Case Study:
Belmont Trio, Kitchener, ON

Kurt Ruhland, P.Eng.
Director, Structural Engineering
MTE Consultants
Background

- Precast Concrete is a mature technology
- Southern Ontario has long been familiar with precast parking garages, precast hollow-core floors and precast cladding
- With the recent opening of two new precast wall panel plants in Southwest Ontario total precast buildings have become a viable and desirable option
• Three residential towers: 14, 12 and 8 storeys
• Central 4-level parking structure
• 412 residential units and 492 parking spaces
• All structures built utilizing total precast construction
• Basements not practical due to high water table
• Necessitated an above-ground parking structure
• Garage built using precast concrete double tee floors support by precast spandrel beams and walls
• Raft slabs used for building foundations
Owner’s objective was to build structures in quick, predictable manner

Precast allowed for fabrication of structural elements to occur off site and be quickly assembled on site

Erection of structures could continue through most weather conditions

Building cladding erected with structure

High durability for both structure and cladding
• Three residential buildings utilized over 3,250 pieces of precast concrete in addition to nearly 434,500 ft² of precast hollow-core slabs
• Parking structure provided additional 230 pieces of precast concrete
• Typically precast floors were erected in a weekly cycle
• 14-storey tower was built, from groundbreaking to occupancy in 17 months
Innovation

- Precast fabricator was introduced into design process during initial phases and was a regular participant in design meetings.
- Allowed design to conform to fabricator’s unique fabrication approach and eliminate changes later.
- Allowed fabricator to start shop drawings and fabrication before final architectural design was completed.
• Utilizing the exterior wall precast wall as the main structural bearing element provided a great deal of structural efficiency, but limited the architectural aesthetics of the building

• Overcome by the architect through a series of offset, two-storey balconies and combining the exterior building penetrations for venting and exhaust in a louver above the glazing
Lessons Learned

• Precast concrete building construction can be effectively used in the efficient construction of residential building towers

• Coordination and scheduling were key to efficiency both in design and construction

• The more familiar designers become with the product, the more creative their designs become