

# “KENSINGTON BANKS”

A STATE OF THE ART MEDIUM DENSITY DEVELOPMENT,  
KENSINGTON, MELBOURNE, VICTORIA.



Recent changes to the Building Code of Australia (BCA), now permits the use of Full Timber Framed Construction Systems in Multi-Residential projects.

**These include Certified timber fire & sound rated**

- Separating (party) wall systems
- Floor/ceiling systems
- External wall systems

## ADVANTAGES

- Significant cost savings
- Speed of construction
- Use of traditional construction techniques
- Design flexibility
- Architectural/Design versatility and innovation

## INTRODUCTION

**M**ulti-Residential Timber Framed Construction (MRTFC) describes the use of full timber framed construction systems in multi-residential developments. These medium-density developments can take the form of attached dwellings or units on several levels. The basic premise behind MRTFC is the utilisation of fire and sound-rated timber framed wall and floor/ceiling systems to provide for vertical and/or horizontal separation between units/dwellings. These approved timber framed wall and floor/ceiling systems replace other more traditional materials such as concrete or masonry.

MRTFC is well established and extremely popular in the United States and other developed countries such as Canada, Great Britain, New Zealand and Japan. In these countries, timber is permissible not only for residential housing, but also for office buildings, hotels, motels and resorts.

Now MRTFC technology is also rapidly being embraced by the Australian building industry, a result of recent changes to the Building Code of Australia (BCA) brought about after an extensive and unparalleled R&D Program undertaken by the Australian timber industry over the past eight years.

These changes to the BCA now permit full timber framed construction including fire and sound-rated timber separating wall and floor/ceiling systems across the following Classes of construction:



### **Class 1 buildings:**

Rowhouses, terrace houses, villa units, townhouses - No limitation on storeys.



### **Class 2 buildings:**

Sole Occupancy Units, apartment buildings - up to 3 storeys or four storeys where the ground storey is in masonry/concrete and is used for carparking or other ancillary purposes.



### **Class 3 buildings:**

Guest houses, boarding houses, hostels - up to 2 storeys.





Three storey executive townhouses at Kensington Banks.

One of the largest multi-residential projects in recent years that utilises MRTFC technology is Kensington Banks, an extensive development situated on the historical site of the former Kensington Abattoirs and Commonwealth Army Depots, in the suburb of Kensington in Melbourne.



*“We have found that MRTFC is a superior building system as it provides a faster construction*

*sequence which enhances cost effectiveness.*

*Timber separating walls provide comparable or improved sound and fire resistant properties to competitive materials.”*

*Greg Langmaid  
Construction Manager  
Urban Pacific Developments Ltd.*

*“We have been most impressed with MRTFC. The structural efficiency, the excellent acoustic and fire ratings achievable and general performance overall!*

*The fact that the construction process can be rationalized and in many cases streamlined to utilize less trades being involved adds to a more cost effective programme.*

*Flexibility in design, particularly on steeper sites where foundations, footings and accessibility play big factors!*

*We continue to utilize this construction, particularly where opportunities permit.”*

*Louis Chiodo  
Architect*



# KENSINGTON BANKS DEVELOPMENT

**K**ensington Banks is unique as it is the largest urban renewal development ever undertaken in Australia. It is a project which now sets the benchmark for urban design standards. The Kensington Banks project, which comprises over 1000 homes with a total value of \$200 million, is a joint venture between leading home builder Urban Pacific Developments Ltd., the Federal Government and the Victorian Government, in close cooperation with the City of Melbourne. A number of recognised quality medium density builders have also committed to the project, including:

- Burbank Homes
- Desar Constructions
- Kent Brothers
- Pioneer Homes Australia
- Renmark Homes
- Tomkin Homes
- Corridor Properties

The 40 hectare development of previously under-utilized government land, is also the largest new residential addition to inner Melbourne for many years and is consistent with government policy to revitalize Melbourne by making inner urban living more affordable and attractive.

This development is a spectacular display of modern building practices which includes terraces, studio apartments, mews, townhouses and rowhouses.

MRTFC has been used extensively at Kensington Banks as the builders involved have found the timber framed systems to be far quicker and simpler to erect and cheaper than equivalent concrete or masonry systems. The timber systems provide, in many cases, improved fire and sound ratings to the masonry or concrete alternatives, allowing the builder to produce a better product at a lower cost.



*Design flexibility in medium density housing*

## Cost Effectiveness

Use of lightweight drywall systems have been shown to provide significant cost savings compared to concrete/masonry walls, as have the use of timber floors when compared to concrete slabs. MRTFC uses traditional timber framing construction techniques and materials which allows full utilisation of the carpenter's services, while eliminating wet trades such as bricklayers and blocklayers, resulting in an improved workflow and less down-time.

## Speed of construction

This is one of the main cost reduction factors since it allows for minimisation of holding costs, interest savings on investment loans, reduction of labour costs and faster

*Speed of construction – double stud separating wall system.*



*Time comparison figures supplied by Urban Pacific Developments Ltd.*



property turnover. In addition, transporting, scaffolding and project/site management costs can be minimised via the use of MRTFC systems. Feedback from building companies has indicated material and labour savings of between 12-30% in the construction of MRTFC separating walls when compared to concrete blocks, tilt-up concrete panels or double brick wall systems.

## Design Flexibility, Versatility and Innovation

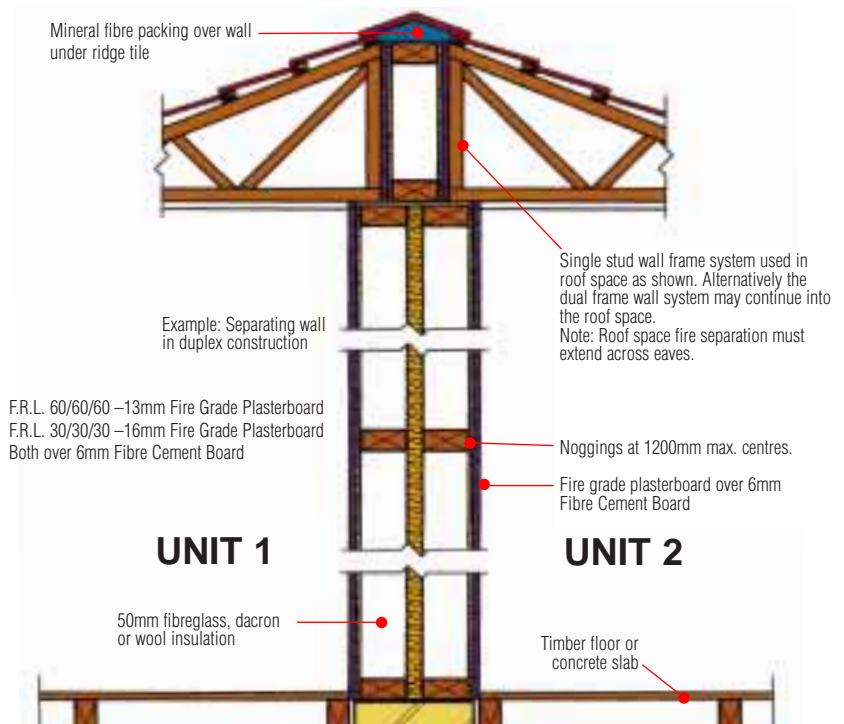
**Design Flexibility:** Timber framed construction provides the designer with great flexibility. Timber can be easily handled on site and architectural features can be incorporated cheaply and with great

ease, using different products to enhance aesthetics; thus adding value to the building. A major advantage of MRTFC is its adaptability to suit a wide range of site sizes, locations and conditions,



## DOUBLE STUD SEPARATING WALL SYSTEM

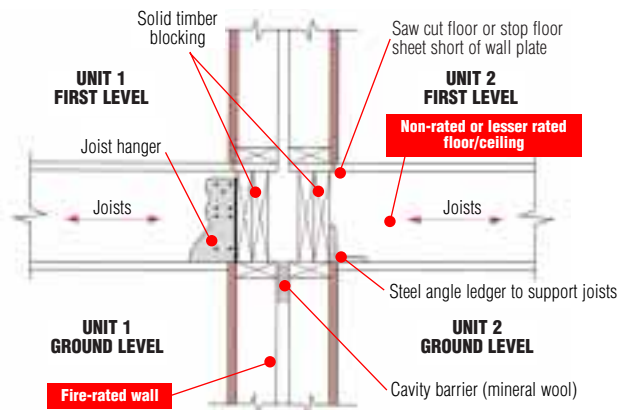
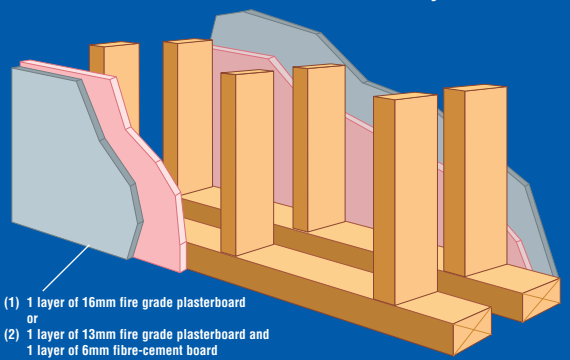
A Double Stud Wall System has been widely adopted by designers and builders at Kensington Banks for separating walls between units. This system is comprised of two separate timber frames with a 30mm cavity, and fire grade linings, such as plasterboard and/or fibre-cement board, installed on each face of the wall. The benefits of this system are that it offers excellent fire and sound ratings, it can be used in load-bearing applications, it allows for easier prefabrication and design flexibility and it is extremely cost competitive.



**Typical profile of a double stud separating wall system. Similar details apply for single stud and staggered stud walls.**

## MULTI-RESIDENTIAL TIMBER FRAMED CONSTRUCTION

### Double stud timber framed wall system



**Typical joint detail of a double stud timber separating wall, separating two units, and a timber floor system as used at Kensington Banks for 2 and 3 storey rowhouses.**

while at the same time satisfying marketing demands in terms of architectural style, quality and amenity. Lightweight frames provide for on site flexibility and can be installed without the need to use heavy lifting machinery. In addition, MRTFC systems are highly suitable for use on sites with unstable and reactive soils because of their lightweight nature. This, in many cases, results in reduction of foundation costs especially on sloping sites.

**Architectural Design Versatility and Innovation:** MRTFC offers a wider choice of construction materials to that currently available to the designer, with inherent flexibility of design which can provide more variety and individuality as well as satisfying community expectations regarding quality of life.

### Leading Edge Technology

#### Fire Resistance Level (FRL):

All MRTFC fire and sound-rated timber framed separating wall and floor/ceiling

systems have been tested and certified by CSIRO in accordance with Australian Standards AS1530 Part 4 - 1990. In addition, extensive research has been carried out in the areas of fire resistance, fire modelling and risk assessment modelling to ensure that MRTFC systems not only meet, but exceed the Building Code of Australia requirements.

#### Sound Transmission Class (STC):

An acoustic testing program carried out by CSIRO has also demonstrated the effectiveness of MRTFC timber

framed systems for acoustic separation. In fact, sound ratings higher than those provided by equivalent concrete/masonry systems have been recorded.

The BCA generally calls for a Sound Transmission Class of STC 45 for separating walls and floors. In some specific cases it calls for an STC 50 for walls only. The results indicate that MRTFC wall and floor/ceiling systems provide superior sound ratings to the BCA requirements. Acoustic ratings of up to STC 61 have been obtained with double stud wall systems, demonstrating the ability of timber framed systems to easily and economically provide very high levels of sound insulation.

### **Environmentally friendly technology.**

In addition to all its other benefits, MRTFC is also the most environmentally friendly construction



*Speed of construction is easily achieved with full timber framed construction.*

system as it uses the only truly renewable resource - timber. Given Australia's expanding plantation supplies, combined with its sustainable native forest harvesting, the future availability of timber is assured. The environmental attributes of timber, together with its thermal/insulating and strength characteristics, make it the ideal construction material choice for architects, builders and specifiers.



*In simple terms, higher STC numbers indicate higher levels of sound insulation ie an increase of 10 STC points will result in a doubling of the sound insulation ability of a wall or floor/ceiling system.*

*MRTFC was awarded the Building Science Forum (BSF) of Australia's Building Science Award for 1996. BSF president Tom McLean said "The award marks a significant advance in the science of building, and will do much to enhance the activity of the Australian building and construction industry."*



*Fire & sound-rated timber framed separating walls (party walls) offer acoustic superiority at a lower cost.*

## Conclusion

New innovative technologies such as Multi-Residential Timber Framed Construction continue to ensure timber's pre-eminence in the residential construction market; a fact recognised by the building industry when it awarded MRTFC the Building Science Forum of Australia's, Building Science Award for 1996.

MRTFC's broad acceptance by builders, developers and designers in Australia, though, has in reality been due to the cost efficiency and design flexibility which these systems offer.

Kensington Banks provides an example of a magnificent residential development, which through quality workmanship, innovation, affordability and diversity has achieved a commercial success second to none and national recognition, as an exceptionally high quality urban environment. In recognition of this, Kensington Banks was awarded the prestigious Royal Australian Planning Institute's 1995 award for residential planning excellence.

The successful implementation of MRTFC systems at Kensington Banks by seven of Melbourne's leading builders, and the continuing interest by Australia's leading developers, is evidence of the acceptance of these systems in Australia.



## SEPARATING WALL DESIGN DETAILS

**In using Full timber framed construction (MRTFC) in Class 1 buildings, the only additional requirements over and above those for a typical house are as follows:**

- Separating walls must have a Fire Resistance Level (FRL) of 60/60/60 (-/60/60 for non-bearing walls).
- Separating walls must extend from the ground to the underside of non-combustible roof cladding (i.e. concrete and terracota tiles, corrugated iron etc.). If combustible roof cladding is used, such as timber shingles, the separating wall must extend 450mm above the combustible roof cladding.
- No common space is permitted to be shared by different attached dwellings e.g. underfloor/subfloor, balconies or roof spaces. The separating wall must provide complete separation.
- Separating walls are to have a minimum Sound Transmission Class (STC) of 45 ( 50 where the wall separates a habitable room in a house from a wet area/kitchen in an adjoining house).
- Roof battens are the only members that are allowed to cross the separating wall from one house to the other. Roof battens or purlins crossing separating walls must be 75 x 50 mm or less in dimension. Any gaps between the separating wall and roofing must be filled with mineral fibre or other suitable fire-resisting material.

In general, the construction requirements in all three classes of buildings relate to the means by which satisfactory fire-resistance can be achieved.

**For Class 1 buildings, however, there are NO BCA requirements relating to:**

- Fire-rating of car accomodation within the dwelling (i.e.garage).
- The use of combustible materials in the separating walls (any materials can be used as long as the wall system achieves the required FRL-fire rating.)
- Fire or sound-ratings for floors.
- Limitation of number of storeys.



*Double stud separating wall system between townhouses.*



## TIMBER ADVISORY SERVICES

### VICTORIA

#### Timber Promotion Council (TPC) – Victoria

320 Russell Street  
MELBOURNE VIC 3000  
Telephone: (03) 9662 3222  
Facsimile: (03) 9662 3666  
Email: tpcvic@tpcvic.org.au

### QUEENSLAND

#### Timber Research And Development Advisory Council of Queensland (TRADAC)

PO Box 2014 FORTITUDE VALLEY  
MAC QLD 4006  
Telephone: (07) 3358 1400  
Facsimile: (07) 3358 1411

### SOUTH AUSTRALIA

#### Timber Development Association of SA

113 Anzac Highway  
ASHFORD SA 5035  
Telephone: (08) 8297 0044  
Facsimile: (08) 8297 2772

### TASMANIA

#### Tasmanian Timber Promotion Board

GPO Box 1682  
HOBART TAS 7001  
Telephone: (03) 6224 1003  
Facsimile: (03) 6224 1030

### NEW SOUTH WALES

#### Timber Development Association NSW Ltd

PO Box 50  
SURRY HILLS NSW 2010  
Telephone: (02) 9360 3088  
Facsimile: (02) 9360 3464

### WESTERN AUSTRALIA

#### Timber Advisory Centre (WA)

PO Box 4002 WEMBLEY WA 6014  
Telephone: (09) 9380 4411  
Facsimile: (09) 9380 4477

## NATIONAL TIMBER BODIES

#### National Association of Forest Industries Ltd (NAFI)

PO Box E89, BARTON ACT 2600  
Telephone: (06) 285 3833  
Facsimile: (06) 285 3855

#### Pine Australia

830 High Street KEW EAST VIC 3102  
Telephone: (03) 9859 2455  
Facsimile: (03) 9859 2466

#### Plywood Association of Australia (PAA)

PO Box 2108 FORTITUDE VALLEY MAC QLD 4006  
Telephone: (07) 3854 1228  
Facsimile: (07) 3252 4769

#### Australian Wood Panels Association

PO Box 158 COOLANGATTA QLD 4225  
Telephone: (07) 5598 1988  
Facsimile: (07) 5598 2007

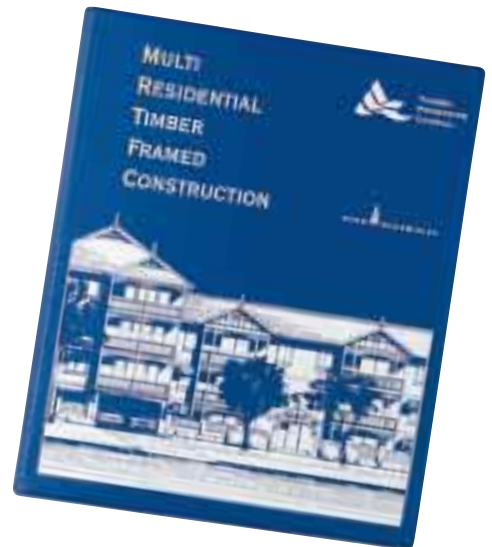
# MRTFC SUPPORT DOCUMENTATION MATERIAL

A comprehensive three part suite of manuals (3 manuals) has been produced by the timber industry. These manuals include substantial information on the approved timber wall and floor/ceiling systems, and the methods of designing and constructing MRTFC buildings to comply with the Building Code.

The MRTFC manuals provide a complete guide that enable designers, local authorities, developers and builders to pursue economical solutions for Multi-Residential Projects.

In addition, the lining manufacturers – Boral Plasterboard,

CSR Building Materials and James Hardie Building Boards, have also produced literature with specific information about their own products/systems.



*The MRTFC Manuals provide a complete guide that enables designers, developers and builders to pursue economical solutions for multi-residential projects.*

**FOREST & WOOD PRODUCTS**  
RESEARCH & DEVELOPMENT CORPORATION

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