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SEPTEMBER/OCTOBER 2021

# + CONSTRUCTION

## GIANTS 400 BUILDING SECTOR REPORTS

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Trends In Airports,  
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SEATTLE-TACOMA INTERNATIONAL AIRPORT  
NORTH SATELLITE MODERNIZATION

HORIZON

# INDUSTRIAL SECTOR BENEFITS

## FROM INSATIABLE NEED FOR ECOMMERCE FULFILLMENT

Automation has become essential to run these facilities efficiently.

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BY JOHN CAULFIELD, SENIOR EDITOR

**2020** was a banner year for Stantec's fulfillment center work, which increased "in the range of an order of magnitude," says Dave Calder, PE, the firm's Vice President and Industrial Buildings Sector Leader. Demand has continued to surge in 2021. "It appears that as two-day, next-day, and same-day ecommerce delivery services become available, the demand [for fulfillment centers] explodes," says Calder.

The industrial sector, in general, is swelling across the U.S. In the first quarter of this year, 55.8 million sf of new warehouse and manufacturing space were delivered, according to JLL, which also estimates that the sector's pipeline has 335.5 million sf of industrial product under construction, nearly half of it preleased.

JLL attributes as much as half of its industrial leasing activity to ecommerce-related operations, and calculates that the anticipated growth in ecommerce through 2025 would equate to demand for an additional one billion sf of industrial

space. For cold storage facilities alone, a recent CBRE study projected the need for 100 million new sf of space through 2025.

Steve Banker, Vice President of Supply Chain Services for the management consultant ARC Advisory Group, has pointed out that, in a U.S. market with 13.6 billion sf of existing industrial space at the end of 2020, new capacity in recent years has actually been modest. But that caveat, while statistically accurate, doesn't minimize the robust client demand that AEC firms say they've been receiving.

In the 18 months through May 2021, Burns & McDonnell's fulfillment center work increased 400 percent compared to the previous comparable period, a good chunk of which was for multi-temperature automated warehouses, frozen foods, and ecommerce distribution, says Brian Chatham, the firm's Automation Project Manager. Ware Malcomb's warehouse volume was up 30 percent in the first half of 2021, and none of its developer or ecommerce end users are showing signs of slowing down, says Jay Todisco, that firm's President.

Fulfillment centers have been a core focus for





TRIANGLE EQUITIES, COURTESY NELSON WORLDWIDE

Clayco since the early 2010s, to where the firm now claims to be the largest builder in this sector. “More businesses are adapting their supply chains to address ecommerce transactions,” explains Anthony J. Johnson, President of Clayco’s Industrial Business Unit.

### SHORTAGES STYMIE SPEED TO MARKET

The impediments to growth in the industrial sector are the same as those for other building types: shortages of labor (especially engineers) and materials (especially steel and roofing). The paradox is that clients still insist that warehouse projects be built as fast as possible. To answer that bell, Clayco, says Johnson, saves time and money through self-perform and turnkey solutions, as well as with creative designs that mitigate price increases and material scarcities.

Stantec’s response to speed-to-market demands has been an integrated architecture/engineering approach that uses advanced 3D laser scanning and BIM to develop coordinated designs quicker to share with contractors, says Calder.

Industrial clients want more amenities in their facilities, partly to recruit and retain talent, says Ware Malcomb’s Todisco. More amenities often mean more land area needed for outdoor meeting areas where employees can socialize, work, and eat lunch.

NELSON Worldwide is also getting more requests for outdoor patios and other amenities,

such as game and break rooms, that allow employees some space to separate from work. In the buildings themselves, “we are seeing a consistent trend to increase clear heights,” says Kathy Craft, NELSON’s Practice Leader of Industrial. She says it’s common for warehouses that are 300,000 sf or larger to have clear heights of 40 feet.

### AUTOMATION IS BAKED INTO INDUSTRIAL

The AEC firms contacted for this article agree that automation is now a byword for the industrial sector. “Demand is steeply rising for increased levels of automation,” says Burns & McDonnell’s Chatham, that includes robotics, helps owner/operators “fill gaps” created by labor shortages, and reduces a warehouse’s down time.

Stantec’s Calder notes that his firm is seeing requests for sophisticated automation for material handling and sanitation equipment. “Internal clearances, floor flatness criteria, and in some locations lighting requirements are very strict, to provide the proper conditions for the operation of material handling equipment, vision systems, and mobile robots.” Clayco’s Johnson adds that plant automation, Internet of Things, and digital twin platforms “are considerations of more companies each year.”

Todisco says automation is now standardized and commoditized “to the point that it is being designed into the shell spec building.” And Chatham notes



**NELSON Worldwide and Triangle Equities are partnering on a 235,000-sf terminal logistics center in the New York borough of Queens. The five-story building will house warehouse and industrial space, covered truck courts on the bottom two levels, and office and self-storage space on the upper three floors. The facility will support cargo management for nearby John F. Kennedy International Airport.**





Stantec's warehouse clients are most concerned about getting new facilities built and running as quickly as possible. These fulfillment centers more regularly include higher levels of automation.



MERLE PROJEKTSKY, COURTESY STANTEC

that prefabrication is now “more defined” for automated materials handling equipment, with pre-identified systems and capability modules.

### GOING TALLER TO GET CLOSER TO CUSTOMERS

It's not surprising that automation is taking hold of the industrial sector at a time when buildings within this sector are getting taller and more operationally complex.

Many of Stantec's fulfillment center projects are either multistory facilities or single-store warehouses with one or more mezzanine levels. Calder says that the multistory trend is being driven by clients choosing to construct industrial buildings closer to urban population centers for quicker delivery. Multistory buildings are their responses to the higher cost and relative scarcity of land in these markets.

Chatham notes that the return on investment is “narrowing” between standard fork operators and multistory automated storage and retrieval systems. Shuttle systems that handle totes and cases are most common in less-than-five-story buildings, while pallet systems are more common for higher buildings.

Ware Malcomb has four full-scale multistory logistics centers under construction, which it developed on spec. (All four are preleased to e-commerce or third-party logistics end users.) Todisco says his firm has another eight spec projects for which it has completed engineering drawings. And to address the challenges of land compression in metro markets, Ware Malcomb is designing multistory centers without traditional warehouses: Fork truck aisles, pallet racks, and pick-to-belt modules are replaced with 100% robots and automation within a 4D artificial intelligence environment.

NELSON Worldwide is partnering with Triangle Equities to deliver a five-story, 100-foot-tall, 235,000-sf logistics center in Queens, N.Y., that will support the storage and management of cargo to and from John F. Kennedy International Airport. The first two floors of this facility, with 29 dock-loading positions, will be accessible to trucks; the upper three floors will be accessed by freight elevators and be flexible for robotics operations, self-storage, and other uses.

### HOTTER NEED FOR COLD BUILDINGS

Clayco has several multistory logistics centers in the planning phase for urban markets. “Buildings

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Clayco is working under an 18-month construction schedule to complete a two-building, \$271.6 million project on the 127-acre former site of the Silverdome in Pontiac, Mich., that Amazon will lease for its first-ever fulfillment center/delivery station combination.



SAM FENTRESS

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are continually going higher, and becoming more automated and sustainable,” says Johnson. To that end, such items as life safety, materials usage, and alternative energy design have become focal points that clients expect Clayco to address.

Craft of NELSON Worldwide says her firm has started getting requests for micro fulfillment centers for “just-in-case” products, located in or near urban residential areas; and shared warehousing for smaller tenants.

Brad Prizer, PE, PMP, an Industrial Engineer for CRB, the process manufacturing engineering firm, also sees warehouse demand arising from the life sciences sector that has grappled with supply-chain disruptions and requires greater

production and throughput flexibility.

There’s also growing demand for cold buildings to accommodate manufacturing and storage for burgeoning grocery ecommerce. To tap that market, Ware Malcomb has developed a “cold ready” speculative and cost-effective prototype that is adaptable for several uses requiring refrigeration and freezer area. The firm is building out its prototype in Texas and Miami, and is in design on cold buildings in 15-20 other cities. Cold buildings can cost three times more to construct than dry buildings, and pose engineering challenges such as maintaining thermal and vapor barrier continuity. But rents are higher and leases longer in cold buildings, says Cameron Trefey, Principal at Ware Malcomb. +

### INDUSTRIAL FACILITIES ARCHITECTURE + AE FIRMS | TOP 10

Rank	Company	2020 Industrial Facilities Revenue
1.	Ware Malcomb.....	\$88,718,629
2.	Stantec .....	\$72,242,355
3.	RS&H.....	\$25,500,000
4.	Nelson Worldwide .....	\$21,984,367
5.	CESO .....	\$21,880,966
6.	Page .....	\$20,895,700
7.	Gresham Smith.....	\$20,134,870
8.	AO .....	\$18,000,000
9.	Macgregor Associates Architects .....	\$16,165,032
10.	Barge Design Solutions .....	\$9,607,065

SOURCE: BD+C 2021 GIANTS 400 REPORT

### INDUSTRIAL FACILITIES ENGINEERING + EA FIRMS | TOP 10

Rank	Company	2020 Industrial Facilities Revenue
1.	Jacobs .....	\$1,569,710,000
2.	Burns & McDonnell.....	\$227,464,491
3.	IPS-Integrated Project Services.....	\$156,528,985
4.	SSOE Group .....	\$111,116,985
5.	Fluor Corp.....	\$85,270,000
6.	Langan .....	\$83,000,000
7.	Kimley-Horn.....	\$69,747,422
8.	Haskell .....	\$61,984,022
9.	Ghafari Associates .....	\$53,300,000
10.	CHA Consulting.....	\$44,600,000

SOURCE: BD+C 2021 GIANTS 400 REPORT

### INDUSTRIAL FACILITIES CONSTRUCTION + CM FIRMS | TOP 10

Rank	Company	2020 Industrial Facilities Revenue
1.	Clayco.....	\$2,284,000,000
2.	Ryan Companies US / Ryan A+E.....	\$1,850,116,876
3.	Hoffman Construction .....	\$1,736,246,050
4.	Alston Construction.....	\$1,558,940,000
5.	ARCO Construction Companies.....	\$1,539,656,206
6.	STO Building Group.....	\$1,372,000,000
7.	Walbridge .....	\$1,285,126,703
8.	Gray Construction .....	\$1,282,154,338
9.	Whiting-Turner Contracting Co., The .....	\$966,148,817
10.	Hensel Phelps.....	\$902,690,730

SOURCE: BD+C 2021 GIANTS 400 REPORT