

Cost Comparison : Dincel vs AAC Walls



DINCEL

STRUCTURAL WALLING

September 2023

**HOW DO YOU GET MAXIMUM
BENEFIT FROM DINGEL WHEN USED
IN APARTMENT CONSTRUCTION?**

WHY APARTMENT BUILDERS / DEVELOPERS SHOULD USE LOADBEARING WALLS INSTEAD OF COLUMN + NON-LOADBEARING WALLS

Land Purchase Price - Same For All

Apartment Selling Price - Same For All

The Only Competitive Edge Would Be **Reducing Construction Cost And Time** Of Your Project By Using **Loadbearing Walls**

WHAT TO LOOK FOR IN COST AND TIME EFFICIENCY

SPEED

- Installation speed - workplace safety
- Co-ordination of trades
- Not affected by wet-weather condition
- Faster than column-slab system having infill walls

MATERIAL COST SAVING

- Less cement/concrete and steel in typical floor slabs and transfer levels
- Eliminates conventional footings and waterproofing costs
- Reduced waste and cleaning costs
- Reduced maintenance costs

DID YOU KNOW THAT LOADBEARING WALLS OFFER:

- Maximum STRENGTH for earthquakes and cyclones
- FASTER construction
- Maximum ENERGY EFFICIENCY*
- Maximum COST EFFICIENCY
 - Up to 43% cost efficiency
 - Concrete Structures Engineering Codes offer significant benefits to load bearing wall systems

*Refer Dincel website for report titled "Energy Efficiency in Buildings, Embodied Energy" as endorsed by the Swinburne University of Technology

DINCEL LOADBEARING WALL MAIN PROFILES

275MM DINCEL



200MM DINCEL



155MM DINCEL



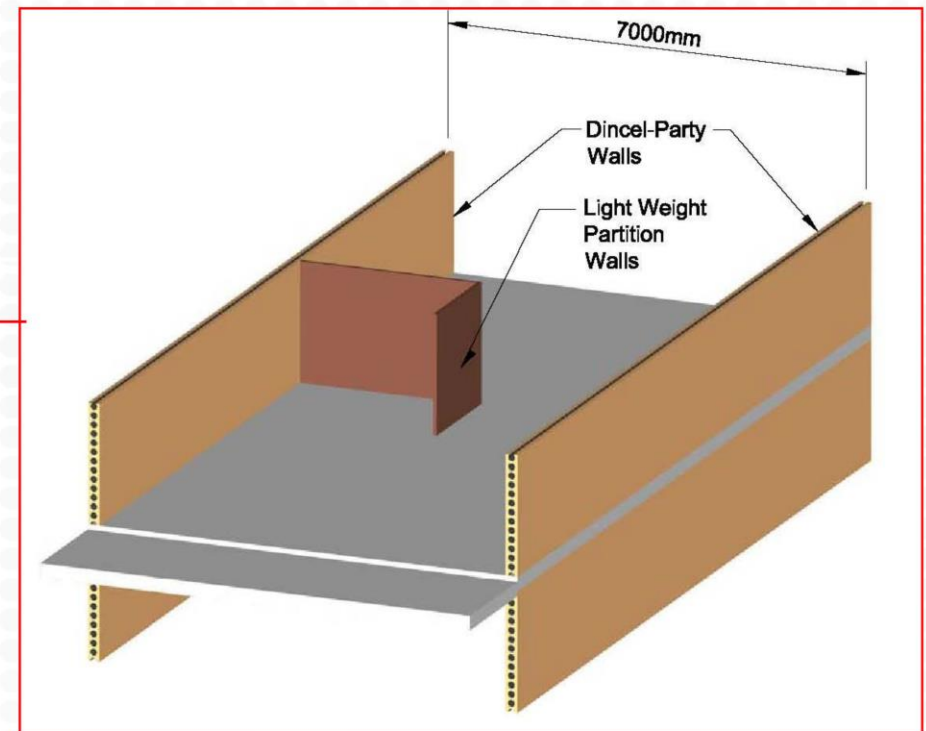
110MM DINCEL



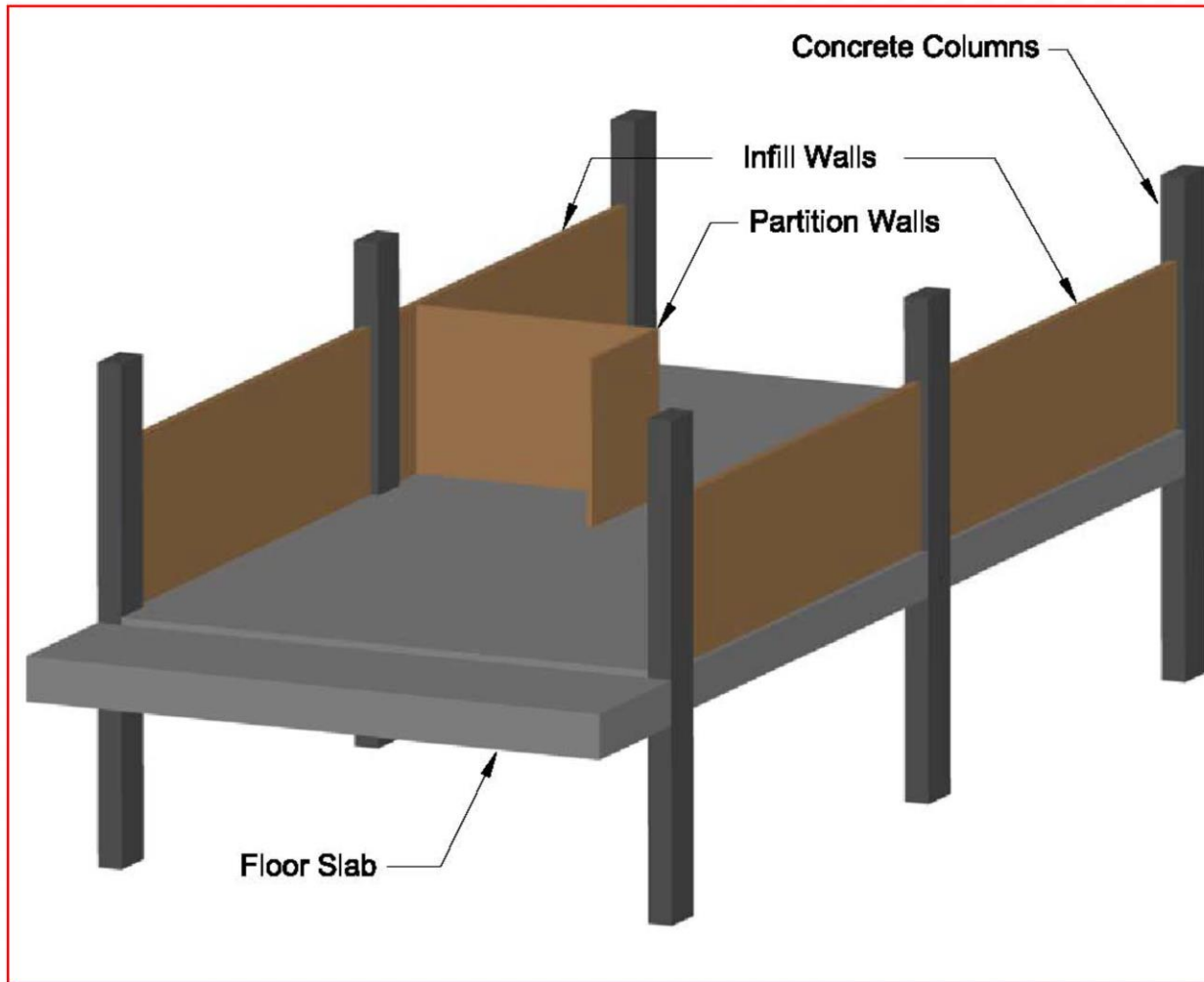
BUILDING WITH DINCEL STRUCTURAL WALLING RESULTS IN LESS CONCRETE / STEEL AND TIME

DINCEL System - no columns, loadbearing
Dinzel Wall and one-way floor system

Floor Systems - timber floors, in-situ
concrete or precast flooring (precast
planks), Bondek, Condeck, Kingfloor etc...

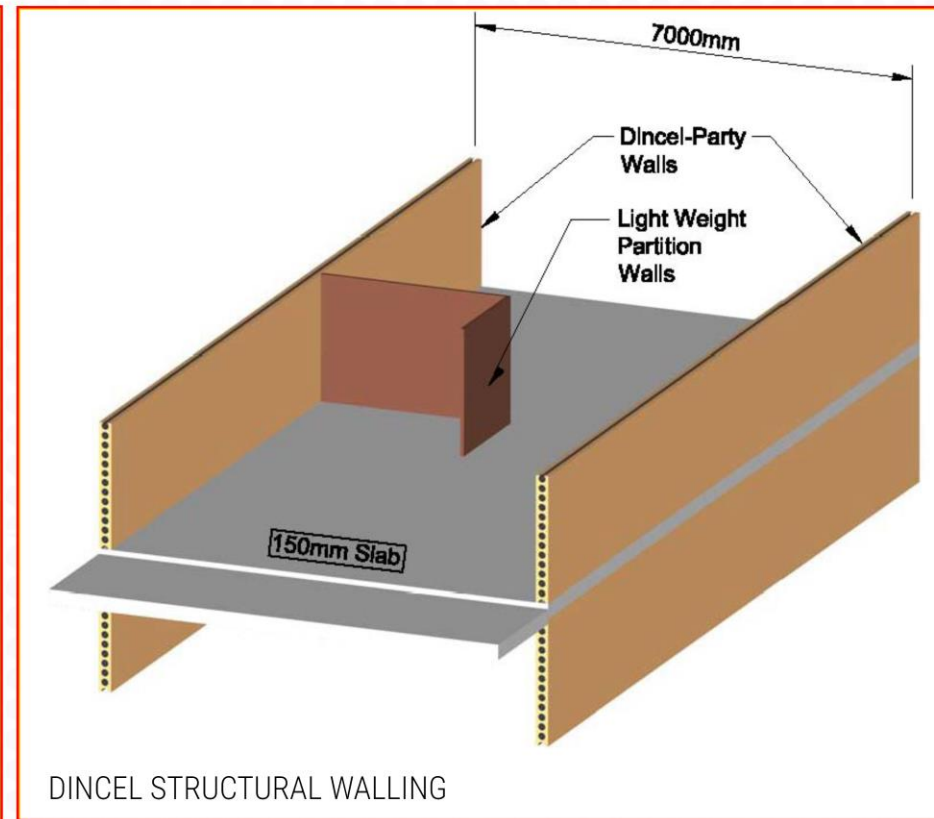
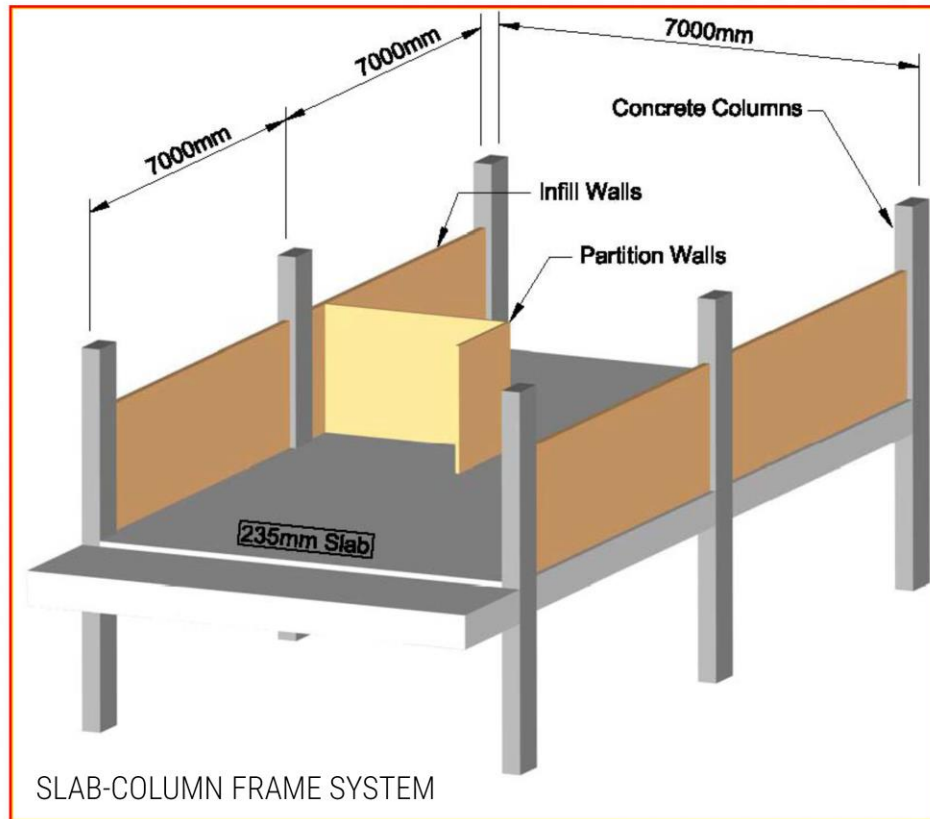


CONVENTIONAL COLUMN-SLAB FRAME



The only reason this most common construction system consisting of column-slab and infill wall system exists is because **there was no cost and time efficient concrete wall system available, like DINCEL**, to replace columns and infill walls used for acoustic and fire purposes

MINIMUM 23% UP TO 43% COST SAVINGS

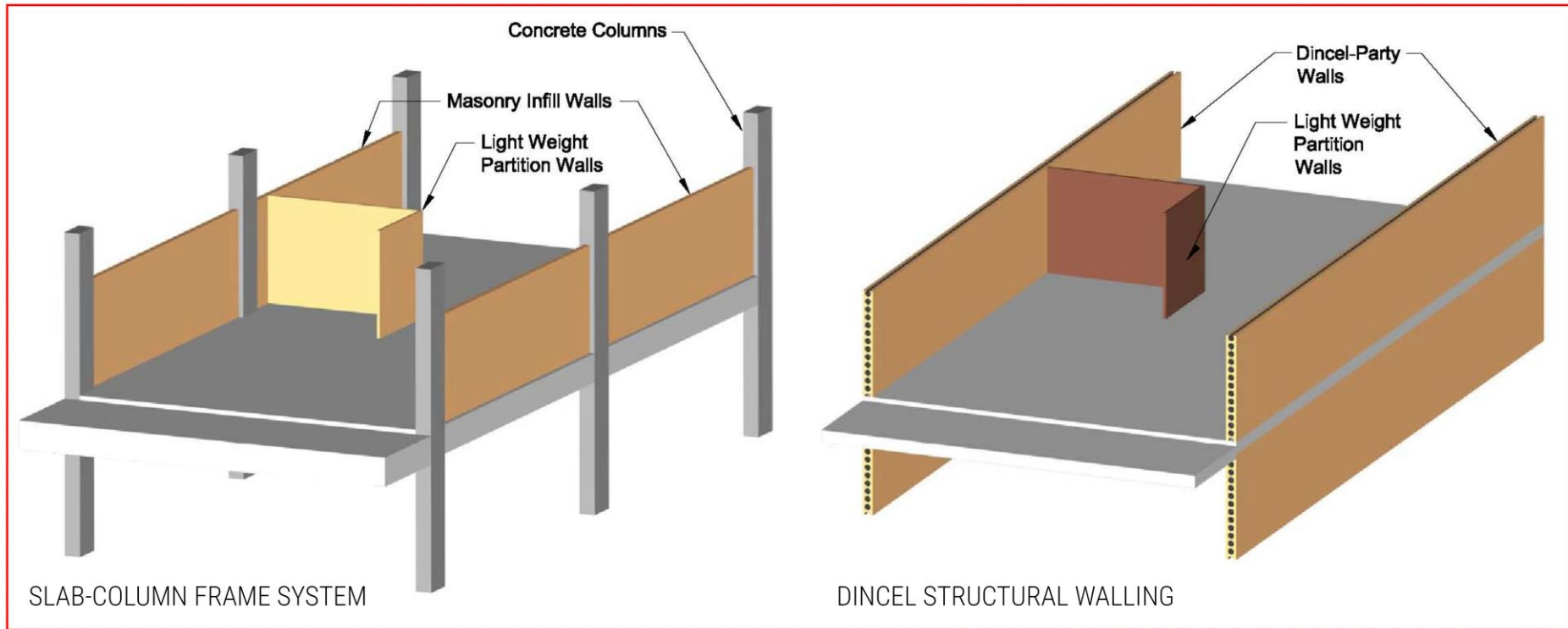


FLOOR SLABS CARRIED BY LOADBEARING DINCEL WALLS WILL ALWAYS RESULT IN LESS CONCRETE AND STEEL

COLUMN-SLAB CONSTRUCTION SYSTEM WITH INFILL WALLS COST MORE THAN USING DINCEL LOADBEARING WALL SYSTEM

DINCEL WALL	0%
COLUMN-SLAB + INFILL WALL TYPE	
Stud & Plasterboard	23% More
AAC Wall System	28% More
Masonry/Brick Wall	43% More

IMPORTANT ADVICE FOR DESIGNERS



MAJOR COST SAVING RULES IN MULTI-STOREY APARTMENT CONSTRUCTION

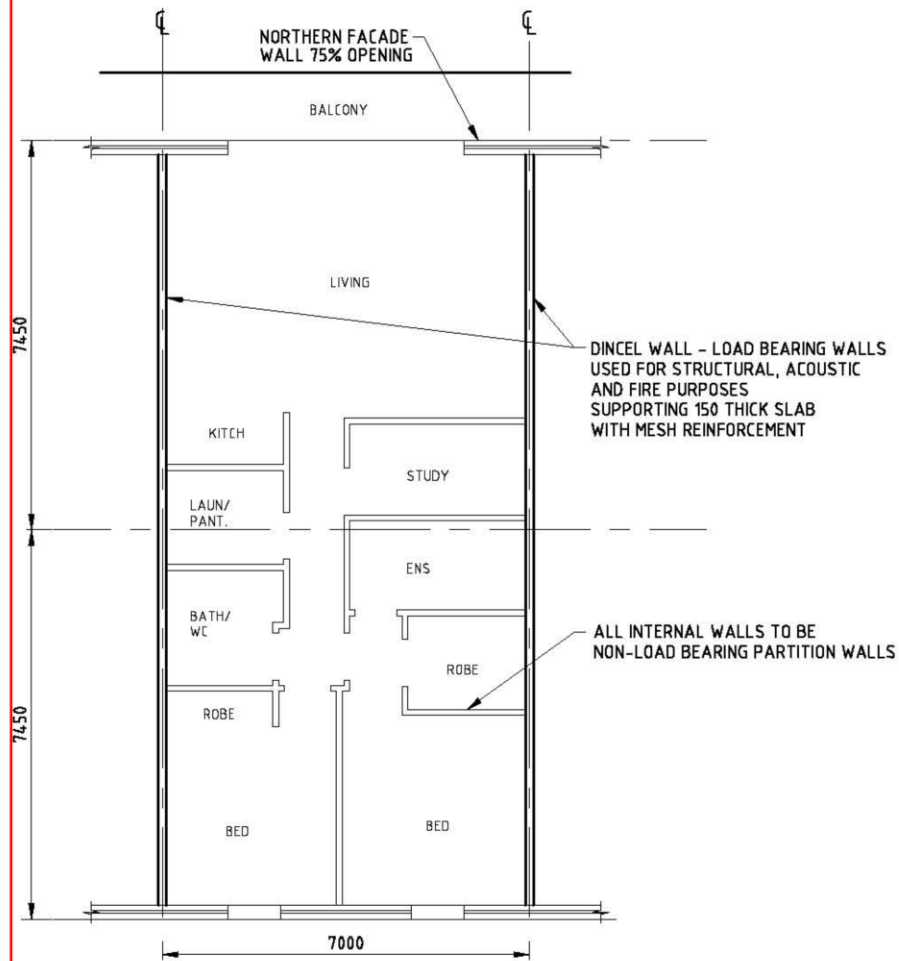
- Cross ventilation requirements mostly result in party walls being parallel to each other
- The most cost effective construction results utilising loadbearing party walls
- All party walls and wet areas are located at the top of each other in multi-unit developments and is a key cost issue
- Where possible it is highly recommended that party walls are orientated at right angle direction to car parking aisle ways

CASE STUDY

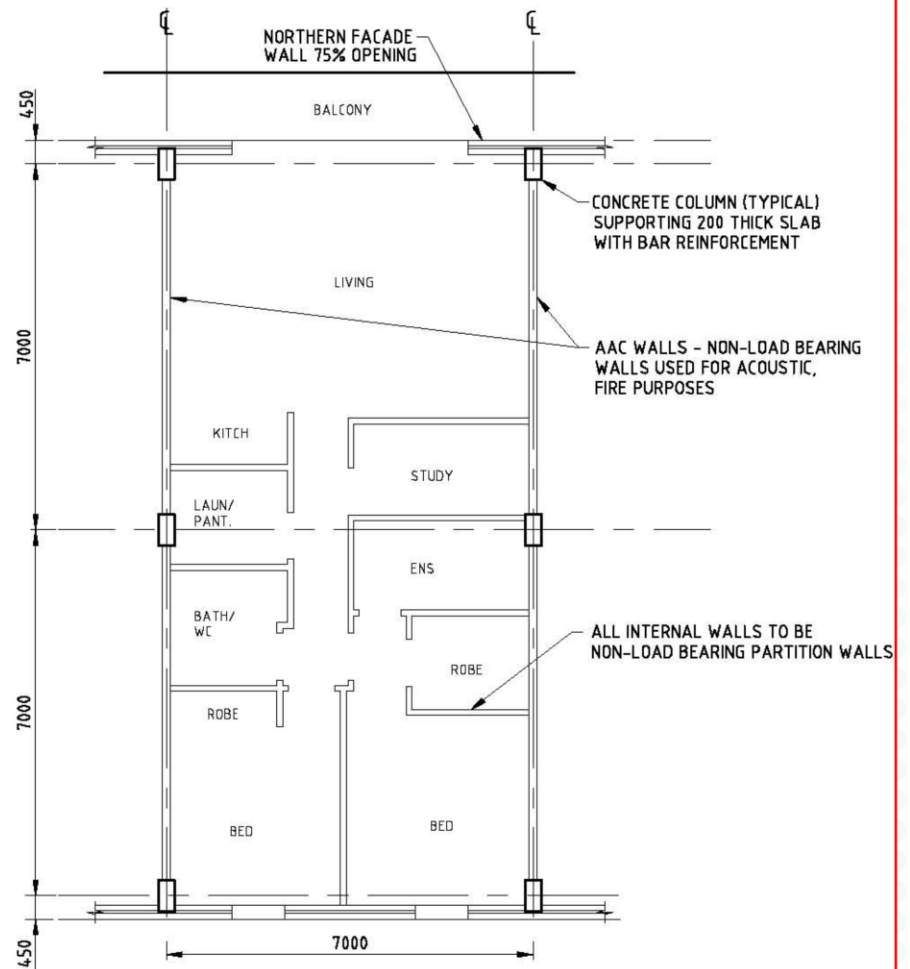
DINCEL VS AAC WALLS

Dincel vs Stud & Plasterboard Walls can be considered similar as per this case study

CASE STUDY FOR RESIDENTIAL APARTMENT UNIT CONSISTING DINCEL WALLS Vs AAC/STUD & PLASTERBOARD

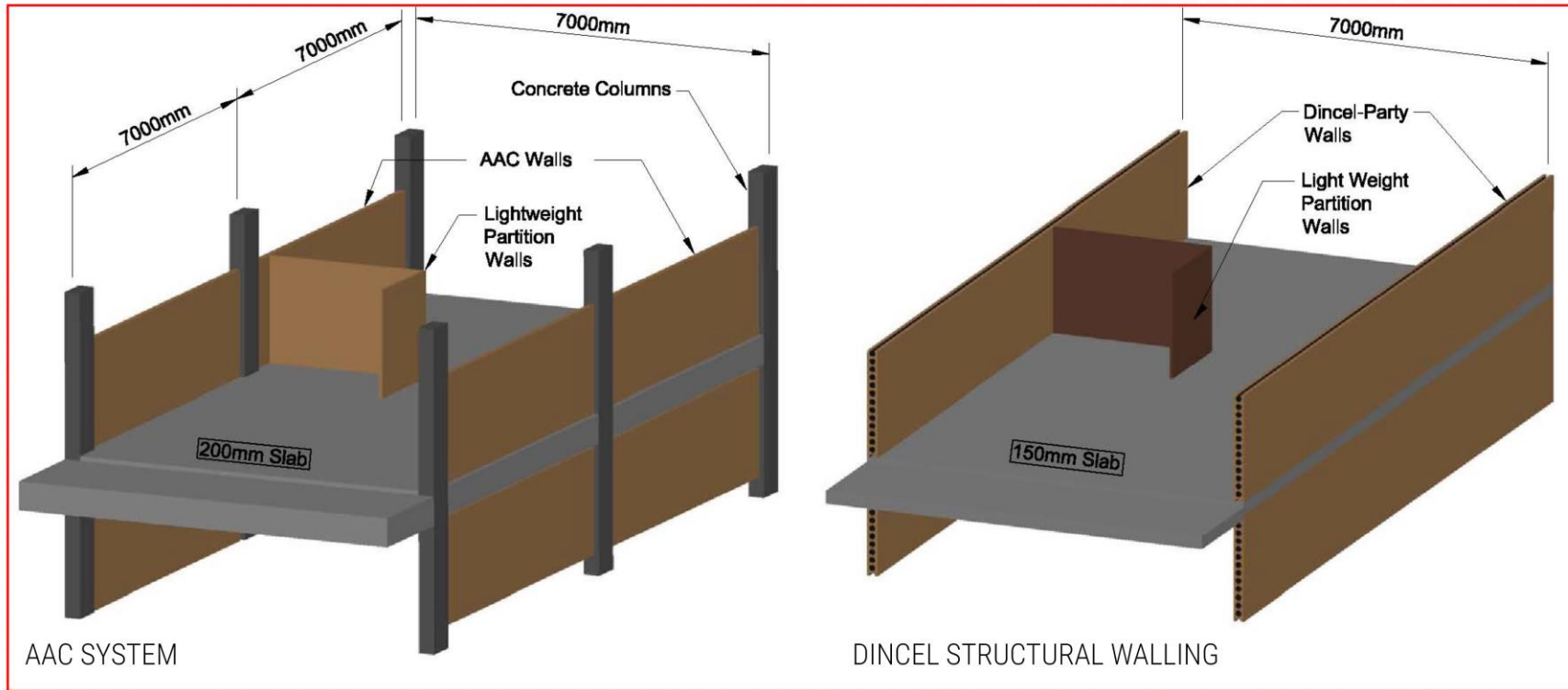


PLAN LAYOUT OF TYPICAL 2 BED + STUDY
APARTMENT UNIT
DINCEL OPTION



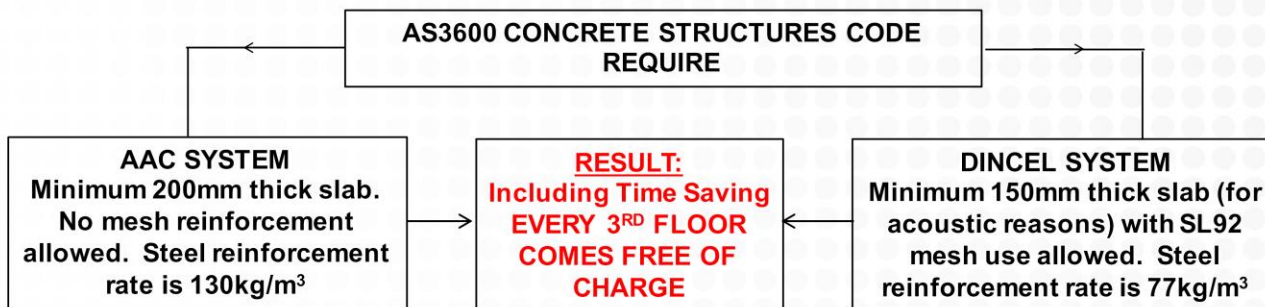
PLAN LAYOUT OF TYPICAL 2 BED + STUDY
APARTMENT UNIT
AAC OPTION

AAC WALL SYSTEM VS DINCEL

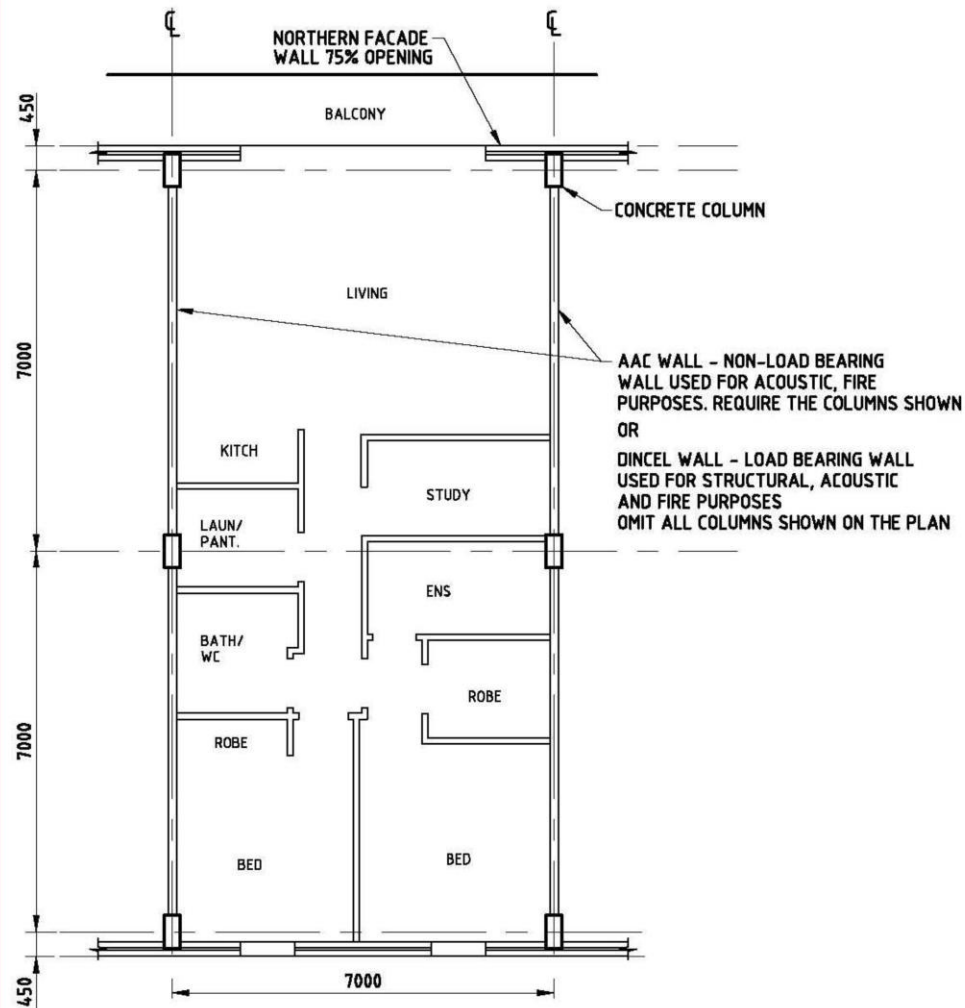


AAC SYSTEM

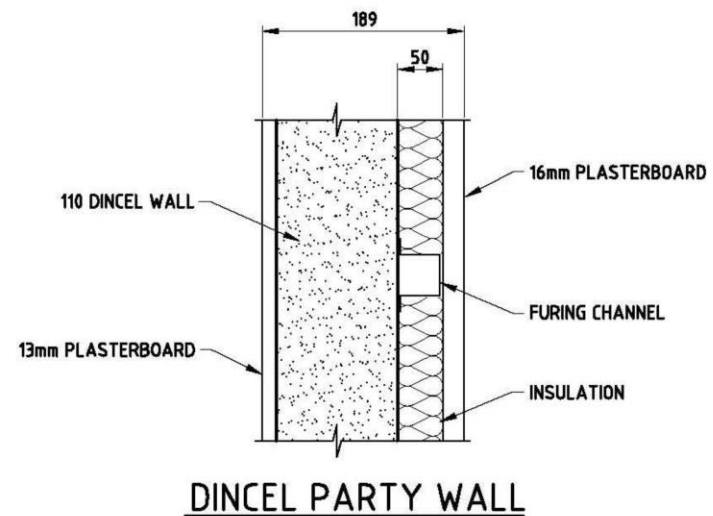
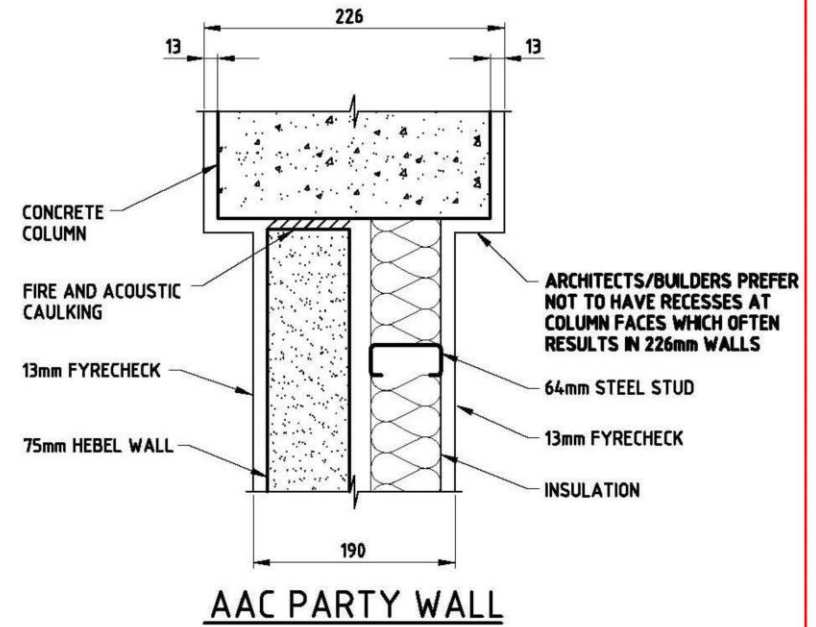
DINCEL STRUCTURAL WALLING



CASE STUDY FOR RESIDENTIAL APARTMENT UNIT CONSISTING AAC & DINCEL WALLS



**PLAN LAYOUT OF TYPICAL 2 BED + STUDY
APARTMENT UNIT**

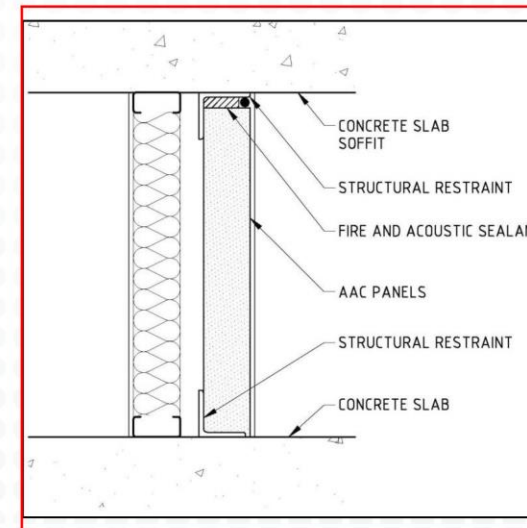
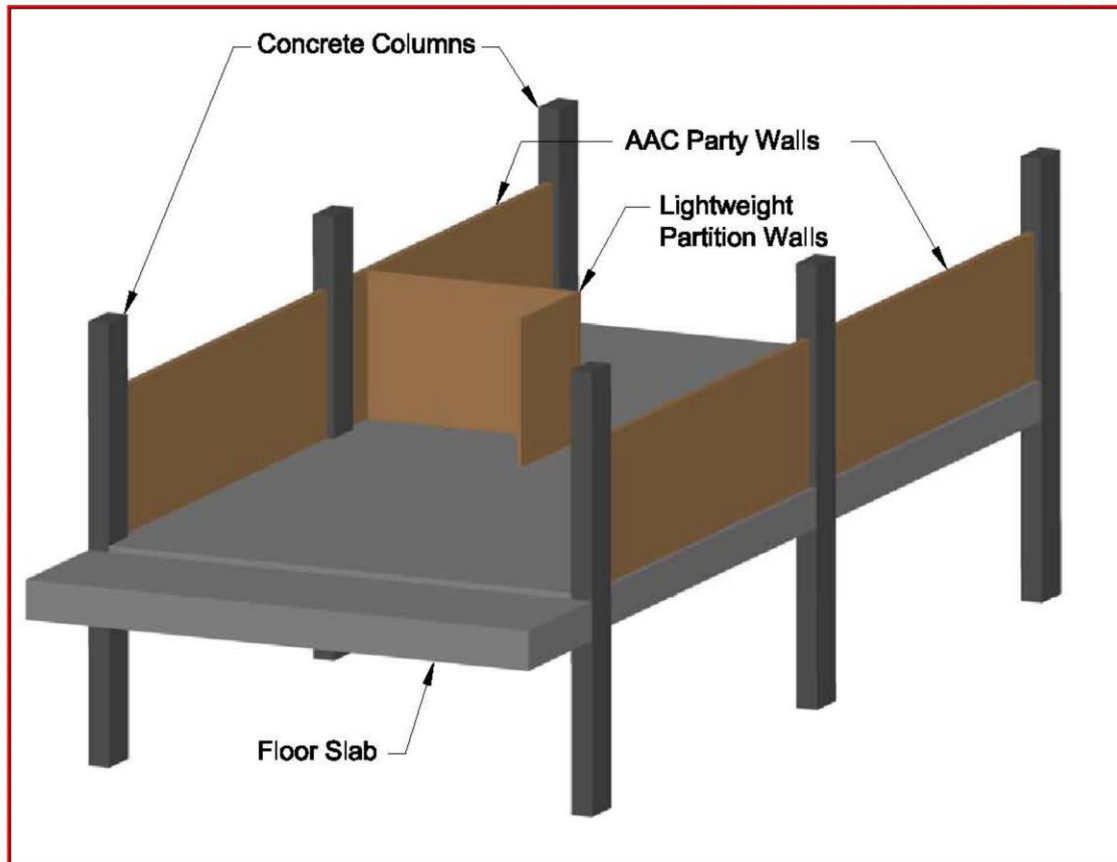




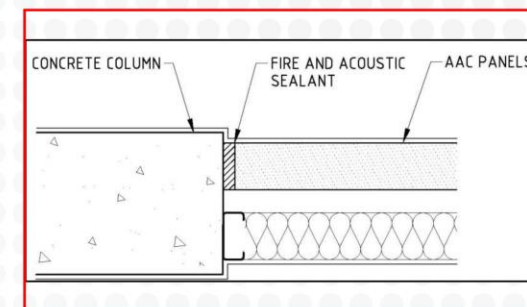
DINCEL LOADBEARING WALLS

BUILDING WITH AAC SYSTEM

BUILDING CODES REQUIREMENT FOR DETAILS BETWEEN STRUCTURE AND AAC WALLS



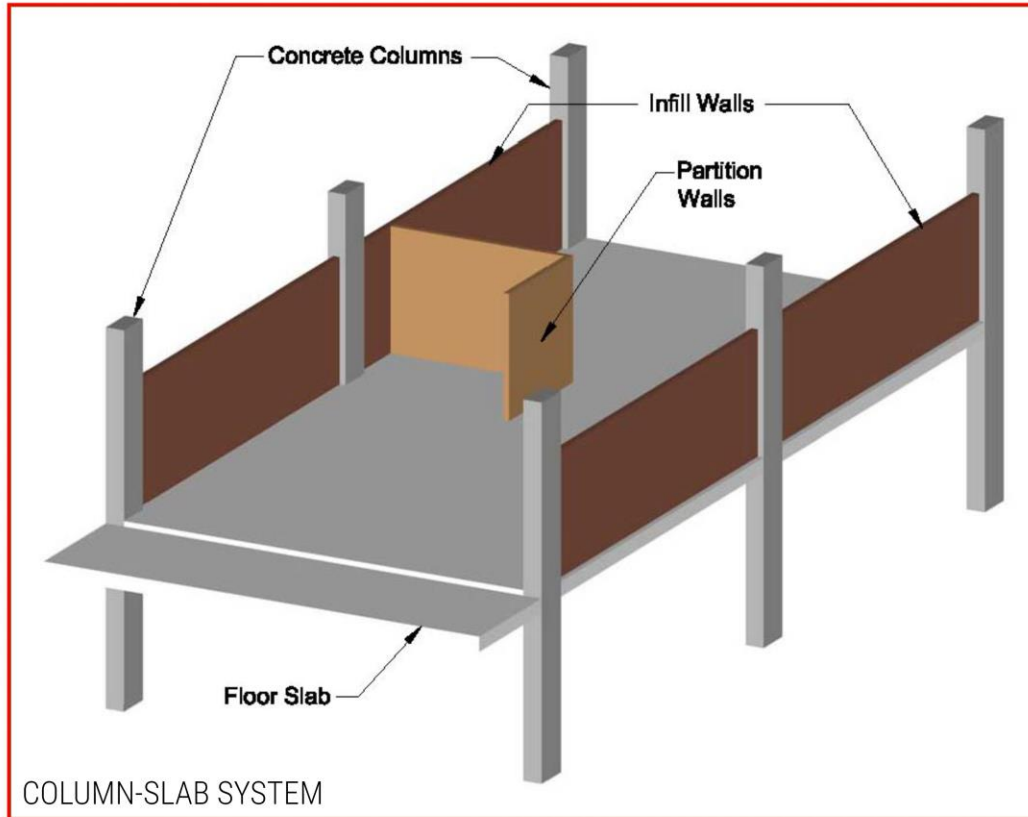
WALL-FLOOR DETAIL AT AAC WALL



WALL-COLUMN DETAIL AT AAC WALL

Buildings move and slabs deflect in time which can result in gaps at fire/acoustic sealants.
WHO BECOMES RESPONSIBLE FOR NON-COMPLIANCE? Builder - Developer - Architect?

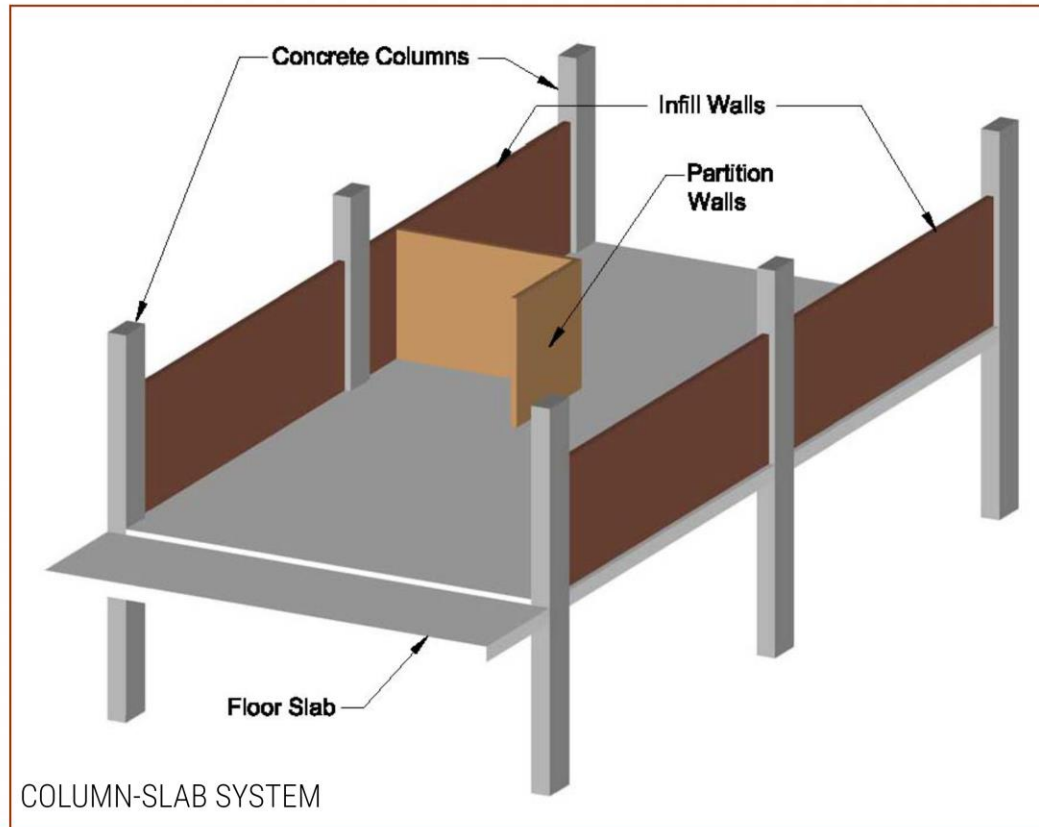
AS 3600 CONCRETE STRUCTURES CODE



FRAME STRUCTURES WITH AS 3600

- Minimum slab thickness is 200mm
- Mesh reinforcement cannot be used
- DINCEL loadbearing system allows 150mm thick slabs and mesh reinforcement

BS EN 1992-1-2 : 2004 EUROCODE



FLAT PLATES

- A 90 minute fire requires **200mm** thick slab (Table 5.9)

ONE/TWO WAY SLABS

- By beams or loadbearing Dintel Wall, a 90 minute fire requires **100mm** thick slab (Table 5.8)

150MM THICK SLAB - ACOUSTIC

QUESTION YOUR ACOUSTIC ENGINEER

- If a 150mm thick wall for **airborne sound** complies with the BCA's "deemed to satisfy" condition. Why a 150mm thick slab would not comply for airborne sound purposes?
- The following Day Design and SLR Acoustic Certificates are based on the Canadian's acoustic floor testing for 150mm slabs.
- There is no reason why your Acoustic Engineer would not agree with Day Design's and SLR's certifications.
- Acoustic improvements to Australian buildings were originally introduced because of inadequate wall construction (e.g. brick walls with excessive wall chasing); not necessarily the poor performance of minimum 125mm thick slabs used then.
- Why would you waste extra concrete and steel resulting in an increase in the structural cost by a minimum of 28% if there is evidence that a 150mm thick slab would comply.

IF YOU DON'T ASK - YOU WILL NOT ACHIEVE MONEY
AND TIME SAVING.



12 April 2013

610.12590.00000 Letter 20130412.doc

Dincol Construction System Pty Ltd
Level 3, 7K Parkes Street
PARRAMATTA NSW 2150

Attention: Burak Dincol

Dear Burak

Floor Slab Acoustic Certification

In our opinion, the following construction meets the laboratory airborne and impact acoustic requirements of the current BCA.

A 150 mm thick concrete slab with carpet – with either a set plaster ceiling, or with a suspended ceiling having a cavity of not less than 70mm.

- a. Tiled or timber finish – with an approved acoustic underlay (to serve as the impact isolator) laid over the concrete slab and under the tiling.

Rationale:

- A 150 mm plain concrete member is “deemed to satisfy” the airborne party wall requirement of $R_w + C_w$ 50 dB, which is also the party floor airborne requirement – even though the deemed to satisfy requirement for a floor includes a 200 mm concrete slab (with carpet).

The presence of set plaster ceiling will not reduce the airborne acoustic performance of the 150 mm thick slab.

Note: A suitably qualified acoustics engineer should advise on the design where the ceiling cavity is less than 70mm.

- The current BCA impact requirement is $L_{n,w} + C_i$ being no more than 62 dB. This will be satisfied through the use of carpet.

Note: A suitably qualified acoustics engineer should specify an appropriate acoustic underlay where a hard floor finish is required.

We hereby certify that the above specification, in association with Dincol-Wall is used, the floor slabs will comply for airborne and impact requirements of the current Building Code of Australia (BCA).

Yours sincerely

HOWARD GWATKIN

Principal – Building Acoustics

SLR Consulting Australia Pty Ltd 2 Lincoln Street Lane Cove NSW 2066 Australia
(PO Box 176 Lane Cove NSW 1595 Australia)

T: 61 2 9428 8100 F: 61 2 9427 8200 E: sydney@slrconsulting.com www.slrconsulting.com
ABN 29 001 584 612

CAN USE 150MM SLAB!

- Building Code of Australia allows “Alternative Solution”.
BCA-Volume 1-A0.4 and A0.5.
- SLR Certification complies with BCA-A2.2-Certificate of Evidence.



DAY DESIGN PTY LTD
CONSULTING ACOUSTICAL ENGINEERS

SUITE 17, 808 FOREST ROAD, PEAKHURST 2210
P. 02 9046 3800 ACOUSTICS@DAYDESIGN.COM.AU WWW.DAYDESIGN.COM.AU

Dincol Construction Systems
PO Box 104
St Clair NSW 2759

26 April 2016
Our ref: 5880-2.1L REV A

Attention: Mr Burak Dincel
Telephone: 9670 1633 Email: burak@dincel.com.au

Dear Burak,

150 mm Floor Slab - Acoustic Opinion

A 150 mm thick concrete slab covered with carpet, with either a set plaster ceiling, or with a suspended ceiling having a cavity of not less than 70 mm with insulation, will meet the airborne and impact sound insulation requirements in the current Building Code of Australia.

Rationale:

- The BCA specifies a 150 mm thick concrete panel as a "deemed-to-satisfy" construction to meet the airborne sound insulation requirement of no less than R_w+C_w 50 for walls, which is equal to the airborne sound insulation requirement of no less than R_w+C_w 50 for floors.
- The presence of a set plaster ceiling or a suspended ceiling having a cavity of not less than 70 mm with insulation will not reduce the airborne acoustic performance of the 150 mm thick floor slab.
- A carpet floor covering will satisfy the current impact sound insulation requirement of no greater than $L_{n,w}+C_i$ 62.

Note: A suitably qualified acoustical consultant should advise whether a particular design, which differs from the above design, meets the acoustic requirements of the BCA.

We therefore certify that the specification given above for 150 mm thick floor slabs used in conjunction with complying Dincol Wall systems will comply with the airborne and impact sound insulation requirements in the current Building Code of Australia.

Yours Sincerely,

Stephen Gauld **Stephen Gauld**, BE (Mech), MEngSc (Noise and Vibration), MIEAust, MAAS
Principal Acoustical Engineer
for and on behalf of Day Design Pty Ltd



• AIRCRAFT, ROAD TRAFFIC AND TRAIN NOISE CONTROL
• ARCHITECTURAL ACOUSTICS • INDUSTRIAL NOISE AND VIBRATION CONTROL
• ENVIRONMENTAL NOISE IMPACT INVESTIGATION AND CONTROL
• OCCUPATIONAL NOISE INVESTIGATION • QUIET PRODUCT DEVELOPMENT



CAN USE 150MM SLAB!

- Building Code of Australia allows "Alternative Solution".
BCA-Volume 1-A0.4 and A0.5.
- Day Design's Certification complies with BCA-A2.2-Certificate of Evidence.

WHY BUILDING WITH DINCEL LOADBEARING WALLS PROVIDES A FAST AND COST EFFICIENT SOLUTION

- AS 3600 allows thinner than 200mm slabs and use of mesh reinforcement.
- The use of mainly mesh reinforcement in the floor slabs achieves the FASTEST possible floor slab reinforcement installation time.
- **The conventional column free vertical elements (mainly walls) with Dincel's snap-on connecting panels achieves the fastest possible installation.**

	CONVENTIONAL FRAME CONSTRUCTION WITH AAC WALLS WITH CONVENTIONAL FORMED SLABS	TOTAL
1	Concrete Supply Slab (200mm) + 600 x 300 columns 3 off (32 MPa) – 25m ³ @ \$280.00/m ³	\$7,000.00
2	Concrete Laid (Slab – 7 x 14.9 + 7 x 1.8 = 116.9m ²) + columns 3 off Slab laid – including pump cost and surcharge = 116.9m ² x \$30.00/m ² Slab pump cost min 5 hours@\$300/hour + \$6m ² @25m ³ Columns – Concrete to be poured prior to slab, minimum charge – 1 man labour (1 x \$750.00/day) + pump cost (5 hours minimum @ \$300.00/hour)	\$3,507.00 \$1,650.00 \$2,250.00
3	Steel Supply Slab and columns reinforcing bars (not mesh) 3.235 @ \$2,100.00/t	\$6,793.00
4	Steel Laid reinforcing bars (not mesh) 3.235 @ \$1,000.00/t	\$3,235.00
5	Formwork Slab 116.9m ² @ \$110.00/m ² Column 3 off x \$700.00 each	\$12,859.00 \$2,100.00
6	75mm AAC Panel supplied and installed Perimeter and party walls 74.5m ² x \$90.00/m ² (includes restraints and caulking)	\$6,705.00
7	Cost difference between Fyrcheck & standard plasterboard 74.5m ² x \$20.00/m ² = \$1,490	\$1,490.00
	TOTAL COST	\$47,589.00
	Per Square Metre of Floor Area Cost \$47,589.00 ÷ 116.9	\$407.00/m ²

Note: Floor finishes, internal partition walls, plasterboard, insulation, metal studs, finishes at party and façade walls are not included in the above cost analysis as they are common to both Dincel and AAC Wall systems. Cost of finishing at the junction of the AAC Wall System and column not included.

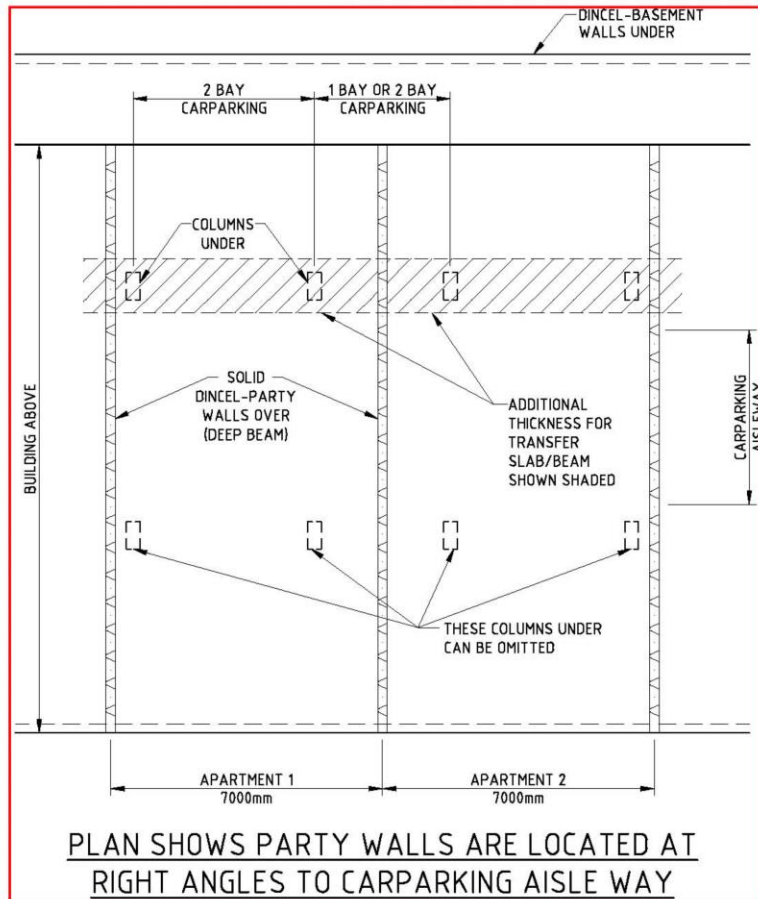
	DINCEL CONSTRUCTION SYSTEM – WITH CONVENTIONAL FORMED SLABS	TOTAL
1	Floor Slab (116.9m²) Concrete supply (32MPa) = 17.5m ³ @ \$280.00/m ³ Concrete laid = 116.9m ² @ \$30.00/m ² Reinforcement (mainly mesh): •SL92 mesh supplied (116.9 ÷ 6 x 2.4)@ \$180.00/sheet •SL92 mesh laid (116.9 ÷ 6 x 2.4)@ \$65.00/sheet •Additional bars (N12@400 top – 3000mm long, 0.222t@ (\$2100t + \$1000t) Slab formwork 116.9m ² @ \$110.00/m ²	\$4,900.00 \$3,507.00 \$1,461.00 \$528.00 \$688.00 \$12,859.00
2	Dintel Wall Concrete supply (20MPa) 6.4m ³ @ \$230.00/m ³ Concrete pump minimum 5 hours @ \$300/hour + \$6.00/m ³ Steel supply 0.031t @ \$2,100.00/t 110mm Dintel Form for party walls 61.3m ² @ \$75.00/m ² Straight Dintel Party Wall without any openings, top-down installation (no bracing), reinforcement placement 61.3m ² @ \$40.00/m ²	\$1,472.00 \$1,538.00 \$65.00 \$4,597.00 \$2,452.00
	TOTAL COST	\$34,067.00
	Per Square Metre of Floor Area Cost \$34,067.00 ÷ 116.9	\$291.00/m ²
	Note: Floor finishes and wall paintings are not included in the costs.	
	DCS COST EFFECTIVENESS [(1 – (\$291.00/m ² ÷ \$407.00/m ²))] = 0.28 = 28%	
	THIS MEANS THAT DCS IS 28% CHEAPER THAN THE AAC WALL SYSTEM	

Note: Floor finishes, internal partition walls, plasterboard, insulation, metal studs, finishes at party and façade walls are not included in the above cost analysis as they are common to both Dintel and AAC Wall systems.

NET BENEFIT WITH DINGEL INCLUDING SPACE SAVING

Time Saving	30-50%
Space Saving (0.226m - 0.189m)	0.037m
Value Gained In Space Saving	
14m x 0.037 x \$8,000/m ²	\$4,144.00 per unit
\$4,144.00/116.9m ² per unit	\$35.00/m ²
Material And Labour Cost Saving	
$1 - [(\$291 - \$35) / \$407.00] = 0.37$	37% SAVING

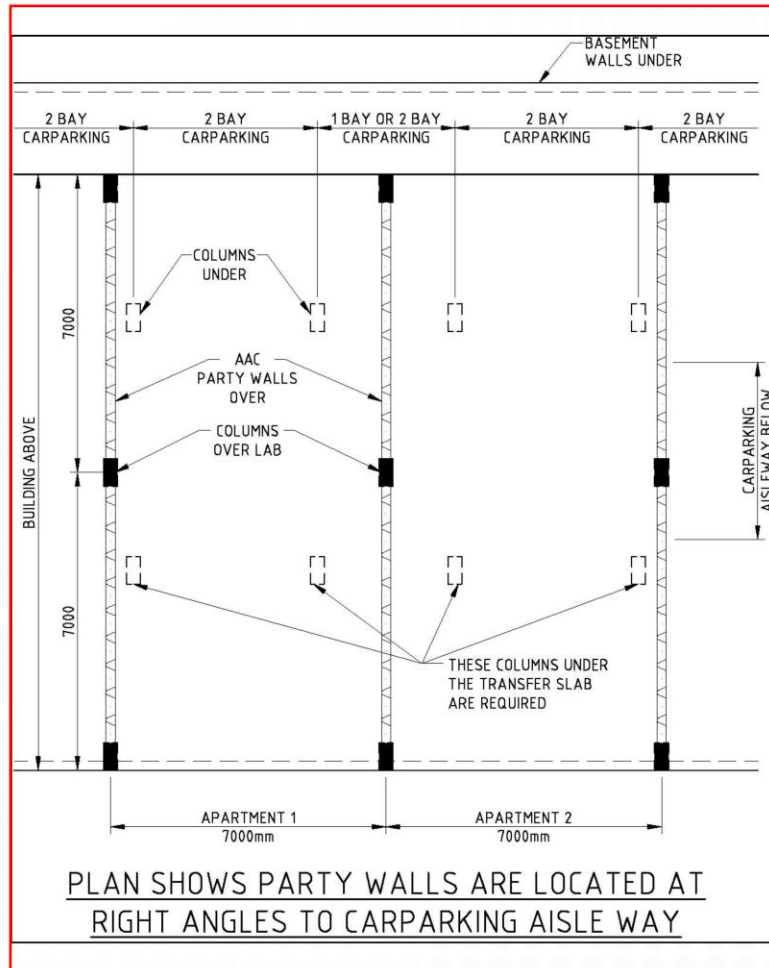
FURTHER SAVINGS - TRANSFER SLAB - DINCEL SYSTEM



DINCEL CAN ELIMINATE COSTLY TRANSFER SLABS

- Transfer slabs are eliminated if party walls are placed in a right angle direction to the car parking aisle way below.
- Result : 150mm thick slabs, steel rate is 77kg/m³ instead of conventional 450mm to 600mm thick slabs with post-tensioning or very heavy steel bars.

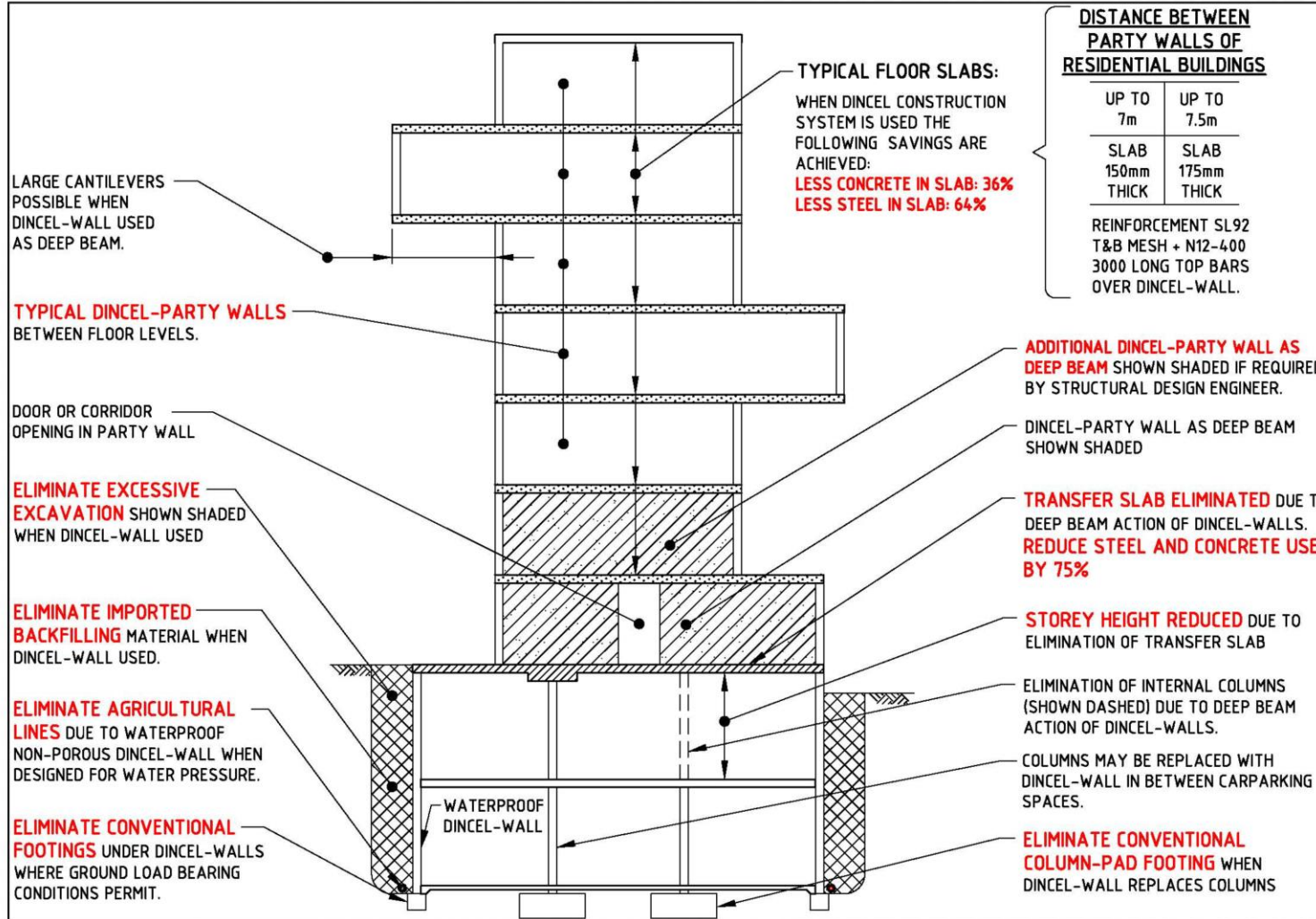
TRANSFER SLAB - AAC WALL SYSTEM



AAC WALLS COSTLY AND TIME CONSUMING

- AAC wall system will always result in very costly and time consuming transfer slabs when car parking columns and superstructure columns are not aligned.
- Result : To carry 8 storeys above:
 - 450mm to 600mm thick slabs with post-tensioning and/or very heavy steel bars.
 - More bulk excavation/more columns.

TYPICAL BUILDING CROSS SECTION



57 LUXURY APARTMENTS - GLADESVILLE, NSW

REFER "PINNACLE" TESTIMONIAL ON DINCEL WEBSITE





40 RESIDENTIAL UNITS - YAGOONA, NSW

REFER "GONDELLA" TESTIMONIAL ON DINCEL WEBSITE

www.gondella.com.au
Gondella
DINCEL

200 APARTMENTS - BRUCE, ACT

REFER "CHC HOUSING" TESTIMONIAL ON DINGEL WEBSITE



77 WEEKS CONSTRUCTION TIME REDUCED BY 26 WEEKS = 30% TIME SAVING

133 APARTMENTS - CAMPERDOWN, NSW

REFER "CEEROSE" TESTIMONIAL ON DINGEL WEBSITE



52 WEEKS CONSTRUCTION TIME REDUCED BY 26 WEEKS

DINCEL SYSTEM VS AAC SYSTEM

- **DINCEL IS CLEARLY A FASTER CONSTRUCTION:**
 - Slabs are minimum 50mm thinner and utilise mesh reinforcement which takes significantly less time than slabs with post-tensioning. True post-tensioned slab design would not incorporate top and bottom mesh reinforcement.
 - Dincel walls and floor slabs can be installed simultaneously. The AAC system requires columns to be installed first, then the floor slabs and then the AAC walls are installed between columns.
 - Column forming and steel bar placement for 3 columns will take more time than installing Dincel Wall. (AAC walls yet to be installed).
- **SPACE SAVING** when 110 Dincel Walls are used.
- Minimum **28% (40% with Space Saving) COST EFFICIENCY** at typical floor levels.
- Minimum **75% COST EFFICIENCY** at the transfer slab level.