



DINCEL STRUCTURAL WALLING

SUSTAINABILITY FOR THE CONSTRUCTION INDUSTRY

PREFACE

The planet's ecology is rapidly changing with the increasing human population.

Our basic needs such as food, clothing and shelter are provided by processing the planet's limited resources namely water, grain and minerals.

The CO₂ emissions, due to industrialisation accumulate within our atmosphere. The vegetation including trees and various types of plants being air cleansing tools of the planet are gradually losing their effectiveness.

The growing human needs by industrialisation and land clearance results in rapid depletion of the planet's plants and vegetables. One of the contributors for destruction of arable land is the excessive reliance on timber and land required for ever increasing building construction activities.

The loss of vegetation therefore significantly affects the quality of the air we breathe and hence our health.

Urbanisation is replacing the vegetation with roofing and hardstand areas which causes "flash" flooding. Our limited fresh water supply is becoming alarmingly scarce with the increasing demands for agriculture, industry and basic human needs.

The majority of our energy needs are catered by burning fossil fuels. However, our reality is that we do not have adequate alternative energy sources to replace the fossil fuel combustion. We can only try to minimise the human expansion impact on the environment by increasing the usage of other environmentally friendly alternative energy sources, use long lasting building materials, encourage recyclability, enforce new solutions for water sources/usage, implement urban planning for consolidation while embracing true sustainability principles.

The following table illustrates how to achieve a better environment, as well as increasing our quality of life with the consideration of economics, incorporating the contribution of the Dincel Construction System.

TO REDUCE / ELIMINATE	TO INCREASE
<ul style="list-style-type: none"> • Timber, steel, aluminum and cement use. • Energy use required for raw materials and production. • CO₂ emissions. • Building waste creation and management. • Building construction and maintenance costs. • Skilled labour use. • Construction defects for material and workmanship. • Construction accidents. • Non-renewable resource depletion. 	<ul style="list-style-type: none"> • Long term sustainability. • Construction cost reduction and advantages. • Speed of building construction. • Recyclability. • Increase building life to at least 100 years. • Food conservation. • Water conservation. • Fire safety. • Health and air quality of building occupants. • Safety and security of building occupiers against break-ins, hurricanes and earthquakes. • Asset values.

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EXECUTIVE SUMMARY

Australian Construction Engineers have developed a new building construction technology called Dincel Construction System (DCS).

The new innovation represents a major advance over any comparable system anywhere in the world for manufacturing, material science technologies and installation methodologies. The system uses a patented concrete forming technology with rigid polymer housing accommodating a concrete fill. The result is a waterproof, crack-free, load bearing or non-load bearing, fire and acoustic wall which is more cost effective than traditional wall systems, and can be both installed faster and safer.

The world population is increasing rapidly.

<u>YEAR</u>	<u>WORLD POPULATION</u>
0 AD	0.2 Billion
1800	1 Billion
1950	2.4 Billion
June 2013	7.2 Billion
2050	9.6 Billion (estimate)

This rapid population expansion brings the following issues for basic human needs.

- **Building (for housing, work place, social needs).**

- Depleting natural resourcing for concrete making.
- Dincel does not attempt to change Portland cement made concrete. Dincel's aim is to improve conventional Portland cement concrete with significantly less steel and cement use but making non-conventional materials such as mining rejects, coal, shale, clay, beach sand, corals, fly-ash and bottom-ash which are available in concrete making.
- Rapidly reducing skilled labour and construction safety concerns.
- Affordable construction; cost and time.
- Buildability in all conditions including flood affected areas, mine subsidence – bushfires – steep land zones, salty-acidic environments.
- Durability/longevity and maintenance free; 100 year life, crack – water damage free, no concrete cancer.
- Less emissions, embodied energy efficiency, less cement and steel.
- Sick building syndrome/indoor air quality.
- Fire safety.
- Structural strength; earthquakes/floods.
- Transportation.
- Protection of township by energy free flood levies or raising sea levels.

Dincel offers an overall solution to any of the above issues. The construction industry is still using the 5,000 year old bricks/blocks technology. These materials are no longer suitable for high capital outlay for establishment costs, high energy use and resultant CO₂ emissions, technical regulations (e.g. earthquakes) – cost – time – skilled labour availability reasons.

These are the main issues to challenge the construction industry. "Skilled Labour" in particular is already the biggest problem.

FOOD SHORTAGE

The current global life span of harvest grain is 3 months. If this can be extended to the next harvest, say for 9 ~ 12 months life span, we can state that we have a solution in assisting worldwide hunger.

WATER CONSERVATION

Design buildings and townships which can be self-sufficient with only 10% town-water top-up.

DCS can be used in the following areas:

BUILDING WALLS	Private residences, villas and townhouses. Basements, lift-stair shafts, party-corridor-façade walls of apartments, offices, retail, industrial, warehouses, hospitals, shopping centres. Excellent corrosion resistance for marine and agricultural building structures such as poultry, piggeries, fertiliser, sewerage plants, irrigation, water management channels and controlling devices. Replacement of conventional precast, tilt-up and masonry block walls.
RETAINING WALLS	Basement walls below permanent water table, earth retaining, mining, erosion control, river embankment protection, sea walls.
STORAGE TANKS	Water (detention, retention, stormwater pits), fish farming tanks, waste water, sewerage, sludge, petrol, manure, grain and contaminated soil.
SPECIAL USES	Bushfire Prone Areas, mine subsidence areas, sound barriers, prevent the migration of contaminated ground water, construction in acid sulphate soils, bund walls to protect islands against rising ocean levels, protect fresh water lagoons against sea water invasion, reclaimed lands in coastal areas for developments, energy free flood levies to protect township or generate flood free developable lands.

DCS addresses the following important key sustainability issues:

- Green Star Rating And DCS [\(Download – 7 Green Star For Your Next Project\)](#)
- Sustainable Construction [\(Download – Sustainable Construction\)](#)
[\(Download – Sustainable Concrete\)](#)
 - Energy Efficiency [\(Download – Part 1 - Energy Efficiency – Embodied Energy\)](#)
[\(Download – Part 2 – Energy Efficiency for Building Operational Use\)](#)
 - Housing Affordability [\(Download – Dincel Solution for Housing Affordability\)](#)
 - Workplace Safety [\(Download – Dincel Solution for Construction Safety\)](#)
[\(Download – FAQ, Answer No: 4 – Safer/General\)](#)
 - Indoor Air Quality [\(Download – Indoor Air Quality, Condensation, Mould and Mildew\)](#)
[\(Download – Leaky Buildings – Are Fibre-Cement Sheets Suitable\)](#)
 - Water Conservation [\(Download – Water Conservation\)](#)
 - Food Conservation [\(Download – Dincel Silos for Food Conservation\)](#)
 - Structural Safety [\(Download – Earthquake Hazard Risk Prevention for Developers and Design Professionals\)](#)
[\(Download\) – Building Solution for Earthquake Prone Regions](#)