1 CONCRETE Framing is the Cheapest way to build
This is confirmed by recent cost studies\(^1\). The study found “Concrete framed structures are more competitive than steel framed structures in the medium- and high-rise commercial office markets in Sydney, Melbourne, Brisbane, Adelaide and Perth. In medium-rise (10 storey) buildings, the cost premium for steel framed structures ranged from 26% (Adelaide) to 85% (Sydney), relative to a concrete framed structure… For high-rise (30 storey) buildings, the cost premium for a steel framed structure ranged from 22% (Adelaide) to 65% (Sydney) relative to a concrete framed structure…”

2 CONCRETE Structures go up Faster
With normal concrete construction techniques many multi-storey buildings are erected at a rate of one typical floor every 4–6 working days. For example, Deutsche Bank Building, Sydney, 31 levels, 43,000 m\(^2\) total floor area: 4-day cycle. Rialto Building, Melbourne, 60 storeys, 86,000 m\(^2\) total floor area: 4- to 6-day cycle.

3 CONCRETE Framing keeps Storey Heights to a Minimum
Reduced floor-to-floor heights mean reduced cost of the facades and services – both expensive items. The cost study\(^1\) found: “The steel framed option adds between 100 mm and 200 mm (for 10-storey buildings) and between 200 mm and 300 mm (for 30-storey buildings) to the floor-to-floor height when compared to the concrete framed structure… The cost of facades would increase by approximately: 2.4% for a 100 mm increase in floor-to-floor height (based on the 16.2 x 8.4 m grid option for 10-storey buildings) and 5.4% for a 200 mm increase in floor-to-floor height (based on the 16.8 x 7.2 m grid option for 30-storey buildings).”

4 CONCRETE allows Construction to Begin Sooner
Steel has a lengthy lead time because of the need for shop drawings and off-site fabrication.

5 CONCRETE Framing is Readily Adaptable to Late Changes
Changes to formwork and reinforcement are generally much quicker than waiting for fabrication of steel replacement members.

6 CONCRETE Framing is Resistant to Fire
The natural fire resistance of concrete eliminates the need for expensively-applied protection. The cost study\(^1\) found: “Fire rating (2 hour) adds 5–10% to the cost of the steel structure depending on fire protection requirements, grid size, locality and concrete design.”

7 CONCRETE can be Easily Moulded
Concrete can produce complex shapes and set-backs and can be self-finished in many attractive ways. This gives expression to more architectural freedom than can be obtained economically from steel.

8 CONCRETE’S Greater Mass means Improved Thermal Behavior
The improved thermal behavior over steel-framed buildings means reduced running costs. Additionally, "the greater mass of the concrete structure provides better acoustic performance for both impact and transmitted noise when compared to the steel solution" the cost study\(^1\) found. The mass of a concrete frame also produces better damping of external wind loads.

9 CONCRETE Reduces Capital and Financing Costs
Cheaper and faster construction means lower holding charges and an earlier yield on investment. From a risk point-of-view, the cost study\(^1\) concluded: “Steel structures have an accelerated cash flow draw-down and arguably greater contract disruption and financial risk in the event of subcontractor/supplier default. Price volatility between locations is high for steel-framed structures.”

10 AUSTRALIAN Concrete Industry
Australia has one of the most sophisticated concrete industries in the world, and a building construction industry highly-skilled in, and well-equipped to handle, concrete construction. The cost study\(^1\) noted: “The expertise in high-rise steel structures is viewed as more limited than in concrete high-rise structures.”

Final comments from the cost study\(^1\) include: “Reinforced concrete columns with post-tensioned concrete floors are the most cost-effective framing design.

Concrete framed structures remain more competitive than steel framed structures across all spans studied – 8.4 m to 16.8 m.

… that alternative designs or price fluctuations would need to be considerable to alter the fact that, for commercial construction in Australia, concrete framed construction… is a significant 26% to 85% cheaper than steel framed solutions”

\(^1\) Concrete Concepts Costing Study an independent study by WT Partnership in conjunction with Irwinconsult for Cement Concrete & Aggregates Australia. A summary is available for free download from the CCAA web site: www.concrete.net.au/concreteconcepts

For further information on steel reinforcement or any other associated matters, contact SRIA on: (02) 9410 3224