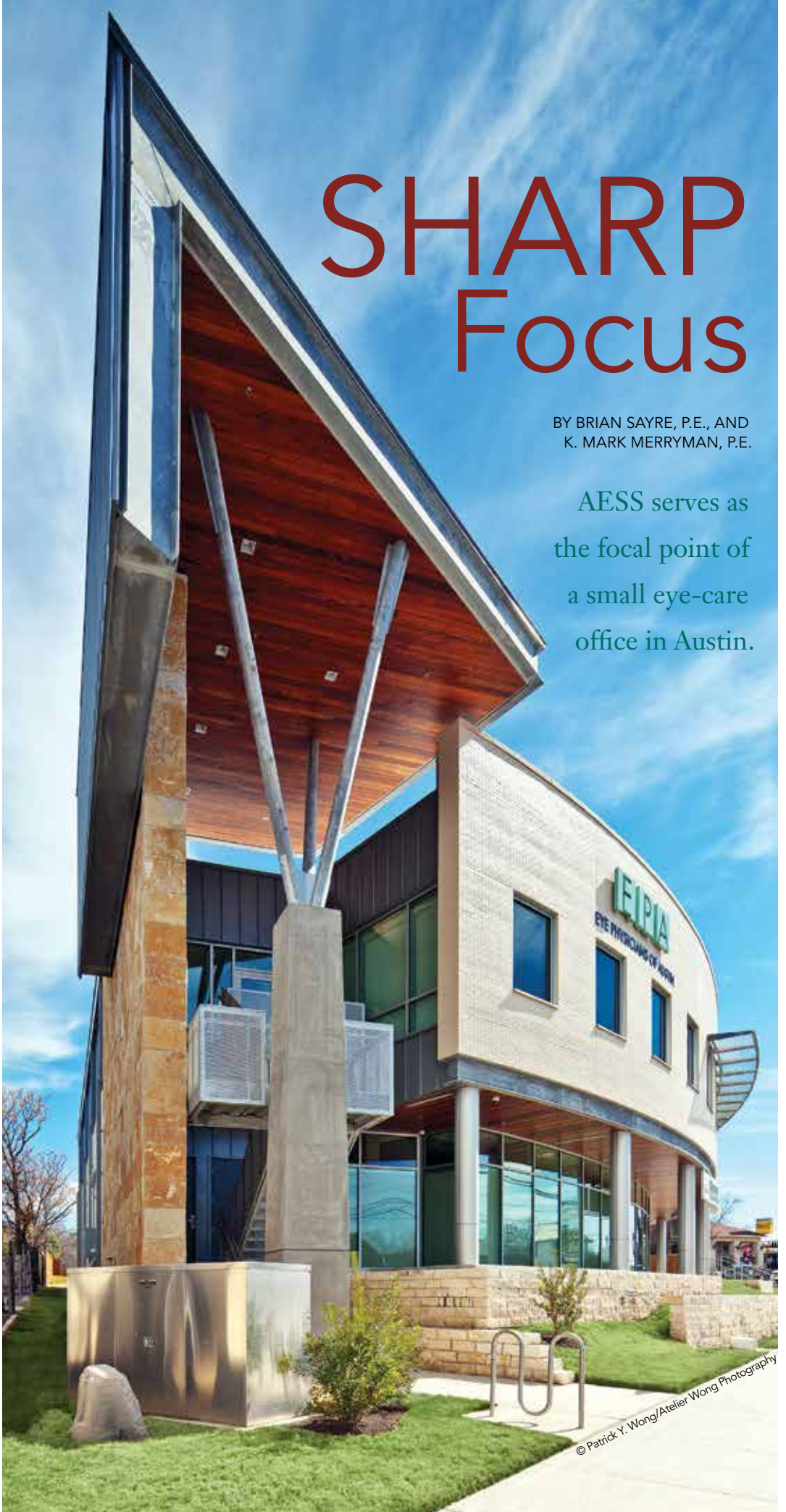
SHARP Focus

BY BRIAN SAYRE, P.E., AND
K. MARK MERRYMAN, P.E.

AESS serves as the focal point of a small eye-care office in Austin.



© Patrick Y. Wong/Atelier Wong Photography

YOU COULD SAY THAT Eye Physicians of Austin had a clear vision for its future.

The group had built a solid practice at its location in Austin's eclectic Lower Burnet neighborhood for more than three decades but had outgrown its aging facility and longed for a modern building that could accommodate future growth; it also wanted to include mixed-use elements, such as retail space and a restaurant, to engage more with the neighborhood. And it wanted to do all of this from the same location.

Thus, the group's original building has been replaced with a new two-story, 21,500-sq.-ft wedge-shaped structure. Located closer to the street, the new steel-framed building includes leasable retail space on the first floor, with a main lobby at one end; Eye Physicians occupies the second floor and will share the lobby when growth demands it. While this gave the retail storefronts more prominence, the entry to Eye Physicians needed to be the most prominent feature, and the architect used distinctive folded roof canopies to demarcate the two main entries, the street-facing pedestrian entrance and the lobby entrance from the vehicular drive at the building's rear.

Creative Canopies

The building has a flat roof that folds down vertically at the lobby entrance at the southeast corner of the building and serves as a large canopy for the vehicular porte-cochère. This element is supported in part by a tapered concrete column with a "tree" of round galvanized HSS branches reaching up to the canopy. The vertical fold of the canopy tapers from the building face to the terminus, from a height of 14 ft to 5 ft, and the canopy extends 37 ft from the building to the center of an exterior tapered concrete column and cantilevers 12 ft beyond. The canopy is ringed on two sides with a galvanized steel sunscreen that extends 5 ft from the canopy perimeter, and the underside is clad in tigerwood.

A second folded roof element canopy that "floats" above the main roof is located at the northwest corner of the building over the pedestrian entrance. The main support of the element is a central tapered concrete column and round galvanized HSS members similar to those supporting the porte-cochère. This canopy is also supported and tied into the main roof at three points with galvanized HSS posts that are just hidden from view, creating an illusion of the entire canopy being independent of the main structure. The vertical fold at this canopy straddles the property line as well as a stone-clad wall that conceals connection points at the roof and second floor.

Structural engineer Cardno Haynes Whaley (CHW) relied heavily on 3D structural modeling to address the wind design of the folded roof canopy elements and their connections to the main structure. The building was modeled in RISA 3D, and the folded roof canopies

© Patrick Y. Wong/Atelier Wong Photography

▲ The unadorned front façade features galvanized AESS sunshades over the ground-floor retail areas and the second-floor windows.

▼ Perimeter structural steel framing and prefabricated AESS sunscreens are erected into place.


Jeff Langham

▼ At dusk, the exterior materials and their relationship to the different programmatic elements of the building become even more apparent.


© Patrick Y. Wong/Atelier Wong Photography

◀ The street-facing pedestrian entry appears to float over the building thanks to hidden galvanized HSS posts. The stone-clad wall houses the posts but also screens the entry from the adjacent property.

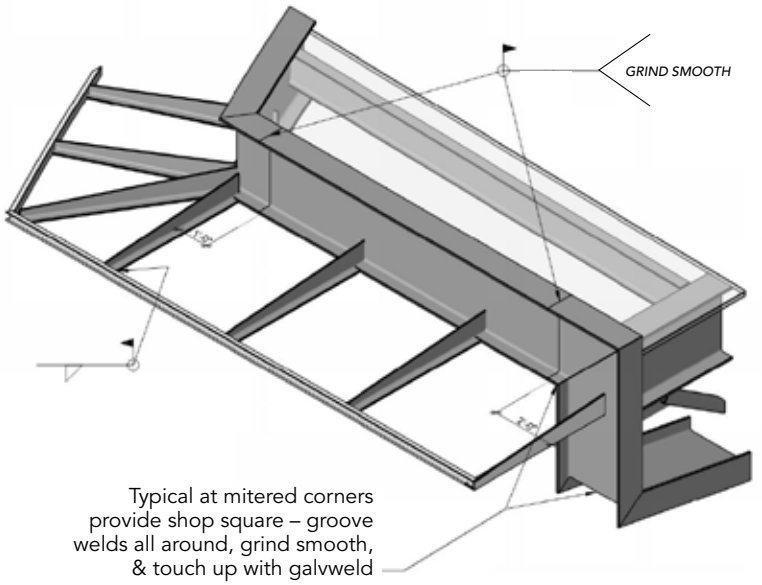
Brian Sayre is the project manager for the Eye Physicians of Austin building. **K. Mark Merryman** (**mark.merryman@cardno.com**) is senior vice president of Cardno Haynes Whaley and principal in charge of the project.

Jeff Langham

▲ The prefabricated AESS sunscreen canopies on the main building and the porte-cochère required only bolt splicing in the field, which sped up construction.

▼ The porte-cochère is the defining element to welcome visitors into the main lobby of the building and showcases the interplay of finish materials, featuring galvanized AESS detailing.


© Patrick Y. Wong/Atelier Wong Photography



Typical at mitered corners provide shop square – groove welds all around, grind smooth, & touch up with galvweld

were modeled separately in RISA 3D. In both models, all ASCE 7 wind cases were modeled along with concurrent wind uplift as well as dead and live loads. The structural model of the canopies also investigated the combined effects of localized components and cladding wind loading on the vertical and horizontal components of the canopies. The results of the separate models were enveloped for the final approach used in the structural drawings. The porte-cochère was part of the main roof diaphragm and resulted in using L5×5×5/16 horizontal bracing welded to the bottom flanges of the roof beams to stiffen the diaphragm sufficiently to meet code diaphragm deflection limits.

Expressive Exterior

The architect used the exterior finish materials to further define the retail spaces and eye physicians' office. The palette is brick, glass, Texas limestone, tigerwood accents and extensive galvanized architecturally exposed structural steel (AESS), the latter of which is featured prominently on the radial perimeter of the building and at the two canopies.

The building is partially ringed at the second floor, roof and porte-cochère with intricately detailed cantilevered sunscreens comprised of tapered WT sections, rolled channels and angles and steel grating. The sunscreens are as small as possible to meet architectural intent and use tapered WT beams that vary between 4 in. and 8 in. in height, creating a thin, elegant profile around the building.

The second floor and each sunscreen are also accentuated with a continuous galvanized rolled MC18, which was carefully spliced with hidden connections that allow some temperature movement. At the sunscreens, the MC18 is mitered and turned down at the vertical fold of the canopy and across the bottom of the elements. This, along with folding the tigerwood soffit material down the inside vertical face of the canopies, creates the illusion that the roof was neatly folded down at some point during construction.

CHW coordinated closely with the architect to ensure all connection details met both structural and architectural requirements for safety, waterproofing the building envelope and aesthetics. All exterior structural connections are exposed, making coordination critical. All of the AESS sunscreens were custom fabricated and welded in the shop in large sections and then bolt-spliced in the field. The sunscreen connections are tucked behind the architectural finish materials to hide all indication of support.

The AESS rolled channels occur at all sunscreens around the front façade and are part of the building envelope. They separate the glass façade at the ground level and windows at the second level from the brick façade above, and CHW worked with the architect to develop connections with a clean, seamless aesthetic as well as support the exterior masonry veneer and minimize the potential points of water intrusion. Continuous field welding was used in conjunction with architectural components to create a watertight exterior building envelope.

◀ An isometric view of a portion of the canopy edge.


© Patrick Y. Wong/Atelier Wong Photography

Clear Coordination

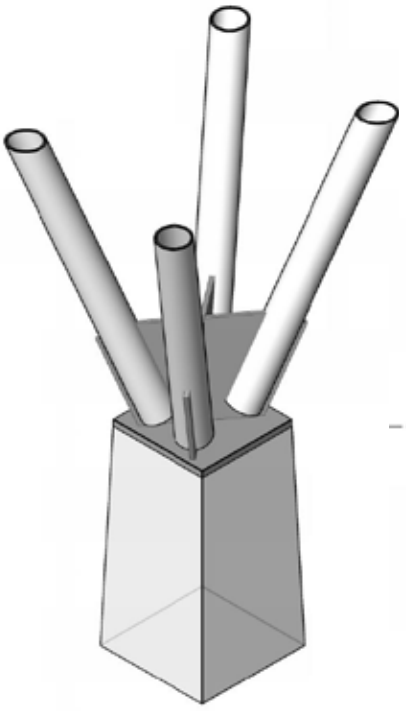
Given the extensive amount of coordination required for all the AESS elements, clear and precise design documentation was imperative to achieve the architect's design intent. Building documentation was done in Revit, and all exposed structural steel was modeled to aid the design team through various detailing challenges and coordination opportunities. In addition to coordination on major structural elements during design, modeling also proved critical to construction efficiency and constructability. CHW modeled details of connections for most of the AESS and included several in axonometric and detail format in the construction drawings. This documentation resulted in an extremely low number of structural RFIs during construction (only 16).

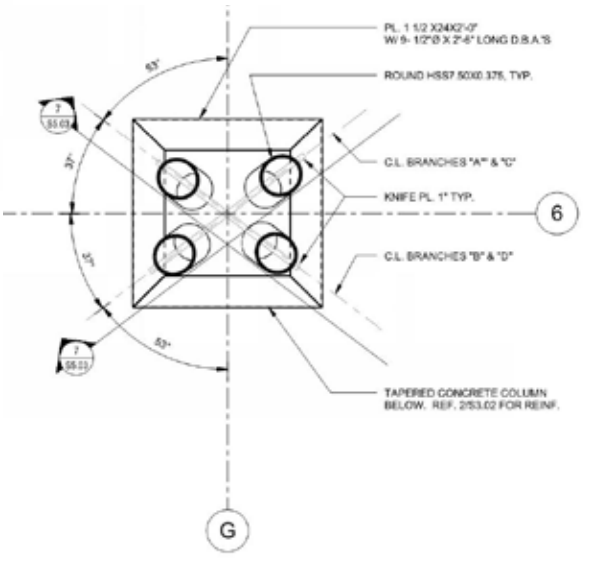
The team also achieved time and cost savings by working closely with the steel fabricator, Hill Country Steel, holding multiple meetings prior to construction to discuss

▲ Located closer to the street than the original building, the new structure includes leasable retail space on the first floor, with a main lobby at one end; Eye Physicians occupies the second floor and will share the lobby when growth demands it.

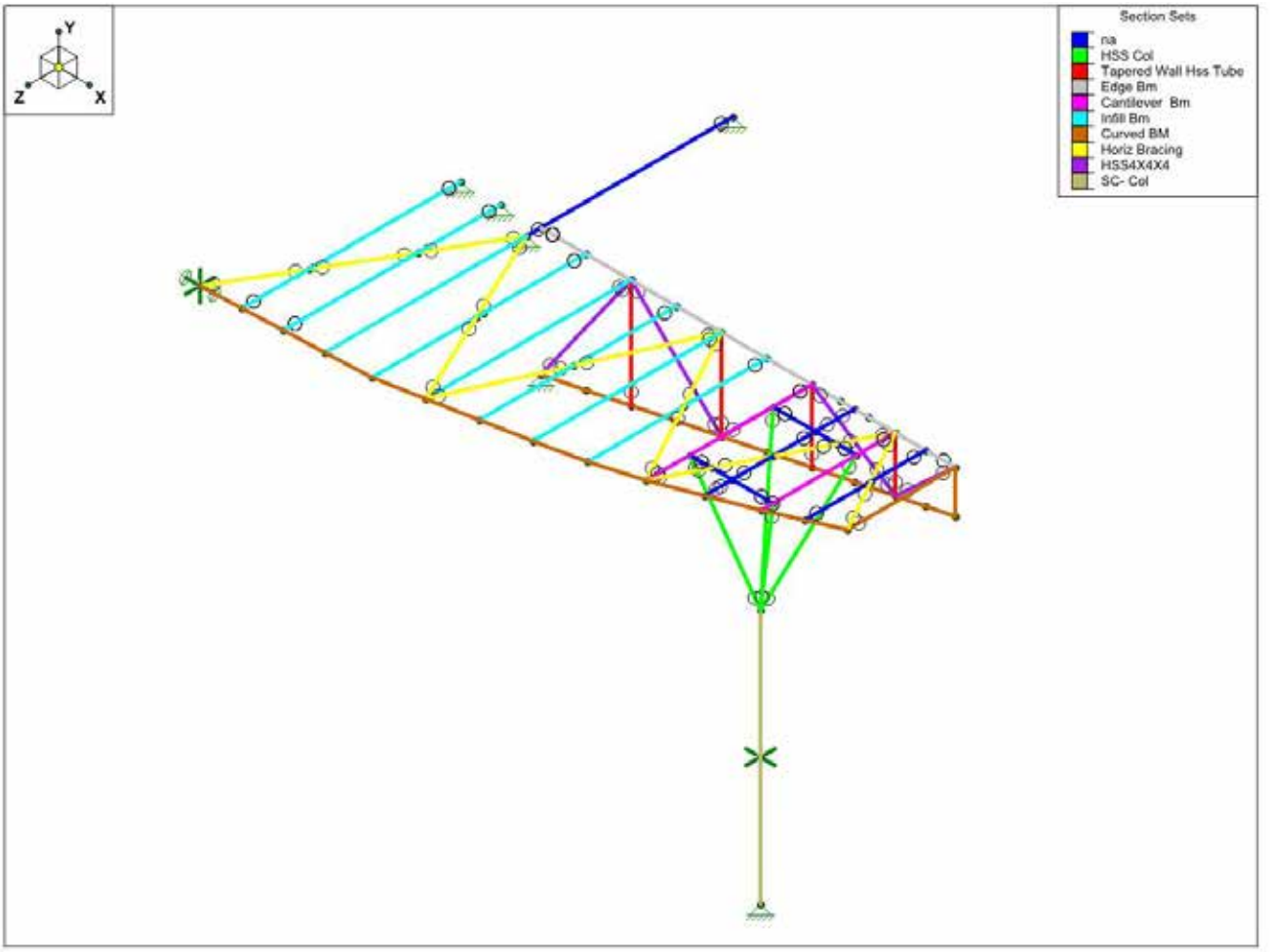
➤ The waiting area and optical store receive ample natural light from clerestory windows.


© Patrick Y. Wong/Atelier Wong Photography





◀ A detail of the tree structure for the south canopy.



constructability and optimize the detailing to aid fabrication and erection efficiency, achieve compliance with AESS tolerances and obtain the look envisioned by the architect.

AESS was the defining material to enable the architect's vision for the Eye Physicians of Austin office. The benefits of its weatherproofing characteristics, ability to be custom fabricated in the shop under tight quality control standards and visual appeal came to the forefront of the project under the scrutiny and close coordination of the structural engineering team, illustrating an optimal partnership between architect and engineer. Despite the project's relatively small square footage, the prominence of AESS required a high level of creative design, detailing and coordination that far exceeded the demands of a typical building of its type and size. ■

▲ A RISA-3D view of the canopy and tree structure.

Owner
Eye Physicians of Austin

General Contractor
Raymond Construction, Inc.

Architect
Sixthriver Architects

Structural Engineer
Cardno Haynes Whaley

Steel Fabricator, Erector and Detailer
Hill Country Steel