use	325	Q2 2019	Q4 2022	Keystone Property Group
The Laurel	Residential	300	Q2 2019	Q4 2022	Southern Land Company
<b>Riverwalk</b>	<b>Mixed-use</b>	<b>300</b>	<b>Q1 2019</b>	<b>2022</b>	<b>PMC Property Group</b>
Riverwalk Tower 1 (North)	Mixed-use	N/A	2019	2022	PMC Property Group
Riverwalk Tower 2 (South)	Mixed-use	N/A	2020	2022	PMC Property Group
Arthaus	Residential MU	253	Q4 2019	2022	Dranoff Properties, SBE Entertainment Group
1608 Sansom	Residential MU	200	Q4 2021	Q4 2023	Southern Land Company
1620 Sansom	Residential MU	200	Q4 2021	2023	Southern Land Co.
2222 Market Street	Commercial	200	2020	2022	Parkway Corp.
Ultra Labs	Life Sciences	190	Q4 2021	Q4 2023	Republic Properties Group/Richard Hayden
LVL North (510 North Broad)	Residential MU	175	Q2 2020	Q4 2022	Alterra Property Group
1520 Hamilton	Mixed-use	160	Q3 2017	Q4 2021	Radnor Property Group, Community College of Philadelphia
1522 Hamilton - Phase 1	Mixed-use	80	Q1 2019	Q4 2021	
Bridgeport development	Residential MU	150	2021	2025	PRDC Properties
Broad and Noble	Residential MU	150	2022	2024	Toll Brothers, Sundance Bay
Incyte Corporate Headquarters-Expansion	Office/Lab	150	Q4 2019	2022	Incyte
Ellis Preserve	Residential MU	140	2021	2024	Equus Capital Partners Ltd.
Center for Engineering Education and Research Expansion	Academic	125	Q2 2022	Q3 2024	Villanova University
12th & Sansom	Residential	N/A	Q3 2021	2023	Greystar Worldwide, LLC
Bridesburg industrial project	Industrial	115	2021	2023	DH Property Holdings
204 South 12th Street	Residential MU	112	2022	2024	Midwood Investments and Development
5th and Spring Garden	Residential MU	N/A	2022	2023	Rodin Development
Viaduct Rail Park	Parks	100	2021	N/A	Friends of the Rail Park, CCD, Dep. of Parks and Recreation
One Dock Street (31-story high-rise)	Residential MU	N/A	Q3 2021	2024	LCOR
33 North 22nd Street	Residential MU	N/A	2022	2024	PMC Property Group
Amy Gutman Hall - Data Science Building	Academic	N/A	Q4 2021	Q2 2024	Gilbane Building Company

Source: BizJournal Philadelphia, Center City Philadelphia, BuildUp, Skyscrapercenter.com, Dharam Consulting Research

A number of major projects were completed last year, exiting our active projects pipeline. Among these are the \$1.5 billion The Pavilion at Penn Medicine, Pennovation Lab and the CHOP Middleman Family Pavilion King of Prussia Hospital. Also completed in 2021 were the Live! Hotel and Casino site and the Philadelphia Public Services Building at 400 North Broad Street.

The largest projects currently under construction are projects within the Navy Yard site, as well as the CHOP Hub for Clinical Collaboration, Drexel Academic Tower (Health Sciences Building) and the JFK West Tower at 3025 JFK Schuylkill Yards all developed within the University City District. The Jefferson Speciality Care Pavilion at East Market and Keystone Trade Center Phase 2 are also significant developments underway.

Apart from the residential tower projects that have received construction permits in 2021, a number of other significant projects are planned to start on site this year and in the near future. Among the largest proposed projects is the \$1.9 billion CHOP New Patient Tower, the CHOP Expansion at 690 Schuylkill Avenue, as well as the proposed \$575 million Spark Therapeutics Inc. Manufacturing Plant, the Caroline Kimmel Biomedical Research Building at Thomas Jefferson University, and the life sciences building at 3201 Cuthbert St.

On the public sector side, the City of Philadelphia set out a \$9.9 billion capital program for financial years 2022 – 2027. Within this, \$3.3 billion are allocated for FY 2022 and \$1.34 billion for FY 2023. The majority of the capital investment is allocated to water-related projects through the PWD, totaling \$4 billion over the next five years. Streets and Transit (SEPTA) are allocated \$1.68 billion and \$1.24 billion, respectively (chart 7).

Our estimation of construction cash flows based on our major projects pipeline of known projects in Philadelphia is shown in chart 8. This only includes projects in the current active pipeline and major projects that have been completed since 2018/19. The pipeline focuses primarily on non-residential and multi-residential projects.

The recent peak in construction volumes and employment in 2018 is clearly reflected in the pipeline. The volume of work has moderated since but is now expected to pick up over the next 18 months on the back of significant project starts and a firm pipeline of work. The strength of the local market and client's appetite to proceed with the planned projects will be tested this year. Given the current uncertainty in the market around sharply higher costs, increasing interest rates and local legislative changes within the residential building market, it remains to be seen whether all projects proceed to plan.

CHART 7: PHILADELPHIA CIP FY2022-27

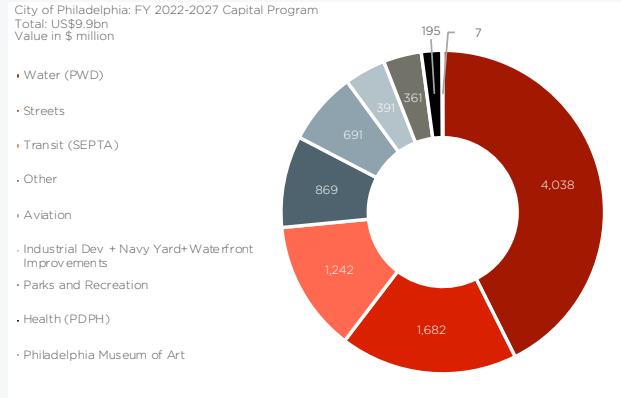
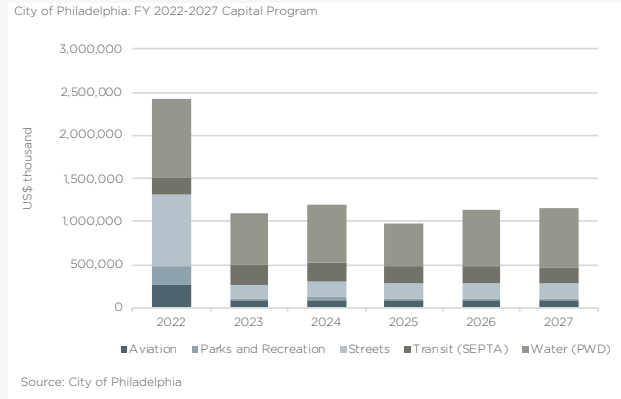
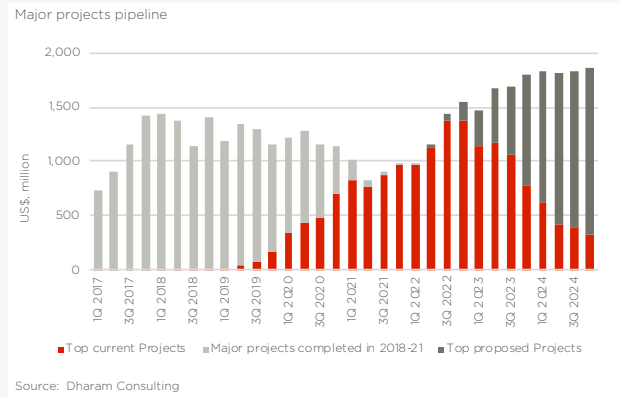


CHART 8: PROJECT CASHFLOW ESTIMATION + FORECAST



The current market appears healthy, but not overly busy. A significant pick up in work would result in increased demand for labor resources and pressure on resources would become a key feature of the local market if all projects planned were to start on site.

Our analysis of the flow of trade resources within the current pipeline of projects is summarized in chart 9 and table 2. This excludes completed projects and includes only a limited number of proposed projects, mainly those which we expect to start at some point in 2022.

The high-level analysis indicates that peak demand for concrete occurred in the final quarter of 2021. However, a number of significant projects are planned to start this year, so that demand is likely to remain solid. Resource demand now appears to increase for steel trades with significant resources required during the second half of this year. Early next year, we expect a strong demand for MEP resources.

Architects' billings and contractor revenue data for 2021, indicating market trends have not yet been published. The largest architects and contractors active in the market in recent years are shown in chart 10 and 11.

Local offices architects' billings of the Top 25 architects totaled \$337 million in 2021, according to BizJournal Philadelphia. This is 5.5% less than in 2020. The top 10's market share within the Top 25 architects fell slightly to 73% from 76%. The top 10's billings fell to \$247 million in 2021, 8% less than in the preceding year.

Local revenues of the top 25 contractors also weakened, according to BizJournal Philadelphia (chart 11). Revenues totaled \$5.6 billion, down 10% compared to 2020. The top 10 accounted for 70% of total revenue and saw their total billings drop from \$4.3 billion in 2020 to \$3.95 billion last year.

CHART 9: TRADE RESOURCE OUTLOOK

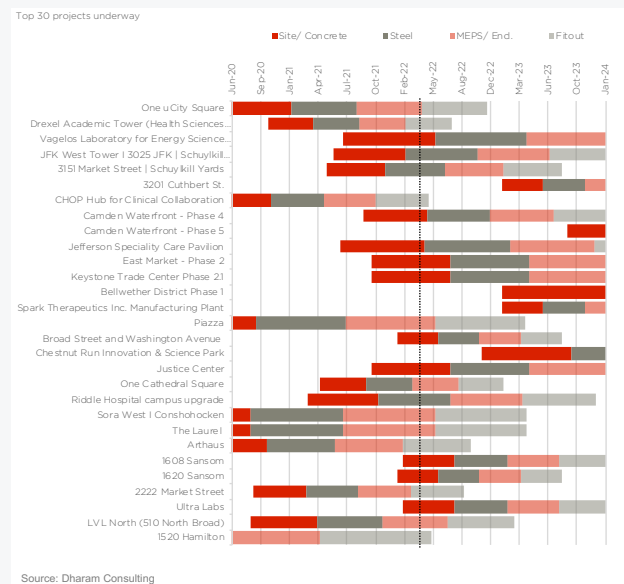


TABLE 2: ESTIMATION OF TRADE RESOURCE DEMAND

Trade	Peak Demand Major Current Projects
Peak Site Concrete	Q4 2021
Peak Steel	Q3 2022
Peak MEPS/Enclosure	Q1 2023
Peak FITOUT	Q4 2023
Source: Dharam Consulting	

CHART 10: LARGEST PHILADELPHIA ARCHITECTS

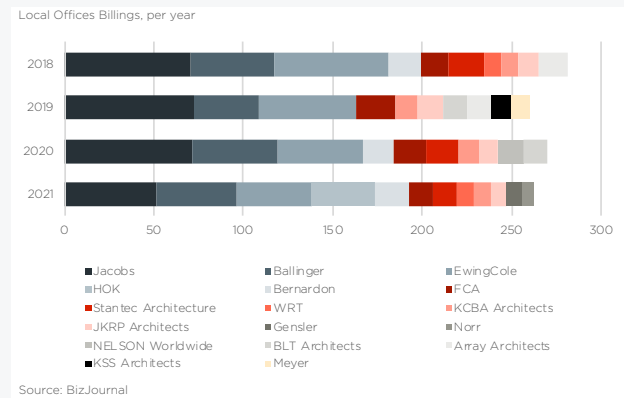
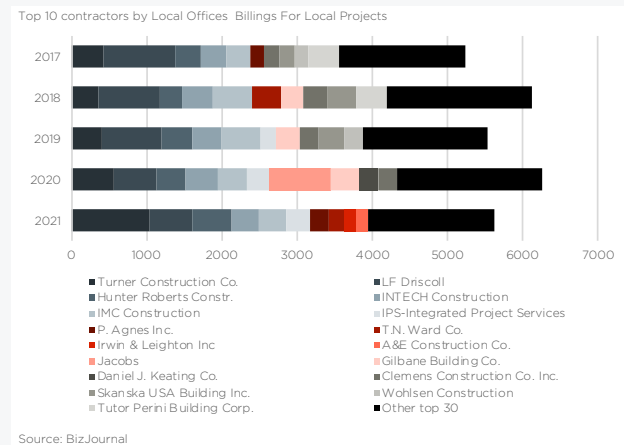


CHART 11: RECENT CONTRACTOR REVENUES





# BUILDING COST + SUPPLY CHAIN CAPACITY

## Building costs

There are no signs of slowing building cost inflation as yet in the market. In the 2nd quarter of 2022, the ENR US building cost index was 16% higher compared to a year ago. Between December 2021 and June 2022, national building input costs were on average 8.2% higher.

Material price hikes are still leading the pace in inflation. The sharp rise of global commodity prices on the back of geopolitical events is maintaining pressure on raw materials, manufactured and fabricated building materials across a range of key product groups. On top of generally higher costs, global price indices are extremely volatile. Higher wage demands, in particular from skilled labor are increasingly feeding through, which in addition to labor resource constraints is challenging the industry.

## Philadelphia Building + Labor cost

According to ENR figures, building cost in Philadelphia are on average 11% higher than the national average in 2022, due to higher labor costs. This cost differential has decreased from recent years, as over the past two years, building cost inflation in Philadelphia has been slower than the national average.

As elsewhere, the local construction market has seen a sharp rise in building costs over the past 18 months. The building cost index for Philadelphia recorded an 6.4% rise in 2021. Cost increases accelerated in the first half of 2022, increasing 9.1% compared to the same period a year earlier. Nationally, the BCI recorded a 15.1% increase in the first half of 2022. The ENR figures show that the difference is due to somewhat slower material price and skilled labor inflation in Philadelphia.

Over the past two years, resource availability within the local construction supply chain has been reported as more balanced than in preceding years, although in instances the industry continued to report some constraints when it comes to labor, on the sub-contractors/ trade and also main contractors' side, in particular for specialist work.

We expect labor supply capacity to become more constrained over the next years if a large number of projects which were awarded permits, proceed through the planning and design pipeline and start on site in about 18-24 months' time.

CHART 12: US BUILDING COST INDEX

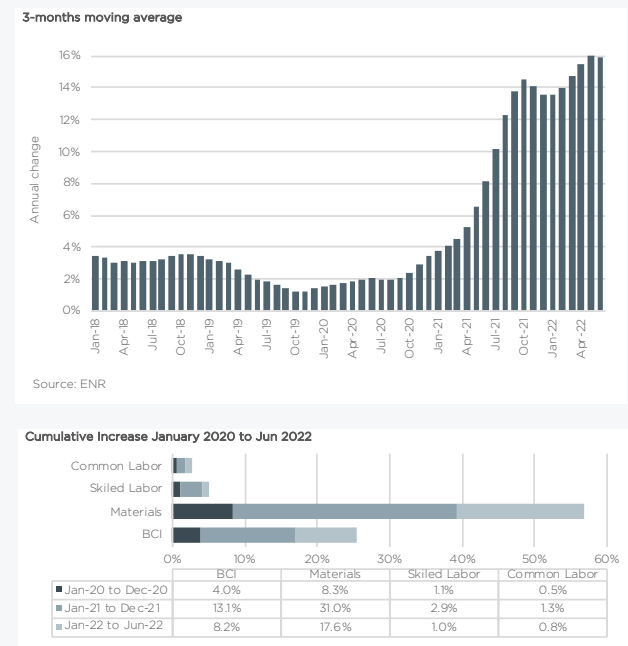
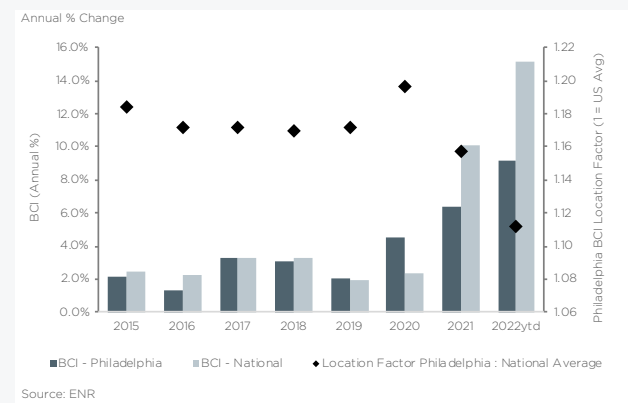


CHART 13: PHILADELPHIA BUILDING COST



The local construction job market continues to improve. Construction jobs in the metro area peaked in 2019 on the back of a jump on project starts in the preceding two years. The construction jobs market was then hit heavily by the pandemic lockdown in 2020, from which it is still recovering. In 2022, the number of construction jobs both in the wider metro area and in Philadelphia City were back at levels seen in early 2020.

Local construction employment growth has outpaced employment creation in other sectors, especially in the City of Philadelphia, where employment is yet to recover the losses sustained during 2020.

Between 2017 and early 2020, annual wage increases for skilled labor outpaced the national average, reflecting the high volume of work in the metro area. The trend reversed over the past two

years. In the first four months of 2022, the skilled labor index for Philadelphia was up 0.9% year-on-year, compared to 2.8% nationally, according to the ENR. We have recorded stronger wage inflation in the local market. In our 2021 US Construction Survey, the majority of respondents from Philadelphia reported that wages & salaries in the industry increased by up to 5%, with some recording increases of 5-10% over the past year.

Current prevailing wage rates for key trades established in May 2021 are shown in chart 15, no updates have been announced as yet.

CHART 14: CONSTRUCTION EMPLOYMENT

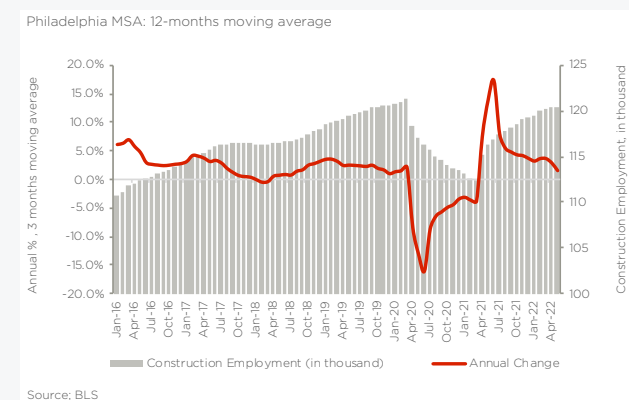
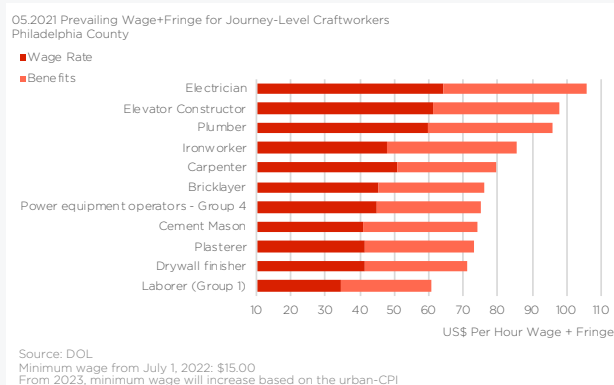


CHART 15: CURRENT PREVAILING WAGES



## Building Materials

Commodity price volatility remains a key feature of global markets. While many raw material and commodity prices have generally trended downwards in the last three months, oil prices have risen again, adding to energy and fuel costs.

US gasoline and diesel prices have risen steadily over the past year. Weekly New England Conventional Retail Gasoline prices stood at \$5.081 per Gallon in mid-June 2022, 48% higher compared to end 2021. Similarly, New England No.2 Diesel Retail stood at \$6.122 per Gallon in mid-June, compared to \$3.623 at the end of December 2021.

Freight costs are declining, but remain high by historic standards. Drewry's World Container Index decreased by 20% to \$7,502 per 40ft container in mid-June compared to the start of the year, but remains 8% higher compared to a year ago.

Global oil, energy and commodity price volatility is impacting logistics and freight costs as well as prices of US building materials, e.g. MEP products, electronic components, cablings, windows and doors, and many others.

CHART 16: WTI OIL

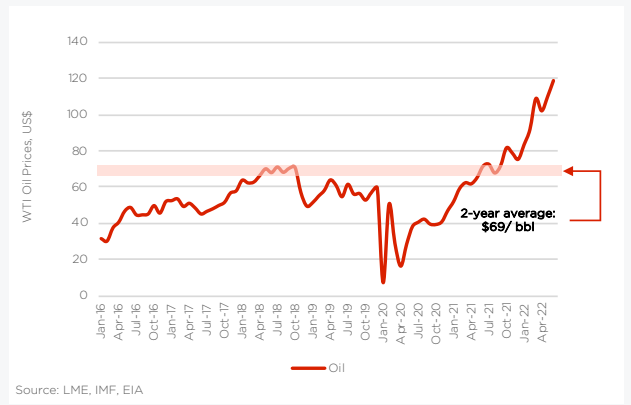


CHART 17: GLOBAL COMMODITY PRICES

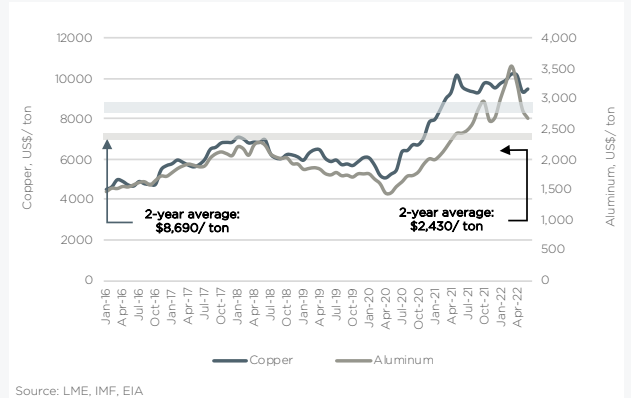


CHART 18: US PETROL + DIESEL PRICES

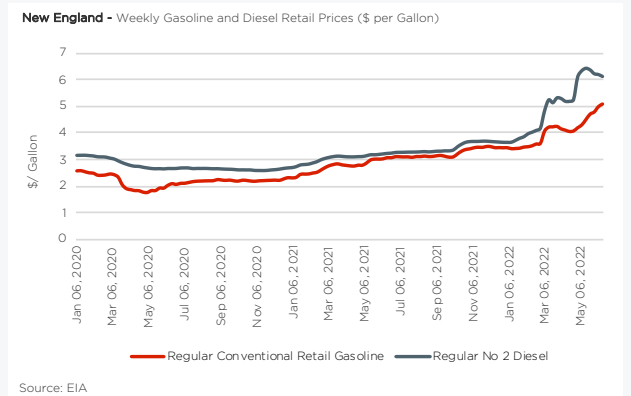
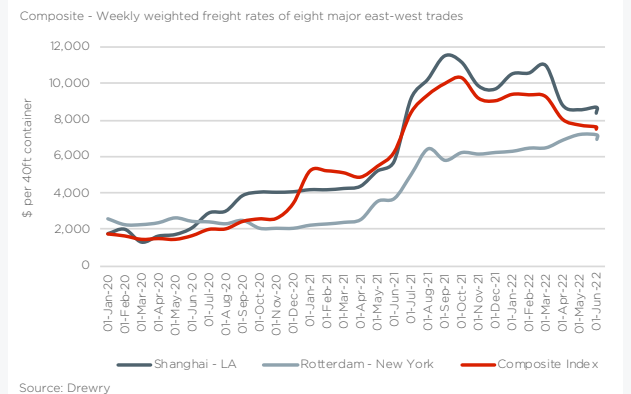


CHART 19: DREWRY WORLD CONTAINER INDEX





US building material price inflation shows no signs of abating. The ENR materials price index recorded a 17.6% increase in June 2022 compared to December 2021 alone. Compared to the same period a year ago, the index recorded a 36% increase in the second quarter of this year. Similarly, the Inputs to Construction cost index rose by 14.2% between December 2021 and May 2022. In May the index was up 21.4% year-on-year.

Basic steel prices eased globally in recent weeks, more so in Europe than in the US and China, which is reflected in the widening

gap between US and European steel prices. Inputs into steel production such as iron ore and shredded scrap held stable and decreased, respectively in May/ June.

Lumber prices pulled back in May and June. For Q2 2022 as a whole, lumber prices averaged \$563 per thousand square feet, down from \$1,200 in Q1 2021 and \$1,225 seen in the second quarter last year. Cost inflation for other building products are shown in chart 21.

CHART 20: US INPUTS TO CONSTRUCTION INDEX

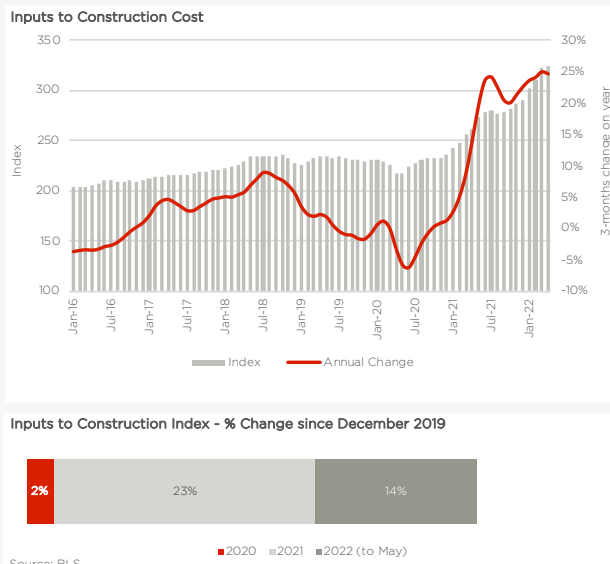


CHART 21: BASIC STEEL PRICES

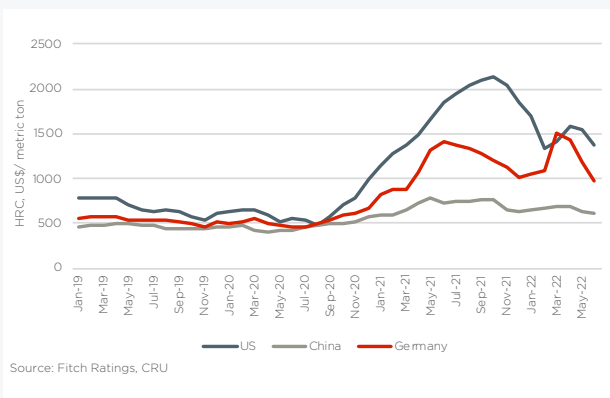


CHART 22: LUMBER PRICES

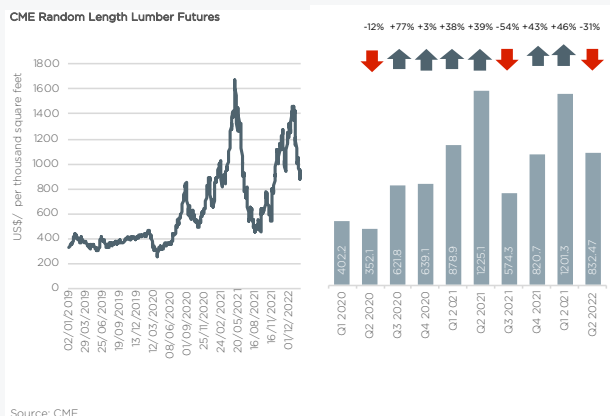
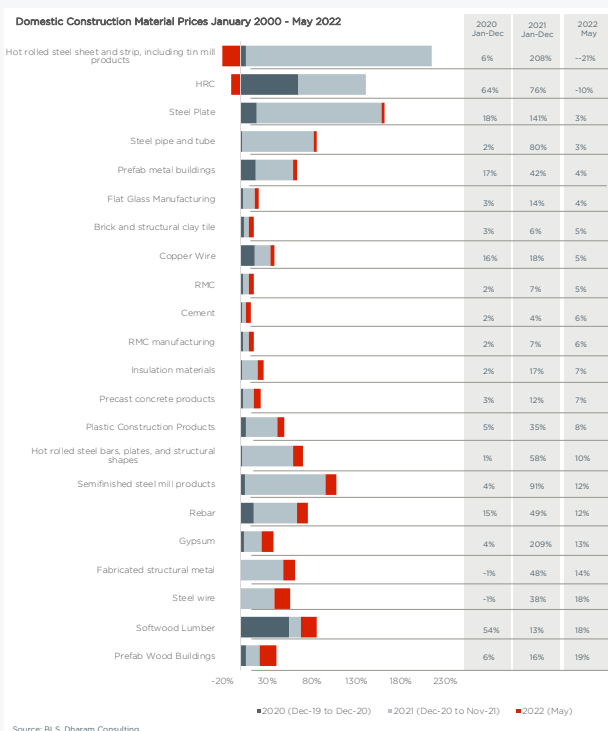


CHART 23: US BUILDING MATERIALS INFLATION





# BID SUBMISSION PRICES

Over the past 18 months, the market has been adjusting to new pricing levels. Current inflation trends in the wider economy, coupled with continued pressure on energy and materials costs, as well as higher wage demands is expected to keep contractor price inflation elevated.

Adding to the uncertainty around the economic outlook, rising interest rates and sustainability of demand, it is not surprising that clients and developers are increasingly scrutinizing their project budgets and becoming reluctant to absorb many more price increases.

In the near term, we expect that it will take some time for price volatility to moderate with higher cost still feeding through the supply-chain. Looking further ahead, despite the broader risks around a significant economic downturn, based on our current view of the market, we do not expect a deflation in prices. We would expect that only a sudden, sharp and widespread drop off in projects commencing on site caused by an economic recession would result in a material decline in prices.

The BLS contractor producer price index, which measures changes in US output prices received by four groups of construction trade contractors on nonresidential buildings, records significant higher price increases during the first months of 2022. The index for roofing contractors recorded the sharpest increase, up 11.5% between December 2021 and May 2022. The index for electrical and concrete contractors increased 4.5% and 5.7%, respectively between the end of 2021 and May this year. The HVAC contractors index was up 8.9% in May compared to December.

The Turner Construction Index also jumped noticeably in Q1 2022. In 2021, the Turner index recorded an increase of just 1.9% in bid submission prices for non-residential projects, much lower compared to our assessment, which saw prices increases by 8% on average. In the first quarter of this year, the Turner Index recorded a 2% quarter-on-quarter increase, with prices up 7.1% compared to the same period a year ago.

Despite the increases in building costs seen over the past 18 months, contractor escalation allowances in Philadelphia have been fairly tempered, which suggests that the supply chain has absorbed a significant share of the higher costs.

We had expected that a slowing in material prices would temper the pace of bid submission price inflation to 3-4% this year. However, unexpected events in world markets have added to risks and maintained - and in some instances increased - the supply chain constraints that have driven a significant proportion of cost inflation.

Our industry contacts suggest that contractor prices will rise by 4-5% this year in Philadelphia. However, we feel that this does not fully reflect the reaction we would expect given the significantly higher material, energy and to a lesser extent labor cost in the market.

We have raised our central forecast to a 10% average increase in bid submission prices this year and still see inflation risk still on the upside for the remainder of the year. However, we see the market reaching a tipping point and do not rule out that a sudden drop in client confidence to progress projects increases competition and slows the ability for contractors to push through higher prices. We expect the Philadelphia area to broadly follow the US trend.

We recognize that the local market will be cautious with regards to these price increases. Demand for residential mixed-use, higher education and healthcare + life sciences projects is firm, but rising costs and volatile pricing trends could at some point dampen investor confidence and clients may be adopting a wait-and-see approach.

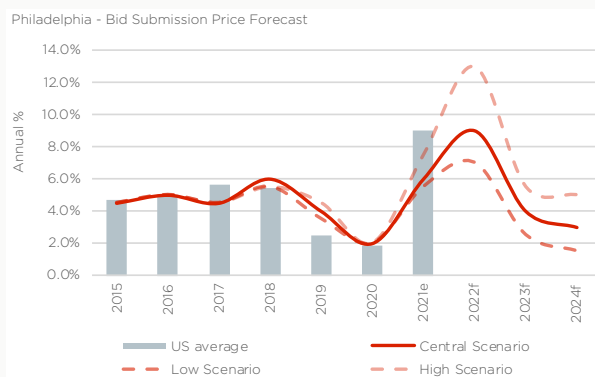
What is clear is that the high degree of pricing uncertainty will be a key feature of the market over the next 12 to 18 months at least. Bid price volatility is set to remain high, as long as market conditions remain unsettled.

To deal with pricing uncertainty, clients and contractors need to achieve a balanced risk allocation during the project procurement.

Clients willing to proceed with their projects need to prepare and make their projects and contracts attractive to the market in order to reduce contractor cost premiums priced into the project and obtain realistic bid submissions. A project owner willing to take on more of the inflation risk by including cost escalation clauses in the contract could attract more competitive bids from the market.

At the same time, early engagement by CM's at Risk in pre-construction services will add to project understanding and alleviate risk, allowing CM's to price projects more efficiently. This will help achieve project viability and maintain the positive momentum in the Philadelphia construction market.

CHART 24: PHILADELPHIA BID SUBMISSION PRICES



Dharam Consulting is an Independent Construction Consultancy specializing in providing proactive and value adding Cost and Risk Services that contribute towards successful outcomes for our clients and their projects. (A registered MBE company)

**DHARAM**  
CONSULTING

## ABOUT US

We are an experienced independent construction consultancy and we concentrate on doing what we do best – providing an intelligent, objective perspective which goes beyond measuring and pricing – delivering the highest quality pre-construction services, cost and budget management, risk, schedule, logistics, and procurement advice to clients.

Project benchmarking, market intelligence and data analytics support our services. We are a certified Minority Business Enterprise.

We have a deep understanding of the critical cost drivers and the administrative realities of working on Government projects. One of our most valued contributions is our ability to bring a balanced and independent viewpoint.

Our services are based upon strong relationships and trust, and our professional advice is grounded in a fundamental understanding of what matters to the project owner, architect and other stakeholders on a high-quality federal or publicly funded project, enabling our clients to deliver their vision.

## CONTACT

### NEW YORK

**Harpy Lally** | Managing Director  
hlally@dharamconsulting.com  
+1 718 913 9420

**Andrew Smith** | Managing Director  
asmith@dharamconsulting.com  
+1 862 208 8206

**Raj Sayal** | Director  
rsayal@dharamconsulting.com  
+1 516 965-3025

### BOSTON

**Owain Jones** | Director  
ojones@dharamconsulting.com  
+1 617 913-4345

**Gavin English** | Director  
genglish@dharamconsulting.com  
+1 617 372-7844

### LOS ANGELES

**Simon Hough** | Director  
shough@dharamconsulting.com  
+1 610 554 6560

### WASHINGTON, DC

**David Pearson** | Director  
dpearson@dharamconsulting.com  
+1 267 455 4244

### SAN FRANCISCO

**Mike Montague** | Director  
mmontague@dharamconsulting.com  
+1 949 304-3099

### SAN DIEGO

**Simon Hough** | Director  
shough@dharamconsulting.com  
+1 610 554 6560

### PHILADELPHIA

**David Pearson** | Director  
dpearson@dharamconsulting.com  
+1 267 455 4244

### CHANDIGARH

**Kafeel Maqbool** | Director  
kafeelmaqbool@dharamconsulting.com  
+44 7810482423

### PUNE

**Kafeel Maqbool** | Director  
kafeelmaqbool@dharamconsulting.com  
+44 7810482423

### NOIDA

**Kafeel Maqbool** | Director  
kafeelmaqbool@dharamconsulting.com  
+44 7810482423