Maintenance systems for wooden façades

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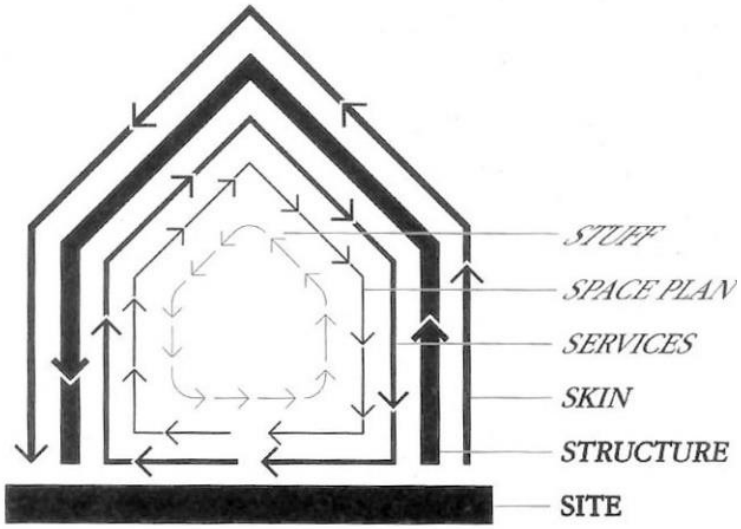
Durability in timber envelopes:

- Natural component durability
- Possibility of skin management



Shearing layers, adapted from Brand, S. (1997), *How Buildings Learn : What Happens after They're Built*, Phoenix illustrated, London

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Useful maintenance characteristics of timber envelopes:

- Light components

- Components can be easily transported and linked (i.e., dry construction systems)

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Useful maintenance characteristics of timber envelopes:

- In case a disassembly process has been planned, components can be reused after dismantling

- Materials and fixings can be selected and monitored

- Durability
- Assembly system
- Materials compatibility
- Environmental impact

Analysis criteria

- Accessibility
- Inspection
- The property of a component to be
  - Installed
  - Assembled
  - Replaced

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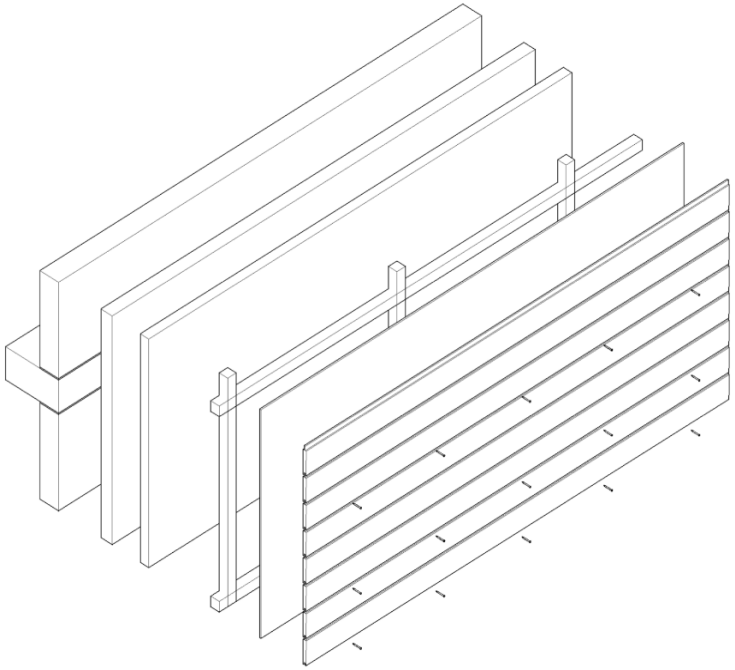
First case study

Mixed-used building in Brescia, AbnormaArchitecture



Mixed-use building in Brescia, retrieved from http://www.abnorma.it/

Functional layer	Components	Material Characteristic	Width(mm)
External finishing	Larch wooden Strips	Natural Larch	20
Fixing	Glue/Screws		
Windproof Membrane	Wind barrier		
Structure	Void for isolation	Wooden frame	60
Thermal insulation	Insulation	Fiber wood board	80
Structure	Wooden Panel	Clt	128
Internal finishing	Transparent paint		
Internal finishing	Larch wooden Strips	Natural Larch	20

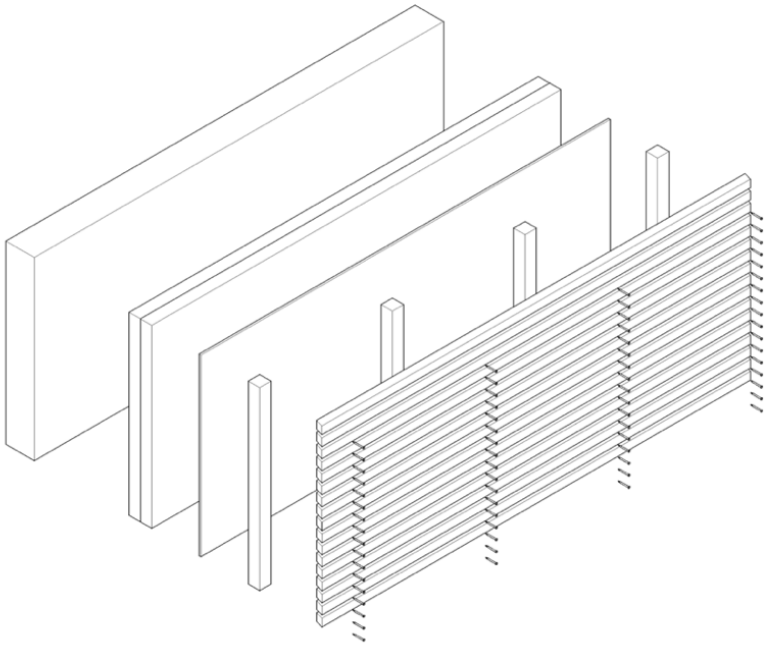


Second case study

M+R house, Diverserighe Architects

M + R house, retrieved from www.diverserighestudio.it, © DavideMenis

Functional layer	Components	Material Characteristic	Width (mm)
External finishing	Wooden larch slat	Natural larch	30 x 40
Support	Vertical frame	Natural larch	60 x 60
Separation	White paint		10
Insulation	Thermal insulation	Woodwool panel	60 + 60
Structure	Wooden panel	Clt	147
Insulation	Thermal insulation	Rockwool panel	27
Internal finishing	Spruce panel	Natural spruce	25

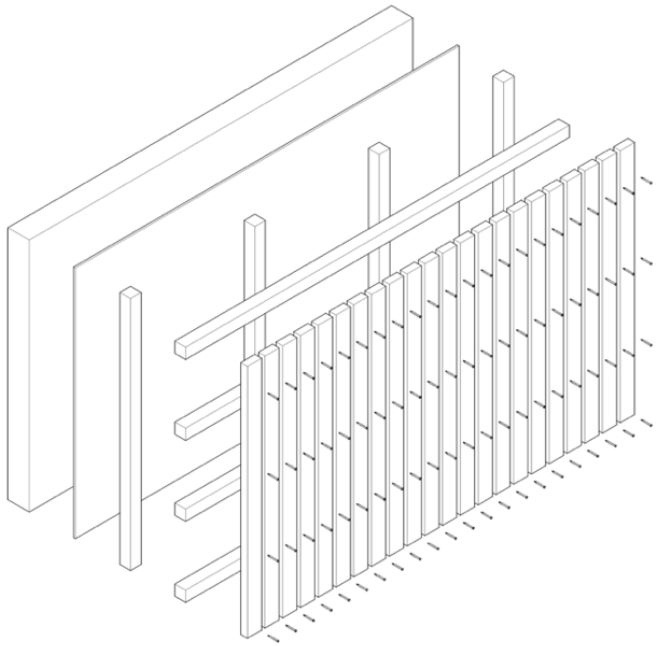


Third case study

Social house in Caltron, Mirko Franzoso Architect

Caltron Social house, from http://www.marianodallago.it, © Mariano Dallago

Functional layer	Components	Material Characteristic	Width (mm)
External finishing	Larch board	Natural larch	60 x 32
Support	Horizontal wooden beam	Larch	40 x 40
Support	Vertical wooden beam	Larch	40 x 40
Membrane	Waterprooflayer		
Structure	Clt	Clt	95
Support	Horizontal wooden slut	Larch	80 x 60
Support	Vertical Wooden slut	Larch	40 x 40
Internal finishing	Larch matchboard	Natural larch	20



Case study	Accessibility	Inspection	Ability to installed/assembled	Repairability
CS1- Mixed-used building in Brescia	Impossible	Impossible	Hard	Hard
CS2 – M + R house	Good	Good	Good	Good
CS 3 – Social house in Caltron	Hard	Hard	Good	Good

Observations

- The use of screws influenced maintenance and durability of a component, as well as the possibility of reusing it
- Model façades with a ventilated system are easily manageable
- Too many fixings could give problems for the maintenance of component
- Modular design has to be preferred as it facilitates partial dismantling (e.g., use of steel joints to split the façade into sectors)

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Conclusions

- Durability related to maintenance strategy
- Design for disassembly: are the designers ready for it?

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Thank you for your attention

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