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LI Carlow are the premier total service provider of engineered structural solutions to the Water, Energy, Storm Attenuation and Bespoke markets. Our capacity to design not just the precast units, but the structure into which they integrate and the manufacturing tools used to make them has kept us at the forefront of innovation in our industry.

The semi-precast approach aims to deliver solutions fully compliant with our operational design requirement. The ideal configuration is not adapted to prefabrication. Whereas we will identify cost and time saving opportunities during the design development phase, we can adapt to the most precise configurations for operational accuracy. In principle, any structure imagined in in-situ concrete can be delivered in semi-precast. Approving Authority confidence is extended by implementing designs which cannot be improved by failure to comply in any respect with the specified codes and standards, whether national, international or customer specific. We place wet concrete against hard concrete, the way it’s always been done. The difference is that some of the concrete was manufactured elsewhere and the location of joints and interfaces are unconventional. Regardless, the integrity of joints and interfaces remains uncompromised and verified by design.

The Benefits of Prefabrication
We complete the difficult parts of construction in our factory, under ideal conditions and under quality supervision. Features including pipe-fittings, ribs, corbels, launder-channels, formwork attachments and stability-footings (among others) are eliminated from the site works. Products are delivered to site on a just-in-time basis then taken from the delivery vehicle to their service position in one simple operation without fuss or temporary staging. Small crews achieve amazing productivity by following simple steps and using well designed components and delivery systems.

Tolerance
Precast concrete units can weight in excess of 20 tonnes. Under normal manufacturing tolerances, it could be very difficult to ensure the precision required to maintain accurate alignment and watertight fit. The in-situ joint provides a transition between elements which ensures a complete and perfect fit (in it's liquid phase) and a completely relaxed structure at introduction to service. We don’t stress pieces into alignment or quality supervision. Features including pipe-fittings, ribs, corbels, launder-channels, formwork attachments and stability-footings (among others) are eliminated from the site works. Products are delivered to site on a just-in-time basis then taken from the delivery vehicle to their service position in one simple operation without fuss or temporary staging. Small crews achieve amazing productivity by following simple steps and using well designed components and delivery systems.

Waterproofing Integrity
At every interface a scabbled surface is prepared. The precast unit is delivered to site with projecting reinforcement often from five of it's six faces. All components are 3D modelled prior to manufacture and assembled in模d-space prior to fabrication. This eliminates the risk of clashing reinforcement and disruption to programme. Projecting reinforcement leaves very few bars to be placed on site. Typically the vertical in-situ stitches represent 30% of the volume of the perimeter and internal walls. While precast concrete products are relatively expensive (although value-adding), the concrete used in the joints is locally sourced ready mix at approximately £40 per tonne.

The formwork required is very light. Shuttering facing with vertical stiffeners is locked against the structure using steel braces and MKK cone anchors. The advantage in this low cost approach is that the formwork is torsionally flexible attaching easily to the surfaces on which they bear. Smooth transitions and light interfaces are achieved. Through-ties are completely eliminated. These are often a problematic feature of conventional in-situ works.

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Waterproofing Integrity
At every interface a scabbled surface is prepared. In addition, a smooth dense slit is preserved for the application of hydraulic strip. This provides ongoing self-healing capability in service. We use only one hydraulic product, Dense Hydrill. Hydrill is resilient to inflation prior to encasement in concrete. It can compress against the surrounding concrete with a pressure of up to 3MPa on contact with water and has been approved by Tokyo Underground for design life up to 100 years. It is also DMW and Materials in Contact approved for potable water.

Semi-precast structures are typically completed in 60% to 40% of the time taken to deliver conventional structures. This is where the value lies, both in terms of reduced preliminaries and hugely increased productivity.