

Precast Car Parks – Concast Precast Group

With the huge increase in car ownership and traffic volumes, multi-storey car parks are now commonplace even in some of Ireland's smaller towns. Car parks are primarily functional structures, but designer input is assuming greater importance. Good car park design is now a primary consideration in new retail developments, with increasing recognition that the car park is part and parcel of the overall 'shopping experience'. As the battle for shoppers intensifies, particularly in the larger urban centres, property developers are keenly aware of the important role which the

car park has in attracting shoppers. In prime retail areas, where competition is intense, the availability of good car parking can be a decisive variable factor. In smaller car parks, outside the major cities, where car occupancy levels may only average 60% to 70%, the need to design parking facilities based solely on maximising parking density is reduced and hence the opportunity for greater designer input.

Free standing, symmetrically shaped car parks, on regular shaped, green field sites are often the easiest to design and construct. In reality however, many car parking structures are built on irregular shaped sites, within a confined space. The challenges facing designers often require well thought out, adaptable solutions, so that the open floor area is maximised to ensure ease of circulation. Precast designers have considerable experience in this field and can provide adaptable fast-track solutions. No Irish company is more experienced in this respect than the Concast Precast Group, Ireland's leading providers of precast concrete multi-storey car parks. The company provides a range of parking solutions including large free standing structures.

The precast mainframe is comprised of columns, beams, wall panels, spandrels, and precast stair units with integral landings. The parking deck is constructed using 400mm hollowcore slabs with a 75mm structural screed

**Rendered Panels -
Factory Applied Finish**



three parking bays so that the structure does not impinge on the usable area or restrict drivers visibility.

In 'split level' car parks, multi-storey precast columns can be used throughout the structure, which significantly reduces the construction time. The multi-storey columns can be up to 4-storeys or 15m high. Multi-storey columns are designed with corbel connections which facilitate beam installation. In 'flat deck' car parks, the decks are linked by either straight or curved ramps and multi-storey columns are generally used in the perimeter area only.

which provides a clear span of 16mm. Precast floors are fully supported by precast beams spanning up to 9.6 m. These factory produced flooring units, require minimum propping and provide an immediate working platform. An experienced team will typically erect in the region of 1,000 sq/m of car park per week.

Ease of traffic circulation in and out of the car park is vital for the success of the structure. The most popular designs for car parks are either 'split level' or 'flat deck' car parks. Columns are clear span over the parking area and are generally spaced every

important multi-functional structural elements. The bottom end of the spandrel is corbelled to carry the flooring units. The spandrel transfers this load to the columns on either side. Spandrels serve many functions simultaneously, acting as code-required edge protection, impact barrier to restrain vehicles, as well as being the structure's major aesthetic element.

A range of external cladding systems can be integrated with the precast structural frame. A complete precast solution can be provided by using factory finished rendered external wall panels, which are

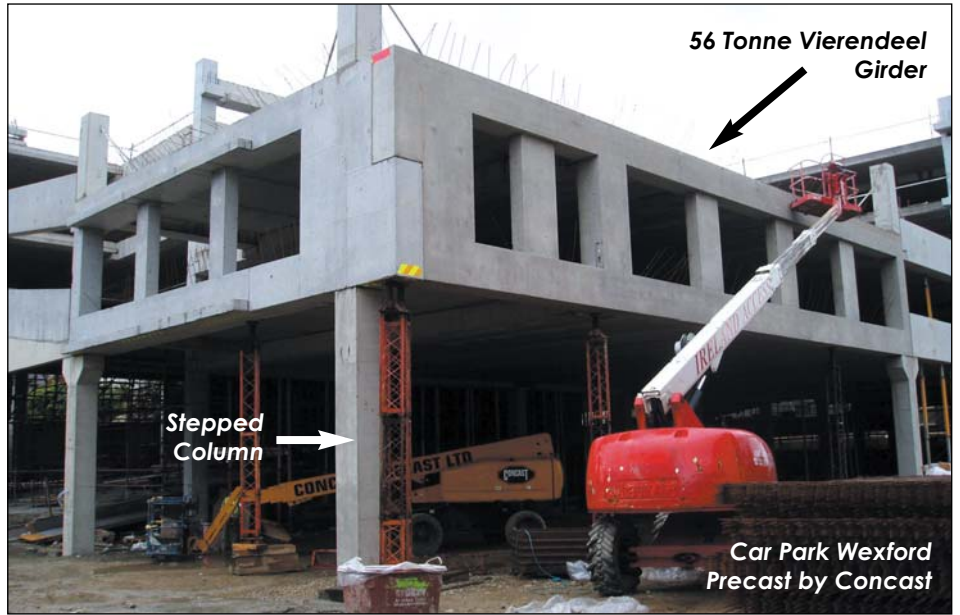


available in a range of over 400 colours/textures. Also, traditional brick-work or other finishes can be easily integrated, depending on architectural and planning requirements.

Once the scheme layout, section sizes, tying system and structural connection details have been resolved, the same design principles normally applied to in-situ concrete design are used. One advantage over in-situ design, is that higher grade concretes are used to achieve early mould turnaround, with strengths of 30 N/sq mm at 24 hours and 50N/sq mm at 28 days. Such high strengths are particularly useful in column design.

The Concast Precast Group recently erected a new 4 storey car park in Wexford town within a 15 week programme required by main contractor Cleary & Doyle. The design solution was selected on the basis that it offered durability, low maintenance, long uninterrupted spans and the potential to complete the project on time.

The scheme developed with Michael Punch & Partners engineers, required



zone of 21 m x 16 m was required with a stepped 'corner column'. The design solution involved the production of a 21 m long, 54 tonne 'vierendeel girder' (a girder with upper and lower beams and rigidly connected vertical members) with no diagonal braces which would have interfered with the window

opes. The use of these girders greatly improved the speed of installation, as the installation of one girder is equivalent to five separate lifts, consisting of 2 beams and 3 columns. The re-positioning of the 'corner column' a distance of 1 m from the front face of the building required that the giant vierendeel girder be cantilevered. Despite the huge load, the girder did not have to be prestressed.

Conclusion

Precast concrete is capable of providing large parking areas with minimal obstruction from columns. The system provides the full range of required components and is flexible enough to allow for innovative design solutions which are often required on restricted sites. Precast concrete is a mouldable material that offers great structural strength, durability and designer choice. It is the most consistent method of delivering projects on time and within budget.

Should you wish to discuss future car park developments please contact the Concast Precast Group @ 01-6288055.

Recently completed projects include:

- Wexford Town Centre
- Omni Centre Santry, Dublin
- Ballaly Park and Ride Dundrum, Dublin
- Blessington MSCP, Co. Wicklow
- Mary Street in Limerick
- SuperValu in Clonakilty, Co. Cork
- Newbridge, Co. Kildare
- Naas, Co. Kildare
- Ormonde st. Car Park Kilkenny
- Dunnes stores Cornelscourt
- Grand Parade, Cork

City Centre Precast Car Park



multi-storey columns throughout the structure, to reduce installation time. Stair cores were constructed from precast wall panels. Pedestrian stairs with combined top and bottom landings were precast in 10 m lengths for rapid installation.

The Wexford project required that a wide, column free 'turning radius' be provided at ground level to facilitate rotation by long heavy goods vehicles which deliver goods to retail units. A column-free

