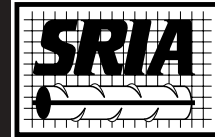


# TILT-UP

## DIGEST 6

Steel  
Reinforcement  
Institute of  
Australia



TEN  
STEPS  
TO  
TILT-UP

# 10 STEPS TO TILT-UP

Tilt-Up is a cost effective building method that achieves the benefits of solid steel-reinforced concrete walls, quickly, and without the need for wall forms or scaffolding.

## Why tilt-up is growing so fast

Its growth in Australia and the USA is phenomenal, running at 25% a year in the USA, outstripping almost any other industry and on a par with the 'star performer', Information Technology. Australia is also expected to reach this level of growth as builders and developers realise the cost-competitive advantages of Tilt-Up.

Jack Cleaver, National Architect for the SRIA recently visited the USA to gather information on the American Tilt-Up construction industry for this report.

He says the same environment for growth applies to Australia as the USA and both countries are leading the world in the development of Tilt-Up. But the benefits of Tilt-Up construction are quickly being realised worldwide and spreading to Europe, Asia, South Africa and New Zealand.



### ① It looks good

It took American and Australian developers and builders a long time to realise that Tilt-Up could be made to look good.

Tilt-Up in the past was saddled with the perception that it was only suitable for factory buildings, where 'the grey box' appearance did not matter.

Australia saw its design potential before America and began to produce colourful and attractive Tilt-Up buildings. Now both countries have plenty of great looking buildings with high-quality detailing and finishes.



BUILDING IN STYLE WITH TILT-UP IN THE USA AND AUSTRALIA  
COVER: SILK IMPORTING COMPANY BUILDING, UNION CITY CALIFORNIA

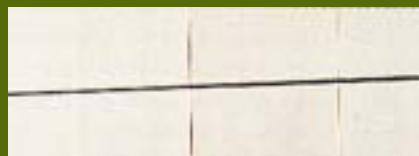


## ② The Major Builders use it

Major American builders are using Tilt-Up for the majority of their low-rise buildings. With America's economies of scale this translates into some of the bigger companies building hundreds of Tilt-Up projects a year. Projects are often a turnkey package incorporating architect/engineering design services. One American contractor commented:

'We got into Tilt-Up, because we knew that if we did not do so, we would not have business.'

In Australia, builders such as Grant Constructions in Sydney, the Fini group in WA and Graham Warren of Tilt Up Pty Ltd in Queensland have developed a high level of expertise in Tilt-Up construction. Many other builders Australiawide are recognising the competitive advantages of tilt-Up.



## ③ Professionalism

In America and increasingly in Australia, Tilt-Up has merged building responsibilities, offering an integrated project delivery team. These dedicated Tilt-Up teams are able to gain exceptional skills and this shows in the quality and reliability of their work.

Leading design consultants are also recognising and exploring its potential. Well known engineers such as Ove Arup, Henry and Hymas, McMillan Britton and Kell and international architects such as Kiss Cathcart Anders of New York and Australia's parry & Rosenthal of WA and Loucas Zahos of SA have produced highly-innovative designs in Tilt-Up.



#### ④ Speed of construction

Tilt-Up can rightly claim to be faster than any other means of construction. The panels are usually erected in only one day, even on quite large projects. New all-terrain cranes are being used for total site access for easy panel lifting.

#### ⑤ Promotion

No industry succeeds without promotion. In the USA, Tilt-Up enjoys the support of the pre-mix concrete industry and SRIA's American counterpart, CRSI. This strong Association support has made Tilt-Up the first building choice for new low-rise building.

The Steel Reinforcement Institute of Australia (SRIA) is committed to supporting Tilt-Up in Australia along with other uses of steel reinforcement, such as precast concrete, insitu concrete and reinforced masonry.

#### ⑥ Security

Tilt-Up answers today's concerns about security. Nothing could be more secure than solid steel-reinforced concrete wall panels. As a result, Tilt-Up is a preferred choice for warehousing and high-tech industries. Shopping centres with major retail tenants such as Woolworths and in America, store chains like Home Depot are turning almost exclusively to Tilt-Up because it enables building owners to offer tenants superior protection.



SECURITY IS IMPORTANT TO CHAIN STORES IN AUSTRALIA AND USA





## COLUMN-FREE QUALITY SPACE



### ⑦ Quality

The new generation of Tilt-Up buildings both in America and Australia rely on quality materials. Care is taken by the leading contractors to insist on using domestically-produced steel reinforcement with known and proven qualities, of strength and ductility.



In Australia, steel reinforcement produced by member companies of the SRIA is assured of meeting the Australian Standards for steel reinforcement AS 1302, AS 1303, AS 1304, and the new joint Australian New Zealand standard, AS/NZS 4671. SRIA member companies are committed to providing the extra quality demands of the new standard.



### ⑧ No columns

Tilt-Up answers the need for column-free space. The loads of upper floors and roofs can be easily supported by the panels, without the need for columns at the perimeter. Column-free space permits easy and flexible fitout and is regarded as high-quality space.

## ⑨ Safety

American and Australian contractors favour Tilt-Up because it simplifies site operations compared to traditional building methods. No scaffolding is needed because the majority of construction work is at ground level, so the chance of injury from falls is limited. The only lifting is done by an erection crane minimising the likelihood of back injuries. Tilt-Up sites are cleaner than traditional sites, with no stockpiles of materials to trip over. A major safety factor with the Tilt-Up method is the reduction in on-site labour.



## ⑩ Economy

Tilt-Up has always been the most economical form of building. This advantage was primarily related to large buildings, but now Tilt-Up is proving economical for small structures as well – even small bus shelters. Particularly appealing to American contractors is the huge reduction in waste generated on a Tilt-Up site compared to other building methods. Building waste is difficult to dispose of and each tonne carries stiff environmental levies that impact on the profitability of a building project.



TOP LEFT: NO SCAFFOLDING NEEDED RIGHT: GREAT FOR BUS SHELTERS AND HOUSING



# Finishes in tilt-up

## Paint

Most Tilt-Up buildings are painted. Striking colours can be achieved with Hi-Build paint finishes to Tilt-Up panels, unmatched by brickwork.

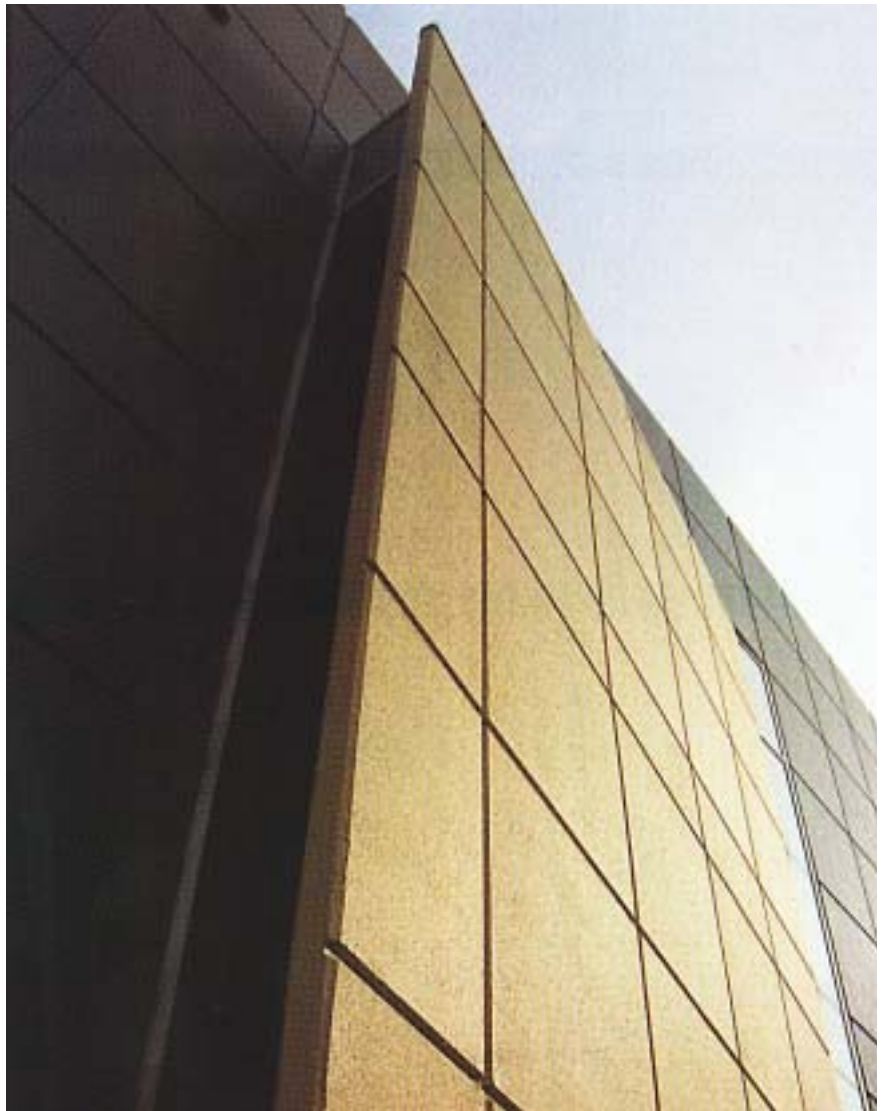
The new generation paints allow the concrete to 'breathe' – or transpire the curing water vapour from new concrete. Breathing can take six months or more so it is vital that the paint suits the properties of 'green' concrete.

Concrete is the ideal substrate for paint, providing a good key for the paint finish and paint coats have a life expectancy of 15 or more years.

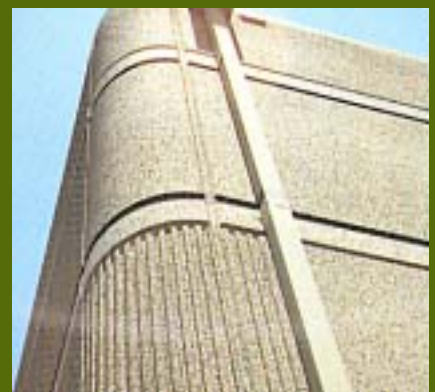


## Colour Oxides

Panels may be integrally coloured by adding colour oxides to the concrete mix. This provides a totally permanent, low cost, colour fast finish. Knowledge of the properties of integral-coloured concrete is needed to achieve a good result and designers/builders should seek expert advice from the oxide supplier for best results.



STRIKING COLOURS MAKE TILT UP A FRONT RUNNER



## Exposed aggregate

This method was popular a few years ago and depending on the aggregate, some striking effects can be achieved at low cost.

The most common method to produce an exposed aggregate finish is to cast the panel face-down onto aggregate embedded in a layer of sand. After the panel is lifted the sand is washed out to expose the aggregate.

## Veneers

Tilt-Up panels can be faced with wide range of veneers including stone, tiles and brick.

The usual practice is to place the veneer material down on the floor slab, then cast the panel on top of the veneer. This is by far the most economical method of constructing a stone-faced building.

## Form Liners

Concrete is a plastic material that will follow the shape of any casting bed. Brilliant, patterned surfaces can be cast in Tilt-Up panels using form liners. Form liners can be fabricated from timber, plastic or metal sheeting. Proprietary polystyrene form liners are available to replicate patterns ranging from stone, to brick to timber boarding.



## Scale

Scale, while not a finish is important to the overall appearance of a building. Grooves or lines can easily be formed in a Tilt-Up wall panel by placing timber battens onto the casting bed, then removing the battens from the erected panel to expose the groove. The surface can be modelled in any shape desired by embedding a suitable removable inset.



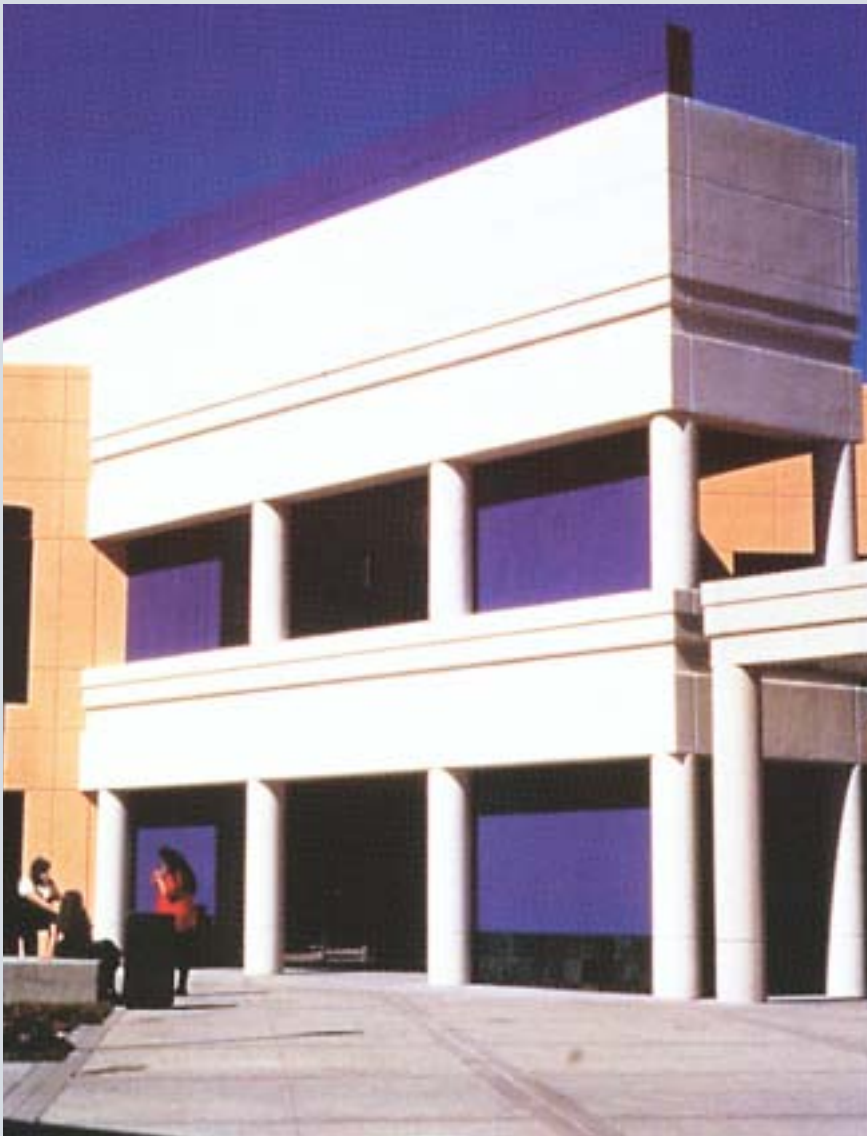
## Shape

Again, while not a finish shape is integral to the design of a building and the design flexibility of Tilt-Up panels means they can be cast in any shape, for example, high parapets, wide openings, oblique walls and distinctive building 'sign posts'.



INTERESTING SHAPES AND CORNER TREATMENTS ARE EASY IN TILT-UP

CLEAN LINES WITH RECESSED AND COLOURED TILT-UP PANELS



## Trends

The trends in architecture are towards a clean, uncluttered look after the excesses of post modernism and neo-historism.

Strip glazing and painted strips of concrete are now the favoured look and Americans have been able to achieve this very effectively and economically using Tilt-Up. Panels can be recessed where needed to allow reflective glazing to run in unbroken strips (as these photographs illustrate) and brightly-coloured concrete slabs, used selectively to accentuate massing.



# The future for tilt-up

America leads Australia in the enormous size of their Tilt-Up buildings, with panels up to 8-storeys high and sometimes as heavy as 128 tonnes. The largest Tilt-Up building in the world, in Tyler Texas, is big enough to house 36 football fields under its roof.

Tilt-Up is used for more than 90% of new low-rise commercial buildings in some areas of America and to date, 14 million panels have been placed, enough to circle the earth two times, if laid end to end.

Australia equals America in its Tilt-Up design and construction skills, and just as America was a couple of year ago, we are on the crest of a huge growth in Tilt-Up. All it will take is determination by our major builders to carve out a significant market and realise the potential of Tilt-Up in this country.

Jack Cleaver of the SRIA says, "Now is the time to get into Tilt-Up or face the danger of being left behind."

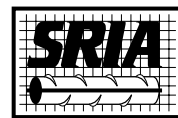
If you would like to know more about Tilt-Up please contact the SRIA for helpful advice. Good luck in your next Tilt-Up project.



FROM TOP: LARGEST TILT-UP IN THE WORLD IN TYLER, TEXAS. INSIDE VIEW. TILT-UP PANELS WERE CAST ON SITE AT SALAMANCA PLACE, HOBART. FOUR-STOREY APARTMENT BUILDING PERTH.



STEEL  
REINFORCEMENT  
INSTITUTE OF  
AUSTRALIA



**CONTACT DETAILS**

**SRIA NATIONAL OFFICE**  
PO BOX 280  
CROWS NEST NSW 2065

TELEPHONE: 02 9929 3033  
FREE CALL: 1300 300 114  
FACSIMILE: 02 9929 3255

EMAIL: [sria@sria.com.au](mailto:sria@sria.com.au)  
INTERNET: [www.sria.com.au](http://www.sria.com.au)