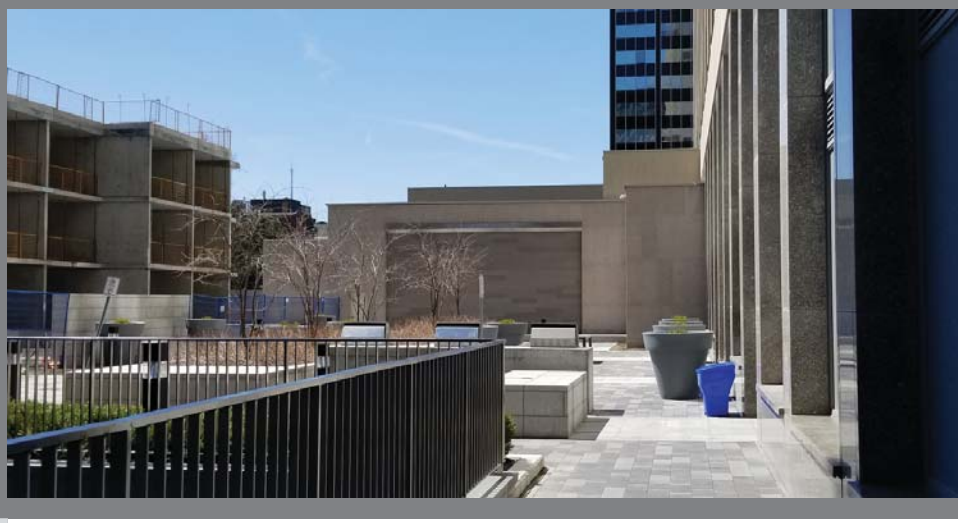
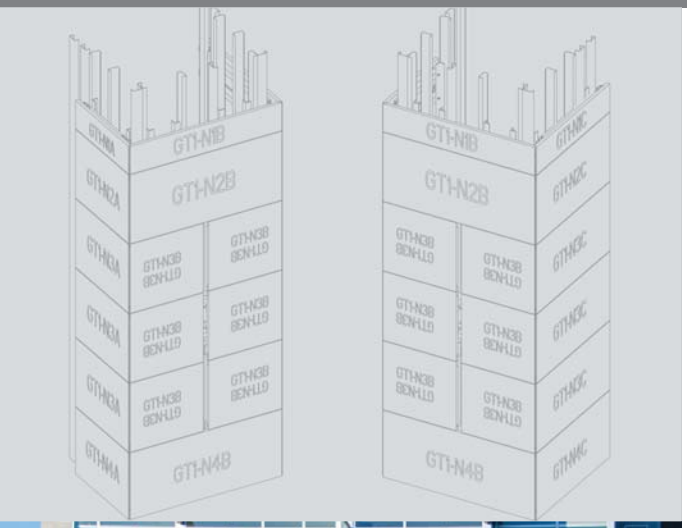
Walls
Columns
Soffits





TECWALL

Quick & Reliable Cladding

2016 TTMAC Hardsurface Awards Winning Project

2018 TTMAC Hardsurface Awards Winning Project

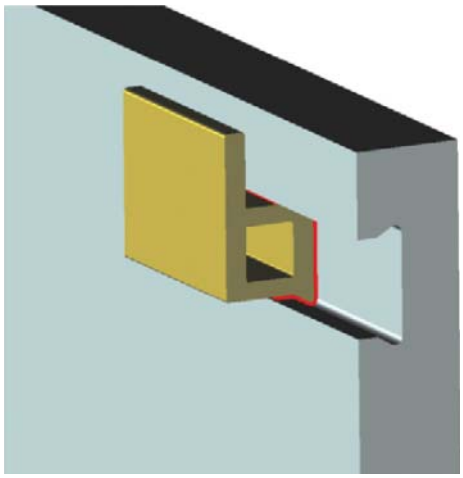
US and Canadian Patent

BY SUNNYWEI GROUP INC.

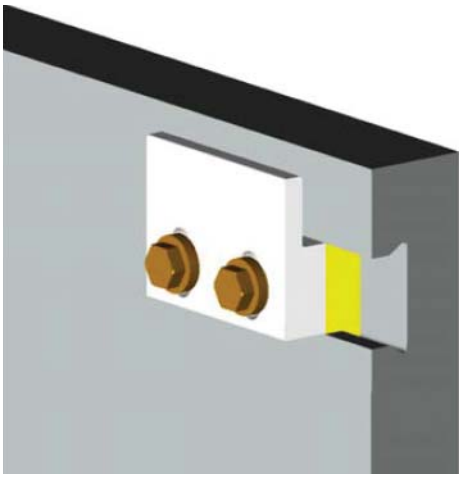
Design
Engineering
Supply
Installation

Sunnywei Group Inc's TECWALL System is able to be applied for **natural stone/porcelain Wall cladding, Columns and Soffits.** As comparing to commonly used methods recommended by ASTM C1242, SGI's TECWALL system is an innovative installation approach to greatly improve the quality and lower overall site labor costs by saving construction time.

The TECWALL is an US and Canada patented system by Sunnywei



Type I - Integrated Hanging Clip



Type II - Removable Hanging Clip


The Director of the United States Patent and Trademark Office

The United States of America

United States Patent

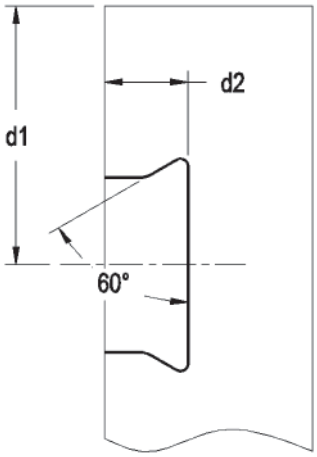
US Patent

TECHNICAL HIGHLIGHT

SGI's TECWALL system has many advantages as comparing to the conventional installation methods:

- Improved reliability as comparing to ASTM C-1242 recommended anchorage design
- Build-in anchor on panel or tile during shop fabrication
- Maximized shop fabrication for well-controlled product quality
- 3-Way adjustability for quick cladding installation on site
- Shared "in-line" back support design to save efforts on cladding alignment
- Innovative design with greatly improved seismic and wind loads resistance as comparing to ASTM C-1242 recommended anchor design
- Pre-engineered product by advanced finite element analysis method
- Low risk of stress concentration on high porosity material, such as travertine
- Excellent construction flexibility, such as flexible construction seauence
- Construction capability with minimum weather impact (low temperature)

The TECWALL System design varies according to the material types. The following table shows the general design requirements for some most commonly used materials.



Detail of Dovetail Groove

Type of Material	Flexural Strength (MPa)	d1 (mm)	d2 (mm)
Travertine	< 6	> 40	> 12
Granite	> 8	> 30	> 10
Porcelain	> 35	> 20	> 5

The TECWALL System can be used at different locations on the wall cladding. The following figures show some typical applications.

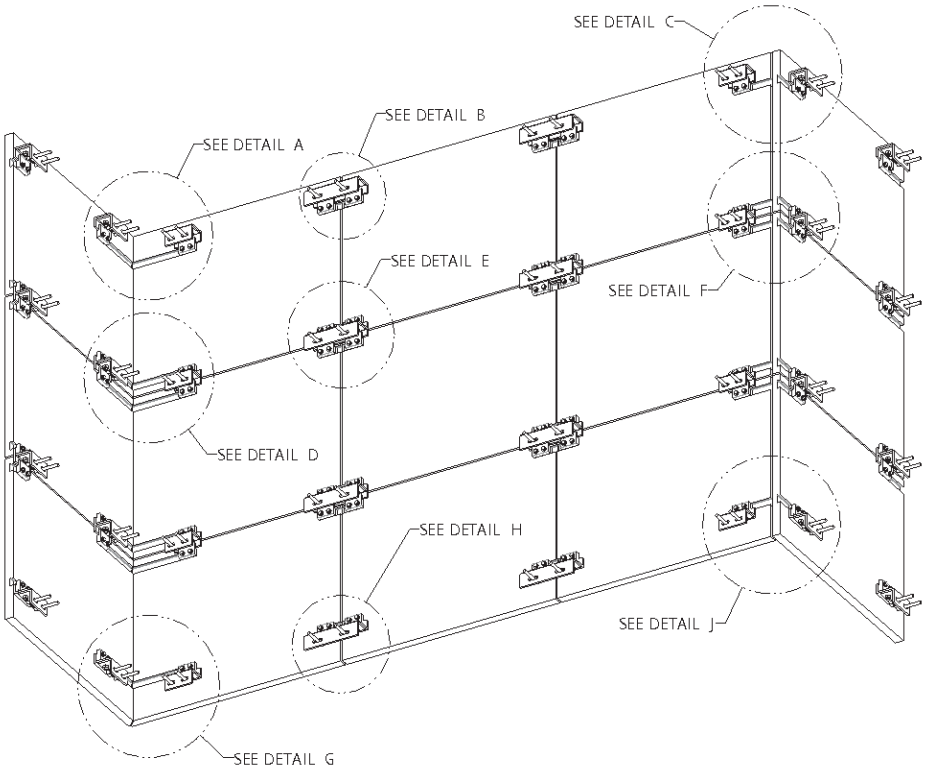


Figure 1. Typical Application of TECWALL System

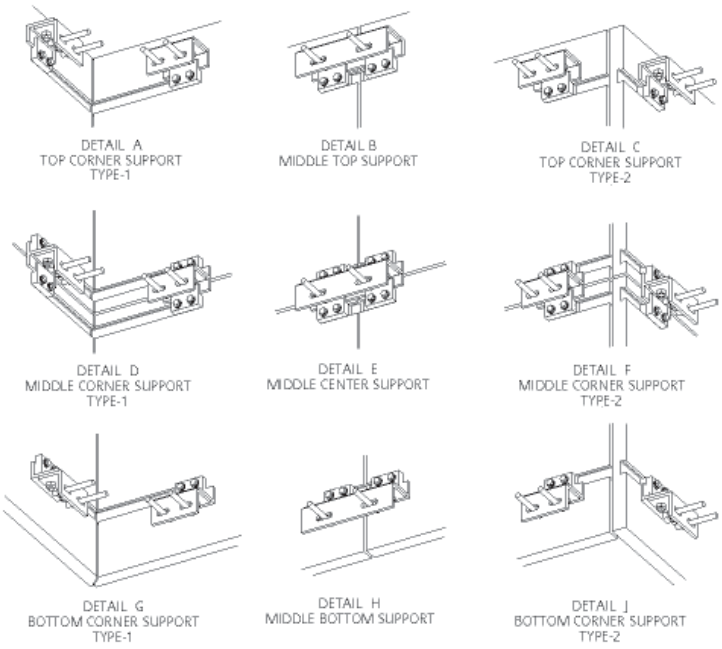


Figure 2. Details of Typical Installation

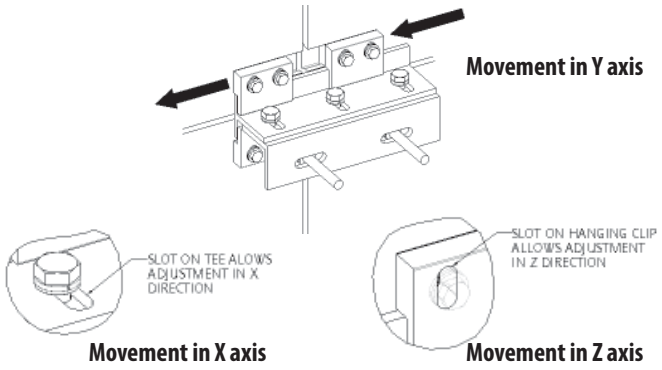


Figure 3. 3-Way Adjustability

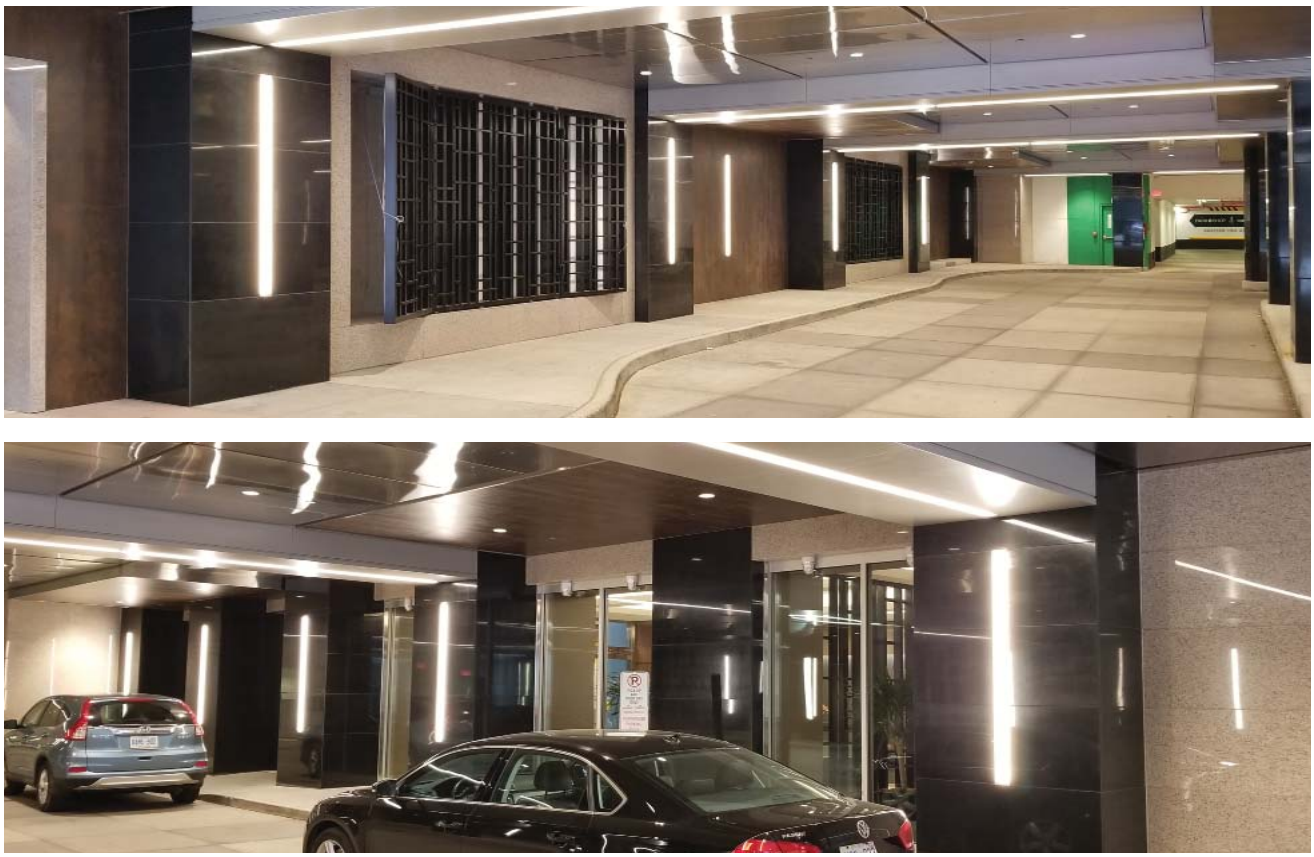


Figure 4 & 5. Application Photo (Toronto Imperial Plaza)

TECWALL System is a pre-engineered product designed by **registerted professional engineers in Canada** with advanced finite element analysis method. The following figures show the engineering details.

ADVANCED STRESS ANALYSIS

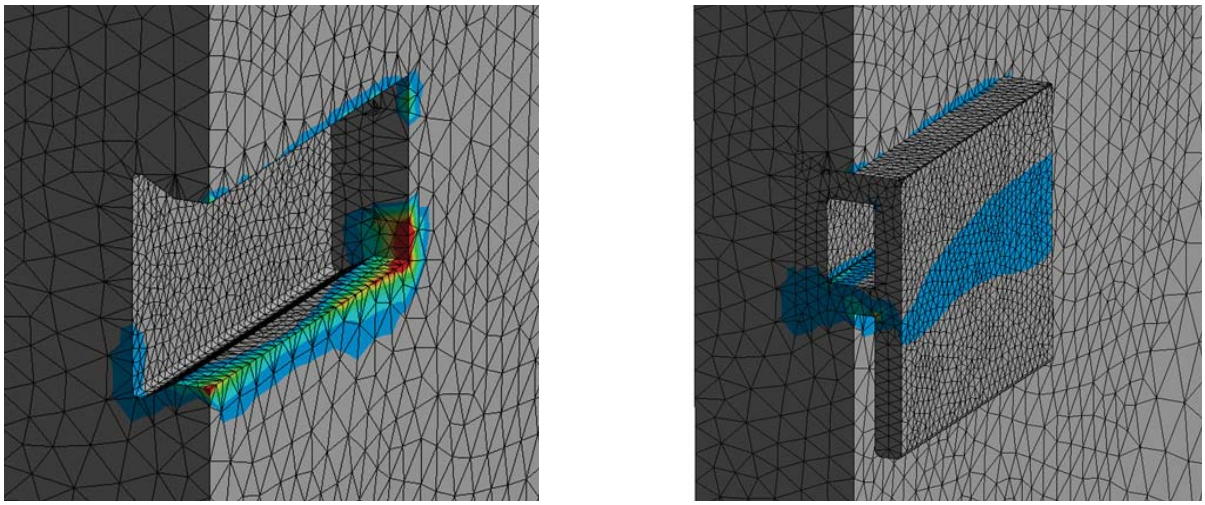


Figure 6. **Stress Analysis of Dovetail on Cladding Panel and Aluminum Hanging Clip Based on Given Design Load**

All TECWALL System hanging designs are checked in details for stress on wall cladding and hanging clips based on wind load, seismic load, dead load, impact load and other specified loads as required. This makes sure that there is no place on the cladding where the stress is higher than the allowable stress defined by the applicable industrial stands and client's specification.

Figure 7 & 8. **Application Photo (Windsor City Hall)**

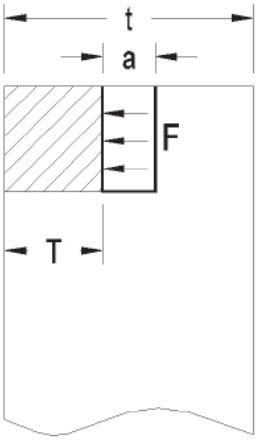


Figure 9. **ASTM C-1242 Recommended "Dowel" or "Kerf" Anchor**

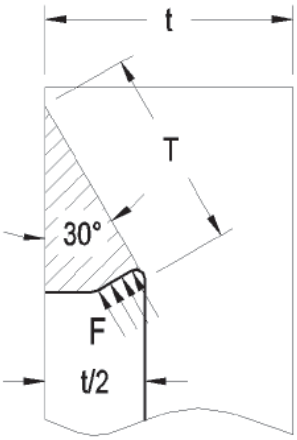


Figure 10. **SGI TECWall Anchor**

Under external loads, such as wind load, the TECWALL dovetail-shaped anchor design shows dramatically increased effective length in taking the applied force, see figure 6 and 7.

In the traditional ASTM C-1242 recommended anchorage method, when the force "F" is applied on the load bearing surface, the effective sectional area in taking the bending and shear is:

$$A = T \times L \text{ (L is the length of slot)}$$
$$T = (t - a) / 2$$

In SGI TECWALL anchor design, the values of A and T is increased as shown below:

$$A = T \times L \text{ (L is the length of dovetail-shaped groove)}$$
$$T = (t / 2) / \sin(30°) = (t / 2) / 0.5 = t$$

As a result, the effective area in take shearing load and bending resistance is significantly increased.

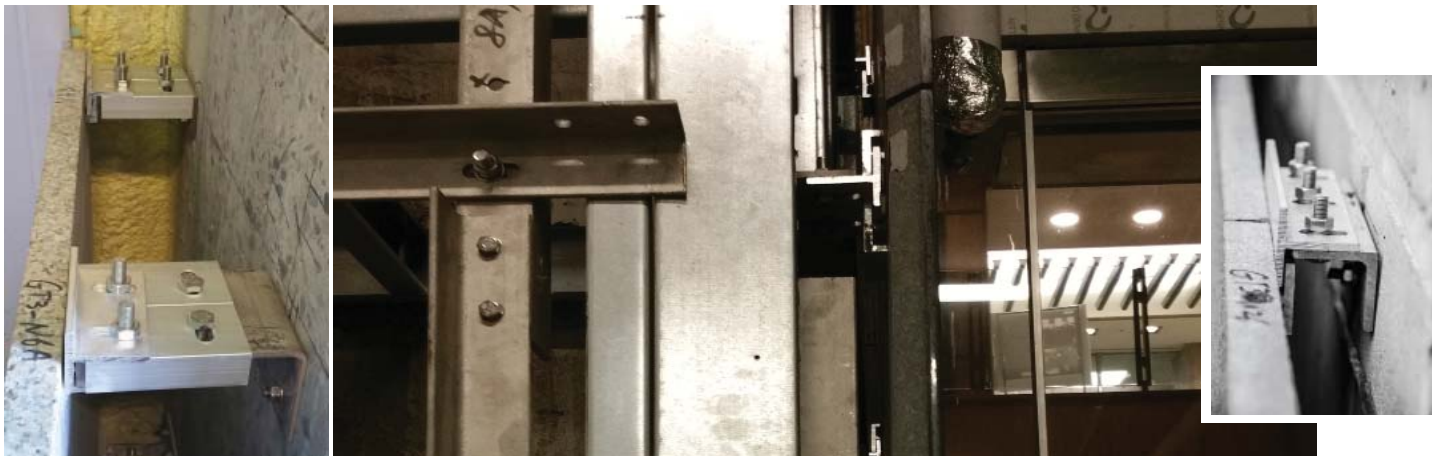


Figure 11. **Application Photo (Anchors, Clips and Support Framing)**

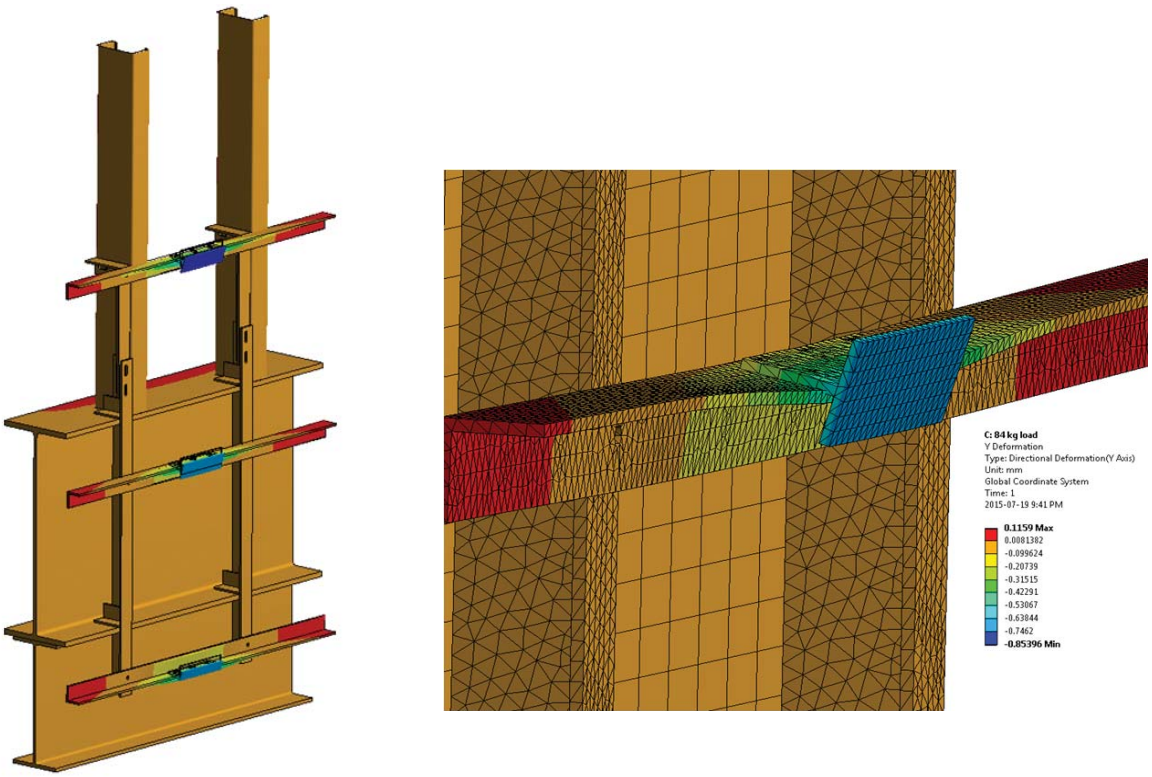


Figure 12. **Deflection of Support Framing System Under Given Design Load**

When TECWALL System is applied on structural framing, the deflection of each member is checked by advanced engineering method. This makes sure that deflection will be within the allowable limit and won't cause the accumulated tolerance issue.

Figure 13. **Application Photo (Support Framing of Columns)**

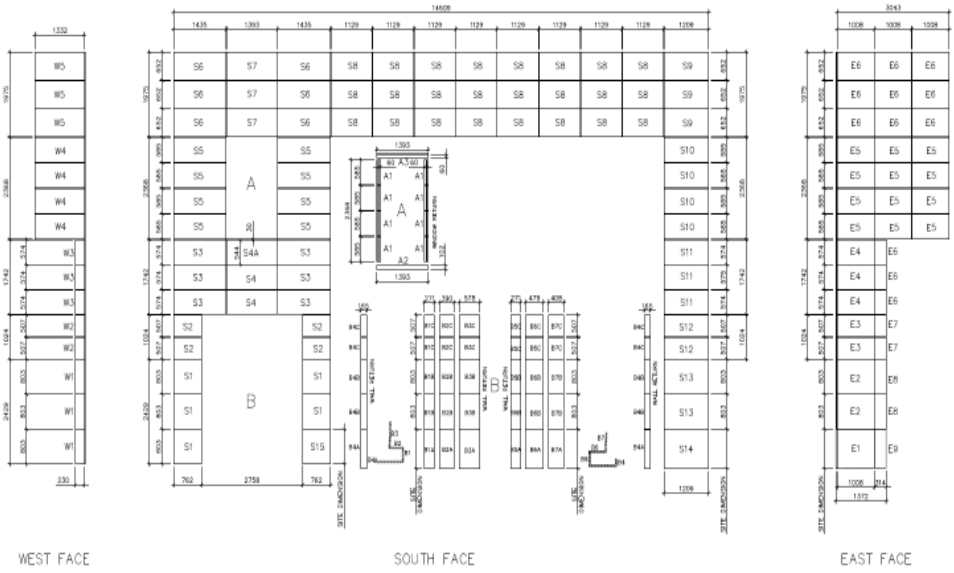


Figure 14. 2D Layout Design of Building Walls (Cinergy Medical Building)

Figure 15. Appliacation Photo (Cinergy Medical Building)

Figure 16. Appliacation Photo (Toronto Imperial Plaza Columns)

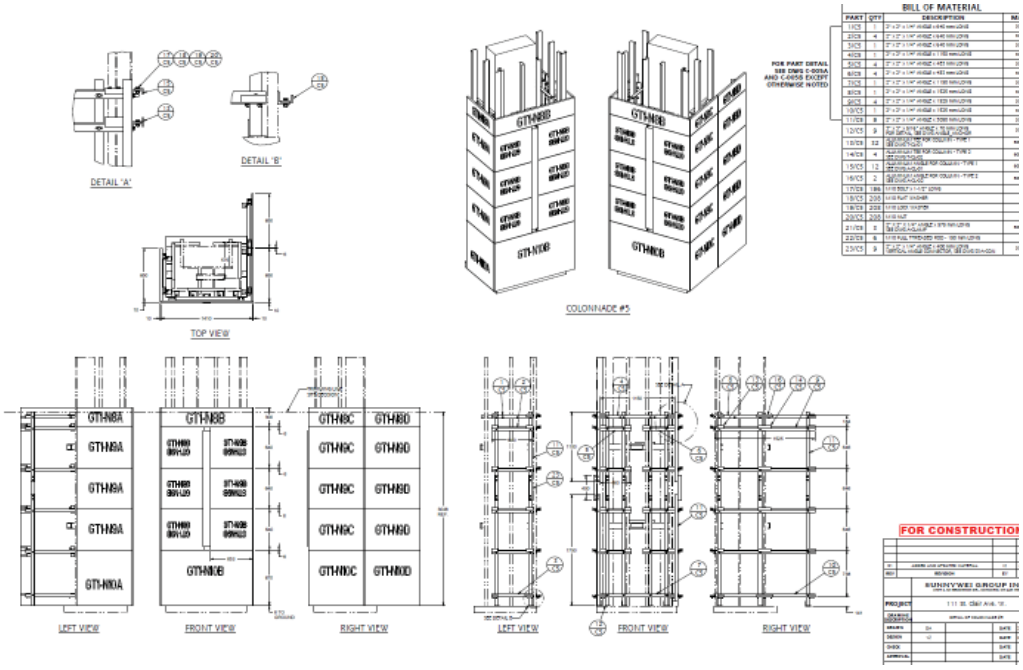


Figure 17. 2D & 3D Layout Design of Customized Columns & Support Framing (Toronto Imperial Plaza)

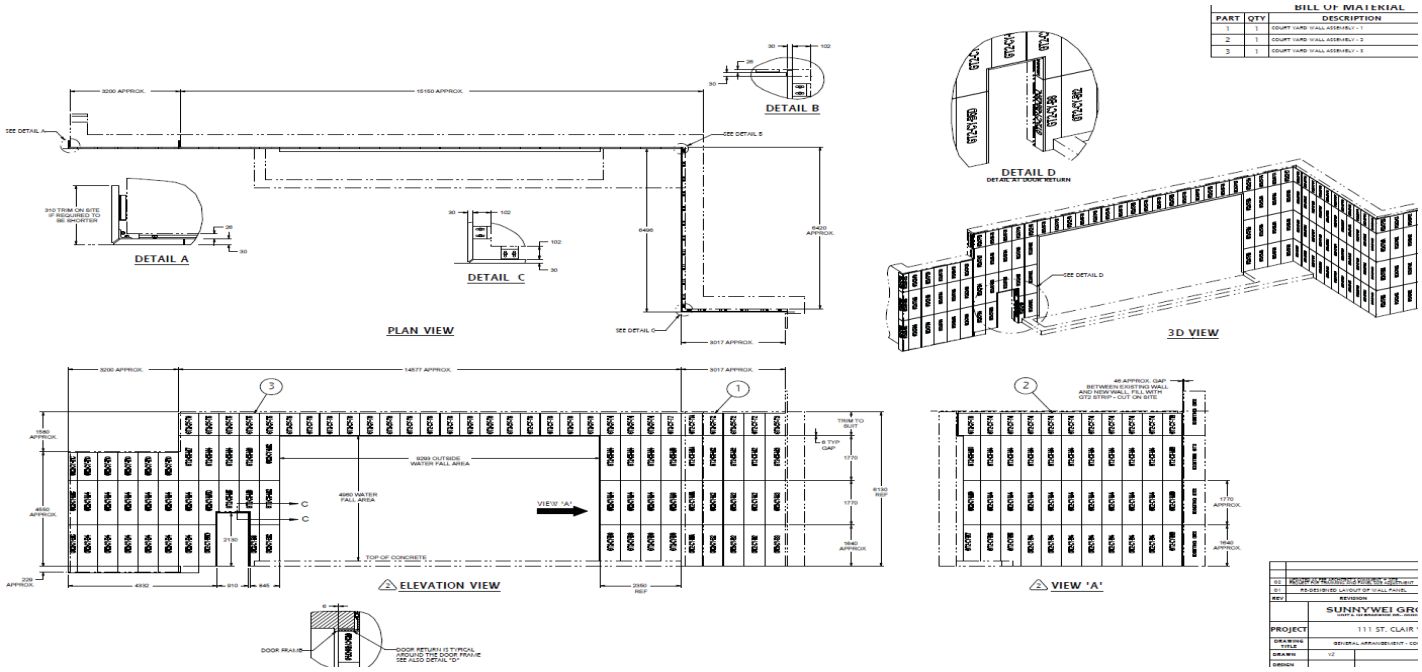


Figure 18. 2D & 3D Layout Design of Building Walls (Toronto Imperial Plaza Court Yard Wall)

Figure 19. Appliacation Photo (Toronto Imperial Plaza Court Yard Wall)

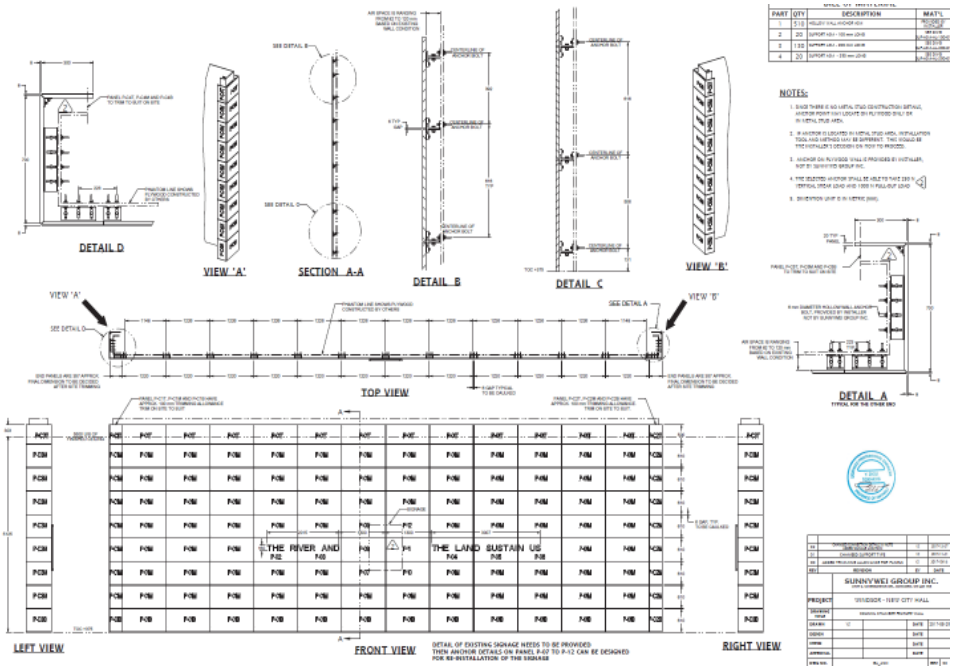


Figure 20. 2D & 3D Layout Design of Walls (Windsor City Hall)

Figure 21. Application Photo (Windsor City Hall-Walls)

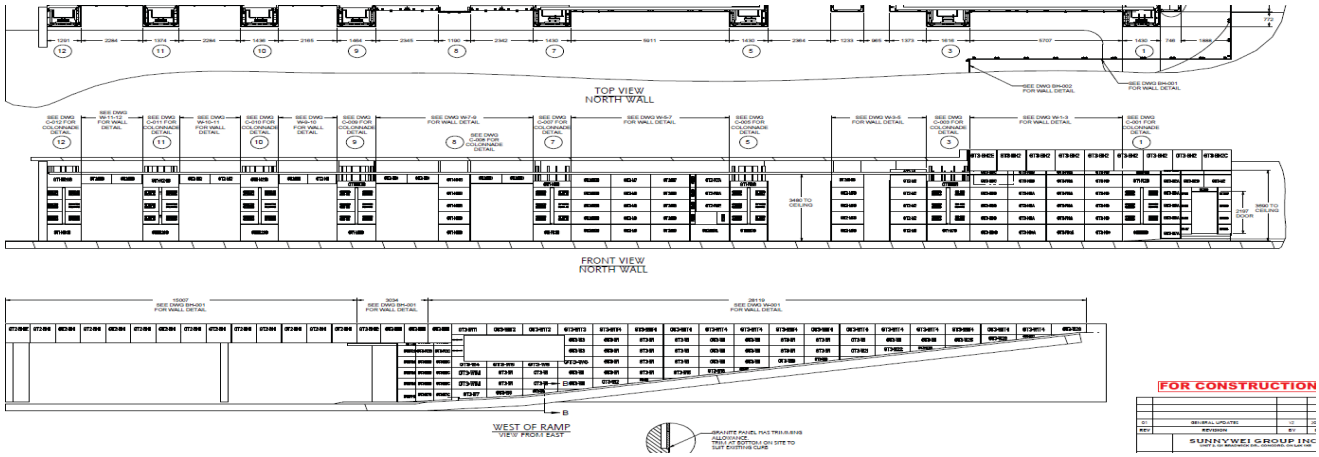


Figure 22. 2D Layout Design of Walls and Columns (Toronto Imperial Plaza)

Figure 23. Application Photo (Toronto Imperial Plaza - Walls and Columns)

Soffit Application

- Stone soffit is always a very challenging design due to its safety consideration.
- Sunnywei's TECWALL system can provide soffit hanging design in a very simple and secure way by which a wide selection of stone materials with different thickness can safely installed.
- TECWALL system can be used not only for flat soffit but also for sloped soffit (with an angle).
- TECWALL system is a low cost system as comparing to conventional stone soffit installation method.
- TECWALLsystem has been specified by architect firms as a standard installation method.

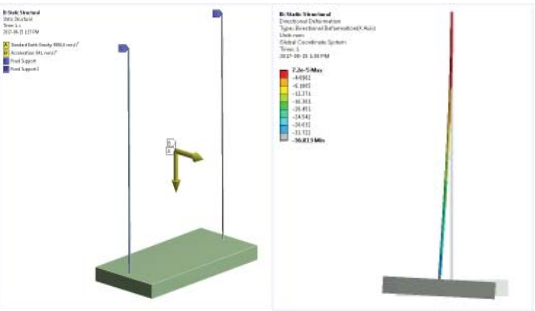


Figure 24. Soffit - Load and Deflection Analysis

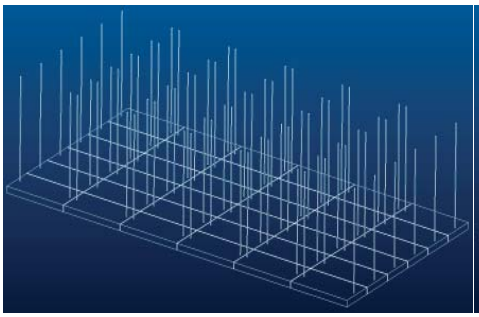


Figure 25. Soffit - Rod Design

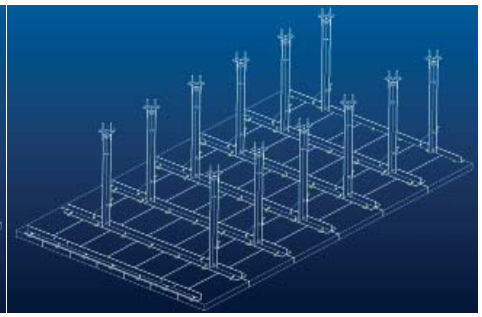


Figure 26. Soffit - Angle Design

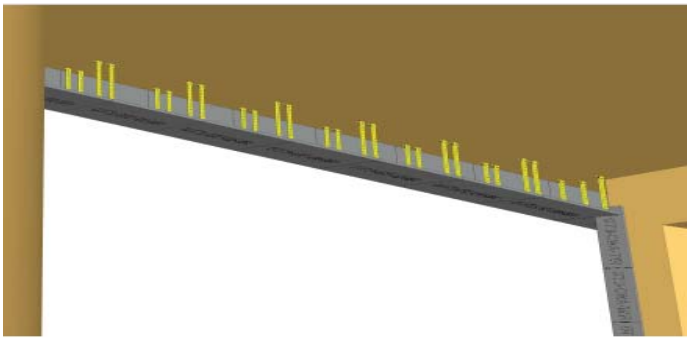


Figure 27. Soffit - 3D Design

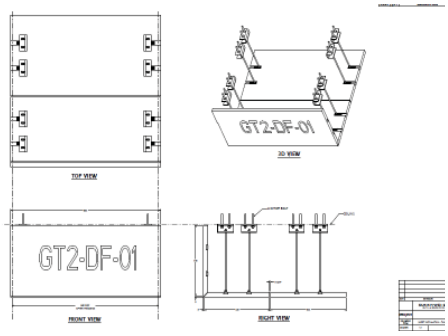


Figure 28. Soffit - 2D & 3D Details of Panel

Figure 29. Application Photo of Soffit (Toronto Imperial Plaza)

TECWALL Cladding is an integrated system of design, engineering, fabrication and services. SGI can supply this product not only on our own cladding material but also on client's provided material. The following flow chart shows a general working procedure to order our services and products.

Client		Sunnywei Group Inc.
Provide architect & civil engineering drawings and documents	⇄	Study and inquiry
		↓
		Site visit (if possible)
		↓
Client's approval	⇄	Quotation
		↓ (if approved)
Client's approval	⇄	Create Detailed design drawings data sheet and documents
		↓
		Fabrication
		↓
		Shipping to job site
		↓
		Installation and Site technical support if required

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