Cross Laminated Timber
Forte & Docklands Library & Community Centre

Lend Lease

Melbourne Forum
Innovative Construction Techniques
Tuesday 17th September 2013

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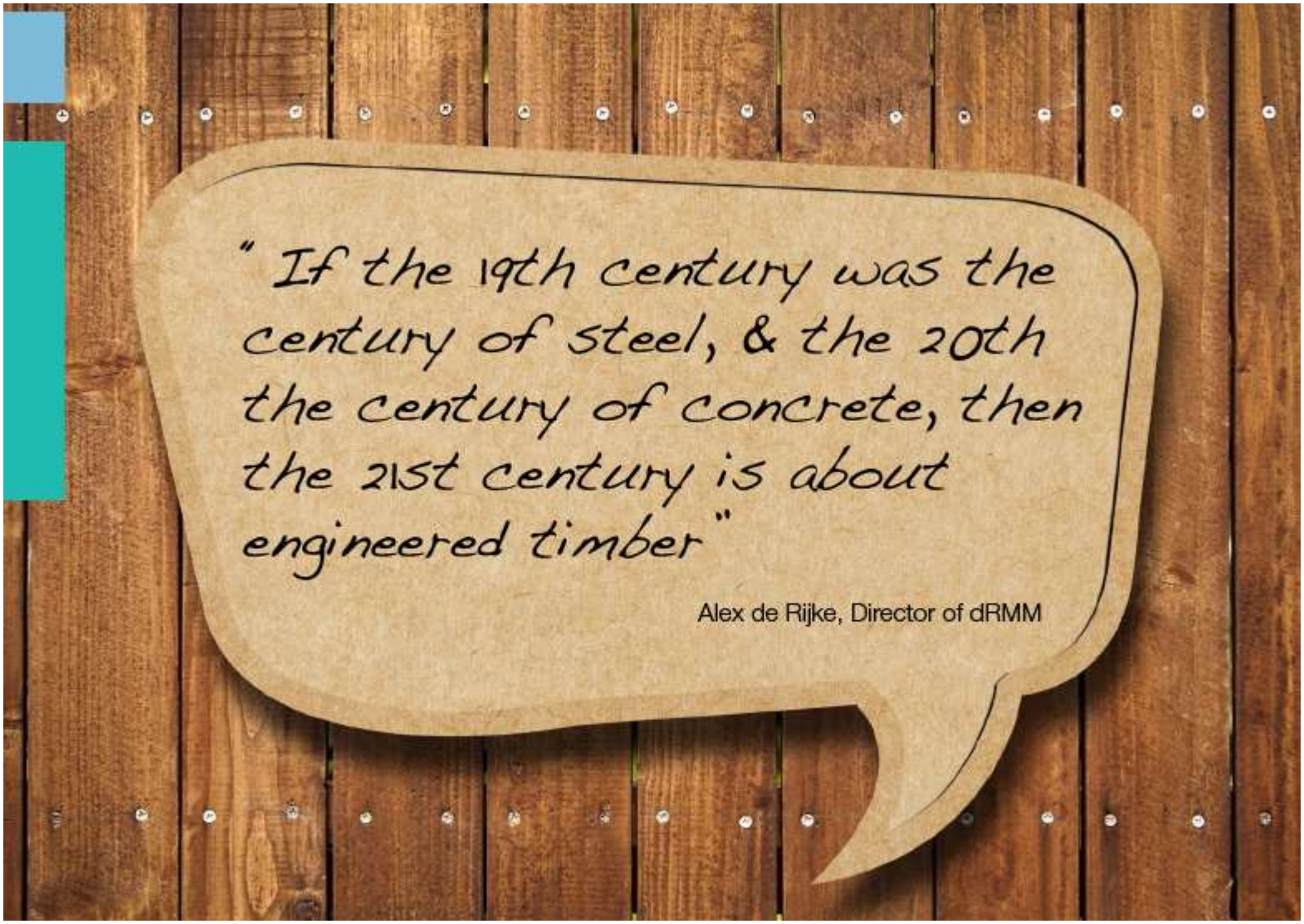
" If the 19th century was the century of steel, & the 20th the century of concrete, then the 21st century is about engineered timber "
Alex de Rijke, Director of dRMM

Project Overviews

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	Forte	Docklands Library & Community Centre
Building Type	Residential / Retail	Commercial (Civic)
Client	LLD/LLA	City of Melbourne Places Victoria LLD
Height / Area	10 storeys (27 appts)	3 storeys (3000sqm)
Structural System	PC piles (30m) Insitu Concrete (ground) CLT	Existing Wharf Insitut Concrete (ground) CLT Glulam

How was CLT applied

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Forte

- Ground level concrete structure
- Slab construction. (inter tenancy LB walls, cores, floors and roof, stairs.)
- Delivered to VH and delivered to site.
- Driverless crane.
- Install crew of 5.
- External over façade cladding.

DLCC

- Ground level concrete slab on wharf.
- Slab and stick construction. (glulam columns and beams, cores, floors and roof, stairs.)
- Delivered to off site storage and delivered to site (JIT)
- Mobile crane.
- Install crew of 5.
- No CLT façade – light weight rainscreen.

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WHAT IS CLT?

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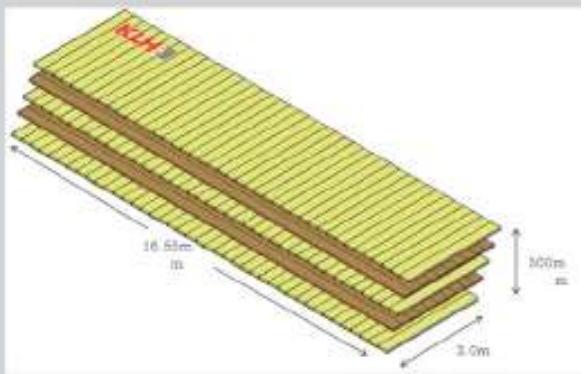

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- Stable engineered product
- Highly mechanised production process
- Simplicity - basic assembly concepts
- Scale - large panel dimensions that suit major commercial construction
- Robust

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SAFE

- Reduced high risk work (eg work at heights). Elimination of injuries associated with formwork and reinforcing
- Better work environment with less dust, less vibration, noise and obstructions
- Reduced impact of construction and disruption on local communities
- Fewer operatives on site and for a reduced period of time

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SUSTAINABLE

- Carbon neutral structural option – 1m³ of timber stores 0.25t of carbon
- Better thermal performance
- **Generates zero waste**
- Reduces fresh water consumption
- Enhances Indoor Environment Quality
- Reduces the deliveries to site

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LIGHT WEIGHT

- 80% weight reduction
- Less mass to support
- Reduces foundations
- Assists with poor ground conditions
- Basic craneage

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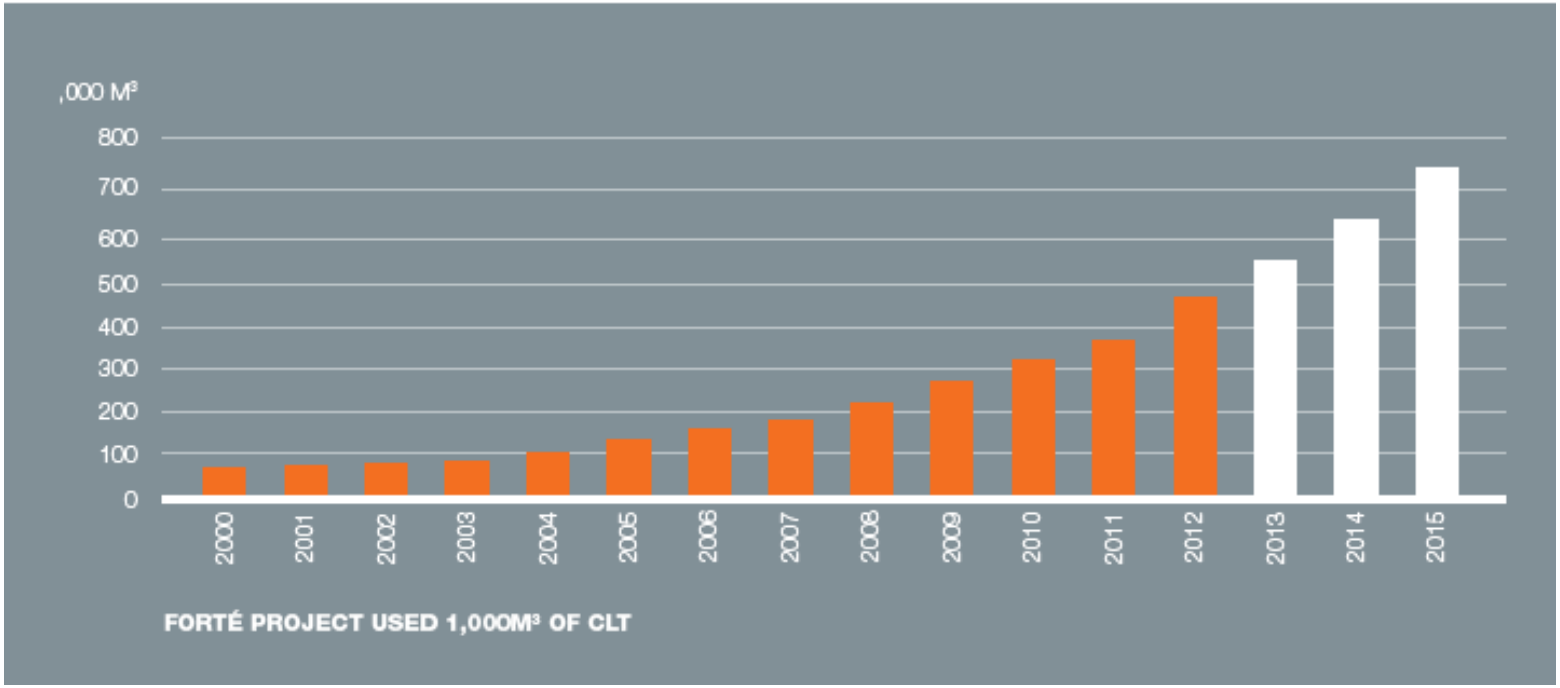
GROWTH OF CLT USAGE IN EUROPE



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TYRANNY OF DISTANCE

SHIPPING A BUILDING FROM EUROPE TO AUSTRALIA

KLH Factory

Koper Slovenia

Suez canal

Port Melbourne
– Australian Customs

Shed at Victoria Harbour
– LL IKEA

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FIRE PERFORMANCE

Technical

- Highly predictable performance.
- Layers char at 0.7mm / min.
- Sacrificial layers and / or supplementary materials can be used.
- Forté uses a combination of protection and sacrificial.

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Technical

- Equal or higher than conventional concrete frame / masonry / plasterboard wall
- Focus on low frequency – need to add mass via floor build up
- Australia has high code requirements
- Lend Lease has higher than code standards

ACOUSTIC PERFORMANCE

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VERMIN – WHAT ABOUT TERMITES?

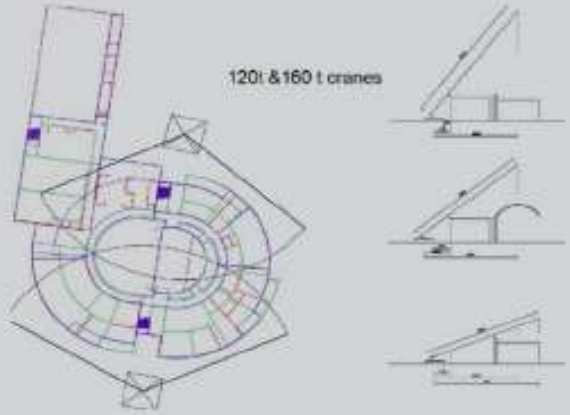
Vermin protection:

- Code requires timber structures to be protected from termites
- CLT structure sits on concrete podium for ground seperation
- Physical termite barriers at perimeter and services penetrations (chemical free)
- Annual inspection regime

DESIGN PROCESS & TECHNICAL DETAILING

IT IS A DIFFERENT DESIGN / CONSTRUCTION PROCESS

- All design completed up front
- File to factory process
- 3D modelling in auto-CAD
- Installation sequencing, crane calculations
- Minimises waste, reduces onsite decision making and errors



Project Achievements

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Safe	0 injuries Clean & quiet site Positive feedback from trade contractors
Sustainable	Forte forecast to reduce GGE by 22% over 50 year cycle 5 star Greenstar As built (Forte). Targeting 5 star + Greenstar Public buildings pilot. (library) Significant waste reduction. Significant emissions and water reduction through construction.
Light Weight	30% reduction in piling (Forte) Re-used substructure (library) Efficient materials handling
Time savings and efficiencies.	3-4 month programme saving (40-50 day structure install) Pod opportunities (Forte) Follow on trades are immediate Minimal back propping.
High Quality	Minimal use of spares Precise tolerance High quality visual finish

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- Proven speed
- Clean and safe
- Robust, high quality result
- Potential to be cost competitive
- Contractors love it
- Bankers and insurers get it
- Customers are not afraid of it

Thankyou

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