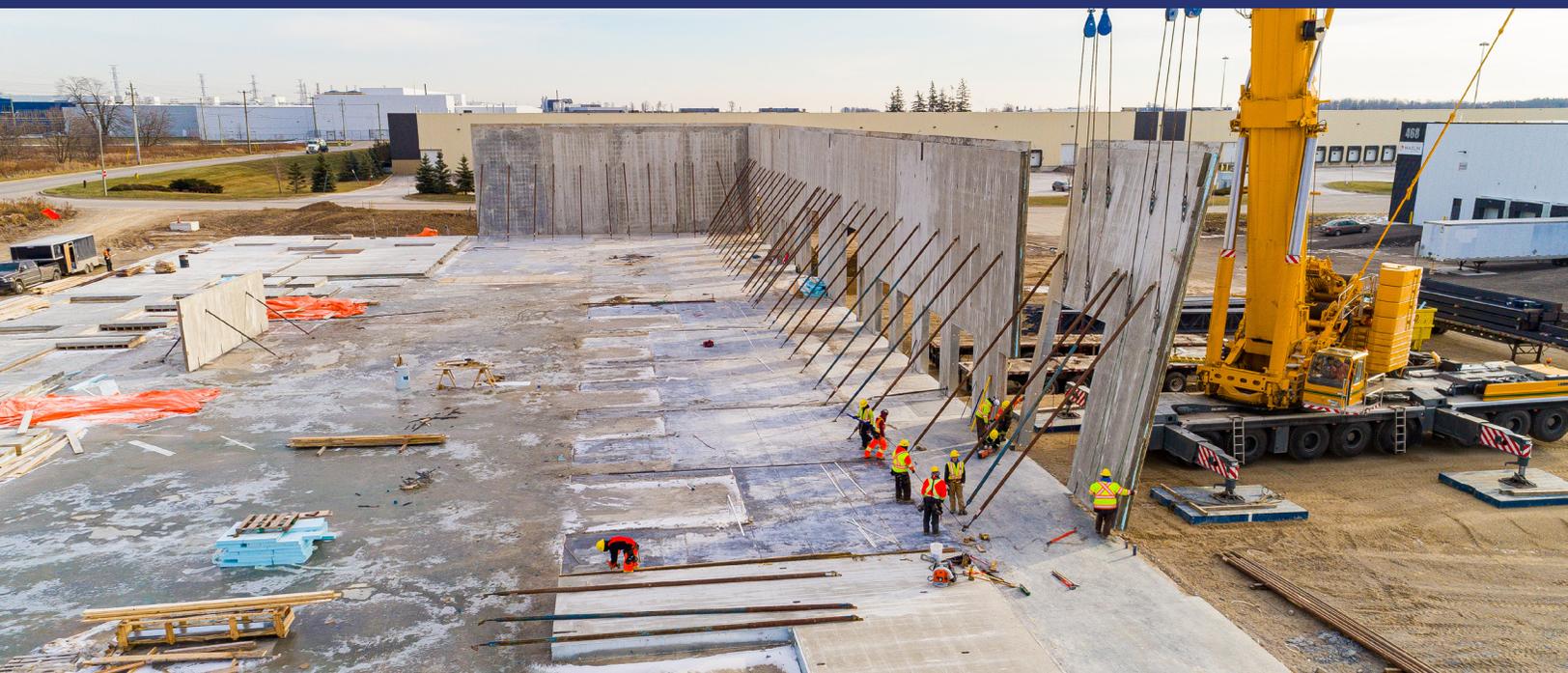


# Introduction Bundle

A Smart Way to Build Warehouses



Tilt Wall Ontario Inc.

[Tiltwall.ca](http://Tiltwall.ca)

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519-602-2990

# Introduction

## TILT WALL'S WAREHOUSE CONSTRUCTION MAKES BUSINESS SENSE

This document will educate you on many of the benefits of choosing tilt-up construction for your next warehouse project. This is how we take care of business!

**Tilt Wall Ontario is a subcontractor committed to bringing a superior building product to the Ontario construction industry since 2002. With our tilt-up construction and design experience we are able to assist our clients in designing buildings with lasting beauty and value.**

Tilt-up construction is a method of building developed more than 100 years ago where walls or building elements are cast on-site. They are lifted (tilted) into place and braced until permanent structural connections are completed. Tilt-up walls can be insulated and/or load bearing with a wide variety of finishes. The many applications of the tilt-up system deliver quality, speed, economics, durability and beauty. With more than 60 buildings and 3,000 panels comprising over a million square feet of panels Tilt Wall has become a leader in tilt-up construction in Ontario.

Over the years, Tilt Wall has built an impressive portfolio featuring a wide range of complex projects, from educational institutions like the University of Guelph's Bio-Products Discovery and Development Centre to multi-storey residential buildings like Muskoka Bay Resort's condominium. In doing so, Tilt Wall has received many industry accolades: 6 Ontario Concrete Awards, 5 Tilt-Up Concrete Association Awards and the TCA's 2018 Contractor of the Year.

Tilt-up construction is able to offer the following advantages:

- Energy efficiency through 100% continuous insulation and zero thermal bridging
- Thermal mass storage through exposed interior concrete
- Durability on the exterior and interior with solid concrete
- Flexibility in interior and exterior design
- Structural integrity with load-bearing concrete panels
- Security and safety
- Sustainability
- Speed of construction
- Cost saving



# Tilt-Up Advantages



## ▶ Energy Efficiency

Insulated tilt-up panels come in a variety of type and thickness of rigid insulation, ranging from 50mm to 200mm thickness. To form insulated concrete walls, concrete is poured on both sides of the foam and the finished panel is held together with a non-thermal conductive fiberglass tie. The thickness will be determined by the thermal characteristics of the insulating material and the thermal loads on the structure. Insulation values range from R10 to R67. The higher the R value the lower the HVAC demands. Large tilt-up panels have sealed joints, reducing uncontrolled infiltration. In a site-cast tilt-up panel, the insulation is 100% continuous, spanning from edge to edge and top to bottom. The insulation is protected from sun, rain, wind, rodents and bugs by the concrete once the panels have cured. The rigid insulation is protected in the panel and retains its R-value over time.

## ▶ Thermal Mass

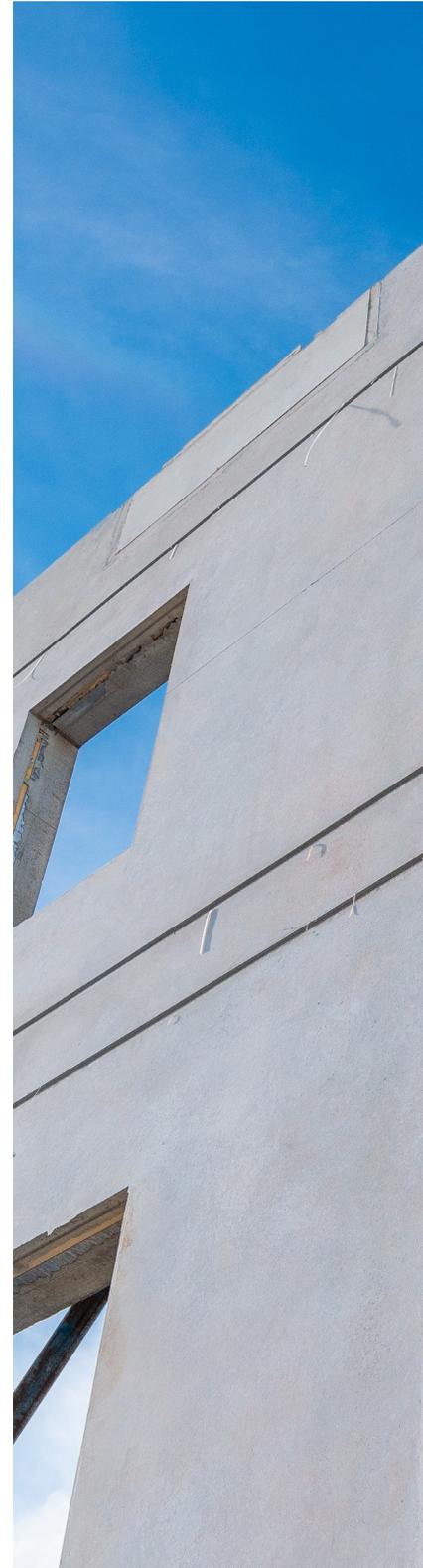
The panel's excellent thermal mass characteristics make it one of the most energy efficient methods of construction. Tilt-up concrete sandwich wall panels used as an interior surface can save materials by eliminating the need for interior framing and drywall, all while allowing concrete to gradually store and release heat to help moderate daily temperature swings. Thermal mass can improve comfort, resiliency and save energy.

## ▶ Durability

Concrete panels are low maintenance, which means cost savings for the entire life of the structure. Normal exterior concrete strength is 30 MPa with air to help it through the freeze-thaw cycles that exterior of building are subject to. Solid concrete on the exterior helps protect the insulation and structural integrity of the building from natural elements such as wind-driven rain, gale force winds, fires and extreme temperature swings all which can deteriorate a building over time. The panels are a cost-effective, energy-efficient, durable, strong and fire-resistant cladding system that will outlast most other building methods.

## ▶ Design Flexibility

Using one of the most fluid building products on the market means that any tilt-up building can be attractive which you can take great pride in. Textures produced by form liners and other methods can result in a wide variety of finish patterns including stone, brick, wood grains and others. An unlimited array of colourings can be added to the concrete, or coatings can be applied after the fact for beautiful affects. Interior wall panels with a smooth finish will resist everyday wear and tear, provide a clean, durable and mold resistant surface no matter the occupancy.





## ► Structural Integrity

Tilt-up panels are load bearing, meaning they eliminate the need for beams and columns along exterior walls. They are usually designed to span between the foundation and roof beams without the need for additional intermediate supports. They can accommodate a variety of loads, including wind, seismic, equipment, structural loads and provide blast resistance.

## ► Security

Tilt-up concrete applications offer superior fire resistance compared to conventional construction materials. The sandwich panels can provide up to 4 hours fire resistance, they have inherent fire containment characteristics, they add safety and security which can improve insurance rates and speed mortgage approvals. Damage to a concrete building is generally minimal and easily repaired. Tilt-up structures withstand wind and hail storms and are impenetrable by the smallest rodent, insect, or even the most determined human.

## ► Sustainability

The raw materials used in tilt-up panel construction are generally sourced locally, reduces construction waste, and minimizes transportation and disposal costs. They can be designed to be disassembled, saving materials and extending the life of the panels. The durability creates a long life-cycle with low maintenance, reducing the need for replacement and maintenance during a building's life.

## ► Speed of Construction

In tilt-up construction much of the work on the walls is done simultaneously. As the walls are built the exterior and interior finishes are completed along with the insulation, air and vapour barriers. Since tilt-up panels are load bearing, the footing and foundation work tends to be simpler also speeding up the construction process. When required a temporary casting slab can be used on-site, which further accelerates the schedule. With 90% of the work happening at ground level the need for scaffolding and aerial work is also minimized, once again speeding up productivity.

## ► Costs

The speed of construction allows for earlier occupancy and reduces the overall construction time and costs. Elimination of most exterior steel columns and piers can also be a significant savings. With tilt-up being an all-in-one exterior wall system much of the small costly details around openings, parapets and transition points in construction materials and finishes is eliminated.

# Tilt-Up Process

## 1 Site Preparation & Foundation Slab

All required materials and equipment are gathered for the job. Next, the concrete floor slab is poured.



## 2 Forming Wall Panels & Adding Formliners

The crew assembles the panel forms on the floor slab. The panel forms serve as molds for the concrete. Each form provides the panel's exact shape and size as well as openings for doors and windows.

## 3 Pouring Outer Layer & Adding Insulation

Concrete is poured into the prepared forms to create the panels. Sandwich insulation is also encased into each building panel to give tilt-up structures true edge-to-edge insulation.



## 4 Panel Reinforcement, Inserts and Embeds & Pouring Inner Layer

Up next, workers tie in the steel grid to reinforce bars into each form. This part of the process gives the panels additional structural integrity. Workers also install inserts and embeds, which will be used to lift the panels later. Then the inner layer of concrete is poured.



## 5 Lifting Concrete Panels In Place

The concrete panels are given time to solidify; The crew then connects the panels to a crane. The crane then lifts the panels from the floor slab into position. From here, the workers will connect the panel's braces to the slab.

## 6 Panel Finishings & Caulking Joints

During the last step of the process, the building begins to look like a finished product. Exterior walls are finished and the joints are also caulked to prevent water penetration.



# Cost Comparison

Choosing the right building method requires a thorough analysis of the construction methods available to get an accurate comparison on construction costs and long-term savings.

Items to consider when computing the total cost of building construction include:

- Savings to excavation
- Elimination of exterior piers and columns
- Savings to perimeter steel
- Elimination of multiple trades
- Speed of construction and reduction of overhead

	Tilt-Up (7-month schedule)	Conventional (9-month schedule)
General requirements	\$ 618,478.00	\$ 738,478.00
Concrete work	\$ 930,842.00	\$ 1,367,497.00
Masonry and precast		\$ 1,419,738.00
Tilt-up	\$ 1,460,000.00	
Interior demising walls	\$ 216,486.00	\$ 472,486.00
Structural steel/misc metals	\$ 998,580.00	\$ 1,520,180.00
Contingencies	\$ 211,219.30	\$ 275,918.95
<b>Total</b>	<b>\$ 4,435,605.30</b>	<b>\$ 5,794,297.95</b>

Savings on a 81,000 sq. ft. building

Savings with Tilt-up in \$: 1,358,692.65

Savings with Tilt-up in %: 23.40%

# Energy Usage Comparison

Among its many benefits, one of the biggest draws of tilt-up construction is its energy efficiency. At a time when environmental impact is top of mind and school districts are looking for ways to cut energy costs, tilt-up buildings are an ideal solution.

Some of Ontario's school districts have the unique challenge of responding to drastic enrollment increases while increasing the sustainability of their buildings. Tilt-up makes it possible to achieve both goals.

Tilt-up construction takes advantage of concrete's thermal mass properties as well as more energy-efficient insulation systems and reduced air infiltration. This results in less air leakage and stable indoor temperatures, which can cut energy costs by up to 35%.

## Traditional Construction VS Tilt-Up Construction



### York Region School Board Average

Electrical:	5.29	kWh
Gas:	1.00	m <sup>3</sup>



### King Christian School

Electrical:	4.58	kWh	-14%
Gas:	0.58	m <sup>3</sup>	-42%



### CEPEO School Board Average

Electrical:	12.4	kWh
Gas:	1.24	m <sup>3</sup>



### Des Sentiers School

Electrical:	9.30	kWh	-25%
Gas:	0.39	m <sup>3</sup>	-68%

\*School energy usage per square feet

# Project Profile



## PPFD New Facility

PROJECT LINK: [Tiltwall.ca/project/ppfd-new-facility-whitby-ontario-2016-2/](http://Tiltwall.ca/project/ppfd-new-facility-whitby-ontario-2016-2/)

“Tilt-up was recommended based on efficiencies from the standpoint of operating the building, as well as construction timing and costs,” says PPFD chief operating officer Aaron Kee. This offered significant energy savings over the life of the building. The project required 88 tilt-up panels with Tilt Wall using the Delta Tie Insulated Sandwich Panel Thermal System to provide 39,665 square feet of continuous insulation.

<b>PROJECT:</b>	PPFD New Facility	<b>SQUARE FOOTAGE OF PANELS:</b>	39,665 sq ft
<b>ADDRESS:</b>	180 William Smith Drive, Whitby, Ontario	<b>NUMBER OF PANELS:</b>	88
<b>YEAR BUILD:</b>	2016	<b>HEAVIEST PANEL:</b>	91,245 lbs
<b>ENGINEER OF RECORD:</b>	WalterFedy	<b>TALLEST PANEL:</b>	40'-0"
<b>GENERAL CONTRACTOR:</b>	Johnson Building Construction Inc	<b>LARGEST PANEL:</b>	1,561 sq ft
<b>BUILDING USE:</b>	Distribution Warehouse		



**LIFTING PANELS**  
Lifting from the interior of the building speeds up the erection of tilt-up panels.



**ERECTED PANELS**  
Load-bearing insulated panels shortened the construction timeline.

# Project Profile

## Copper Wire Stripper Warehouse

PROJECT LINK: [Tiltwall.ca/project/copper-stripper-warehouse-woodstock/](https://tiltwall.ca/project/copper-stripper-warehouse-woodstock/)

Tilt Wall exceeded its client's expectations by demonstrating the strength of the tilt-up construction process at this 10,000 sq.ft. warehousing project in Woodstock, Ontario. The insulated concrete panels greatly reduce the amount of noise emanating from the facility, which is beneficial since a residential neighbourhood is only one block away. The durable walls and insulated panels will ensure the building stands for decades to come.

<b>PROJECT:</b>	Copper Wire Stripper Warehouse	<b>SQUARE FOOTAGE OF PANELS:</b>	7,692 sq ft
<b>ADDRESS:</b>	Woodstock, Ontario	<b>NUMBER OF PANELS:</b>	24
<b>YEAR BUILT:</b>	2020	<b>HEAVIEST PANEL:</b>	40,300 Lbs
<b>ENGINEER OF RECORD:</b>	Stonecrest Engineering	<b>TALLEST PANEL:</b>	19'-5"
<b>GENERAL CONTRACTOR:</b>	Owner	<b>LARGEST PANEL:</b>	539 sq ft
<b>BUILDING USE:</b>	Processing Facility		



### CASTING PANELS

Each of the panels was cast on the warehouse's floor before being tilted into place.



### POURING PANELS

East Elgin Concrete Pumping poured concrete into the forms.

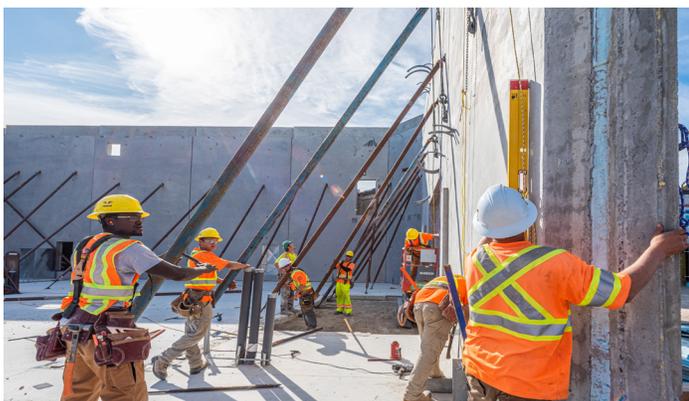
# Project Profile

## Lakeland Developments Warehousing

PROJECT LINK: [Tiltwall.ca/project/lakeland-developments-warehousing-barrie-ontario-2019/](https://tiltwall.ca/project/lakeland-developments-warehousing-barrie-ontario-2019/)

The Lakeland Developments Warehousing Project was a prime example of the speed of tilt-up construction. Panel construction began on September 9, and panels were erected in just 8 hours over the course of October 7-8. In addition to a short construction schedule, tilt-up construction helped reduce overall costs for this warehouse. Tilt-up will also enable the building owners to operate the space more efficiently over time.

<b>PROJECT:</b>	Lakeland Developments Warehousing	<b>SQUARE FOOTAGE OF PANELS:</b>	19,950 sq ft
<b>ADDRESS:</b>	50 Lockhart Road Barrie, Ontario	<b>NUMBER OF PANELS:</b>	45
<b>YEAR BUILT:</b>	2019	<b>HEAVIEST PANEL:</b>	63,750 lbs
<b>ENGINEER OF RECORD:</b>	StructuralEdge Engineering	<b>TALLEST PANEL:</b>	29'-4"
<b>GENERAL CONTRACTOR:</b>	Lakeland Developments Warehousing	<b>LARGEST PANEL:</b>	946 sq ft
<b>BUILDING USE:</b>	Warehouse		



**LIFTING PANELS**  
Cranes are brought in to do the heavy lifting of the panels- the heaviest panel was 63,750 lbs.



**WALL DETAIL**  
Beautiful architectural elements are worked into the design prior to casting.

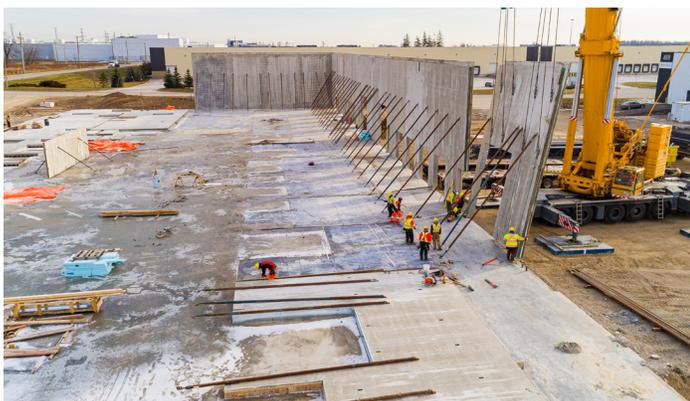
# Project Profile

## Granval Warehousing

PROJECT LINK: [Tiltwall.ca/project/granval-warehousing-woodstock-ontario-2019/](https://tiltwall.ca/project/granval-warehousing-woodstock-ontario-2019/)

This multi-tenant industrial warehouse project began in fall 2019. The first floor was formed on October 15, and panel construction started October 21. The first section of walls was lifted into place in early December, and the remaining walls were lifted in early 2020. Though the warehouse is quite large, totalling 100,000 sq. ft., it was designed to be divided into 10 separate units, with each one measuring 10,000 sq. ft.

<b>PROJECT:</b>	Granval Warehousing	<b>SQUARE FOOTAGE OF PANELS:</b>	54,364 sq ft
<b>ADDRESS:</b>	377 Woodbridge Ave, Woodstock, Ontario	<b>NUMBER OF PANELS:</b>	45
<b>YEAR BUILT:</b>	2019	<b>HEAVIEST PANEL:</b>	120,000 lbs
<b>ENGINEER OF RECORD:</b>	GranVal Construction Inc.	<b>TALLEST PANEL:</b>	34'-9"
<b>GENERAL CONTRACTOR:</b>	Granval Construction Inc.	<b>LARGEST PANEL:</b>	1,604 sq ft
<b>BUILDING USE:</b>	Multi-Tenant Industrial Warehouse		



**LIFTING PANELS**  
Once the concrete hardens, many panels can be raised in a single day.



**WALL DETAIL**  
These strong, maintenance-free structures often cost less and still have the ability to incorporate unique architectural elements as desired.

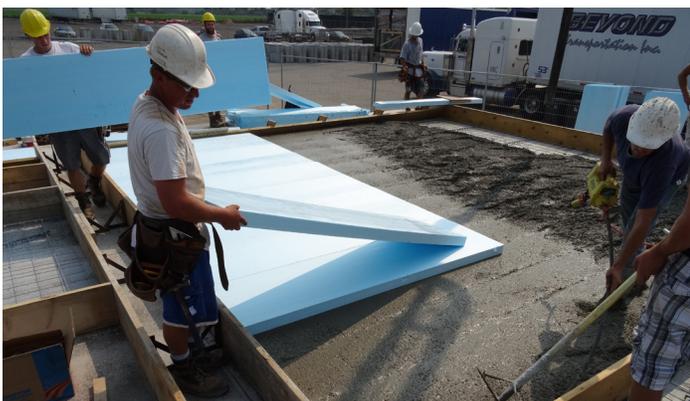
# Project Profile

## 300 Melair Drive Warehouse

PROJECT LINK: [Tiltwall.ca/project/300-melair-drive-warehouse/](https://tiltwall.ca/project/300-melair-drive-warehouse/)

With AEC Developments looking to use tilt-up in one of their projects they chose this simple addition to try it on. The load bearing insulated tilt-up panels provided a durable wall system for a building requiring something rugged. Using form liners the addition was easily matched to the original building.

<b>PROJECT:</b>	300 Melair	<b>SQUARE FOOTAGE OF PANELS:</b>	6,987 sq ft
<b>ADDRESS:</b>	300 Melair Dr. Ayr, ON NOB 1E0	<b>NUMBER OF PANELS:</b>	13
<b>YEAR BUILT:</b>	2015	<b>HEAVIEST PANEL:</b>	61,171 lbs
<b>ENGINEER OF RECORD:</b>	Walter Fedy	<b>TALLEST PANEL:</b>	21'-9"
<b>GENERAL CONTRACTOR:</b>	AEC Developments	<b>LARGEST PANEL:</b>	601 sq ft
<b>BUILDING USE:</b>	Warehouse		



**PANEL CONSTRUCTION**

The fully insulated panels offer energy efficiency.



**PANEL ERECTION COMPLETE**



DESIGN-BUILD  
CONSTRUCTION MANAGEMENT  
TOTAL PROJECT DELIVERY

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April 18, 2016

**To whom it may concern;**

We are pleased to provide a reference for Tilt Wall Ontario.

We have had the pleasure of working with them on a project in Ayr Ontario.

We have found their workmanship to be reliable and professional and their office staff and site personnel have met all of our expectations.

We are confident in the service provided by Tilt Wall Ontario and would recommend their services for any size project, large or small.

Sincerely,

A handwritten signature in blue ink that reads 'Dan Woodcock'.

Dan Woodcock, A.Sc.T., LEED® AP, GSC. PMP  
Project Manager

# Letter of Reference



**BARRY BRYAN  
ASSOCIATES**

Architects  
Engineers  
Project Managers



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December 12, 2014

## **Letter of Reference for Tilt Wall Ontario Inc.**

To whom it may concern:

On behalf of Barry Bryan Associates (BBA), Architects, Engineers, it is my pleasure to provide this positive letter of recommendation for Tilt Wall Ontario Inc.

Tilt Wall Ontario Inc. has worked with BBA on numerous occasions over the past 12 years on a variety of Tilt-Up Projects. Noteworthy project would include:

- Humber College, Building 'B', New Academic Services Building
- Cargowall Industrial Warehouse
- Russell Reid Public School Addition
- Port Hope Police Facility
- London medical Centre Building

We have consistently found the management and staff at Tilt Wall Ontario to be professional, thorough and possess a high level of technical expertise.

I have no hesitation in recommending Tilt Wall Ontario Inc. as a highly competent concrete tilt-up contractor, capable of handling any project, based on our years of experience working with them.

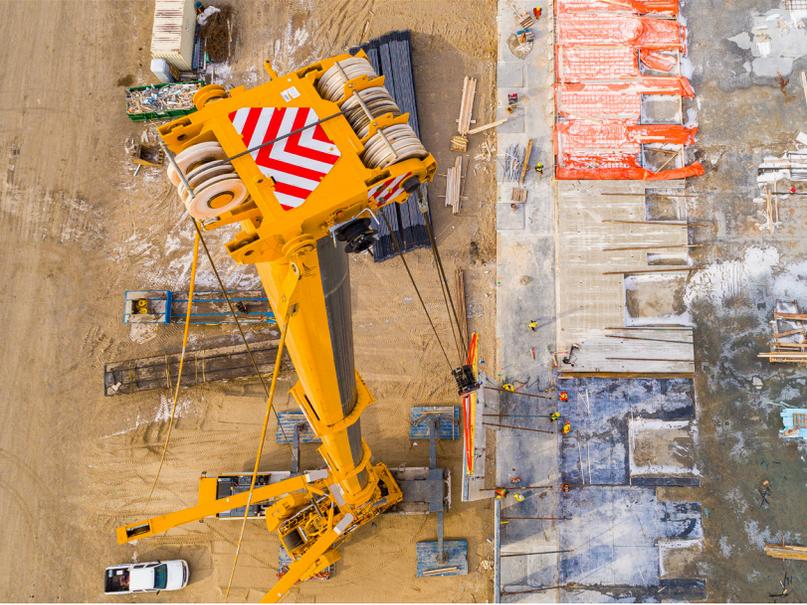
Yours very truly,

**Barry Bryan Associates**  
*Architects, Engineers, Project Managers*

Dennis L. Bryan, P. Eng., OAA, MRAIC, CAHP  
Principal

DLB/gs

# Contact Us



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