



INTRODUCTION: CURTAIN WALL & WINDOW WALL

by Joseph DeAngelis, AIA, LEED AP, and Amanda Gibney Weko



DEVIL'S DETAIL

INTRODUCTION

Curtain wall, storefront glass, and windows are everyday parts of building design and construction. Like all parts of a building exterior, glazing elements have to meet the fundamental functional requirements of providing thermal, water, and air/vapor control, while also being aesthetically pleasing. They must also be transparent, non-bulky, and in many cases, operable.

Arguably, glazing elements are the most complicated components of the building envelope and successfully integrating glazing – for functionality and aesthetics – remains a perpetual challenge. Here is where the “devil is in the details” for architects, contractors, and glaziers. In the Devil’s Details series, AGI will illustrate common glazing challenges and communicate best practices to keep design and construction aligned for efficiency and elegance.

Although most contemporary exterior wall systems that are suspended from the building are technically considered curtain walls, the design community has accepted this term to mean any multi-story glazed system. This discussion will concentrate on two particular product types: curtain wall and window wall.



Left: window wall; below: curtain wall

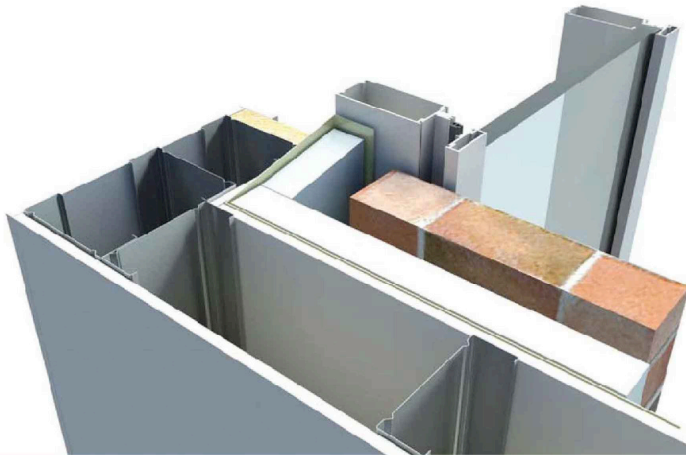


About the Devil's Details

The AGI educational series illustrates and describes common glazing challenges as a means to communicate best practices for the design and construction industry. To share a devilish detail, contact info@theagi.org.

PERIMETER SYSTEMS

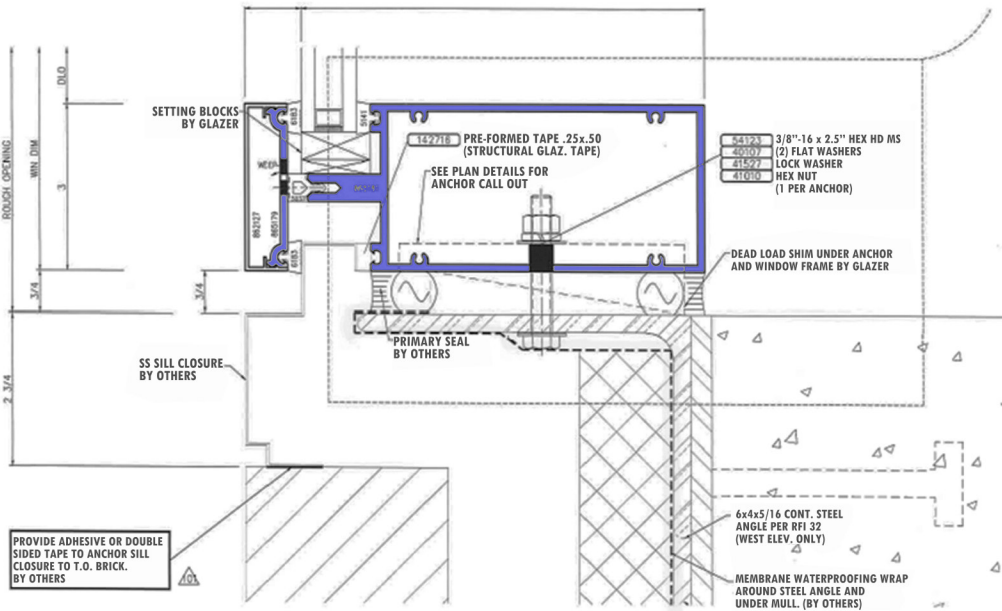
The perimeter conditions can be problem areas for glazing systems. Flashing the sill of the glazing system can be achieved several ways. These can include extending a membrane or metal sill flashing under the system (similar to pan flashings) or sealing and inserting a flashing member into the glazing pocket. It is important to consider sill anchorage when designing sill flashing. T-shaped or F-shaped anchors typically bear directly at the sill and are bolted into the substrate below, penetrating the flashing. All anchor penetrations through the flashing must be sealed. These seals must be particularly reliable because substrates at flashing may not be adequately sloped toward the exterior. Sealants and adhesives have been introduced to improve durability of these seals. Traditional through-wall flashing has been used successfully on all types of glazed systems, although other flashing methods can take advantage of the mullion geometry and zoned drainage common to many glazing systems.



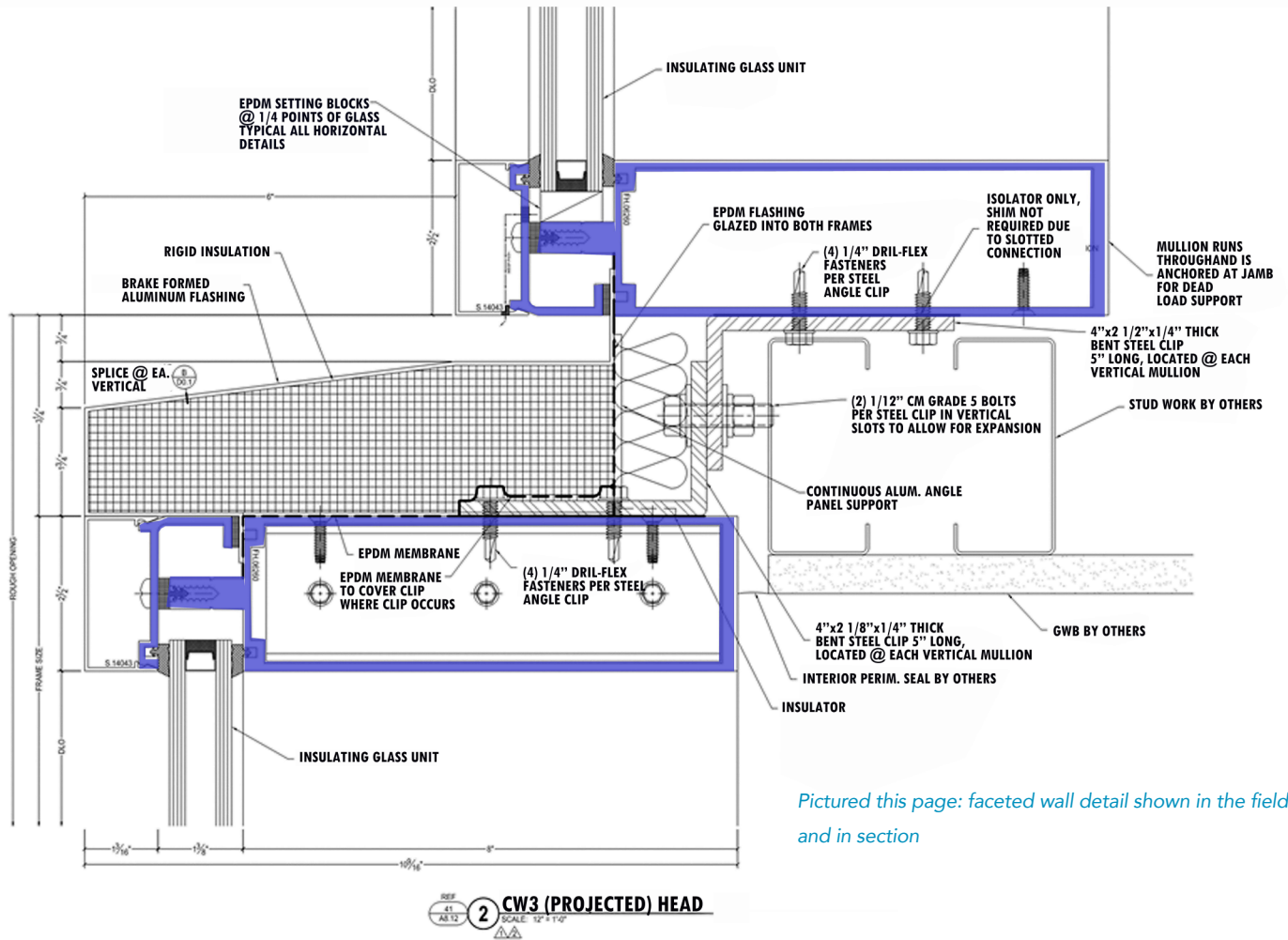
Below: intersection of glazing system and brick cladding at inside corner

As building materials have advanced, so too have the components that comprise the wall assembly. Exterior walls have become more slender as the individual components that perform specific functions have been separated into individual layers. Today the layers that control air, vapor, water, and thermal resistance can be separate or combined into a single product.

One area that remains challenging, however, is how to integrate the control layers of opaque areas of the exterior wall into a glazing system. Often, the location of the glazing system plane, dictated by a desired aesthetic, creates a precarious geometry for continuity and integration of the control layers with the glazing system.



Pictured along bottom of previous page and above: curtain wall detail pairs illustrated in the field and in section; images this page courtesy R.A. Kennedy & Sons, Inc.



Pictured this page: faceted wall detail shown in the field and in section



RECOMMENDATIONS

Aluminum-framed curtain walls and window walls are complex glazing systems that require careful thought during design and construction. Special consideration is required for how the systems are attached and how penetrations and perimeter conditions are fully integrated with the rest of the building envelope.

Project-specific details can be very challenging to design and construct. These conditions are often the first to fail to perform. It is advisable for project teams to consider early involvement with the glazing contractor, supplier, and/or manufacturer to carefully address all potential options. Through early collaboration and communication, the team can resolve potential construction issues and maintain project budgets during construction.

Field photographs and construction drawings used courtesy of National Glass & Metal Co., Inc.