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September 2025


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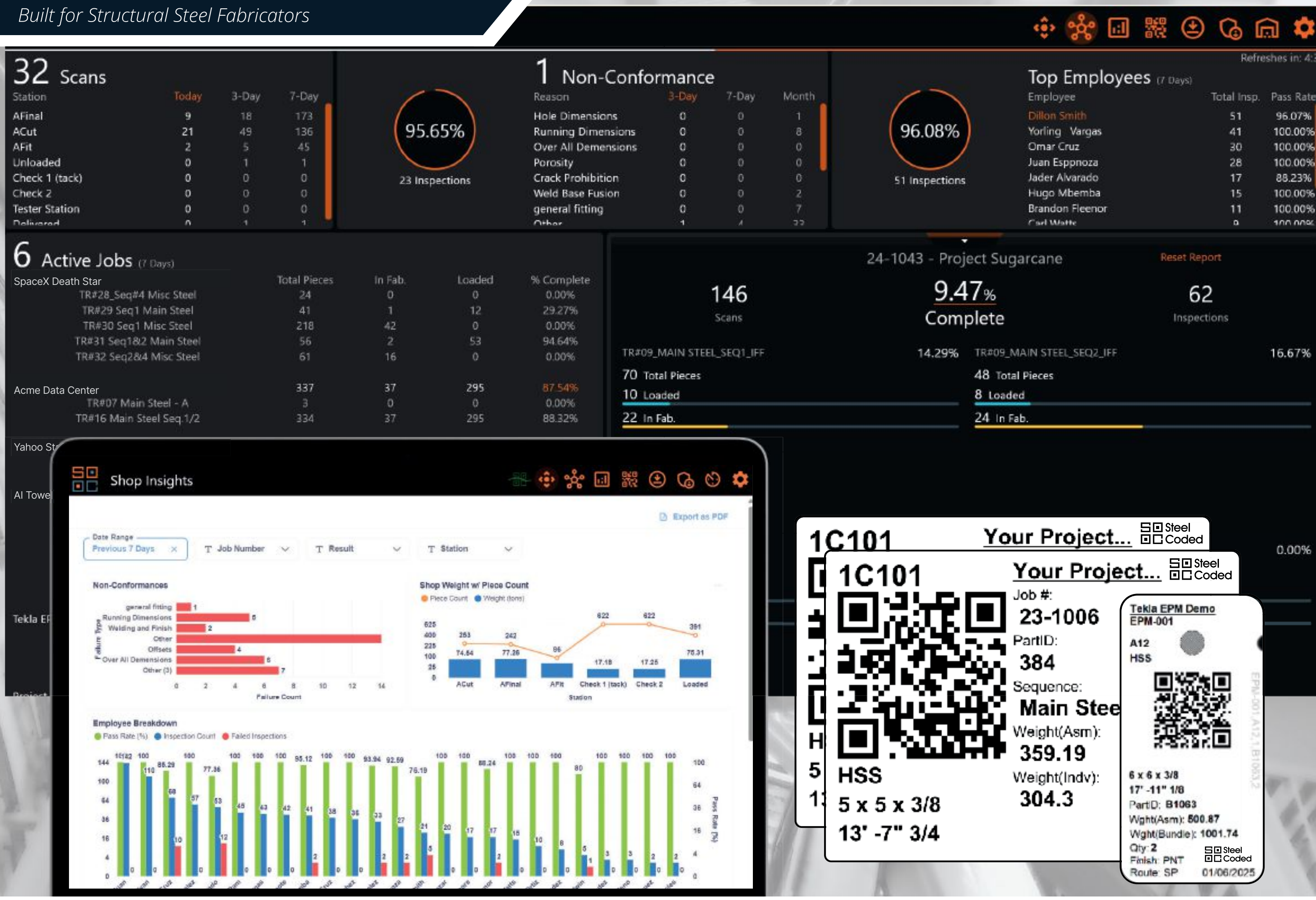


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# Modern Steel Construction

September 2025


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**ON THE COVER:** A new hospital bed tower leaned into SidePlate moment frames to save time and money, p. 22. (Image: Walter P Moore)

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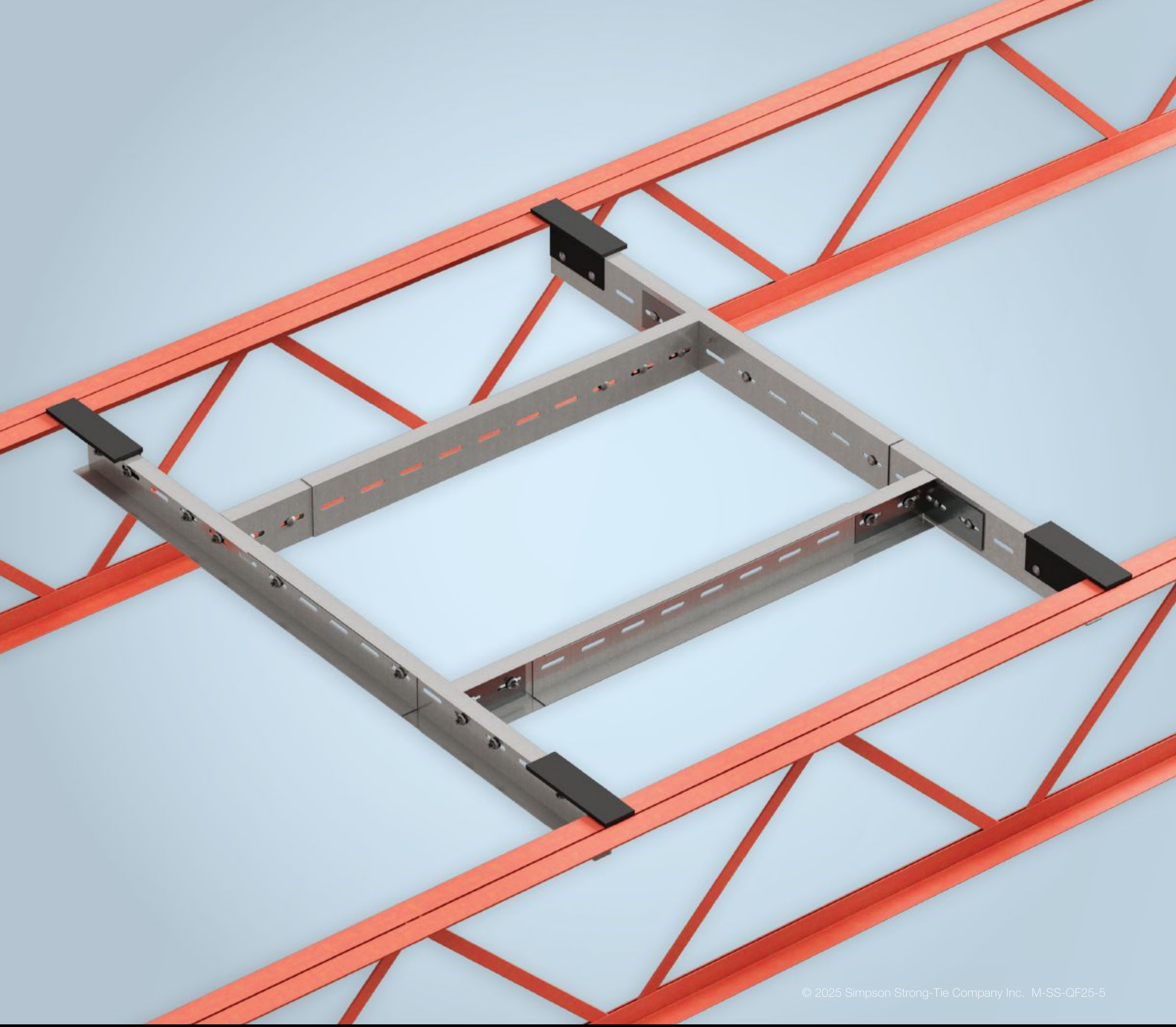



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# editor's note

The image to the left is what happens when you ask AI—in this case, ChatGPT—to create a "Disney cartoon version" of a photo.

The photo I started with has me standing next to a sculpture of multiple heads stacked on top of each other, and AI basically brought them to life. That was a bit unsettling, so I reqested them to be turned into tiki statues, and here we are.

My experience with AI so far has been limited to such trite endeavors and Google's new habit of responding to any search with an "AI Overview." And now I have so many questions.

For starters, will AI take over the steel industry, and eventually, the world?

Will Skynet become self-aware and send a killer robot with an Austrian accent back from the future to ensure the demise of humanity?

Regarding the latter scenario, my goodness, I sure hope not.

As for AI and how it relates to steel design and construction, the short answer is no. In fact, it's helping our industry. Take Clark, for example.

Who—or rather, what—is Clark? Simply put, Clark is the AI in AISC, a chatbot that can quickly pull and organize relevant information from the entire library of AISC's technical publications: the *Steel Construction Manual* and other manuals, our specifications, our design guides, all of it. Introduced earlier this summer, Clark always cites its sources and, best of all, it is a closed-loop system, so the information it provides can't be compromised or altered by outside actors. Want to ask Clark a question? Head over to **aisc.org/clark**.

But this is a good reminder that the steel story is a human story. Clark is simply a tool like any other that you might see advertised in *Modern Steel* or exhibited at NASCC: The Steel Conference (of which the next edition takes place in Atlanta, April 22–24, 2026; mark your calendars). Every issue of this magazine highlights the work that *people* have done or provides practical information for *people* to use—and this issue is perhaps even more of a celebration of the people that shape our industry than usual.

There is no better illustration of this than "Real People, Real Stories" on page 52, a story focusing on Visions in Steel, the traveling exhibition that shines a light on the people working in steel fabrication, their lives, and their roles in creating the country's newest steel icons. So far, Visions in Steel has visited Dallas, Philadelphia, Tampa, and Louisville, focusing on new voices and stories, and the next stop on the tour is Raleigh, N.C., beginning September 22. You can learn more about it at **aisc.org/visions**.

For a look at people's role in steel research, check out "Finding Answers…and Answer-Finders" on page 46 for a tour of the University of Arkansas' Grady E. Harvell Civil Engineering Research and Education Center (CEREC), which has quickly become one of the country's premier steel research and testing labs. Named for W&W|AFCO president Grady Harvell, an Arkansas alum, the lab has already conducted about $26 million in research projects in its five-year existence. But as assistant professor Morgan Broberg, who works at the lab, puts it, "Buildings don't get research projects. People do."

AI engines like Clark, research labs full of the biggest and best equipment, software packages that perform connection design faster than the previous version, and automated drills and saws are all helping steel projects come together faster and more precisely than ever. But again, they're all simply tools that help us do our jobs better. Highly motivated and creative people will continue to drive the steel industry and keep the robots at bay—or, better yet, train them to bring steel projects together more efficiently.

Geoff Weisenberger
Editor and Publisher


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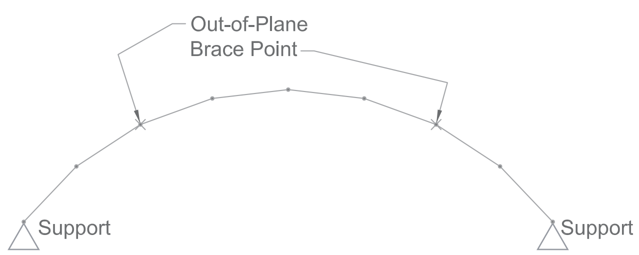
If you've ever asked yourself "Why?" about something related to structural steel design or construction, *Modern Steel*'s monthly Steel Interchange is for you! Send your questions or comments to **solutions@aisc.org**.

## Effective Lengths of Curved Members

**What are the *K* and *L* values when using the direct analysis method to determine the out-of-plane strength of the curved member shown below?**



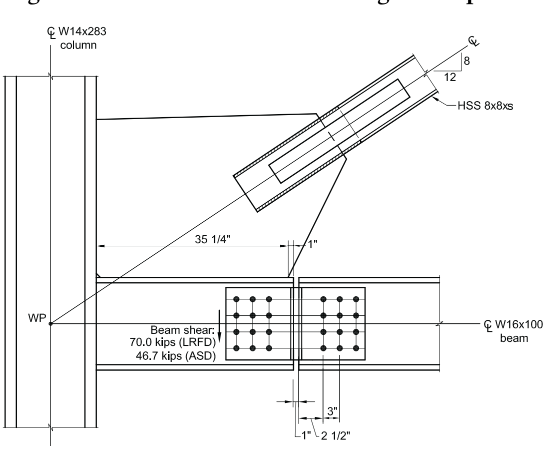

Curved member analysis

When using the direct analysis method, $K$ = 1.0. For straight members, $L$ is the actual member length between brace points. When analyzing the out-of-plane strength of curved members, $L = L_{db}$, where $L_{db}$ is defined in AISC Design Guide 33: *Curved Member Design* (download or order at **aisc.org/dg**) Section 6.3.2 as the "developed length (arc length) along the arch between out-of-plane bracing, in."

*Bo Dowswell, PE, PhD*

## Brace Frame Beam Hinge Design

**Design Example 6.1 in AISC Design Guide 29: *Vertical Bracing Connections—Analysis and Design* appears to neglect a moment at the beam-to-column flange connection. There is a beam shear equal to 70 kips (LRFD), but the beam-to-column connection does not include a moment resulting from eccentricity to the beam hinge. Is there a mistake in this design example?**




High-seismic design with hinge (moment release)

The design example is correct. The eccentricity is considered at the splice and therefore need not also be considered at the face of the column.

The example states:

*"Check bolt shear strength*

With three vertical rows of four bolts, the distance, $e_x$, from the face of the column to the centroid of the farthest bolt group is, from Figure 6-1:

$e_x$ = 35¼ in. + 1 in. + 1 in. + 2.5 in. + 3 in. = 42.75 in.

This value exceeds the maximum eccentricity given in AISC 16th edition *Steel Construction Manual* Table 7-10 of 36 in. A computer program based on the *Manual* inelastic theory used in Table 7-10 yields $C$ = 1.04. The 1.04 value will be used."

This model is also discussed earlier in Design Example 6.1 as:

"Moment Release Shear Splice

There are two design possibilities.

1. The splice must be capable of transporting the 70 kips (LRFD) or 46.7 kips (ASD) beam gravity shear force to the face of the column. This is necessary because this is the boundary condition usually assumed in the design of the beam. Also, this splice must be checked for rotational ductility in accordance with AISC *Manual* Part 10 to qualify as a simple connection in accordance with AISC *Specification* Section B3.6a. It might be possible to satisfy AISC *Specification* Section B3.6a without satisfying the checks of Part 10 of the AISC *Manual* if the rotational demand at the end of the beam is small. However, a good deal of judgment may be involved and in most instances satisfying the rotational ductility checks in the AISC *Manual* provides a cleaner solution.
2. If the structural analysis is performed with an actual moment release at the splice location, then the splice could be designed for the gravity shear without consideration of the moment required to transport the shear to the column face. This splice, being a simple shear splice, will satisfy AISC *Specification* Section B3.6a.

The first option will be used here. Use two 2-in.-thick ASTM A572 Grade 50 splice plates."

*Larry Muir, PE*

## Block Shear $U_{bs}$ Factor

**For the brace connection shown below, what $U_{bs}$ factor would be appropriate? The configuration does not exactly match any shown in Figure C-J4.2 in the Commentary of the 2022 *Specification for Structural Steel Buildings* (ANSI/AISC 360).**

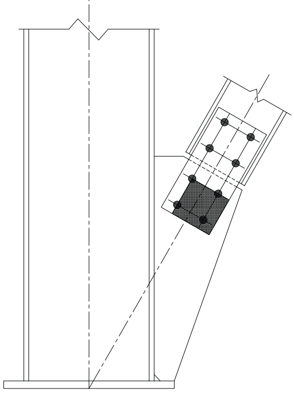


Fig. 1. $U_{bs}$ Factor for Shaded Block Shear Pattern

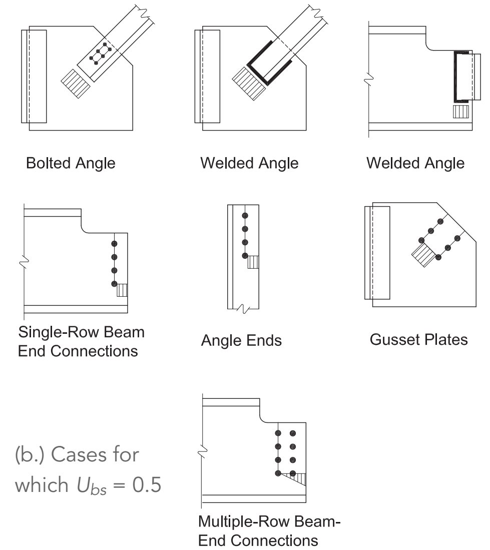
For the condition shown in Figure 1, a $U_{bs}$ = 1.0 would be appropriate. Figure C-J4.2 indicates the single angle brace with a similar L-shaped block shear pattern with a $U_{bs}$ = 1.0. The bolt group in Figure 1 would typically be designed without eccentricity.

Though not stated in the Commentary, it is often useful to consider the assumptions made when designing the bolt group. If no eccentricity is considered in the design of the bolt group, then generally $U_{bs}$ = 1.0. If eccentricity is considered in the design of the bolt group, then generally $U_{bs}$ = 0.5. This should be thought of as a rule of thumb to which further judgment can be applied, as there may be cases that go against this logic. For example, some eccentricity might be considered in the design of the bolt group for a standard single-plate shear connection, though Figure C-J4.2 tends towards $U_{bs}$ = 1.0.

*Larry Muir, PE*

Fig. C-J4.2. Block shear tensile stress distributions.

(a.) Cases for which $U_{bs}$ = 1.0




**Bo Dowswell**, principal with ARC International, LLC, and **Larry Muir** are consultants to AISC.

# steel quiz

This month's quiz is all about the different methods to protect steel bridges from corrosion. The National Steel Bridge Alliance (NSBA) website includes many informative resources on this topic, including Volume 19 of the *Steel Bridge Design Handbook*, which focuses on corrosion protection. You can access the corrosion protection resources put together by NSBA at **aisc.org/nsba/corrosionprotection**.

1 **True or False:** Corrosion protection systems perform uniformly across the United States.

2 Which of the following environments would be classified as severe by corrosion engineers?
**a.** Rural
**b.** Industrial
**c.** Marine
**d.** (a.) and (b.)

3 What is the process of dipping steel elements into molten zinc to create a protective layer?
**a.** Metallizing
**b.** Hot-dip galvanizing
**c.** (a.) and (b.)

4 **True or False:** Weathering steel is a corrosion-resistant steel specially formulated to form a protective oxide layer, or patina, on the surface of the steel.

5 What location is likely to be the first to corrode on an I-shaped member of a bridge?
**a.** Top Flange
**b.** Web
**c.** Bottom flange
**d.** Both flanges corrode at about the same rate

6 **True or False:** When preparing a steel surface for metalizing, steel shot can be used as a blast medium.

7 **True or False:** Passive cathodic protection involves the intentional use of a metal that is less electrochemically active than the metal to be protected.

TURN TO PAGE 12 FOR ANSWERS

Answers reference Volume 19 of the NSBA *Steel Bridge Design Handbook* and NSBA resources on corrosion protection. Make sure to explore all of the great content on corrosion protection at **aisc.org/nsba/corrosionprotection**.

1 **False.** The U.S. encompasses a variety of climate and exposure zones, which vary greatly in terms of temperature, humidity, ultraviolet radiation from the sun, pollution, and airborne salts. Therefore, it cannot be expected that all corrosion protection systems (protective coating systems or corrosion-resistant alloys) will perform equally across the U.S. This means that site conditions will play an important role in deciding which corrosion protection system to choose. See Section 2.0 (Environment) of the *Steel Bridge Design Handbook* for more information.

2 **c.** Marine. Corrosion engineers have traditionally classified the general environment around a structure as mild (rural), industrial (moderate), or severe (marine). Those are the starting points for determining the appropriate level of corrosion protection. Bridges located right along the coast are in a severe environment, and most studies also classify areas within one to two miles of the coast as "marine" environments. This environment contains high salt content from proximity to seacoast or from deicing salts, along with high humidity and moisture levels. The environment classification descriptions can be found in Section 2.0 (Environment).

3 **b.** Hot-dip galvanizing. The hot-dip galvanizing process is a multistep application of cleaning and coating that requires the steel piece to be lifted and dipped into a series of tanks or kettles. The final dip in the process is immersing the component into a molten kettle of pure zinc, typically at temperatures between 820°F and 900°F. These kettles are typically around 40 ft long, but kettles up to 60 ft long exist. The heat from the zinc dip creates a metallurgical bond between the zinc and steel, which forms a layer of sacrificial zinc. For more information on the hot-dip galvanizing process, see *Handbook* Section 3.2 and page 60 of this issue.

4 **True.** Weathering steels are specially formulated alloys designed to naturally form a stable oxide layer, or patina, that protects the steel from further corrosion. Uncoated weathering steel is a widely used corrosion protection system today and performs well if detailed properly and used in the proper location and environment. Under a wide range of exposure conditions, weathering steels will rust, but form oxides that remain tightly adherent to the steel substrate and develop a much more stable oxide layer than non-weathering steel. Weathering steel is covered in Section 3.3.

5 **c.** Bottom Flange. The lower portions of flanged structures typically corrode earlier than the rest of the shape due to higher times of wetness for these parts relative to the rest of the bridge because they are likely horizontal and can pond water. The higher time of wetness is also caused by preferential condensation on the lower portions of a steel element. Section 5.2.11 discusses corrosion protection considerations for bottom flanges in design.

6 **False.** Metalizing is a corrosion protection option that involves a process of thermal spraying a metal coating onto a steel substrate. Metalizing requires an SSPC-SP 10 "near-white" surface preparation with an angular surface profile. This means that steel shot cannot be used as a blast medium because the shot leaves a peened (rounded) surface profile that the metalizing cannot adhere to. For more information on element detailing for metalizing, see section 5.3.21.

7 **False.** The metal used for passive, or sacrificial, cathodic protection is *more* electrochemically active than the metal to be protected. For natural environments containing moisture and salt, zinc and aluminum are both "electrochemically active" with respect to steel. Thus, both metals will naturally sacrifice, or preferentially corrode, to protect steel when the two metals are in electrical contact and within the same environment. Section 3.0 (Materials for Corrosion Protection) includes information on passive corrosion protection.

Everyone is welcome to submit questions and answers for the Steel Quiz. If you are interested in submitting one question or an entire quiz, contact AISC's Steel Solutions Center at 866.ASK.AISC or **solutions@aisc.org**.

STEEL SOLUTIONS CENTER

# Don't Get Distorted

BY KEN PECHO

## To understand how distortion impacts curved HSS members, keep these three rules of thumb in mind.

David Camp/HOK

The pickup and drop-off area canopies at Hartsfield-Jackson Atlanta International Airport are comprised of 14-in. and 20-in. curved round HSS with up to ½-in. wall thickness.

**CURVED STEEL MEMBERS** are a norm in architecture and design today, whether they're a small piece of a building frame or the primary architectural or structural feature.

Designers have many options for selecting members for curved elements, and bending technology at bender-rollers like AISC member Chicago Metal Rolled Products (CMRP) makes them possible. CMRP's 115-plus years of experience have helped it find ways to roll any mill-produced structural shape and develop design rules of thumb that engineers can use to be confident their curved HSS will be practical, achievable, and perform as intended.

In my nearly 20 years at CMRP, I have seen hollow structural sections (HSS) become a common choice for curved structural elements. Curved HSS significantly enhances the serviceability and aesthetics of the structure. HSS provides symmetry in closed shapes, torsional stiffness, and clean appearances. However, bending HSS presents many unique challenges to the bender-roller, mainly cross-sectional distortion, which affects aesthetics, connection feasibility, and strength. The design rules of thumb will help mitigate those issues and deliver members as envisioned.

### A Crucial Balance

The primary rule of thumb when designing curved HSS members is to evaluate the relationship between the size of the HSS section specified and the desired curvature of the bend. This relationship significantly influences the amount and type of cross-sectional distortion that can occur. Larger HSS sections bent to tighter radii tend to experience more significant and


In this extreme example, RHSS tubes were rolled without internal support, causing uncontrolled growth and shrinkage, which led to noticeable concavity on the inside and outside walls.

complex distortions. The design team must think ahead about how much distortion the member is likely to experience, and more importantly, how much distortion the design can tolerate before it starts to create problems. These issues might affect aesthetics, structural performance, or connections/fit-ups, and they are often more difficult and costly to address once fabrication is underway.

Understanding the balance early in design helps ensure the member performs as intended without unexpected complications. Curved HSS distortion is CMRP's top consideration when judging internal capabilities to help provide high-quality HSS bends. Providing a seriously distorted member is cause for rejection because it can undermine the member's performance. When members are formed at room temperature and without heat, distortion is an inherent byproduct of the rolling process. As the material is pulled through a configuration of rollers, internal stresses propagate unevenly throughout the cross-section, naturally leading to shape changes such as ovalization, buckling, or concavity—depending on the bend geometry and orientation of loading.

The designer should evaluate the risk of cross-sectional distortion based on the member's size relative to the intended curvature. Distortion is not a uniform phenomenon; it is heavily influenced by the bend radius, the member's proportions, and wall thickness. Severe curvature, especially in combination with larger-section HSS members, significantly increases the likelihood distortions like ovalization, localized buckling, and concavity.

Due to their closed shapes, curved HSS members have a definitive neutral axis, where flexural stresses span across the section depth in plane of bend. While square HSS members can experience issues in this regard, rectangular HSS members curved on their strong axes are most susceptible to deformations across their webs. The larger depth in the plane of bend introduces a more varied strain across the section, increasing the potential for distortion, displayed as localized buckling, visually appearing as dents, dimples, or oil-canning. The same is true for the compression flange, where larger square and rectangular HSS members have long flat faces, bringing them into a more slender category and making them more vulnerable to localized buckling during bending.

Thin member walls, common in large HSS sections, offer little resistance to rolling stresses. Increasing wall thickness is one effective way to mitigate the limited resistance. Thicker walls reduce the width-to-thickness (*b/t*) ratios, shifting the section from a slender to a more compact classification per local buckling criteria. This enhanced stiffness improves the member's capacity to resist shear and flexural stresses introduced during the bending operation, aiding in maintaining cross-sectional integrity while the member is in its plastic phase. Designers who overlook these interactions may inadvertently specify HSS members that are theoretically sufficient in straight form but can be impractical for the rolling operation or even unusable once curved.

## Know the Behaviors

The second rule of thumb is understanding how the three HSS shapes behave when forming. Each shape—round, square, and rectangular—responds differently to the rolling-induced stresses.

Round HSS is by far the most forgiving. Its closed, uniform geometry in all directions makes it efficient in bending. It naturally distributes stresses evenly around the cross-section, which makes it more resistant to localized deformation than shapes with flat sides. Thus, round HSS are often rolled without internal mandrel supports.

Buckling at the intrados of the bend can occur depending on the wall thickness and severity of radius. The most common distortion issue with round HSS is ovality, where the cross section shrinks in the plane of bend and grows in the adjacent axis. Ovality and severity of the curve are proportional to one another. For example, as the radius gets tighter, so does the severity of ovality. The proportionality makes multi-radial (elliptical/parabolic) geometries challenging, especially if aesthetics is a concern, as with architecturally exposed structural steel (AESS) members.

The other distortion implication with round HSS is reduction of diameter or necking down, because the rolling process tends to stretch or uniformly deform along the direction of rolling. Round HSS offers a few fabrication advantages. With its lack of any clear distinction of sides, the design team can manipulate simple single-plane curves to fit a number of complex geometrical configurations, such as compound (multi-axial). Round HSS is also easy to manipulate within the tooling used to bend such members, rendering it possible to introduce twist into the curving geometry and creating helices.

Square HSS are harder to curve and can take a rhombus shape when they distort.

Chicago Metal Rolled Products

Square HSS and rectangular HSS, though, are more sensitive. They have flat faces, which are fully exposed to induced inelastic compression stresses during the bending operation. The lack of natural curvature to their profile to redistribute those stresses makes the compression flange experience flexure. They can buckle inward, seen as concavity. Or, depending on slenderness, they can buckle both inward and outward, repeated throughout the inside arc and seen as ripples commonly referred to as waves. This type of deformation is particularly true when tight radii, larger-profile HSS, or thinner walls are involved.

Achieving a quality square or rectangular HSS bend requires internal tooling, such as mandrels or other internal support mechanisms. These tools maintain the cross-section during plastic deformation. Distortion is not technically eliminated, but maintained to an acceptable form I often refer to as "controlled distortion," where the overall shape has slightly altered. It's seen as growth or shrinkage of nominal cross-sectional dimensions, but localized buckling is eliminated and concavity is minimized. CMRP's extensive tooling catalogue has shaped its current strategy to prevent square and rectangular HSS distortion: rolling them with internal support mechanisms.

Square and rectangular HSS offer the designer some advantages in forming geometry and can be rolled on two adjacent axes. With round HSS members, this geometry is often "cheated," but square and rectangular HSS' flat faces make them ideal for inducing a radius in plan and elevation in the same member, referred to as multi-axial rolling (or as compound by others). This type of rolling geometry allows the member's faces to remain truly plumb as the member curves along the compounding geometry.

One major difference between square and rectangular HSS is their ability to be twisted. Rectangular HSS has one longer side wall that brings a lower polar torsional stiffness than similarly sized square HSS,


Sphere in Las Vegas has an exoskeleton with curved round HSS that frame between cast steel nodes.

making it an ideal choice for HSS helical members. Square HSS have equal external dimensions at both adjacent axes, causing high torsional stiffness, which distorts square HSS more than it twists about its central axis. Square HSS tends to take on a rhombus shape, where the compression and tension flanges tilt out of plumb, and the top and bottom webs run askew.

## Consider the Connections

The final rule of thumb is the profound impact cross-sectional distortion can have on connections, mostly from a constructability standpoint. Connection impact is largely overlooked and has caused serious issues. As an HSS member undergoes plastic deformation during bending—especially with tight radii, thinner walls, and larger HSS members—the section is prone to ovalization, cross-sectional dimension changes, flattening, or localized buckling.

Some distortions occur due to initial contact with machine tooling, typically observed at each end of the rolled HSS members (which coincides with connection locations). They alter the member's geometry at the connection interface, leading to challenges that can jeopardize the intended fit-up of welded connections. These challenges are especially prevalent in CJP welds, where weld success often depends on the fit-up of aligned surfaces. Concavity or warping at a curved member's end can make achieving these connections extremely difficult. The same care and consideration must be taken with cast insert connections, which can be used successfully with curved HSS elements, but the resulting distortion to cross-sectional dimensions may require custom-fit casted inserts.

## Better Grasp, Better Design

By understanding the inherent properties and potential distortions of HSS members during the bending process, designers can make informed decisions that enhance their projects' aesthetic and structural integrity. With careful consideration of key design principles and appropriate tooling, it is possible to achieve high-quality bends that meet the desired specifications. AISC Design Guide 33: *Curved Member Design* (download or order at **aisc.org/dg**) is a helpful resource for understanding curved member behavior and finding design tips. As the use of curved steel continues to increase, embracing these best practices and working with a knowledgeable AISC member bender-roller such as CMRP will ensure curved HSS elements are practical and visually appealing. ■

**Ken Pecho** (**ken@cmrp.com**) is the engineering and technical operations lead at Chicago Metal Rolled Products.

# Architecture to Academics

INTERVIEW BY GEOFF WEISENBERGER

Judy Liu pivoted from childhood architectural dreams to a closely related engineering discipline—paving the path for her career in academia and, eventually, an AISC Lifetime Achievement Award.

**JUDY LIU'S** childhood interest in buildings initially fueled visions of being an architect. Even when she enrolled in college to study architectural engineering, she envisioned a career designing buildings. Instead, she's teaching structural design, working with AISC to help shape steel design instruction across America's college campuses, and finding reward and fun in each activity.

Liu, a professor at Oregon State University since 2015, is also a respected researcher and is closely involved with AISC. She was awarded the 2005 AISC Milek Fellowship for research on steel slit panels for lateral resistance and earned an AISC Special Achievement Award in 2013. She's the research editor of *Engineering Journal* and a member of AISC's Partners in Education committee. She earned a 2025 AISC Lifetime Achievement Award for teaching and mentorships of students and faculty, plus leadership and service on AISC technical and educational committees.

Liu spoke with *Modern Steel Construction* about her career, AISC committee involvement, mentorship, and more.

**Where are you from and where did you grow up?**

I grew up in a small town in Pennsylvania called the Village of Lemont. It's just outside State College, next to Penn State University. Both my parents were researchers at the university.

I applied to various places, and of course, applied to Penn State. It wasn't a foregone conclusion at all that I'd go there. In fact, I initially applied to different programs for architecture. My mother, meanwhile, researched architectural engineering, and as luck would have it, the No. 1 architectural engineering program was right in my backyard. I went to Penn State not for architecture, but architectural engineering. It was one of the best decisions I ever made.

**When did your interest in buildings develop?**

The story goes, as my father tells it, that in junior high, I started complaining about the design of our house. If I remember correctly, I didn't like how our front door opened into a stair landing. I didn't like the layout or the feel of the space, and he said I should become an architect. I got hooked, read more about architecture, and did a deep dive—even in my French class, I did a project on Le Corbusier.

I had a lot of fun and still love architecture. I took a summer architecture class at Penn State in high school. I loved it, but I realized I didn't quite have the talent or patience to be an architect. But I had a big interest in what makes buildings work, how they stand up, how they survive earthquakes, things like that. Architectural engineering was a good match for me.

**What was your journey to academia?**

I went straight from undergrad to grad school at the University of California, Berkeley to teaching at Purdue University until 2015. I didn't plan it that way or plan on going the academia route. Until around my third year of undergrad, I had no inkling or interest in it. It's a five-year professional degree, and at the end of undergrad, I was one of two people in our graduating class of 90 to go to grad school. I thought I'd move to New York, live in a loft apartment, and design skyscrapers.

But I had this great undergrad research experience in the summer after my junior year, and I got hooked. I showed my undergrad adviser, Lou Geschwindner, the report I made at the end of this research experience, and it seemed like his wheels turned. He said if I had fun with that, I might have an interest in going to grad school. He told me more about what it would mean to be in academia, get a PhD, and pursue a faculty position. That got me thinking as well.

I was fortunate to have some inspiring professors who made the material exciting. I eventually thought it'd be a lot of fun to be in front of the classroom sharing my nerdy excitement about structural engineering and getting students excited about it. I started thinking I could do it and being a professor was the route for me.

**What was your first day in front of a class like?**

Before I got to that point, I remember thinking it'd be easy. I had helped friends with homework and figured this shouldn't be too bad. But as it got closer, I remember being super nervous about it. I don't remember much about my first lecture, but I'm pretty sure it wasn't great. They didn't throw me out of the room, and we all survived. I worked on it and I reached a point where I felt like I had a balance between communicating the information, engaging with students, and making sure they're following and understanding the content. I have grown a lot as a professor and am proud of that. I think I'm at a happy place with teaching and being in the classroom.

Field Notes is *Modern Steel Construction*'s **podcast series**, where we interview people from all corners of the structural steel industry with interesting stories to tell. Listen in at **modernsteel.com/podcasts**.

**Do you see yourself as a mentor, and are there mentors who influenced you?**

I never consciously decided or said, "I will be a mentor," though our department has a formal mentorship program. There's a lot of informal mentoring that comes about organically, which is great.

Whether it's conscious or not, I draw a lot from what mentors have done for me as I've grown as a faculty member. Lou Geschwindner has probably been the strongest example of mentorship for me. It was a quiet mentorship, in a way. He was my official undergraduate adviser, but he mentored me in ways without me realizing it by meeting me where I was and telling me what I needed to hear, especially with the idea of graduate school and possibilities I hadn't considered. It was mentorship in those ways and by being an example of how to be a good professor—as some of my other professors did too. I owe a lot to him and others who have helped me in my career.

I feel the desire to give back. I want to help however I can, whether it's a colleague or someone I meet at NASCC: The Steel Conference in the educator session. If they're asking for help and asking questions, I want to help where I can and draw from my experiences and the benefits I received from my mentors.


**What projects are you working on as part of your AISC committee involvement?**

One of the AISC Partners in Education committee projects I have enjoyed is developing student learning outcomes for structural steel education across structural engineering, construction management, and architecture programs. Like the committee makeup, we developed a task group of designers, fabricators, and faculty across engineering, construction management, and architecture.

We examined what we're teaching across our programs and the industry's interest. What do we feel are the essential student learning outcomes for undergraduate education? What should our graduates be able to do when they leave? This task group is great. We brainstormed a lot and developed a core competencies matrix for working and designing in structural steel. It includes system behavior analysis, design, communication, collaboration, manufacturing, fabrication, design documents, and sustainability, among others. We have a table across the different programs—engineering, construction, and architecture—showing the level of proficiency we'd like to see in each of those programs for those core competency areas. Should they have fundamental awareness, intermediate, or advanced knowledge? We have a table where we've mapped that out.

For each level of proficiency, we've outlined specific learning outcomes for what it means to have fundamental awareness of, say, sustainability in structural steel. What does it mean to have intermediate or advanced knowledge? We're excited about this. We have finished our draft, and AISC helped us put it in a nice format.

We're also looking across the great inventory of AISC teaching aids (available at **aisc.org/teachingaids**) and determining which core competency areas they hit and which levels of proficiency they help. Eventually, you'll be able to look up a teaching aid, see what's in it, and see the core competencies and levels of proficiency associated with it. By mapping our teaching aids to student learning outcomes, we can see if there are gaps in our teaching aids and solicit new proposals for teaching aids.

**What do you enjoy about Oregon State and Corvallis?**

Our students seem to have extra energy, and I think part of that is the culture of our program. It's called the School of Construction and Civil Engineering (CCE), and we often talk about our CCE family. It's a supportive environment, and I think students and faculty embrace that. The students are fun to teach.

Corvallis is a stone's throw from anything you want to do, especially if it's outdoors. There are beautiful hikes and other activities that are easily accessible. ■

*This interview was excerpted from my conversation with Judy. To hear more, listen to the September Field Notes podcast at Apple Podcasts, **modernsteel.com/podcasts**, or Spotify.*

**Geoff Weisenberger** (**weisenberger@aisc.org**) is the editor and publisher of *Modern Steel Construction*.

# Future Focused

BY RICK GOODMAY

Infusing youth into the workforce is top of mind for many in the building trades. One company shares its efforts and their results.

**FINDING YOUNG, QUALIFIED TALENT** is a challenge that has persisted throughout my entire construction career, which spans almost four decades. The industry has been hampered by long-term structural issues and more recent accelerants. Those recent trends include an aging workforce (most U.S. construction workers are in their 40s or older), the pandemic (which further increased retirements), and a decline in vocational training. Luckily, change is shifting their direction.

As the director of client relations at Industrial Constructors/Managers, Inc. (ICM), an AISC-certified and full-member fabricator based in Colorado, I have helped implement several recruitment tactics to attract younger workers who will ensure our talent pipeline is full now and in the future. Those tactics range from partnering with local high schools and unions to implementing internships and part-time opportunities. They enable us to bring more awareness to careers in the trades and demonstrate why they're a desirable lifelong career path. The strategies we have implemented over the past few years can benefit other contractors facing similar labor shortages.

## High School-Focused

High school is a critical window to promote careers of any kind. It's when students first form career goals and make pivotal decisions about going to a four-year college or taking a more direct and faster path to a full-time job, such as the trades. The trades are gaining traction with high school students because they promise immediate employment, earnings potential, and little to no student debt.

Many high schools are helping fuel interest in the trades through career and technical education (CTE) programs. CTE programs provide middle school, high school, and post-secondary students access to several career pathways, including welding and other steel industry jobs. Post-secondary students often include apprentices, trade school students, and those seeking new credentials for a career change. CTE programs teach specific skills students can apply directly to their careers, with credits counting for high school and college courses.

ICM started working with Brighton High School near our Denver office several years ago. The school has a "Careers in Construction" pathway at its recently opened STEM and CTE center, which features hands-on construction spaces alongside labs for engineering, welding, and small engines. The hands-on construction spaces include hand and power tools so students can practice using them, along with rooms to teach OSHA safety training so students can begin their careers with a strong foundation.

Students can also take courses like Construction Trade 1, which teaches the basics of excavation, foundation, and concrete work, rough framing, interior/exterior finishes, blueprint reading, permits, and building code. Construction Trade 2 gives students a chance to work on an actual structure (mainly a single-family home) by collaborating in the same way professional trade teams do for things like site prep, layout, and basic electrical or plumbing simulations.

ICM visits Brighton's CTE program several times each quarter to give presentations on the various construction career paths and attends job fairs to recruit students and teach them about construction careers. ICM subject matter experts present on topics including welding, millwrights, and construction accounting practices so that students have a better understanding of the career options available. Several presentations have focused specifically on apprenticeships, including the different types, how long they last, and the absense of student loan debt.

ICM also provides paid summer internships to high school students, which often lead to part-time employment once they resume school. Internships help us establish a connection with students, build their skills over the summer or the school year, and then hire them upon graduation if their skills match our current project needs. ICM had seven paid summer internships in 2025, all of which were in its steel fabrication shops. Inters do hands-on work, including prepping metal for coatings, welding, and grinding. They are also required to do ICM's extensive safety training to ensure they understand the protocols and processes for working safely while in the fab shops.

## Partnerships are Practical

Partnering with local unions and trade groups is another critical way to connect and engage the next generation of workers. Unions often offer apprenticeships to entry-level students and workers, giving them hands-on training while connecting them to employers in need. Students can apply for apprenticeships in several trades, including steel fabrication and erection, rigging, and welding. Apprenticeships come from Ironworkers Local 24, Millwrights Local 1607, Carpenters Local 555, and Denver Pipefitters Local 208. ICM employs seven different trades, all unionized, so we are in near constant contact with all seven unions about sourcing apprentices for our jobsites. Roughly 15% to 20% of ICM's field staff are currently in apprenticeships.

"Apprenticeships provide a direct gateway for new talent," ICM estimator Bill Niday said. "They help feed the trades by providing employers with people willing to learn and grow in their careers. They also teach them important things like safety, which is vital in our industry."

## Competition Connections

Last year, ICM also partnered with the American Welding Society (AWS) to develop Colorado's first-ever high school welding competition to help expose students to welding and build their excitement about it. Twenty students competed to be the top high school welder at Buckeye Welding Supply in Henderson, Colo. Winners earned scholarship money and connected with contractors, including ICM.

In fact, ICM hired competition winner Trenton Carlson, who joined as a full-time welder soon after graduating from high school. Carlson came to ICM with welding experience because he participated in the CTE program at Pickens Technical College in Aurora, Colo. After Carlson graduated from high school, he took night classes at Pickens Tech twice a week to get customized welding training, and he used the scholarship money he won at the competition to pay for the classes.

"A lot of young people like to do stuff with their hands, but they're predisposed to think that college is the only option," Carlson said. "High schools should also highlight trade schools because of all the benefits they have provided to people like me."

## Put it in Motion

Just as no single effort can effectively fill a company's project backlog, no single effort will fill a company's talent pipeline. However, several efforts in tandem can create multiple streams of awareness and exposure for the trades, offering young workers entry into profitable and exciting careers. When these efforts are put into practice at scale, we can shape a stronger future for our industry, cultivate a robust talent pipeline, and empower the next generation to thrive in meaningful, long-term construction careers. ■

**Rick Goodmay** is the director of client relations at Industrial Contractors/ Managers, Inc.


ICM helped develop Colorado's first high school welding competition in 2024.

# Meeting the Moment

BY BRENT BANDY, SE, PE

A steel moment frame design unlocked schedule and cost efficiency for a new hospital bed tower project.

The new Atrium Health Carolinas Medical Center bed tower is scheduled to open in 2027.

NBBJ

SPEED
FEATURE STORY

**THE 12-STORY ADDITION** to the Atrium Health Carolinas Medical Center campus in Charlotte had a yearlong gap in its construction schedule due to demolishing and rebuilding its predecessor on another site. Its architecture—crucial to its program—created irregular shapes and grids.

Using structural steel for the new tower made the most of the gap by making it an extended design and detailing phase, and a steel moment frame system achieved the tricky angles and grids while shortening the erection schedule and reducing the weight.

Concrete and steel trades each have a strong presence in the Charlotte market, giving the project team several framing options to evaluate for the 1.1-million-sq.-ft tower, which will have about 450 patient rooms and 50 operating spaces. The Walter P Moore engineering team evaluated five primary contenders: steel braced frames, steel moment frames, concrete with shear walls, concrete moment frames, and a steel-concrete hybrid option.

During the schematic design phase, the team used a CBA (choosing by advantages) process to weigh and evaluate factors for each option, including cost, schedule, and prefabrication. A steel moment frame option using SidePlate field-bolted connections was the choice, and that choice withstood design development phase scrutiny during pandemic lockdowns and amid price fluctuations.

## Taking A Gap Year

The tower was built on the site of the existing Carolinas Rehabilitation Hospital, which had to be demolished and rebuilt on an adjacent site before starting construction. The hospital design and construction schedule left a 12-month gap between the completion of bed tower construction documents and the start date for bed tower construction. The gap allowed the design to be coordinated and documented to a 100% construction document level and full steel detailing to occur before construction started, resulting in efficiencies in the design and detailing processes.

Atrium's strong commitment to maximizing prefabrication opportunities was also an advantage for structural steel. With steel's inherent shop fabrication component, site laydown space was minimized. Field-bolted connections reduced the number of trade workers on site and trimmed the steel erection schedule. Taking further advantage of the schedule gap, the design team and trade partners—under the leadership of the DPR Rodgers construction management team—did more up-front VDC work to coordinate trades and increase prefabrication before their related construction activities.

## Moment Frames Win Out

The project leadership settled on an iconic architectural aesthetic, which included irregular shapes and different grids for the upper and lower portions of the building. The building geometry resulted in irregular grids, column transfers, and other challenges that were more efficiently addressed with structural steel. The team looked at more orthogonal geometries such as parallel wings, but concerns about patient room privacy and overall building image drove the team back to the iconic angular design.

Many factors made SidePlate steel moment frames appealing. SidePlate connections use interconnecting plates to connect beams to columns and feature a physical separation between the face of the column flange and the end of the beam(s). They work on rolled or built-up wide-flange sections or HSS. In SidePlate field-bolted connections, beam flanges are connected to the side plates with either a cover plate or a pair of angles and high-strength pretensioned bolts. Learn more about SidePlate in *Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications* (ANSI/AISC 358-22), available at **aisc.org/specifications**.

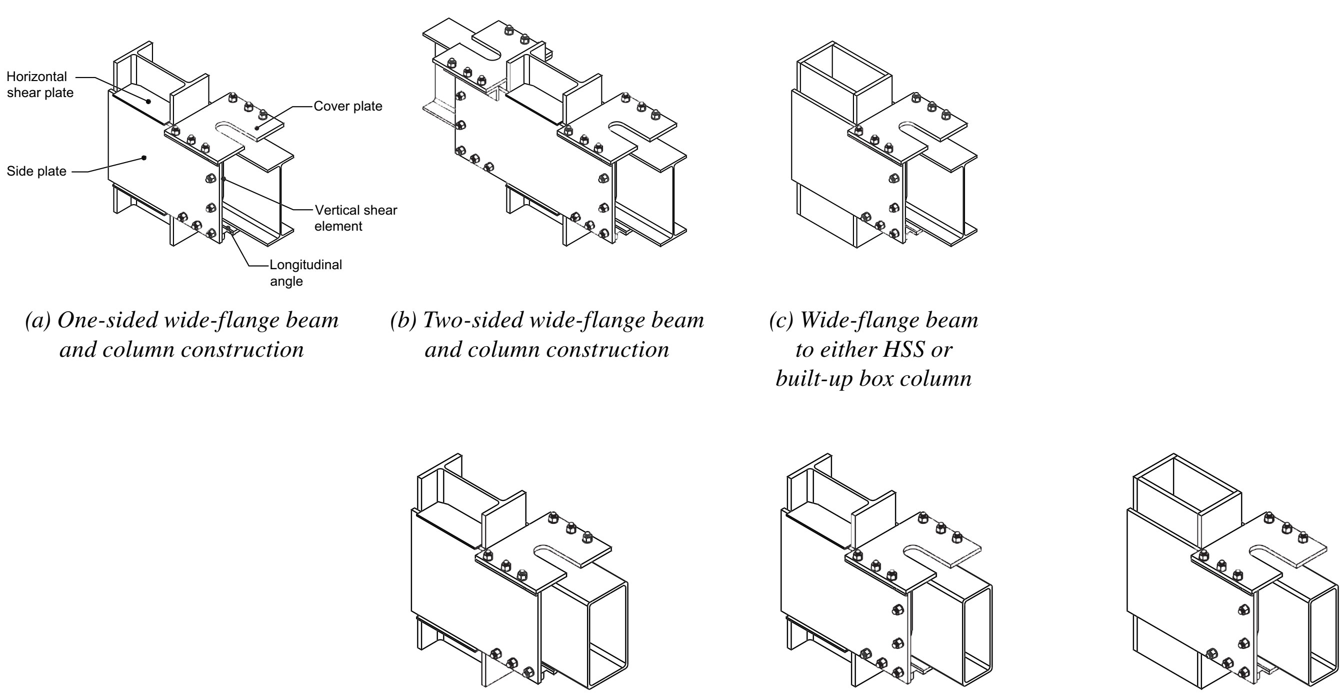
After initial evaluation, the design team eliminated the braced frame option due to the need to transfer the frames multiple times because of the irregular shape of the building, combined with the changing grid systems for upper and lower levels. The same reasoning eliminated the concrete shear wall with steel framing option, which could not accommodate multiple stairs and elevator shafts that are not continuous through the tower.

Moment frames also enabled maximum functional flexibility for initial and future architectural planning of spaces within the facility. Without shear walls or braced frames, relocating interior openings, corridors, and room layouts would only be restricted by the columns.

Walter P Moore and steel fabricator SteelFab had experience with SidePlate, including multiple in-market projects for Atrium Health that were cost, schedule, and functional flexibility successes. SteelFab's involvement began in the project's early phases. SidePlate saved an estimated 20% in steel erection time and 2 to 3 lb per sq. ft compared to conventional $R = 3$ steel moment frames with CJP-welded connections. The bolted-bolted SidePlate system's reduction in erection time and field welding helped meet project prefabrication goals. Even with its simplicity, the system achieves the required ductility and resilience required by the building code for this Risk Category IV structure.

From the early design phases, Walter P Moore tracked structural steel piece count and tonnage using several discrete framing and miscellaneous component categories. The tracking allowed for more transparent communication of design decisions' impact and helped in the structural component team's decision-making.

With SteelFab engaged along the way, the team could quickly determine the cost and schedule impact of certain proposed changes in tonnage, piece count, and complexity. All told, the




*(a) One-sided wide-flange beam and column construction*

*(b) Two-sided wide-flange beam and column construction*

*(c) Wide-flange beam to either HSS or built-up box column*

*(d) HSS beam to wide-flange column with the same flange width*

*(e) HSS beam to wide-flange column*

*(f) HSS beam to either HSS or built-up box column*

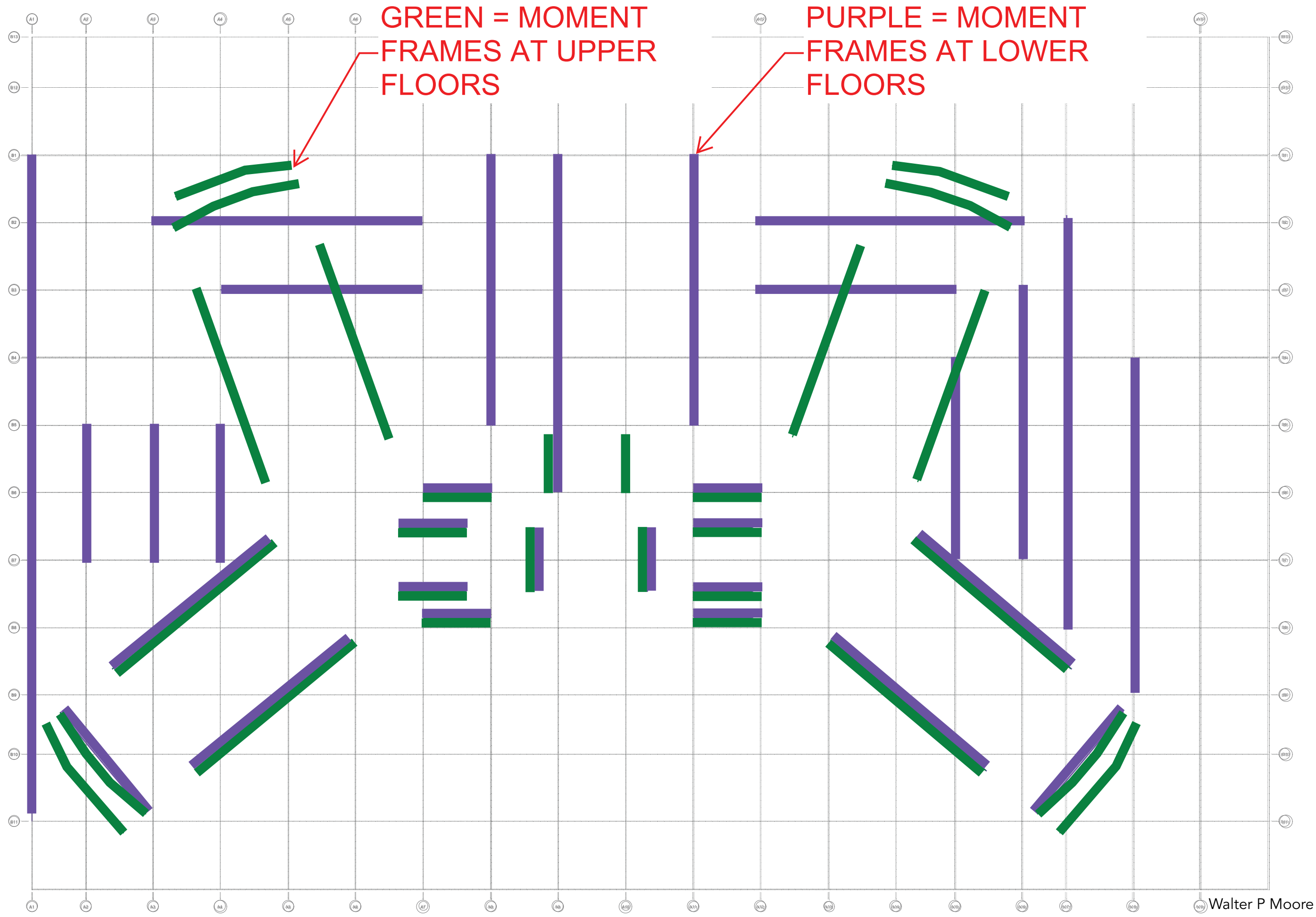
Bolted-bolted SidePlate uniaxial field-welded configurations.


Walter P Moore

above: The building has more than 650 SidePlate beams and nearly 900 SidePlate joints.

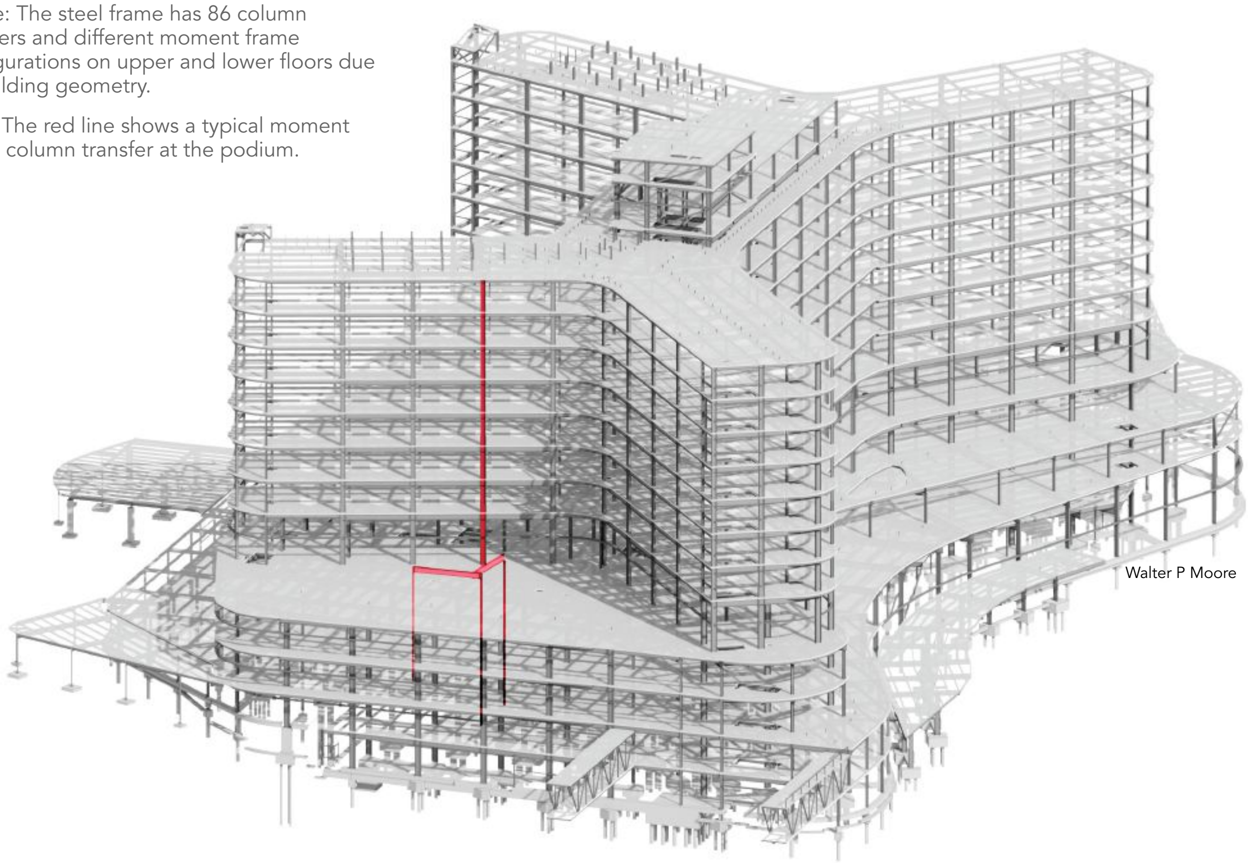
below: Curved corners were handled with the flexibility of steel framing.


Walter P Moore




above: The steel frame has 86 column transfers and different moment frame configurations on upper and lower floors due to building geometry.

right: The red line shows a typical moment frame column transfer at the podium.



building has 10,525 tons of steel and more than 11,000 steel pieces, with 663 SidePlate beams and nearly 900 SidePlate joints. Moment frame columns were typically W30 at the lower levels and W27 at the upper levels. The typical floors were W16×31 and W18×35 filler beams and W21×44 and W18×35 girders. Overall, beam sizes were as heavy as Grade 65 W40×593, and the heaviest column shapes were W30×391.

## Technical Challenges

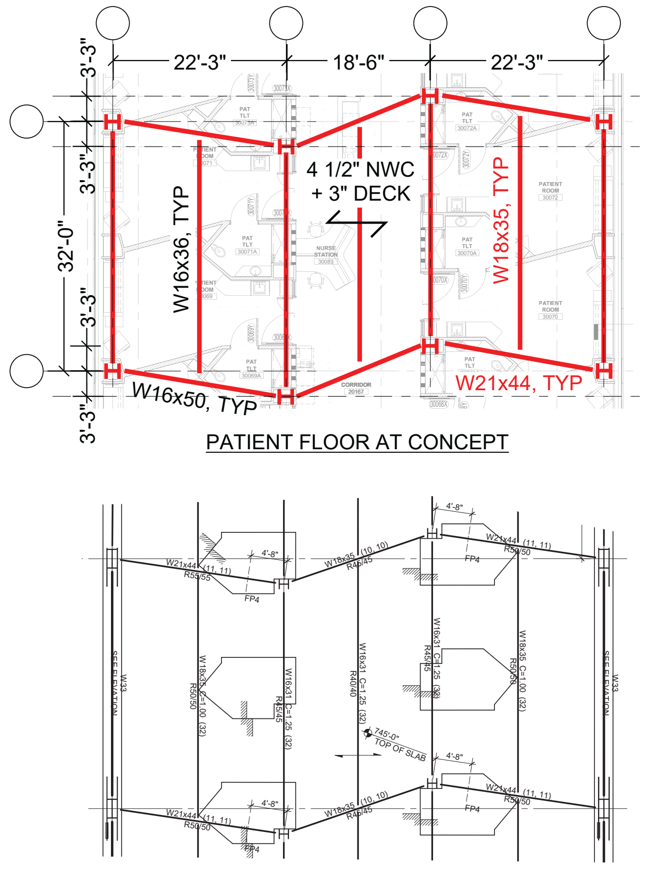
The building shape created irregular grids, column transfers, and many skewed and kinked beams. One of the first challenges was the typical patient floor grid system. The architect, NBBJ, had pioneered the distributed nursing station layout design in the early 2000s, in which care team work areas are distributed along wider corridors within patient wings. The architectural layout did not allow for orthogonal grids, though. To accommodate the functional design, the structure took on a lightning-bolt-shaped grid system known as a "Harry Potter" grid.

The alignments of the patient tower wings were skewed relative to each other to avoid sightlines between patient rooms in opposite wings. Orthogonal grids were used at the lower levels (podium) for optimal operating room, procedural room, and support space layout. The Harry Potter grids resulted in additional offset columns at the transition between tower and podium. Walter P Moore looked at different skew angles for the tower wings and made small adjustments in some tower columns, relative to the tower grid system, to eliminate a few transfers. After final adjustments, the steel frame has 86 column transfers.

Moment frames at the end of each tower wing were located along a tightly curving exterior edge. The rounded corners were a key part of the overall architectural design aesthetic and the owner's vision for the project. The SidePlate beams were kinked to help create the curve at each wing end and at some other locations. Moment frames along the ends and corners optimized the resistance to lateral loading. Large roll beams were added at 1 ft from the kink to resist the out-of-plane forces created by the kink.

Despite the roughly 500 ft by 600 ft floor plan at the lower levels, the structure was built without expansion joints. The desire to eliminate expansion joints was discussed early in design. The steel moment frames and their layout mitigated restraint, and the design team increased the reinforcing in the slab-on-metal deck at the first and second elevated decks to control cracking due to restraint, temperature, and shrinkage. Even with these measures, the team anticipated significant temperature movements at the building corners between the ground floor and first elevated floors. Sequencing exterior cladding installation to accommodate these movements was coordinated between the structural, the enclosure, and the construction management team members.

Given the size and complexity of the structure, managing the large quantity of data was a challenge. Walter P Moore used its integrated delivery digital platform to create and manage analysis and Revit models to coordinate with partners and more accurately track material quantities throughout the design process.




Walter P Moore

The "Harry Potter" grids best accommodated the distributed care team work area layout, which needed wider corridors within patient wings.

## Commitment to Cohesion

When Atrium Health was assembling the team for this project, it released a request for collaboration instead of a more typical RFQ and RFP—an early indicator of its commitment to building a team based on LEAN principles. Walter P Moore frequently used A3 documents to communicate and document team decisions, which was especially useful given the long schedule. A3s are a Lean Construction Institute tool that describes a problem or decision where the problem statement, summary of research and discussion, and confirmation of the solution is memorialized in a single document. The decisions related to structural systems were often revisited using these A3s to remind the team of the reasons for earlier decisions.

Target value design was used within the weekly structure cluster team meetings to discuss various aspects of the structural design, review options and impacts on other trades, review cost and schedule benefits, and track progress toward cost and schedule goals.

The frame has 10,525 tons of steel and topped out in December 2024.

Walter P Moore

NBBJ

The moment frame system enabled maximum functional flexibility for initial and future architectural planning of spaces.

Targeted co-location with the entire team in the same physical space and surveys to gauge the project team's health and effectiveness emphasized the attention to making the most of how everyone worked together, building trust and creating a productive team environment when working through tough issues together. The co-location included not only the owner, construction manager, and design team, but also trade partners such as the steel fabricator. Having key trade partners involved in the cluster and big room meetings provided the level of communication and transparency necessary for a project of this size and complexity.

The new bed tower is the marquee project in a multi-billion-dollar ongoing redesign and upgrade of Atrium Health's facilities and capabilities at the site. The new tower will tie into the existing hospital to the north and the new Carolinas Rehabilitation Hospital to the south. A healthcare project of this scale takes many years to design and build. Although the structure topped out in December 2024 and the top level of concrete deck was poured out in May 2025, the completion of exterior cladding, interior fit-up, and installation of specialty equipment is scheduled for mid-2027. ■

**Owner**
Atrium Health Carolinas

**Architect**
NBBJ

**General Contractor**
DPR Rodgers

**Structural Engineer**
Walter P Moore

**Steel Team**

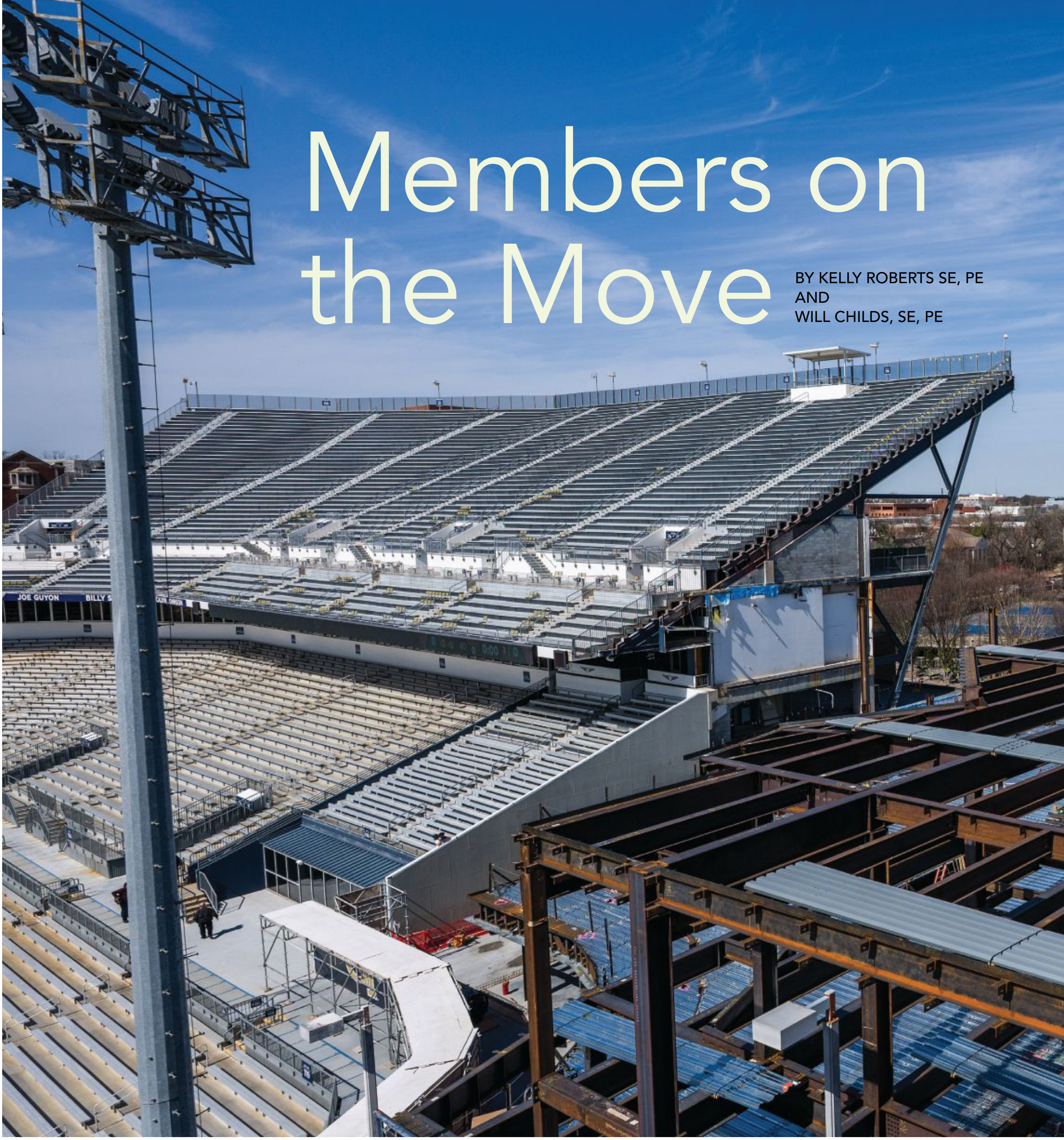
**Fabricator**
SteelFab (AISC Certified Fabricator)

**Detailer**
Prodraft (AISC Detailer)

**Brent Bandy** (**bbandy@walterpmoore.com**) is a senior principal at Walter P Moore.

# Members on the Move

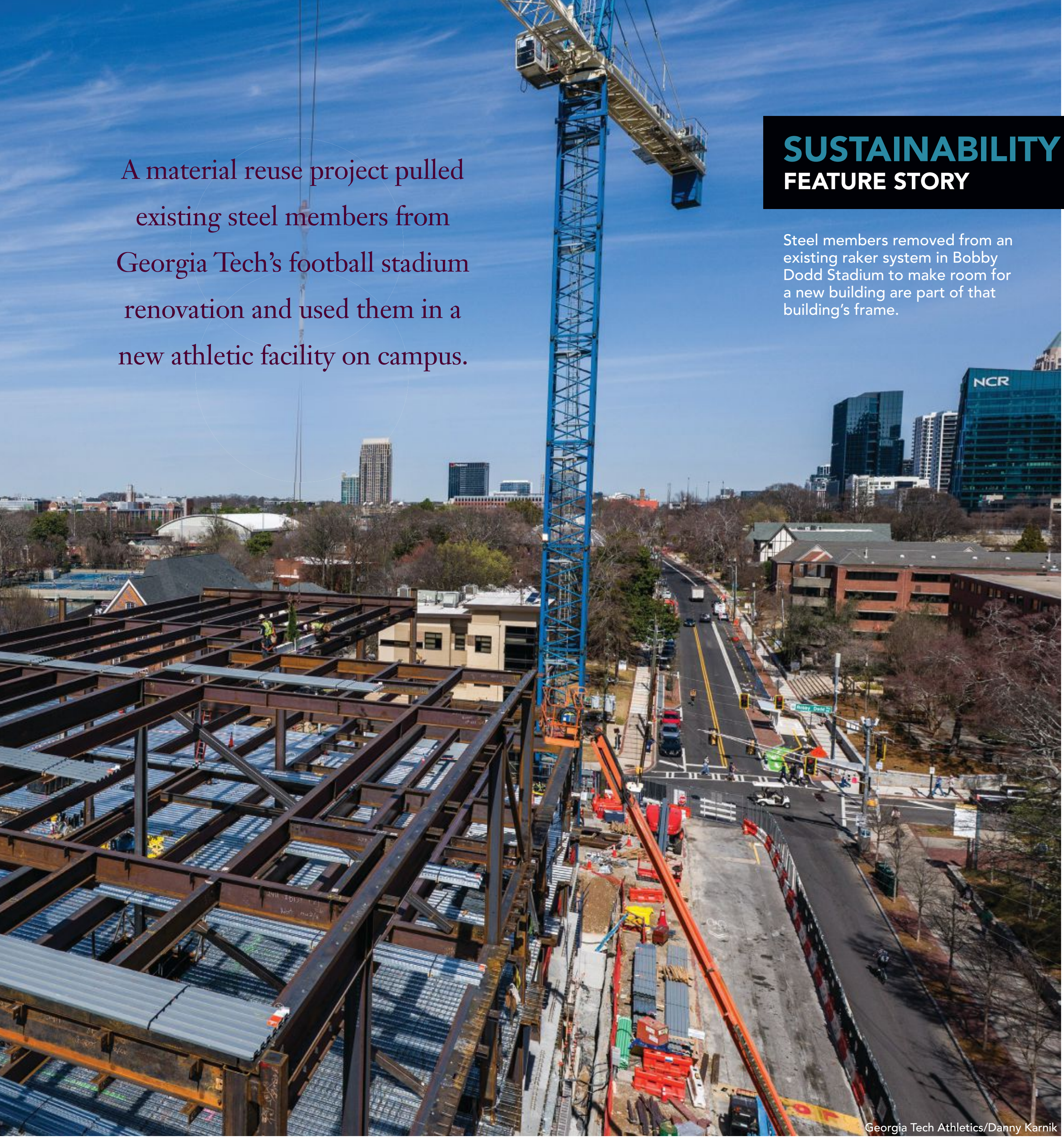
BY KELLY ROBERTS SE, PE
AND
WILL CHILDS, SE, PE




**A NEW STUDENT-ATHLETE** training facility built in a corner of the Georgia Institute of Technology's football stadium quite literally includes pieces of the athletic department's past. They are not showcased in a trophy case or memorabilia display. Rather, they are part of the building itself.

The Thomas A. Fanning Student-Athlete Performance Center's steel frame has about 20 members that were removed from adjacent Bobby Dodd Stadium, home of the Georgia Tech Yellow Jackets football team, and incorporated into the facility's design. Those members were harvested from a portion of the stadium that was deconstructed to make room for the facility.

The 100,000-sq. ft Fanning Center is one of a growing number of structures in the United States, and one of the first in the Southeast, to use salvaged steel from another structure in the project's construction. (Boulder Fire Station 3 in Boulder, Colo., is believed to be the first major steel reuse project in the U.S. Read about that reuse project in the "Ambitious Reuse" article in the August 2024 issue at **modernsteel.com/archives**) This steel member reuse design strategy is part of the overall goal of material circularity, which helps minimize waste, promote construction efficiency, and reduce embodied carbon.




A material reuse project pulled existing steel members from Georgia Tech's football stadium renovation and used them in a new athletic facility on campus.

**SUSTAINABILITY**
**FEATURE STORY**

Steel members removed from an existing raker system in Bobby Dodd Stadium to make room for a new building are part of that building's frame.

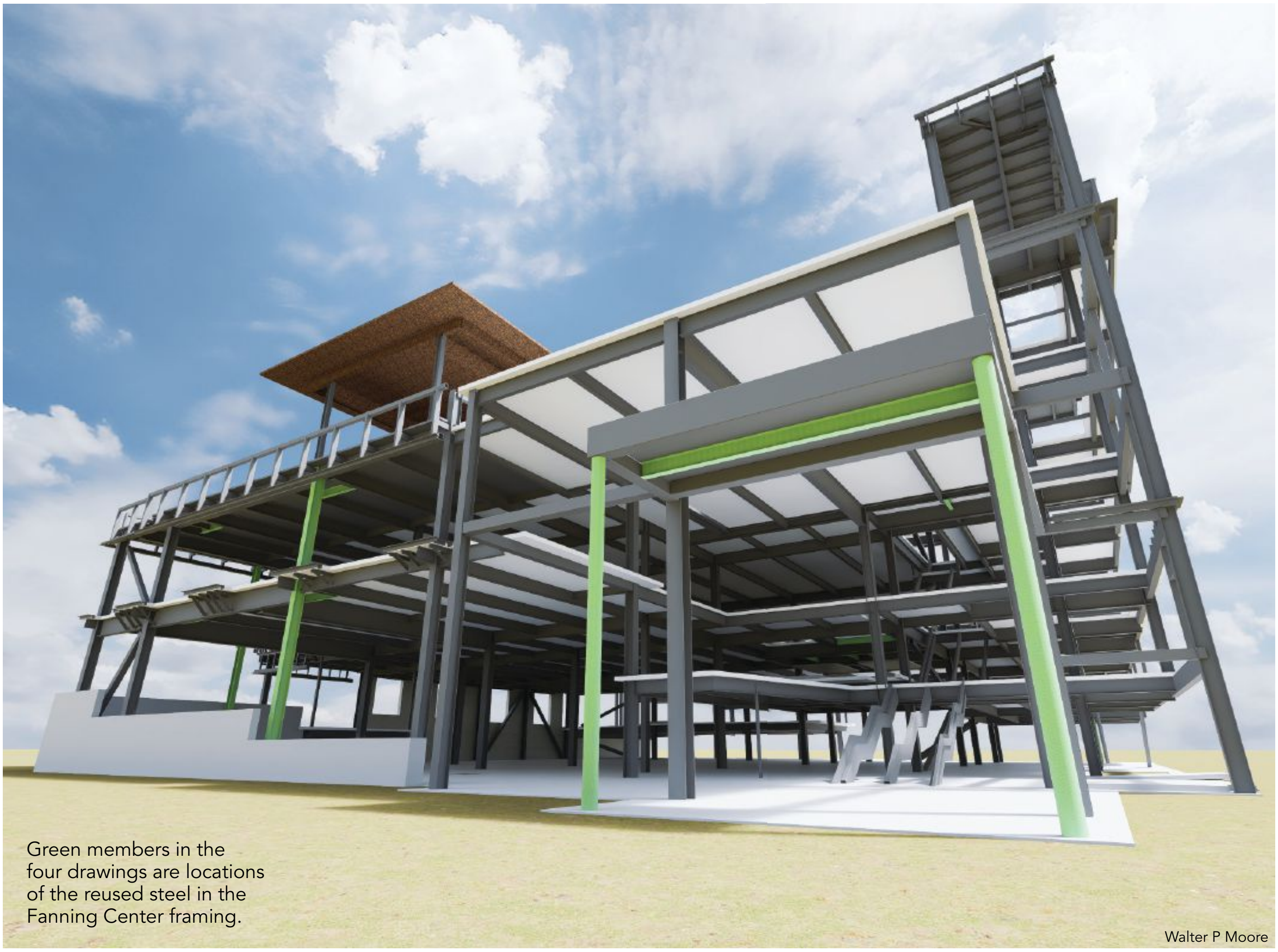
Georgia Tech Athletics/Danny Karnik

## Steel Reuse Strategy

Steel reuse is central to the Fanning Center project, and successful reuse requires careful planning and coordination by the project team from start to finish. A constant line of communication among trades—which included architect S/L/A/M Collaborative, general contractor DPR Construction, structural engineer Walter P Moore, steel fabricator Steel, LLC, and demolition contractor Green Circle Demolition—was vital to ensure the steel reuse strategy was properly coordinated.

"The biggest difference was factoring in the time required for coordination and getting engagement from all parties as early as possible," said Sarah Rohlfsen, project engineer at DPR Construction. "We had trade partners on board to consult a year before we ever started demo or steel erection. It was crucial to have Walter P Moore's selected members for reuse early on so that we could get buy-in from demo and steel trade partners on sequencing, storage, and installation. Getting this feedback while we were still in the preconstruction phase was also incredibly beneficial so that we could analyze any required costs and include proper language into subcontracts."

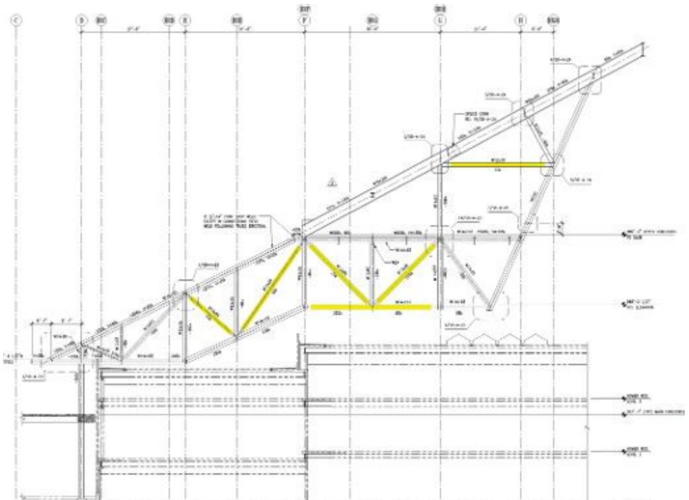
The entire project team was engaged in the steel reuse discussions to ensure a smooth and coordinated process. Group engagement from the start created a clear and concise understanding of the logistics, technical complexities, and expectations pertaining to each party's specific discipline.



Green members in the four drawings are locations of the reused steel in the Fanning Center framing.

Walter P Moore

"Extensive work was done on DPR's side to make sure every single member was labeled and tracked from the second that it was cut from the stadium, to when it was being loaded onto a truck, to when it was processed by the steel fabricator, and back on site," Rohlfsen said. "Production tracking markups and logs were sent almost daily to demo and steel trade partners with status updates on each piece."



Walter P Moore

Yellow indicates reused member locations in Bobby Dodd Stadium.

Walter P Moore advocated for the single project steel reuse design strategy, which was implemented at no additional cost to Georgia Tech and had no impact to the project schedule.

"Designing for reuse is a much more sustainable strategy," said Marc Clear, principal and sports national market leader at the S/L/A/M Collaborative. "Designing for material circularity is a way we can do so much better than just recycling. The reused steel also paired well with the Fanning Center's hybrid steel-timber structure for a great study in circularity, carbon reduction, and carbon sequestering—all strategies to reduce the embodied carbon of the building."

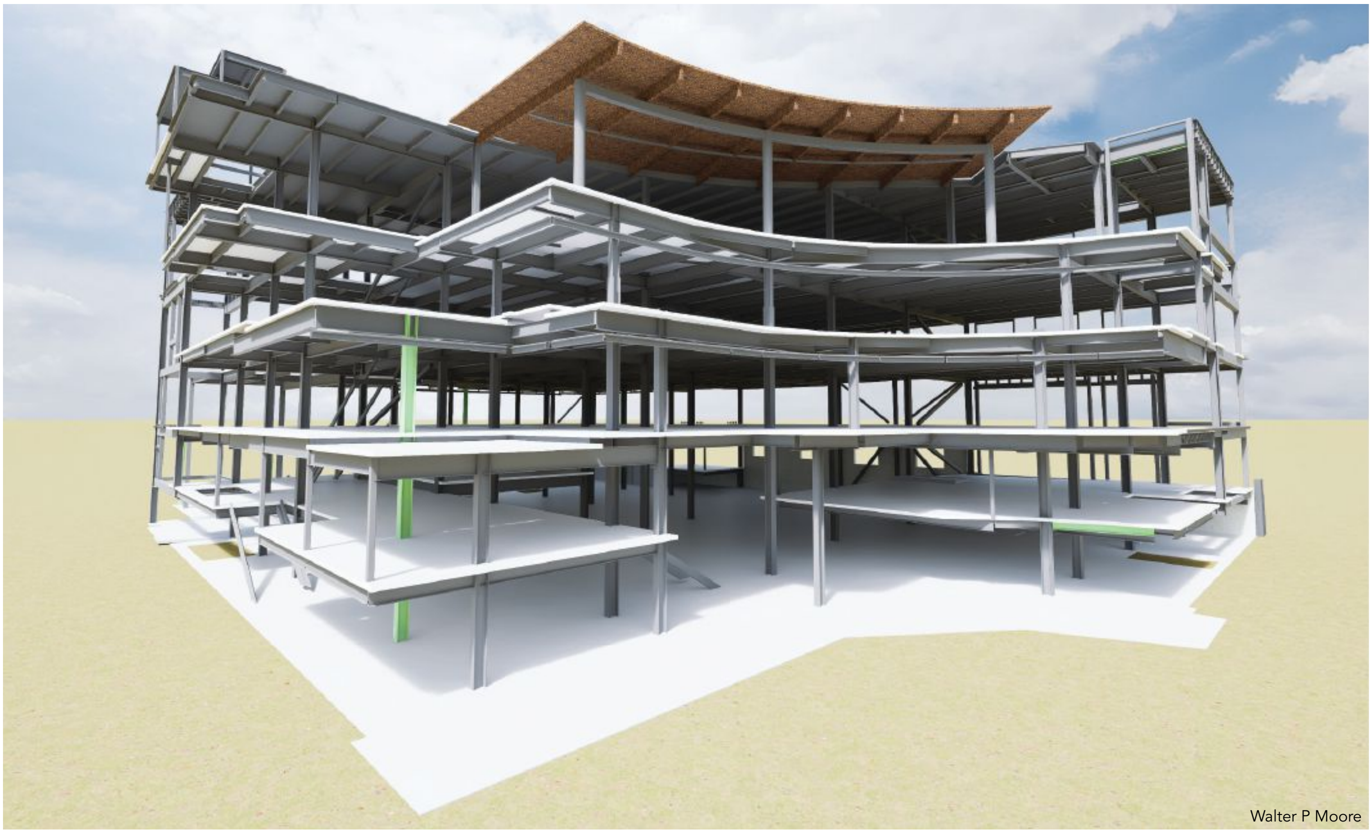
The project team opted to reuse the steel members to avoid carbon emissions stemming from steel recycling and reproduction. While recycled electric arc furnace steel undergoes an efficient process, it still produces emissions from transport to a mill that could be hundreds of miles away and operating a furnace to melt it.

In this reuse project, though, the steel traveled just nine miles to Steel, LLC's fabrication shop, where it was refabricated and equipped with new connections, and returned to the jobsite for installation. The 18-mile round trip made for minimal transportation-related emissions, and fabrication itself is a low-emission activity.

Ultimately, about 25 tons of steel were salvaged and reused in the new building, saving about 25,000 kg of carbon emissions, equivalent to the emissions of driving a gas-powered vehicle for 60,000 miles.

Walter P Moore

Walter P Moore



Walter P Moore

## Sustainable Sequencing

From the onset of design, the project team embarked on design sessions and site walks to align the logistics, sequencing, safety, and connection strategies for the reused steel. The approximately 20 truss members and sloped steel members from the existing raker system, which supported the upper deck portion of Bobby Dodd Stadium, were part of the demolition to make room for the Fanning Center. Those members were installed in the raker system in 2002 and 2003.

The project team required detailed and comprehensive assessments to verify the designated members were structurally sound, a viable option for reuse, and could retain the load paths while adapting to the current performance and building code requirements. Once the team confirmed the steel could be reused, it was removed, cut to size, and sent to the steel fabricator to be prepared for installation, which finished without a hitch. Ensuring steel was reusable mostly involved determining whether it was non-composite, how it could be disassembled, and the size of the members approximately matching where it was needed within the new building.

Some of the key factors learned during the refabrication was that the pieces were not always perfectly straight, had unexpected penetrations, and had existing connection material that had to be removed, requiring more preparation and attention than the new pieces of steel to prepare them for refabrication.

"It was paramount the reused steel would come with the performance, code, or maintenance efficiency of new steel," Clear said. "That's one of the great things about steel. When properly maintained and protected it can last forever, be reused, or be recycled."

## Industry Impact

Reusing steel does more than reduce embodied carbon. It can be financially beneficial to the owner, especially when the option is presented early in the design phase. Georgia Tech was on board with reusing steel after reviewing the design plan and learning reused steel would be cost-neutral to incorporate. This project is also representative of how structural steel reuse can support the architectural, design, and sustainability vision in larger-scale construction projects.

"This steel was not designed to be reused, but structural engineers identified the compatibility of the demolished steel," Clear said. "The entire team recognized the significance of this opportunity and got behind the process to show it could be achieved without burdening the project financially."

A truss segment being removed from Bobby Dodd Stadium that was later sent for refabrication.

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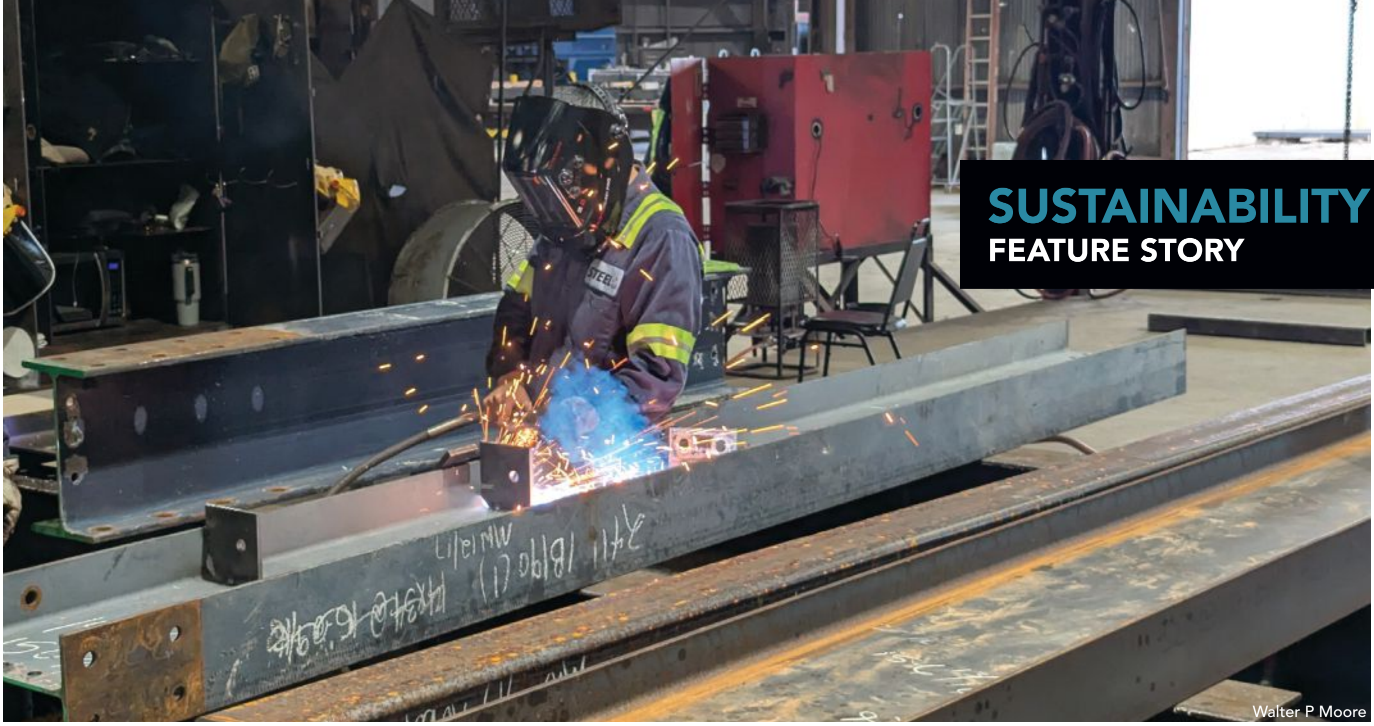


above: The approximately 20 reused steel members were transported from the jobsite to Steel, LLC for refabrication.

below: Steel was stored at Steel, LLC's facility before refabricating rather than on the demolition jobsite.

The Fanning Center entry vestibule has pipe columns salvaged from Bobby Dodd Stadium.

Walter P Moore

A reused and refabricated column in place in the Fanning Center framing.

Walter P Moore

The exposed portions of the reused steel members that were intentionally left visible symbolize the connection between the new facility and the time-honored Bobby Dodd Stadium, which dates to 1913. The Fanning Center, set to open in spring 2026, includes dedicated spaces for sports medicine, strength and conditioning, nutrition, academic support, and a sports science laboratory. The Georgia Tech football team will also have its own meeting rooms and coaches offices within the facility.

And outside of Georgia Tech athletics, the project is an excellent case study for future structural steel reuse projects as project teams explore methods of reducing embodied carbon for their clients. ■

**Owner**
Georgia Institute of Technology

**Architect**
S/L/A/M Collaborative

**Structural Engineer**
Walter P Moore

**General Contractor**
DPR Construction

**Steel Team**

**Fabricator and Detailer**
Steel, LLC (AISC Certified Fabricator)

**Erector**
Williams Erection Co., Inc. (AISC Associate)

**Kelly Roberts** (**kroberts@walterpmoore.com**) is a principal and managing director, and **Will Childs** (**wchilds@walterpmoore.com**) is a senior associate, both in the Atlanta Structures Group at Walter P Moore.

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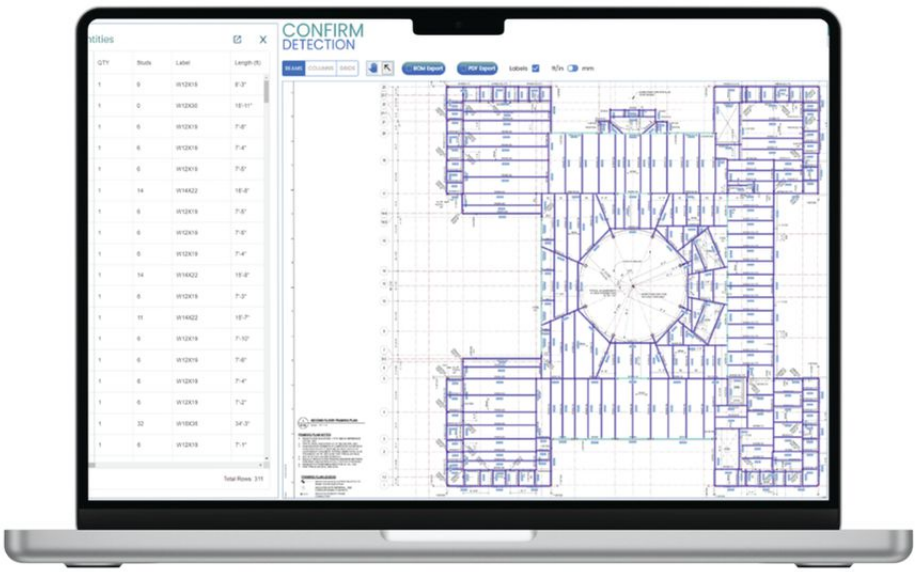


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— [redacted]

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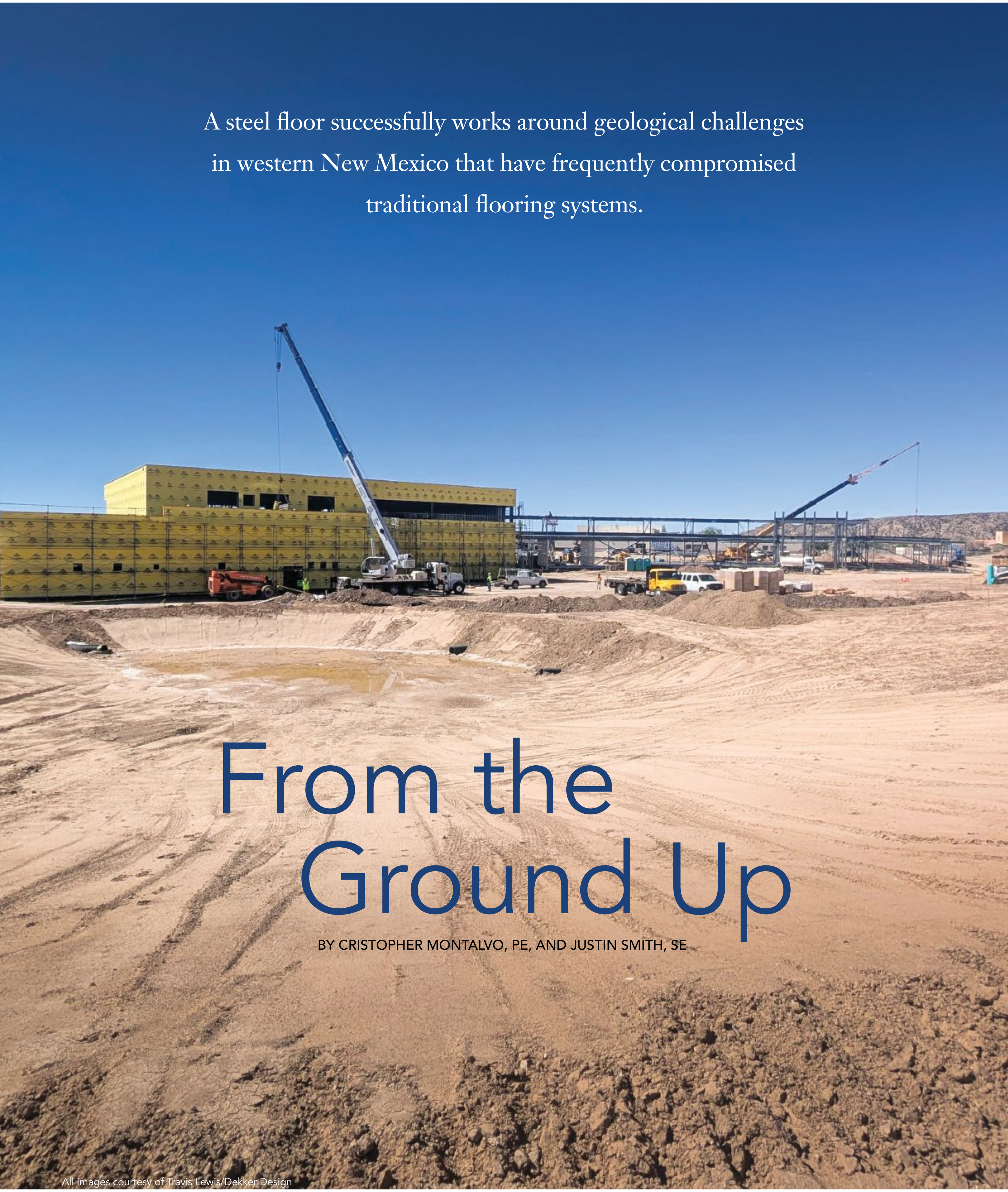
SKETCH DECK.AI

A steel floor successfully works around geological challenges in western New Mexico that have frequently compromised traditional flooring systems.

# From the Ground Up

BY CRISTOPHER MONTALVO, PE, AND JUSTIN SMITH, SE



All images courtesy of Travis Lewis/Dekker Design

Tohatchi High School's steel floor is designed around the site's 8-in. potential soil heave.

Double-pitched steel joists help achieve a 62-ft span for the gym.



**A SCHOOL DISTRICT** in western New Mexico wanted one of its newest buildings to avoid the geology-induced foundation performance issues that have burdened its other structures. Tohatchi High School in Tohatchi, N.M., opening this fall, represents one solution to those persistent problems: design a building with steel floors.

The school's design aims to withstand issues stemming from interactions with subsurface materials comprised of soft sandstone layers and shale deposits. Historically, the approach to founding buildings in the area has been shallow foundations—as expected in a sandy environment. The shale and sandstone swell and erode, though. Traditional load-bearing CMU masonry systems with masonry partitions supported on thickened slab-on-grade are unforgiving of movements, leading to flooring failures, cracked interior partitions, stuck doors, and roof leaks. Those problems cannot be remedied through maintenance or even renovation.

The new Tohatchi High School replaces a 1970s campus that had all those foundation problems. Those issues, combined with outdated infrastructure and growing demands for a larger modern facility, earned Gallup-McKinley County Schools' approval for a replacement campus.

From the beginning of programming and design, conversations with the district's project manager made it clear that several criteria would shape the structural solution: the requirement of a crawlspace with coordinated plumbing access, the importance of minimizing onsite complexity given the remote location, and the critical nature of designing around the site's 8-in. potential soil heave.

## Lay of the Land

The Tohatchi floor design is an evolution from recent school district mandates and 30 years of experiments with techniques for building ground level floors. Gallup High School in Gallup, N.M., was built in 1995 with deep foundations, grade beams over void forms, and conventional slab-on-grade supported by engineered fill (Figure 1). That school has major slab issues and is currently being replaced. Ten years later, two schools built in Crownpoint used deep foundations supporting grade beams over void forms. However, one school used a steel bar joist-supported floor over a crawlspace (Figure 2) and the other used conventional slab-on-grade. The difference in quality was apparent as soon as the buildings were opened, and a crawlspace became the district standard.

The school district has four new schools in various states of design and construction. The first is Red Rocks Elementary, which has a steel composite floor slab with wide-flange infill beams supported by 5-ft-deep concrete girders running through the footprint between the tops of piers (Figure 3). The district requires access to all areas of the crawlspace, so passageways through interior grade beams had to be coordinated throughout design and construction.

After completing Red Rocks Elementary, the district thought the schedule and cost could improve if interior grade beams were replaced with wide-flange girders to lessen the concrete work needed. Coordinated passageways could be jettisoned as well. The new Tohatchi High School project implemented this strategy (Figure 4).

## Steel Wins Out

To address the site's geotechnical risks, Geomat, the project's geotechnical engineer, recommended a deep foundation system consisting of auger-cast piles paired with void forms and a structural slab. This foundation strategy enabled the structure to span over heaving soils and provided the necessary clearances for the crawlspace, meeting both geotechnical and owner-driven requirements.

Initially, the design team proposed several alternatives to the district standard to ensure the client was getting the best value. Three systems were evaluated for ground-floor construction: a two-way, mild-reinforced concrete slab, a precast hollow-core system, and a composite structural steel floor system. A major factor in choosing between these options was the district's remote location, which has long influenced construction methods. The low population density and distance between cities significantly increase labor and material costs. These economic constraints have traditionally led to shallow foundations and CMU load-bearing walls. Working with concrete in this region poses logistical challenges, often relying on a single supplier and requiring strategies to extend batch plant delivery times to remote sites.

Precast was quickly ruled out due to cost premiums and the difficulties of transporting large components to the area. Likewise, the consistent challenges experienced with concrete construction in similar rural projects made a full concrete system less appealing. Steel, on the other hand, offered lighter materials, greater control during

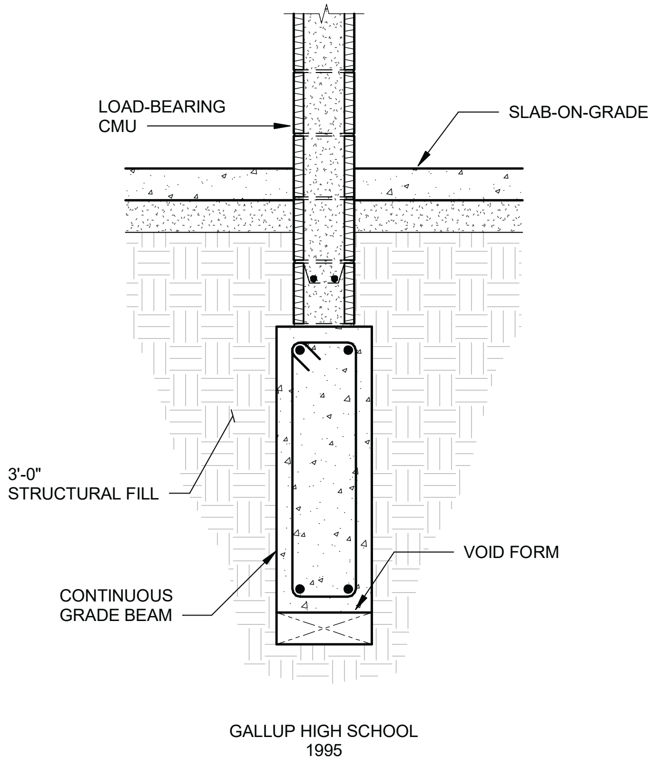



Fig. 1.

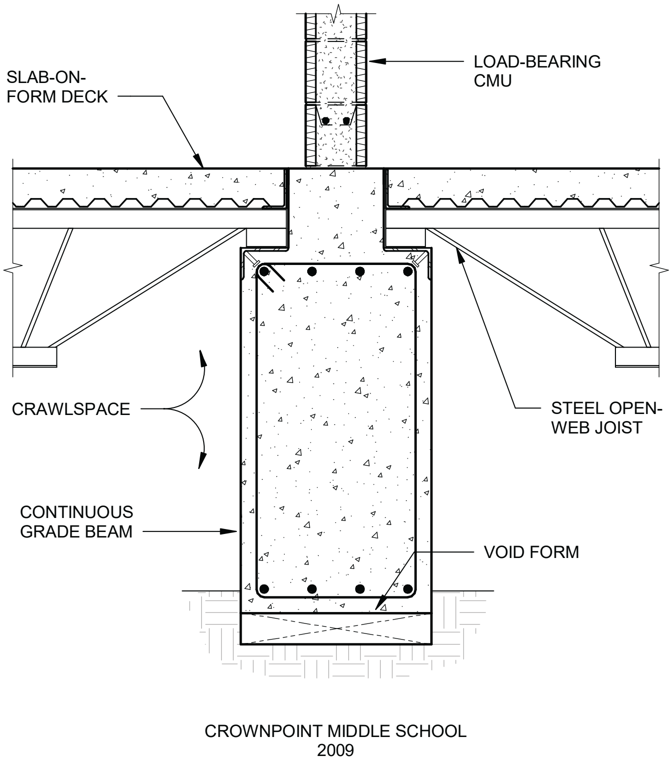



Fig. 2.

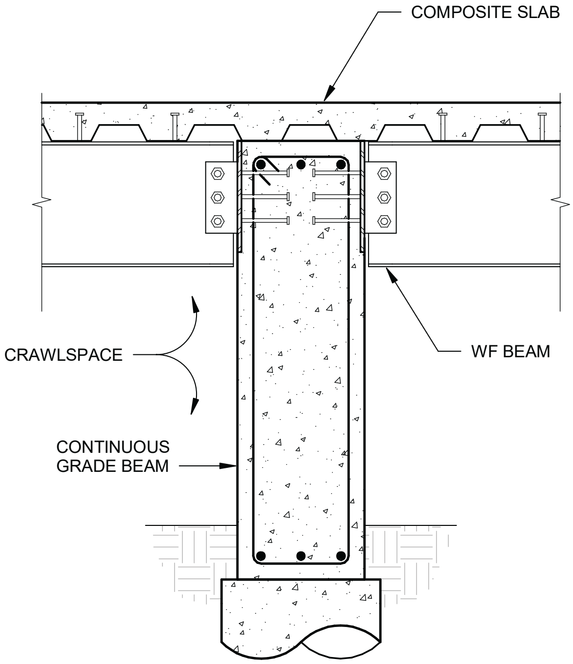



Fig. 3. RED ROCKS ELEMENTARY
2022

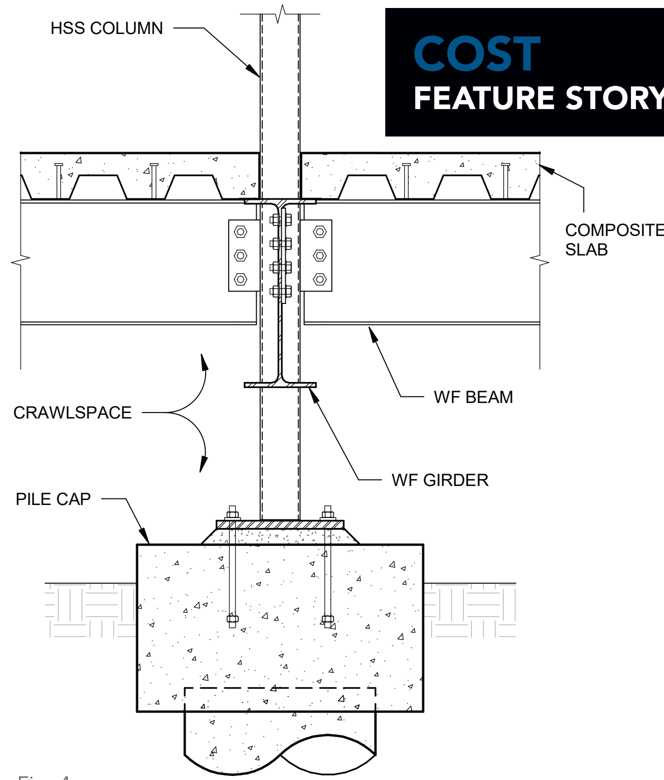



Fig. 4. TOHATCHI HIGH SCHOOL
2023

above: The building transitions to steel braced frames above Level 1 to resist lateral loads.

below: The interior columns are a mix of square and round A500 Grade C HSS sections.


All wide-flange members were specified as ASTM A992 steel.

erection, and a more adaptable solution. Ultimately, a composite steel system was selected for the elevated ground floor and framing.

Modern K-through-12 architecture poses unique challenges for structural engineers. A program of regular and repeatable classroom spaces has evolved into a more complex arrangement of flexible spaces, allowing for 21st-century teaching methods. Clients want places where students can come together outside of the conventional classroom and be stimulated in new ways by their surroundings. Libraries are giving way to media centers. In New Mexico, there is a renewed interest in modern career and technical education (CTE) spaces.

The new Tohatchi High School design reflects this evolution. The two-story facility features a prominent gymnasium, a CTE wing built to accommodate forklifts and heavy equipment, a rooftop penthouse for geothermal units, a cafeteria, and administrative spaces. These program elements result in an irregular building footprint and massing. Vibration concerns further complicated the design, especially for the gym, where an elevated floor system was required rather than a typical slab-on-grade.

## Steel Design Decisions

The final design features below-grade concrete retaining walls and shear walls around the perimeter of the building footprint to form the crawlspace and support the steel framing above. The interior of the building footprint consists of pilasters at girder lines and major beam locations, with interior hollow structural section (HSS) columns. The interior columns are a mix of square and round A500 Grade C HSS sections. Square HSS columns range from HSS5×5×¼ to HSS8×8×½, while round HSS columns range from HSS6×0.500 to HSS10.750×0.500. At locations with longer unbraced lengths, such as the gymnasium, wide-flange columns (W12×136) were used to meet strength and stability requirements. Columns bear directly on pile caps and exterior columns aligned with 24-in. by 24-in. concrete pilasters.

The typical bay spacing throughout the academic portions of the building ranges from 30 to 35 ft. Floor beams consist primarily of composite W21×50 and W24×55 wide-flange members, while girders range from W24×62 to W36×135. All wide-flange members were specified as ASTM A992 steel. These members were


The new building is scheduled to be completed in late 2025.

selected to work in conjunction with the composite metal deck and concrete topping to develop composite action, increasing the strength and stiffness of the framing while reducing overall steel weight and member sizes.

In the CTE wing, where shorter spans and heavier loads occur, a mix of W14×22 and W16×26 beams was used to accommodate anticipated equipment weights and concentrated loads. The gym floor framing includes a combination of W16×26 and W18×35 beams to meet vibration and loading requirements, particularly under the bleacher areas and open spans. In total, the project used just over 500 tons of structural steel.

The ground floor consists of 3-in. concrete on a 3-in. VLI composite metal deck, with a 6-in. concrete topping at the gymnasium, CTE, and high-density storage areas to accommodate heavy loading and vibration criteria. In these zones, the typical bay spacing of 30 to 35 ft was reduced to spans between 15 and 17 ft. Additional interior columns—ranging from HSS6×6×½ to HSS8×8×½—were introduced from pile caps up to the ground floor to improve stiffness and reduce vibration.

These design choices were critical in supporting concentrated equipment loads in the CTE area (including forklifts or scissor lifts between 10,000 and 15,000 lb), dense storage racks, and to mitigate gym vibrations, particularly important where instructional spaces share a common wall. AISC Design Guide 11: *Vibrations of Steel-Framed Structural Systems Due to Human Activity*, Second Edition (download or order at **aisc.org/dg**) provided guidance when sizing the ground floor beams, which was critical for instances where English instruction classrooms share a common wall with the gym.

Above Level 1, the building transitions to steel braced frames to resist lateral loads, which are governed by wind rather than seismic forces due to the site's low seismicity. One of the most technically demanding features was the long-span roof system over the gym. The architectural vision called for a fully open 143-ft by 140-ft space without intermediate columns. To achieve this, the design team used 44LH14 double-pitched joists spanning 62 ft, 6 in. at the center bay, supported by 108-in.-deep joist girders spanning 104 ft. An acoustical 3½-in.-deep dovetail roof deck was included to improve sound performance.

The greatest challenges were the extensive design iterations and close coordination with the architect to deliver the desired aesthetic of exposed steel framing—a visual and functional highlight of the space. The gym serves as a central gathering point for the school and the broader community, and the open, expressive structure plays a key role in defining the building's identity.

Educational facilities today are architecturally complex, making them particularly challenging for elevated ground-level slabs. Irregular footprints, demanding vibration criteria, and diverse loading requirements, especially in CTE labs or gymnasiums, complicate structural design. Composite steel systems, paired with thoughtful detailing, offer a robust and efficient solution.

In remote locations with limited access to labor and materials, a unique level of care is required when making decisions about

Below-grade concrete retaining walls and shear walls around the perimeter form a crawlspace and support the framing.

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structural systems. Upfront costs may have a bigger impact on the financial health of institutions when the costs of maintenance and future replacement are unusually high. Given the area's history of foundation issues, investing upfront in high-performance systems is imperative. The school district's floor design evolution, which culminates with the new Tohatchi High School, leverages steel's transportability and malleability to achieve long-term performance with constructability. ■

**Owner**
Gallup-McKinley County Schools

**General Contractor**
Bradbury Stamm Construction

**Architect and Structural Engineer**
Dekker Design

**Geotechnical Engineer**
Geomat Inc.

**Steel Fabricator, Erector, and Detailer**
Cold Steel Inc. AISC CERTIFIED FABRICATOR

**Cristopher Montalvo** (cristopherm@dekkerdesign.org) is a project engineer at Dekker Design, and **Justin Smith** (justins@wallaengineering.com) is a structural engineer at Walla Engineering.

# Finding Answers...and Answer-Finders

BY PATRICK ENGEL

**Visit a structural engineering lab—like the University of Arkansas' CEREC—for an inside look at conducting research and an appreciation for its other crucial mission: producing successful students.**

**GARY PRINZ LIKENS HIS JOB** running a structural engineering lab to the childhood experience many engineers credit for sparking their career choice.

"It's not unlike playing with LEGO and Erector sets," Prinz said, "just on a larger scale."

Prinz is a professor at the University of Arkansas and the director of the Grady E. Harvell Civil Engineering Research and Education Center (CEREC), a five-year-old facility that's working to become one of the premier steel research and testing labs in the country. The 216 steel anchors embedded within the 3-ft-thick reinforced concrete floor of the high-bay structural testing area are like a big LEGO board, a canvas for building, except they're for anchoring large steel assemblies. The lab was built with versatility as a top priority, and the embed layout creates a "strong floor" that helps accommodate a wide range of testing layouts. No structural steel research projects are alike, but they all have the same goal.

"Basically, we construct little structures inside a larger structure, and that allows us to break really big stuff," Prinz said.

In some form, that's daily life in most structural engineering labs. For Prinz and assistant professor Morgan Broberg, it usually focuses on steel. Structural engineering research often involves testing, either at the material, component, or structural system scale, to better understand the limits and any unanticipated avenues for failure. Research projects come to large labs like CEREC to test new ideas under simulated real-world conditions rather than learning from nature, which can be costly.

"CEREC is a place that can validate acceptable structural performance, under realistic conditions," Broberg said.

But that's only the start.

## Two Products

Research findings are a lab's obvious product. They are published in widely available papers, influence design, and create cutting-edge products (such as AISC's SpeedCore and FastFloor, developed at Purdue University and West Virginia University, respectively).

Recently, Prinz and his CEREC colleagues completed an AISC project researching shear stud fatigue demands in composite bridge girders, helping improve upon the recent AASHTO *LRFD Bridge Design Specifications*. Ongoing shear stud work for the National Cooperative Highway Research Program hopes to expand upon these improvements. On a late June day when *Modern Steel Construction* visited, testing of skewed special moment frames was ongoing for another AISC project. Most projects that come to CEREC fall into two categories: fundamental research or applied research.

"There's fundamental research, where you're learning about something new or developing a deeper understanding of an issue," Broberg said. "AISC projects are more on the applied end, where the research is fairly targeted toward improving current practice."

Ask Prinz, Broberg, and researchers at other university labs about their mission, and they'll likely say the research is only half of it. The other lab product is students. Labs aim to give students hands-on training and prepare them for an engineering career—Prinz and Broberg's titles have "professor" in them, after all. They work with students, from undergraduates to PhD candidates. Go to any lab, and students are integral to the operation. Labs are training centers for future engineers and researchers as much as they are fact-finding hubs.


The biaxial fatigue testing machine is in a separate room from the main testing area.

Photos courtesy of AISC unless otherwise noted.

above: The CEREC exterior.

below: CEREC has a 25-to crain that spans the lab floor.

"Our success is also measured by the fact that students eventually leave CEREC," Prinz said. "They come to get great training, become great at their job, and then leave to impact the world."

Most students who spend significant time in the lab are in graduate school pursuing master's degrees or PhDs. Undergraduate students are also common at CEREC, though, whether they're working on honors research or doing material testing as part of a civil engineering class. They come for hands-on training, from learning how to control equipment during a test, collecting samples, or even simple text fixture welding.

"Whether it's undergraduate or graduate students, they all contribute to the work at CEREC," Broberg said. "Tightening a bolt may be needed, but you don't need a PhD to tighten every bolt. But if you have a PhD, you should probably have tightened a bolt at some point."

If students are involved, the project adds value to the lab's mission. Without them, the lab's purpose as a research and education center would be incomplete.

"We can have the best idea ever," Broberg said. "But if there's not a great student who we can partner with to do the research, it won't get off the ground."

## Why CEREC Was Built

No facility like CEREC existed in Arkansas before it opened in 2020. Building a new lab on campus was important to many university officials and leaders, but W&W|AFCO Steel president Grady E. Harvell—a class of 1971 Arkansas graduate—was at the forefront of fundraising and championing the cause for Arkansas to be a leader in civil engineering research. If a university wants to establish itself as a leader, having a high-end lab is crucial.

Gary Prinz

Prinz and his colleagues' prior research efforts and demonstrations of success boosted the buy-in to build CEREC. And Prinz, who has worked at Arkansas since 2014, has a strong research track record. Prior to CEREC's construction, he earned AISC's Milek Fellowship (a four-year, $50,000-per-year research award) in 2018 for a project called "Steel Seismic Systems with Architectural Flexibility: Seismic Performance of Non-Orthogonal SMF Beam-to-Column Connections." That same year, he earned a U.S. National Science Foundation CAREER Award to develop tools for predicting micro-level material fractures in 3D-printed steel alloys. While Prinz had enough support and resources to succeed before CEREC, he admits that it required some creativity.

"The facility where we did research before CEREC was a 30-ft by 30-ft room with 12-ft ceilings," Prinz said. "It had a modest reaction frame that forced us to be creative in our research approach but still allowed us to do great things that had real impact."

The university and Harvell imagined greater research impact if they could build a space for research on a larger scale. The goal was to create a lab that could handle a wider range of projects and make Arkansas a research destination. W&W|AFCO Steel and Lexicon, Inc. have been crucial partners and often donate material and fabrication time.

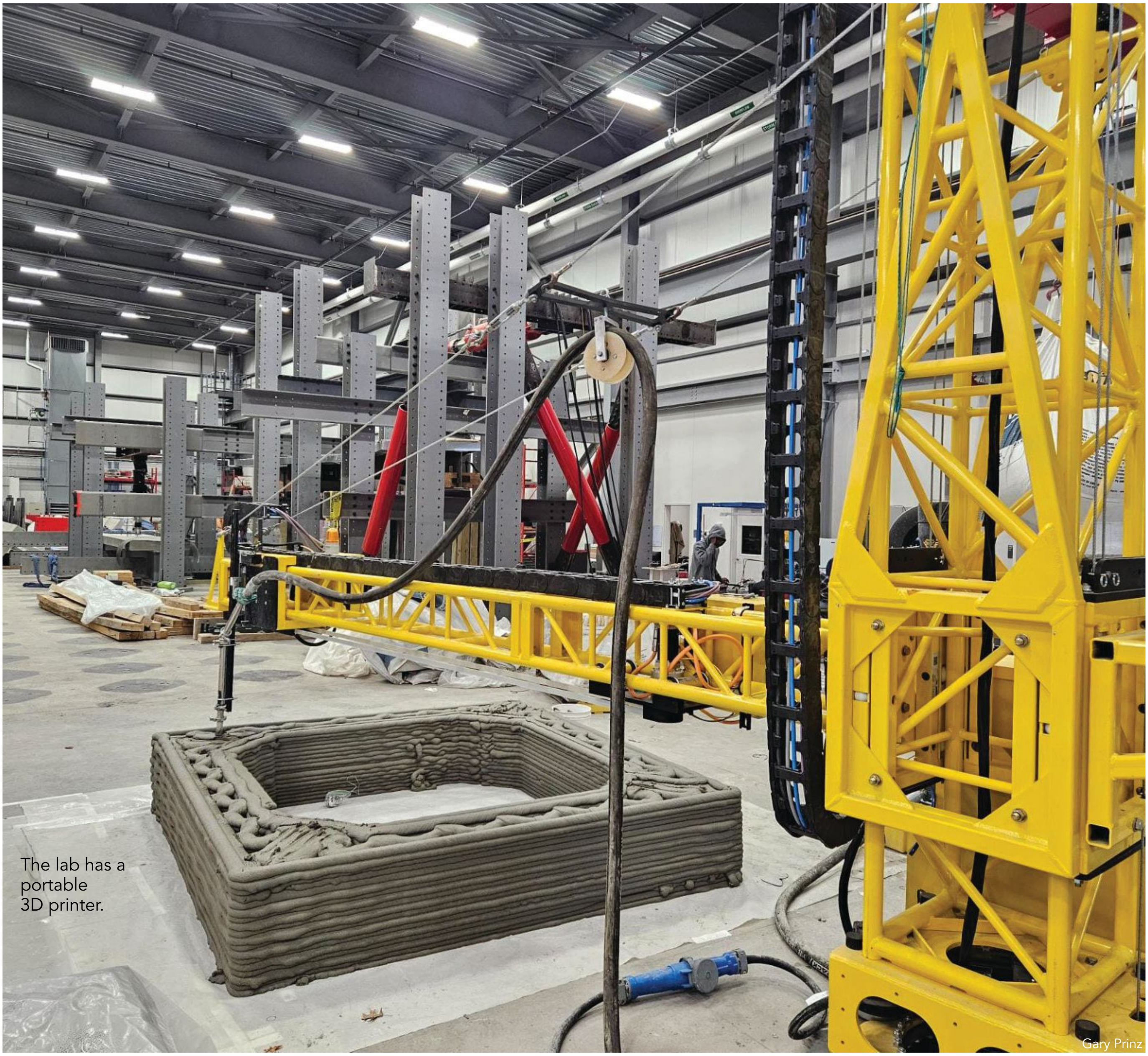
"Our steel industry partners have been great and continue to support the research and student efforts at CEREC," Prinz said. "Industry support has been instrumental in CEREC's success."

The impact has been immediate. CEREC construction cost totaled nearly $14 million, and it has already helped secure nearly $26 million in research projects.

"It's not unlike the outcome in the movie Field of Dreams," Prinz said. "We hoped that if we built it, projects would come."

above: Data gathering during a test.

below: Gary Prinz has been at the University of Arkansas since 2014.



The lab has a portable 3D printer.

Gary Prinz

That's also true for students and faculty. A facility like CEREC is a recruiting tool for the people conducting the research projects, and Broberg is proof. She arrived in 2024 and admits she'd likely be elsewhere if not for CEREC. The lab was a main draw for her to come to Arkansas.

"Buildings don't get research projects," Broberg said. "People do. But without a facility, you can't do the types of impactful projects we're doing."

## Designed for Flexibility

There is likely no best or ideal way to design a structural engineering lab. Labs are envisioned and designed to achieve a specific mission, and there are many useful, admirable missions.

"There are a lot of labs that can do the things we do," Prinz said. "We simply tried to design a space and acquire equipment that will make us flexible to do a lot of types of testing and keep us competitive for impactful projects going forward."

The 216 octagonal embeds (attachment points on the strong floor) are the lab's most visible feature, and visitors realize it before stepping onto the lab floor. Without the ability to connect and react against the floor, the lab wouldn't function as needed. Each embed is like a single stud on a LEGO baseplate, except they can resist 250,000 lb of uplift and 220,000 lb of lateral shear.

The embed design is not the only sound method for anchoring test components, but it's a strong choice when malleability and versatility are priorities. It's a major reason the lab can be ready for any project that shows up.

"You never know what the next project or test will be," Prinz said. "Having a strong floor that can adapt to a wide range of testing configurations is important."

CEREC also has a 25-ton crane to facilitate fixture setup and specimen transport from within the high bay area. It has space to add a second crane, which Prinz says is planned for this academic year. It hosts a wide range of equipment capable of applying massive loads to structural components. Several large servo-controlled hydraulic actuators are used for various load applications. Some individual actuators can apply up to 500,000 lb, and plans are underway for adding larger testing equipment capable of supplying


Gary Prinz

The lab has 216 embeds that anchor steel columns for testing.

Each embed can resist 250,000 lb of uplift.

below: A hydraulic machine in a back room pumps force through hoses into the servo-controlled hydraulic actuators on the lab floor.


nearly 3 million lb. Computers control the actuators, and large hoses supply pressurized oil to apply the large loads needed.

Testing isn't finished when something breaks (or doesn't break) on the lab floor. CEREC has a material testing room for twisting, pulling, bending, and other tests. It has another room for metallographic grain structure analysis and specimen preparation.

"We are trying to solve problems," Prinz said. "It's important to have all of these different testing capabilities to understand problems well."

AISC has provided several practical problems to solve. The Milek study investigating skewed special moment frame testing results will help inform guidance in the next edition of the *Seismic Provisions for Structural Steel Buildings* (ANSI/AISC 341). Another AISC project testing rooftop moment frame connections is underway, as is a different skewed weld research project that has potential to influence the next edition of AWS D1.1: *Structural Welding Code-Steel*.

Research work at CEREC or any another university-affiliated lab often takes time because of the lab's training center component. Learning isn't linear, and projects don't come with a textbook that tells students how to handle each step. Taking a research project to a lab means supporting students' education as much as finding new information. And clients are usually happy to know they're contributing to both.

"It's like running a small business with initially unskilled labor and a lot of different collaborators," Prinz said. "These projects take time, because the product is not just finding the answer. It's finding the answer while training people to become answer-finders."

**Patrick Engel** (**engel@aisc.org**) is the associate editor of *Modern Steel Construction*.

AISC's Visions in Steel exhibit shares stories of the people behind the sparks and machines, and its next installment starts soon.


# Real People, Real Stories

BY HOPE HRABOWY AND KATE DUBY

**DEANNA JACKSON GREW UP** hearing stories of steel.

Her grandfather was a welder. Her uncle worked in a fabrication shop. She started her own career in an office but realized she wanted something different—something more hands-on and meaningful, like the job that's part of her family's story.

Years later, she stood beside a portrait of herself at the Visions in Steel exhibit at the Center for Architecture and Design Tampa Bay in Florida. A quality control technician at AISC full member fabricator Precision Build, Jackson is part of the next generation shaping the industry, and on opening night for Visions in Steel Tampa Bay in January 2025, architects, engineers, fellow fabricators, and close friends gathered not just to celebrate great design, but the people who make it possible.

## What Is Visions in Steel?

Steel buildings go up every day, whether they're towering and iconic or unassuming low-rises. But it's rare to glimpse the hands and minds behind the steel. Visions in Steel began with a simple idea: What if the spotlight shifted from the cityscape to the shop floor?

The traveling exhibit celebrates the fabricators who give shape to the built environment—those who solve problems with precision, turn raw steel into form, and bring architectural ideas to life. Each stop reflects the people and projects of that region—different people, different perspectives. The common thread? Deep pride in building with steel.


Since its launch, the exhibit has traveled to Dallas, Philadelphia, Tampa, and Louisville, Ky., with each location bringing new voices and stories to the forefront. The next installment is in Raleigh, N.C., beginning September 22.

Over the past few years, AISC has traveled the country to interview fabricators behind projects like Moynihan Train Hall in New York City and Amalie Arena in Tampa (home to the NHL's Tampa Bay Lightning!). We expected technical insights. What we found were powerful, personal stories.

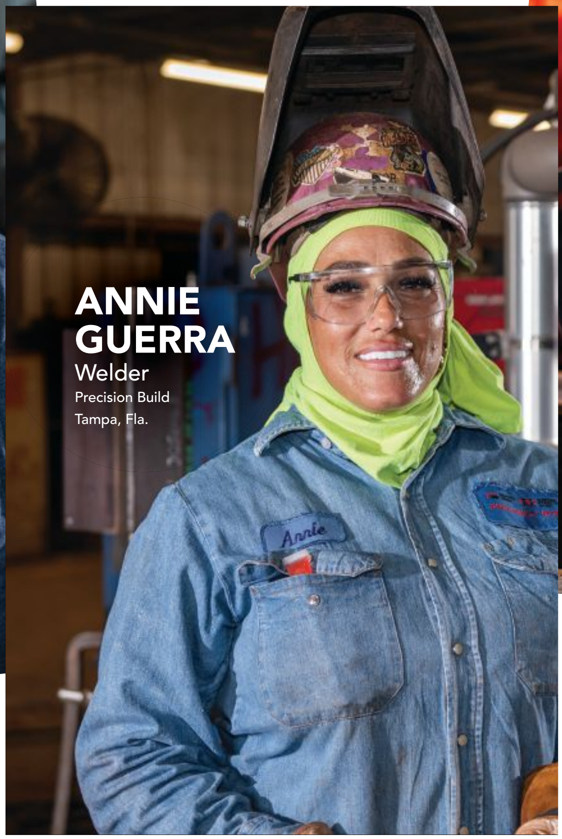
Start with Annie Guerra, a native of Cuba who has been a welder for more than 20 years. She can count on one hand how many other women she has worked alongside in the field. The job is gritty and demanding, but Guerra says it's uniquely beautiful and rewarding.

"As an immigrant, you have to do basically whatever you can to adapt and figure it out," she said. "Jobs are on every corner, but not the opportunity to make a career and do the same job for your entire life. It's like being a doctor or lawyer, right?"

Guerra immigrated to the U.S. as a young mother of two and found opportunity and stability in the steel industry. At 23, while her friends were going out on weekends, Guerra was learning to weld and coming home exhausted from the shop. Even now, she still feels the need to prove herself daily in a male-dominated field, but she doesn't flinch.

"The men are working to take care of their families, and I'm doing the same," Guerra said.

She never wanted a "normal" job. And she's proud of the one she's built.



For Onray Winfield, steel represents something else entirely: a second chance. After being incarcerated, Winfield entered a welding apprenticeship at JGM. What drew him in wasn't just the hands-on work—it was also problem-solving and camaraderie.

"I had friends who labored in the shop and told me how it changed them," Winfield said. "I wanted that too."

Winfield hasn't been working in the field long, but already, the work has brought meaning and structure. His dream? To become a certified welder or work in another fabrication role.

"Every mistake is a chance to learn," he said. "But when you see the finished project? It's worth it."

## More than Metal

Visions in Steel offers a different kind of blueprint—one built from experience, mentorship, mistakes, second chances, and pride. Each portrait and story on display is a reminder that every beam carries more than just loads. It carries the lives of the people who made it.

What surprised us most wasn't just the technical skill on display, but how often fabricators talked about relationships: the people who shaped their paths, offered them chances, taught them patience, or simply stood by them.

"The visual displays wonderfully capture the passion and the unique path each steelworker traveled to perfect their trade," said Hugh McCaffrey, owner of Southern New Jersey Steel and outgoing chair of the AISC Board of Directors. "I witnessed members of the architectural and engineering community display pride in seeing their designs come to life through the human connections provided by the trade artisans. It created a sense of connection much stronger than a literal bolt-to-nut connection."

Ideally, when designers go to a Visions in Steel exhibit and see the pride steel industry workers take in their craft, they will remember it when deliberating material choice on a future project. Visions in Steel amplifies and adds to the workers' pride.

"Seeing my photos and story in the exhibit was exciting, and it made me feel proud of what I do," said Courtney Lilly, a featured fabricator in the Philadelphia Visions in Steel exhibit. "It was even more meaningful to hear my family and friends say they were proud of me, too.

"But the most impactful part was being able to share my story with the younger generation and answer their questions. And just as importantly, it gave designers—from engineers to architects—a better understanding of what it actually takes to bring a project to life."

An architect and recent Visions in Steel attendee can confirm.

"The pride that the steelworkers have in fabricating and building what is designed was inspiring," said Peter Hauerstein, AIA, of Sol Design Studio LLC. "As an architect, it makes me happy to see that the steelworkers are as excited about the buildings as we are."

## Steelworker Stories

Visions in Steel attendees will learn about several fabrication shop employees' stories. Each person's story is unique, such as these two:

**SNJS's Courtney Lilly steps up to the plate—and makes sure it's to standard.** Courtney Lilly learned to trust her intuition and maximize her resources from a young age. And at the Southern New Jersey Steel fabrication shop, where Lilly heads the quality assurance and quality control division, it pays to be intuitive—and knowing your stuff doesn't hurt either.

Although she spends most days ensuring layouts and fit-ups are up to standard and making sure no beam goes unfabricated, Lilly, a certified welder, always keeps a face shield and gloves ready.

"I'll jump in and help the guys weld if we're tight on a deadline," Lilly said.

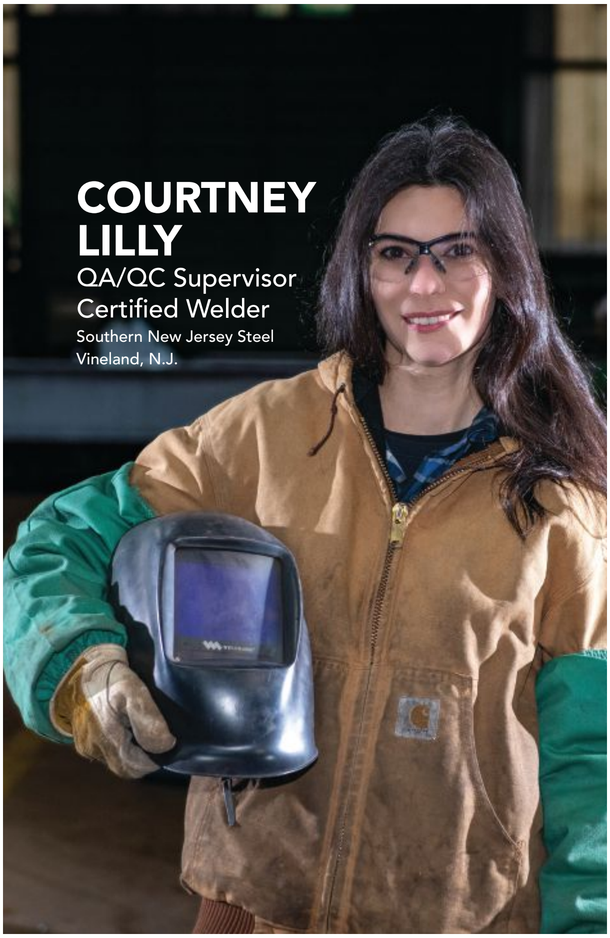
Before she came to SNJS, Lilly worked at RCC Fabricators for eight years. She started as an intern at age 17 and decided to make a career out of steel fabrication when she got pregnant in college.

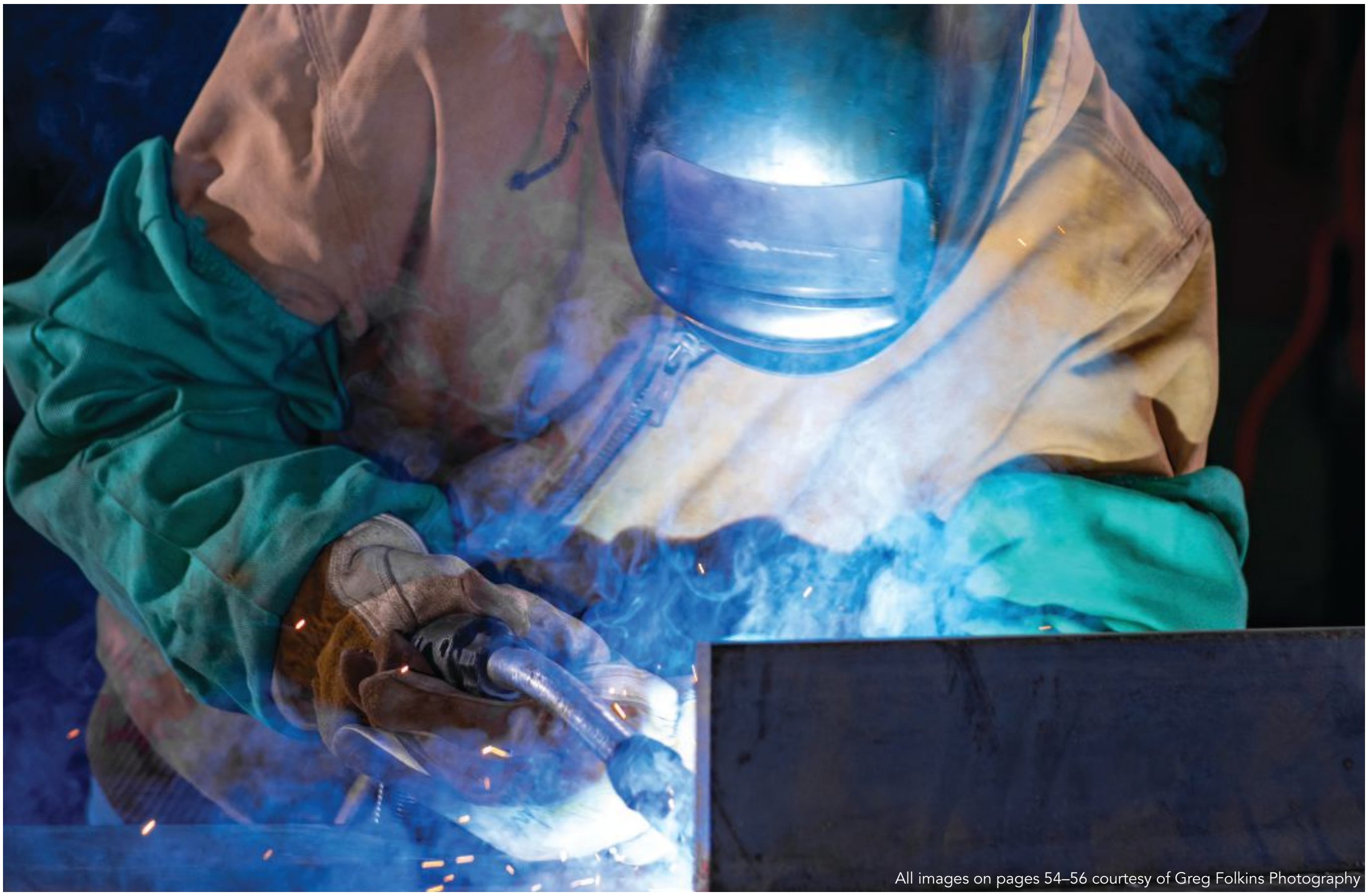
"I knew I needed a full-time job then, because I had a child, and I got really interested in the work," Lilly said. "I started helping the project managers out and going on the shop floor, working side-by-side with the crew to get a better understanding of what they do. I enjoyed what I was doing—it wasn't like I felt stuck. I wanted to work with my hands, be on the floor, and really see things come together."

Lilly made the move to SNJS two years ago to help the company earn AISC certification. She developed their quality control manual by herself and got her welding certification in the process.

Now a mother of two young girls, Lilly is passing down her knowledge and the curiosity she first felt for the steel industry as a teenager.

"One of my daughters is eight now, and she's actually in engineering courses in second grade," Lilly said. "She loves it, too."



All images on pages 54–56 courtesy of Greg Folkins Photography

**Quality control inspector Francisco Rodriguez is building a life to his standards.** Ten years ago, Francisco Rodriguez put on a suit and tie, knocked on the recruitment and development manager's door at AISC member fabricator Tampa Tank, and said, "I need a job." It was the day after his high school graduation.

When he walked to his welding station for the first time, the 18-year-old Rodriguez, with years of work experience under his belt already, was the sole provider for his family.

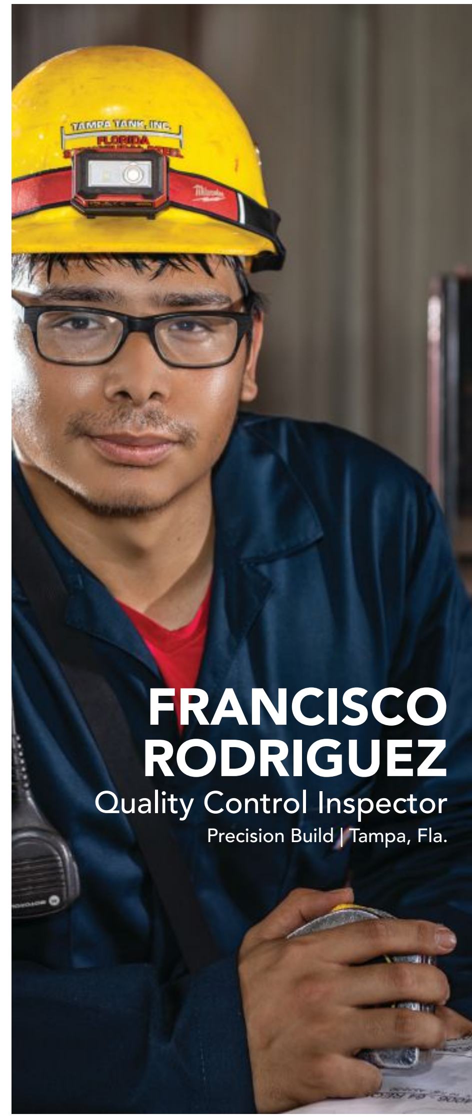
"Growing up a child of immigrants, I've been working my whole life," Rodriguez says. "I had prior experience working in construction with my father, so when I came here at 18, I already knew how to read most drawings. At the time, my dad was in prison and my mom was a stay-at-home mom. [I could] go to college or be a welder."

By the time he turned 19, Rodriguez had been promoted to foreman. He could run most machines, lead yard crews, and take the reins on pretty large projects, he recalls. Now, he's a quality control inspector at Precision Build (which acquired Tampa Tank) working toward Certified Associate Welding Inspector credentials from the American Welding Society. His job demands laser-sharp focus and a keen eye for detail, especially when it comes to safety.

"For me, the day-to-day work is not hard at all. That's just routine," Rodriquez says. "The hardest thing is coming in every day with the energy and attitude you had on the very first day. Otherwise, people will get hurt."

A first-generation American and new father to a one-year-old son, Rodriguez is invested in setting a positive example of discipline and success.

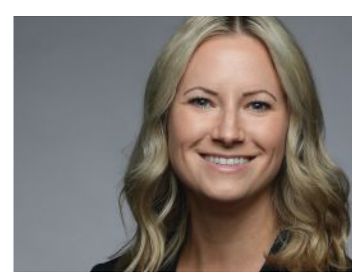
"I want to show my son, 'Work hard, even if you come from absolutely nothing,'" he says. "There have been times when I've wanted to quit and do something else, but I'm like, 'No, I've been doing this a long time and I'm good at it.' I just want him to be proud of me."




## See for Yourself

At the upcoming North Carolina stop, Visions in Steel visitors can expect a photography exhibition featuring local fabricators who help bring iconic projects to life across the region. Highlights include work from firms that serve the North Carolina area, as well as displays celebrating structural steel in projects throughout Raleigh, Durham, and beyond.

Visions in Steel will be on view at AIA North Carolina's Center for Architecture and Design in Raleigh from September 22 to October 24, 2025, with an opening reception on Thursday, September 25. To learn more about the exhibit, view upcoming events, or suggest the next stop, visit **aisc.org/visions**. ■



**Hope Hrabowy** (**hrabowy@aisc.org**) is AISC's industry initiatives specialist, and **Kate Duby** (**duby@aisc.org**) is AISC's communications content specialist.

This month's new products include three protective coating systems, two for steel members and one for structural fasteners.

## PPG Steelguard 951 Fire Protection

PPG Steelguard 951 epoxy intumescent fire protection is designed for advanced manufacturing facilities, including semiconductor plants, electric vehicle battery facilities, data centers, and other commercial infrastructure. It provides up to four hours of fire protection by expanding from a thin, lightweight film into a thick, insulating foam. The expansion maintains structural integrity, allows more time for evacuation, and minimizes damage to buildings and assets.

The coating delivers up to 3,500 microns of dry-film thickness in a single coat and cures rapidly to be ready for handling the next day. PPG's patented flexible epoxy technology ensures excellent durability and edge retention—reducing the risk of cracks during handling and transportatio—and provides corrosion resistance up to ISO 12944 C5 without a topcoat.

PPG Steelguard 951 coating is tested in accordance with all recognized national and international fire and corrosion standards. For more information, visit **ppgpmc.com/protective**.

## Sherwin-Williams Global Core Coatings

Sherwin-Williams Protective & Marine delivers superior coating-system consistency and specification efficiency with an expanded line of Global Core products that are available at the same quality and performance standards anywhere in the world. These universal products offer asset owners, engineers, specifiers, and applicators peace of mind in ensuring compatibility, color matching, and performance on projects spanning multiple regions while also enhancing shop throughput capacity.

The new Global Core coatings include an inorganic zinc primer (Zinc Clad 2500), epoxy primer (Macropoxy 4600), epoxy intermediate coat (Macropoxy 2600), and urethane topcoat (Acrolon 7700). These versatile coatings can be used in various combinations and with other products to create multi-layer coating systems for corrosion protection and aesthetics for a wide range of applications in commercial infrastructure, bridge and highway, energy, manufacturing and processing, and water and wastewater markets.

Each coating is third-party validated to meet ISO 12944:2018 and NORSOK M501 standards. For more information, visit **www.protective.sherwin.com**.

## DÖRKEN PFAS-Free Fastener Coatings

In response to the potential universal ban of PFAS and existing regional PFAS restrictions, DÖRKEN introduced PFAS-free coatings for structural fasteners under the brand names DÖRKEN BASE, DÖRKEN SEAL, and DÖRKEN TOP. These innovative coatings are an addition to the company's PFAS-free portfolio, which includes the products: DELTA-PROTEKT KL 100, DELTA-PROTEKT TC 502 GZ, DELTA-PROTEKT TC 500 GZ, and DELTA-LUBE 50.

The PFAS-Free coating systems from DÖRKEN are specified to ASTM F3393 and are approved for use on a multitude of applications, including those with the most stringent performance requirements for friction control, real world corrosion resistance, and functionality. In addition, the coating system's performance is achieved with a thin coating layer structure that is sustainable, resource efficient, and suitable for small, large, and complex components. For more information, visit **www.doerken.com**.

**GALVANIZING**

## Going for a Dip

Angela Pearl/HNTB

One extra step in the steel supply chain can make steel members forgotten—in the best way—once placed in the field.

Galvanizing, considered the premier corrosion protection system for steel, puts a thin coat of zinc on members to give them decades of durability. On average, hot-dip galvanized steel in atmospheric environments lasts 70 years before first maintenance, making it ideal for steel that must withstand harsh outdoor conditions and elements. Galvanizers dip fabricated steel into molten vats of zinc that are between 820°F and 850°F. The iron in the steel reacts with molten zinc to create a series of alloy layers that require 3,600 psi to remove. The galvanized layer's tight bond to the steel makes part of the steel itself and is not merely a surface coating.

Galvanized steel is cost-competitive with high-performance paint systems, and the lack of field maintenance means it's even more economical when considering life-cycle costs. In addition to galvanizing's durability benefits, the silver-gray color that comes from being dipped into zinc is a neutral palette that doesn't detract from its surroundings.

The first U.S. galvanizing plant opened in 1870, and today, there are 13 AISC member galvanizing facilities in the U.S. (find them all at **aisc.org/member-directory** and select the category "coating applier"). The galvanizing process was discovered in the 1700s, and even with technological advancements and standardized galvanizing requirements, it has largely stayed the same. The main steps are material check-in, staging, surface preparation, hot-dip galvanizing, inspection, touch-up, and storage.

When fabricated steel arrives at a galvanizing shop, it's inspected to make sure venting holes and drainage holes are in the correct spots and to identify contaminants that can't be removed in galvanizing. After that, it's staged for cleaning—a high-quality galvanized coating will only form on properly prepared surfaces.

Before steel is dipped in zinc, it goes through three pretreatment baths: degreasing, chemical cleaning, and fluxing. Degreasing removes contaminants like dirt, gas, and oil. Chemical cleaning uses a dilute solution of sulfuric or hydrochloric acid that removes mill scale or rust. Fluxing adds zinc ammonium chloride, creating a protective layer and further cleaning the steel. It also creates a protective layer to prevent further oxidation before the steel's immersion into molten zinc.

Some prepared pieces are small enough to need only one dip in the vat. For larger ones, galvanizers often dip one end, flip it around to dip the other, then coat the middle with an overlap. Galvanizers can also add bismuth or aluminum to the vat for improved processing or aesthetics, but the bath must be 98% pure zinc by weight. Depending on its size, steel can be drained, vibrated, or spun to remove excess zinc when pulled out of the vat.

Once the galvanized steel is cooled, it's inspected to meet the galvanizing requirements in ASTM A123, A153, or A767 to ensure it will provide long-term protection. The most important inspection step is assessing the coating thickness, with zinc adherence, appearance, and finish as other important inspection categories.

The repair step looks for small voids that can develop during the process or from mishandling. ASTM A780 says any defects may be fixed with zinc-rich paint, zinc-rich solder, or thermal-sprayed zinc. Finally, finished galvanized steel is stored outside on wood spacers, ensuring proper air flow all around the steel and preventing moisture buildup.

U.S. galvanizers' thoroughness and care have made hot-dip galvanized steel a trusted and unmatched corrosion protection solution. Designing bridges and highway structures with it in mind is easier with the AASHTO/NSBA Steel Bridge Collaboration *Hot-Dip Galvanizing Specification*, available at **aisc.org/galvanizingspec**. For a virtual reality 360° tour of a galvanizing shop from arrival to storage, visit **aisc.org/galvanizingtour**. For more information about galvanizing, visit the American Galvanizers Association (AGA) website at **www.galvanizeit.org**.

CODES

## AWS Releases Updated Bridge Welding Code

The American Welding Society (AWS), in collaboration with the American Association of State Highway and Transportation Officials (AASHTO), has released *American National Standard (ANS)* AASHTO/AWS D1.5M/D1.5:2025, *Bridge Welding Code*, its latest edition of welding fabrication requirements applicable to steel highway bridges and bridge components. It is intended to be used in conjunction with the applicable AASHTO design specifications.

AASHTO/AWS D1.5M/D1.5 is the premier reference used by professionals responsible for the strength, safety, and reliability of steel bridge structures across the U.S. Whether welding is performed in a fabrication facility or in the field, AASHTO/AWS D1.5M/D1.5 provides the procedures, testing requirements, and acceptance criteria necessary to meet rigorous performance expectations.

"The release of D1.5:2025 reinforces AWS's commitment to safe, effective bridge welding practices," said Jennifer Molin, AWS director of standards committee operations. "This edition reflects ongoing developments in bridge fabrication and repair, ensuring the code continues to meet the needs of today's bridge welding professionals."

Key updates in the AASHTO/AWS D1.5M/D1.5:2025 edition include:

- Addition of flare-bevel groove welds for design
- Provisions for unlisted base metals, fillet weld qualifications, post-weld heat treatment, SMAW restrictions
- Provisions for undercut tolerances
- Clarification of fracture critical welding personnel qualification
- Editorial changes to improve clarity, consistency, and ease of use

AASHTO/AWS D1.5M/D1.5 is designed to support engineers, inspectors, and welding personnel with a shared framework for critical decision-making on infrastructure projects. The 2025 edition updates the advanced ultrasonic inspection requirements to align with AWS D1.1/D1.1M:2025, *Structural Welding Code–Steel*.

AASHTO/AWS D1.5M/D1.5:2025 is available now through the AWS bookstore at **www.aws.org**.

AWARDS

## Prize Bridge Awards Seek Best U.S. Steel Bridges

There's still time to submit a project for the 2026 AISC Prize Bridge Awards, which will recognize country's most innovative new steel bridges. The 2026 Prize Bridge Awards will honor outstanding bridges of all sizes and scopes and give special recognition to one outstanding owner. Winning projects get a national spotlight in a variety of media, including *Modern Steel Construction*. There is no fee to enter, and any member of a project's team may submit it for consideration. Submissions can be made at **aisc.org/prizebridge** are due by September 30.

A panel of industry professionals considers innovation, economics, aesthetics, design, and engineering solutions. The competition has six categories:

- Short span: No single span greater than 140 ft.
- Medium span: Longest span equal to or greater than 140 ft but less than 300 ft.
- Major span: One or more spans greater than or equal to 300 ft.
- Movable span
- Rehabilitation: Projects that work on an existing structure without replacing primary members. New structures built on an existing alignment should be entered by span length.
- Special purpose: Bridge that does not fit any of the above categories. Examples include bridges for pedestrians, pipelines, and airplanes.

Each bridge may compete in only one category. All entries in all competition categories will be considered for Bridge of the Year and Owner of the Year.

Projects must be built of structural steel produced and fabricated in the U.S.; must be located in the 50 U.S. states, District of Columbia, or a U.S. territory; and must have been completed and open to traffic between September 1, 2023 and August 31, 2025.

## People & Companies

**Walter P Moore** has added an office in Seattle to serve the Pacific Northwest's growing and vibrant building and infrastructure market.

"Our presence in Seattle strengthens our ability to deliver specialized services in a market known for its progressive design and development," said Dilip Choudhuri, Walter P Moore President and CEO. "With key leadership already established in Seattle, this expansion allows us to better support both our national clients and regional partners on the West Coast."

The Seattle office will be led by Vlad Ivanov, managing director of diagnostics, who brings extensive expertise in condition appraisals, façade evaluations, forensic investigations, and the assessment of corrosion-related deterioration. Additionally, the Walter P Moore Structures Group has team members Pete Range and Scott Kinney in the region, supporting the firm's future growth plans for structural engineering services in Seattle.

The **Short Span Steel Bridge Alliance (SSSBA)** has named SSAB steel applications engineer **Myrissa Welch** its next chair. She succeeds David Stoddard, also of SSAB, who has served as chair since 2016. Welch brings a strong technical background and industry experience to the role. She earned her bachelor's in Materials Science and Engineering from Virginia Tech and completed her MBA in Organizational Leadership at the University of Iowa. Her expertise as a metallurgist and her practical experience working with steel applications make her well-suited to lead the SSSBA's efforts to promote cost-effective, resilient and accelerated solutions for short-span bridge projects.

WEBINARS

## AISC Launches Quarterly Workforce Development Webinar Series

AISC has launched a new webinar series called Building Stronger Futures, which features quarterly interviews on fabricator workforce development. September is National Workforce Development Month, and to mark the occasion, the first webinar will be hosted live on September 10, spotlighting the growing partnership between AISC member fabricator Universal Steel and Decide DeKalb, a local development authority based in Decatur, Ga., near Atlanta. Their partnership has opened real pathways into the skilled trades for local talent in DeKalb County, Ga., and is a testament to the power of collaboration and intentional workforce development efforts.

The webinar will explore how aligning education, economic development, and industry can expand post-high school options, create job access, and tackle the skilled labor shortage head-on. Listeners hear stories of persistence, progress, and potential, and learn how this model program works. As an employer, you'll come away with a deeper understanding of how intentional partnerships can shape stronger communities and careers. Find your community's workforce liaisons at **aisc.org/workforceallies** and start exploring how you can leverage your efforts by partnering with the workforce development efforts near you.

Webinar speakers will include Universal Steel CEO Bray Bourne, Katrina Young and Rudi Pangad of Decide DeKalb, and AISC director of workforce development Jennie Traut-Todaro. Register for the webinar at **aisc.org/workforcehub**.

AISC

## AISC Launches Chatbot with Decades of Technical Experience

Structural steel designers with technical questions can now go straight to the authoritative information they need at lightning speed thanks to Clark, a new AI chatbot from AISC.

"AISC literally wrote the book on structural steel—and has for more than a century," said AISC director of technology integration Luke Faulkner. "AISC has hundreds of thousands of pages of go-to, trusted publications like the *Steel Construction Manual*. Clark is designed to cut straight through that vast library to find the answer to a designer's specific technical question."

Clark is a free resource that's been trained on the *Steel Construction Manual*, *Seismic Design Manual*, all AISC standards, and all AISC design guides. It'll always cite the source for specific information, and it's a closed system that can't pick up bad habits from users. Curious? Try Clark today at **aisc.org/clark**.

STANDARDS

## AISC 358-27 Prequalified Moment Connection Standard Available for Public Review

The AISC standard *Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications* (AISC 358-27) is available for public review from September 15 until October 31, 2025.

The standard is available for download on the AISC website at **aisc.org/publicreview** along with the review form. Copies are also available (for a $35 nominal charge) by contacting Martin Downs at **downs@aisc.org**. Please submit comments using the forms provided online by October 31, 2025, for consideration.

AISC certification sets the quality standard for the structural steel industry and is the most recognized national quality certification program. It aims to confirm to owners, the design community, the construction industry, and public officials that certified participants, who adhere to program criteria, have the personnel, organization, experience, documented procedures, knowledge, equipment, and commitment to quality to perform fabrication, manufacturing, and/or erection. Find a certified company at **aisc.org/certification**.

The following U.S.-based companies were newly certified or renewed certification in at least one category from June 1 to 30, 2025.

### Newly Certified Companies
(June 2025)

Mi-De-Con, Inc., Ironton, Ohio
Westco Iron Works, Newman, Ga.

### Certification Renewals
(June 2025)

3 Sons Steel, Inc., Tarboro, N.C.
Adena Corporation, Mansfield, Ohio
Advanced Welding & Steel, Inc., Grangeville, Idaho
Agate Steel, Inc., Scottsdale, Ariz.
Alliance Industrial Group, Inc., Ridgefield, Wash.
Alliance Riggers & Constructors, Ltd., El Paso, Texas
Alpha Iron, LLC, Ridgefield, Wash.
American Erection, LLC, Pittsburgh, Pa.
American Iron and Crane Inc., Schenectady, N.Y.
American Welding Company, Inc., West Greenwich, R.I.
Amfab Steel Specialties, Inc., North Salt Lake, Utah
Ben Hur Steel Worx, LLC, St. Louis
Ben's Structural Fabrication, Waite Park, Minn.
Bottoms Engineering and Service, Inc., Frankfort, Ky.
Broeren Russo Construction, Inc., Champaign, Ill.
C&K Johnson Industries, Inc., Arcata, Calif.
Carolina Fabricators, Inc., West Columbia, S.C.

Cayce Steel Co., Cayce, S.C.
Cimolai, Olean, N.Y.
Cobb Industrial Inc., Holly Springs, Ga.
Construct, Inc., Wilson, N.C.
Construction Supply & Erection, Inc., Germantown, Wisc.
Contour Steel, Inc., Eden, N.Y.
Contract Erectors, Inc., Randleman, N.C.
Crossland Construction Company, Inc., Columbus, Kan.
Cundiff Steel Fabricators & Erectors, Louisville, Ky.
Custom Iron Works, Inc., Coventry, R.I.
D&E Steel Services, Inc., Northglenn, Colo.
D&E Steel Services, Inc., Pueblo, Colo.
D.S. Duggins Welding, Inc., Winston-Salem, N.C.
DAKA Corporation, Pine City, Minn.
Daniel Koury Construction, Inc., Warwick, R.I.
Dant Clayton Corporation, Louisville, Ky.
E&D Specialty Stands, Inc., North Collins, N.Y.
Edwards, Inc., Spring Hope, N.C.
Fabco Metal Products LLC, Daytona Beach, Fla.
Farwest Fabrication, Puyallup, Wash.
Fields Welding Inc., Walton, Ky.
Flawless Steel Welding LLC, Denver
Foust Fab & Erectors, Colville, Wash.
Gayle Manufacturing Company, Caldwell, Idaho
Gayle Manufacturing Company, Nampa, Idaho
Gilchrist Metal Fabricating Co., Inc., Hudson, N.H.
GMF Steel Group, Lakeland, Fla.
Greybeard Steel, LLC, Post Falls, Idaho
GSI Group, LLC, Paris. Ill.
Haberle Steel Inc., Delano, Pa.
Haberle Steel Inc., Souderton, Pa.
High Steel Structures, LLC, Lancaster, Pa.
Hill Country Steel, LP, Converse, Texas
ICM Georgia, Inc., Austell, Ga.
Ideal Steel and Builders Supply, Detroit
Industrial Field Maintenance, LLC, Ewing, Ky.
Iowa Engineered Processes Corp., Independence, Iowa
J.P. Donovan Construction, Inc., Rockledge, Fla.
K&T Steel Corporation, Twin Falls, Idaho
King Fabrication, Houston
Lancaster Burns Construction, Inc., Roseville, Calif.
Linita Design & Mfg. Corp., Lackawanna, N.Y.
Liphart Steel Co. Inc., Richmond, Va.
Madden Bolt Corporation, Houston
MAK Steel Services, LLC, Seymour, Ind.
Manowske Welding Corp., Fond Du Lac, Wisc.
McAlister Welding & Fabricating Inc., Glassboro, N.J.
McClean Iron Works, Everett, Wash.
McDaniel Steel Erection, Walton, Ky.
Metal Technologies of Murfreesboro, LLC, Murfreesboro, N.C.
Metal Works, Oroville, Calif.
Meyer Utility Structures, LLC, Lancaster, S.C.
Midwest Metal Works, Inc., New Albany, Ind.
Midwest Steel Inc., Detroit
Modern Welding Company of Kentucky, Inc., Elizabethtown, Ky.
Montana Fabrication Works, Stevensville, Mont.
Montana Steel Industries, Inc., Belgrade, Mont.
Moore Erection L.P., Garden Ridge, Texas
Myers Steel Works, Inc., Dillsburg, Pa.
New Age Ironworks LLC, Clinton, S.C.
NMI Industrial Holdings, LLC, Sacramento, Calif.
North Central Fabrication, Mansfield, Ohio
Northwest Steel Fab, Inc., Deer Park, Wash.
NYSFAB, Inc., Jamaica, N.Y.
Oden Enterprises, Inc., Wahoo, Neb.
Owen Steel Company, Inc., Columbia, S.C.
Owen Steel Company, Wilmington, Del.
Padgett Incorporated, New Albany, Ind.
Paxton & Vierling Steel Company, Carter Lake, Iowa
Peterson Beckner Industries, Inc., Houston
Piedmont Steel Company, LLC, Winston-Salem, N.C.
Precision Iron Works, Inc., Pacific, Wash.
QSR Steel Corporation, Hartford, Conn.
Quinlan Enterprises, Claxton, Ga.
Rackley Company, Inc., Orland, Calif.
Ranger Steel, Inc, Maysville, Ky.
RBC Lubron Bearing Systems, Inc., Santa Fe Springs, Calif.
RC Fabricators, Inc., Wilmington, Del.
Ritner Steel, Inc., Carlisle, Pa.
RND Contractors, Inc., Fontana, Calif.
RW FAB, Spokane, Wash.
Sabre Industries, Sioux City, Iowa
Schenectady Steel Company, Inc., Schenectady, N.Y.
Scriba Welding, Inc., Baltimore
Seibel Modern Mfg. & Welding Corp., Lancaster, N.Y.
Sentry Steel Inc, Louisville, Ky.
Shepard Steel Co., Inc, Hartford, Conn.
Smith Ironworks, Inc., Lyerly, Ga.
Smith Welding and Fabrication Inc., Burlington, Ky.
Southern Tech Fab, La Blanca, Texas
Spokane Metals LLC, Spokane Valley, Wash.
State Service Co., Inc., Ingleside, Texas
Steel Construction Specialists, Inc., Mableton, Ga.
Steel Specialty, Inc., Belmont, N.C.
Steel Supply Center, LLC, South Haven, Mich.
SteelFab, Inc., Charlotte
Stewart-Amos Steel, Inc., Harrisburg, Pa.
Stone Bridge Iron & Steel, Inc., Gansevoort, N.Y.
Strong Structural Steel, LTD, Pharr, Texas
Structures USA, LLC, Elizabethtown, Ky.
Summit Steel, Inc., New Castle, Del.
Susan R. Bauer, Inc., Ringwood, N.J.
TEiC Construction Services, Inc., Duncan, S.C.
Tri-County Welding and Fabrication, LLC, Arthur, Ill.
Trinity Steel Services, LLC, Seymour, Ind.
Trinity Steel, Inc., Rankin, Pa.
Tuttle Construction, Inc., Lima, Ohio
Valmont Industries, Inc., Columbus, Neb.
Valmont Industries, Inc., Valley, Neb.
Veritas Steel, LLC, Palatka, Fla.
Washington Iron Works, Inc., Oak Harbor, Wash.
Watson Bowman Acme Corp., Amherst, N.Y.
Western States Steel & Fabrication, Inc., Spokane, Wash.
Wilshar Steel, Lowell, Ark.
Zinsmeyer Structural Steel, Castroville, Texas

EDUCATION
## Future-Focused Fundraising

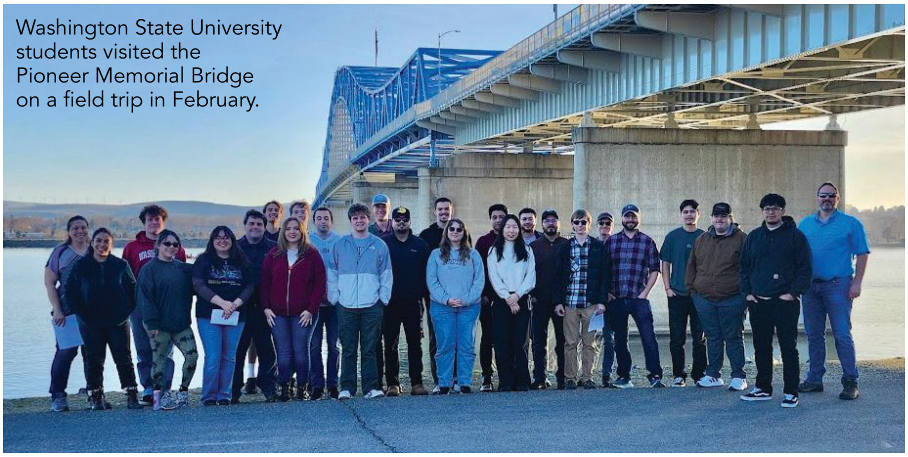
Beginning in 2020, AISC poured more time and resources into the AISC Education Foundation, including an expanded board of directors, new board leadership, added task groups, and a new mission statement. The heightened focus on the foundation aimed to do more for the structural steel industry, starting with a new fundraising initiative that raised about $83,000 in six weeks for emergency scholarships during the COVID-19 pandemic.

The fundraising initiative's success has continued in the five years since. The Education Foundation has expanded AISC's annual scholarship programs and created several new and engaging programs providing grants and awards to faculty, students, and young professionals. Two of those programs, Faculty-led Field Trip Grants and Campus Connection Grants, are especially worth highlighting after seeing their impact.

The Faculty-led Field Trip Grants program originated from events connected to SteelDay, initially funding college student visits to fabrication shops and ironworker training facilities. The program, formalized in 2023 and now offered nationwide, provides up to $1,500 to college-level faculty for structural steel-related class field trips at any time of year.

In 2024, the Education Foundation awarded nearly $20,000 in grants to 15 university faculty, covering critical transportation and other trip-related expenses. The funding enabled nearly 500 students across the country to engage in pivotal learning experiences, such as tours of steel fabrication shops, production facilities, jobsites, ironworker training facilities, and steel buildings and bridges. The foundation is on track to award $30,000 in Faculty-led Field Trip grants in 2025.

One field trip in February 2025 gave Washington State University (WSU) structural steel design students and the WSU ASCE student chapter a memorable and valuable experience. They joined WSU Tri-Cities students for a seminar led by a WSDOT bridge engineer. After the seminar, another WSDOT engineer took the students to the Pioneer Memorial Bridge, a four-lane arch truss bridge across the Columbia River also known as the Blue Bridge. The field trip grant went to WSU engineering professor Hyeyoung Koh, PE, PhD, who is planning to take her students on a tour of AISC member fabricator Metals Fabrication Company this fall.


Washington State University students visited the Pioneer Memorial Bridge on a field trip in February.

LeTourneau University professor Hanwan Jiang, PhD, led another insightful trip that took students to Nucor Building Systems' plant in November 2024. LeTourneau's civil engineering materials class and 2024–25 Student Steel Bridge Competition (SSBC) team participated in a lunchtime seminar with Nucor's engineering design team, where they learned about Nucor's custom design approach and 3D BIM technology. Nucor engineers and staff watched a design presentation from the SSBC team and offered valuable insights to support the team's efforts.

Following the seminar, a Nucor quality control leader led a comprehensive tour of the facility, showcasing the entire steel manufacturing process, including the production of plate parts for columns and rafters. The tour provided students with an in-depth look at welding and manufacturing processes for pre-engineered girders, as well as design insights from a manufacturing perspective and Nucor's family-friendly company culture.

While field trips offer impactful learning, sometimes the industry needs to come to the students. That's where Campus Connection Grants play a crucial role.

Launched in 2024, the Campus Connection Grants program funds college-level faculty and AISC Student Club leadership up to $1,200 to host inspiring, high-quality speaking engagements on campuses nationwide. AISC staff members can also assist in connecting hosts with in-demand and notable speakers.

At Oklahoma State University (OSU) earlier this year, Michel Bruneau, PhD, presented to an enthusiastic student audience from bthe architectural engineering and civil engineering departments. Professor Christina McCoy, SE, organized a meet and greet for students and faculty before the talk and gave Bruneau a tour of OSU's facilities and program. Students enjoyed a group dinner and the opportunity to mingle and discuss at the end of the event.

"This was a great way to bring outside ideas and perspectives about steel design to our students," McCoy said. "Dr. Bruneau's research highlights the broader impact of structural engineering knowledge and capabilities."

All of these experiences would not be possible without the donors who support the AISC Education Foundation. You'll continue to see the lasting effects our donors are making in the lives of those who drive the future of design, fabrication, and construction of structural steel in our impact updates, found at **aisc.org/yourimpact**. For more information on AISC's University Programs, visit **aisc.org/universityprograms**.

If you have given to the AISC Education Foundation in the past, thank you for your generosity! If you'd like to support programs like these and the foundation's other impactful work, or simply learn more, visit **aisc.org/giving**.

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# Staying on Brand

**WHILE IT SEEMS OBVIOUS** that a new Iron Workers Local training center would be built with steel, the actual reason was more practical. The project's architect, Gensler, and the structural engineer, Nayyar & Nayyar International, chose steel because it was the best choice to meet the project's design requirements. The 12,000-sq.-ft. facility opened in June 2024 as the new training center home for Iron Workers Local #63 in Broadview, Ill., about 12 miles west of Chicago. The building is nicknamed "Glass Box" and showcases steel to anyone who steps inside or looks through the glass exterior. Its concave shape is an architectural nod to the shape of a perfect weld bead.

The training center is primarily used for apprentice curtain wall training, including installation, pressurized testing, rigging, climbing, and crane signaling. To achieve its purpose, the facility needed to accommodate an overhead crane. The building had to be no higher than 50 ft, maximize the overhead crane span, minimize lateral displacement because of the overhead crane and glass curtain wall, and minimize roof deflection for crane operation. The facility was envisioned as a showpiece for the ironworkers' craft. It helps attract new apprentices and acts as a regional training center for the International Iron Workers Union, welcoming trainees from the U.S. and Canada.

Steel offered solutions on all fronts. Steel braced frames provided minimal lateral displacement for the glass curtain wall system, and W36 beams controlled the deflection of the overhead bridge crane, which had 1-in. hoist clearance.

The result is a single-story 50-ft-tall building with a 52-ft-clear-span, 5-ton overhead bridge crane. It incorporates 213 tons of structural steel, with AISC full-member Nick's Metal Fabricating & Sons, Inc., as the fabricator and Chicago Metal Rolled Products as the bender-roller. It has W36×194 roof beams, W21×44 roof beams along its curved sides, W16×67 outriggers and crane rails, W14×176 columns on the perimeter, and W12×65 columns on the interior. The training center floor has a 5-ft by 5-ft grid of column footings, which accommodates temporary 35-ft-tall columns used for training.


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