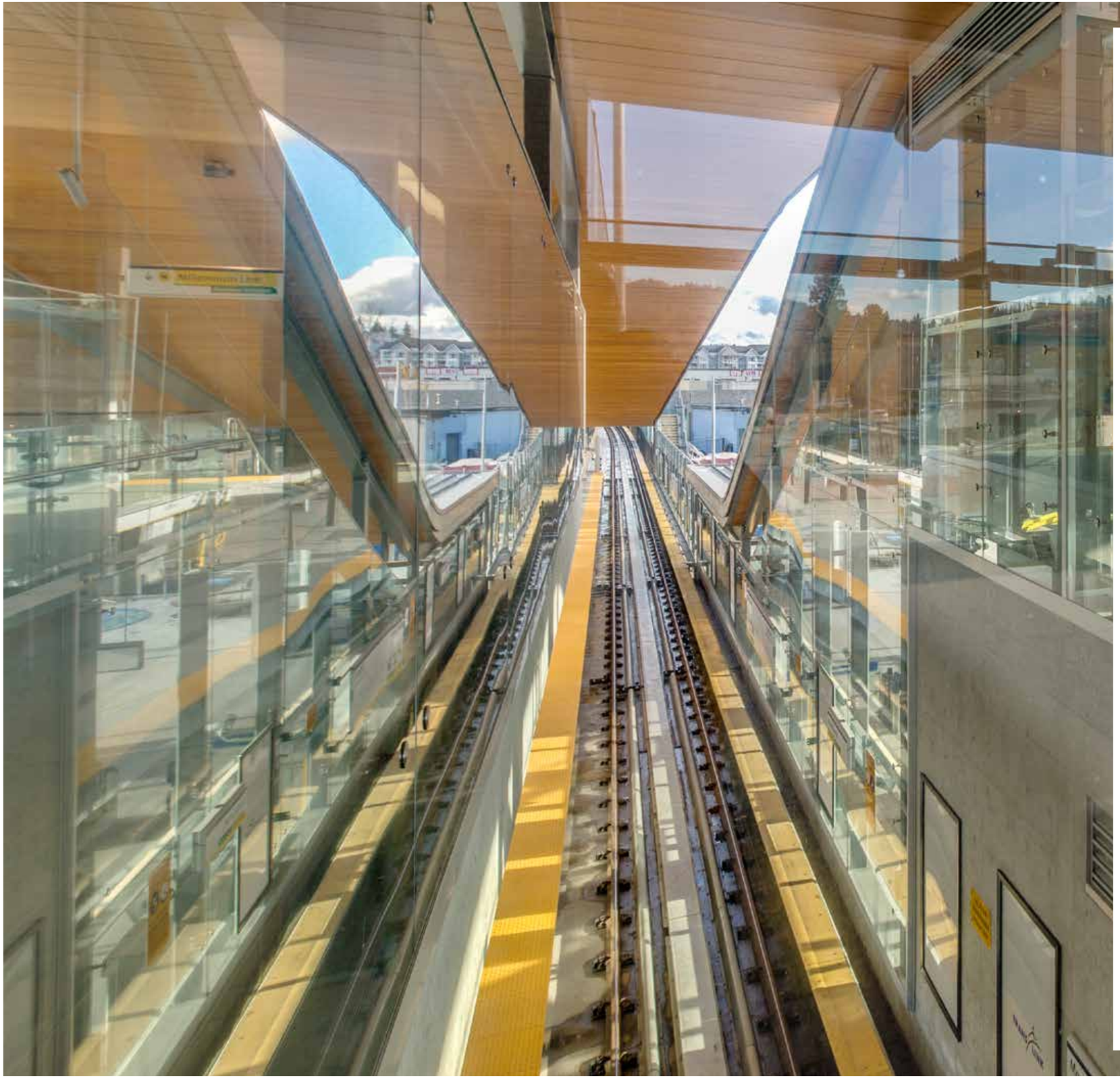
stella
Custom Glass Hardware

TRANSPORTATION DESIGN GUIDE

STELLA PROJECT PORTFOLIO

stellaglasshardware.com



TRANSPORTATION OVERVIEW

Stella has supplied hardware for transportation systems across Canada and the United States.

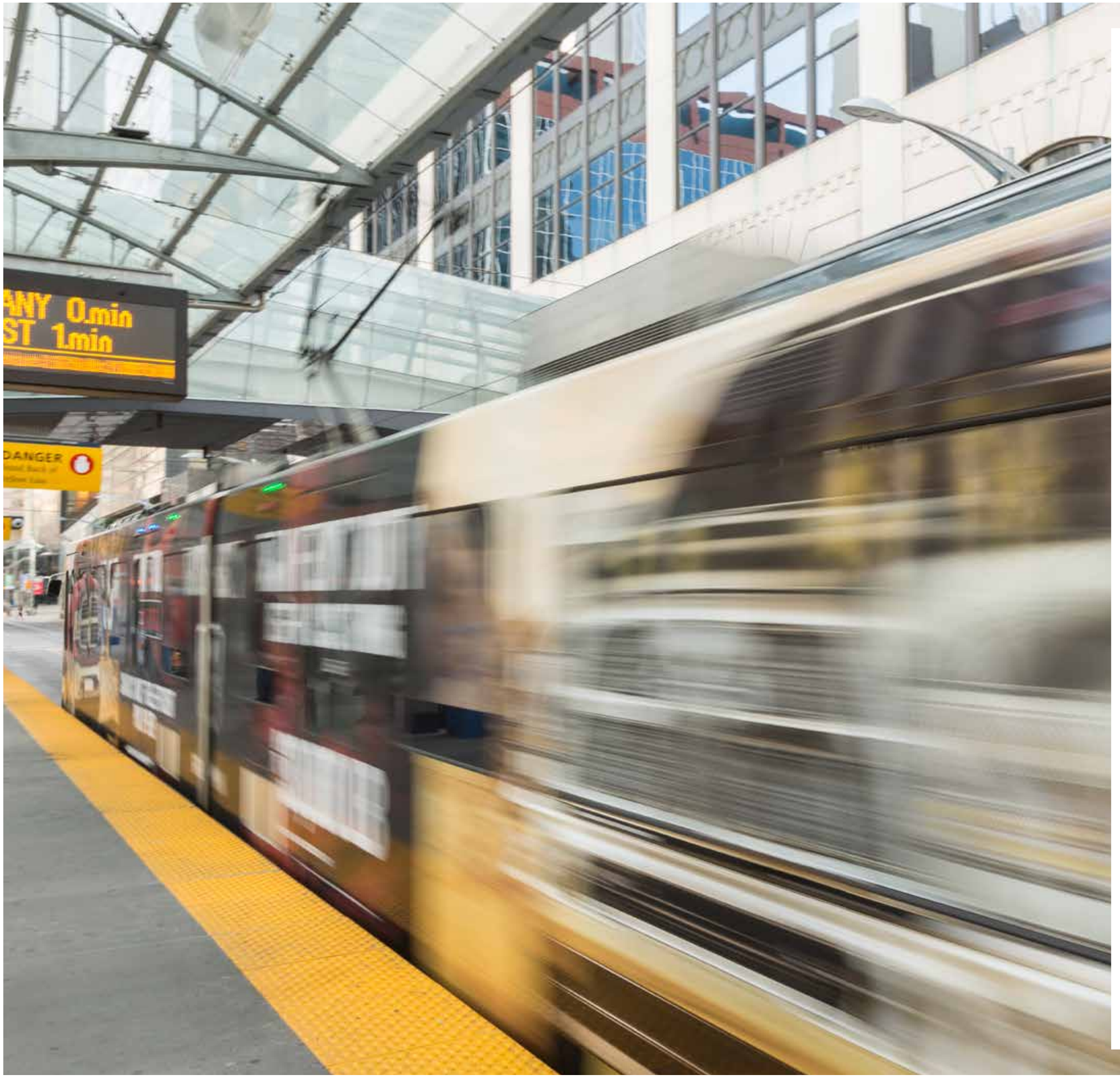
We work closely with our transportation partners to ensure the products meet their specifications, installation needs, and matches the design intent.

Project Types
Station Facades (Structural Glass Walls), Station Canopies, Bus Shelters, Transit Enclosures, Light Rail Station Guardrails, Fare Gate Barriers, Wind Screens

Hardware Type
Point Supported Glass Hardware, Edge Supported Glass Hardware, Balustrade Hardware, Guardrail Hardware, Wind Screen Hardware, Canopy Hardware

Design Services
Hardware Design (Standard and Custom), Shop Drawings, Glass Drawings, Engineering

Key Projects
Ottawa LRT (Ottawa, Ontario), Waterloo LRT (Waterloo, Ontario), Canada Line (Vancouver, British Columbia) Evergreen Line (Coquitlam, British Columbia), Santa Clara Bus Shelters (Santa Clara, California), Calgary West LRT (Calgary, Alberta), Edmonton LRT (Edmonton, Alberta)



TRANSPORTATION EXPERIENCE

Proven Track Record

We've worked on large scale projects with multiple stations and overlapping timelines. We understand the unique challenges and design requirements that come with a transportation project.

We Maintain your Design Intent and Provide Efficiencies

A project starts by collaborating with the project partners at the planning stage. Our goals is to maintain the design intent and provide install friendly hardware solutions and system designs. One less hole to drill across 10,000 fittings can create huge savings.

Cost-Effective, Custom Options

Customized hardware can create a cost-effective solutions especially across multiple stations. Other efficiencies come from reducing glass thicknesses, increasing the panel size and reducing installation times.

Your Design and Engineering Resource

Our team has design and engineering experience in Canada and US as it relates to glazing in mass transit structures with knowledge on various code requirements and experience with large project timelines.

Supporting Glass Systems

Past projects include structural glass walls on station exteriors, oversized and standard canopies for stations and bus shelters, station balustrades and guardrails. We can provide hardware and design services for single station renovations as well as entire transit lines.

EVERGREEN LINE (LRT)

6 Station Skytrain Line Extension (Coquitlam, British Columbia)

Transportation in Vancouver is constantly expanding.

The Evergreen Line is a 7 station, light rail system. It connects Coquitlam and Port Moody to an existing station on the Millennium Line.

Design assistance was provided to create standard hardware that would work across all the stations and site conditions. The resulting product was a side mounted, heavy-duty, one arm spider.

This allowed the designers to use taller and wider glass throughout the project while accommodating the weight of the glass.

Varying distances between the structure and the glass also had to be resolved. To keep the core of the hardware consistent across all stations, custom extensions were made to screw into the standard fitting.

The custom extensions could be used where required without changing the overall look.

View from the exterior of Inlet Centre Station Line (Coquitlam, BC)


T
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Elevator

WEST 7TH STATION

(Calgary, Alberta)

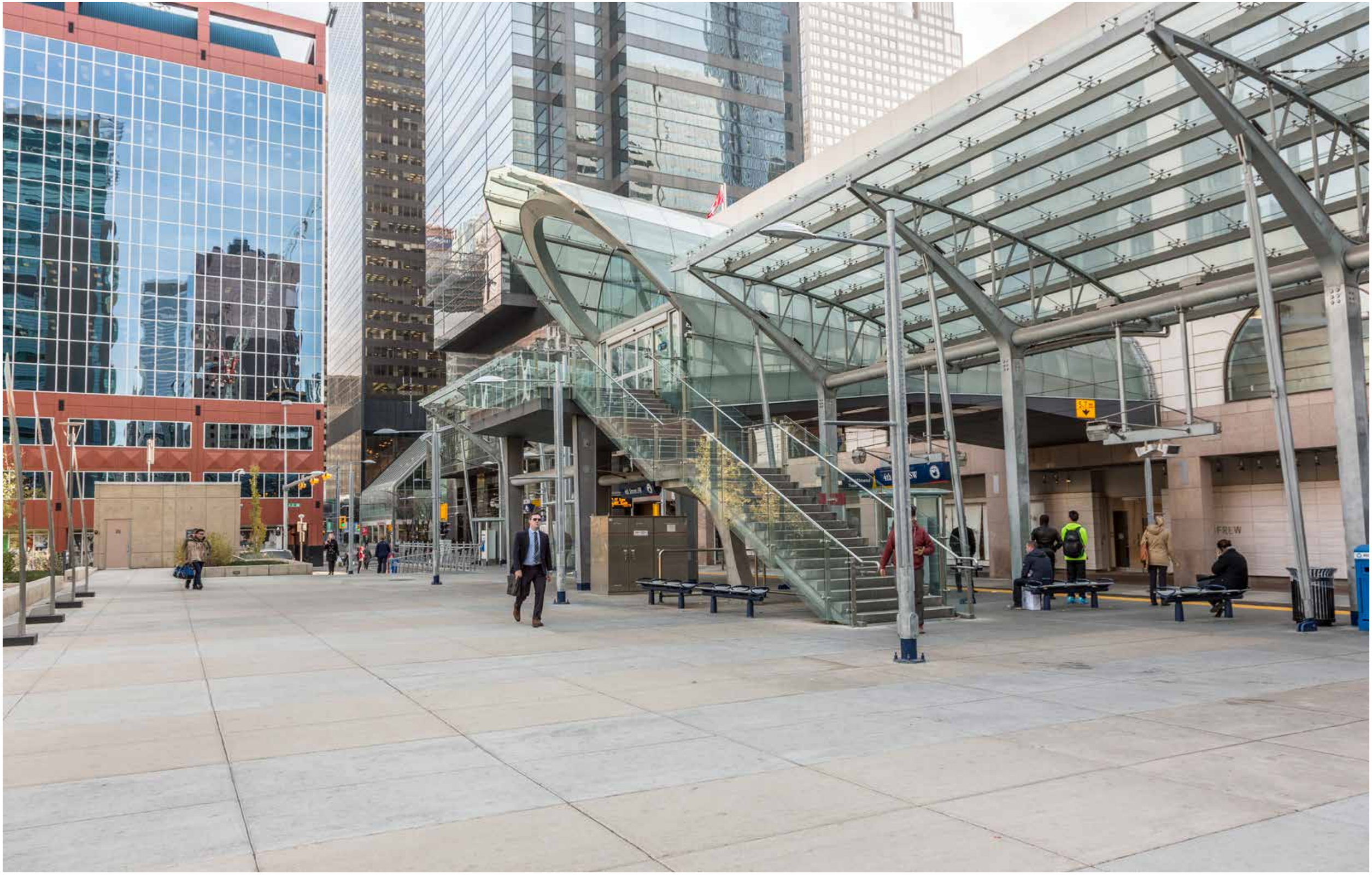
This station was completed in conjunction with 6 other stations as a expansion project.

Stella supplied fittings for the refurbishment of all 7th Avenue canopies as they were expanded to accommodate longer LRT trains.

Ease of install on Stella's products was critical to project success as the glass needed to be installed in a short window of time to minimize interruption to the line.

Articulating bolts and two arm spiders were used on this project to achieve the faceted look.

Faceted Glass Canopy
West 7th LRT Station



UNIVERSITY OF BC BUS LOOP

(Vancouver, British Columbia)

This canopy spans about 105m [345 ft], sheltering university students from the elements as they wait for their bus.

Stella provided standard one arm spiders with custom 6-inch spacers to bring the glass up to the required height.

The articulating glass bolts allowed the hardware to accommodate the canopy's slope.

The glass make up is a 21.5 mm laminate. The size of the panels are approximately 2m by 3m each.

Standard one-arm spiders shown with custom 6-inch spacer measuring from the wood beam to the underside of the glass panel.


UBC AQUATIC

SUNALTA STATION

Stella was involved from early project days in providing shop drawings, engineering, and fittings for the six stations on Calgary's newest LRT line.

Stella created its adjustable Doc and Pin product to achieve the curved glass look of the stations.

This would not be possible with the spider assemblies originally shown on drawings.

Discrete Doc & Pin fittings are installed with a bolt through structural steel.

The pin is connected to the structure while the doc is free to rotate around pin.

This Doc and Pin has in and out adjustability to accommodate facets. The rotation on the pin also accommodates and steel or structural variation.

BETHEL TRANSIT STATION

(Edmonton, Alberta)

The Bethel transit terminal features a significant curve that required supporting hardware to accommodate varying conditions along the changing radius.

A no-holes-in-glass (NHG) system was selected to give the most adjustability. The mounting hardware included articulating arms to give more flexibility to the installers as the glass was fitted along the curve.

A custom face plate was designed to mimic the rounded edges and curves found in the structure.

Rounded faceplate shown on the exterior of the glass with articulating brackets on the interior.

SANTA CLARA BUS SHELTERS

(Santa Clara, California)

This series of bus shelters features varying decorative glass-art walls supported by stainless steel spiders and glass bolts.

The clear-glass segments of the bus shelters are supported by dead load Clipz for easy installation.

This also allows the glass to be easily replaced in case of damage or breakage as no holes are required in the glass for this product.

Deadload Clipz are shown on the left with glass bolts shown on the right.

CANADA LINE LRT

(Vancouver, BC)

The Canada Line Skytrain LRT system features 17 stations both above grade and underground.

The station entrances were designed with a west-coast modern aesthetic featuring concrete, wood, and glass.

The station structure consisted of steel knife plates welded to structural steel supports.

Stella's side mounted spiders and glass bolts were used to support monolithic glass.

The SS15 spiders had the advantage of vertical and horizontal adjustment of on the structure.

The holes in the knife plates could be drilled on site to ensure alignment and the silicone butt joints were minimized with this process.

SS15 spiders installed in the City Centre station.


Vancouver City Centre
Elevator
Cadillac Fairview

CANADA LINE LRT

(Vancouver, BC)

This 375 foot long glass roof is curved like a wave and was designed to welcome visitors at the Vancouver International Airport.

In order to accommodate the unique multi-directional curve, a custom arm bracket was created.

The bracket was made with long arms to minimize glass deflection. This resulted in reducing the specified glass thickness which provided cost savings.

The arm bracket also enabled the distance between the holes in the glass to be extended.

The Arm Bracket was designed to accommodate curved steel structure.

The hinges on the hardware provided flexibility when working with different angles of the roof beams and glass to give the structure its characteristic shape.

Labour costs were reduced with the unique clamping system which attached to the steal beams. Installers were able to avoid drilling and tapping each individual connection to the support structure (which is the traditional method).

Wide-Arm clamps and steel structrure shown

ABOUT STELLA

Canadian-owned and operated since 2001, we design, manufacture and supply innovative glass hardware for glass doors and point-supported glass walls, tension trusses, canopies, guardrails, balustrades, and partitioning systems.

Specializing in custom design and a collaborative approach, Stella creates hardware that transitions your vision into a unique and buildable solution. From tender-ready to shop drawings, engineering through to install.

While our products are designed, engineered, and tested for strength and safety, we're passionate about aesthetic features such as sculpted lines, rounded edges and clean connection points. Our custom approach is reserved for those projects that are setting new precedents and simply can't be specified from a catalog.

Custom can mean a lot of things, and often the term is reserved for high-end, one off projects, but at Stella, we find that custom is often the answer to practical problems. Taking an early look at the materials, the installation conditions, and how our parts interact with these items provides greater control and cost savings during the construction and installation process.

Services include:

- Design collaboration
- Pre-tender technical review
- Shop drawings and drafting services
- Structural and glass engineering
- Providing specification language for tender
- Guidance with project timelines
- Recommendations for install

DESIGN SERVICES

Stella offers a range of products and services to suit your needs. Services include hardware supply, design assistance, shop and glass drawings, and engineering services.

Design + Drafting Services

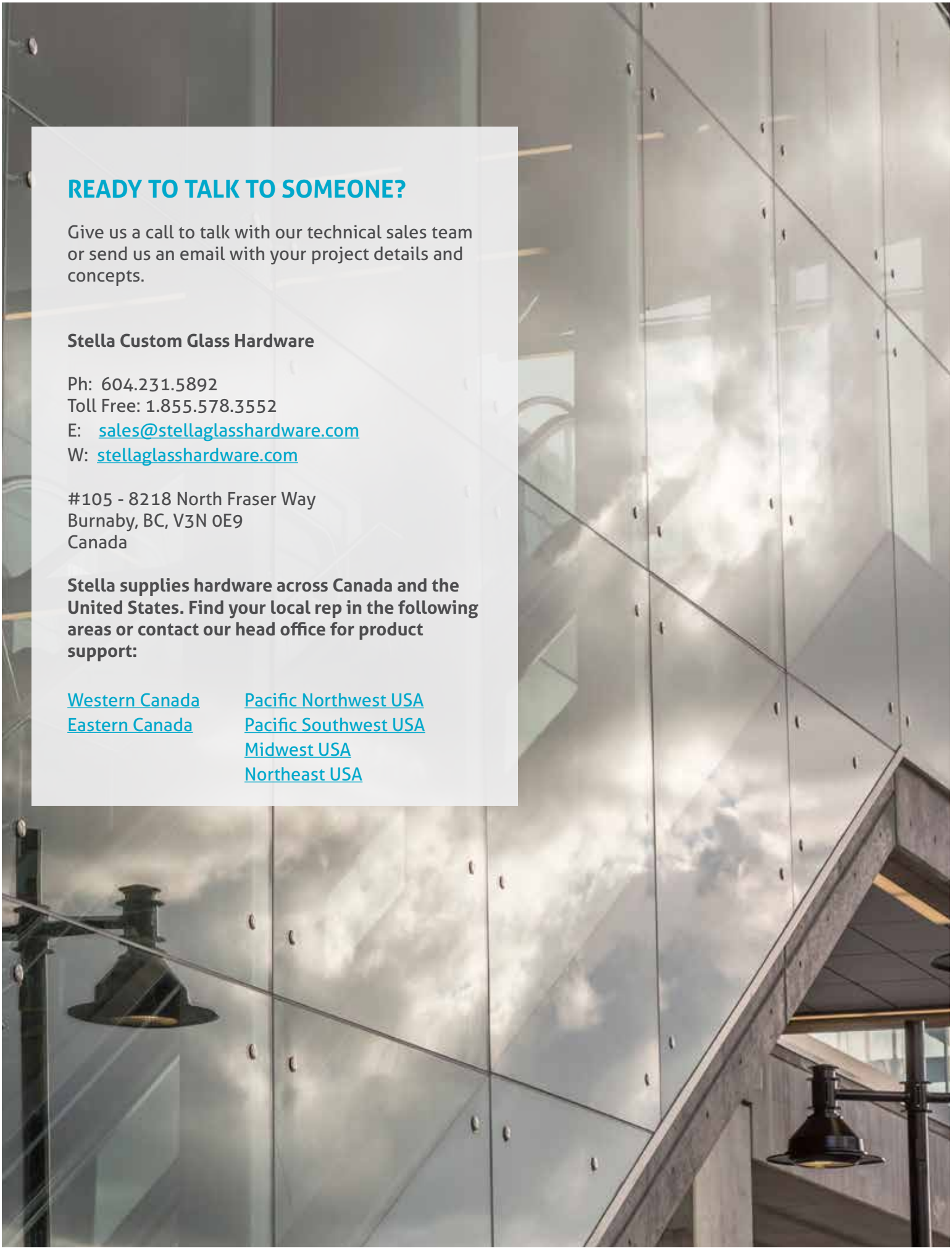
- Pre-tender consultation and feasibility study
- Conceptual design of hardware components
- Preparation of shop drawings
- Glass fabrication drawings
- Hardware assembly drawings and installation manuals
- 3D model rendering of hardware
- Construction support

Project Engineering

- Full system design including glass and hardware
- Review and engineering stamp on shop drawings
- Submittal of calculations
- Field Reviews and Letters of Assurance
- Load testing of hardware components

Hardware Supply

- Full assembly supply for standard hardware
- Fixing hardware
- Gaskets



READY TO TALK TO SOMEONE?

Give us a call to talk with our technical sales team or send us an email with your project details and concepts.

Stella Custom Glass Hardware

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