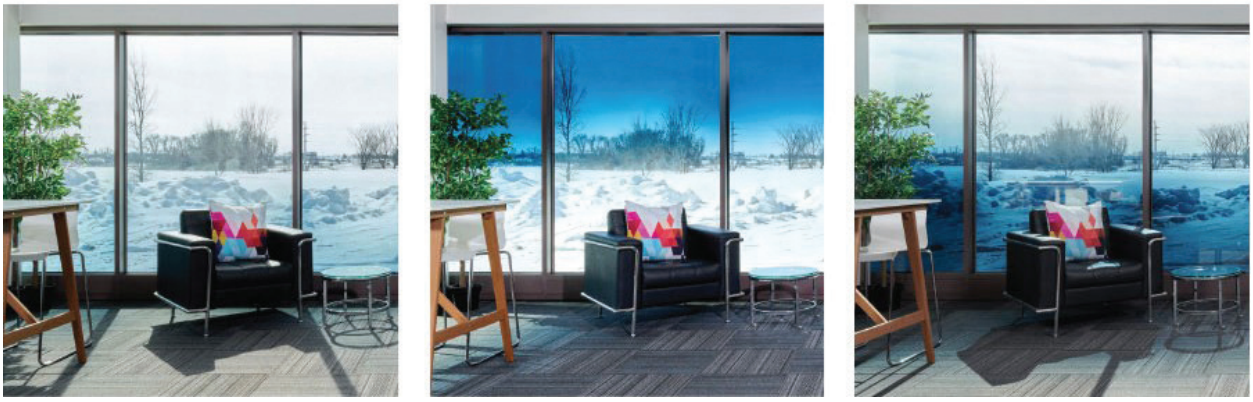
35: DYNAMIC GLAZING AND THE INFLATION REDUCTION ACT INVESTMENT TAX CREDIT

By: Amanda Gibney Weko

DEVIL'S DETAIL



Dynamic Glass tints automatically based on sunlight level. (image courtesy SageGlass)

INTRODUCTION

According to a summary published by U.S. Senate Democrats, "The Inflation Reduction Act of 2022 will make a historic down payment on deficit reduction to fight inflation, invest in domestic energy production and manufacturing, and reduce carbon emissions by roughly 40 percent by 2030."

The $739 billion Inflation Reduction Act includes tax credits, consumer rebates, and incentives for American businesses and households. The Internal Revenue Code Section 48 – Energy Investment Tax Credit (ITC) offers a 30% energy tax credit amendment to the Internal Revenue Code of 1986 for electrochromic glass (also known as dynamic glazing). Language of the ITC now adds dynamic glass to the definition of Energy Property: "Equipment which uses solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight or electrochromic glass which uses electricity to change its light transmittance properties in order to heat or cool a structure."

Read the White House Inflation Reduction Act: By the Numbers narrative: https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/15/by-the-numbers-the-inflation-reduction-act/.

Supporters say dynamic glass offers proven climate benefits. According to Architecture2030.org, "The built environment generates 40% of annual global CO2 emissions and building operations account for 27% of annual emissions. Smart glass can help reduce a building's heating or cooling energy needs by about 20%, per a U.S. Department of Energy estimate. Plus, if lots of buildings in a single city adopt smart glass, it can reduce the peak load on the local electric grid during times of heavy use."

The new tax incentives compensate for the higher up-front costs for incorporating dynamic glass technology, with the goal of widespread adoption of long-term green technologies.

DYNAMIC GLASS OVERVIEW

Electrochromic or dynamic glass is a type of "smart glass" capable of altering its light transmittance and solar heat through the application of a small voltage. The technology was invented in 1989 by SageGlass® founder Jon Van Dine. The first SageGlass factory opened in 2004. Saint-Gobain purchased SageGlass in 2012 and invested to globalize the product. SageGlass continues to be the world's leader in dynamic glazing. Read more in AGI Devil's Detail 27: SageGlass.

Additional manufacturers have come on the dynamic glazing scene, including View, Inc., which has the largest market share in North America, and Halio, Inc. *Powered by Halio* windows and skylights are available from both Halio and third-party fabricators, including Viracon. Manufacturers offer various glass coatings and configurations to customize their dynamic glass products, including blast and impact resistance.

According to SageGlass Territory Manager Matthew Cleary, the biggest hurdle for the early adoption of dynamic glass was perceived risk.

"As owners, developers, and operators began to purchase dynamic glass, market share increased and manufacturers lobbied hard for the product's environmental benefits."

After risk, cost was the next greatest hurdle, as the electrical components of dynamic glass significantly increase price over traditional glazing.

"The market has proven that risk isn't a factor and the tax credit means that cost is no longer an issue," Cleary adds.

ITC FAST FACTS

The International Union of Painters and Allied Trades (IUPAT) continues to publish guidance about dynamic glass tax incentives and can be reached for more details at IUPATGLAZIERS@IUPAT.ORG.

- The Act permits taxpayers to claim the ITC with respect to several additional technologies, including dynamic glass. Dynamic glass was not a technology eligible for this tax credit under section 48 until the passage of the Inflation Reduction Act.
- Projects will not be subject to the prevailing wage and apprenticeship requirements if they have begun construction before the date that is 60 days after the Secretary publishes guidance with respect to such requirements.
- The ITC rate for most ITC-eligible property is 30% of the basis of qualified energy property (ITC Bonus Rate); if the prevailing wage and apprenticeship requirements are satisfied, construction on the project begins before the date that is 60 days after the Secretary publishes guidance with respect to such requirements, or the applicable project has a maximum net output of less than 1 MW(ac).
- The prevailing wage requirement applies for a period of five years after the facility has been placed in service. If the prevailing wage and apprenticeship requirements are satisfied with respect to any eligible facility, the taxpayer would be eligible to claim the 30% ITC.
- The credit is increased by 10% if the domestic content requirement is satisfied, and 10% if the facility is located in an energy community, increasing the ITC credit rate to 50% in some circumstances.
- The domestic content adder is only 2% (rather than 10%), and the energy community adder is only 2% (rather than 10%) if both construction of the facility begins after the Act Beginning Construction Deadline and the prevailing wage and apprenticeship requirements are not satisfied.
- The IRA allows tax-exempt entities, such as nonprofits like houses of worship, rural electric cooperatives, municipalities, tribal governments, and municipal utilities, to monetize the full value of the ITC and receive a payment from the Treasury Department in lieu of claiming the credit on their taxes.
- Speak to your tax professional to ensure you are getting the most out of your energy efficient construction and retrofits.

INDUSTRY ENTHUSIASM

Dynamic glass manufacturers and clean energy advocates alike have expressed enthusiasm for the ITC. According to a statement released by View, Inc., "View applauds Congress for taking the ambitious and necessary steps required to address the climate crisis . . . This legislation will unleash clean technology deployment across the country to cut greenhouse gas emissions, reduce energy costs, and create millions of jobs."

Halio, Inc. published a similar endorsement, "This ITC is similarly structured to generate rapid adoption of smart glass in the same manner that it kick-started the solar industry. Additionally, electrochromic glass will play a key role in helping buildings achieve net zero."

ITC BENEFITS EXPLAINED

The tax credit can cover up to 30-50% of the costs associated with dynamic glass, moving it toward cost parity with traditional glazing. The key piece of information in the bill is that the 30% tax credit applies not just for smart glass materials such as glass, controls, and software, but also for the metal framing system as a whole and glazing labor, provided prevailing wage and apprenticeship utilization criteria are met.

"Owners can potentially get back 30% or more on the entire facade system," said Cleary. "There's still a gray area that's yet to be tested. We suggest making calculations based on conservative estimates but pursue the most aggressive incentive based on how you interpret the law." He adds that bonus credits can get the tax incentive up to 50%. These include domestic content, not only in the glass or curtainwall, but in the entire building. Always consult with your accountant and/or tax professional to understand your specific project's tax implications.

Read the White House Fact Sheet: https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/19/fact-sheet-the-inflation-reduction-act-supports-workers-and-families/.

Read the SageGlass Dynamic Glass ITC Informative Commentary memo: https://www.sageglass.com/sites/default/files/2022-10/SageGlass_ITC_Memo.pdf.

COST IN PERSPECTIVE

To put the tax incentives into perspective, consider you are a glazing contractor putting curtainwall on a building. Your bid is $100/square foot with static glass. The glass might be 10% of the total cost. You also have framing and other materials, engineering, equipment, and labor. Dynamic glass has been such that it might increase the overall cost to $150/square foot. In the past, this has been cost-prohibitive for some owners. At the 30% level, the ITC brings the upfront cost of dynamic glass close to cost parity with a low-e window system using manual blinds. At the 50% level, smart windows can actually be less expensive. Manufacturers describe single-digit premiums rather than the significant costs before the ITC. It's now an incremental cost for a tremendous benefit.

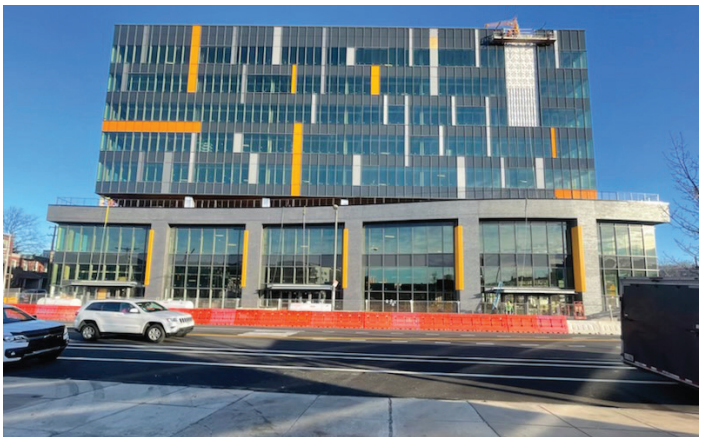
ELIGIBILITY

The ITC applies to dynamic glass placed into service after January 1, 2023 and for projects that begin construction before January 1, 2025. The final owner of the system is eligible to claim the credit; however, that owner may elect to sell it to a third party. The team involved in selling or installing the glazing system has no bearing on credit eligibility (typically, this includes the dynamic glass manufacturer, glazing contractor who provides framing and installs the window system, and electrical contractor who purchases and installs the dynamic glass controls). Any dynamic glass product is eligible, and any number of team members is acceptable.

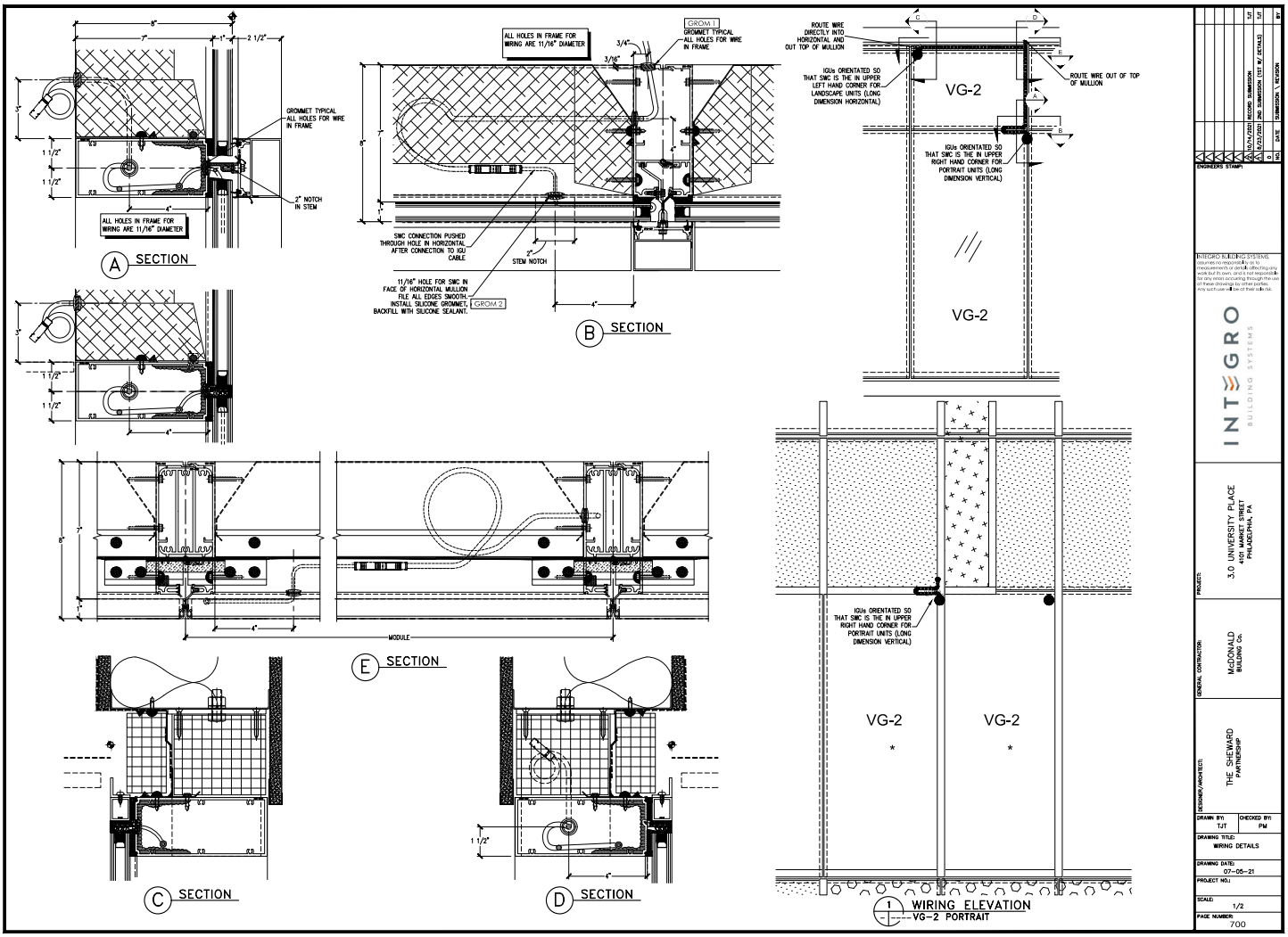
PRO-UNION EMPHASIS

The White House Fact Sheet describing how the Inflation Reduction Act supports workers and families calls President Biden "the most pro-worker, pro-union President in history." The act builds on this legacy in two ways: by incentivizing prevailing wages and including provisions for American-made equipment for clean energy. In order to earn the dynamic glass ITC, some projects may require businesses to pay prevailing wages and hire apprentices, with penalties to companies that don't follow through.

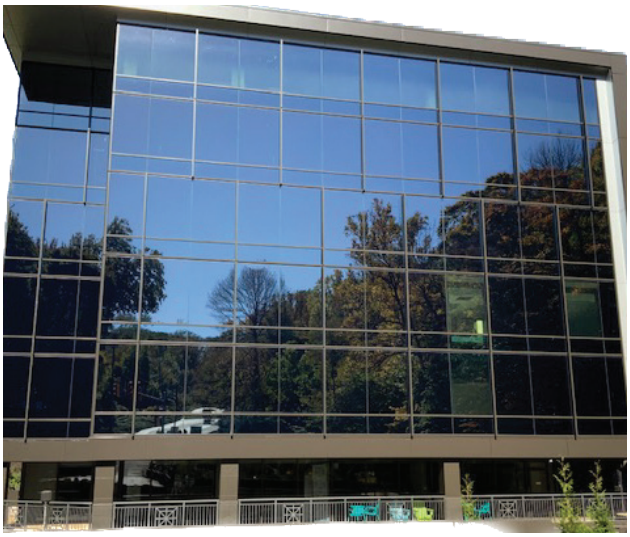
Prevailing wage and apprenticeship utilization are qualifications met by union glazing contractors such as the members of AGI and IUPAT. The IUPAT glazier members of Local Union 252 are trained professional installers of dynamic glazing and other green technologies that support energy savings. They have collective bargaining agreements that meet the prevailing wage requirements to help owners obtain maximum tax credit. IUPAT glaziers have registered apprenticeship programs and 105 training centers across North America. In addition, both SageGlass and View are manufactured in the U.S. These products will contribute to the added buy-American credit value.



Above: View dynamic glass installation at 3.0 University Place
Below: INTEGRO curtainwall supplier detail sheet showing View cabling.
(images courtesy R.A. Kennedy & Sons)







Above: SageGlass dynamic glass installation at 1K1 (images courtesy R.A. Kennedy & Sons)

AGI MEMBER ADVICE

Senior Project Manager John J. Hermansen and Project Manager Joseph Kraus of AGI member glazing contractor R.A. Kennedy & Sons, Inc. have both completed dynamic glazing projects and shared their feedback. Hermansen managed 3.0 University Place, a 250,000-sf flagship commercial laboratory and office building in Philadelphia, Pa., which incorporated View, Inc. dynamic glass. Kraus managed the 1K1 building renovation (formerly the Four Falls Corporate Center) in Conshohocken, Pa., which features SageGlass.

Hermansen and Kraus agree the complexity of electrical wiring is the biggest consideration with dynamic glass. This complexity impacts glazing system fabrication, installation, and testing.

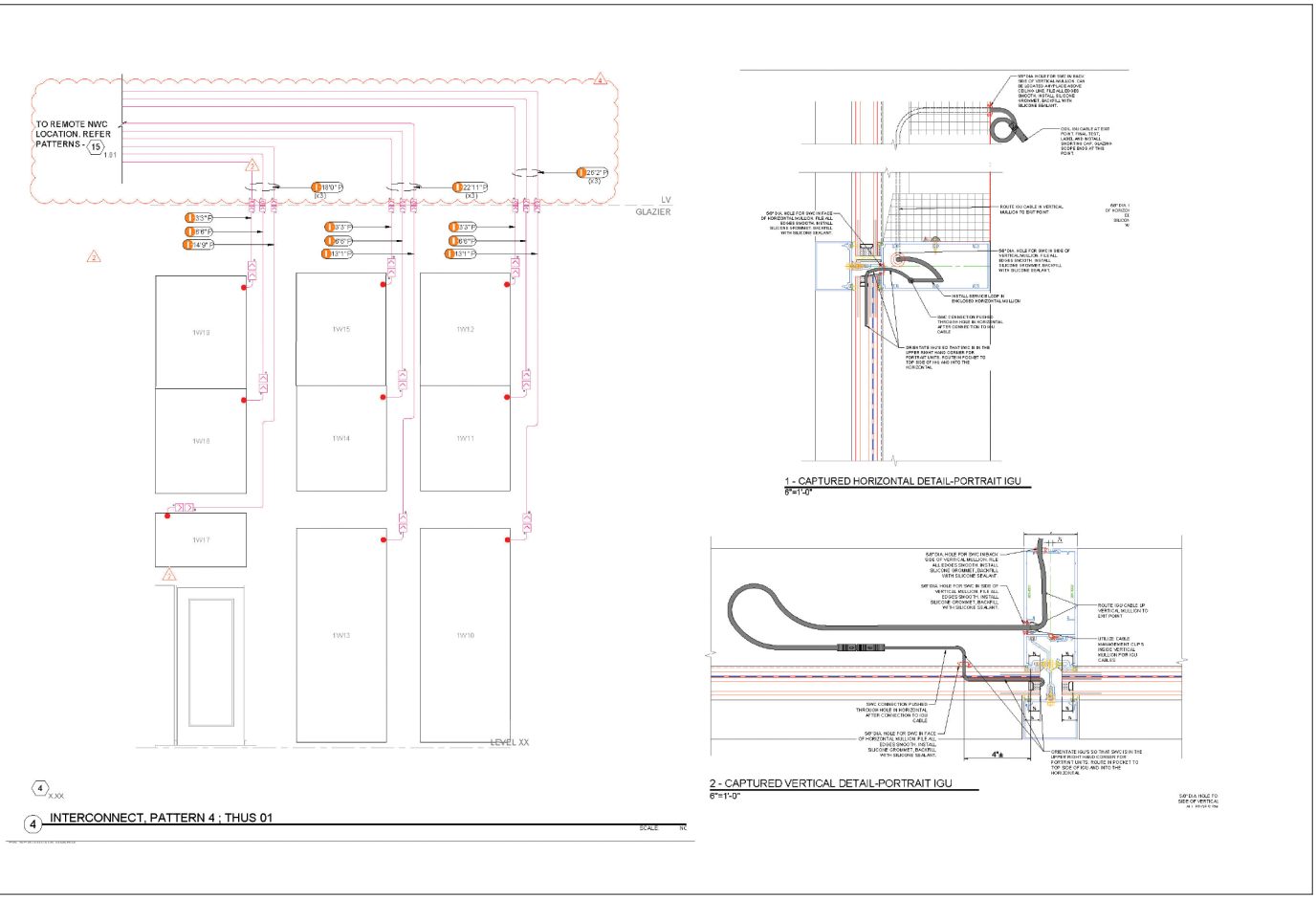
"The SageGlass wiring is very thin, so glaziers have to be careful when pulling it through framing," explained Kraus. R.A. Kennedy fabricated frames in its shop, ran the wiring through grommets, and shrink-wrapped the wiring to the frames before shipping units to the site. "This was a big time savings," he added.

As the field team installed each unit, they made wiring connections in the glazing pocket according to detailed guidance provided by SageGlass. The team multi-tested the wiring before and after installation in the frames, when it arrived on site, and after each frame was installed. Then the low-voltage electrical contractor took over to run wiring to terminal blocks.

Kraus warned about two items. First, adequate testing will add to the labor time involved in a dynamic glazing project. Also, during fit-out work, any trade member working in the vicinity may accidentally manipulate exposed wires. In some cases, they could pull hard enough to disconnect wires within the glass pockets. "This happened in a few instances after SageGlass commissioned the completed curtainwall and certified our portion was complete," he added. Although this issue falls outside a glaziers' realm, it is still a potential concern with the product that can be addressed through careful coordination with SageGlass, the general contractor or construction manager, and any trades working near wiring.

Hermansen's experience with View glass is similar. "View's cables are a bit more robust, but we included a two-to-three-foot service loop of wiring in each curtain wall horizontal [to prevent anyone pulling wiring and disconnecting the system]." The View project incorporated unitized curtainwall fabricated in Vancouver. Once again, the Kennedy team field-tested repeatedly. "When we identified a couple of failures of the system, instead of ordering new glass or cables, the View team was able to send a technician to the Vancouver fabrication facility to resolve."

Hermansen and Kraus encourage those interested in dynamic glass to think about replacement cost and logistics if a piece of glass should break or crack, including the glass, freight, installation, and electrical connection costs, as well as access to wiring within insulated glass units (IGUs).



"If a two-piece horizontal framing member is not used, replacement of the IGU cable requires cutting into the given horizontal and patching with break metal," explained Kraus. Designers can support future replacement or repair needs by incorporating a two-piece horizontal framing member into a glazing system for easier access (see construction detail above). The SageGlass system incorporated at 1K1 incorporated a similar design.

Hermansen and Kraus agree that both SageGlass and View provide good documentation, wiring diagram packages, and troubleshooting assistance. Fabrication costs will be higher for dynamic glass to run wiring through framing. There will be additional field costs to test all units – which at 500-600 units can be quite a task. But the added tax incentives will help mitigate these costs. And the ultimate value - from energy savings to indoor comfort - might be well worth it for owners and occupants.

Read more about the 3.0 University Place project at: https://www.universityplacephl.com

Read more about the 1K1 project at: https://www.sageglass.com/case-studies/1k1

Learn more about SageGlass at: https://www.sageglass.com

Learn more about View, Inc. at: https://view.com

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, not as a sole source for design guidance. AGI recommends design professionals consult with an AGI contractor regarding specific project challenges. AGI contractor profiles may be accessed at www.theagi.org. To share a devilish detail of your own, contact info@theagi.org.