

Mitrex Case Study

1154 Wilson Ave - Balcony Railing Retrofit

Mitrex SolaRail™



Project Overview

The retrofit of 1154 Wilson marked a pivotal step for Ten Block in aligning its sustainability goals with innovative building technologies. By integrating Mitrex's balcony BIPV technology, the project achieved a sleek, photovoltaic balcony facade that offers long-term ROI and enhances environmental responsibility. The 142 kW system generates approximately 89,300 kWh annually, equivalent to powering 16 residential units. This transformative approach not only reduced energy costs but also contributed to Ten Block's reputation as a forward-thinking, sustainable developer. By replacing traditional balcony railings with Mitrex's energy-generating railings, 1154 Wilson became a showcase of how building retrofits can unlock new revenue streams, lower maintenance costs, and lead the industry in sustainable innovation.

PRODUCT USE:
SolaRail™

PROJECT LOCATION:
Toronto, Ontario, Canada

BUILDER:
Tenblock Development on behalf of property ownership

OWNER / DEVELOPER:
DIS Wilson

GENERAL CONTRACTOR:
KingsGate Restoration Inc

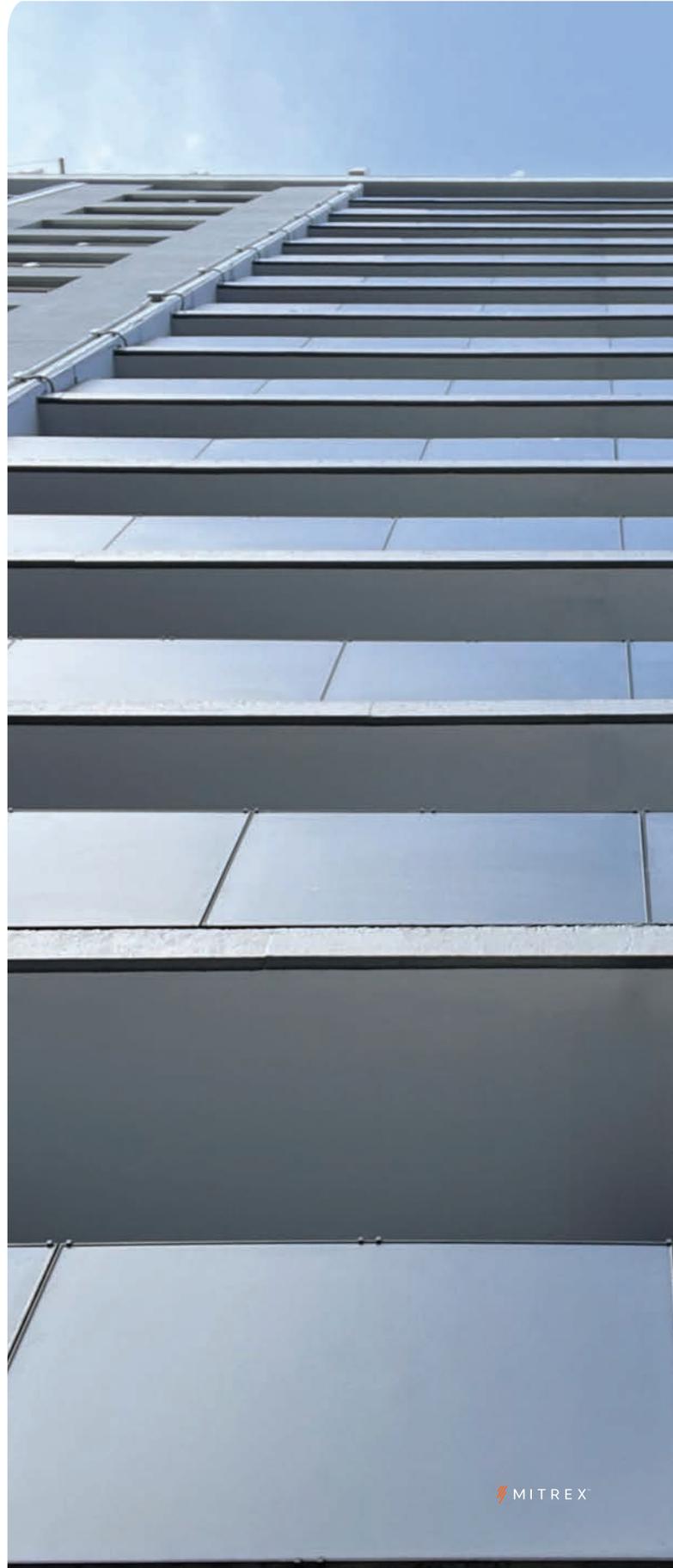
ENGINEER:
NoVi Engineering

BUILDING TYPE:
Multi-Family Residential

PROJECT SIZE:
Solar Railing: 4,000 LFT

POWER OUTCOME:
Facade Power: # 142kW

COMPLETION DATE:
2024



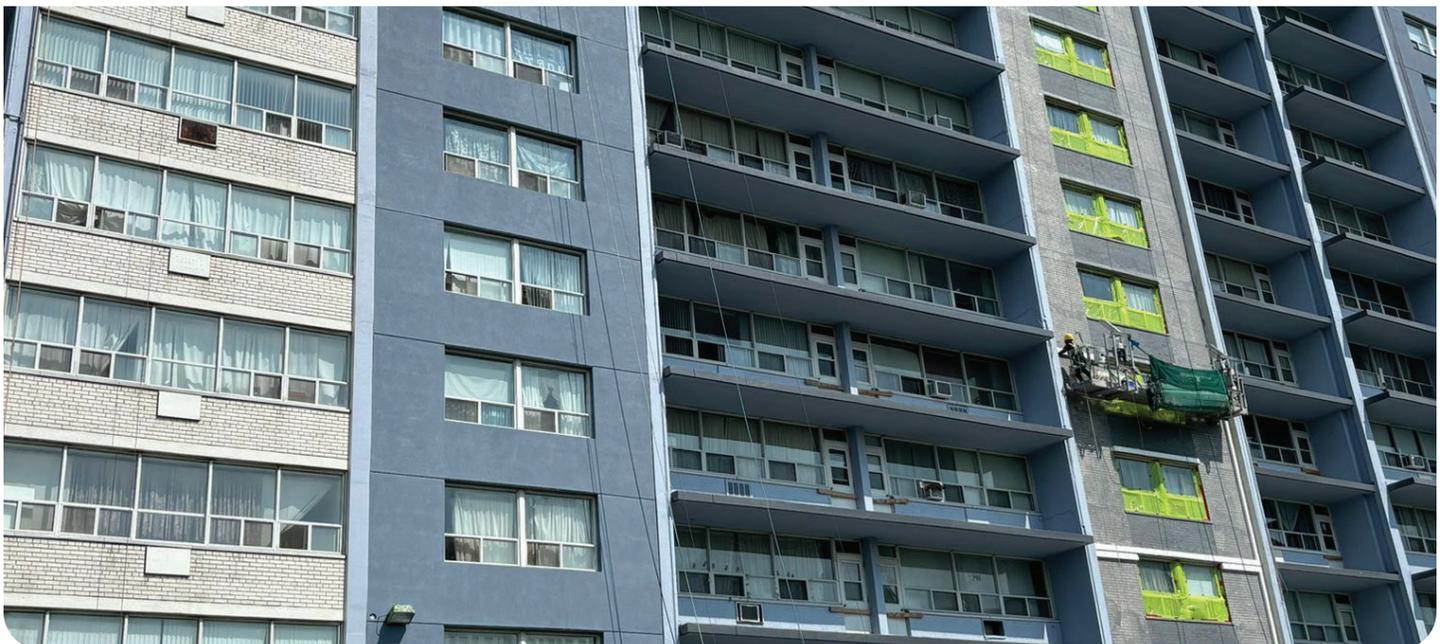
Project Challenges

- **Traditional vs. Innovative Materials:** Initially, traditional railings were selected. Transitioning to a BIPV system mid-project meant adjusting plans, budgets, and installation methods to accommodate the more advanced technology.
- **Budget & ROI Considerations:** The General Contractor, KingsGate Restoration Inc., needed to demonstrate to DIS Wilson (the owner of the building) that the additional upfront investment in BIPV railings would pay off through long-term energy savings and reduced maintenance cost.
- **Aging Infrastructure:** Prior to the retrofit, the building's original balcony railings and facade were showing significant wear and tear. Over time, the existing materials had become increasingly difficult to maintain, presenting a costly challenge for property management. The aging infrastructure not only detracted from the building's aesthetic appeal but also highlighted inefficiencies in upkeep costs, prompting a need for a more durable and sustainable solution.

Mitrex Project Solutions

- • **Seamless Integration:** By providing detailed guidance on custom coloring, external wiring, and installation adjustments, Mitrex ensured that the transition from traditional railings to innovative solar solutions went smoothly. Work was performed entirely from the outside, ensuring tenants remained undisturbed while the building benefited from cutting-edge energy solutions.
- • **ROI-Driven Approach:** The ROI-driven approach was an integral part of addressing the budget and ROI considerations. By illustrating the long-term financial benefits—including reduced operating and maintenance costs—KingsGate Restoration Inc. and DIS Wilson were able to justify the switch from traditional railings to Mitrex BIPV. This alignment of budget and sustainability goals helped ensure the project's overall success. With a positive ROI and marketing opportunities from this innovative installation, the project achieved both financial and sustainability goals.
- • **Energy-Generating Railings:** The Mitrex balcony BIPV solution turned traditionally unused space into an energy-generating asset. The 142 kW system results in a significant reduction in energy costs and supports the building's sustainability goals, providing both financial and environmental value. By replacing traditional railings with Mitrex's BIPV panels, the project demonstrates how innovative solutions can turn unused infrastructure into an energy powerhouse.

Key Takeaway: The challenges faced in this project—from transitioning to advanced materials, to addressing aging infrastructure, and ensuring a clear return on investment—were met with tailored solutions. Mitrex's BIPV panels not only improved the building's energy profile but also demonstrated that innovative materials can address complex retrofit challenges while delivering long-term financial and sustainability benefits.



Facade Design Process



1. Original Design

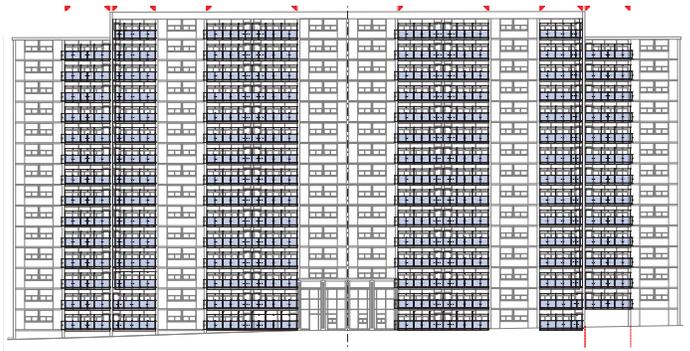
The project began by evaluating the building's structural and aesthetic needs. This included identifying the aging balcony infrastructure and determining the potential for photovoltaic integration.

2. Incorporating BIPV

The design team collaborated with the owner to create a custom color that matched the existing facade. This step ensured that the solar railings would seamlessly blend into the building's aesthetic, preserving visual integrity while introducing advanced solar technology.



Custom Color
⚡ Solar Railing



3. SolaRail™ Manufacturing

Once the design was finalized, Mitrex manufactured and produced Solar Railings that met both the structural and energy performance criteria. This phase also included quality checks to ensure long-term durability.

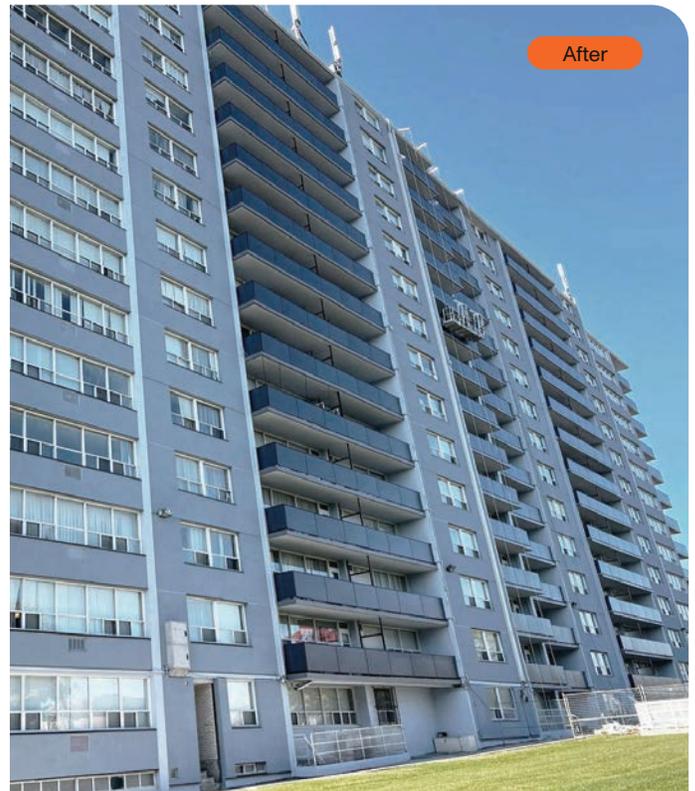


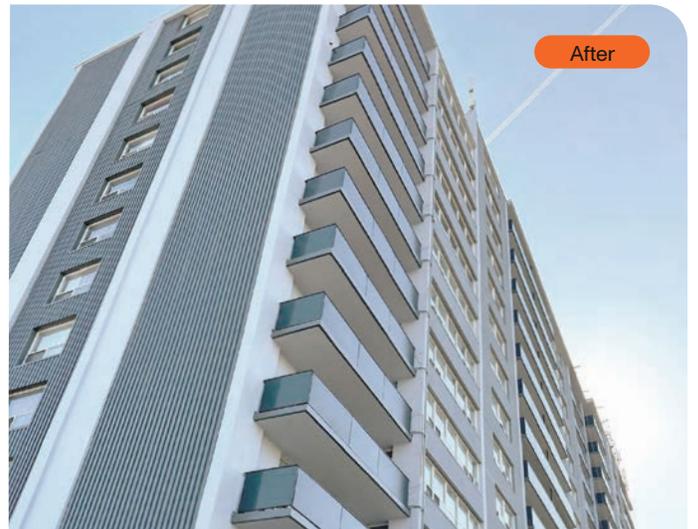
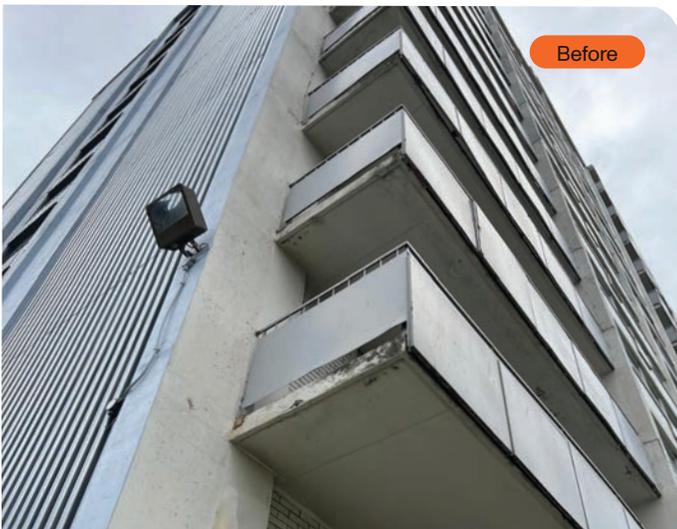
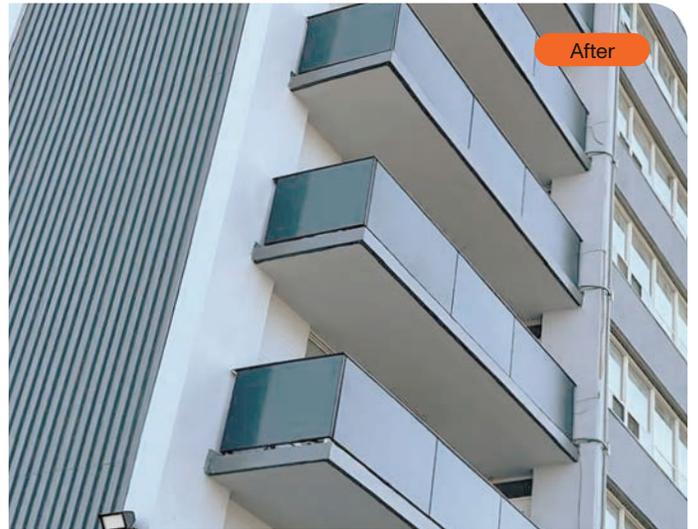
Facade Design Process



4. SolaRail™ Installation

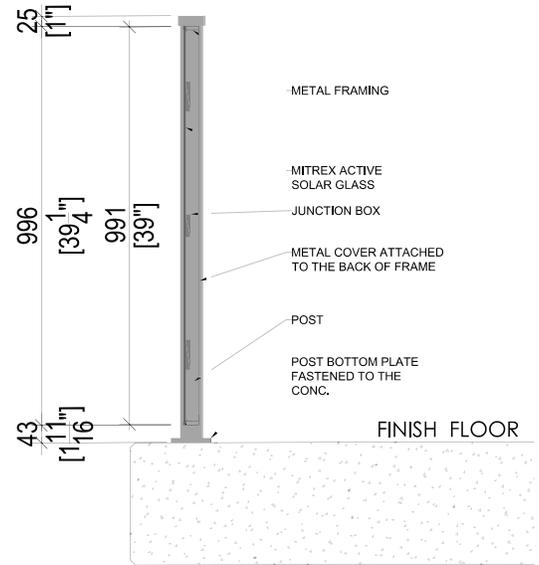
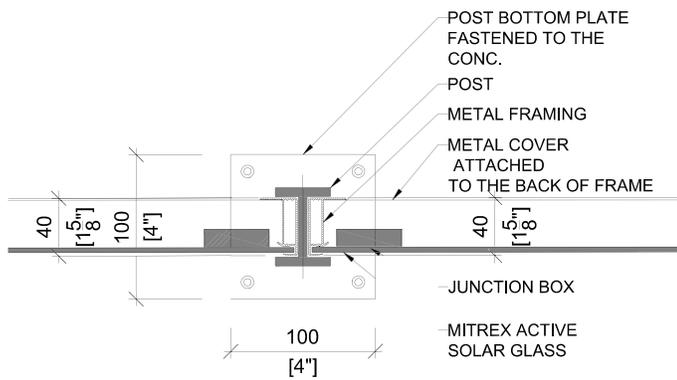
The installation was completed entirely from the building's exterior to ensure tenants remained undisturbed throughout the process. Using a swing stage, the Mitrex BIPV balcony panels were efficiently installed and seamlessly connected to the existing power infrastructure through Mitrex's plug-and-play system. The modular design allowed for a quick and clean installation, maintaining both the safety standards of a traditional balcony and the added value of energy generation—all without compromising visual appeal.





Architectural Details

The 1154 Wilson balcony retrofit was completed entirely from the exterior, allowing tenants to remain in place throughout the process and preventing any loss of revenue due to displacement. By conducting all work externally, the building was able to remain fully occupied while benefiting from renewable energy with minimal disruption. NoVi Engineering provided the necessary structural and electrical expertise, ensuring all electrical connections were routed externally, eliminating the need for interior work and avoiding any tenant inconvenience.



ROI & Cost Comparison

Energy Generation (Toronto, Canada)

● Orientation	System Size (kW)	Energy Estimation (kWh)
East	74	42,100
West	68	47,200
Total	142	89,300

ROI and Cost Comparison

- **Cost Parity with Traditional Railings:** Mitrex SolaRail™ solution was competitively priced, comparable to traditional balcony railings.
- **Long-Term Energy Savings:** Starting from the first year, the 142 kW system provides substantial energy savings that contribute to lower operational costs.
- **Maintenance-Free Durability:** With no additional maintenance requirements, the railings offer long-term cost benefits compared to traditional materials.

Project Impact

The integration of Mitrex SolaRail™ at 1154 Wilson Ave. underscores how innovative building technologies can transform standard retrofits into groundbreaking projects. Key outcomes include:

- **Energy Efficiency:** The photovoltaic railings generate power equivalent to adding 16 new residential units.
- **Sustainability Leadership:** Ten Block's decision to adopt BIPV aligns with their eco-conscious philosophy, enhancing their reputation as a forward-thinking, sustainable developer.
- **Enhanced Marketability:** By implementing cutting-edge technology, Ten Block sets a precedent for other property owners, showcasing the viability of BIPV systems in both financial and environmental terms.

This project serves as a template for future retrofits, demonstrating that standard building elements, such as balcony railings, can become powerful tools for sustainability and long-term cost savings.



Comparison: Project Energy Generation Per Location

Below is a comparison of Mitrex SolaRail™ system's performance in different regions. In regions like Texas, California, and New York, differing sunlight levels and energy costs impact the system's effectiveness:

● Orientation	System Size (kW)	Toronto, On (kWh)	Los Angeles, CA (kWh)	New York, NY (kWh)	Miami, FL (kWh)	Chicago, IL (kWh)	Houston, TX (kWh)
East	74	42,100	61,180	50,236	56,236	50,996	52,915
West	68	47,200	58,738	48,288	52,454	48,493	50,064
Total	142	89,300	119,918	98,841	108,690	99,489	102,979

- **Toll Free**

+1 (855) 254 0214

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mitrex.com

info@mitrex.com

- **Headquarters**

41 Racine Rd, Toronto, ON M9W2Z4, Canada

+1 (416) 497 7120

- **USA Office**

Chrysler Building, 405 Lexington Avenue Floor 26, New York, USA, 10174

+1 (646) 583 4486