

# **Il progetto SOFIE**

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## FOWL - Forest and Other Wooded Land



### Italia

Italy land 29.4 M ha

Italy FOWL 11.1 M ha

## FOWL - Forest and Other Wooded Land



## Trentino

Trentino land 0.62 M ha

Trentino FOWL 0.34 M ha

Percentuale di FOWL 55 %

## FOWL - Forest and Other Wooded Land



### Trentino

500 000 000 trees

Population 453 000

**1人あたり1,000本以上の立木**

## FOWL - Forest and Other Wooded Land



### Trentino

Timber stock of forests 55 M m<sup>3</sup>

Annual growth 1.3M m<sup>3</sup>

Amount of timber felled annually 100 000 m<sup>3</sup>  
Capacity of sustainable exploitation 500 000 m<sup>3</sup>

# L'altro massiccio

promo\_legno



PROVINCIA AUTONOMA DI TRENTO



progetto **sofie**



**“Usare il legno  
per salvare le foreste!”**

**Il legno proviene dal Trentino (abete rosso)**







PROVINCIA AUTONOMA DI TRENTO



Lo scopo del progetto è quello di definire le **prestazioni** ed il potenziale di un **sistema di costruzione per edifici pluri-piano**, i cui elementi portanti (pareti e solai) sono realizzati con pannelli (**XLam**) attraverso prove, analisi e studio di ogni singolo aspetto:

**(sismica, fuoco, durabilità, building physics).**

Il progetto è finanziato dalla Provincia Autonoma di Trento

- I pannelli X-Lam sono estremamente resistenti e rigidi, e consentono l'utilizzo anche di categorie di qualità di legno medio-basse di provenienza locale.

- Il sistema **X-Lam** risulta più **attraente** per il pubblico europeo, diffidente nei confronti delle costruzioni leggere di legno, spesso considerate adatte solo per utilizzazione temporanee.

# L'altro massiccio

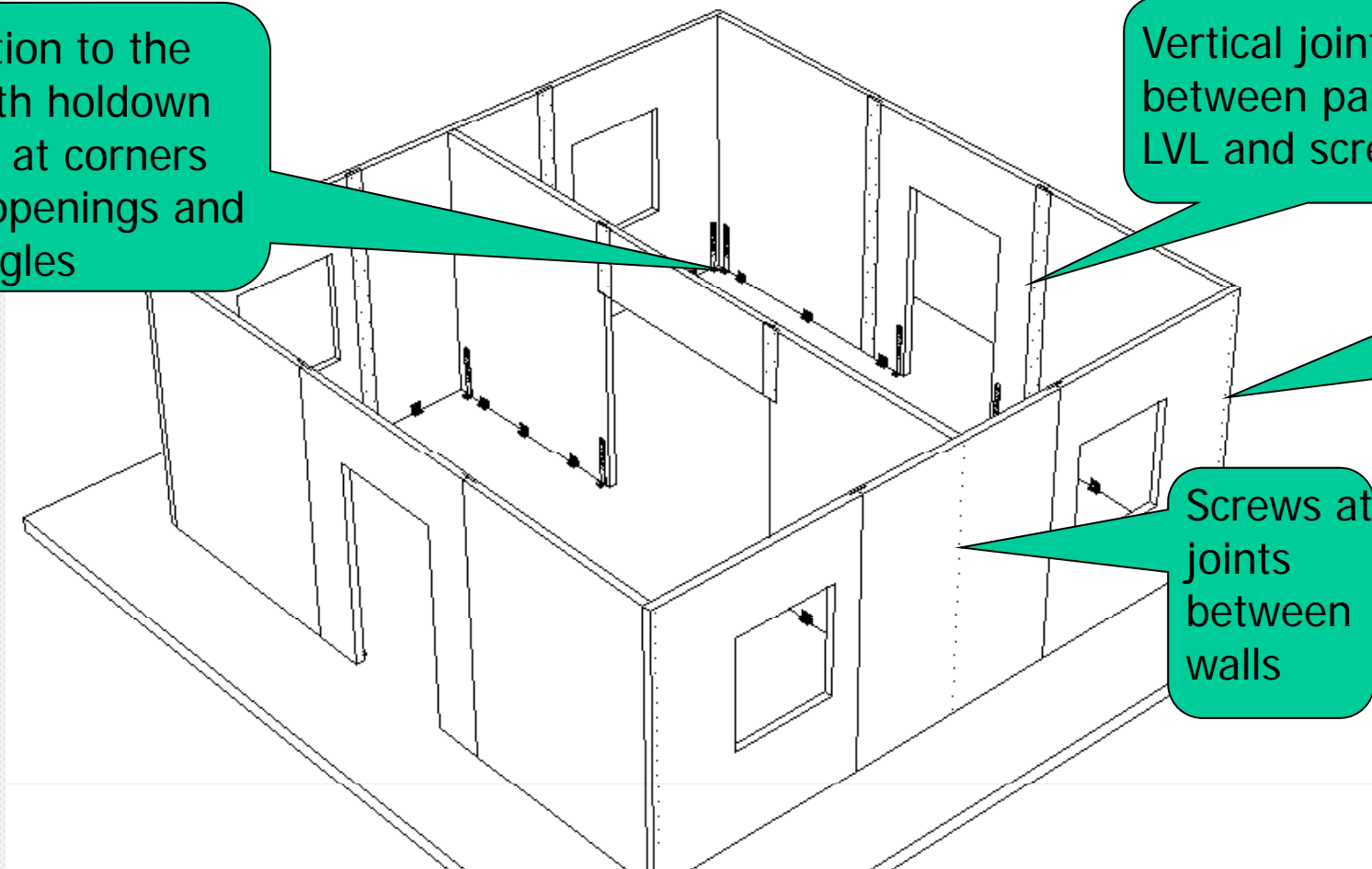
promo\_legno

Connection to the base with holdown anchors at corners and at openings and steel angles

Vertical joints between panels with LVL and screws

Screws at corner joints

Screws at joints between walls



# L'altro massiccio

promo\_legno

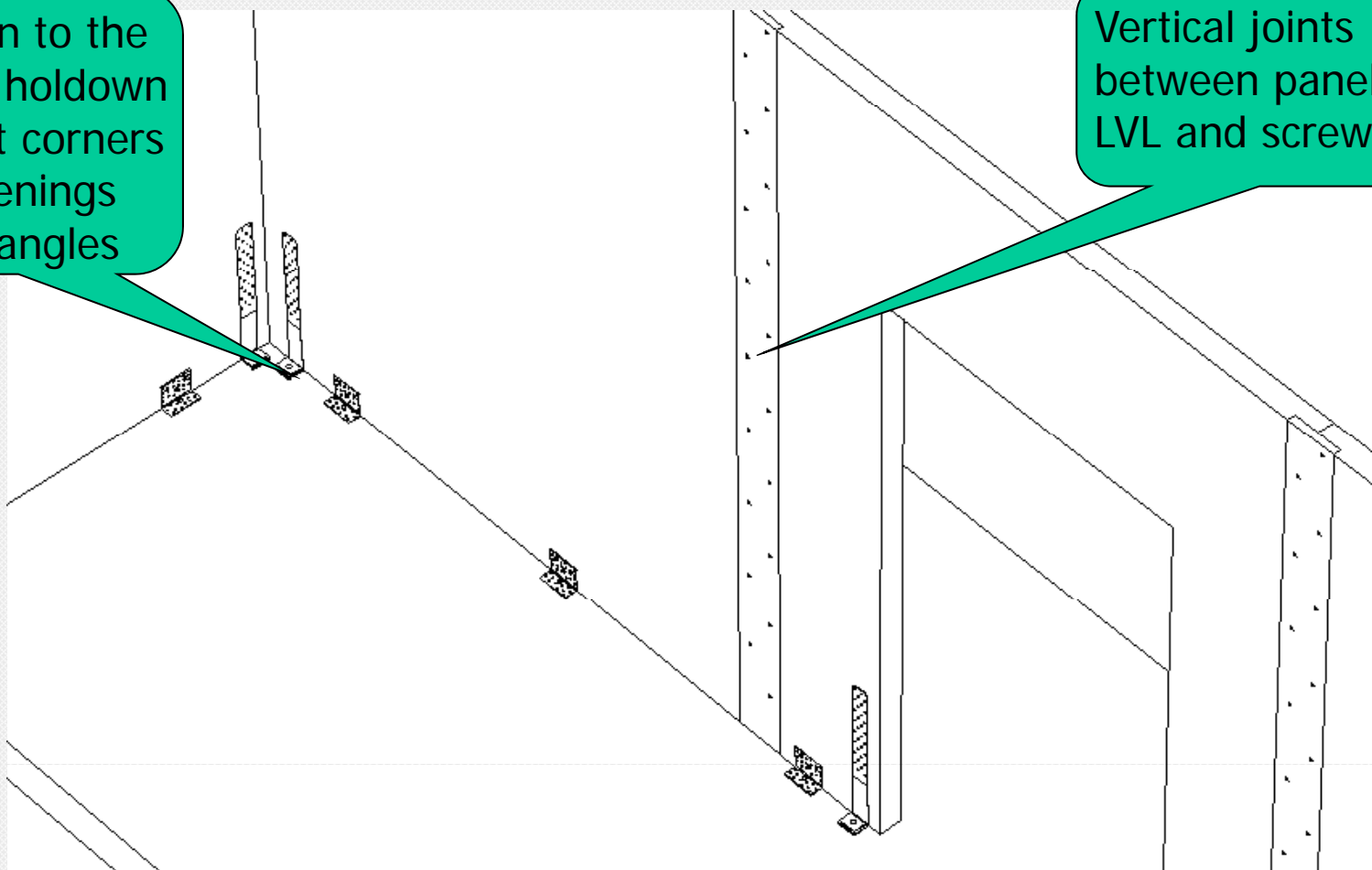


# L'altro massiccio

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Connection to the base with holdown anchors at corners and at openings and steel angles

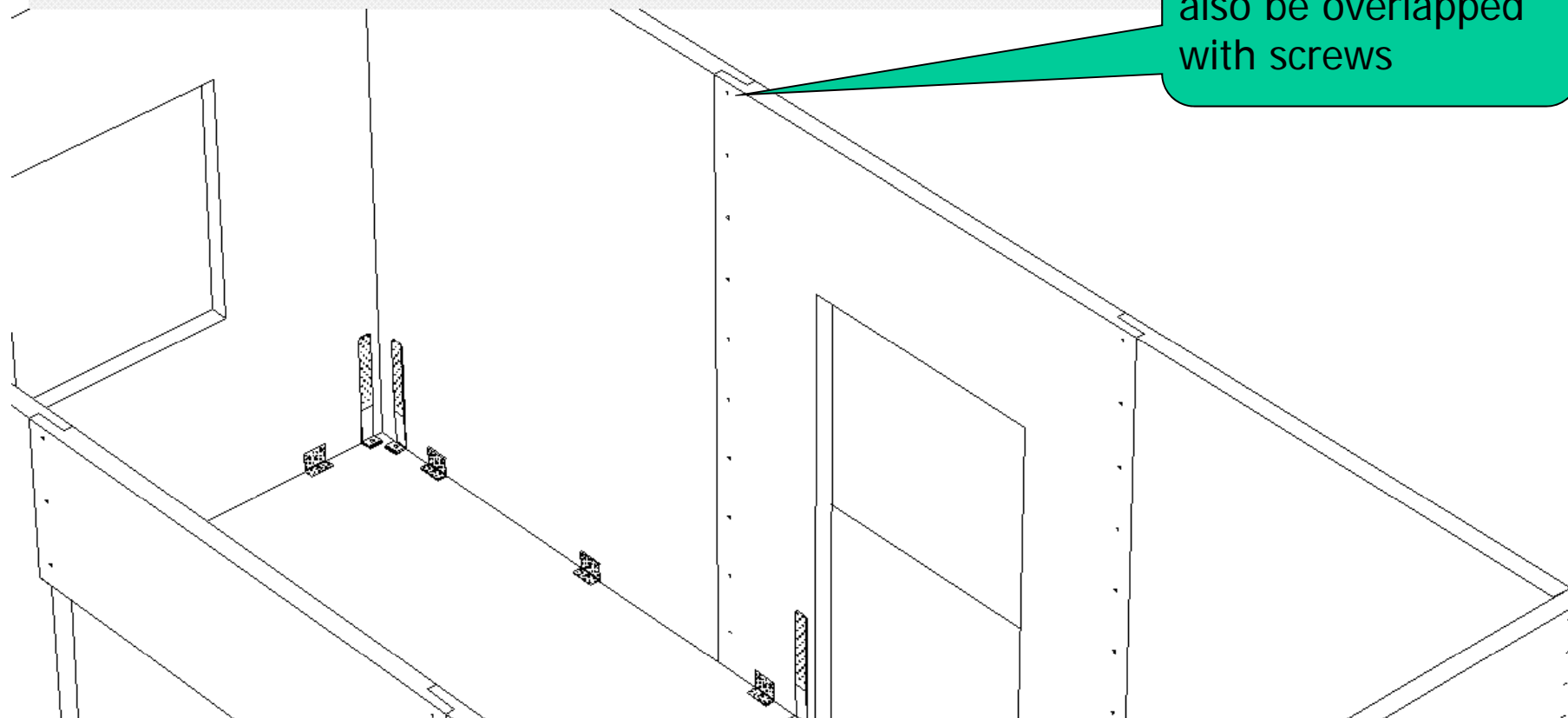
Vertical joints between panels with LVL and screws



# L'altro massiccio

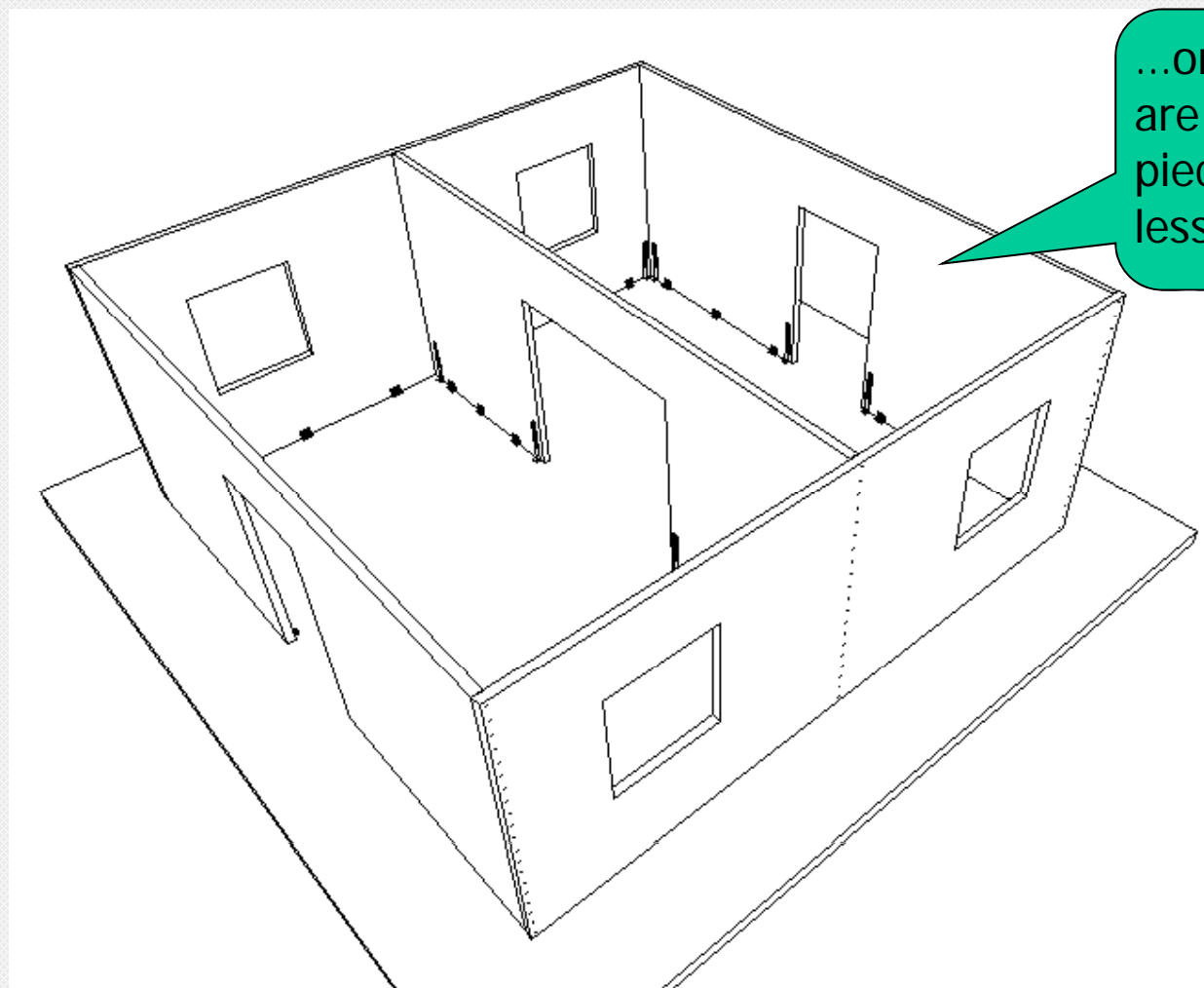
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Vertical joints may also be overlapped with screws



## L'altro massiccio

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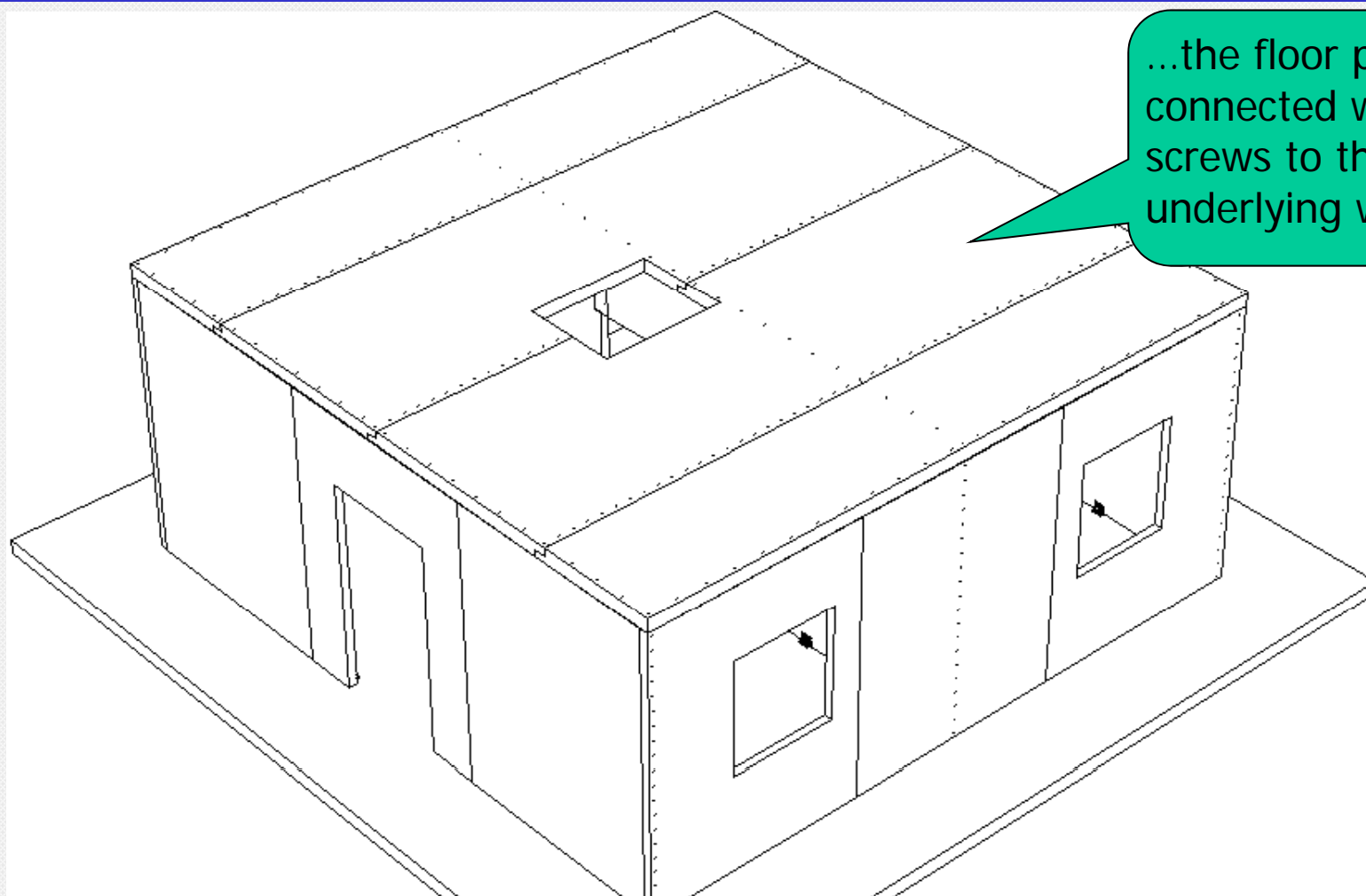


...or more often walls are made of one piece if total length is less than 7-10 m



## L'altro massiccio

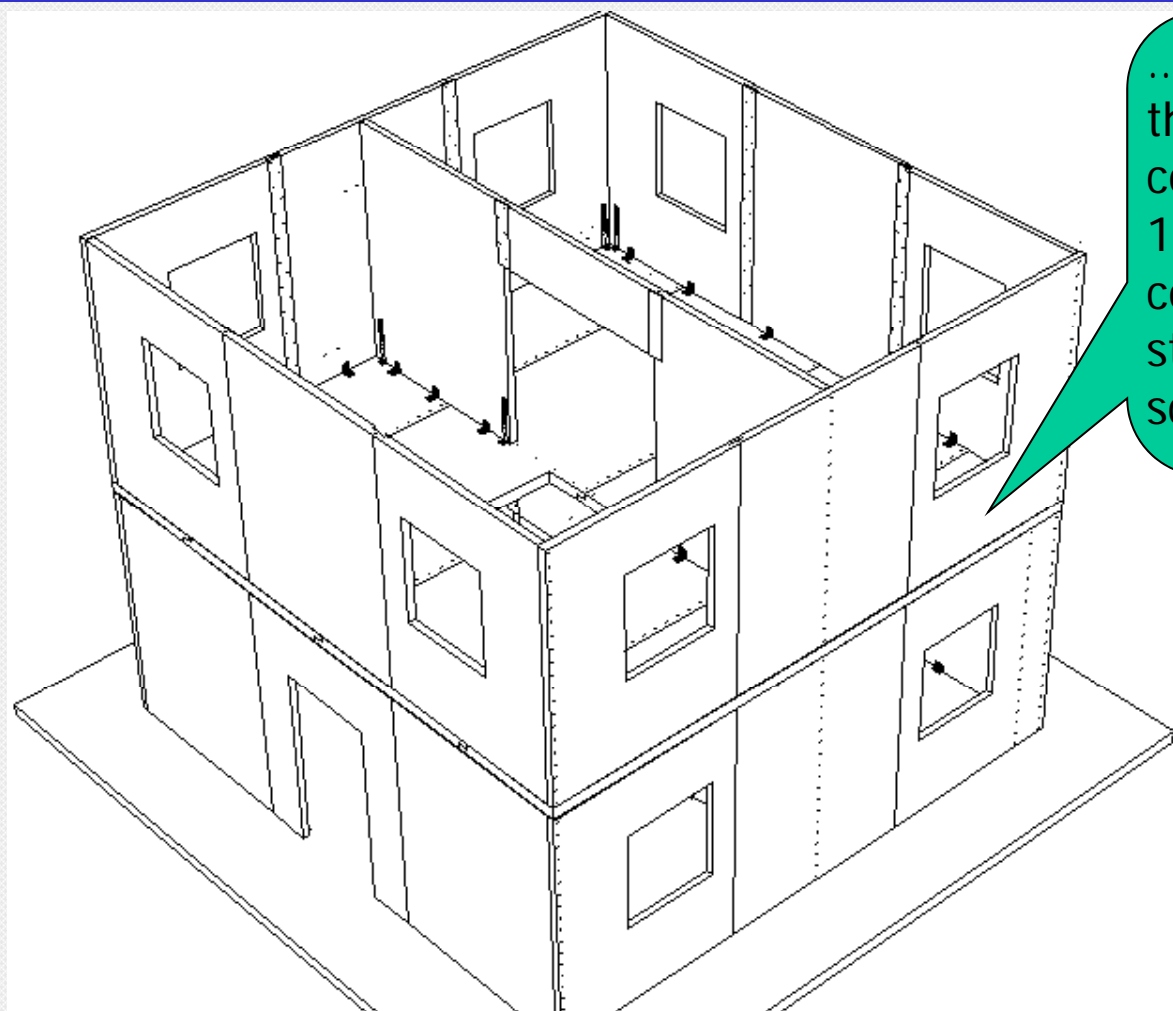
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...the floor panels are connected with screws to the underlying walls

# L'altro massiccio

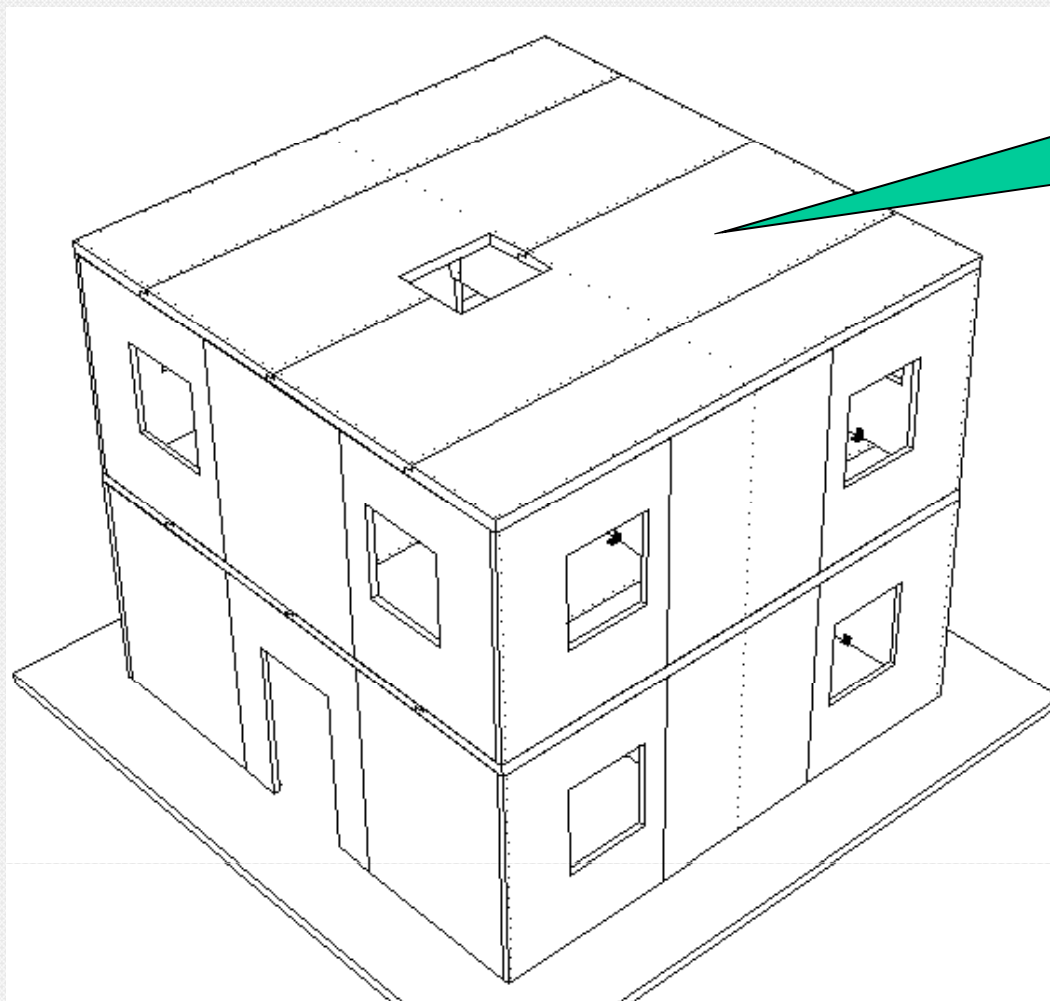
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...the wall panels of the second floor are constructed over the 1<sup>st</sup> floor and connected again with steel connectors and screws

## L'altro massiccio

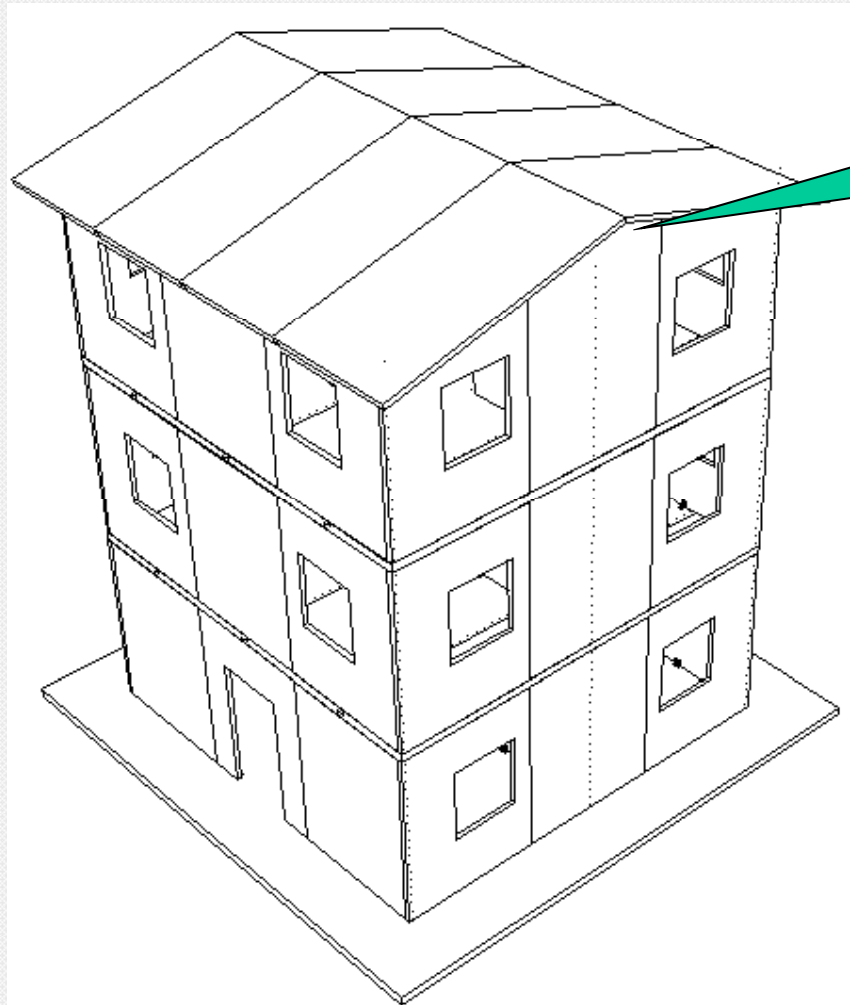
promo\_legno



...the 2<sup>nd</sup> floor is connected in the same way

## L'altro massiccio

promo\_legno



...the construction is then completed very quickly

## L'altro massiccio

promo\_legno

Quakes!



by San Francisco Museum



In plane  
Cyclic Tests  
on walls and  
connections

Pseudo-  
dynamic  
tests on  
one storey  
specimen



Shaking Table Test on a full-  
scale 7mx7mx10m of height 3  
storeys XLam building

## L'altro massiccio

promo\_legno

3storey house  
7x7x10m

Total weight  
XLAM: 20 ton  
(3<sup>rd</sup> grade timber)  
Ultimate Lateral  
Load carrying  
capacity

XLAM: 35 kN/m

Lateral Stiffness

XLAM: 2.5 kN/mm/m



3storey house  
7x7x10m

Total weight  
2by4: 7 ton  
(1<sup>st</sup> grade timber)  
Ultimate Lateral  
Load carrying  
capacity

2by4: 7 kN/m

Lateral Stiffness

2by4: 1 kN/mm/m

## L'altro massiccio

promo\_legno

Seismic Test on Shaking Table Facility in Tsukuba,  
Japan in July 2006



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# L'altro massiccio

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Fire Test in Tsukumba March 2007



## L'altro massiccio

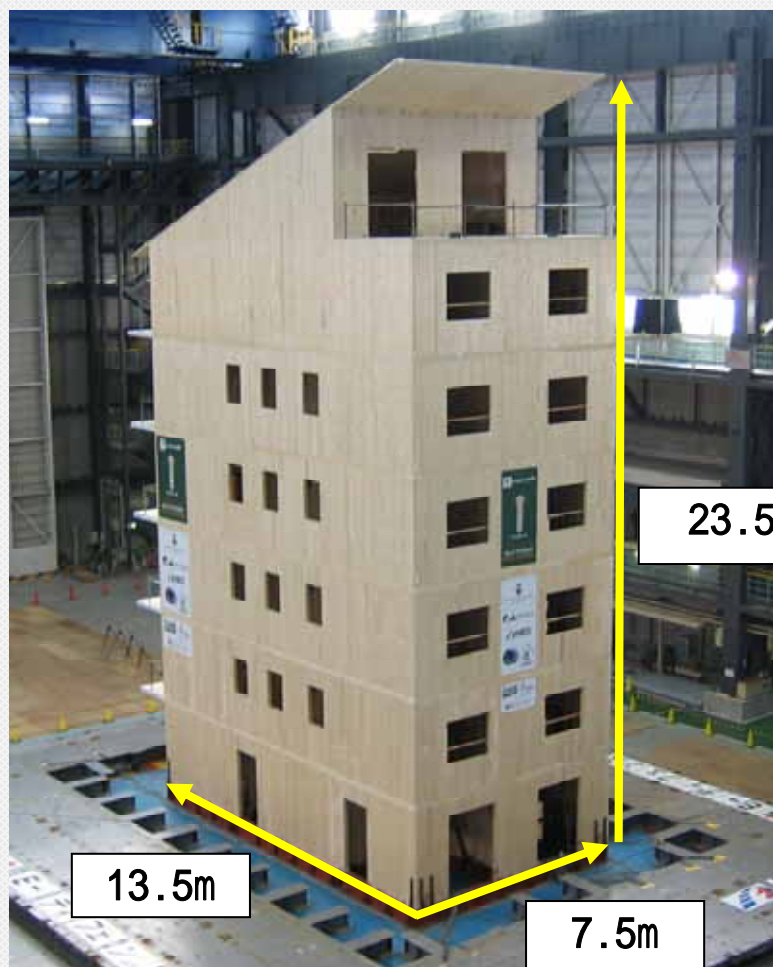
promo legno



## L'altro massiccio

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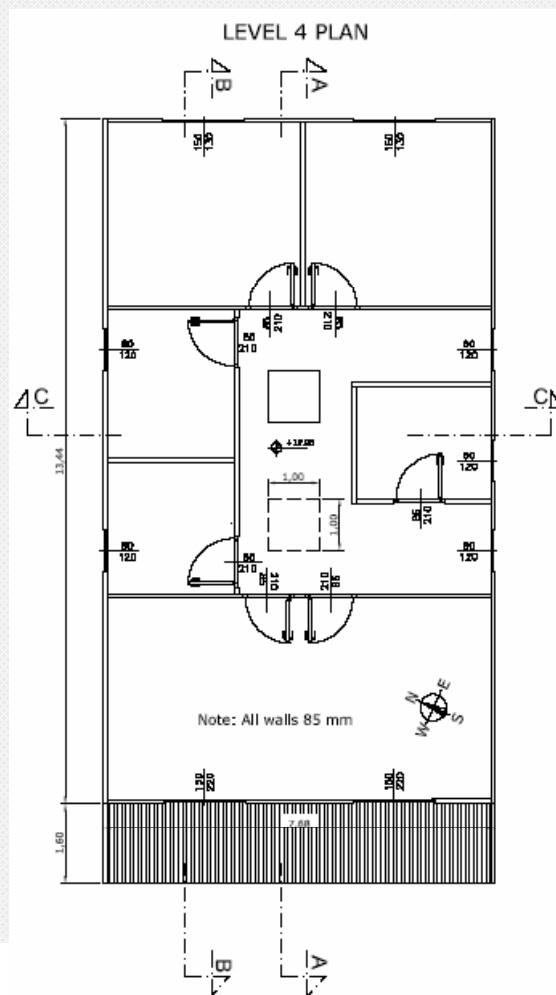
SEISMIC TEST IN MIKI 2007 OCT 23



*Input :*

*JMA Kobe 3D x,y,z 0.60, 0.82, 0.34 g*

**BUILDING SELF WEIGHT 120 t  
ADDITIONAL LOAD ON FLOORS 150 t**





# L'altro massiccio

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*Shaking table test of a 7 Storey XLam Building*



## L'altro massiccio

promo legno

Before the shaking...



After 7 big quakes in a row!





## L'altro massiccio

promo\_legno

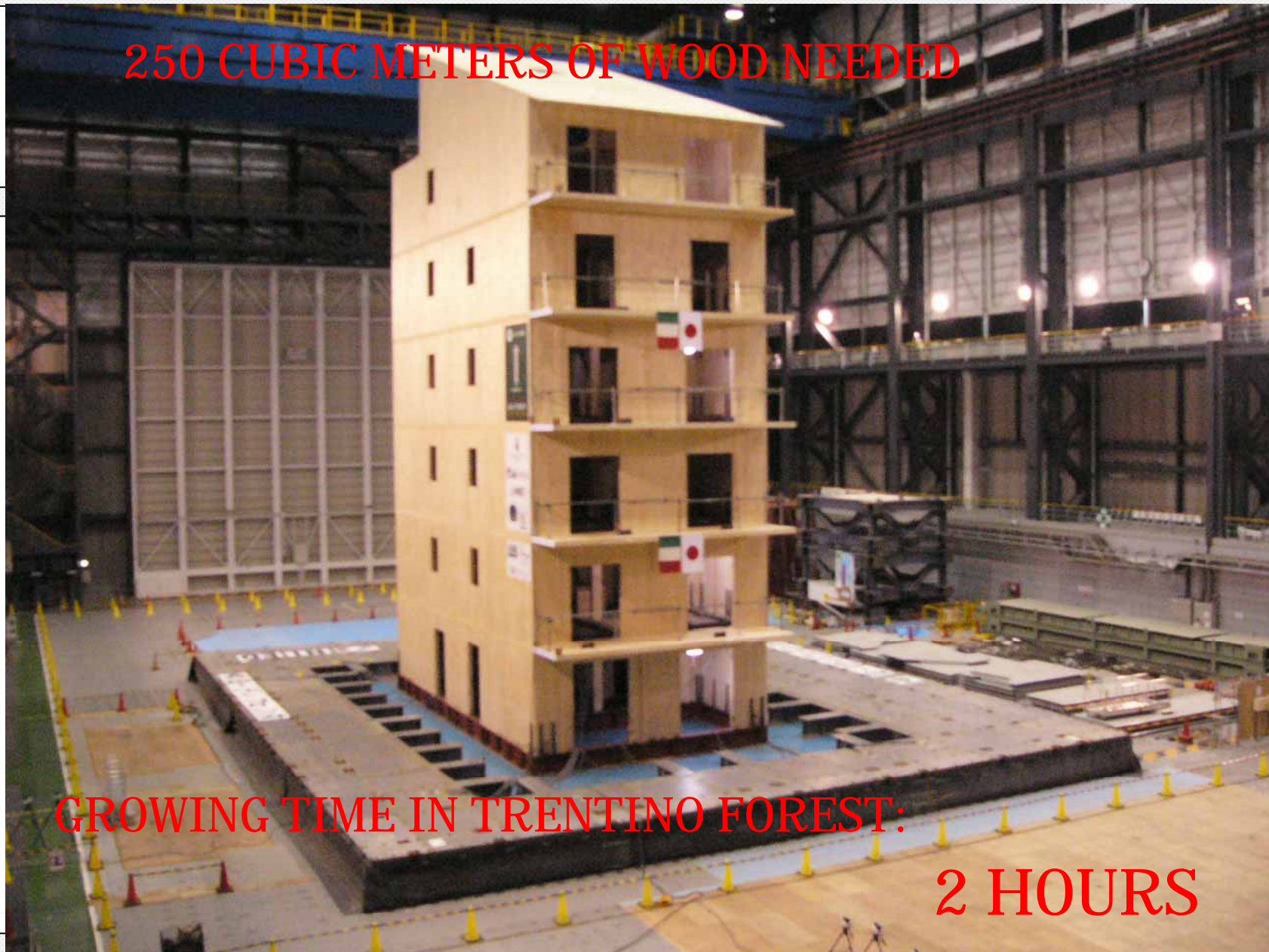


Nuova tendenza:

**Non solo salvaguardia delle vite  
ma anche del patrimonio**

Anche per terremoti distruttivi...

250 CUBIC METERS OF WOOD NEEDED



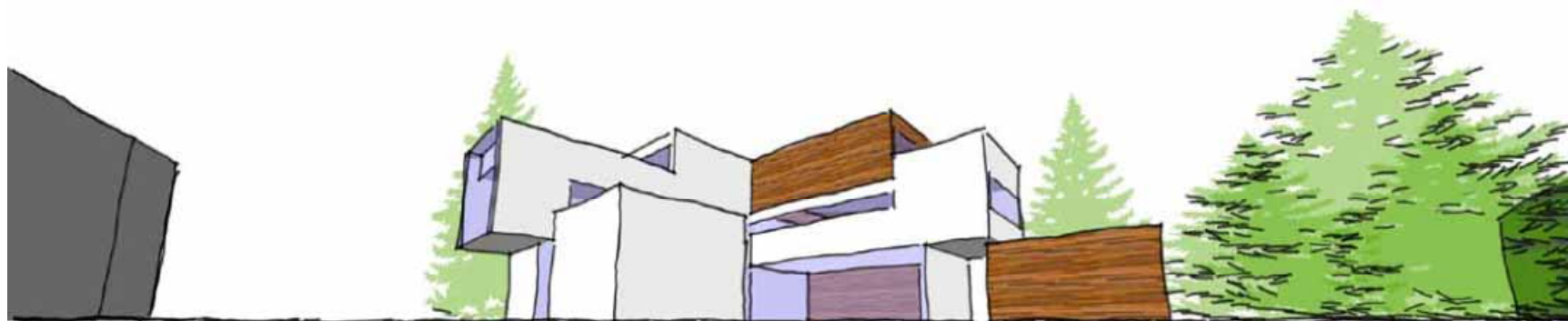
GROWING TIME IN TRENTO FOREST:

2 HOURS

## L'altro massiccio

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X-Lam panels have been sent back to Trento...



THE BEGINNING...

