



DINCEL

STRUCTURAL WALLING



PERMANENT POLYMER FORMWORK FOR RESIDENTIAL, COMMERCIAL, INDUSTRIAL & CIVIL APPLICATIONS

THE NEXT LEVEL.

OUR OBJECTIVE:
TO PROVIDE EDUCATION
ON AN ALTERNATIVE TO
TRADITIONAL CONCRETE
FORMWORK FOR WALLS



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THE NEXT LEVEL.

AUSTRALIAN INVENTED, OWNED AND MANUFACTURED

Launched in 2006, and prompted by increasing construction costs with a decreasing availability of skilled labour, an advanced, cost-effective and innovative construction technology called Dincel Construction System was developed.

Locally manufactured and supplied from 22,000sqm quality controlled Dincel plant located at Erskine Park, NSW.



WHAT ARE DINCEL STRUCTURAL WALLS?

DinCEL Structural Walls are a permanent polymer formwork system that uniquely snaps into position to quickly build all types of structural walling. When filled with ready mixed concrete, provides a waterproof, strong and durable protective barrier for residential, commercial and civil applications.

- **Simple to use and fast to install**
- **Acoustic tested and certified**
- **Fire tested by the CSIRO**
- **Waterproof protective barrier**
- **Termite, rot and mildew proof**
- **Joint and crack free**
- **VOC free**
- **Available in 110, 155, 200 and 275mm profiles and in custom lengths between 1.8m & 8m.**

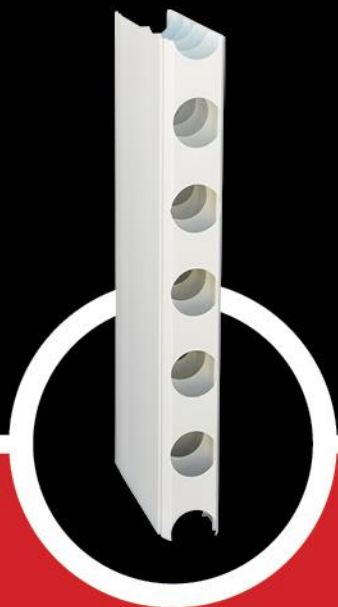


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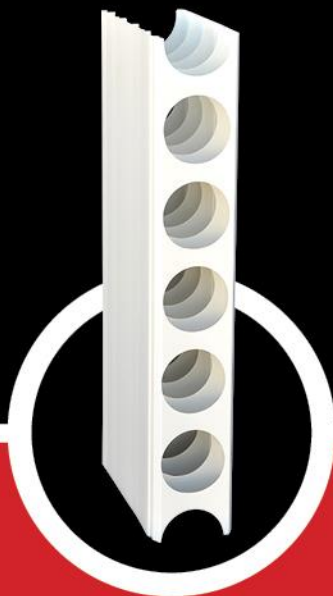
PROFILE RANGE TO SUIT MARKET APPLICATIONS

**110mm profile –
Up to 12 storeys**



110MM

**155mm profile –
Up to 22 storeys**



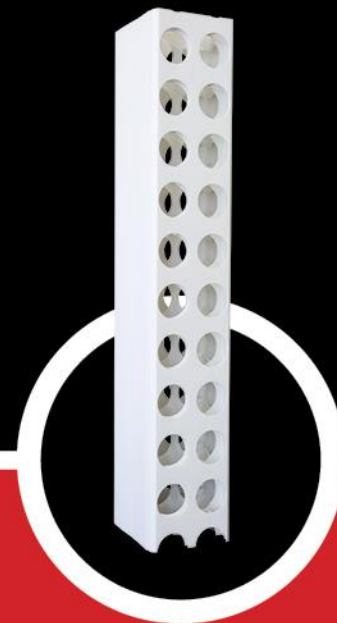
155MM

**200mm profile –
Up to 40 storeys**



200MM

**275mm profile –
Up to 60 storeys**



275MM



Lightweight



Fast installation



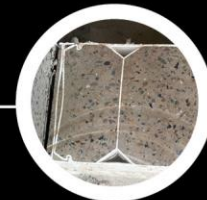
Less reinforcing



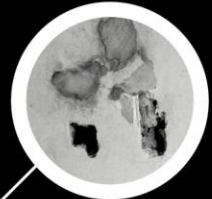
'Snaplock' technology



Prevents mould
and mildew



Internal crack control



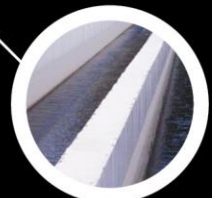
No air voids



Fire resistance
tested



Easy to render
or clad



Waterproof certified

WHY BUILDERS & DEVELOPERS USE DINCEL

SPEED & EFFICIENCY

- Lightweight panels provide speed of installation, require no crane and improve workplace safety
- Allows installation without scaffolding by one trade only
- Not affected by wet weather conditions
- 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



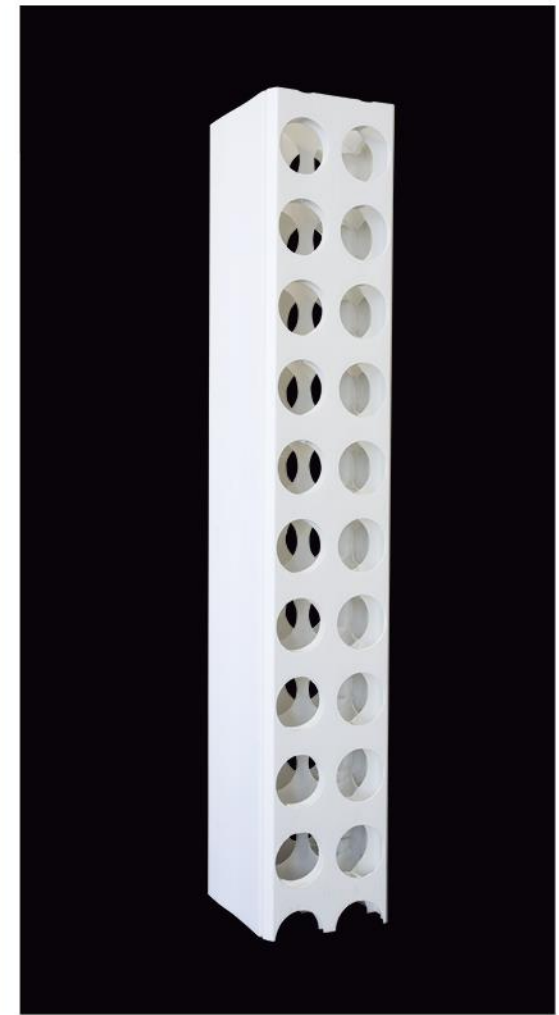
CONVENTIONAL CONCRETE ISSUES

1. Conventional concrete requires formwork to hold wet concrete until it dries. **It's therefore expensive, requires skilled labour, increased material handling, storage and safety issues.**
2. Conventional concrete is brittle and weak in tension **Hence the reason for steel reinforcement.**
3. Conventional concrete is porous which leads to durability-corrosion/concrete degradation issues. **Concrete cracking is unavoidable, inadequate concrete cover, honeycombing, air voids lead to concrete cancer.**



THE NEXT LEVEL.

HOW DINCEL WALLS ACT AS A 'PROTECTIVE SKIN'

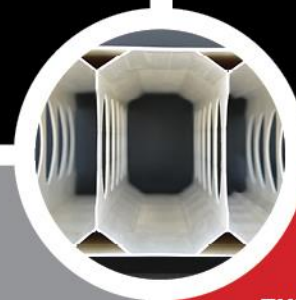
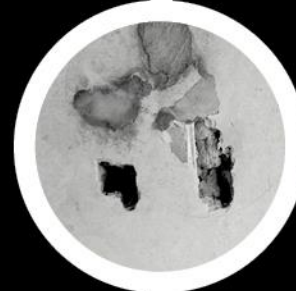


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THE NEXT LEVEL.

WHY DINCEL FORMWORK IS DIFFERENT

- Dincel's polymer is impervious which does not suck water from wet concrete. Hence no friction between the formwork and concrete infill, thus preventing:
 - **No elaborate tying of formwork, i.e. no buoyancy upward movement during concrete pouring**
 - **No honeycombing, air voids**
- Web holes smaller than 85mm prevent an easy flow of concrete which can cause air voids
- The round web holes of Dincel's panels act as an 'Elephant Trunk' which means:
 - **No segregation – free fall of aggregate is prevented**

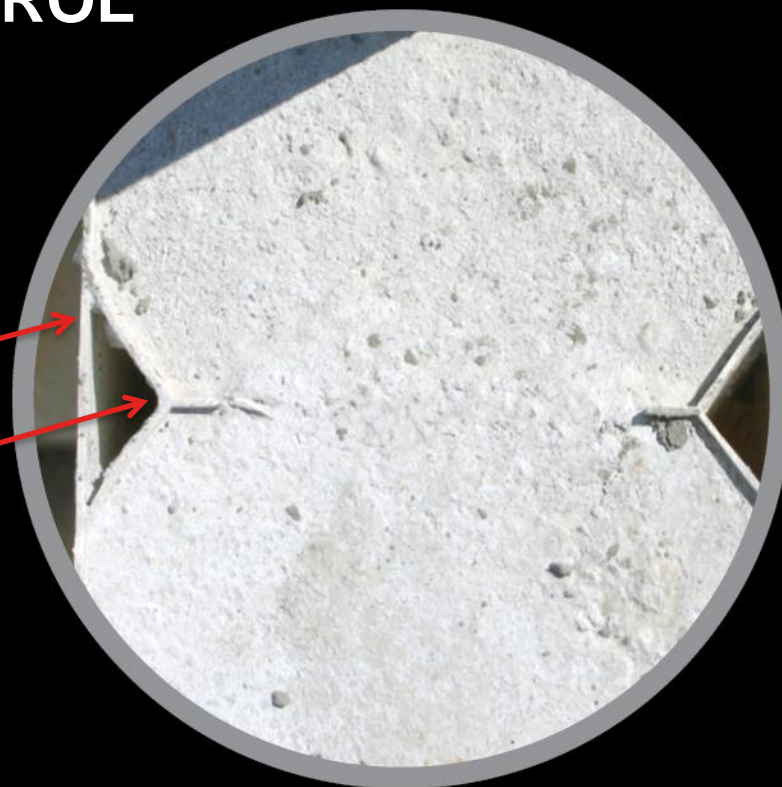


WALL JOINTS & CRACK CONTROL STEEL IS NOT REQUIRED WITH DINCEL WALLS

Impervious vapour barrier for both faces

Crack control joints at 125mm centres

EuroCode and American Code allow unreinforced concrete walls provided crack control measures are adopted. Elimination of steel bars, at least in one direction, is the key for end of life total recycling.



WHY DINCEL WALLING IS WATERPROOF



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UNIQUE DURABILITY OF DINCEL MATERIAL

HYGROSCOPIC

- Porous material sucks the water from the concrete mix (e.g. Besser Blocks, Fibre Cement Sheets, MgO Boards) which can lead to concrete cancer, mould and mildew.

DINCEL IS A NON-HYGROSCOPIC MATERIAL FOR THE FOLLOWING REASONS:

- **POLYMER MATERIAL**; CSIRO testing confirms that the vapour transmission rate of Dincel is 180 times better than the Australian Standard's threshold for conventional membranes.
- Dincel Panel Joints are **WATERPROOF** as confirmed by CSIRO tests and under 6m of water head pressure at the panel joints.



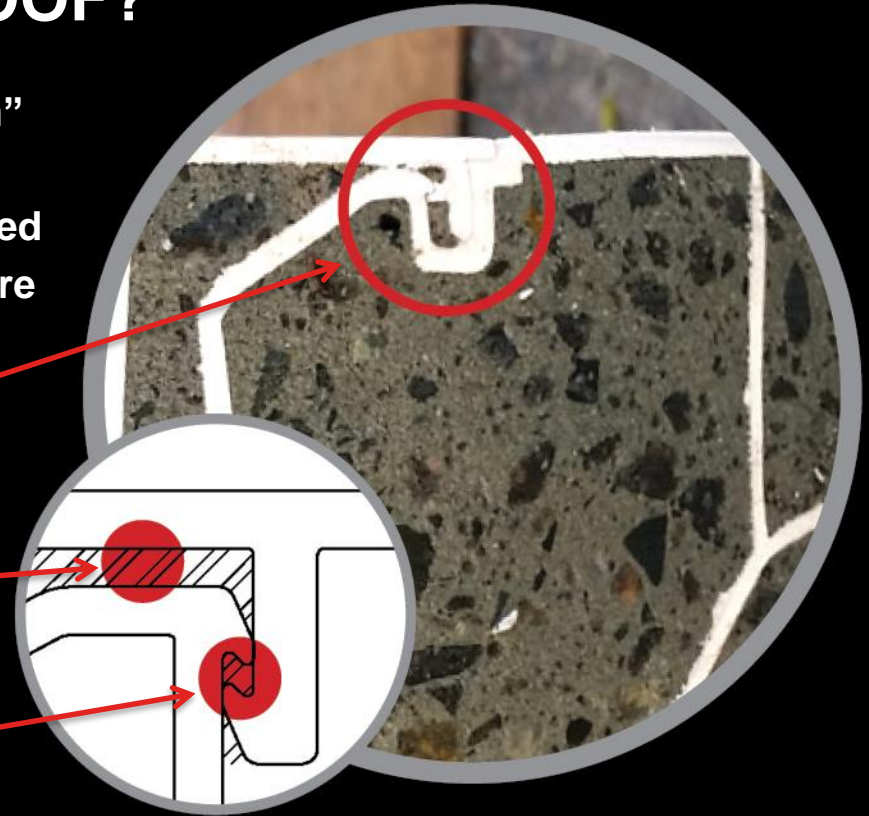
WHAT MAKES IT WATERPROOF?

- Polymer material acts as a “protective skin”
- Improves concrete flow and compaction
- No additional waterproof membrane required
- CSIRO test under 6m head of water pressure at both joints confirmed waterproofing.

Slump invades connection between panels

Concrete slurry

Patented Dincel barbs and cement slurry ensures that snap joint is waterproof



HOW DINCEL MEETS COMPLIANCE & SAFETY



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CONSTRUCTION METHOD = 25M² / 2 MAN / HOUR

**Top-down
method**
(Requires
safety rail)



**Bottom-up
method**
(Safest install
methodology)



The bottom-up
method is the
only way to eliminate
scaffolding and safety rails

4 HOURS FIRE RESISTANCE

The fire performance of a Dincel Wall has been assessed by the CSIRO for the following:

- **Fire resistance levels**
- **Fire hazard properties**
- **Non-combustibility**
- **Bush fire prone areas**
- **Dincel material's char formation does not allow the polymer webs to burn**

In a CSIRO test, a 200mm concrete filled Dincel Wall completed a minimum fire resistance level of 4 hours to meet relevant building code requirements.



WORKPLACE SAFETY IN CONSTRUCTION

With tighter legislation around OH&S requirements, Dincel Walls provide a safer alternative.

- **Light – Man Handleable – No Cranage**
- **Minimise the risk of back injury**
- **Reduction in the risk of cuts, trip hazards and crushing fingers**
- **Eliminates the risk of accidents due to wall formwork stripping**



Dincel Structural Walling eliminates the need for scaffolding for edge protection.

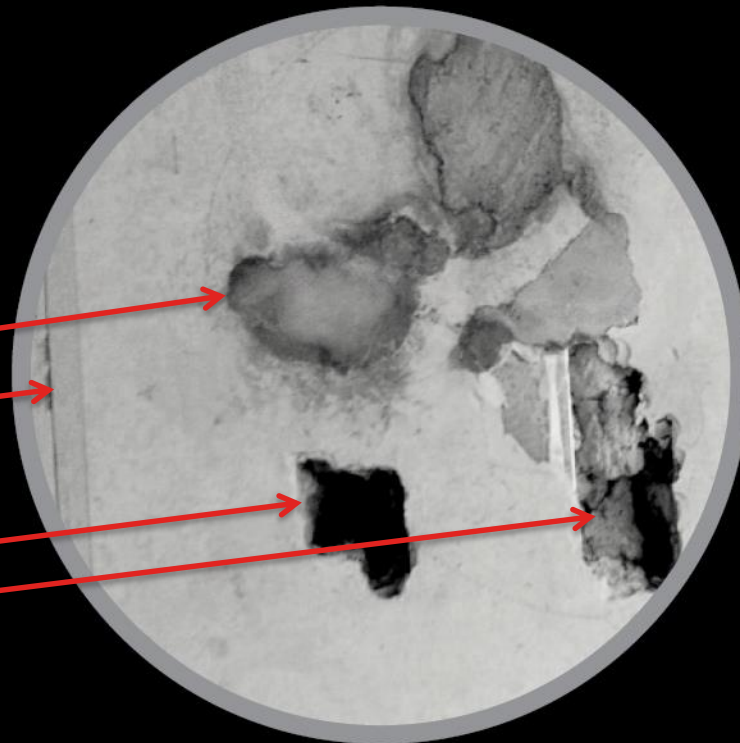
ISSUES WITH POROUS PERMANENT FORMWORK

The main reasons for honeycombing and air voids that lead to corrosion are hygroscopic material such as besser block, fibre cement and sheet formwork that sucks the moisture, along with low slump and inadequate compaction.

Air voids identified and grouted by installer

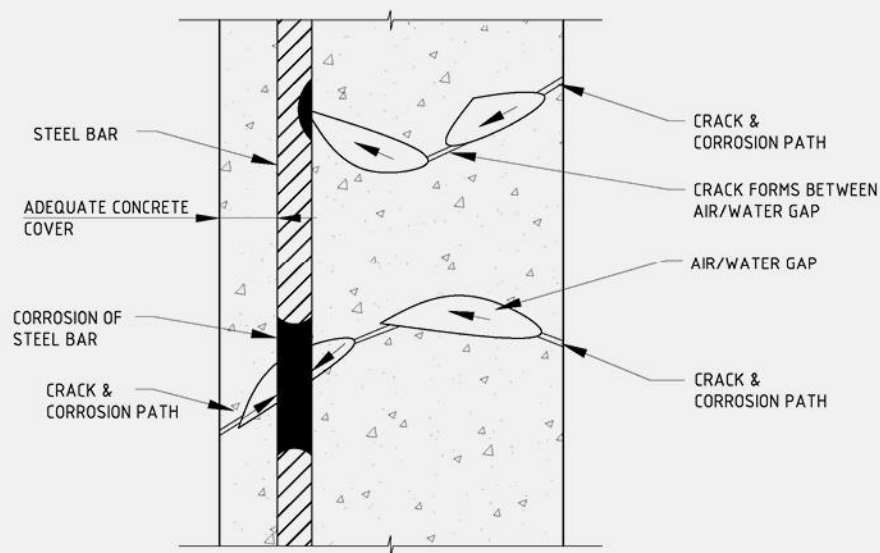
Fibre cement sheet joint

Air voids failed to be identified by the installer who grouted the above voids



Note: Better block and cement based formworks require in excess of 200mm slump concrete to minimise honeycombing and airvoids.

CONVENTIONAL CONCRETE WALLS' CORROSION PATH



ADEQUATE CONCRETE COVER IS NOT NECESSARILY
THE SOLUTION FOR STEEL CORROSION SINCE THE
CRACKS MAY EXTEND FOR THE FULL THICKNESS



If air-water gaps shown are not filled by cement hydration, the gaps are easily linked to each other by concrete cracking which leads to steel corrosion.

USING DINCEL INCREASES CONCRETE STRENGTH

A Holcim Concrete test concluded the strength of concrete at:

28 days = 18MPa

120 days = 32MPa and increasing in strength.

COMPRESSIVE STRENGTH OF CONCRETE CYLINDERS

Details of Sampled Concrete				Concrete Specimens and Results											
Date & Time Batched	Truck No	Plant Name	Grade(MPa)	Air (%)	Specimen Ident.	Dimensions (mm)	Density (kg/m³)	Curing Initial (hrs)	Type of Cap	Date of Test	Age (days)	Strength (MPa)	Mark	Fail Location	Remarks
Load / Prog.	Time Sampled	Docket No	Product Code	Slump(mm)	Design	Measured	Avg. Diameter	Height							
17/11/11	2560	MITCHELL	S20		27661A	99.6	194	2240	22	3	G	21/11/11	4	5.8	N Sampling AS 1012.1 Cl 6B
10:20	11:04	45180621	20	Ex/Vibe	27661B	99.6	195	2240	6	G	24/11/11	7	8.0	N	Wall 1 to 2
6/22.8		NS20TBMXD	120	120	27661C	99.8	196	2240	27	G	15/12/11	28	19.5	N	Concrete Temp. (°C): 27
					27661D	100.0	195	2240	27	G	15/12/11	28	18.0	N	
					27661E	100.2	195	2240	55	G	12/01/12	56	26.0	N	
					27661F	99.8	194	2240	55	G	12/01/12	56	26.0	N	
					27661G	99.8	194	2280	90		16/02/12	91	30.0	N	
					27661H	99.8	195	2260	13		01/12/11	14	14.0	N	
					27661I	99.6	194	2280	119		16/03/12	120	32.0	N	

Dincel Wall encapsulation achieves greater concrete strength by minimising moisture evaporation throughout the curing process.

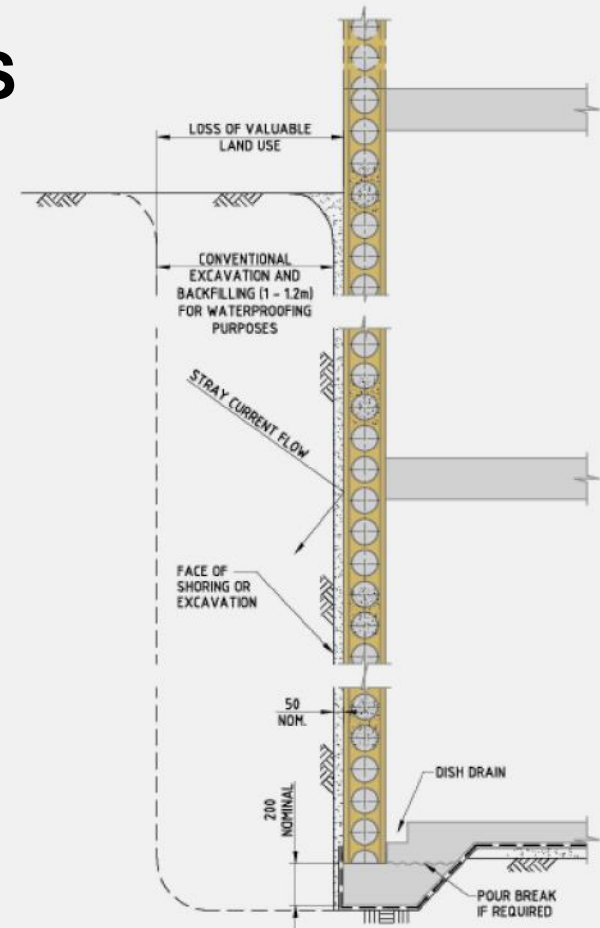
Note: Design requirement strength = 20MPa achieved using a mix consisting of 50% less cement.

Not actual test image shown.

BENEFITS FOR BASEMENT WALLS

Dincel Walls eliminate/minimises:

- Loss of valuable land use
- Waterproofing need for the wall
- Stray current corrosion damage
- Excavation behind the wall
- Backfilling the excavation
- Wall joints
- Agricultural lines
- Conventional footings
- Horizontal wall reinforcement
- Scaffolding
- Painting of the internal wall face
- Cleaning costs
- Wastage
- Builder's Liability for wall cracking, water damages



MINIMUM BASEMENT EXCAVATION WITH NO WATERPROOFING

DinCEL Walls allow:

- Habitable spaces in basements
- Minimum 100 years wall life
- Stronger structural walls in comparison to reinforced masonry walls
- Fastest wall construction

With a minimum 50mm clearance, and minimal overcut required to site excavations, build times, labour and project costs are significantly reduced and even eliminated.



RENDERS AND FINISHES FOR DINCEL WALLS



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SMOOTH & TEXTURED FINISHES

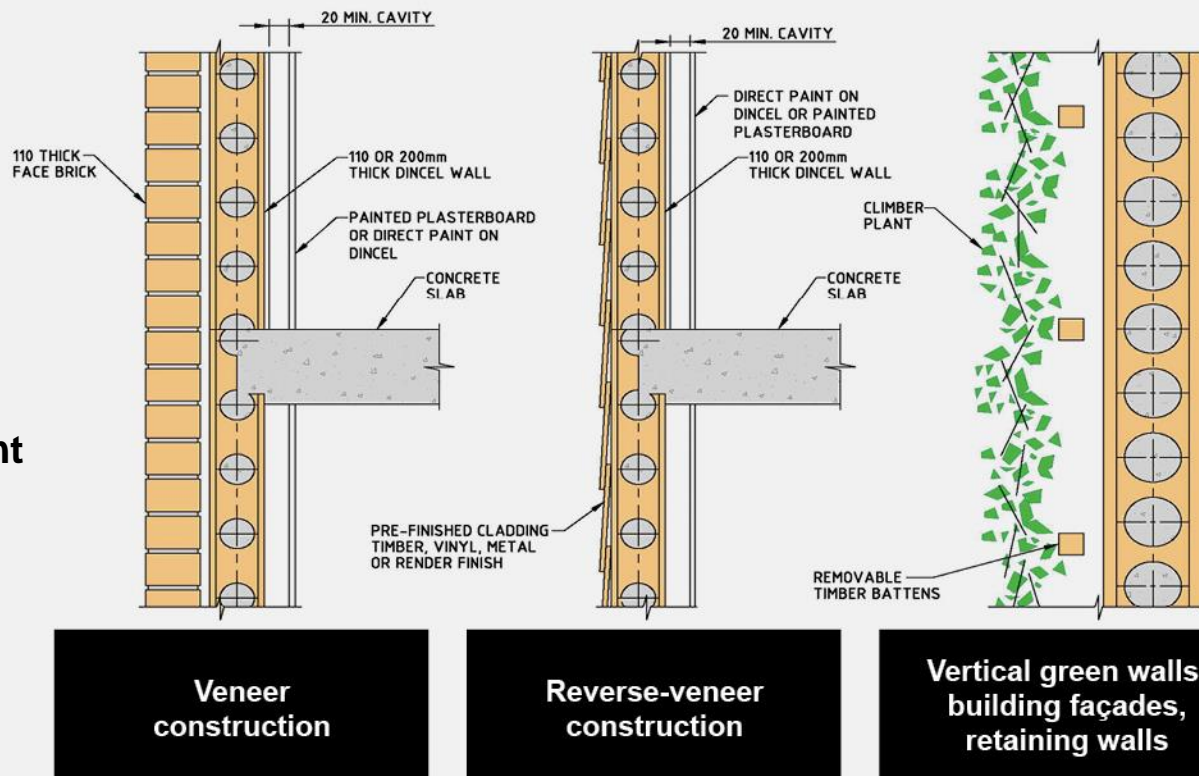


15 year
Warranty with
render manufacturers



EXTERNAL FAÇADE FINISHES

- **Waterproof**
- **No cracks**
- **No concrete cancer**
- **Insulation for hot and cold climates**
- **Effective solution for condensation, mould and mildew development**

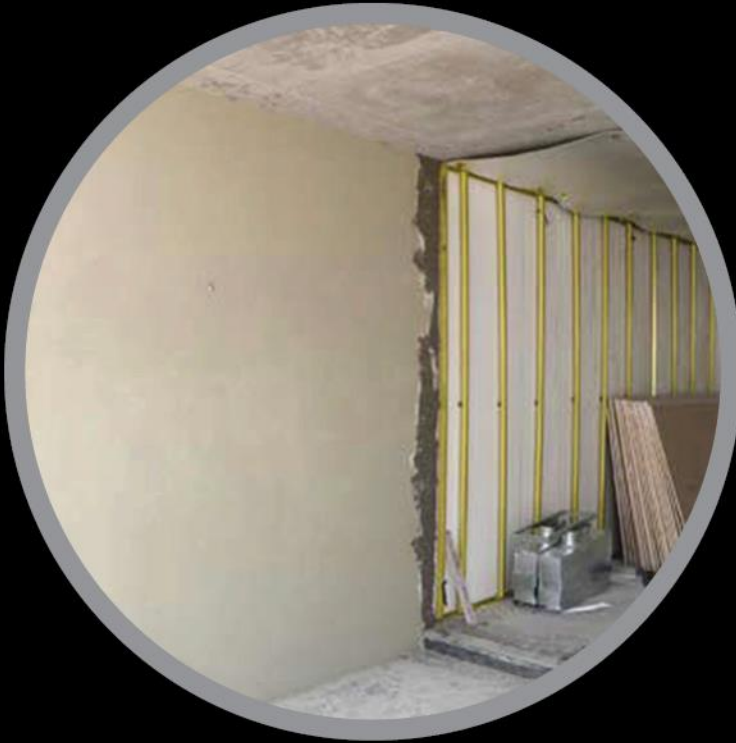


CLADDING

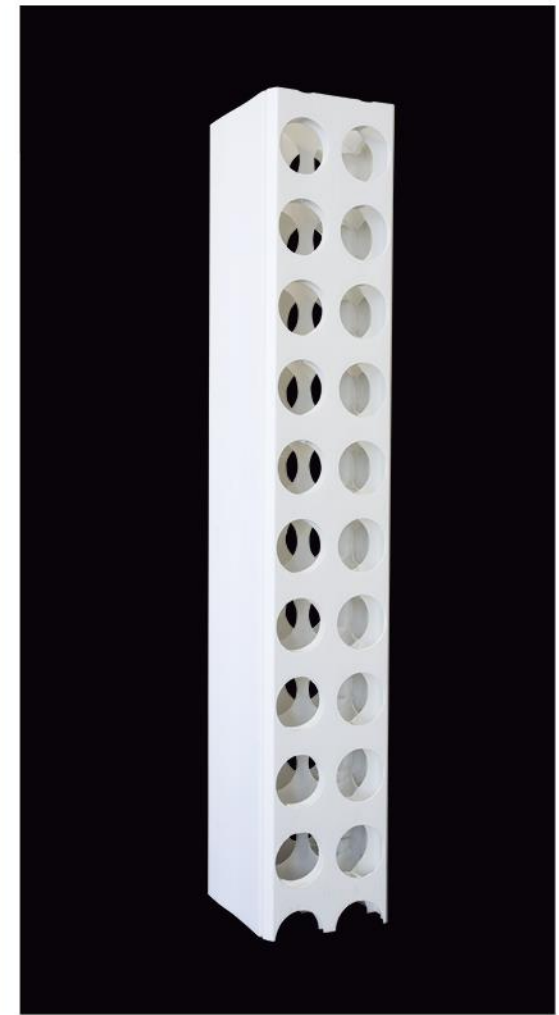
Dincel can be cladded in a range of options including Stone, Timber, Alucobond & many more.



INTERNAL FINISHES



WHERE DINCEL HAS BEEN SUCCESSFULLY USED



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Residential – Avoca NSW



Lend Lease Barangaroo – NSW



Hamilton Reach – Brisbane



Hickory Group – Victoria



Meriton Apartments – NSW



Mendri Apartments – NSW



Mirvac Apartments – NSW



Bay Pavilions – NSW

DINCEL WALLING MARKETS AND APPLICATIONS



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DINCEL PROFILE APPLICATIONS

Being a maintenance-free, waterproof and airtight construction solution, the benefits for residential, commercial, civil and infrastructure applications makes this profile ideal for:

- **Column construction in new builds**
- **Blade, party-corridor-façade walls**
- **Lift and stairwells up to 60 storeys**
- **Waterproof basements**
- **Tanks – water, sewer, oil, grain and petrol**
- **Retaining walls – sea walls, flood levees, erosion, contamination control in soils for chemicals**
- **Culverts for roads, railways, drainage, service ducts**





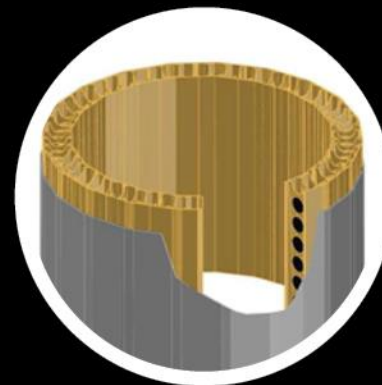
Road/Rail/Drainage Culverts



Water Retention/Detention



Erosion Control & Flood Levees



Storage Tanks & Grain Stores



Cable & Services Pits



Basement Walls



Substations



Mobile Structures

CURVED WALLS OF ANY HEIGHT AND LENGTH WITHOUT JOINTS



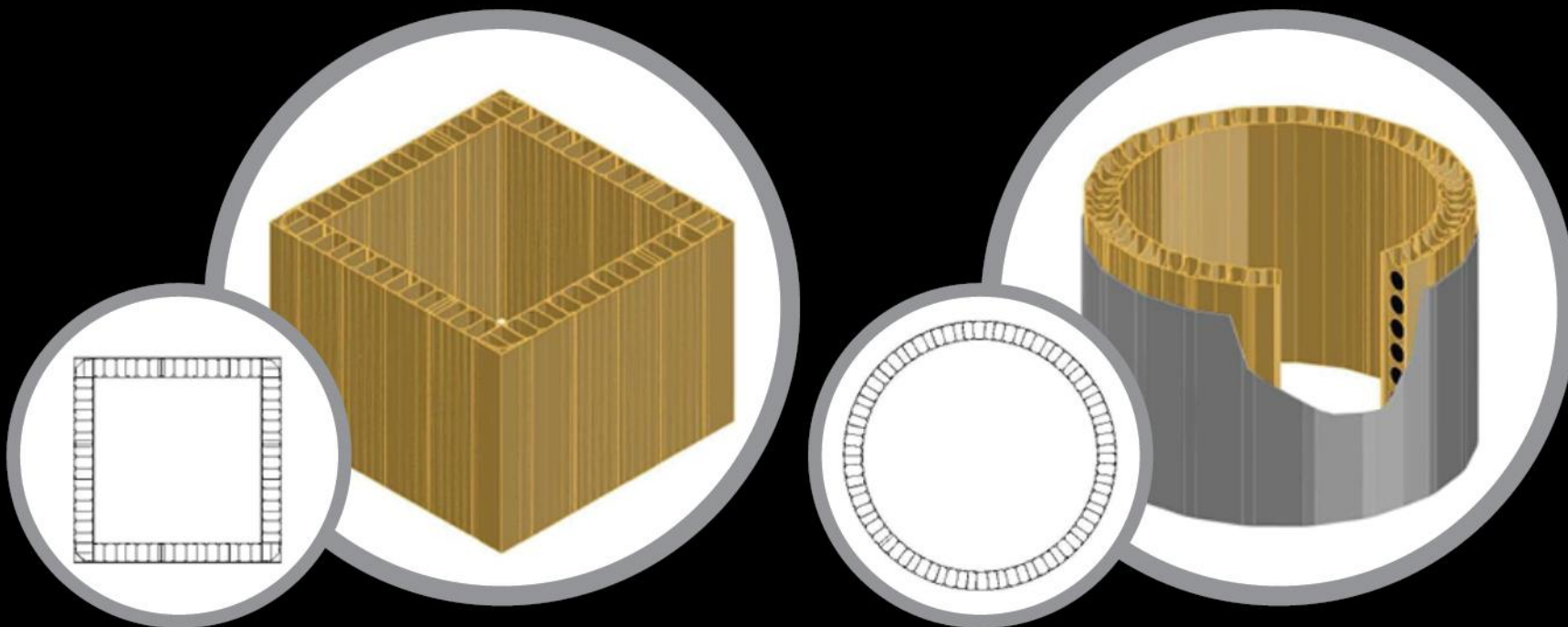
CURVED WALLS



LIFT & STAIR SHAFTS



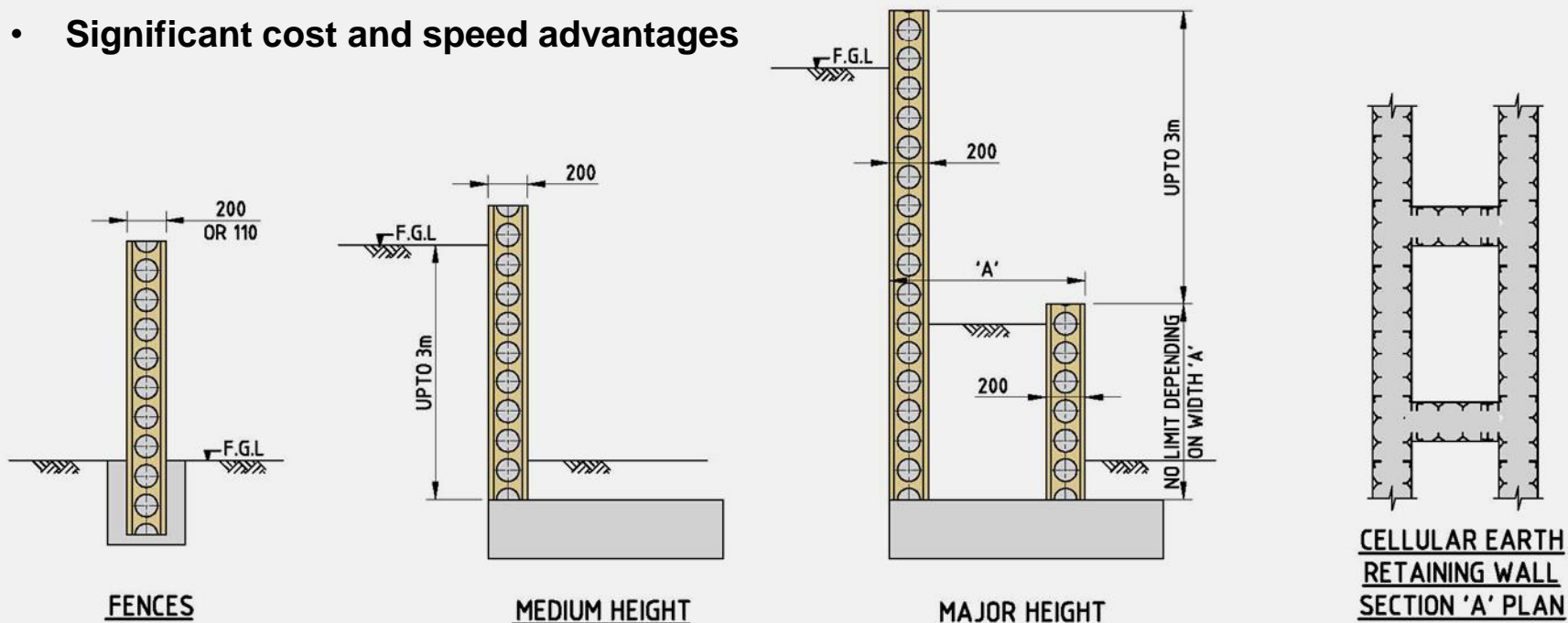
STORAGE TANKS



Dincel panel joints have been tested by CSIRO Australia for waterproofing under 6m head of water pressure.

RETAINING WALLS

- Significant cost and speed advantages



USING DINCEL AS A LOAD-BEARING WALL



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BENEFITS FOR USING DINCEL FOR LOAD BEARING WALLS IN BUILDINGS

- Construction at lower cost and less time
- Maximum strength, safety and simplicity
- Up to 50% faster construction
- Maximum cost efficiency both in walls and floor slabs
- Maximum space saving
- Maximum recyclability and embodied energy saving
- Less steel and concrete
- Waterproof
- Longer building life and better air quality



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77 WEEKS
CONSTRUCTION
TIME REDUCED BY
26 WEEKS =

30%
TIME SAVING.

GREEN CONCRETE =

50%
CEMENT REDUCTION
ACHIEVED.

RESIDENTIAL APPLICATION:
200 APARTMENTS — BRUCE, ACT



THE NEXT LEVEL.



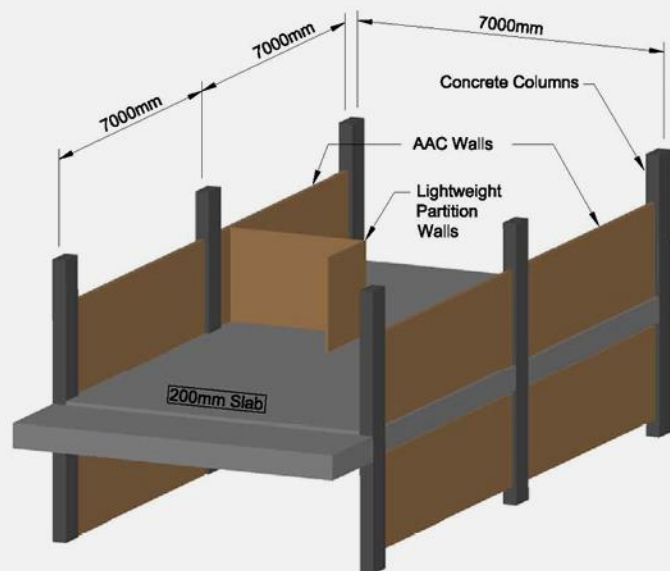
52 WEEKS
CONSTRUCTION
TIME REDUCED BY
26 WEEKS =
50%
TIME SAVING.

RESIDENTIAL APPLICATION:
133 APARTMENTS — 5-11 PYRMONT BRIDGE ROAD, CAMPERDOWN, NSW

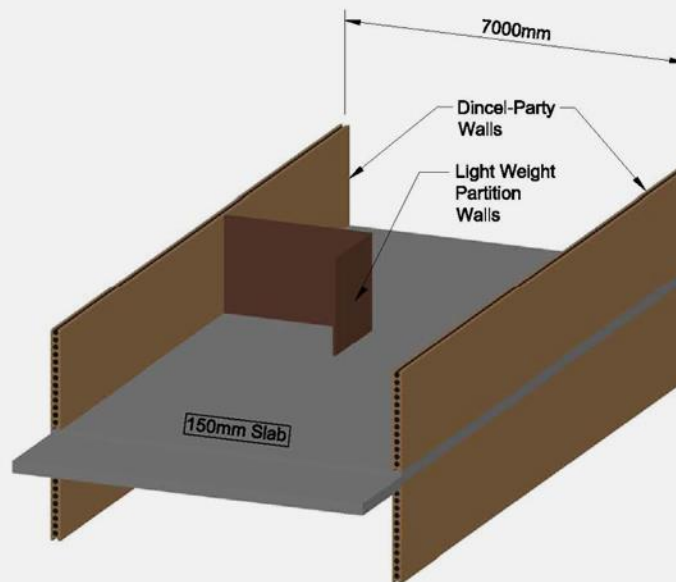


THE NEXT LEVEL.

CASE STUDY: AAC WALL SYSTEM vs DINCEL CONSTRUCTION SYSTEM



AAC System



DINCEL

Both systems in case study comply with AS3600:2009 – Concrete Structures

AAC SYSTEM

Minimum 200mm thick slab.
No mesh reinforcement allowed.
Steel reinforcement rate is 130kg/m³

DINCEL SYSTEM

Minimum 150mm thick slab (for acoustic reasons) with SL92 mesh use allowed.
Steel reinforcement rate is 77kg/m³

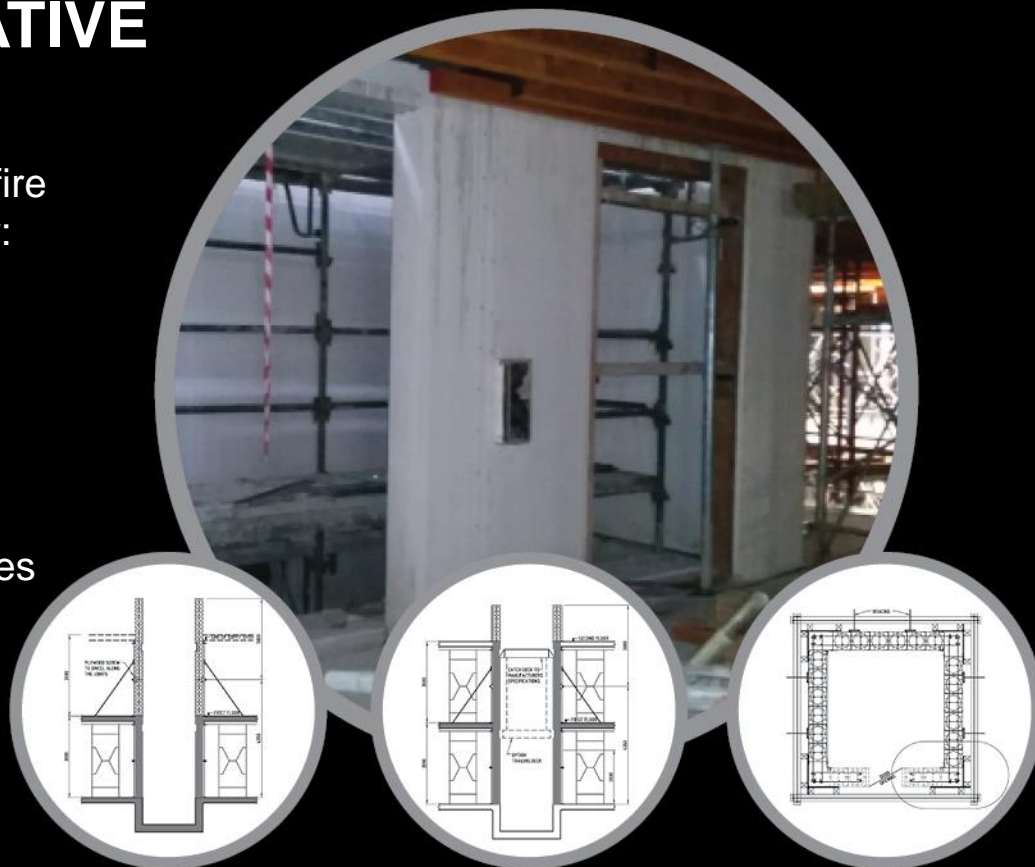
RESULT:
INCLUDING TIME
SAVING, EVERY
3RD FLOOR COMES
FREE
OF CHARGE.

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JUMP-FORM ALTERNATIVE

Replaces conventional columns and challenges jump-form in lift shafts and fire stairs in up to 60 storey construction by:

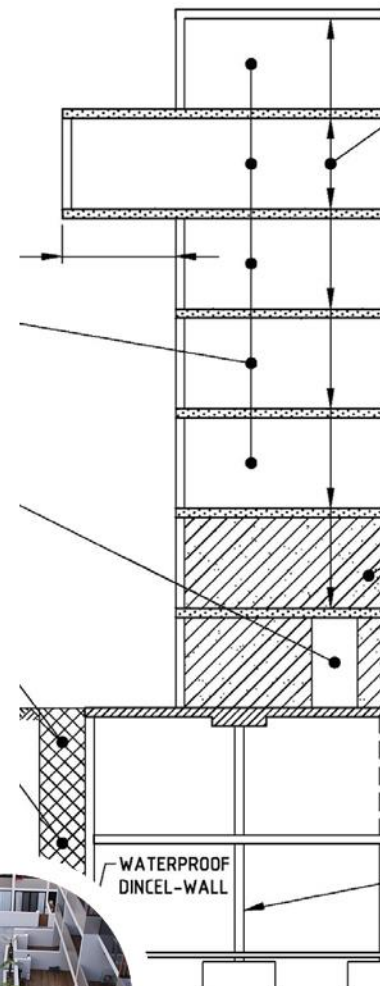
- Eliminates high cost for jump-form assembly
- Faster floor construction
- Allows construction of lift/stair shafts with or without scaffolding
- Reducing install costs such as cranes
- Eliminating operation costs
- Reducing labour costs



DESIGNING WITH DINCEL

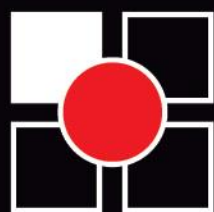
When you talk to us early in your project, design and technical support is always available with our highly skilled engineers and backed by Australian manufacturing in an ISO 9001 production facility.

- Now on PlusSpec™
- NATSPEC Partner
- Technical support and design assistance available at Dincel
- On-site and installation support



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