

Providing Vision and
Leadership for the Future
of the HVAC and
Sheet Metal Industry

THE CHANGING RISK ENVIRONMENT

2022 Prepared By:

*Mike Clancy, Partner and Strategy Practice
Leader, FMI*

Matthew Minchew, Consultant, FMI

Dylan Szumanski, Senior Analyst, FMI

2022 NEW HORIZONS FOUNDATION MANAGING PROJECT RISKS TASK FORCE

Shasta Erickson, *Vice President of Business
Development & Finance*
Miller Bonded Inc.
Albuquerque, NM
Ph: (505) 881-0220
serickson@millerbonded.com

Charlie Kletecka, *Vice President, National
Operations*
Harris
Ogden, UT
Ph: (385) 408-1630
ckletecka@harriscompany.com

Wayne Greenwood, *President*
JEC Service Company, Inc.
Waltham, MA
Ph: (617) 268-3800
wgreenwood@jec-company.com

Randy Pagel, Sr., *President*
Bumler Mechanical
Sterling Heights, MI
Ph: (586) 731-0028
randy.pagel@bumlermech.com

Robert Grossmann, *Senior Estimator*
Murphy Company
Saint Louis, MO
Ph: (314) 692-1540
rgrossmann@murphynet.com

Thomas J. Soles, Jr., *Executive Director*
New Horizons Foundation
Chantilly, VA
Ph: (703) 402-7395
tsoles@newhorizonsfoundation.org

TABLE OF CONTENTS

Executive Summary: The Changing Risk Environment	1
Theme 1: Fast, Cheap, and Poorly Designed	2
Theme 2: The Forty Years War – For Talent	3
Theme 3: A Post-Pandemic World (Re) Introduces Scarcity	5
Theme 4: Calamitous Contracts	7
Theme 5: “Unknown Unknown” Risks	9
Offsite Construction	10
Marijuana Confusion	10
Regulatory Complications	10
Cybersecurity Challenges	10
Appendix: Industry Survey Results	16
Schedule Impact and Productivity Analysis	24
Contract Durations and Assumptions Overview	25
Survey Respondents by Contract Experience	25
Material and Scope of Work Impact	26
New Horizons Foundation Contributors	27

EXECUTIVE SUMMARY: THE CHANGING RISK ENVIRONMENT

Every HVAC and sheet metal contractor – and really, every contractor – is aware that construction is an inherently risky business. Failing to address the risks native to the construction industry has long been understood to have a downward pressure on industry profitability, as well as potentially more serious ramifications for the individual contractor. This paper seeks to address some of the core risks that have been facing sheet metal contractors for decades.

During the 2010's, three converging trends began changing the nature of the game for HVAC and sheet metal contractors. Faster, more aggressive schedules for construction combined with a shortened and less complete design process and a desire for earlier cost certainty to create a core business challenge for contractors to navigate. Into this unpleasant stew of uncertainty, the COVID-19 pandemic dumped toxic new ingredients of supply chain disruptions, labor productivity and availability challenges, and a more challenging operating environment where the value of long-term relationships has been minimized or overshadowed in favor of onerous and one-sided contractual language.

Our study of the key risks facing the industry led us to conclude that our original assumptions – that the three core risks of earlier cost certainty, accelerated schedules, and delegated design were the major challenges to today's sheet metal contractor – were merely the tip of the iceberg. Additional sources of risk abound, and so our view of the risk environment shifted to five key themes.

1. **Fast, Cheap, and Poorly Designed:** the convergence of too-early cost certainty, too-shortened construction schedules, and design that is at best incomplete and at worst unacceptable
2. **The Forty Years' War – For Talent:** the ongoing challenge of attracting, developing, and retaining a sufficient skilled workforce of craft labor to meet the growing demand

3. **A Post-Pandemic World (Re)Introduces Scarcity:** the supply chain disruptions that began with COVID and have now become a part of doing business in the 2020s
4. **Calamitous Contracts:** how upstream and downstream contracts have become more burdensome, and counterparties less willing to budge
5. **Unknown Unknown Risks:** those emerging risks that the industry has not had to face before the last decade which will disrupt the business in the future

Beyond these key themes, this white paper provides guidance for HVAC and sheet metal contractors looking to improve their approach towards risk management with both strategic insight and some tactics that can be implemented immediately to tackle the industry's most persistent and significant challenges.

"It is up to the contractor to figure out their appetite for the risk and their ability to monetize it. The challenge is to see the risk; if you see it, and can quantify it, it enables you to make a business decision."

– Charles F. Boland, Greyhawk



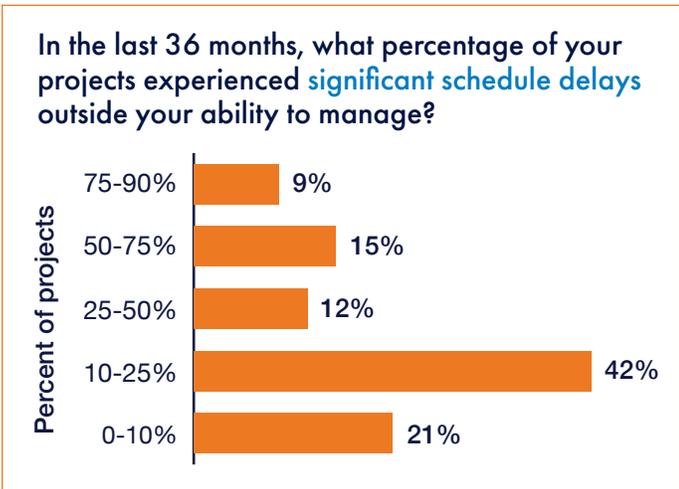
THEME 1: FAST, CHEAP, AND POORLY DESIGNED

When FMI first proposed this study on behalf of the New Horizons Foundation in 2019, our belief was that three key trends were exacerbating the industry’s already unbalanced risk/reward calculation. The first was the continuing demand by the owner community, and the general contractors and construction managers whom they hire, to reduce already extremely tight construction schedules. The ongoing schedule compression in the industry has been so severe that, for nonresidential building projects of \$25 million or more in total contract value, today’s construction schedules are on average twelve months shorter in total duration than they were a mere decade ago.

Complicating the situation is the unyielding nature of contract end dates regardless of what happened up to that point. Even though, according to SMACNA contractor Tom Martin, “the schedule may be impacted by circumstances beyond our control or ability to directly manage.” And owners and general contractors often fail to appreciate the complexity of HVAC and sheet metal work, and so misunderstand the impact of phasing changes and other seemingly benign changes. “We have to fabricate our ductwork; we can’t just pull it off the shelf, so sequencing changes are a big deal for us” said Angie Simon of Western Allied Mechanical. For her firm, jumping around and mixing up workflows is an even bigger issue than merely compressing the schedule.

And these contractors are not alone. Among the HVAC and sheet metal company executives we surveyed, only three percent said they never or rarely experienced compressed schedule durations for their scopes of work. 68% said these compressed schedules had a substantial or major impact on the efficiency of their scopes, while 59% said they had a substantial or major impact on the financial performance of their companies. Meanwhile, the willingness of owners to pay for these delays was extremely low; 73% of survey respondents said they were able to be compensated for the impacts of delays less than 10% of the time. The infamous “no damages for delays” contractual clause was referenced in interview after interview as providing seemingly unlimited protection to owners and general contractors at the expense of trade contractors.

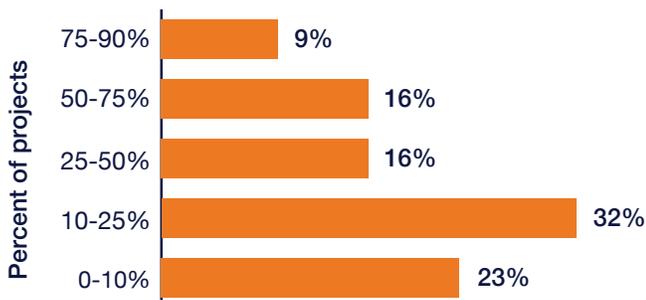
Sometimes, it is not the owner or the general contractor who is creating the challenges for sheet metal contractors to work efficiently. One SMACNA member shared that his firm had experienced the impact of “life safety” framing on their scope of work. Framing contractors had been able to get large portions of wall framing designated as “life safety” elements and thus be able to install them prior to the mechanical trades. In addition to the challenges and potential for back-chargeable damage to that framing, there was also the tendency for additional, non-life-safety elements to be installed at the same time, creating more obstacles to efficient work.



THE CHANGING RISK ENVIRONMENT

The second key risk we identified in 2019 that has, if anything, worsened today, is the risk associated with owner demands for earlier cost certainty. Of our survey respondents, only 20% said that they were rarely or never expected to commit to cost well in advance of biddable design. For those that did have to make that early commitment, though, more than half said it had a substantial or major impact on the financial performance of their companies. This ties to an ongoing industry trend of poorer and less complete design which has been much discussed among contractors for the past two or three decades. However, the solution developed by the design community has been to “delegate” portions of the design to the trade contractors to complete.

In the last 36 months, what percentage of your projects experienced **subcontractor trade stacking** on the jobsite that created productivity challenges for one or more trades?



This trend towards more delegation of design is the third key risk we identified for HVAC and sheet metal contractors in our initial hypothesis. Three quarters of HVAC and sheet metal contractors we surveyed described delegated design as a challenge they deal with at least occasionally in their businesses. Forty-four percent of respondents experienced substantial or major schedule impacts from delegated design, while 39% experienced similar efficiency impacts, and half rated the financial impact of delegated design on their business as substantial or major.

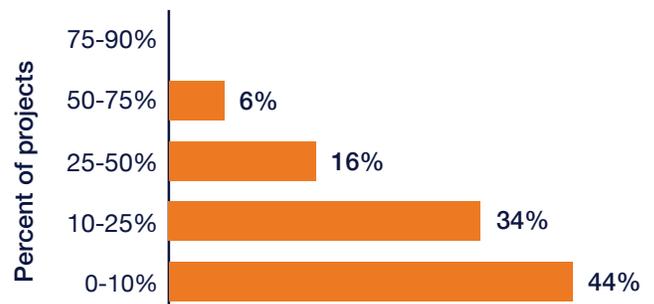
At the end of the day, however, these risks are really a fundamental part of the landscape by now. As one claims consultant we interviewed put it, “with respect to

owner and general contractor demands, owners and GCs are always going to ask the subcontractor to do more and more with less and less.” What is different is that these risk factors are at play in an industry challenged by a key structural risk and significant, rapid changes in business practices.

THEME 2: THE FORTY YEARS WAR – FOR TALENT

The availability of skilled labor has been an industry challenge for so long that it is difficult to remember a time when the construction industry was fully staffed. One way of assessing the longstanding nature of this problem is with a literature scan, which found headlines going back to 1976 about the “skilled labor crisis” in the construction industry. Regardless of when they started, the construction industry’s labor woes have continued unabated for at least the last forty years. According to last year’s joint FMI-AGC Industry Risk survey, 48% of respondents (largely GCs and CMs, over half with annual volumes of \$500 million or more) rated the limited supply of skilled craft workers as a top industry risk, the most of any risk identified. And only one in ten respondents gave themselves a score of 90% on the effectiveness of their companies’ strategies to mitigate these risks. The picture does not improve, either, as two thirds of respondents believe that skilled labor availability will still be a key industry risk in 2025.

In the last 36 months, what percentage of your projects experienced **significant personnel/staffing challenges** that impacted your ability to perform your scope of work?



For the sheet metal trade, the picture is no better. Over half of our survey respondents saw staffing challenges that significantly impacted their ability to perform contracts on 10% or more of their projects. 79% said it was at least sometimes difficult to staff their projects due to general labor availability issues, which led to substantial or major efficiency and schedule impacts half the time, and substantial or major financial impacts to the overall company nearly half the time.

While there is no single cause of these labor availability challenges, there are a few contenders that were shared by our survey and interview respondents.

- **Insufficient apprenticeship intake:** in the past, the trades may not have always been as keen to focus on pre-apprenticeship and apprenticeship, but today’s labor partners are much better about open apprenticeship programs and reducing or eliminating obstacles to intake. However, for many of the interview participants, their local apprenticeship applications are less than the demand for apprentices and allow for no attrition. The general belief among respondents is that this issue is driven by a lack of awareness of the opportunity available in the skilled trades, an education establishment that prioritizes college for post-secondary education over an apprenticeship, and an inability to market to and attract the next generation into the industry. As one respondent said, “it seems like there is a whole generation of potential workforce who could be interested in becoming members, but we don’t pursue them actively enough.”
- **Megaproject “sugar rush”:** one of the key challenges for union labor is in megaproject construction. These billion-dollar projects provide a high demand for labor and get everyone off the bench, but they do so at the cost of established local contractors and their market share. One interviewee we spoke with pointed to a single project that had absorbed 25% of the local’s labor force, with unlimited

overtime opportunities. While those projects are not sustainable, they are financially significant for the tradespeople who work on them. And as all the union labor floods to those projects, the local contractors are unable to staff all their traditional opportunities, allowing non-union competition to gain a foothold. When the megaproject is completed and the national contractor leaves, the local labor and contractor community has lost substantial market share, often irreversibly.

“I could go sign \$5 million of work this month but cannot be sure I can staff it.”

– Chad Bunting, President, Schoppe Co.

- **Knowledge loss to retirement:** “The Great Crew Change” is the ongoing ripple effect of the Baby Boom generation heading into retirement and leaving the workforce, and nowhere is this challenge more keenly felt than in the skilled trades. Field leaders such as foremen and superintendents have been a special challenge, but overall, the effect of accelerated retirements (especially in the context of COVID-related shutdowns and unemployment) has meant a workforce that is on average less skilled and experienced. One interviewee also referenced a seeming unwillingness on the part of craft workers to continue to train to add to their skillsets and enhance their capabilities; in his words, “since 2010 we have lost a lot of skilled craft leaders, and many of the new ones coming up are not as capable nor willing to invest the time and effort to grow their capabilities.”
- **Value proposition challenges:** For signatory sheet metal contractors, the value proposition for their signatory relationship has always been that their union partner manages the availability and training of skilled labor for them in exchange for contractually higher wages and established benefits. However, in many markets today, skilled union-trained

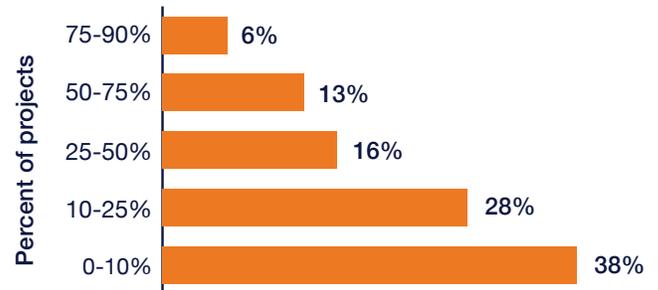
sheet metal workers can work non-union both more consistently and for higher wages in their paycheck. The benefits are not the same, but oftentimes, especially for younger workers, the value of benefits is overcome by several more dollars per hour. An inability to restate the value proposition for workers to remain in the union will create a challenge to the value proposition for the contractor.

The sum total of these contributing factors is an industry that is consistently eating its seed corn, unable to attract enough new entrants to reverse decades of decline in union density in most markets. Without aggressive and innovative action to reverse this trend, the ability for HVAC and sheet metal contractors to retain their existing market share, let alone gain share versus non-union competition, is endangered.

THEME 3: A POST-PANDEMIC WORLD (RE) INTRODUCES SCARCITY

We in the West have been unfamiliar with scarcity since the end of World War II. Rationing is something our parents or grandparents told us about, along with Victory Gardens and War Bonds – a quaint anachronism of a time when it was possible not to have enough. And apart from a brief five-month interlude in 1973 and 1974, when oil supplies were embargoed, the United States and Canada have experienced a steady increase in the availability of – well, everything. If you had the money, you could get it – and with technology, get it ever quicker. Sure, periodic weather-related disruptions to supply chains happened, or maybe those tied to a shutdown of a particular plant – but these were more of an inconvenience, really.

In the last 36 months, what percentage of your projects experienced significant material availability challenges that impacted your ability to perform your scope of work?



All of that changed over the past two years. Suddenly, materials were scarce. When you could get them, they were more expensive – and sometimes you couldn't get them at all. The fragility of our globally interconnected supply chain was put on display, and our industry suffered along with all the rest of them. Among our survey respondents, 63% experienced significant material availability issues that impacted their ability to perform on 10% or more of their projects. One SMACNA contractor reports waiting six months for chillers to be delivered, pushing school renovation projects that should have been delivered before classes began in the fall out to after the winter break. Another interviewee was getting quotes in March of 2022 for rooftop units that wouldn't be delivered until 2023. Custom units, and those for critical systems like healthcare or clean rooms were delayed by a year or more over typical lead times as well, requiring a whole new discipline and mindset around procurement.

When material could be procured, there were often issues with damage and quality control. Since all manufacturers are dealing with the same shutdown, material shortage, and labor availability issues, quality of delivered components has been patchy at best. According to Bill Singleton of SMACNA member contractor Vision Mechanical in Colorado, "On a recent equipment order from (a major manufacturer), 52% of the equipment was delivered damaged. Some of that was cosmetic, but others required extensive

THE CHANGING RISK ENVIRONMENT

local repairs.” Packaging failures and trucking damage and delays became so extensive, Vision actually had a fleet of tractor trailers picking up equipment from the manufacturer to allow for improved predictability and control.

“The quality of manufactured components is lower than ever, and vendor and manufacturer training on start-up is inadequate.”

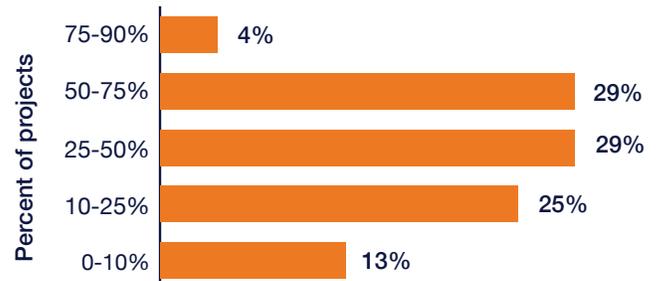
– Jay Hansen, C.J. Hansen Co.

Even if you can secure material and can do so in a timely fashion without excessive damage, price fluctuations have occurred on many specialty equipment and commodity material products. Of our survey respondents, 87% of them experienced significant, profit-impacting material price increases on at least 10% of their projects – and for a third of the respondents, this occurred on half or more of their projects. Given the already historically narrow margins in the industry, covering such wild swings in material cost turned profitable projects for many into challenging ones.

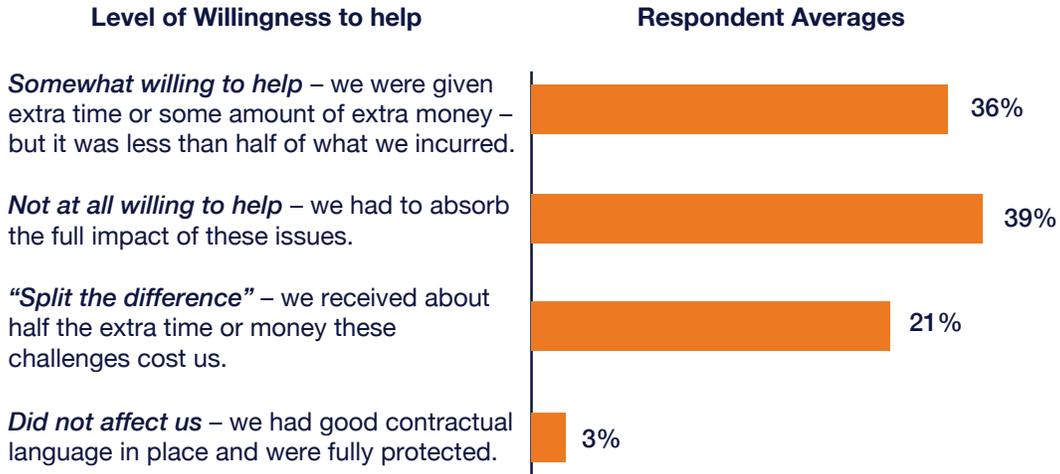
“We have had to absorb significant price increases,” said one interviewee, who reported having to buy steel at \$1.40 per pound that was estimated at sixty cents per pound. Nevertheless, that contractor considered himself lucky; one of his key vendors, a supplier of galvanized steel, has been working to manage material prices for his company due to their longstanding business relationships. However, most interviewees reported that stainless steel material and other exotic or specialty metals had increased astronomically in price, making certain types of work, such as in chemical or food processing plants, essentially unbiddable. And shockingly, for almost 40% of respondents, contractual counterparties were unwilling to do anything to help in spite of the unprecedented global nature of the supply

chain disruption. “We have had very little success in getting owners to help us with material price and delay issues,” said Rick Ferguson of Toronto-based Black and McDonald. “Public sector owners have worked with us, but private ones are holding a pretty firm line.”

In the last 36 months, what percentage of your projects experienced significant material price increases that impacted the profitability of your scope of work?



If you experienced material availability or price increase challenges on projects, how willing were your contractual counterparties to help you?

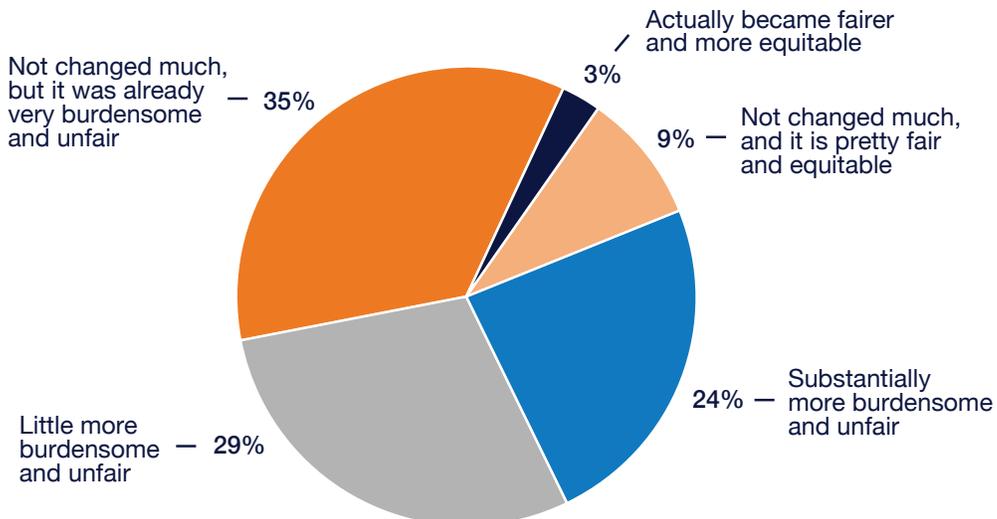


THEME 4: CALAMITOUS CONTRACTS

The supply chain challenges also served to expose another significant risk to specialty contractors – the one-sidedness of many contractual relationships. Clauses like *force majeure* that once were perceived

to be a warm blanket of protection for a contractor’s business were shown to be shredded and ignored at will, while other clauses, such as broad indemnity language or no damage for delay clauses became weapons to be wielded against the trade contractor who got sideways with their client.

In the last 36 months, what have you experienced with respect to the language of the contracts you are asked to sign?



“Industry contracts have always been one-sided but have swung more so lately.”

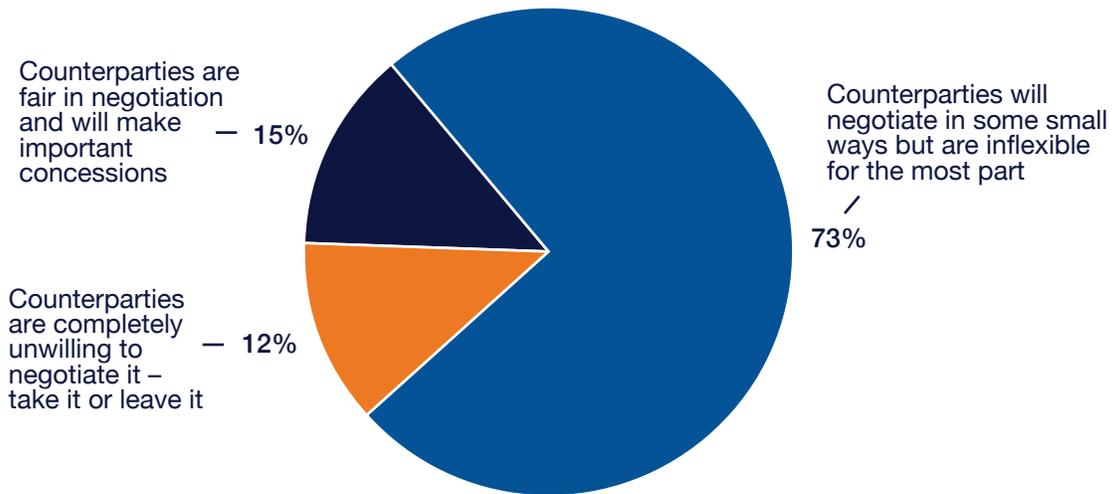
– Midwestern Multi-Trade Mechanical Firm President

Among survey respondents, more than half said the contracts they are being asked to sign have gotten more burdensome and unfair over the past three years – and that is on top of the 35% who pointed out that, even though their contracts hadn’t changed much, they were already burdensome and unfair to begin with. These burdensome contracts have a real financial impact too – 96% of survey respondents said that contractual requirements had a negative financial impact on their companies, as well as on the efficiency of their project performance. “We don’t even bother to have attorneys look at the contracts anymore because they aren’t going to negotiate or redline the terms – especially on

indemnification, insurance, and liquidated damages,” said one interviewee. “The big national CMs are offering no revisions to their contract language.”

This “take it or leave it” mentality is nothing new, but both survey respondents and interviewees stated that where once personal relationships could be counted upon to soften the sting, now there is truly no room for negotiation. Only 15% of survey respondents rated their counterparties as fair in negotiations and willing to make important concessions. Nearly as many, 12%, said their counterparties are completely unwilling to negotiate and have a “take it or leave it” stance to contract language. “The contract language is pretty terrible. We tend to accept whatever language gets crammed down on us, and it’s not uncommon for us to still be chasing down change orders for a year or more” according to one interviewee who asked not to be quoted by name on this subject.

In the last 36 months, what have you experienced with respect to the willingness of counterparties to negotiate the terms of the contracts you are asked to sign?



Other interviewees report that since contracts and specifications have gotten so burdensome, there can be a bit of a “kitchen sink” effect. “Specifications have gotten much more egregious about downloading all of the design risk onto the contractor” says a Canadian interviewee. “For example, we are seeing specifications where we are being required to submit engineered drawings of ductwork support, which is way beyond what has historically been needed.” Another interviewee points out that, given the change to electronic bidding documents for most projects, it has become easier to dump in a lot of language and specifications, which may not be aligned. Angie Simon, CEO of Western Allied Mechanical, notes that “when we bid a job, even as a design-build, we are responsible for having reviewed all the documents in the bid package. With electronic documents there is no cost to the owners to incorporate a lot of stuff in there that may even be contradictory, we may not have time to read all the documents in the time to pursue, and if they want to hang us up they can certainly hide things there.”

Ultimately, the onus with these calamitous contracts is on the trade contractor not to sign a contract whose terms you have not examined and assessed yourself. According to Charles F. Boland, P.E., Principal and Chairman of the Board of project consultancy GREYHAWK, “A lot of times you are pushing out a lot of bids and may not see the risk and downside coming. You need to be able to see it, value the downside, and then make a business decision to go or no-go, and need to create and price the risk register when you pursue the project.”

“You need to put on your risk manager’s hat, not just a work acquisition one”

– Charles F. Boland, Greyhawk

While focusing on the GC, CM, and owner contracts is critical, sheet metal contractors cannot lose sight of downstream contracts either. Most trade contractors have been used to thinking of their vendors as trusted partners, or at least allies. However, many of the more sophisticated corporate vendors are as eager as the GC

and CM community to push risk onto the sheet metal and HVAC contractors. Vendor terms and conditions are generally routinely accepted along with acceptance of a quote. However, those terms and conditions that are implicitly accepted can have a huge impact on a project, such as the large national equipment brand whose terms and conditions explicitly shed accountability for delivery dates. The unwary sheet metal contractor could find itself wholly liable for delays caused by the vendor’s inability to meet delivery, with no recourse to backcharge for liquidated damages or other costs incurred. “You need to be reviewing contracts both upstream and downstream” according to Angie Simon.

THEME 5: “UNKNOWN UNKNOWN” RISKS

Former Secretary of Defense Donald Rumsfeld was perhaps best known for his bombastic, combative style with other government officials and the press. However, on the subject of risk management, he may have coined one of the most pithy and accurate truisms ever.

Reports that say that something hasn’t happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns—the ones we don’t know we don’t know. And if one looks throughout the history of our country and other free countries, it is the latter category that tends to be the difficult ones.

We have explored some of the known known risk factors facing the sheet metal industry; there is no risk better known than the risk of insufficient skilled labor, for example. Likewise, the recent uncertainty around the supply chain is certainly a known unknown – we know it will be a problem, just not necessarily how big a problem or how it will manifest on any particular project. So, what are the unknown unknowns facing the sheet metal industry? While we can never know perfectly what the next black swan issue will be, there are some emerging challenges that are introducing new risks.

Offsite Construction

Offsite construction, or prefabrication, can be a risk or an opportunity for the sheet metal trades. FMI interviewed one sheet metal contractor who is currently using prefabrication to help with his labor challenges by outsourcing fabrication to a union fabrication shop in another state; on the other hand, a Canadian interviewee mentioned modules being manufactured with unskilled labor in factories overseas and imported for projects, which would certainly be an unfavorable situation for union sheet metal contractors and workers.

Marijuana Confusion

The hodgepodge of laws in the United States about marijuana use, either recreational or medicinal, creates another area of risk for sheet metal contractors. Unlike alcohol, which metabolizes quickly, current methods of testing for marijuana use either pre-employment or post-incident cannot establish recency of use. It is entirely likely that an employee who uses marijuana recreationally and crashes a company truck could have a cause of action if terminated. Policies around employee use of marijuana will be the next critical employment law frontier.

Regulatory Complications

The trend over the past few years has been towards increasing regulation and documentation across the board, whether in the area of employment disputes or in OSHA reporting standards. As one interviewee put it, “there appears to be a sea change in the relationship between the employer and employee, and a lack of trust or long-term interest by the employee in the employing company.” As another example, some sheet metal contractors we interviewed have seen an apparent shift in focus by OSHA towards extreme record-keeping rather than a stronger focus on employee health and safety. “The new recordkeeping requirements feel like an overstep. What occupational safety or health problem are they even solving with the proposed rule changes?” asked one interviewee off the record.

Cybersecurity Challenges

Cybersecurity has moved from the concern of large multinational firms to an issue affecting businesses and organizations of all sizes, including sheet metal and HVAC contractors. In 2021, with many more workers operating remotely, cyber attacks on businesses increased by 50% compared to 2020; from a strict mathematical standpoint, the average organization faced 925 cyber attacks per week last year. One interviewee shared the story of a non-union competitor who lost \$100,000 to a cyber-attack; another, a vendor whose business was effectively shut down for several days.

THE CHANGING RISK ENVIRONMENT

Action: How You Can Protect Your Business

An exhaustive survey of the risk environment has educational value, certainly. But beyond identifying and documenting the risks, the real value is in having a plan to mitigate, manage, and insure them. David Madison, FMI Principal and leader of its Risk Management discipline, states that “for years, contractors have tackled risk by relying on insurance programs and managing claims. That is no longer

good enough in today’s ever-changing and fast-paced environment.” Today’s sheet metal contractor must manage risk both defensively and offensively; in other words, there is a need to both protect the business from risk and strategically embrace enough risk to generate returns. Implementing that balanced risk management mindset is an organizational lift that touches on the entirety of the business; the various elements of the risk management function are laid out in the table below.



Risk Management	2008-2022 Trend Relative Impact	2022 Outcome & Likely Future
Risk Management Partners	<ul style="list-style-type: none"> ■ Capable partners who add value to your organization <ul style="list-style-type: none"> ■ Carriers ■ Sureties ■ Attorneys ■ Brokers ■ Dedicated construction practice ■ Depth of industry knowledge ■ Appropriate resources <ul style="list-style-type: none"> ■ Bench strength ■ Succession 	<ul style="list-style-type: none"> ■ Broker’s practice is not 100% dedicated to the construction industry ■ Broker does only “transactional” business i.e., purchasing insurance/ processing certificates of insurance (are you getting other services)

THE CHANGING RISK ENVIRONMENT

Risk Management	2008-2022 Trend Relative Impact	2022 Outcome & Likely Future
Enterprise Risk Management	<ul style="list-style-type: none"> ■ A process to identify potential risks, beyond the traditional risk elements, which could significantly impact the business ■ Facilitated exercise that leverages internal resources to establish a company’s risk tolerance level ■ Injects a comprehensive and repeatable process into the strategic management process ■ Follow-through on risk mitigation and management plans 	<ul style="list-style-type: none"> ■ Risks are discussed only as “known” risks ■ New risks are not identified in your strategic planning discussion ■ How siloed are your risk management functions? Does a consistent risk mindset permeate through the organization? ■ Do you assign a champion to manage identified risks?
Leveraging Risk Management	<ul style="list-style-type: none"> ■ Paradigm shift of how risk is viewed <ul style="list-style-type: none"> ■ Recognition that risk management can add significant value to an organization ■ Embrace and manage risk as an organization for a better outcome ■ Effectively incorporating our risk management program into all parts of our business and create a value for customers. 	<ul style="list-style-type: none"> ■ Risk is not discussed internally at the highest levels and therefore is not discussed widely with customers ■ Risk is not properly evaluated, recognizing that it can become an offensive tool which can profit the bottom line ■ Risk is still viewed as a defensive strategy and primarily an insurance and safety issue
Risk Management Department	<ul style="list-style-type: none"> ■ Risk Management function effectively connected to all functions of the organization ■ Seat at the senior management level ■ Charter and authority to manage risk management throughout the organization ■ Dedicated resources appropriate to the size of the organization 	<ul style="list-style-type: none"> ■ Risk is evaluated within silos of an organization ■ Risk, once identified, is no longer discussed at the highest levels of the organization ■ No person or persons are responsible and held accountable for Risk Management
Insurance Program	<ul style="list-style-type: none"> ■ Leveraging innovative product options in the insurance industry ■ No “gaps” in the program which leave the organization exposed ■ Broad/Comprehensive program in place ■ Structured to best protect the balance sheet and company legacy 	<ul style="list-style-type: none"> ■ Insurance purchasing decisions are based on price only without due consideration of coverage ■ Insurance purchasing is purely transactional and renewed year after year without proper evaluation ■ Programs are not marketed regularly (every 3-5 years)
Financial Participation	<ul style="list-style-type: none"> ■ Maximizing financial benefit by retaining as much risk as your Balance Sheet will allow ■ Appropriate retention levels (large deductibles) ■ Leverage financial tools and consideration of captive involvement ■ Strategies to minimize the price of insurance 	<ul style="list-style-type: none"> ■ Deductible levels are not reviewed annually ■ Internal insurance rates are not adjusted year over year to reflect cost of insurance and deductible risk

THE CHANGING RISK ENVIRONMENT

Risk Management	2008-2022 Trend Relative Impact	2022 Outcome & Likely Future
Project Execution	<ul style="list-style-type: none"> ■ Subcontractor and Vendor Management <ul style="list-style-type: none"> ■ Pre-qualification & selection process in place and utilized ■ Project Quality Assurance & Quality Control <ul style="list-style-type: none"> ■ Integrated into all projects ■ Appropriate documentation 	<ul style="list-style-type: none"> ■ Subcontractors and vendors are not vetted and no formal process around selection ■ No consistent way to gather project data ■ No postmortem project evaluation being done around subcontractor/ vendor performance
Safety Program	<ul style="list-style-type: none"> ■ Culture of safety embedded in the organization ■ Safety department is a resource to operations ■ Aggressive claims process that is utilized by an engaged team <ul style="list-style-type: none"> ■ Structured hand-off between field & home office 	<ul style="list-style-type: none"> ■ Safety is viewed as “overhead” ■ Safety personnel are not used as a resource but still function as a “safety cop” ■ Safety is not built into performance reviews ■ Claims are outsourced to a third party with little or no involvement at the corporate or field level
Project Risk Assessment	<ul style="list-style-type: none"> ■ Process to systematically and consistently evaluate potential projects on key areas of risk ■ Assists in appropriately pricing risk ■ Create simple to use dashboard for decision-makers ■ Integrate completed project experience ■ Provides good foundational risk information for field in pre-mobilization 	<ul style="list-style-type: none"> ■ Contingency placed on jobs during estimating / preconstruction is a guess ■ Process for go/no-go is fragmented within the organization ■ Executives depend on evaluation at project manager level with little or no accountability or communication

With regards to the specific risks discussed in our surveys and interviews, there were a few tactics identified as having worked in whole or in part by the participants.

- **General business management acumen** – several interviewees pointed to the value of having key leaders participate in the Business Management University program, as well as other SMACNA-provided training like its Basic and Advanced Project Management institutes training for project managers.
- **Supply chain impacts** – while some contractors shared experiences of clients unwilling to work with them on these challenges, most had a more positive experience. “Since this is a global issue and front of mind, most owners expect problems

and are being more reasonable about them” said one interviewee. However, Boland points out that the reasonableness of clients will have a limit.

“At the end of the day, it really comes down to dealing with the supply chain basis. You may see dramatic increases in delays and lead times, but now that we know that is the case you as the subcontractor are responsible for that. You need to factor in the risks that you know and temper that with your risk appetite. Also, somewhat qualify your bid with the risks that you know. Given the fluidity of the supply chain right now, it is irresponsible not to heavily qualify any bids you are sending with specifics of your ‘informed market assumptions.’ Make your assumptions, price to those, then state your assumptions (tied to

market awareness) and state your intent to seek relief/consideration for impacts outside the ones you have documented. You must show in your bids that you are addressing the known impacts to labor and material.”

Other basic protections sheet metal contractors should be considering include qualifying bids with a firm expiration date or providing allowances for especially volatile materials. Communication with owners is especially important, and one contractor mentioned the value of open book transparency in preventing issues with material escalation from negatively impacting their projects. Inventory management software has proven to be a good investment for some contractors, especially when pre-buying commodities or equipment for pricing or availability assurance, as well as online marketplaces for commodities, like Felux for steel.

- **Labor availability** – this remains one of the most critical challenges facing the union sheet metal industry. Unlike in years past, most local unions are completely aligned with their signatory contractors on the need to dramatically increase the supply of skilled labor, and the day of closed apprenticeship intakes is mostly over. However, decades of erosion of the value of a trade education in the mind of the broader culture is not easily overcome.

Some innovative programs exist. For example, Angie Simon shared in her interview the huge positive impact of the Heavy Metal Summer Experience (<https://www.westernallied.com/insights-news/heavy-metal-summer-experience-2022/>) in expanding the interest of previously underserved minority and female pre-apprentices. In fact, as part of the pilot, the team from Western Allied Mechanical prepared a complete toolkit for those interested in implementing the program in their area. This is not the only example of outreach to young people that the interview participants shared.

Other interviewees have opted to tackle other parts of the problem head-on. One contractor, who has seen nearby megaprojects strip all the available labor from the local, is aggressively marketing to those sheet metal workers, with the message that when they want a balanced life and to sleep in their own bed at night again, come on back. Others are aggressively using social media and other forms of outreach to drive interest in the trade. Ultimately, growing the supply of available skilled labor will require an “all of the above” approach at an industry level, as well as a focus on developing a culture that encourages engagement and retention.

- **Contract issues** – while contracts aren’t likely to improve in their terms anytime soon, understanding them is critical. Beyond SMACNA’s Business Management University, and having good legal representation, several interviewees mentioned the online application Document Crunch (documentcrunch.com) as a great tool for those without consistent legal representation. The service purports to use AI to scan contracts and identify particularly risky language. If “forewarned is forearmed” this tool can give a contractor necessary knowledge.

However, the best risk management tool to deal with contractual issues remains client selection. Having a distinctive advantage in demand, such as a design-build capability that causes end-users to seek you out, can be an effective tool to mitigate the most egregious contract terms. In addition, sheet metal contractors should remember the most basic rule of contracts – when someone tells you who you are, believe them. If a GC or CM expresses a willingness to partner with you, or tries to drive towards collaboration early, it seems likely the experience will be positive. If, on the other hand, a GC or CM seems to be insistent on abusive and one-sided contract language, the likelihood is high that at the first inevitable trouble, they will act abusive and one-sided.

As Charles Boland put it, “you should know your regional and local players. But on a larger project you may not be dealing with your normal GC relationship – you’re now dealing with the local firm’s national JV partner, who doesn’t care if you survive or not. What do you do? Once the bid is on, you need to be focused on a real schedule that connects to the GC’s schedule. You need to document your sequence and means and methods, either in a standalone schedule or as part of the master GC schedule. Then you need to document the actuals as they happen – this is critical. If you don’t document until it’s too late you miss required notice dates. If you aren’t documenting and doing good daily reports you have no chance of recovery. If you don’t have documentation you won’t get paid. Period. You may know how to do your work, but if you aren’t documenting and communicating where you are being impacted, you lose your opportunity to recover.”

“Larger firms have the infrastructure in place to manage the risk; more local players will put themselves in a bad spot if they don’t document and track the risks. Some of these are bet the firm decisions”

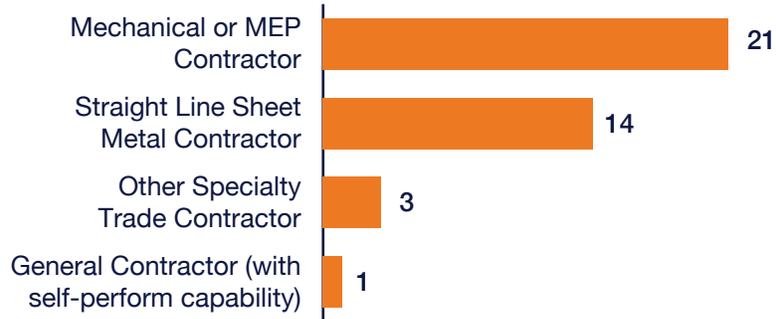
– Charles F. Boland, Greyhawk

The bottom line to all of the risks the industry is facing is that sheet metal contractors must be able to recognize and quantify them to be able to make effective use of the risk management tools above. The challenge, as always, is to be able to see and quantify the risk. If you can see the risk, estimate the likelihood of its occurrence, and put a value on its impact if it does occur, you can make an informed business decision.

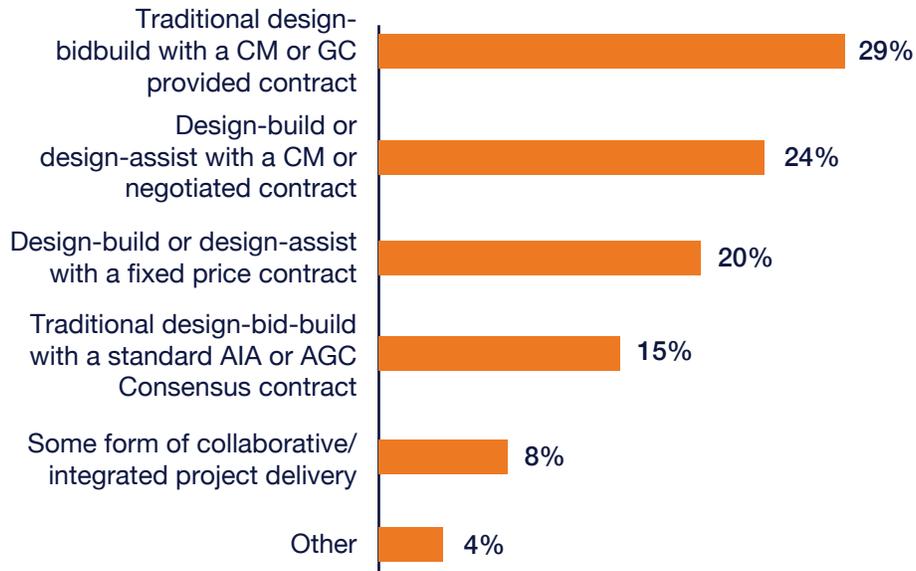
That is ultimately the way sheet metal and HVAC contractors will thrive in an environment full of new and familiar risk challenges.

APPENDIX: INDUSTRY SURVEY RESULTS

Survey Respondents by Demographics



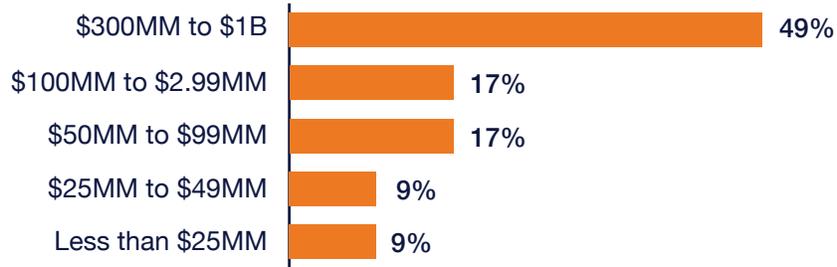
Survey Respondents by Contract Experience



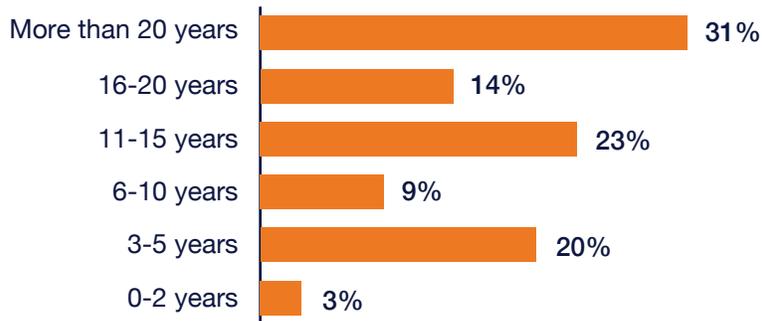
Survey Respondents Roles



Respondents Annual Construction Put-in-Place



Respondents Tenure



THE CHANGING RISK ENVIRONMENT

For each of the following project-related risks, how frequently have your projects experienced them in the past 36 months?				
Project Risks to Frequency	Often	Sometimes	Always or Almost Always	Never or Rarely
Compressed schedule durations for scope of work	57%	23%	17%	3%
Significant schedule changes (phasing, logic, sequence) after contract	49%	37%	14%	0%
Trade stacking on the project site	40%	34%	23%	3%
Owner selection delays impacting fabrication schedules	37%	46%	3%	14%
Design decision delays impacting fabrication schedules	29%	43%	14%	14%
Significant portions of the design “delegated” to their trade	17%	49%	9%	26%
Cost commitment well in advance of biddable design	23%	49%	9%	20%
Material price escalation (protected by an escalation clause in the contract)	14%	34%	9%	43%
Material price escalation (unprotected by an escalation clause)	43%	34%	9%	14%
Material prices unprotected by vendors (pricing durability/ holds)	40%	43%	9%	9%
Difficulty in staffing the project due to general labor availability issues	17%	51%	11%	20%
Difficulty in staffing the project due to project-specific requirements	17%	43%	0%	40%
Onerous contractual requirements	31%	37%	11%	20%

THE CHANGING RISK ENVIRONMENT

How much impact have these project-related risks had on the efficiency of the execution of your scope of work?				
Project Risks to Frequency	No Impact	Minor Impact	Substantial Impact	Major Impact
Compressed schedule durations for scope of work	0%	32%	50%	18%
Significant schedule changes (phasing, logic, sequence) after contract	6%	29%	51%	14%
Trade stacking on the project site	0%	39%	38%	24%
Owner selection delays impacting fabrication schedules	7%	53%	37%	3%
Design decision delays impacting fabrication schedules	3%	40%	43%	13%
Significant portions of the design “delegated” to their trade	4%	58%	35%	4%
Cost commitment well in advance of biddable design	0%	54%	39%	7%
Material price escalation (protected by an escalation clause in the contract)	10%	50%	35%	5%
Material price escalation (unprotected by an escalation clause)	3%	37%	40%	17%
Material prices unprotected by vendors (pricing durability/ holds)	9%	34%	50%	6%
Difficulty in staffing the project due to general labor availability issues	4%	46%	29%	21%
Difficulty in staffing the project due to project-specific requirements	10%	38%	43%	10%
Onerous contractual requirements	4%	54%	36%	7%

THE CHANGING RISK ENVIRONMENT

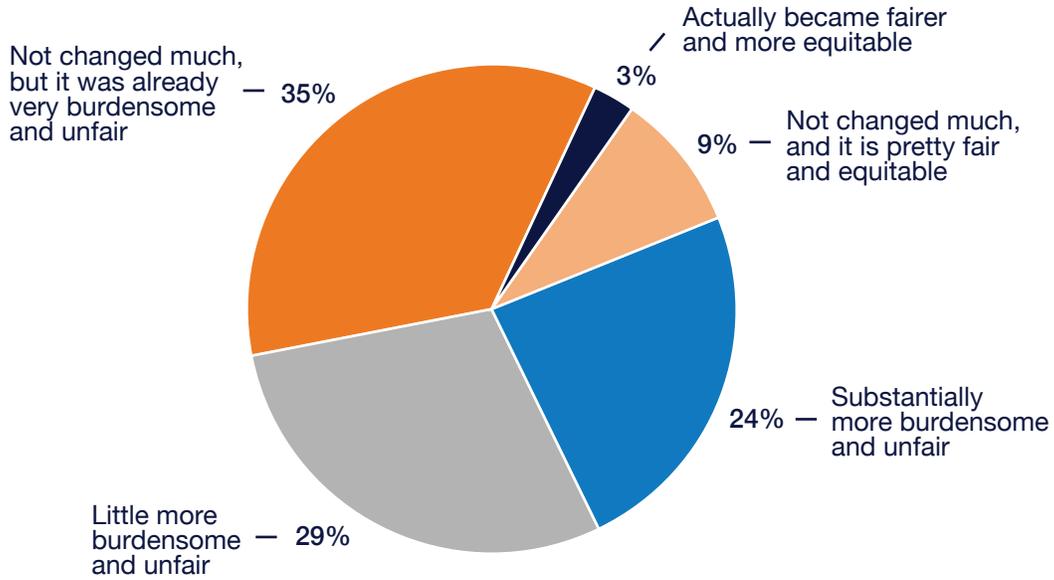
How much impact have these project-related risks had on the financial performance of your company?				
Project Risks to Frequency	No Impact	Minor Impact	Substantial Impact	Major Impact
Compressed schedule durations for scope of work	0%	41%	41%	18%
Significant schedule changes (phasing, logic, sequence) after contract	6%	31%	43%	20%
Trade stacking on the project site	6%	38%	38%	18%
Owner selection delays impacting fabrication schedules	7%	63%	17%	13%
Design decision delays impacting fabrication schedules	7%	47%	37%	10%
Significant portions of the design “delegated” to their trade	8%	42%	38%	12%
Cost commitment well in advance of biddable design	0%	46%	46%	7%
Material price escalation (protected by an escalation clause in the contract)	10%	55%	25%	10%
Material price escalation (unprotected by an escalation clause)	3%	33%	47%	17%
Material prices unprotected by vendors (pricing durability/ holds)	6%	38%	44%	13%
Difficulty in staffing the project due to general labor availability issues	4%	50%	21%	25%
Difficulty in staffing the project due to project-specific requirements	0%	48%	43%	10%
Onerous contractual requirements	4%	63%	18%	11%

THE CHANGING RISK ENVIRONMENT

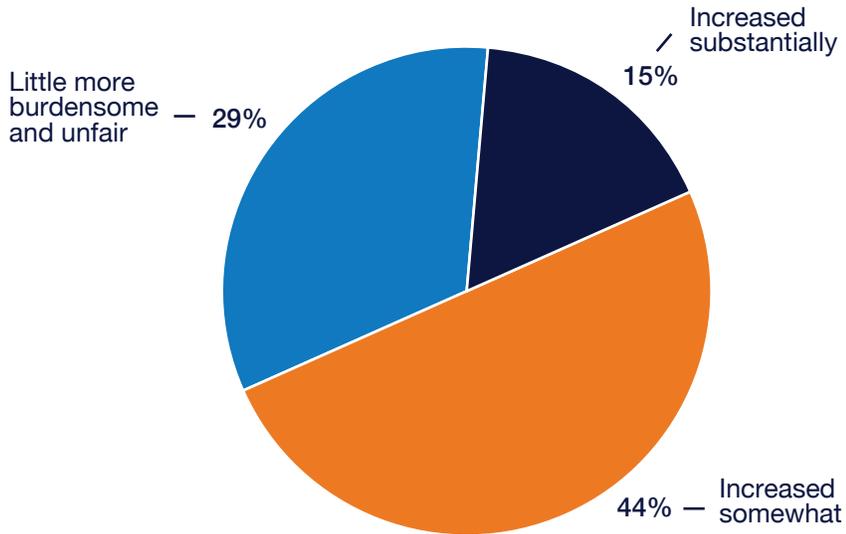
How much impact have these project-related risks had on the schedule performance of your company?				
Project Risks to Frequency	No Impact	Minor Impact	Substantial Impact	Major Impact
Compressed schedule durations for scope of work	3%	27%	48%	21%
Significant schedule changes (phasing, logic, sequence) after contract	6%	18%	47%	29%
Trade stacking on the project site	3%	42%	30%	24%
Owner selection delays impacting fabrication schedules	10%	45%	24%	21%
Design decision delays impacting fabrication schedules	3%	34%	48%	14%
Significant portions of the design “delegated” to their trade	8%	48%	36%	8%
Cost commitment well in advance of biddable design	7%	61%	29%	4%
Material price escalation (protected by an escalation clause in the contract)	25%	60%	10%	5%
Material price escalation (unprotected by an escalation clause)	20%	63%	17%	0%
Material prices unprotected by vendors (pricing durability/ holds)	16%	58%	23%	3%
Difficulty in staffing the project due to general labor availability issues	4%	48%	26%	22%
Difficulty in staffing the project due to project-specific requirements	0%	50%	30%	20%
Onerous contractual requirements	4%	70%	22%	4%

THE CHANGING RISK ENVIRONMENT

In the last 36 months, what have you experienced with respect to the **language** of the contracts you are asked to sign?

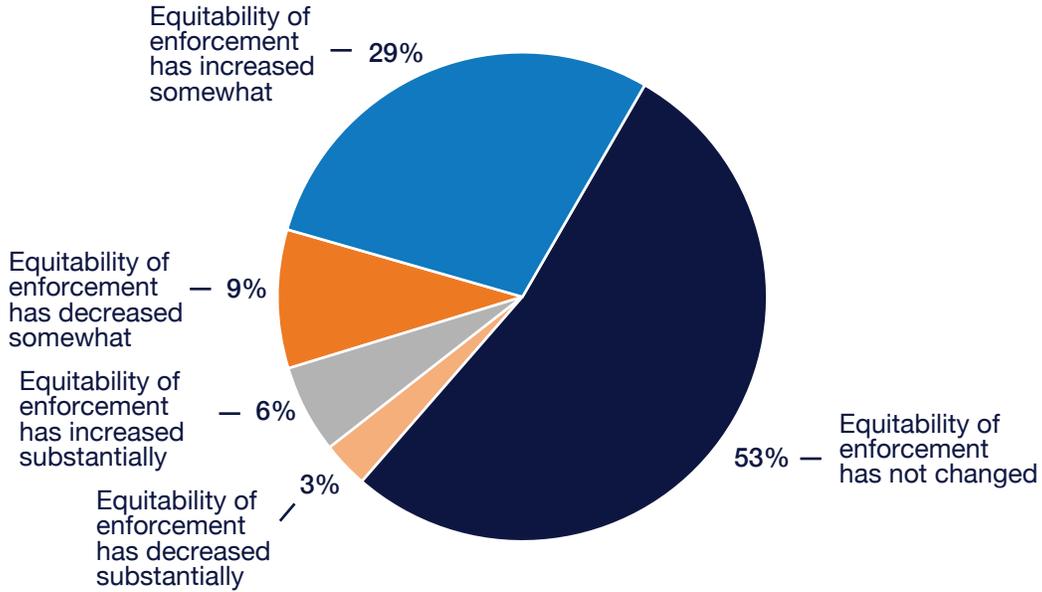


In the last 36 months, what have you experienced with respect to the **enforcement** of the contracts you are asked to sign?

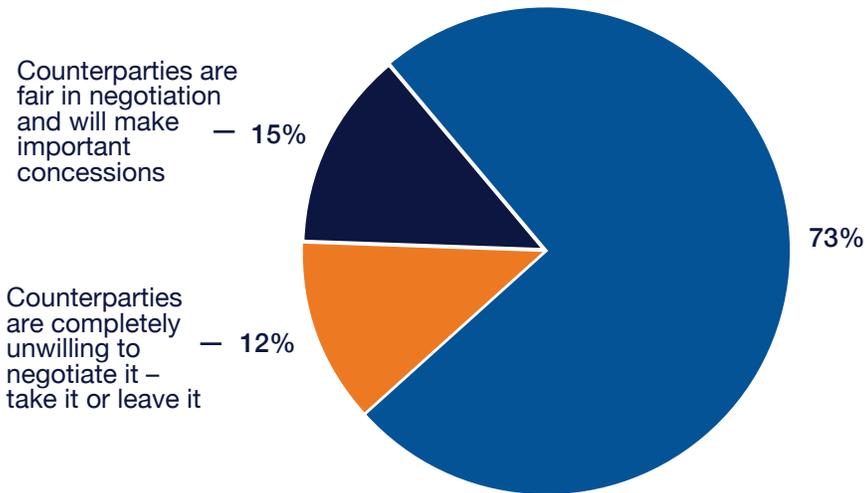


THE CHANGING RISK ENVIRONMENT

In the last 36 months, what have you experienced with respect to the **equitability** of contract enforcement on each party?

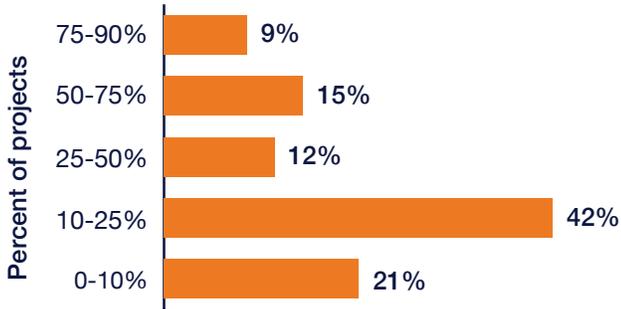


In the last 36 months, what have you experienced with respect to the willingness of **counterparties** to negotiate the terms of the contracts you are asked to sign?

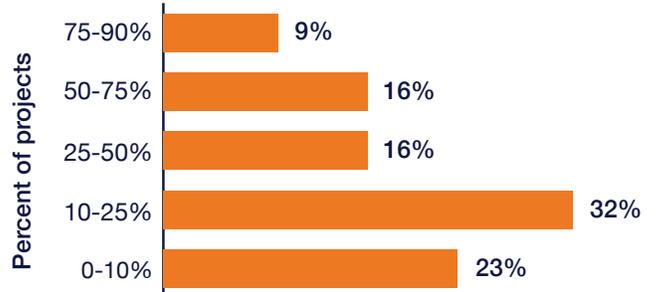


Schedule Impact and Productivity Analysis

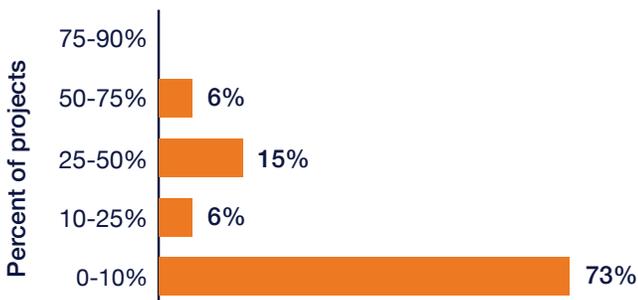
In the last 36 months, what percentage of your projects experienced **significant schedule delays** outside your ability to manage?



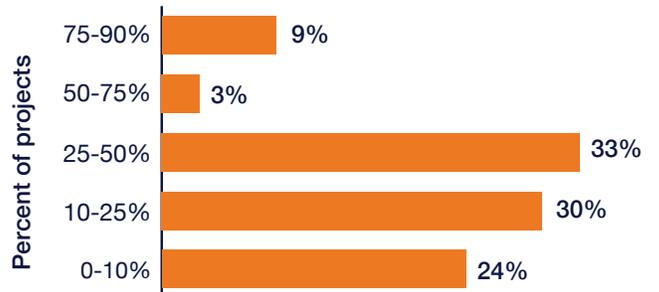
In the last 36 months, what percentage of your projects experienced **subcontractor trade stacking** on the jobsite that created productivity challenges for one or more trades?



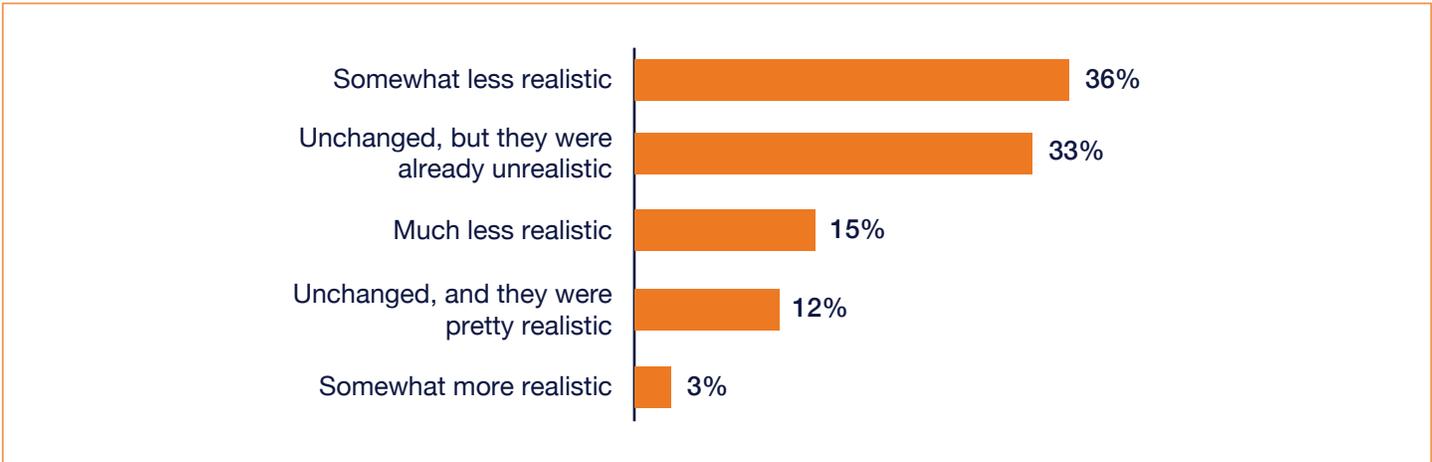
In the last 36 months, of the projects where you experienced significant delays, what **percentage of the time** were you able to be compensated for the impact of those delays on your business?



In the last 36 months, what percentage of your projects experienced significant changes in the **schedule sequence or logic** that had a negative impact on prefabrication, material availability, or staffing availability?



Contract Durations and Assumptions Overview

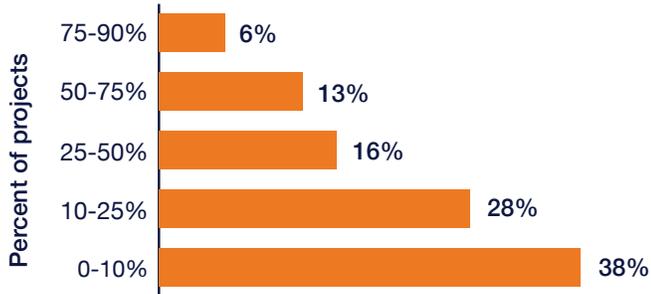


Survey Respondents by Contract Experience

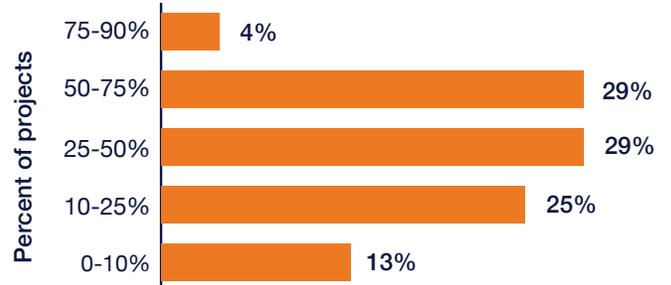


Material and Scope of Work Impact

In the last 36 months, what percentage of your projects experienced **significant material availability challenges** that impacted your ability to perform your scope of work?



In the last 36 months, what percentage of your projects experienced **significant material price increases** that impacted the profitability of your scope of work?



If you experienced material availability or price increase challenges on projects, how **willing were your contractual counterparties** to help you?

Level of Willingness to help

Respondent Averages

Somewhat willing to help – we were given extra time or some amount of extra money – but it was less than half of what we incurred.



Not at all willing to help – we had to absorb the full impact of these issues.



“Split the difference” – we received about half the extra time or money these challenges cost us.



Did not affect us – we had good contractual language in place and were fully protected.



NEW HORIZONS FOUNDATION CONTRIBUTORS

SUMMIT COUNCIL MEMBERS

The Summit Council is comprised of the Premier, Champion, Summit Counselor, Summit Circle, and Industry Mentors contributor categories. All members of the Summit Council receive national public acknowledgment at industry annual meetings and other special events and programs. In addition, they have the opportunity to participate in shaping the agenda for the New Horizons educational and research program.

Guy Gast, Chair

Angela Simon, Vice Chair

Ron Rodgers, Chair Emeritus

PREMIER - \$300,000 AND UP

ACCO Engineered Systems

Peter Fortin, California

Bay Area SMACNA Chapter

Sean O'Donoghue, Executive Vice President

Sheet Metal and Air Conditioning Contractors' National Association, Inc.

Represented by Aaron Hilger

CHAMPION - \$200,000 AND UP

McCusker-Gill, Inc.

Kevin R. Gill, Sr., Massachusetts

SMACNA - St. Louis Chapter

Howard Stine, Chapter Representative

SMACNA - Western Washington, Inc.

Brian Fluetsch, Chapter Representative
Julie A. Muller, Esq., Executive Vice President

SMACNA Greater Chicago

Jim Cesak, Chapter Representative
Tony Adolfs, Executive Vice President

SMACNA Southern California

Richard Rivera, Chapter Representative
Kevin O'Dorisio, Executive Director

Streimer Sheet Metal Works, Inc.

Frederick L. Streimer, Oregon

SUMMIT COUNSELOR - \$100,000 AND UP

AABCO Sheet Metal Co., Inc.

Ronald J. Palmerick, New York

Bright Sheet Metal Co., Inc.

Hank Meyers, Indiana

C & R Mechanical Company

E. Timothy Decker, Missouri

Climate Engineers

Peter Watson, Iowa

Holiday-Parks, Inc.

Grace Pizzey, Washington

Lennox Industries, Inc.

Texas

Marelich Mechanical Co., Inc.

Keith Atteberry, California

NEW HORIZONS FOUNDATION CONTRIBUTORS, CONTINUED

SUMMIT COUNSELOR - \$100,000 AND UP, CONTINUED

NYC SMACNA

John Contrubis, Chapter Representative

William Rothberg, Executive Director

Ron and Cindy Rodgers

Arizona

Sheet Metal Connectors, Inc.

James R. Myers, Minnesota

Sheet Metal Contractors Association of Philadelphia & Vicinity

Ernest J. Menold, Chapter Representative

Peter Jenkins, Executive Director

Sheet Metal Contractors of Iowa, Inc.

John Ilten, Chapter Representative

Kim Best, Executive Vice President

SMACNA Boston, Inc.

James M. Morgan, Chapter Representative

Thomas J. Gunning, Executive Director

SMACNA Oregon & SW Washington

Chris Schneider, Chapter Executive

Therma, LLC

Joseph Parisi, California

Welsch Heating & Cooling Company

George L. "Butch" Welsch, Missouri

Yearout Mechanical, Inc.

Kevin Yearout, New Mexico

SUMMIT CIRCLE - \$50,000 AND UP

Angie and Michael Simon

California

Charles E. Jarrell Contracting Co.

Howard Stine, Missouri

Felhaber Larson

Daniel Kelly, Minnesota

General Sheet Metal

Carol Duncan, Oregon

Guy and Deana Gast

Iowa, Field of Dreams

Key Air Conditioning Contractors, Inc.

Richard Rivera, California

Melrose Metal Products, Inc.

Mitchell Hoppe, California

Miller Bonded, Inc.

Keith E. Wilson, New Mexico

New England Sheet Metal and Mechanical Co.

John Sloan, California

SMACNA - Cleveland

Tom Martin, Chapter Representative

John Sindyla, Chief Executive Officer

SMACNA - New Mexico

Ronda Gilliland-Lopez, Executive Director

SMACNA Metropolitan Detroit Chapter

Phil McShane, Chapter Representative

Mark Saba, Executive Director

SSM Industries, Inc.

Thomas A. Szymczak, Pennsylvania

Stromberg Metal Works, Inc.

William Gawne, Maryland

Walsh Mechanical Contractors

Paul M. Le Bel, Sr., Massachusetts

NEW HORIZONS FOUNDATION CONTRIBUTORS, CONTINUED

INDUSTRY MENTORS, CONTRACTORS LOOKING TO THE FUTURE - PERSONAL PLEDGES OF \$50,000

Guy Gast
Des Moines, IA

Ron Rodgers
Peoria, AZ

Angie & Michael Simon
Menlo Park, CA

Mark Watson
Hiawatha, IA

Keith Wilson
Albuquerque, NM

OTHER CONTRIBUTORS

PATRON - \$25,000 AND UP

ACP Sheet Metal Co., Inc.
Nathan Dills, Oklahoma

Cox Engineering Company
Jon Desmond, Massachusetts

D.D.S. Industries, Inc.
Dwight D. Silvia, Massachusetts

Dee Cramer, Inc.
Matt Cramer, Michigan

J.C. Cannistraro, LLC
David Cannistraro, Massachusetts

Lyon Sheet Metal, Inc.
Michael C. Corrigan, Sr., Missouri

Matrix Group International, Inc.
Joanna Pineda, Virginia

Novak Heating & Air Conditioning, Inc.
Randy Novak, Iowa

Sheet Metal Contractors Association of Central Pennsylvania
Lori A. Eshenaur

SMACNA - Sacramento Valley Chapter
Cheryl Sprague

SMACNA Mid-Atlantic
Kurt Snyder

SMACNA of Oklahoma, Inc.
Matt Wansley

Viewpoint Construction Software
Karl Rajotte, Pennsylvania

STATESMAN - \$10,000 AND UP

McKamish, Inc.
David McKamish, Pennsylvania

SMACNA - Kansas City Chapter
Stacey Smyly

SMACNA of Long Island, Inc.
Melissa Barbour

U.S. Sheet Metal, Inc.
Bruce J. Stockwell, Michigan

NEW HORIZONS FOUNDATION CONTRIBUTORS, CONTINUED

AMBASSADOR - \$5,000 AND UP

Emcor Services Scalise Industries
Mark Malencia, Pennsylvania

Enterprise Holdings Foundation
Missouri

Florida SMACNA, Inc.
Lisa Falk

Jack's Mechanical Solutions, Inc.
Gabe Martinez, New Mexico

Murphy Company
Mark Bengard, Missouri

Tri-Metal Fabricators
Joe Toso, British Columbia, Canada

Wm. J. Donovan Co.
Edmund J. Bransfield, Pennsylvania

DIPLOMAT - \$2,500 AND UP

CMF, Inc.
David Duclett, California

Houston Sheet Metal Contractors Association
Glenn Rex

Kinetics
Arizona

DELEGATE - \$100 AND UP

Architectural Sheet Metal Systems, Inc.
James Van Becelaere, Missouri

Blue Diamond Sheet Metal, Inc.
Al LaBella, New York

Boston Air Systems, Inc.
Barry Dwyer, Massachusetts

Energy Labs, Inc.
Ray Irani, California

LADCO, Inc.
Doug Hamilton, Iowa

MCA-SMACNA of San Antonio, Inc.
Sandee Morgan

SMACNA Arizona
Carol Goguen