

TILT-UP DIGEST



STEEL
REINFORCEMENT
INSTITUTE
OF AUSTRALIA



BRICK VANEER WALL PANELS

TILT-UP CONSTRUCTION

is being used with increasing sophistication for a growing range of structures and building types.

This is characterised by the greatly improved range and standard of finishes being achieved on site; and by designers being more aware of the ease with which interesting shapes, profiling, modelling and special veneers can be incorporated into tilt-up panels.

The advent of custom-fabricated formliners to secure bold patterning and modelling promises further enhancement of architectural possibilities.

The extension of the tilt-up process to include site-precasing at ground level of suspended floors and other structural elements is showing substantial gains in productivity and speed of construction. Nowhere is this more important than in medium-density housing, particularly if such housing is to remain affordable. The projects illustrated here are typical of recent work, and indicate the quality possible in tilt-up construction. In each project the form of construction was selected to satisfy budgetary and time constraints, whilst meeting the requirements of an ever more demanding market-place.



COVER: RIBBED FINISH



SITE PRECAST
TOWN HOUSES



APPLIED EXPOSED-
AGGREGATE FINISH

SITE PRECAST
OFFICES



TEXTURED PAINT
FINISH



INTEGRAL EXPOSED-
AGGREGATE FINISH

STATE BANK CENTRE ASHFIELD, NSW



This prestigious commercial development is a fine example of the current state-of-the-art in architectural tilt-up panelling. The centre comprises an office tower with six floors of office space plus a two- and three-storey annexe built partly over a semi-basement public car park. It is this annexe which is clad with tilt-up panels.

Each panel has an upper and lower herring-bone ribbed surface separated by a horizontal, indented painted band. The ribbing has been very well executed, arrises being crisp and true. Such a standard of finish was made possible through the use of custom-fabricated fibreglass formliners.

In all, five fibreglass formliners were required for the casting of the 54 panels, each of which measured 4 x 10 m with a minimum thickness of 175 mm.

All panels were cast face down using an adaptation of normal stack casting. The stack was overset by a frame to lift each panel clear of the formliner on the third day after casting. To ease stripping, compressed air injection was used. To permit this early handling and to ensure a good finish with clean arrises concrete strengths of 40 and 45 MPa were specified. A first-class strip resulted.

Finally, an exposed aggregate coating was applied to the ribbed areas of the panels. This is one of the few examples, so far seen in this country, of the use of custom-fabricated reusable formliners to achieve dramatic surface modelling in tilt-up panels. It is a technique offering a rich palette of design opportunities.

DEVELOPER:
Capcount Property Trust

ARCHITECT:
Sabemo Projects Design Division

STRUCTURAL ENGINEER:
W L Meinhardt and Partners Pty Ltd

FIXING DETAILS
Henry and Hymas

BUILDER:
Sabemo Pty Ltd

PROJECT MANAGER:
P Rochlin



STATE BANK CENTRE



WAREHOUSE COMPLEX

SEVEN HILLS, NSW



A noteworthy feature of this multiple warehouse building is the very fine integral exposed-aggregate finish to the tilt-up panels. It is one of a group of buildings, using a similar form of construction and finish, being erected in the area.

On this job panels were cast face-up using normal structural concrete with Nepean River gravel as the coarse aggregate. Exposure was by water washing. Lifting points were subsequently disguised by patching, following erection.

A remarkably consistent result has been achieved through careful quality control. This finish was secured at a very modest cost premium when compared to coating with a high-build paint.

DEVELOPER:
Hardman Australia Pty Ltd

ARCHITECT:
Development Consulting Associates

STRUCTURAL ENGINEER:
Gary Truswell and Associates Pty Ltd

BUILDER:
Cedra Constructions Pty Ltd

TILT-UP CONTRACTOR:
Austilt Constructions Pty Ltd



LAW OFFICES

MILE END, SA



These striking inner-suburban offices are an excellent example of the effectiveness of on-site precasting of both walls and floors to speed construction of a small building.

All wall panels are fully load-bearing two-storey (or two-storey plus gable) tilt-up units. First-floor panels were stack cast at ground level and then lifted into position. The total time taken to cast and erect the structure represented only 8% of the overall time to completion.

Wall panels were formed up to receive door and window frames. To control scale and create a shadow pattern to reinforce the classical proportions of the facade, five horizontal grooves have been incorporated in the face of the panels. Vertical arrises are chamfered to match the grooves. The external finish to the panels is an acrylic coating. Internally the finish is paint over plasterboard.

DEVELOPER:
Lez Nominees

ARCHITECT:
A D'Andrea and Associates

STRUCTURAL ENGINEER:
TMK & Associates

BUILDER:
A L Seeley Constructions

TILT-UP CONTRACTOR:
Friendly Terrazzo

RHODE ISLAND BROADBEACH, QLD



The Rhode Island Condominium development comprises 172 luxurious townhouses plus a residents' clubhouse. Abutting the river and a golf course, the 16-hectare site has been generously landscaped, including provision of a number of artificial lakes and water features.

Originally designed in loadbearing blockwork with concrete floors, it was decided, in the interests of speeding construction and avoiding high bricklaying costs, to site-precise a majority of structural elements. This decision was influenced by experience gained in building the Cairns International Hotel.

A precasting area was established on site for smaller components such as retaining-wall panels, columns, beams and stairs. Larger elements such as tilt-up wall and floor panels were cast adjacent to their final locations. Floor panels were cast against textured fibre-cement sheets set within the perimeter forms. These sheets, bonded to the concrete, eliminated problems of separation and provided a smooth soffit.

Once the panels had been lifted into position the only ceiling finishing required was to flush the joints between the boards, prior to painting. Edge forms for both floor and wall panels were designed to be reusable, and were fabricated from light steel C-sections.

Floors spanning up to eight metres are generally 200 mm thick with two layers of reinforcement. Wall panels are 150 mm thick with a single layer of reinforcement. All electrical conduits and plumbing sleeves were cast in. Overlapping U-bars and locating pins were used at concrete-to-concrete joints, and were grouted up following final positioning of panels. Generous tolerances were adopted to further speed construction.

All residences are villa-type split-level townhouses offering three bedrooms, or three bedrooms plus study, and spacious living and dining areas. All command extensive water views over either lake or river.

DEVELOPER:

D & S Mulgrave Properties Pty Ltd

ARCHITECT:

Media Five Architects Pty Ltd

STRUCTURAL ENGINEER:

Moir Harding Gill and Metzroth Pty Ltd

PANEL DETAILS:

Tilt-Lift Equipment Pty Ltd

BUILDER:

Prentice Builders Limited

RESIDENT PROJECT MANAGER:

J Ward

RHODE ISLAND
CONDOMINIUMS



SPLIT-LEVEL DINING
AND LIVING AREA



FIRST FLOOR PANELS
POSITIONED



FIBRE-CEMENT
FORMLINERS TO
FLOOR PANELS



FIRST FLOOR WALL
PANELS ERECTED



SITE-PRECAST STAIRS



EXTERNAL COLUMN
AND BEAM ERECTION
AND ROOF FRAMING
WELL ADVANCED



**INDUSTRIAL
ESTATE**
CASTLE HILL, NSW



Pleasing forms, crisp lines and a colour scheme which is both fresh and distinctive impart an invigorating quality to this small industrial development.

All panels are loadbearing. The end panels to the projecting first-floor offices have been blocked out to create a feeling of lightness and an illusion that the upper floors are cantilevered rather than being supported by these panels.

Full-height panels form the wall behind the covered parking bays and frame the roller shutter doors which form the entries to the warehouses. Maximum panel lift was 20 tonnes.

An applied exposed-aggregate finish has been used externally.

DEVELOPER:
Zenis Investment Pty Ltd

ARCHITECT:
Development Consulting Associates

STRUCTURAL ENGINEER:
Gary Truswell and Associates Pty Ltd

BUILDER:
Cedra Constructions Pty Ltd

TILT-UP CONTRACTOR:
Austilt Constructions Pty Ltd



INDUSTRIAL ESTATE
CASTLE HILL, NSW



MILLERS STORAGE HARRIS PARK, NSW



A prime requirement of Parramatta City Council was that the exterior finish of this development should be brick, or a combination of brick and stone, to tie in with the general character of the area. The solution was to use tilt-up panels incorporating a brick veneer facing to the upper floors and a simulated stone finish to the ground floor.

A total of 80 panels up to 1.8 m high were required, having a face area of 3500 m². To control scale, mock windows have been introduced at each floor level, matching practical windows in the administrative section.

A special polystyrene formliner was used between edge forms, to accurately locate the purpose-made brickettes employed as the veneer. After placing, the joints between brickettes were filled with a coloured cement mortar and ironed to ensure adequate compaction. Joints were then flushed using a trowel, prior to placing concrete.

A low-shrinkage 32-MPa concrete, having a slump of 8–100 mm, was used. A shrinkage limit of 600 microstrain at five days was specified to limit differential movement between the concrete and the brickette facing.

The panels with the triangular parapets were cast in one piece and then sawn for lifting. This kept the maximum panel lift to 26 tonnes.

Using this method the warehouse was erected at a substantially lower cost, and in just seven weeks against an estimated twenty weeks, when compared with conventional brickwork.

DEVELOPER:
Millers Self Storage

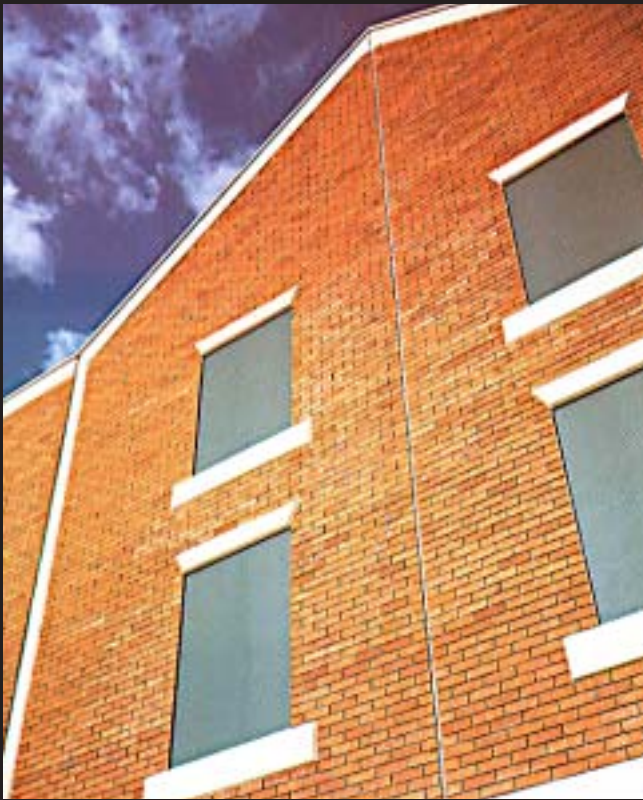
ARCHITECT:
Ceccato McGrane Architects

STRUCTURAL ENGINEER:
Partridge Partners Pty Ltd

PANEL DETAILS:
Gary Truswell and Associates Pty Ltd

BUILDER:
Cedra Constructions Pty Ltd

TILT-UP CONTRACTOR:
Austilt Constructions Pty Ltd



MILLERS STORAGE



EASTGARDENS ESTATE

MATRAVILLE, NSW



Located close to both the Port Botany container terminal and Sydney airport, this industrial park was designed to attract companies engaged primarily in the storage and distribution of imported or export goods.

Formality and symmetry were regarded as essential to the achievement of the necessary sophistication in an otherwise unprepossessing, but improving neighbourhood. To this end, and to ensure clear corporate identities for the occupants, units are grouped around a spacious, landscaped central circulation and parking area.

Tilt-up walls are used throughout for both offices and warehouses. Site-precast panels were also used to enclose a major water channel which bisects the site diagonally. Panels were stack cast and are generally 175 mm thick. All wall panels are fully loadbearing, carrying first-floor slabs spanning up to seven metres and all roof loads. Window openings were blocked out to provide stepped sills and recessed surrounds where required. Window frames are set well back within the panels. Ground floor windows are shadowed by being recessed some distance behind the rear face of the panel.

A textured paint finish is used externally, contrasting colours being used to differentiate between office blocks and warehouses.

DEVELOPER:
Kiambal Pty Ltd

ARCHITECT:
Kym and Associates – Kooi-ying Mah

STRUCTURAL ENGINEER:
Henry and Hymas

PANEL DETAILS:
Henry and Hymas

PROJECT MANAGER AND BUILDER:
Richard Crooks Construction



EASTGARDENS ESTATE





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