NECA SHOW COVERAGE

Hanging Tough: EC&M's 2021 Top 50 Electrical Contractors Special Report

Despite unprecedented business challenges in 2020, many of this year's Top 50 electrical contractors posted strong revenue numbers, enough to propel the group to another revenue record. Sponsored by LaborChart

Tom Zind

With a mixture of doggedness, patience, creativity, and flexibility, most of the nation's top electrical contractors managed to outmuscle the unprecedented COVID-19 pandemic year of 2020, .many even posting revenue gains that helped push the group's top line by $1 billion over 2019.

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The companies, whose 2020 electrical revenues placed them in the 2021 installment of the annual *EC&M* Top 50 Electrical Contractors ranking (**Table 1**), escaped the debilitating fallout many in non-essential industries faced from the pandemic. But they still had to contend with project cancellations, delays and disruptions, seized-up markets, supply constraints, stay-at-home orders, distancing protocols, and a disorienting climate of uncertainty. The ultimate toll might not be fully revealed until 2021 or 2022 numbers are reconciled.

Still, the Top 50 cobbled together enough business last year to log its 10^{th} consecutive year of revenue growth, registering almost 3% higher than 2019 at $34.1 billion, nearly three times the amount the Top 50 booked a decade ago (**Fig 1**).

THE TOP 50 ELECTRICAL CONTRACTORS					
Ranking					
2021	2020	Company	Headquarters	2020 Sales	% change (2019-2020)
1	1	Quanta Services	Houston	$7,773,343,000	9.48%
2	2	MYR Group, Inc.	Henderson, Colo.	$2,250,000,000	8.64%
3	3	Rosendin Electric	San Jose, Calif.	$2,058,000,000	10.27%
4	4	MDU Construction Services Group, Inc.	Bismarck, N.D.	$1,743,184,339	14.94%
5	5	Cupertino Electric, Inc.	San Jose, Calif.	$1,390,239,000	-4.91%
6	6	Henkels & McCoy Group, Inc.	Blue Bell, Pa.	$1,158,000,000	5.85%
7	9	IES Holdings, Inc.	Houston	$1,082,449,000	15.20%
8	8	M.C. Dean	Tysons, Va.	$1,029,106,315	2.86%
9	7	ArchKey Solutions	St. Louis	$946,943,271	-5.66%
10	13	Helix Electric, Inc.	San Diego	$768,500,000	6.00%
11	12	Power Design, Inc.	St. Petersburg, Fla.	$757,500,000	2.23%
12	10	Faith Technologies, Inc. (FTI)	Menasha, Wis.	$696,816,119	-18.22%
13	18	Bergelectric Corp.	Carlsbad, Calif.	$667,733,834	28.05%
14	17	Cache Valley Electric Co.	Logan, Utah	$667,224,174	13.34%
15	14	E-J Electric Installation Co.	Long Island City, N.Y.	$651,700,000	2.29%
16	11	MMR Group, Inc.	Baton Rouge, La.	$608,000,000	-22.55%
17	15	Facility Solutions Group (FSG)	Austin, Texas	$499,593,744	-18.15%
18	25	Five Star Electric Corp.	Ozone Park, N.Y.	$448,230,673	25.55%
19	20	Hunt Electric Corp.	Bloomington, Minn.	$440,000,000	-3.11%
20	19	Redwood Electric Group, Inc.	Santa Clara, Calif.	$400,000,000	-20.00%
21	23	Miller Electric Co.	Jacksonville, Fla.	$399,167,000	5.04%
22	26	Wayne J. Griffin Electric, Inc.	Holliston, Mass.	$396,038,000	12.15%
23	16	The Newtron Group, LLC	Baton Rouge, La.	$387,000,000	-28.73%
24	22	Hatzel & Buehler, Inc.	Wilmington, Del.	$374,305,863	-10.07%
25	30	O'Connell Electric Co., Inc.	Victor, N.Y.	$364,002,517	20.75%
26	21	Walker Engineering, Inc.	Irving, Texas	$350,400,000	-18.89%
27	28	Motor City Electric Co.	Detroit	$341,392,300	4.96%
28	NL	Railworks	New York	$340,600,000	NA
29	31	Gaylor Electric	Indianapolis	$339,768,925	15.96%
30	27	VECA Electric & Technologies	Seattle	$333,800,000	-3.53%
31	29	Rogers Electric	Atlanta	$315,000,000	-0.63%
32	36	Fisk Electric Co.	Houston	$276,000,000	7.00%
33	35	J.F. Electric	Edwardsville, Ill.	$274,500,000	1.25%
34	38	The Morse Group, Inc.	Freeport, Ill.	$262,323,374	23.31%
35	34	Wachter, Inc.	Lenexa, Kan.	$260,779,099	-7.27%
36	33	Cleveland Electric Co.	Atlanta	$239,100,000	-16.73%
37	39	Interstates, Inc.	Sioux Center, Iowa	$233,080,352	9.78%
38	41	Cochran, Inc.	Seattle	$217,000,000	5.44%
39	37	Encore Electric	Lakewood, Colo.	$215,500,000	-6.30%
40	43	Guarantee Electrical Co.	St. Louis	$206,200,000	0.59%
41	42	JMEG, LLC	Farmer's Branch, Texas	$202,576,600	-1.30%
42	46	Tri City Electric Company of Iowa	Davenport, Iowa	$200,333,540	4.65%
43	NL	ERMCO, Inc.	Indianapolis	$200,003,596	NA
44	47	Delta Diversified Enterprises, Inc.	Tempe, Ariz.	$198,000,000	4.21%
45	40	Lake Erie Electric Companies	Westlake, Ohio	$196,895,821	-6.89%
46	48	Decker Electric Co., Inc.	San Francisco	$190,770,000	2.02%
47	49	Ludvik Electric Co.	Lakewood, Colo.	$190,651,592	3.39%
48	NL	Amteck, LLC	Lexington, Ky.	$182,612,453	NA
49	NL	Commonwealth Electric Company of the Midwest	Lincoln, Neb.	$180,000,000	NA
50	45	Egan Co.	Brooklyn Park, Minn.	$178,613,000	-10.33%
NL-not listed. This company did not appear in last year's Top 50 listing. NA-not available. *EC&M* did not have access to the electrical and datacom sales figure for 2019.					

Table 1. 2021 Top 50 electrical contractor rankings based on 2020 revenue numbers.

That number, however, obscures the fact that 2020 was clearly a challenging year for many of the Top 50 contractors. Responses to a range of questions in the annual *EC&M* survey that produces the Top 50 rankings confirm that contractors faced novel difficulties last year even as they had to contend with long-term obstacles that the pandemic only aggravated. At the same time, though, optimism that an overall bright future lies ahead came through in both the survey responses and commentary from select contractors.

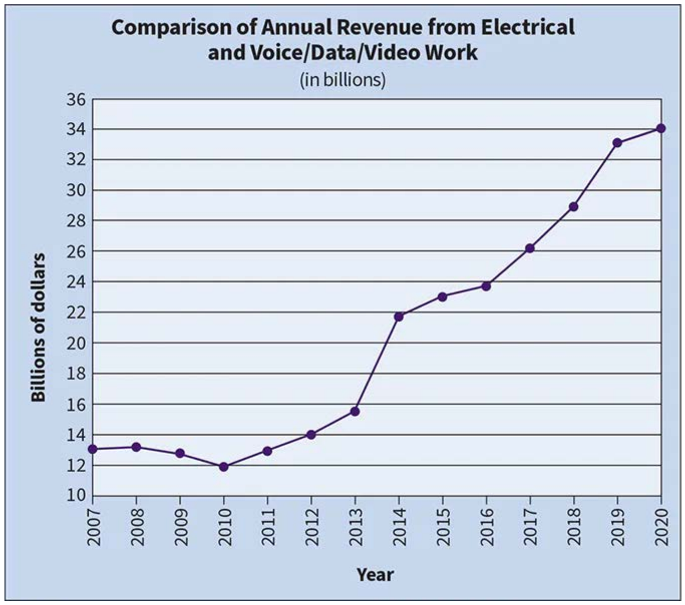


Fig. 1. Despite the ramifications of the pandemic in 2020, Top 50 companies still managed to exceed last year's revenue total as a collective group, boosted by large numbers from a few key players.

Climate change

First, the obvious: There was broad agreement that 2020 was a downer. Even though 33 firms saw their revenues grow in 2020, only 37% of the Top 50 said they'd rate last year's business climate as "strong," as shown in (**Fig 2**). That's a sharp drop from the last two surveys, in which more than 80% said the prior year's climate was strong. "Fair" was this year's description of choice, surely a reflection of COVID-19 keeping a lid on opportunity and complicating all aspects of running a business. More specifically, contractors said the year pummeled the optimism they had at the outset. Only one-quarter said they exceeded their sales goal for the year (**Fig 3**), down from nearly half of last year's respondents who said they surpassed their 2019 sales goals. But failure to hit revenue targets wasn't the chief negative by-product of the pandemic. Contractors said the most palpable short-term impacts were delayed projects and canceled projects along with material supply chain complications (**Table 2**).

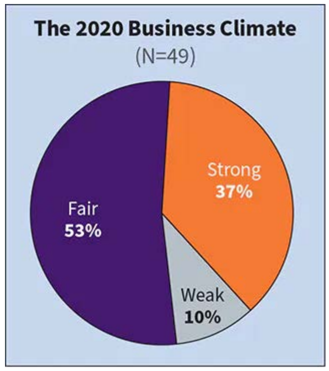


Fig. 2. Unlike past years, the majority of Top 50 respondents to this year's survey (based on 2020 numbers) characterized their business climate as "fair" instead of "strong." In 2019, only 15% of Top 50 companies considered the climate "fair" compared to 53% in 2020. Similarly, last year only 2% found it "weak" compared to 10% this year.

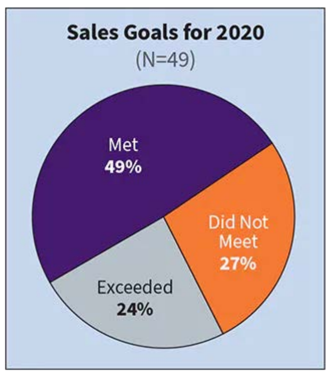


Fig. 3. The number of Top 50 companies that "did not meet" revenue expectations in 2020 rose 19 percentage points from last year. Roughly the same number "met" their sales goal, while the percentage of companies exceeding it dropped from 47% last year to 24% this year.

Greatest Short-Term Impact of the Pandemic

Factor	Ranking
Delayed projects	1
Supply chain issues (delays in equipment or material shortages)	2
Canceled projects	3
Failure to meet budget due to decreased revenue	4 (tie)
Laying off of employees	4 (tie)

Table 2. Far and away, the factor respondents felt had the greatest short-term impact on their companies in 2020 as a result of the pandemic was delayed projects, followed by supply chain issues and canceled projects.

At ArchKey Solutions (No. 9), St. Louis, combined revenues from multiple operating companies declined as work in some important markets receded or grew more complex to navigate.

“It was a challenging year, requiring a lot of adaptation and perseverance as our ‘normal’ ways of doing business changed rapidly,” says Clay Scharff, president and CEO. “Markets that were strong for us, like sports and entertainment, saw the largest impact, while other markets like mission-critical had more demands placed on them.”

Market and geographical diversification helped Commonwealth Electric Company of the Midwest (No. 49), Lincoln, Neb., deftly steer around the pandemic. Recent expansion into data center projects was fortuitous as those stayed strong and became especially abundant in the company’s Midwest backyard where power costs and labor availability lure builders. Still, multiple projects were delayed, the company idled 38% of its labor force for several months, and even a chunk of service business was curtailed for a time, says Company President Michael Price, who spent a lot of time figuring out how to work amidst the pandemic, which reduced productivity, among other impacts.

“I formed a COVID-19 response team to deal with all of the issues that it raised for how to adapt,” he says. “Since then, we’ve had to update that plan 18 times. As we got that figured out and learned how to work with it, we moved ahead.”

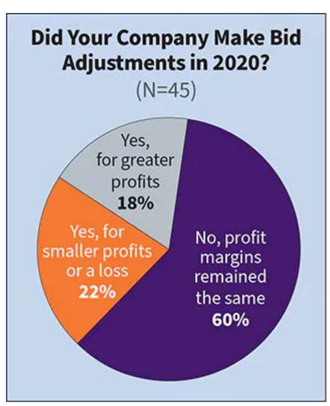


Fig. 4. One dramatic shift in the survey results can be evidenced by the fact that 22% of this year’s respondents reported smaller profit margins as compared to only 2% last year.

The contraction of new business opportunities due to heightened uncertainty, along with in-progress project delays and cancellations, led to generally more competition for projects that did go out to bid in 2020. That had the effect of putting the squeeze on more contractors to bid more aggressively — on more projects and on less favorable terms. Ten firms said they made bid adjustments resulting in smaller profits or even a loss (**Fig. 4**), a big shift from the last two surveys in which only 2% of firms said they did. About the same number of firms, however, said they bid for higher profits, while 60% said margins were unchanged, down from 77% in last year's survey.

The scramble for work was evident in the Greater New York City market, where Five Star Electric Corp. (No. 18), Ozone Park, N.Y., is active. President and CEO Russ Lancey says his company was able to hold the line and stay selective but guesses many others felt pressure to bend.

"The market was more aggressive and competitive because everyone was hungry for work," he says. "We saw some projects with as many as 15 companies on the bid list so that probably means it's been slimmer pickings and maybe tougher going as far as being a successful bidder. A lot were just wanting to stay busy."

Competition for available jobs seemed stiffer in markets that Interstates, Inc. (No. 37), Sioux Center, Iowa, works, especially in the second half as more companies scrambled for work as pandemic restrictions began lifting, says Joel Van Egdom, chief financial officer. A primary driver for that increased competition was the prolonged slowdown in the commercial building space.

"As companies worked through their backlog, we saw bid lists expand and companies get more aggressive on pricing and margins to win work," he says. "Now, though, we're seeing some declining to bid because their backlog is back up, and there are challenges in securing skilled workers. So there's an opportunity to put some more margin back in."

Market turbulence

COVID-19 also scrambled the deck when it came to market sector opportunities for contractors. Markets that had been seeing increased activity in a brightening pre-pandemic economy, such as offices, education, and retail, stumbled. Others that had been strong stayed strong, despite O. And still others surged because their long-term prospects in a post-Covid future weren't shaken. Tallying it all up, contractors again judged data centers and health care the two hottest markets but put three newcomers in the next three slots: manufacturing, transportation, and renewable energy (**Table 3**). The coldest sector list also shuffled from 2019, with private office, education/institution, and sports/recreation joining repeat selections hospitality and retail in the top five (**Table 4**).

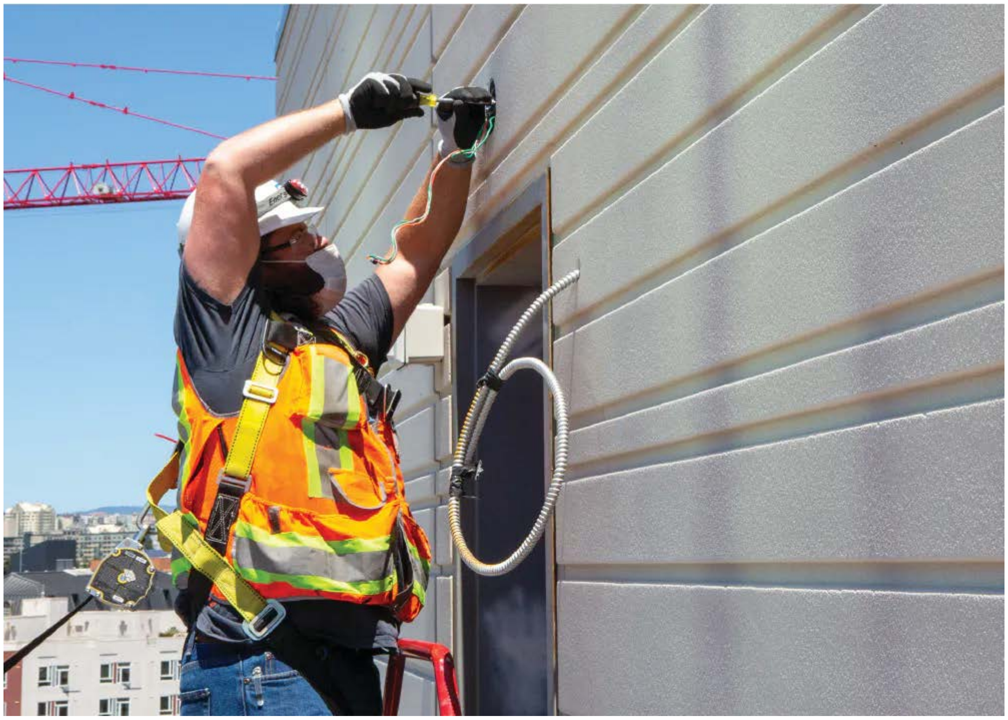
Hottest Market Sectors for 2020
Data Center/Mission Critical
Health Care
Manufacturing
Transportation
Renewable (Wind & Solar)

Table 3. For the fifth year in a row, data center/mission-critical construction and health care held their place as the top two markets, bringing in the greatest dollar volume of projects in 2020. Three newcomers (manufacturing, transportation, and renewables) made their debut on the list this year as well.

Coldest Market Sectors for 2020
Hospitality
Private Office
Education/Institution
Retail
Sports/Recreation

Table 4. Not surprisingly (given the impact of the pandemic), like last year, the hospitality market held on to its top spot as the slowest market among Top 50 respondents, followed closely by office and education.

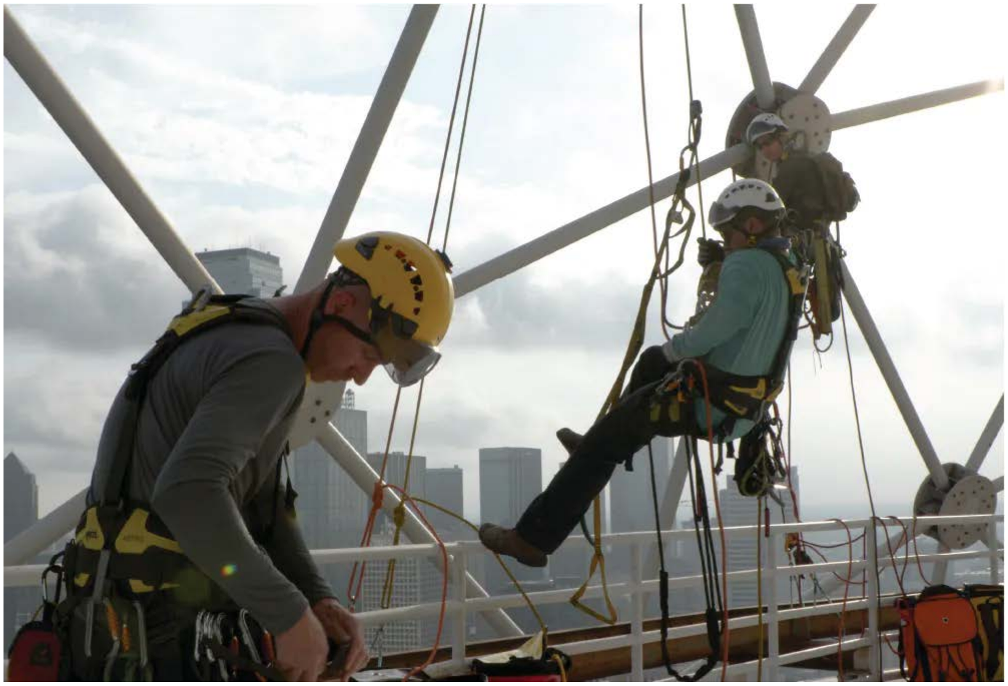
Cupertino Electric (No. 5), San Jose, Calif., is trying to capitalize both on its multi-year effort to diversify across markets and double down on its key markets. In the former, a stronger push into renewable energy paid dividends in 2020. In the latter, data centers have stayed a consistent winner. A newer initiative puts the company in line to benefit from higher infrastructure spending as well.



A Cupertino Electric, Inc., employee performs exterior wiring work on Chorus, a 29-floor residential tower in San Francisco, slated for completion in 2021.

"A new public infrastructure group under our commercial group will benefit us going forward as transit spending in California grows," he says. "It's part of an effort to get us deeper into large-scale projects where fewer competitors have those capabilities."

Large, multi-year public projects that stayed alive also kept Fisk Electric Co., (No. 32), Houston, insulated from market gyrations that cut into gap-filling smaller project work, says Cory Borchardt, senior VP of operations.



With a plan in place, iconHD reached out to FSG's Dallas branch for licensed electricians with skills and certifications that enabled them to execute the work on Dallas' iconic Reunion Tower while rappelling from the tower's observation deck 561 feet above the ground.

"We didn't see those slow anything like industrial and commercial, so we focused on and shifted resources to those large projects that were in place," he says.

Water, airport, subway, and warehouse projects moved ahead; however, some others, such as hospitals, were suspended but now show new life. As Covid recedes, Borchardt says, Fisk expects further shifts in demand in health care and other key opportunity sectors "as money is reallocated into different types of projects" by clients whose perspective on future needs has been altered by COVID-19.

Power Design deployed construction photo documentation software during the pandemic that allows the fir… to capture real-time job-site footage through the use of hard hat cameras.

Sheer size helped MDU Construction Services (No. 4), Bismarck, N.D., manage market disruptions in 2020. The conglomerate's 16 operating companies, geographically spread out, provided enough market diversification to keep combined revenues up for the year. But a key factor, says Vice President Ray Kelly, was the client base.

"Big national customers that remained consistent in their plans helped us," he says. "There were not as many fits and starts with their plans, especially those in the mission-critical space, technology, and automotive."

Rebound bound?

Midway through 2021, contractors were weighing whether more of that consistency and a return to normal was in the cards. That looked dicey with the emergence of the virus' potent Delta variant, but by several measures, many of the Top 50 saw a better business year taking shape. Close to half said they were already back to "business as usual" (**Fig 5**); a third said they expected to exceed their sales goal for the year, up from 12% last year (**Fig 6**); 90% said they saw a chance for stable or higher profits, up 27 percentage points (**Fig 7**); 56% saw 2021 revenues increasing, up from 25% (**Fig 8**); and projections for pandemic-caused 2021 revenue shortfalls were much more heavily clustered on the low-end — 84% seeing a 0% to 10% range, compared with 64% last year (**Fig 9**).

Fig. 5. Last year, the majority of respondents (44%) believed the industry wouldn't be back to business as usual, given the circumstances surrounding the coronavirus pandemic, until early 2021. This year, 34% say this won't happen until early 2022. However, unlike last year, when only 11% of respondents said business was already back to normal, this year 42% of Top 50 companies see it as such.

Fig. 6. Last year, 44% of respondents indicated they didn't expect to meet revenue expectations for the coming year, a significant deviation from historical trending data in this category. However, one bright spot in this year's survey can be found in the fact that only 17% of this year's Top 50 indicated they expect a shortfall for 2021, suggesting a recovery from the pandemic may be underway.

Fig. 7. The number of Top 50 companies expecting profit margins to stay the same surged from 56% last year to 73% this year. Only seven companies are forecasting an increase in profits this year.

Fig. 8. Last year, more than 50% of respondents were expecting a decrease in revenue. This year, the tables have turned with 72% of respondents expect their company's revenue to either stay the same or increase. In fact, last year only one company expected an increase of 11% or more; this year that number increased to 11 companies.

Fig. 9. Last year, nearly two-thirds of respondents expecting a revenue shortfall as a result of the pandemic anticipated the percentage drop to be no more than 10%. This year, that number grew to 84%.

Heartened by a big rebound in project starts and bidding late last year, Fisk Electric sees a chance for a repeat revenue gain for 2021 as large infrastructure projects proliferate and opportunities to piggyback on parent company Tutor Perini Corp.'s construction projects emerge.

Houston-based Fisk Electrical Company handled electrical and systems work for a San Francisco Mass Transit Authority subway extension that includes a new subway tunnel. Fisk parent company Tutor Perini Corporation is the general contractor for The Third Street Central Subway Extension project, which will be completed in 2022.

"Work came back with a vengeance later in the year, and there was a lot of activity. Even with the materials price increases, we were seeing that put some owners on the hesitant side," says Borchardt. "The amount of bid opportunities for us are now back to pre-pandemic levels, and pent-up demand is coming back."

One of just a handful of companies that rated 2020's business climate as "weak," Egan Company (No. 50), Brooklyn Park, Minn., sees a chance for 2021 to be better, but the slow pace of project starts has President and CEO Duane Hendricks looking at a longer path back to normal. Bidding continues to be crowded, he says, while materials are harder to source.

The Nashville SC stadium for MLS soccer and live concert events features 30,500 seats, seven premium areas, and 27 suites. At 532,000 square feet, this facility will be the largest soccer-specific stadium in the United States when completed in 2022. ArchKey Technologies provided network infrastructure, bowl and BOH AV, broadcast, security, and public safety DAS solutions for this project.

"Things may start to loosen up next spring, and we'll be in a position to get more new work," he says. "We have the capacity to not overreact to market conditions so that puts us in an overall good position. We just have to be more selective in the projects we bid and make sure that we're getting reasonable margins."

Interstates, after realizing 9% revenue growth in 2020, sees continued strength in 2021 and beyond in its primary markets, which include industrial, food processing, and data centers, provided the overall economy stays strong and building costs don't get out of hand.

Cache Valley Electric was proud to be a trade partner on the new Salt Lake City International Airport North Concourse Phase 1 project, completed in October 2020. CVE completed electrical construction and redundant power system work, including electrical distribution, structured cabling, teledata system, DAS, physical security, network, Wi-Fi access infrastructure, fire alarm system, signage, wayfinding, VDGS, power and data provisions for airport tenants, and building automation system.

"We're not seeing any shaking of confidence of the owners we work with," Van Egdom says. "Their capital budgets for the next year or two are as high as they've ever been in some cases, and there is a lot of cash on hand. We'd expect that appetites could wane if costs escalate but, so far, we're not seeing any impact on how they plan to spend."

A material problem

Rising costs that could come with a sustained resurgence of inflation could become worrisome for contractors. They've gotten a taste of it already as availability and prices of construction materials were affected beginning last year by coronavirus-related supply chain disruptions and a stimulus-flooded economy. A lack of visibility on material supply and price has also made project bidding and successful completion a more difficult task.

Delays and logistical challenges in securing materials, deemed a leading short-term by-product of the pandemic, also came in as the top-ranked impediment to on-time/on-budget project completion in 2020 (**Fig 10**). Those delays have cost implications that compound the profit worries presented by spiking prices of the materials themselves, which have continued into 2021. In last year's survey, contractors said increases on the most price-volatile materials last year were mostly 10% and under. This year, the range has expanded greatly to include 28% saying the biggest increases are topping 50% on some materials (**Fig 11**), wire and cable and conduit/raceway/wireway (**Fig 12**), identified most often as the biggest price gainers of the year.

Fig. 10. Delays due to the pandemic were the most pressing issue on Top 50 company's minds as having the greatest impact on their ability to get a job done on time and within budget last year. This year, delays were still the primary concern, but this time they were due to material delivery and logistics issues.

Fig. 11. Most Top 50 respondents reported material prices rising between 1% and 10% last year. This year, that trend has definitely shifted, with the majority expecting at least a 20% increase — and nearly 30% are anticipating a 50% or more price hike.

Fig. 12. After replacing "distribution equipment" last year as the material type experiencing the greatest increase in price, "wire and cable" extended its lead, grabbing the top spot by an even bigger margin. "Conduit, raceway, and wireway" also passed "distribution equipment" in the ranking.

Five Star Electric's Lancey says unusually widespread materials sourcing challenges have presented contractors with a new set of problems. Shortages, longer lead times, and wider materials price swings and spikes are taking uncertainty to new levels and pressuring contractors to become more accurate forecasters.

MYR Group subsidiary, MYR Energy Services, Inc., is providing full engineer-procure-construct services on the Battle Mountain Solar & Storage project, a 101MW photovoltaic farm located near Battle Mountain, Nev. The project's 25MW of battery capacity will be the nation's largest DC-coupled combined solar and battery storage system.

"It's creating an additional layer of difficulty in bidding and building," he says. "We're letting owners know that things are taking longer than expected, and they're more expensive. That's taken into account when we bid, but it's also a challenge when you have a project schedule laid out and things change."

MDU's Kelly says price escalations are complicating client calculations on timing for moving ahead with projects, with some owners contemplating holds because of "sticker shock" and some facing longer wait times. MDU has had some success moderating materials issues by leveraging sturdy relationships with suppliers, but some are unavoidable.

Sloan's Lake is one of the largest parks in the city of Denver with a lake that now bears the reflection of a 12 story glass high rise. Ludvik Electric Co. worked on this luxury condominium tower, which is named "The Lakehouse on 17th."

"With some of our big mission-critical clients, some lead times on transformers and similar equipment has moved out from 12 weeks to 36 weeks, adding maybe half a year to a facility ready date," he says.

A new labor twist

Another growing cost worry for contractors is the rising price of labor. Wages across the economy have been rising at their fastest clip in years since last summer. And if a surge in post-COVID-19 demand materializes, construction employers, already battling structural labor shortages, could face a heftier bill. That scenario could be teed up because after the business slowdown reduced labor pressures, three-quarters of the Top 50 now say they're facing worker shortages (**Fig 13**). As business returns, 83% say they're planning to add to their labor forces (**Fig 14**). That's a big swing from last year on both counts: Only about a quarter said last summer they were short on labor and were expecting to add employees. As it happened, a little more than a third reported a net increase in hiring in 2020, down from 75% in 2019 (**Fig 15**).

Fig. 13. For many years, the vast majority of Top 50 companies have indicated they were experiencing worker shortages. However, for the first time in a long time, 49% of respondents last year said they were not having issues with labor shortages, potentially reversing that trend. However, this year, that number shifted the other way with only 25% of respondents saying they were not dealing with labor shortage issues.

Fig. 14. Last year, half of respondents said they planned to lay off employees, which was a contradiction to historical Top 50 data from many years before. However, the tides may be turning, as only 2% of Top 50 companies expect to reduce headcount in 2021.

Fig. 15. The number of Top 50 companies adding headcount in 2019 held strong at 77%; however, that number plummeted to 38% in 2020. Similarly, whereas only 2% of respondents laid off employees in 2019, 31% of respondents reported doing so in 2020.

Costlier labor might be an acceptable tradeoff if it helps address contractors' worker supply problems. Chronic skilled labor shortages have been a near constant backdrop for contractors and many of the Top 50 continue to see hiring as their biggest challenge if the worst of the pandemic is over. Echoing pre-COVID-19 Top 50 contractors, nearly half said finding and retaining quality employees was the single thorniest company growth impediment (**Fig 16**).

Fig. 16. With the exception of last year, when the pandemic was the most obvious deterrent from business growth among Top 50 companies, difficulty finding and retaining quality employees reclaimed its spot as the most obvious concern this year.

"If I had 150 electricians and foremen, we could hire them tomorrow," says Commonwealth's Price. "There's a lack of workers. We're trying to find electrical apprentices and field leadership as well to get the work done."

Like many other contractors, Commonwealth is trying to adapt to the worker shortage by moving to more off-site pre-fabrication work that can utilize less skilled labor that's in greater supply. Union agreements, however, complicate the company's ability to take full advantage of pre-fab's productivity features, he says.

A name that reflects tomorrow's technology, treatment, and training, as well as the suite's shape, the T-suite is a new space that is one of the most advanced of its kind. In a design/build role, Egan's electrical team worked with M Health Fairview for this phased addition and remodel of the University of Minnesota Medical Center's East Bank campus.

The tight construction labor market has MDU thinking creatively on how to cope with the twin challenges of workers leaving and evolving electrical work demanding those with different skill sets. That's prompting it to look farther afield — to new pools of talent in non-traditional places.

"We're doing a lot of outreach to include those who might cross over from another industry, such as the software field where we could get people into our 3-D modeling area," says Kelly.

While long-term growth will create professional talent needs at many levels, the more immediate need now might be the muscle and skills to simply get stuff built. Electrical foreman, journeyman, and electrician topped the list of the hardest positions to fill, a shift from 2019, when project manager and job superintendent ranked just below foreman (**Fig 17**).

Fig. 17. "Electrical foreman" retained its position in the top spot as the most difficult position to fill this year, according to Top 50 respondents. However, "journeyman" and "electrician" moved up several spots.

"Our challenge is people — finding skilled workers to competently take on these jobs," says Fisk's Borchardt. "It's been tough with incentives making it harder to keep people on the job. We're trying to rebound from that, and we've resorted to doing more of our own recruiting and encouraging union apprenticeship committees to take on bigger classes."

Interstates needs more electricians and foremen, too, but also is scouting for more project management and engineering talent needed for both construction and contracted plant operating system service work, says Van Egdom. The company is recruiting more outside the industry and banking on being able to offer prospects the opportunity to do more work remotely, a practice the pandemic has helped cement.

Far from all contractors, though, are sold on the idea of making work-from-home arrangements permanent or widespread. A solid majority said 100% office-based workers pre-pandemic wouldn't have the chance to work remotely going forward (**Fig 18**). After transitioning many to at least some remote work in 2020, contractors have moved many back to the office. Nearly half last summer said up to 10% of their employees had shifted to some remote work. A year later, almost 40% said those arrangements have ended (**Fig 19**).

Fig. 18. When asked if their companies would allow employees who used to work in the office pre-pandemic to continue working from home part- or full-time going forward, the majority of Top 50 firms (58%) said no, while 42% answered affirmatively.

Fig. 19. At the time this survey closed last year (early July 2020), close to 50% of Top 50 companies had up to 9% of its workforce working from home who were not previously doing so. This year, that number dropped drastically to 36%. In addition, 38% of companies indicated that none of their employees were working at home.

The pandemic, however, could produce some long-term human resource-management consequences for contractors. Eventual expanded remote work for employees is one but mentioned more often as lasting pandemic-induced changes were expanded virtual meetings, increased attention to employee health and safety, and using technology more to boost productivity and competitiveness (**Table 5**).

Table 5. The No. 1 factor respondents believe will have the greatest long-term impact on their companies going forward as a result of the pandemic is the trend to continue conducting more meetings virtually. An increased focus on employee health and safety as well as using technology more frequently also ranked high on the Top 50's list of future plans.

Technology payoff

The construction industry continues to increase and expand its adoption of information technology, and electrical contractors aren't being left behind. Echoing survey findings that field workers are using apps and software extensively for project, time, and labor management (**Table 6**), and that product specifications, installation guidelines, and codes and standards requirements are the most accessed on mobile devices (**Table 7**), some contractors say productivity improvement is a primary goal of expanded digitization, especially as project schedules grow more compressed and staffing levels are pressured.

Table 6. Again this year, Top 50 respondents overwhelmingly indicated their employees use project management tools more than any other type of digital program, followed closely by time management and labor management platforms.

Table 7. Again this year, Top 50 respondents indicated their employees are accessing product specifications and installation instructions most frequently in the field, followed closely by codes and standards requirements.

ArchKey's Scharff says digitization has become central to the company's "continuous improvement" push aimed at gaining better understanding of workflow and processes that are central to profitability. "Making sure you have the data and insight into your processes to make smart changes that will yield better, more efficient and safer results for our people is critical," he says.

As sophisticated and capable as such technology has become, however, it demands worker buy-in and understanding to deliver its full value to contractors. That's especially true when it comes to applications used on the ground in projects via mobile devices. Pushing technology out to work sites, where the work occurs, delivers a big part of the value proposition. That might be why more contractors surveyed have consistently named field apps and software as the area where employees need the most training (**Table 8**). That may partly reflect the still-unsettled state of the technology, says Cupertino's Schott.

Table 8. "Field apps and software" passed the "NEC" last year as the most common topic Top 50 employees need training support on. Both of these categories maintained their spots in the top two. Remarkably, every category fell into the exact same ranking as last year, suggesting a consensus.

"A constant issue in front of us is so many new technologies and new software platforms," he says. "It can be overwhelming when you have four different projects underway, and four different software platforms you're working with. So you have to be careful sometimes about grabbing the shiny new thing. There's an impact on employees when we throw too much at them."

Some potentially game-changing construction technologies, however, have been moving ahead slowly. Notable are augmented reality (AR) and virtual reality (VR) — tools that allow unprecedented levels of detailed plan visualization, design changes, collaboration, and project planning and scheduling. The Top 50 survey has monitored sentiment on AR/VR as viable electrical design tools for several years, finding that most contractors say they're still a ways down the road. This year, though, the ranks of those saying each is now viable took a jump, from 20% last year to a record 34% this year for VR (**Fig. 20**), and less dramatic, from 18% to a record 25% for AR (**Fig. 21**). What changed little, though, was that collaboration, planning, and training were selected as the primary applications for both AR and VR (**Fig. 22** and **Fig. 23**).

Fig. 20. Last year, 35% of Top 50 companies (5% more than the previous year) didn't see this technology materializing until five years or more. That number dropped to 19% this year. Firms indicating that they're already using the technology made a dramatic increase from 20% last year to 34% this year, taking over the most popular response to this question.

Fig. 21. Again this year, the greatest number of Top 50 companies (32%) believe it will be two years or more before augmented reality technology is a viable component of their electrical work. The number of firms saying they're already using the technology also increased from 18% last year to 26% this year.

Fig. 22. These are the top six areas in which Top 50 respondents see their firms incorporating augmented reality technology into the business in the next few years. Pre-construction planning surpassed collaboration with other contractors as the driving force behind this trend.

Fig. 23. These are the top six areas in which Top 50 respondents see their firms incorporating virtual reality technology into the business in the next few years. This year, responses were more evenly spread across all of the categories than in year's past.

Commonwealth Electric's engineering group and building information modeling group has been experimenting with VR, "using it to show some customers where components will be while physically standing in the model," but routine use, says Price, isn't imminent with either AR or VR.

"The customer has to have the money for it," he says. "But it's interesting stuff and maybe there comes a time when that's essential to making money, but not now."

Now, it's maybe fair to say, contractors need to focus on the nuts and bolts of getting their businesses fully back on track. In the wake of pandemic-related disruptions that may not show up in revenue and profit numbers until several quarters down the road, many might need to adjust to some new realities that could have staying power — from shifts in relative strengths of markets to employees working remotely to an ever tougher labor availability landscape. Indeed, contractors' views of top challenges their businesses face in the next few years broadened this year, partly reflective of the pandemic's impact. Labor-related issues still dominate contractors' views of their "single biggest business challenge," but now the list includes "price escalations;" vendor provision of "real-time information for cost and time impacts to our projects;"

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