Precast
Concrete Structures Ltd

A COMPLETE DESIGN MANUFACTURE AND ERECT SOLUTION

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Ramada Encore Hotel, Warrington

Overview

Precast Concrete Structures is the industry specialist in the design, manufacture and erection of offsite modular building techniques using precast concrete manufactured by our production facility in Stoke-on-Trent and other manufacturing partners.

Precast Concrete Structures has built a reputation based on extensive experience of economical design, the latest manufacturing processes and the use of composite steel and concrete materials most appropriate to the project. The adoption of modern methods of building construction is limited when restricted to a single material and is often constrained by conventional design thinking.

Precast Concrete Structures designs are innovative in both manufacture and concept. By directly employing in house erection teams the practicality of the erection process is factored into the project design.

With the experience of the Precast Concrete Structures team a partnership can be developed with the Project Design Team and assist in developing new solutions, by providing critical design information at early development stages. This can assist in the choice of precast concrete as the correct solution to the building design development.

Ramada Encore Hotel, Warrington

Hotels

Cross-wall construction

Precast Concrete Structures uses a system of precast elements which link together to form a cross-wall format. Panels can be formed in solid or twin wall styles to suit the design requirements of the structure. Whichever solution is selected the sections are produced in high quality finish which is suitable for direct decoration, with minimal preparatory work, obviating the need for plaster finishes, leading to cost and programme savings.

The philosophy of Precast Concrete Structures is to produce a design which will provide the most cost effective solution, utilising the most appropriate materials for the project. This can include such items as hot rolled steel sections and cold rolled steel infill panels as appropriate.

Benefits of using Precast Concrete Structures include:

- High quality concrete designed for direct decoration or exposure
- Architectural and structural quality components
- Large volume supply capacity
- Dedicated experienced project management
- In house erection by trained and qualified erection personnel
- Solid room size slabs
  - prefinished for direct ceiling decoration
  - suitable for direct carpet application
- Reduced structural zones free from downstands
- Erection of stair and lift cores as erection progresses allowing safe access for subsequent trades
- Pre-fitted windows option

Precast Concrete Structures specialise in the fast efficient delivery of the building structure, where minimal wet trades and high quality finish are essential to follow on trades.
Precast Concrete Structures strive to be market leaders in quality of finished product and offer an innovative and non-contractual approach to building structures.

Brunel University, Uxbridge

Police Federation HQ, Leatherhead

Brunel University, Uxbridge

Student accommodation

Cross-wall construction

The use of cross-wall construction in student accommodation gives significant benefits for short-term build projects where a deadline for opening is critical.

Precast concrete construction offers extremely durable accommodation, capable of sustaining even the toughest conditions of student living.

By the use of direct finishing techniques to the walls and ceiling, together with solid room-sized slabs, and the preinstallation of bathroom pods, cross-wall construction offers speed of construction together with economy.

Key requirements for economical construction in student accommodation include:

- Repetition of room layout
- Consistency of vertical alignment to division walls
- Repetition of elevational treatment

By adhering to these basic principles, Precast Concrete Structures will provide advice and innovative solutions on the most economical means of manufacturing the components and sequencing the erection to the maximum benefit of the client.

These benefits include:

- Fast-build programme within term-time constraints
- Direct decoration to walls and ceilings, with only minor pre-decoration treatment
- Pre-installation of windows
- Early "dry-box" working for subsequent trades
- A variety of elevational treatments using non-loadbearing cladding systems (loads are transferred via the cross-walls and do not rely upon external walls for support)
- Reduced structural zone without downstands

Brunel University, Uxbridge

The Hub, Manchester

Apartments

Modular build system

Apartment construction has become increasingly popular as a modular build alternative to traditional steel and insitu concrete frame methods. The system adopted uses cross-wall construction in a similar method to the hotel construction system, but differs in that the variability of room layouts and external elevations require differing techniques and innovative thinking to produce fast-build economical solutions. The options for apartments are both extensive and flexible providing key criteria in design are met. Precast Concrete Structures has broad experience in developing solutions for alternative construction, particularly suited to the Design and Build market.

Benefits include:

- Direct decorative finish to walls with only minor pre-decoration treatment, negating the requirements for wet plaster
- Optional methods of floor construction, allowing flexibility for individual client requirements, including: traditional hollow-core, wide slab composite flooring, pre-finished solid slabs
- Direct soffit finishing in replacement of suspended ceilings, significantly reducing construction build costs
- Reduced structural zone without downstands
- Construction of common stairs and lift cores as the erection progresses, permitting early access for subsequent trades
- Pre-fitted windows
- External pre-finished cladding panels, grey concrete inner leaf only or curtain-walling/ metal stud permitting total flexibility in elevational treatment

Apartment construction is usually designed with traditional building solutions which are subsequently modified during the design process to obtain a competitive edge in Design and Build solutions. The benefits of early consultation with Precast Concrete Structures will result in significant savings in both cost and time, resulting from economical manufacture solutions and reduced erection periods.

Budenburg Haus, Altrincham

Middlewood Locks, Salford

Precast Concrete brickwork cladding panels

Architectural concrete

Feature concrete finishes

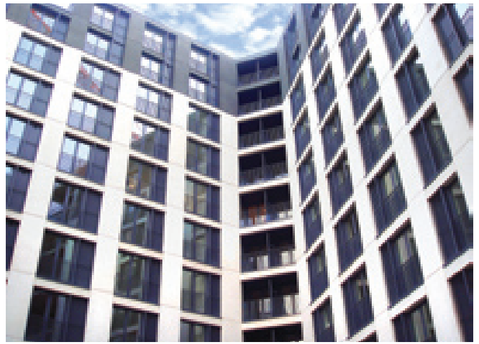
Precast Concrete Structures has extensive experience with design, manufacture and erection of architectural and structural building components.

Sections are bespoke and can be manufactured within the programme for our standard materials with a wide range of finishes and colours including:

- Brick
- Wet cast reconstituted stone cladding and dressings
- Composite architectural/structural insulated columns
- Exposed structural elements

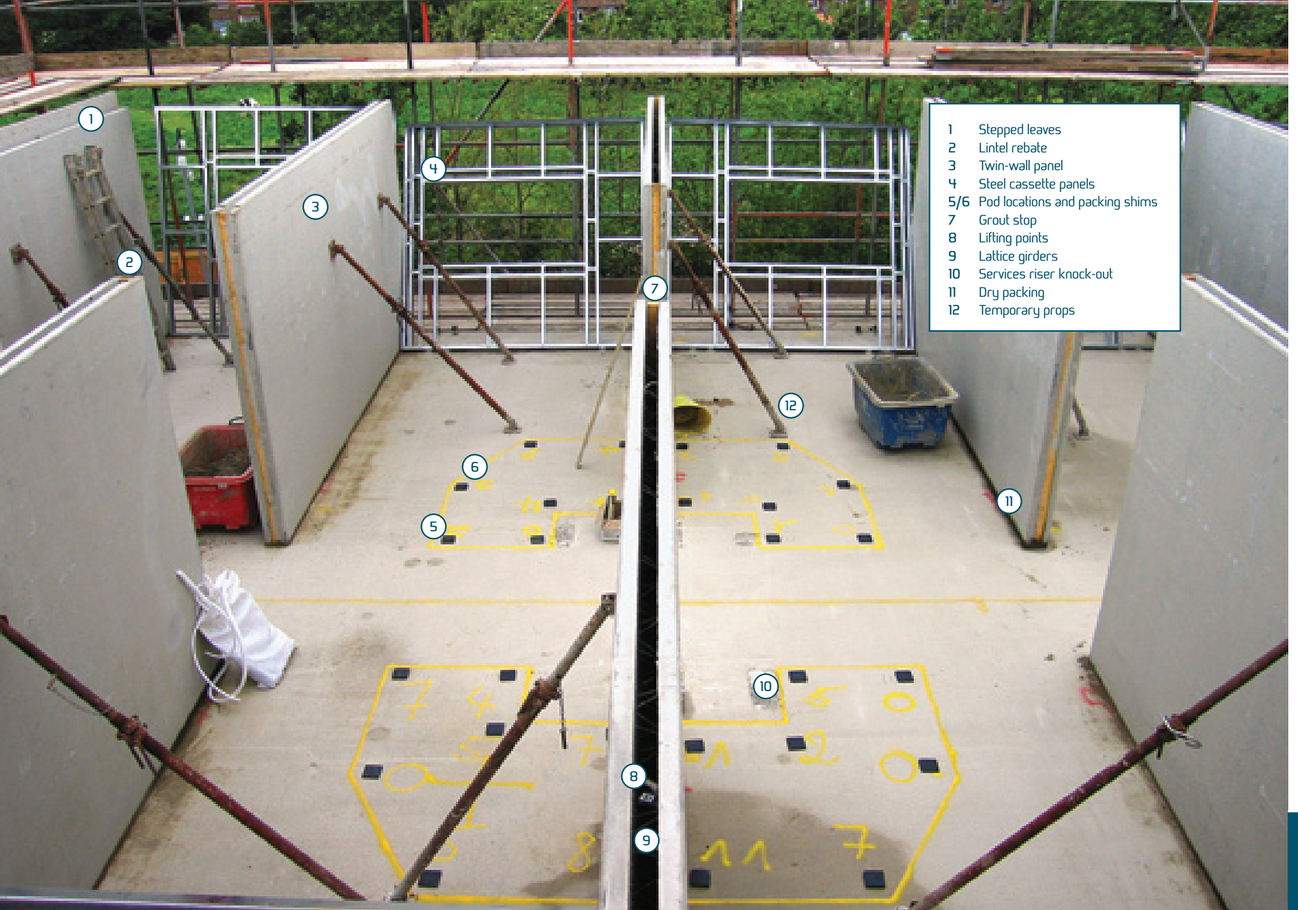
Buildings are considered on an individual basis and assessed for integration of structural components to reduce programme and to ultimately drive down costs.

This project (right) is a flagship example of the benefits of incorporating architectural cladding into the structure. Originally concepted as an insitu frame, with independent cladding, the revised Precast Concrete Structures proposal produced cost saving and significant overall programme reduction.



Budenburg Haus, Altrincham

Carver's Warehouse, Manchester



1 Stepped leaves
2 Lintel rebate
3 Twin-wall panel
4 Steel cassette panels
5/6 Pod locations and packing shims
7 Grout stop
8 Lifting points
9 Lattice girders
10 Services riser knock-out
11 Dry packing
12 Temporary props

Twin-wall

Walls for direct emulsion finish

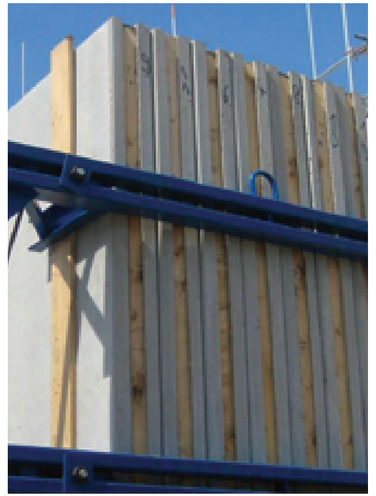
A production technique used by Precast Concrete Structures as an alternative to cross-wall vertical cast production which is used to provide all the benefits of cross-wall with the additional advantages:

- Flat cast production to both faces from high quality mould faces produces outstanding quality of finish suitable for direct decoration of faces with minimal pre-decoration treatment being necessary
- Insitu fill of the cavity provides enhanced continuity giving the benefits of insitu with the finish quality of precast
- Optional insulation application to insulate outside faces without the requirement for post fixing on site
- Concrete continuity at joint interfaces between wall and floor providing greater security in meeting the requirements of sound reduction in the Building Regulations at component interfaces
- A system of sway frame design allowing removal of shear walls in the longitudinal direction and allowing non structural elevation cladding, glass infill or clear openings between walls

Optional hollow core or composite slabs with cast in fittings for passive fall protection.

Optional limited services incorporated within wall panel to permit direct finishing of the wall face without rebates.

Precast Concrete Structures manufactures concrete in both UK and Germany, thereby offering a very large production capacity.



Brooklands Avenue, Cambridge

Cross-wall construction

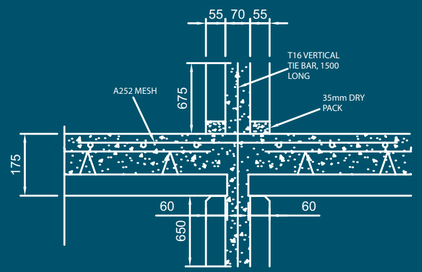
Frameless building method

Cross-wall is a generic method of building construction using a series of division or party walls which transfer the floor loads through the building to foundation or transfer slab level.

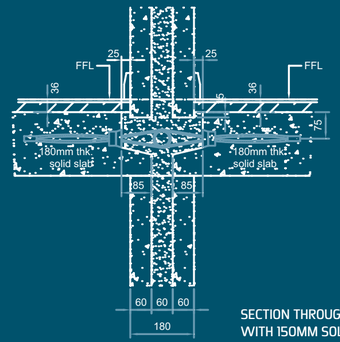
Precast Structures' system of cross-wall incorporates vertically cast walls providing two faces of formwork-cast concrete suitable for direct decoration, with only minor predecoration treatment.

External walls to achieve "dry-box" working are effectively only cladding panels supporting their own weight and do not necessarily contribute structurally to the stability of the building. The system allows either concrete perimeter wall infill, or lightweight cladding alternatives for a variety of elevational treatments.

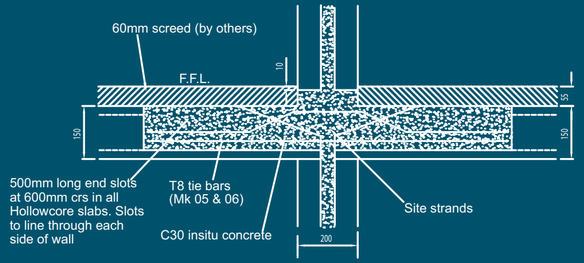
The cross-wall system generally utilises stair cores and lift cores for overall stability, using the floors as stiff diaphragms for the transmittal of horizontal forces into shear walls located at staircase and lift shaft positions. The floors are made up of either hollow core, solid slab, or composite construction.



SECTION THROUGH INTERNAL TWIN WALL WITH 60MM COMPOSITE PLANK



SECTION THROUGH INTERNAL TWIN WALL WITH 150MM SOLID PLANK



SECTION THROUGH INTERNAL TWIN WALL WITH 100MM HOLLOWCORE PLANK

Progressive collapse

Design for robustness BS8110

Concrete building structures whether insitu or precast, are required to perform in the event of accidental damage or explosion by meeting the design criteria set out in BS8110 for progressive collapse.

Within the building structure, ties are incorporated to resist calculated forces determined by a variety of factors, including:

- Number of stories
- Centres of walls/size of spans
- Total loads carried

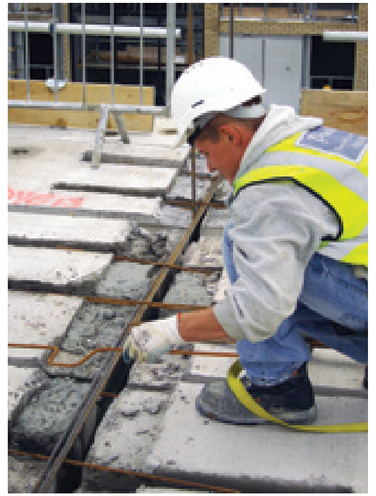
These are achieved by the use of the following ties incorporated into the precast cross-wall design:

- Vertical ties
- Horizontal ties
- Peripheral ties
- Internal ties

Joints between panels are tied together using pre-shuttered insitu-fill to create a robust joint with minimal finishing required. The joints use wire ties designed to meet the specific tie-force criteria and also allows flexibility in assembly tolerances during erection.

Peripheral and internal ties use high strength steel strand within the nominal insitu joints at cross-wall locations and around the perimeter of the building to create a continuous tie arrangement.

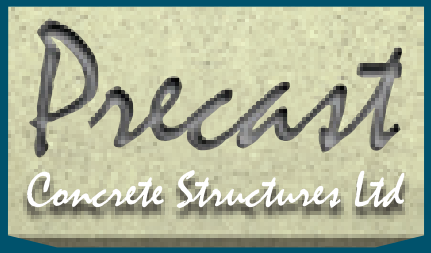
Building design is analysed for structural stability by Precast Concrete Structures consultants who have extensive knowledge in the design stability of cross-wall building structures.



Typical crosswall construction

Addenbrookes Hospital key worker accommodation under construction using a combination of precast brickwork balconies, twin wall, structural steel, insitu gable cantilevers and precast hollowcore flooring erected by PCS specialist erection labour.

A new experience for SDC builders and the basis of a future relationship.



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