

CPA MEMBER profile



NEWTON PARKING STRUCTURES
PRE-CAST PLANT

Mr. Edwin Newton has spear-headed from its inception in 1994, Kiwi-Newton Construction Ltd., which has since quality built scores of industrial, commercial and institutional projects spanning across Ontario, into European countries such as Germany and Hungary, and now Asia with large industrial projects in such countries as Korea and China. The goal of Kiwi-Newton is to become a provider of "one source building solutions" in direct benefit to all Stakeholders.

In his pursuit he now has Newton Parking Structures Ltd., which is the proprietary owner of the CANADACAR System an advanced parking structure discussed in this article. From 1999, Mr. Newton has formed and operated Nadeco Limited, a company that constructs and specializes in waste water treatment plants and other environmentally related buildings and processes. Newton Bridge Solutions Ltd., formed in 2007 offers conventional cast-in-place bridges, GRFP (glass-fiber reinforced polymer) composite bridge decks and precast decks.

Mr. Paul Aumuller has facilitated the creation of Newton Parking Structures Ltd., since 2004 and is responsible for business and product research and development as well as the manufacturing of the high performance concrete precast decks for the CANADACAR System. The manufacturing and sales of GRFP composite bridge decks is also Mr. Aumuller's responsibility.

I N N O V A T I O N A NEW PARKING STRUCTURE SYSTEM

A new parking structure system is emerging: a prefabricated, engineered and constructed freestanding parking garage structure that utilizes superior technology combining pre-cast concrete onto cambered steel beams and fastened to perimeter column steel works generating free span module parking bays. The advantages of the system are numerous. Its evolution is based on a proven history originally through a large European company spanning decades of prefabrication and design-build experience. Over 200 similar parking structures have been built in Europe totaling over 120,000 car spaces. This new building technology is now available in Canada, and will be soon in the entire North American marketplace, including the Caribbean. Unique in the marketplace, this system offers potential customers a truly "one source" total service beginning with quality design-build techniques together with the prefabrication of the major building components.

With the most economical, low cost pricing based on a single car parking space, significant capital cost savings may be realized by the owner. This highly competitive cost advantage over conventional garage buildings comes complete with potentially significant savings on the lifetime upkeep of the garage. The life span is decades longer than any other conventional parking structure without the need for any major repairs.

Maintenance costs are the lowest in comparison to any other building system - as much as 90% less than the industry standard. Conventional garages have high building care costs due to the necessary and frequent maintenance of the topping which spans the entire concrete slab surface. The system does not require a topping over its deck surface due to its superior precast concrete mix design using advanced ultra high pressure, performance concrete. In addition, the precast deck panels are uniquely designed in combination with the building structure, in order to maintain biaxial compressive forces through the top of the deck. These biaxial compressive forces prevent cracks, which is a critical element for the long life span and low maintenance of the structure. Any cracks will allow chloride ingress no matter how good the concrete quality is, which is the fatal blow for most structures exposed to deicing salts. With this system, special attention is paid to joints between precast slabs whereby a proprietary topping system is applied on all joints which prevents the entrance of chlorides or water. This brings the average annual maintenance costs over 50 years or more down to a range (estimated \$14 per car space) saving millions of dollars over the life span of the parking structure.

The modular system provides flexible and economic construction solutions, which also allows the client and/or designers the freedom to achieve the same unique flexibility even in later stages of the life of the building. Being LEED friendly, these structures are ideal for those projects wanting to score the highest LEED points - something that does not often come with the most competitive price tag. A higher standard of safety and quality is achieved by factory produced prefabricated systems and components, which in turn by design reduces on-site erection time and risk, including erasing the vulnerability to adverse weather conditions. As an example, a 500 parking space structure could be completed turn-key in as little as six months.

With no or fewer interior columns, the parking structure has reduced concealment



NEW PARKING STRUCTURE SYSTEM



BIAXEL COMPRESSIVE FORCES

areas and offers a safer, more openly designed space that is secure and user-friendly. The even leveled floors with patterned slip resistant surfaces discourage unsafe activities such as skate boarding. Open concepts, including stairwells and elevators with glass are standard features which make it a safe public facility.

The steel sub-structure, including assemblies such as guardrails, mesh systems and fasteners are all hot dipped galvanized for superior weather protection.

Architects, designers and clients can enjoy the wider flexibility and range of building aesthetics, inner space, split levels, easy ramps, horizontal building lines with a bright, clear and clean concrete deck system paralleled with galvanized or colour painted steel works, with the ability to incorporate a host of attractive options for facades. Glass, authentic brick works, galvanized mesh or painted mesh systems, and facades of many sorts are all possible with the system.

The concrete precast deck and ramp system is supported on a structure of steel perimeter columns and steel beams which span the entire parking bay, for column free parking and open visibility. The entire system is lightweight but super strong, using advanced techniques of concrete design and structural engineering. Therefore, the steel works are less bulky and the foundations are smaller, saving additional costs from the reduced energy required to produce and ship the materials - having less impact on the environment and making the new system one of the most "Green" options. Finally, bolting of steel on site makes for longevity since the hot dipped galvanized coatings remain intact and it is also possible to remove and possibly reuse the structure, effectively making the entire structure "mobile".

The precast concrete system surpasses even the most stringent standards such as the Ministry of Transportation of Ontario's Test Method LS-412 used in bridge design to ensure the buildings ability to withstand frequent "free-thaw" conditions and exposure to salt. These tests conduct harsher salt exposures and conditions beyond the current requirements of the CSA standard for parking structures.

The precast is poured into a steel mould which has a patterned surface providing a shiny polished feel and appearance with the luxury of non-slip surfacing. To maintain the crack free integrity of the precast, specialized handling equipment is utilized at the plant for curing and storing. Special transportation equipment to the site and rigging into position in the building structure are all part of the process as well.

Several prime design elements of the concrete deck system produces "near zero" or minimal standing water conditions as it incorporates a slope of two percent with a collection system at the perimeter; a knurled patterned surface, which inherently reduces surface slippage and less contact with wetted areas, and carefully designed drainage systems are incorporated. The patterned surface also allows for quicker drying times of the concrete deck system as does the open concept of the building structure.

Each ramp design incorporates a smooth and gentle rounded top and bottom, avoiding any and all harsh bumps while driving.

Roof designs are efficient and take into account the need for minimal snow plowing and energy saving devices including solar energy panels can be incorporated to supply lighting systems in a cost effective manner - just another "GREEN" idea for North America's most "sustainable" and "environmentally friendly" new parking structure system. ■

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OPEN-CONCEPT
DESIGNS



PRE-CAST STORAGE
& HANDLING



DRAINAGE
SYSTEMS



RAMPS



ROOF DESIGNS



SOLAR ENERGY