

THE INSIDE STORY OF THE SKYLIGHT REPAIR AND RENOVATION AT THE NATIONAL AQUARIUM IN BALTIMORE, MARYLAND.

Super Sky Products Enterprises has completed some of North America's most iconic skylight projects. The newest one was an ambitious renovation on the waterfront in Baltimore at the National Aquarium. Super Sky's Renovation Manager, Todd Wilde, was ultimately responsible for this effort. We caught up with him to walk us through this project and more. Then, we visited with two of the major collaborators on this portion of the project, Linetec, and Walker Glass, to get their insights on the process.

HOW LONG WAS SUPER SKY ON SITE?

Todd Wilde: Materials were first delivered to the site on April 1st, 2022 and we demobilized at the end of September 2022, so 6 full months onsite.

WHEN DID THIS PROCESS START FOR YOU PERSONALLY?

TW: I got involved in reviewing the preliminary project scope of work from Design Collective and starting the estimating and budget proposal process in late July of 2019. We submitted our initial proposal to Plano-Coudon on February 25, 2021. Plano-Coudon was awarded the project on March 18, 2021. The initial 100% CD bid package was issued by Design Collective on August 11, 2021, and we submitted our updated proposal to Plano-Coudon on August 19, 2021.

An addendum bid package was received on August 20, 2021, and an updated proposal was furnished to Plano-Coudon on August 21, 2021. We were aware that we were not the only company bidding this project and in fact our competitor was a local Baltimore company. On September 8th, 2021, I was asked to provide a presentation to Plano-Coudon as well as the Design Collective and National Aquarium team members via an MS Teams platform. Our presentation highlighted our scope of work, installation plan and some of our past completed large scale projects. Ultimately, that presentation solidified our capabilities with the project team. and we were awarded a Letter of Intent by Plano-Coudon on September 23, 2021.



DID ANYTHING SURPRISE YOU WITH THIS PROCESS?

TW: I think that the one item that initially surprised me quite a bit was the choice of glass. I had not really had any projects with the bird friendly glass specified yet, especially not with an acid-etched texture on the #I surface. I was very concerned with handling issues, how foot traffic during installation would affect the quality of the glass, how well the sealant would stick to the surface, as well as how difficult it would be to remove excess sealant, cup marks, fingerprints, and boot marks. In the end, after some reassurance from Walker Glass, and discussing the product with another glazing company who had experience installing it, we felt a little more at ease and ultimately the glass worked out well and provided the aesthetic that Design Collective and The National Aquarium desired.





WHAT MADE THIS PROJECT STAND OUT?

TW: I think for me the initial eye-opening moment (when I was physically standing on the pier) was the fact that the base of the glazed structure started 96 feet above the surface of pier 3 and the fact that there was not much extra room on the pier for material staging and equipment staging. I knew that this was going to be very challenging and that we would have to be very careful in planning out our space usage and equipment selection. The means and methods of the reglazing process are pretty basic; however, the site planning and equipment access are where the initial challenges were going to be!

WHY ARE PROJECTS LIKE THIS PERFECT FOR YOU AND THE SUPER SKY RENOVATION TEAM?

TW: From an engineering standpoint these types of projects are rather unique, especially if they are another manufacturers system, in that you have to really get into the forensic investigation and reverse engineering of the system to understand what's there, learn how it works, and come up with a plan to address what is needed to fix and improve the components and system as a whole to move the project forward.



You need to have a very detail oriented, mechanically oriented and problem solving thought process to work through all of that and think that myself, and the other team members that I rely on, have that very mindset and do a great job at working through all of the issues to give the client a much improved system while at the same time reducing budget and minimizing the project effect on the day-to-day operations of the facility. I'm not sure that there are a lot of other skylight companies out there that want to bother with this kind of scope and the process required to pull it off.

From an installation standpoint, our installers do an outstanding job at planning out the required site logistics and sequencing necessary to complete this type of project safely and on time. There are different kinds of risks, both safety and financial, when it comes to fixing old, sloped glazing systems versus installing shiny brand-new systems and our installers do it very well.

WHAT HAD YOU MOST WORRIED GOING INTO THE PROCESS, AND HOW DID YOU GET PAST THAT?

TW: On most re-glaze projects that consist of another manufacturers system, dimensions become the biggest worry for me because I do not have any shop drawings to start with as a baseline which means that all dimensions must be physically obtained in the field. Accurately measuring all the necessary dimensions, accurately documenting all of those hundreds of dimensions and then digesting all of the dimensions to arrive at an accurate as-built layout is always the most difficult task on these projects.

I spent a week with 2 of our installers field measuring (and remeasuring) all daylight openings, taking certain conditions and interfaces physically apart to document the as-built construction, sketching, and discussing the details in order to feel comfortable with the information I was taking back to the office.

So far, with the incredible dimensional juggling talent of our Production Engineering Manager, Mr. Jeff Parmann, we have been very successful on all renovation projects

WHO SUPPLIED THE NEW GLASS?

TW: Oldcastle BuildingEnvelope, out of Wright City, MO, fabricated the laminated inboard unit, cut the bird friendly acid-etched outboard lite with glass that was furnished by Walker Glass, and then assembled the insulating / laminated units. There were 347 sloped lites and 332 vertical lites for a total of 679 units. (See more below from Walker Glass)

WHAT ABOUT THE FINISH ON THE ALUMINUM?

TW: Linetec, from Wausau, WI expertly finished all of the new aluminum components with a 70% PVDF 2-coat spray applied finish in a "Quaker Bronze" color to match the existing dark bronze anodized finish. (See more below from Linetec)

HOW DOES IT FEEL TO GET RECOGNIZED ON SUCH A COOL AND IMPORTANT PROJECT?

TW: Although I don't do this for any sort of notoriety, it feels awesome for the entire team that made it happen to be recognized by the Building Congress and Exchange of Metropolitan Baltimore for this very high-profile monumental project that turned out looking great and was a very successful project! There is great satisfaction in seeing your repair concept come to fruition, get completed without too many issues, look like a brand-new product once completed and know that you helped the owner improve the aesthetics and performance of the building all while minimizing the impact to the occupants!

HOW MANY RENOVATIONS DOES SUPER SKY DO PER YEAR?

TW: It varies from year to year, but I would say that it is around 15 to 20 on average.

WHERE DOES THIS RANK FOR YOU AMONG YOUR FAVORITE PROJECTS?

TW: I would say that this project is in the top 5 for sure! The Waldorf Astoria in Washington DC (Formerly the Trump Hotel & amp; The Old Post Office), The National Humanities Center in Research Triangle Park, NC, Union Station in Chicago, IL and the Dayton Arcade in Dayton, OH would be the other 4.

WHAT WAS THE VIEW FROM THE GLASS FABRICATION SIDE?

PERSPECTIVES PROVIDED BY DANIK DANCAUSE OF WALKER GLASS.

WHEN AND HOW DID YOU GET INVOLVED IN MANUFACTURING AND SUPPLYING THE BIRD-FRIENDLY GLASS ON THE NATIONAL AQUARIUM PROJECT?

Danik Dancause: Toward the end of 2020, Design Collective got in touch with us about acid-etched glass for a big renovation project: the glass pyramid of the National Aquarium in Baltimore, Maryland. This building, with its original 684 panes, had been in use for nearly four decades and the Aquarium had decided it was time to replace the glass.

The pyramid is a highlight of the city's skyline and an important public institution, so this project had a lot riding on it. The work had to restore the pyramid to its original glory in a way that would last for many decades. Plus, the new glass needed to meet modern performance standards, like bird deterrence and energy efficiency, which weren't even on the radar when the Aquarium was first built. Daylight transmission and diffusion were key factors, as well.

Design Collective was particularly interested in energy efficiency and bird deterrence, and they wanted an etched glass product with a low-e coating that would be visible to birds. They didn't have very much experience with this kind of product, so the architect, Seonhee Kim, had a lot of questions about what options were available and how they compared in terms of bird deterrence, light transmission, low-e treatments, and substrate compatibility. Our Architectural Managers, John Just and Jacob Bowser, were able to advise on the best glass product for the project.

Ultimately, Design Collective chose a full-surface etched glass with low-e coating. Specifically, they went with a 6mm Starphire Ultra-Clear® substrate with Walker Textures® fullsurface Opaque etch on surface one and a Solarban® 60 lowe coating on surface two. This was a fantastic choice. The lowiron substrate and Opaque etch provide high VLT levels and reduce glare, which encourages plant growth inside the exhibit and makes it more comfortable for visitors. The Solarban® low-e coating from Vitro Architectural Glass reduces heating and cooling loads, and the full-surface etch deters bird strikes.

WHAT MAKES THE GLASS BIRD-FRIENDLY AND WHAT'S WALKER'S EXPERIENCE WITH THIS PRODUCT LINE?

DD: We introduced the Walker Texture® brand of full-surface acid-etched glass in the 2000s to meet architectural demands for lightdiffusing glass. Then, in the early 2010s, we realized that the acid etching on our glass could also make the glass visible to birds and reduce the risk of bird-glass collisions. Since then, Walker Textures® glass has been used in many projects to improve daylighting and prevent bird strikes. By the time we got involved with the National Aquarium project, we'd had quite a lot of experience and seen good results from using full-surface etched glass in bird-friendly projects.

Even though we were familiar with bird-safe glazing by then, the building industry as a whole was still discovering it. Part of the glass selection process for this project was about communicating how effective full-surface acid-etched glass could be at deterring bird strikes. A lot of the literature on bird-friendly building focuses on patterned glass, and Design Collective was looking at that option initially. However, full-surface etched glass can be even more effective than patterned glass because the entire surface is visible to birds. This, along with the daylighting benefits of full-surface etch, convinced the team to go with a full-surface etch treatment.

It turned out to be the right choice. The National Aquarium hasn't seen a single bird strike against the glass since the site reopened, and they monitor daily for collisions. We asked the curator, Ken Howell, for feedback. He told us, "A year has now passed, and I am super happy with the glass panels provided for that project; it was an excellent choice for this application. I have paid close attention to any possible bird strikes occurring on this glass and that number appears to be zero, which is not unexpected as the acid-etched glass is clearly visible to flying birds. In addition, the plants and animals living under the glass in the rainforest exhibit have responded very favorably to the glass provided."

One thing that was somewhat new for us at Walker was the combination of full-surface etch with a low-e coating. We introduced this combination in February 2020, less than a year before Design Collective chose the glass for the National Aquarium project. In fact, this renovation is one of the product's early success stories. Since then, we've worked on several projects that combine acid etching with low-e coatings to achieve environmentally friendly, high-performance glazing.



WERE THERE ANY CHALLENGES ON THIS PROJECT THAT YOU DID NOT EXPECT AND IF SO, HOW DID YOU OVERCOME THEM?

DD: The most important challenge for us on this project was making sure our clients understood and had confidence in the product. The skylight manufacturer, Super Sky, and the fabricator, Oldcastle BuildingEnvelope, were both new to fullsurface acid-etched glass, and they wanted to make sure everything went smoothly. Longevity and handling were top concerns for this glazing, which made sense considering the entire project was a result of aging glass installations. Todd Wilde of Super Sky was cautious and thorough with his questions about what to expect, including cleaning practices and compatible products.

The fact that this project is essentially one big skylight was probably a factor, too. Skylights are notoriously prone to leakage, so the glass and sealants really had to work. Fortunately, Walker had just done a round of testing with Dow Chemical and Sika to make sure that their sealants were compatible with Walker Textures® glass. Marc Deschamps, our Director of Products and Business Development, was able to share those test results with Super Sky, and I think that helped a lot to address their concerns.

There was a bit of a hiccup during the sampling stage when three of the insulated units developed marks during fabrication. As we mentioned, OBE wasn't entirely familiar with products like these, so handling the etched glass involved a learning curve for their team. To their credit, Super Sky and OBE caught the error right away and corrected their handling methods, with some guidance from Marc and our product handling guidelines.

WE'LL FINISH WITH THE FINISH!

TAMMY SCHROEDER OF LINETEC TAKES US THROUGH THEIR JOURNEY ON THIS PROJECT.

FOR THIS PROJECT LINETEC HAD TO MATCH THE EXISTING FINISH ON THE ALUMINUM COMPONENTS. TAKE US THROUGH THE PROCESS WHEN YOU ARE ASKED TO DO THAT ON A TYPICAL JOB?

Tammy Schroeder: Linetec utilizes the most advanced equipment and techniques throughout our painting operation. For existing buildings in need of color-matching, our color matching capabilities are unparalleled. We use the latest technologies to analyze and formulate thousands of color variations, ensuring creation of the exact color specified. With our in-house experts and computerized blending capabilities, we've applied more than 65,000 unique colors.

Linetec can supply color sample chips for any order or quote. Typical response time is 48 hours on most in-house blendable colors. Each color sample has key information documented on the back of the chip. Color name, finish type, finish code, number of coats required and if it is in-house blendable.

When appearance is critical, our paint technicians will examine a finished part from the existing building to create the closest match possible. Even if we know the precise details from the original finish, adjustments can be made so the newly finished material aligns with the correct vintage of color currently on the building.

FOR THIS JOB SPECIFICALLY- WHAT WERE THE STEPS YOU TOOK TO DELIVER THE FINISH TO MEET THE DESIGN EXPECTATIONS? WHAT WAS THE FINAL PROCESS AND FINISH USED?

TS: For Super Sky's aluminum-framed skylight system on the National Aquarium, the design team specified Quaker Bronze as the color. Different paint coating manufacturers may each have a special shade of Quaker Bronze. To ensure we have the correct match, the design team references the unique Linetec color code, which is LT602. This is one of 20 standard in-house colors offered by Linetec. Standard colors generally provide the most economical choice for architectural coatings, while still delivering the highest performance painted finish.

Through the use of our five-stage pretreatment system and our highly automated paint line, Linetec produces top-quality finishes with consistent results and warrantied coatings. We follow a rigorous process that cleans thoroughly, racks material and applies liquid paint with our state-of-the-art equipment. Our Quality Assurance team inspects every job for color, mil thickness, appearance and multiple other performance specifications. As an environmentally responsible finisher, Linetec also safely captures and destroys volatile organic compounds (VOCs) associated with liquid coatings during our paint application process and repurposes the heat produced from their reclamation. This means that when the finished products from Linetec are installed on a building project, such as the National Aquarium, there are no adverse effects from "off gassing" on the building's indoor air quality or its occupants.

BEING A PAINTED COATING, WHAT ARE THE DURABILITY EXPECTATIONS? ANYTHING SPECIAL BECAUSE OF THE LOCATION ON THE WATER IN BALTIMORE?

TS: In addition to matching the aesthetic requirements for finishing Super Sky's aluminum-framed skylight system on the National Aquarium, Linetec also meets the highperformance requirements for the project. The design team specified a 70% fluoropolymer resin-based coating that meets AAMA 2605. AAMA 2605, "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels," is published by the Fenestration and Glazing Industry Alliance (FGIA). It is the most stringent industry standard for painted coatings available for aluminum-framed skylights and other architectural aluminum building products.

For the National Aquarium, Linetec applied a PPG Duranar® two-coat architectural liquid paint to Super Sky's extruded aluminum framing members under factory quality-controlled conditions. Standard color two-coat systems consist of a primer and color coat. The Duranar coating's fluoropolymer formulation includes 70% polyvinylidene fluoride (PVDF) resin. Resins are the compounds in the paint that form the film and hold the pigment in place. Pigments are the material added to the paint to give it color or to enhance certain physical properties of the coating.

Considering Baltimore's hot summers, cold winters and proximity to the coast, fluoropolymer coatings with 70% PVDF resin offer the ultimate protection in building performance. In compliance with AAMA 2605, these finishes exhibit outstanding resistance to humidity, color change, chalking, gloss loss, chemicals and salt spray. Linetec ensures a longlasting, durable finish, typically supported with a 10-year warranty. No other coating system can withstand the rigors of nature and time like those based on 70% PVDF resin coatings.

FOR MORE ON SUPER SKY: SUPERSKY.COM

FOR MORE ON WALKER: WALKERGLASS.COM

FOR MORE ON LINETEC: LINETEC.COM