

# Murray Grove



Architects:  
Waugh Thistleton

Engineers:  
Techniker

Timber Supplier:  
KLH



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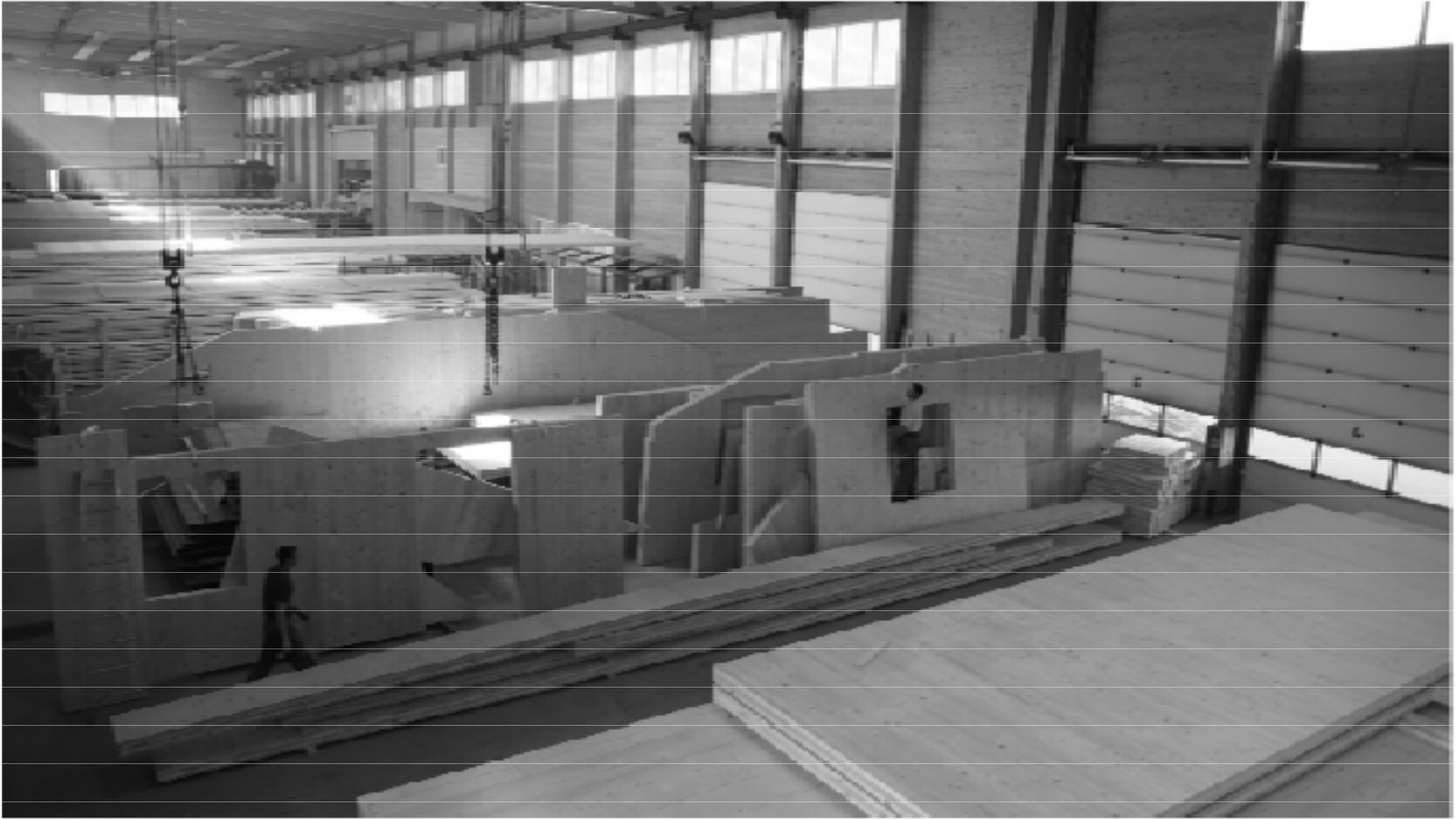
Development of 29 flats  
10 affordable and 19 private

Residents office on ground floor

Clients  
Telford Homes  
Metropolitan Housing Association

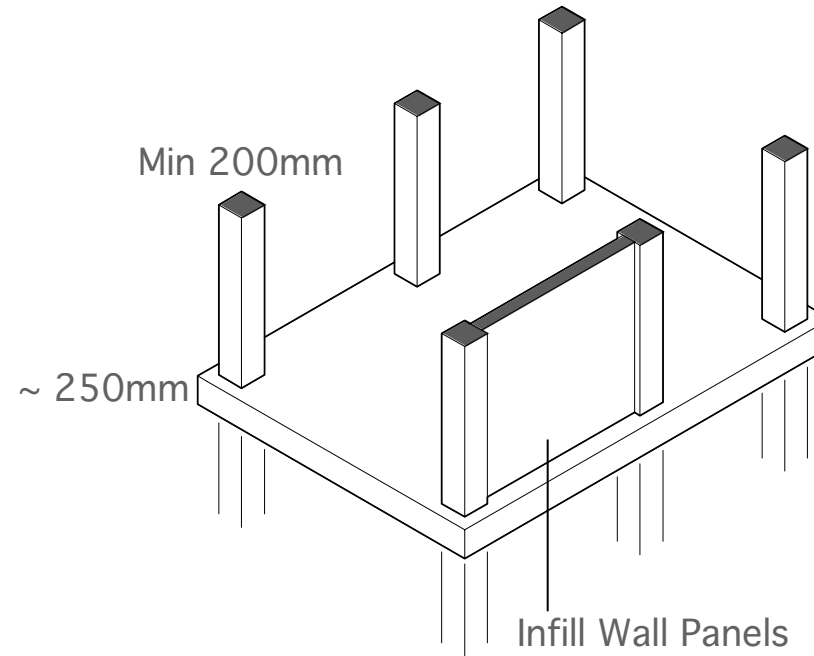
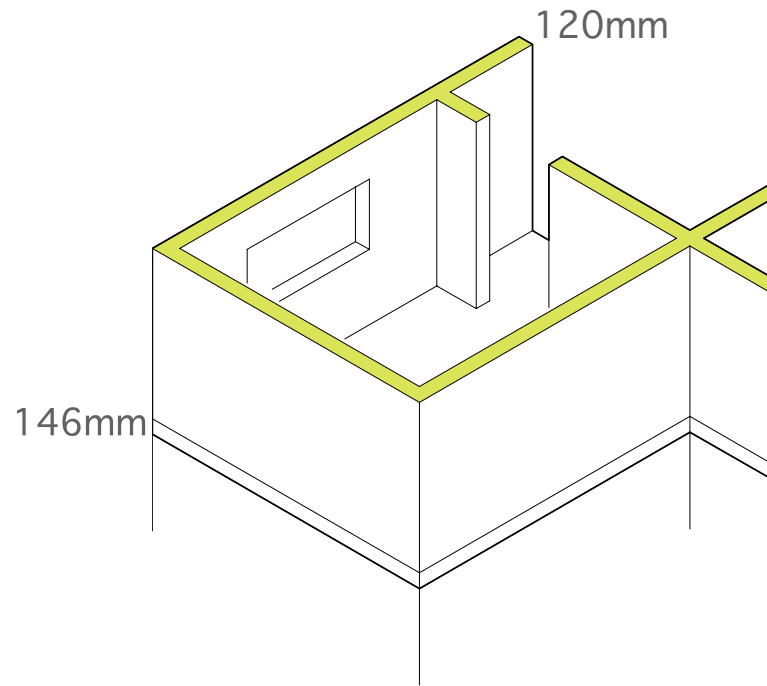
MURRAY GROVE





CO2 store  
saves 300,000 kg of carbon  
equivalent to 210 years of 10% reduction

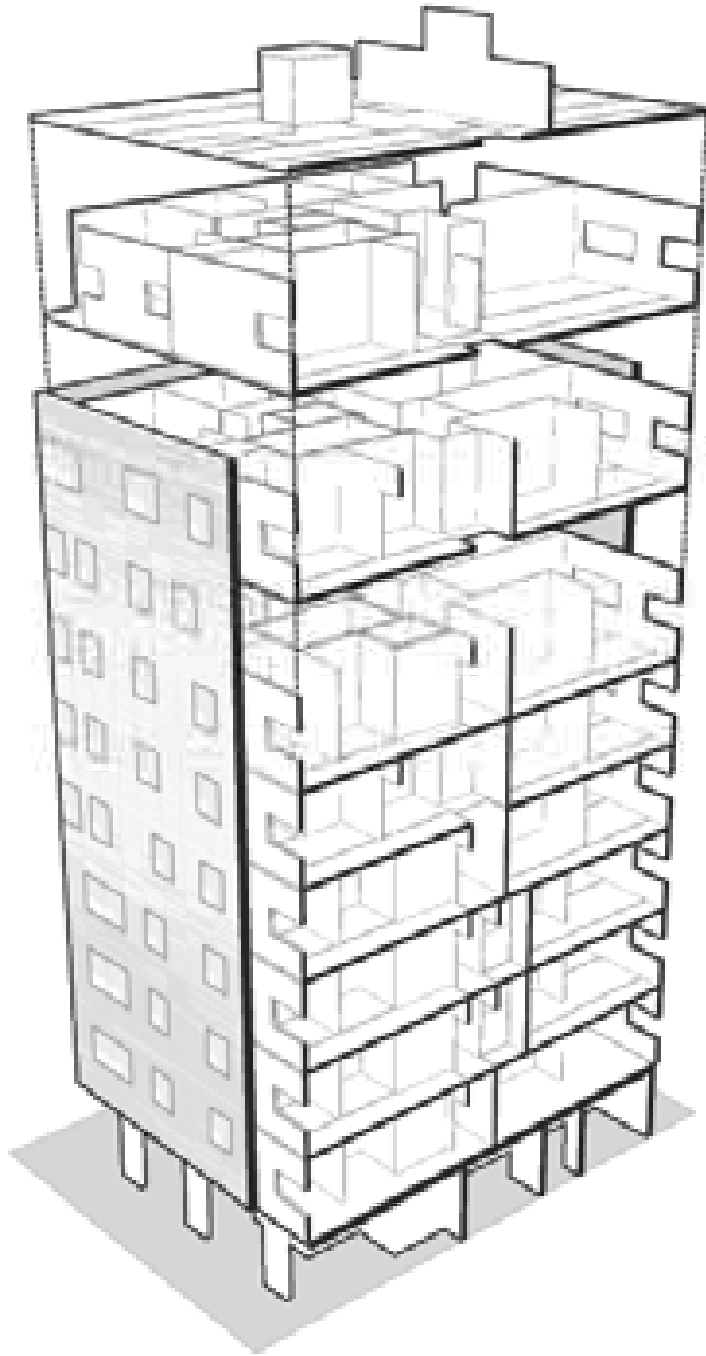
# Structural Form



Density	480kg/m <sup>3</sup>
Weight	300tonnes
Programme	49 weeks

2400kg/m <sup>3</sup>
1200tonnes
72 weeks





Honeycomb structure

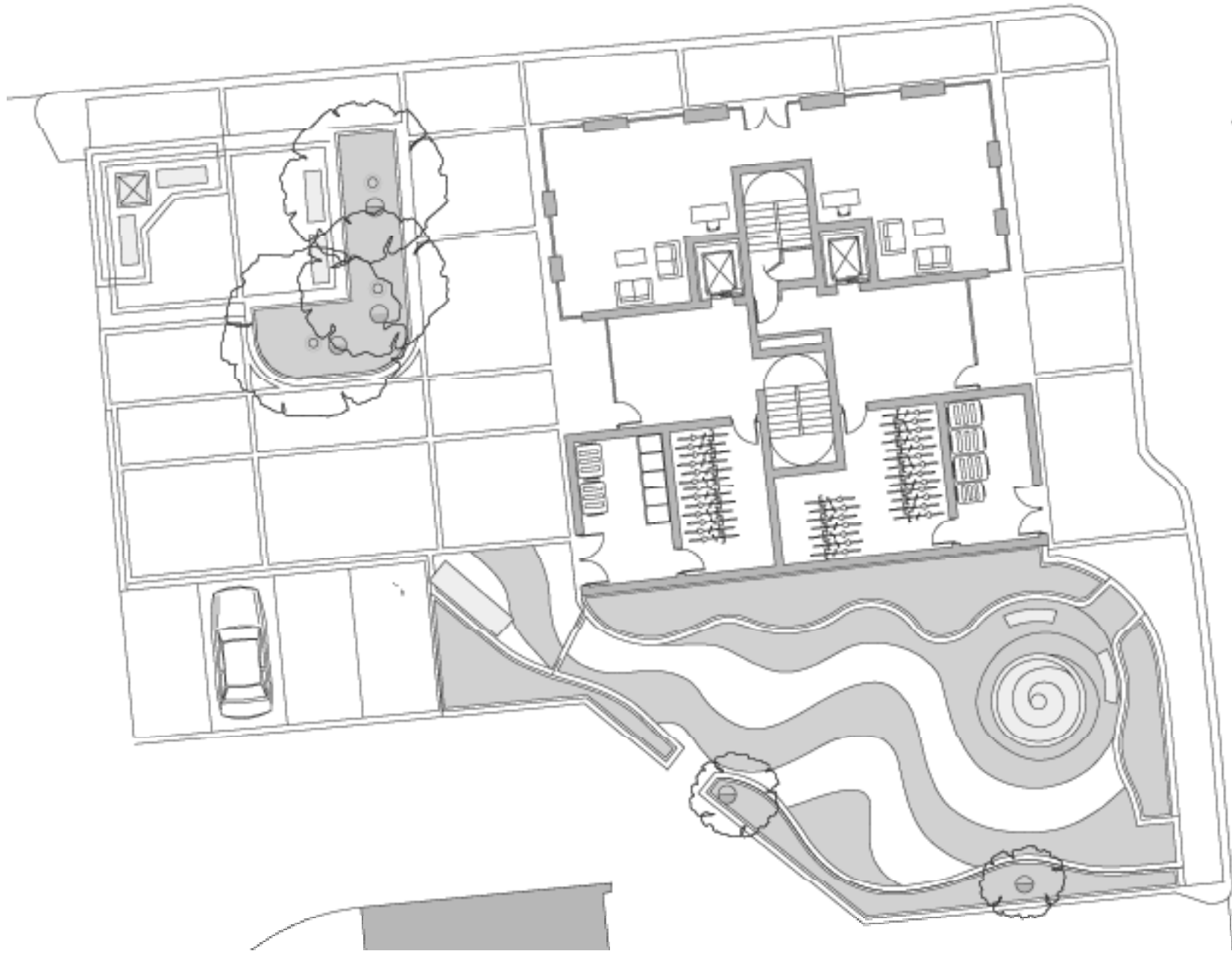
Rotated plans

Load-bearing walls, floors  
and cores

Tallest timber building in  
the world

MURRAY GROVE

PROVOST STREET

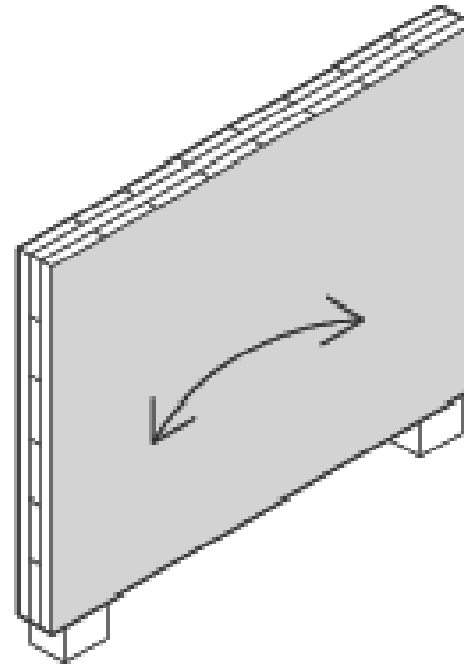
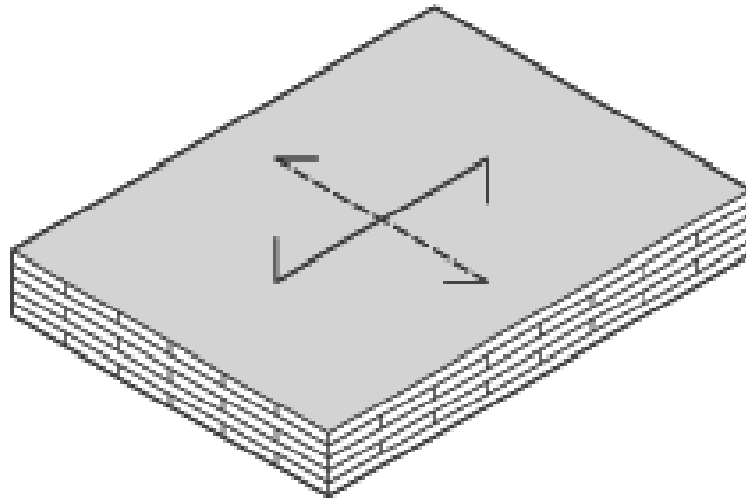




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3D advantages of KLH  
Horizontal panel - 5 ply

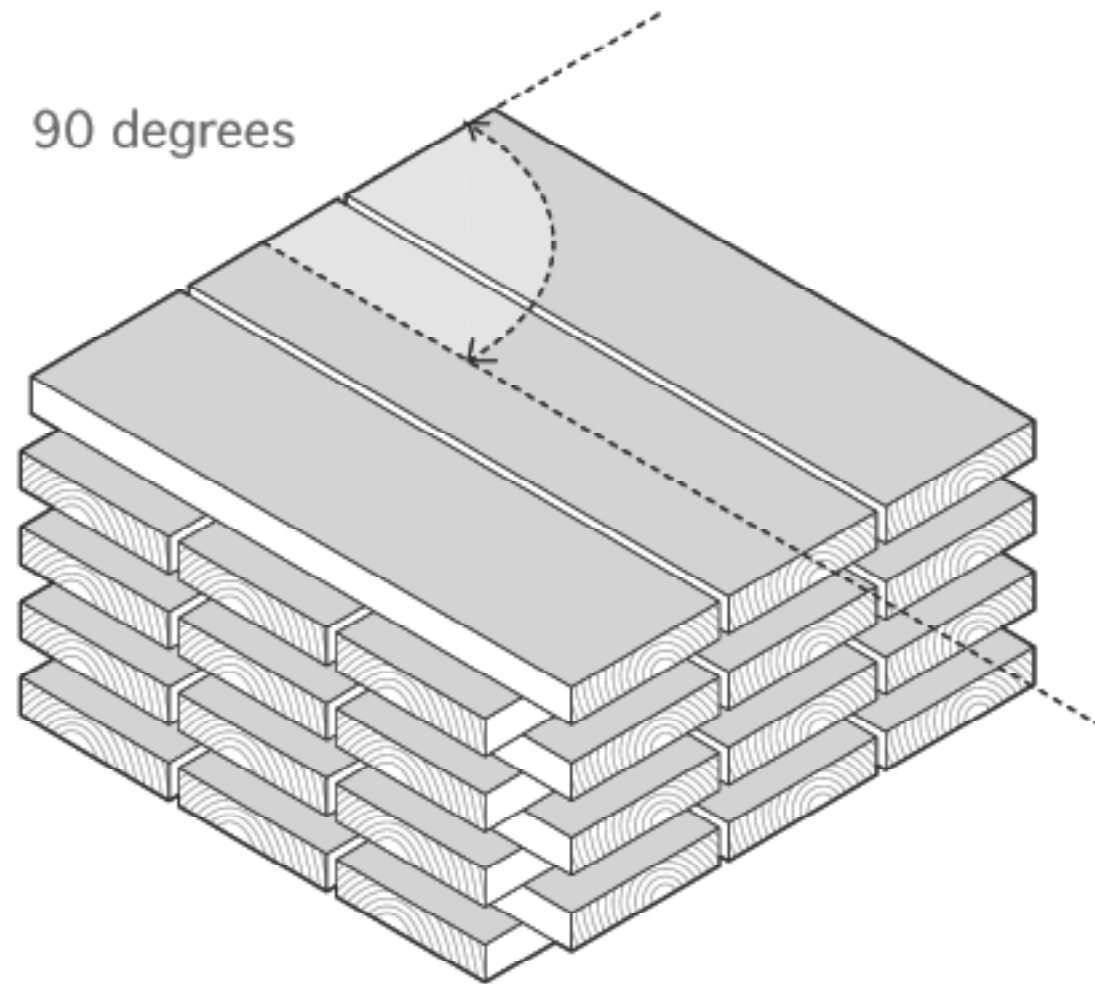
Building High

Movement

Stability

Fire

Acoustics



KLH Cross-laminated Panel

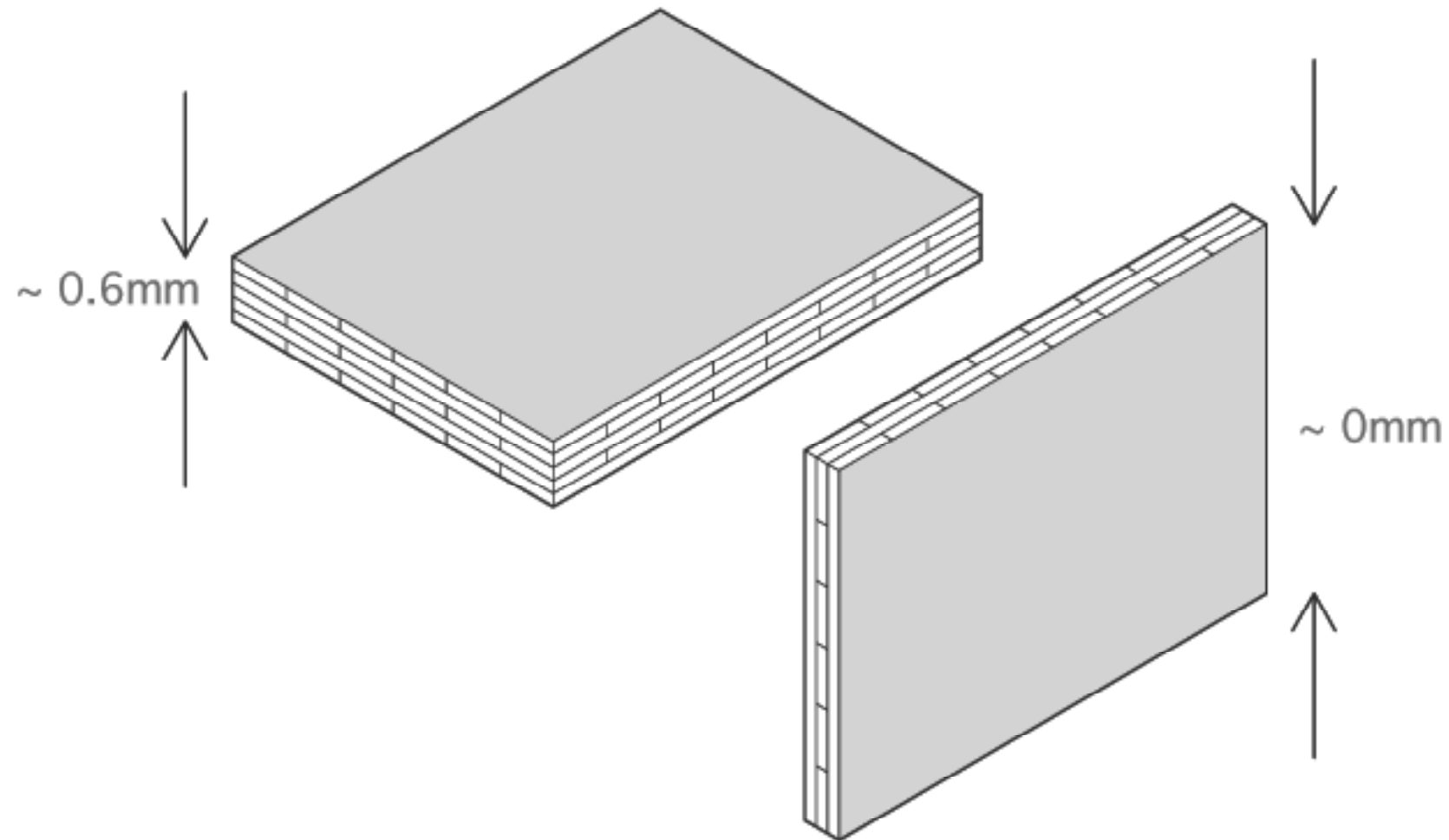
Movement

Creep

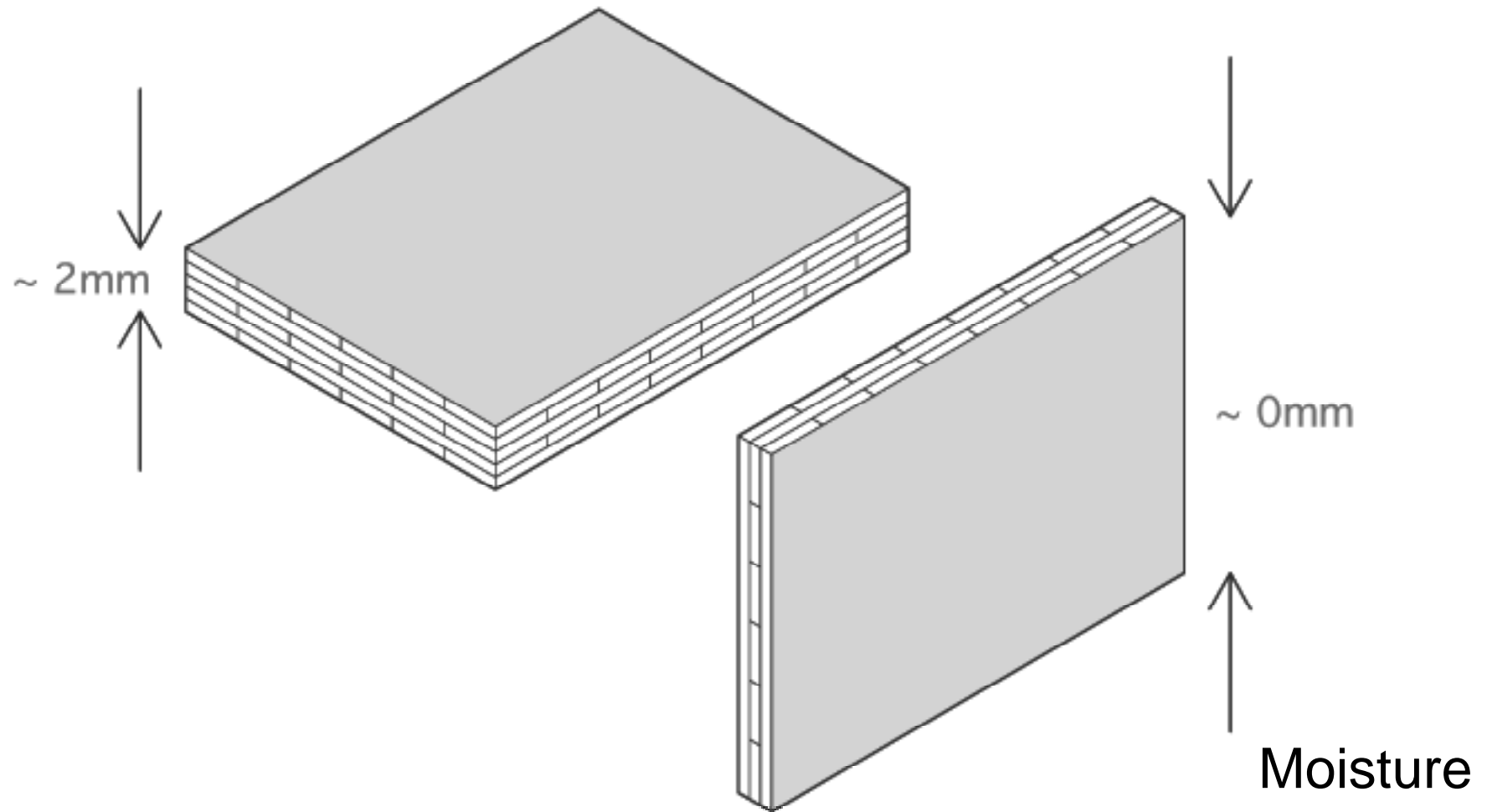
Moisture

Thermal



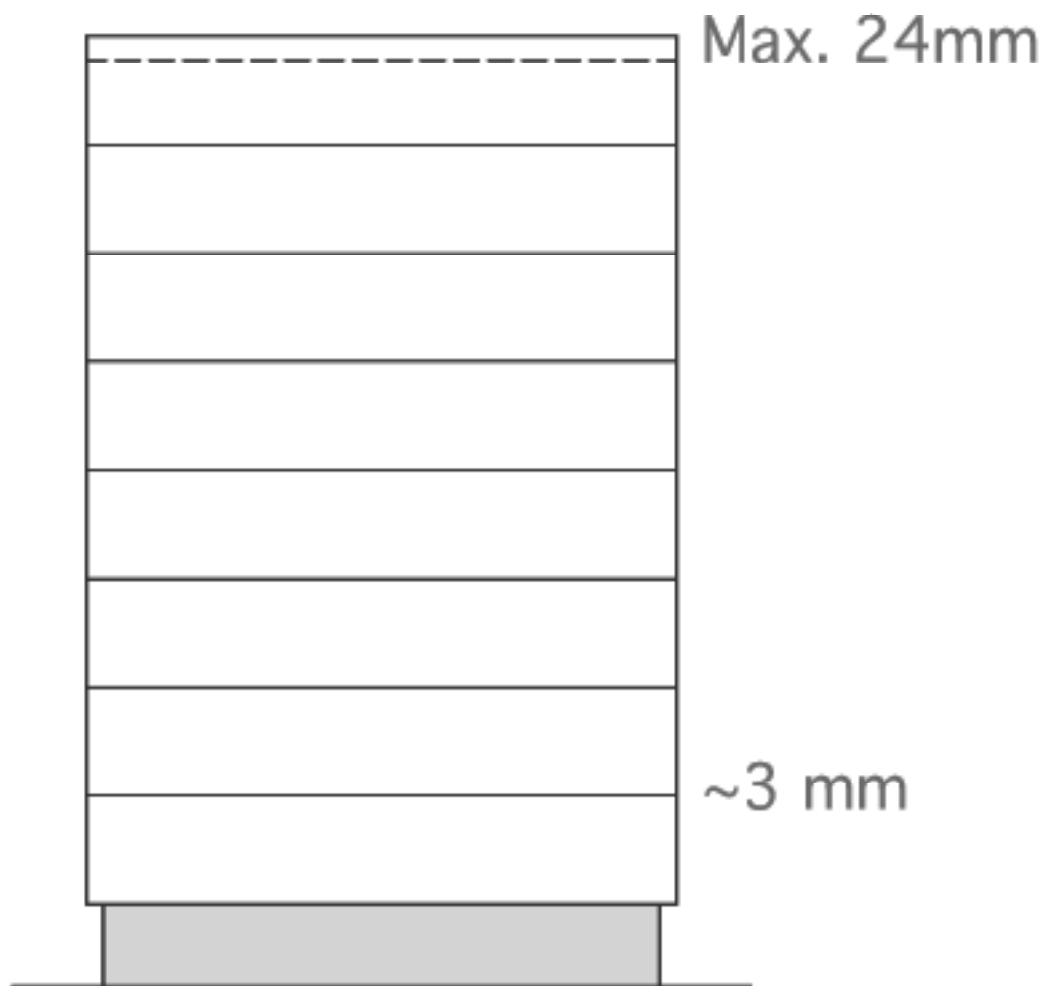


Creep - shortening due to compression under load

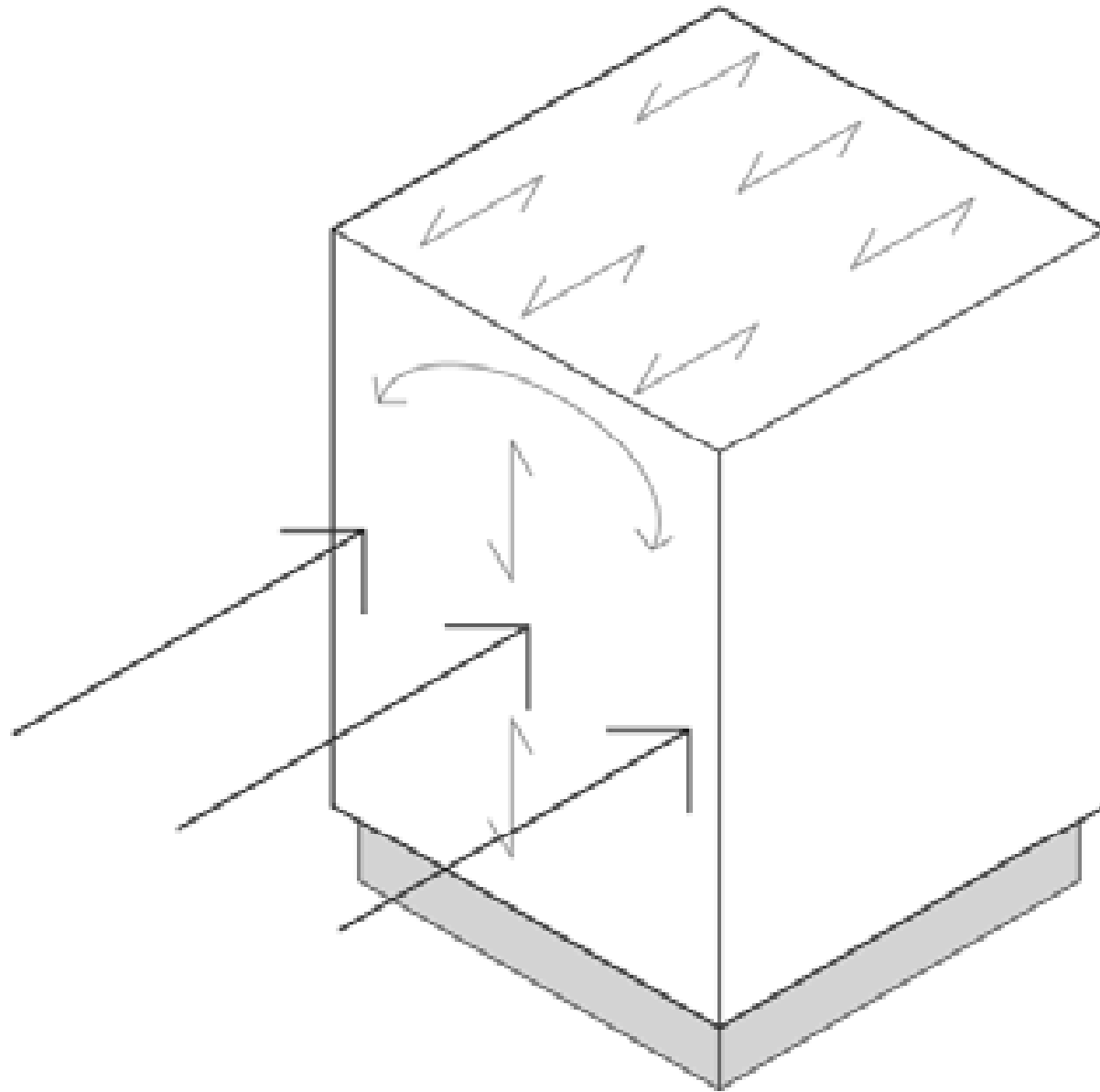


Maximum moisture content at erection: 14 - 16%

Minimum moisture content in use: 8 - 10%



Total



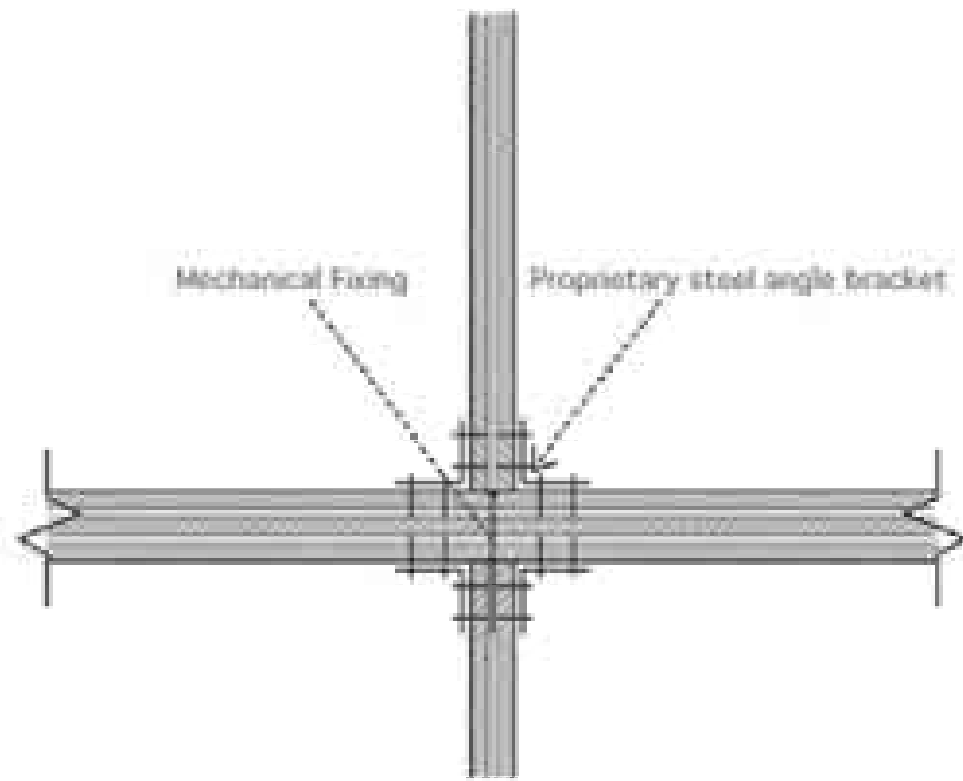
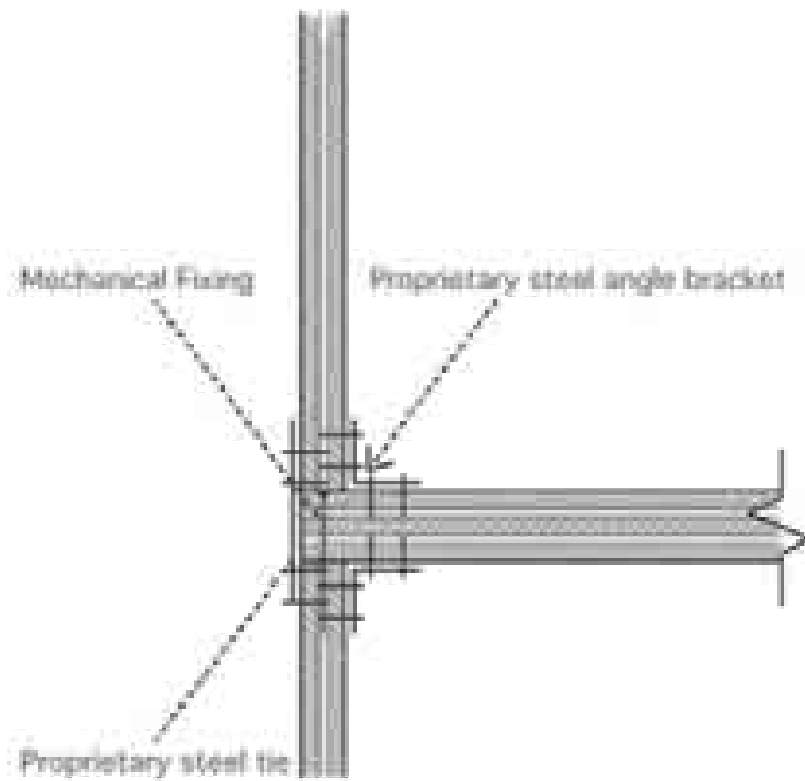
Stability

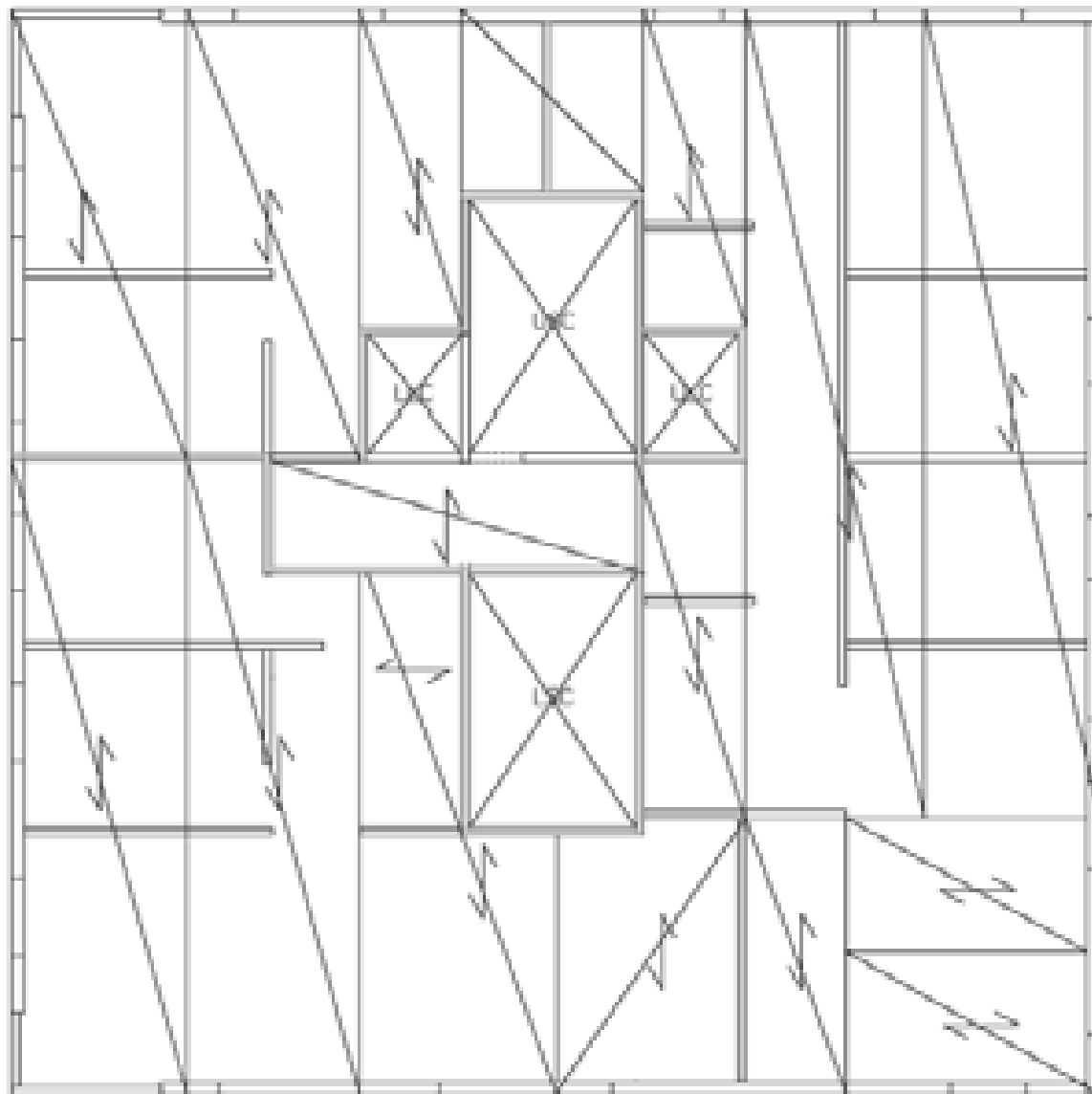
Progressive collapse

Notional horizontal and vertical ties - min 75kN

Removal of elements - 15% floor area,  
<70m<sup>2</sup>

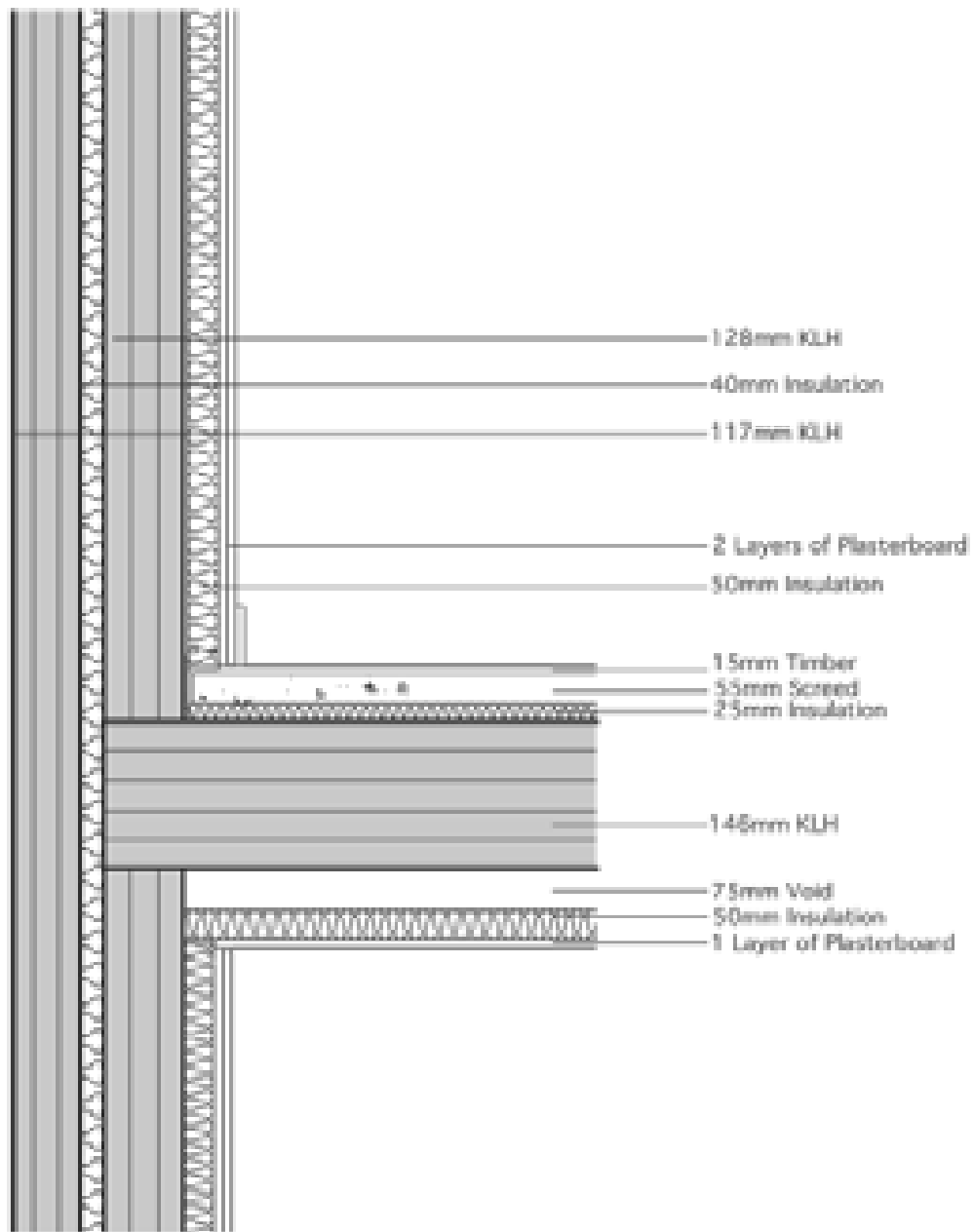
Design of key elements - 34kN/m<sup>2</sup>





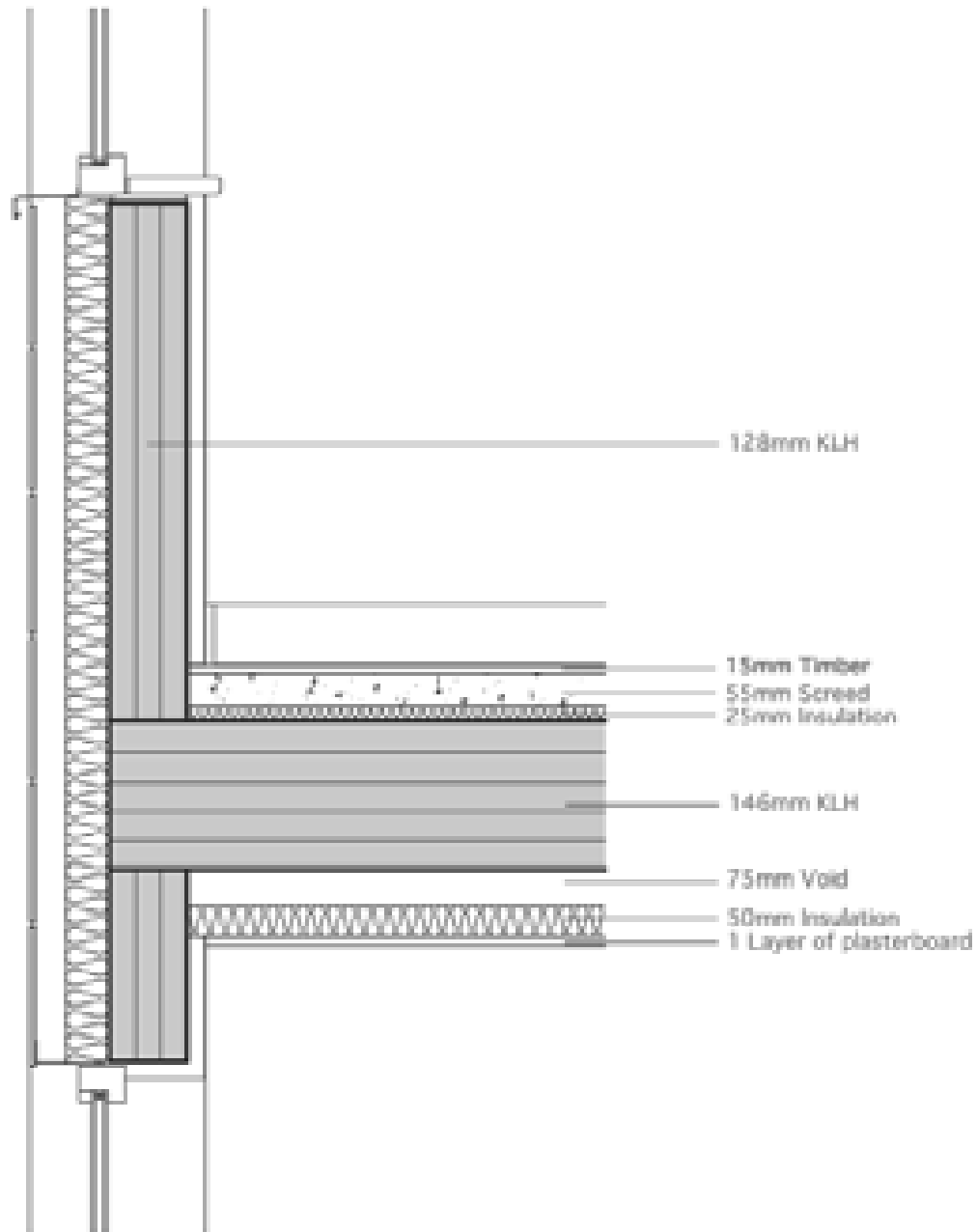
- Party Wall Line
- ULC Upper Lift Core
- LLC Lower Lift Core
- LSC Lower Stair Core
- USC Upper Stair Core

## Progressive Collapse



## Acoustics





## Acoustics



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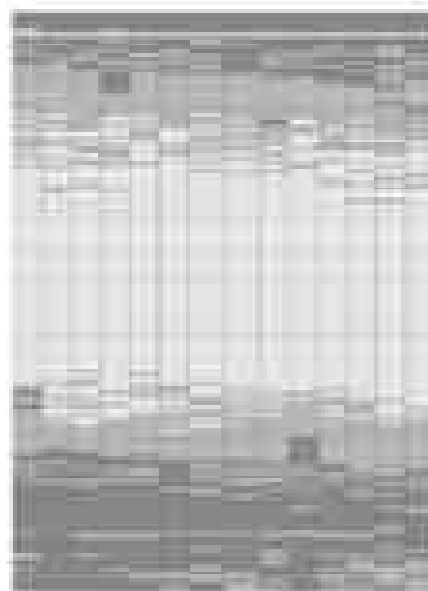
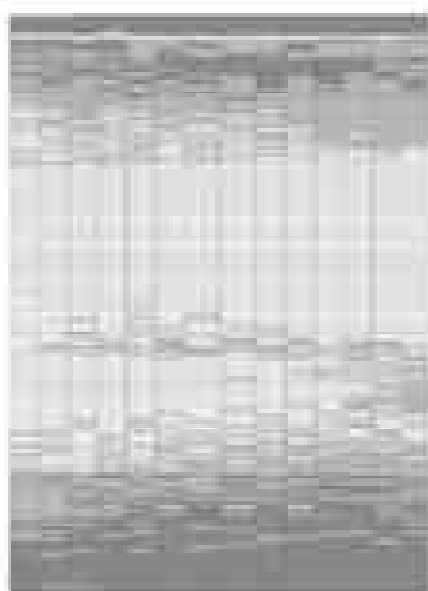




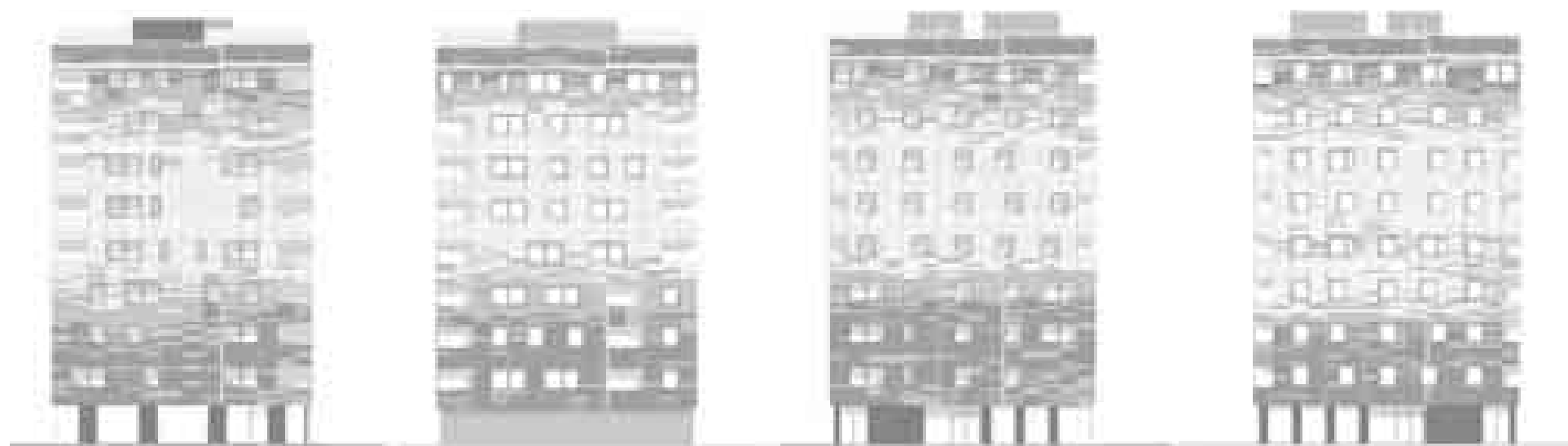


Nine storeys in nine weeks

Time saving of 22 weeks



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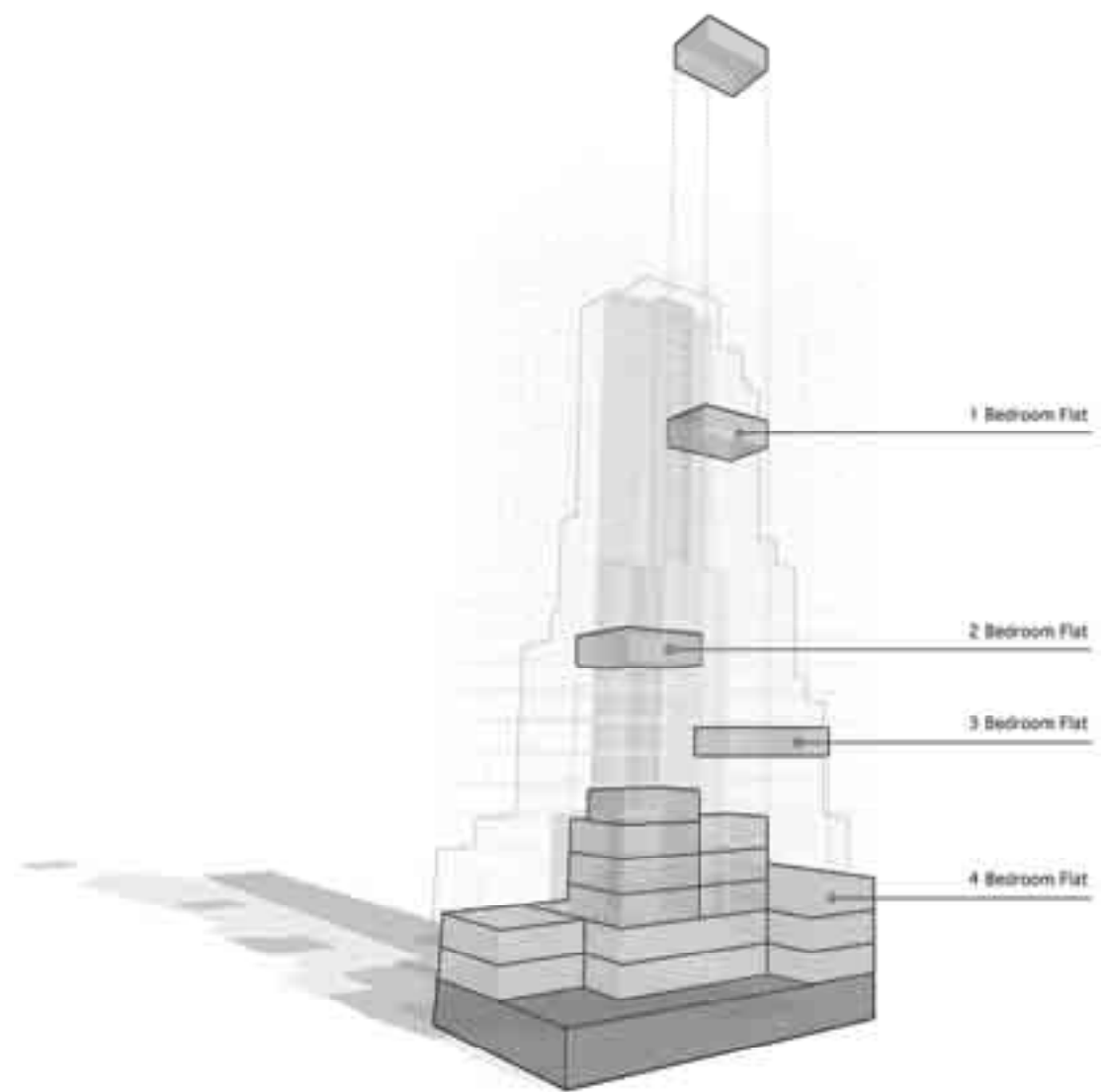
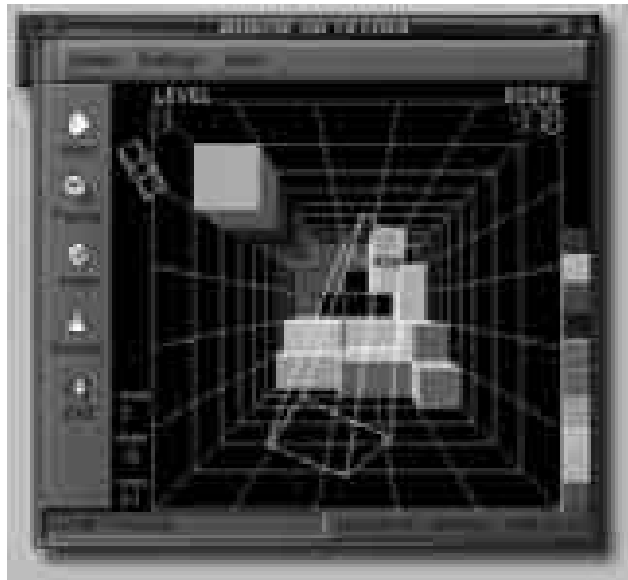
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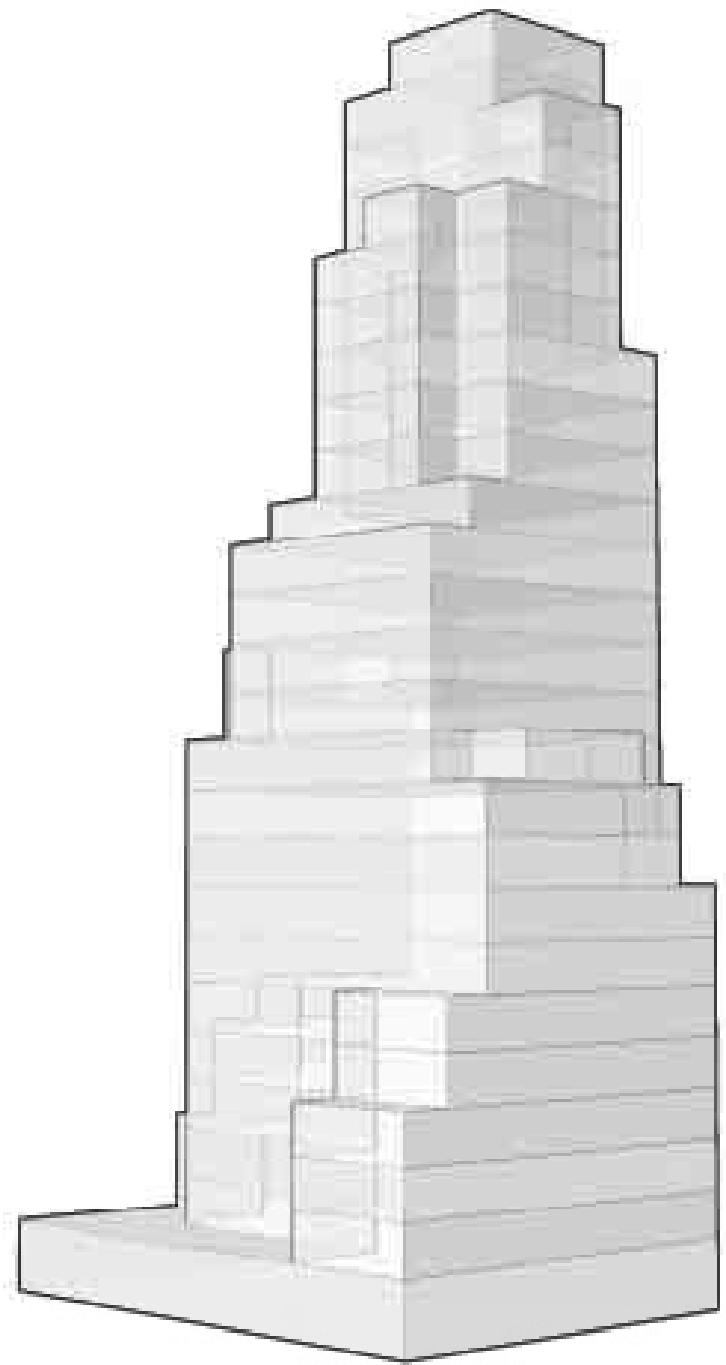
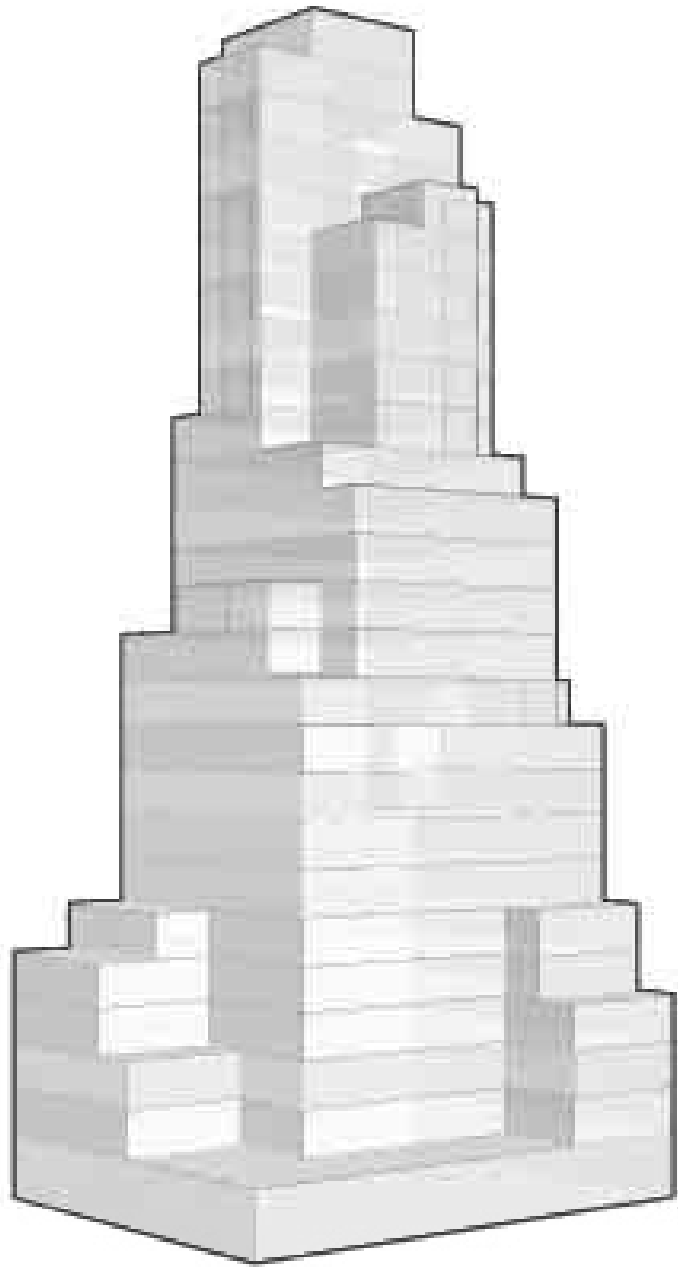
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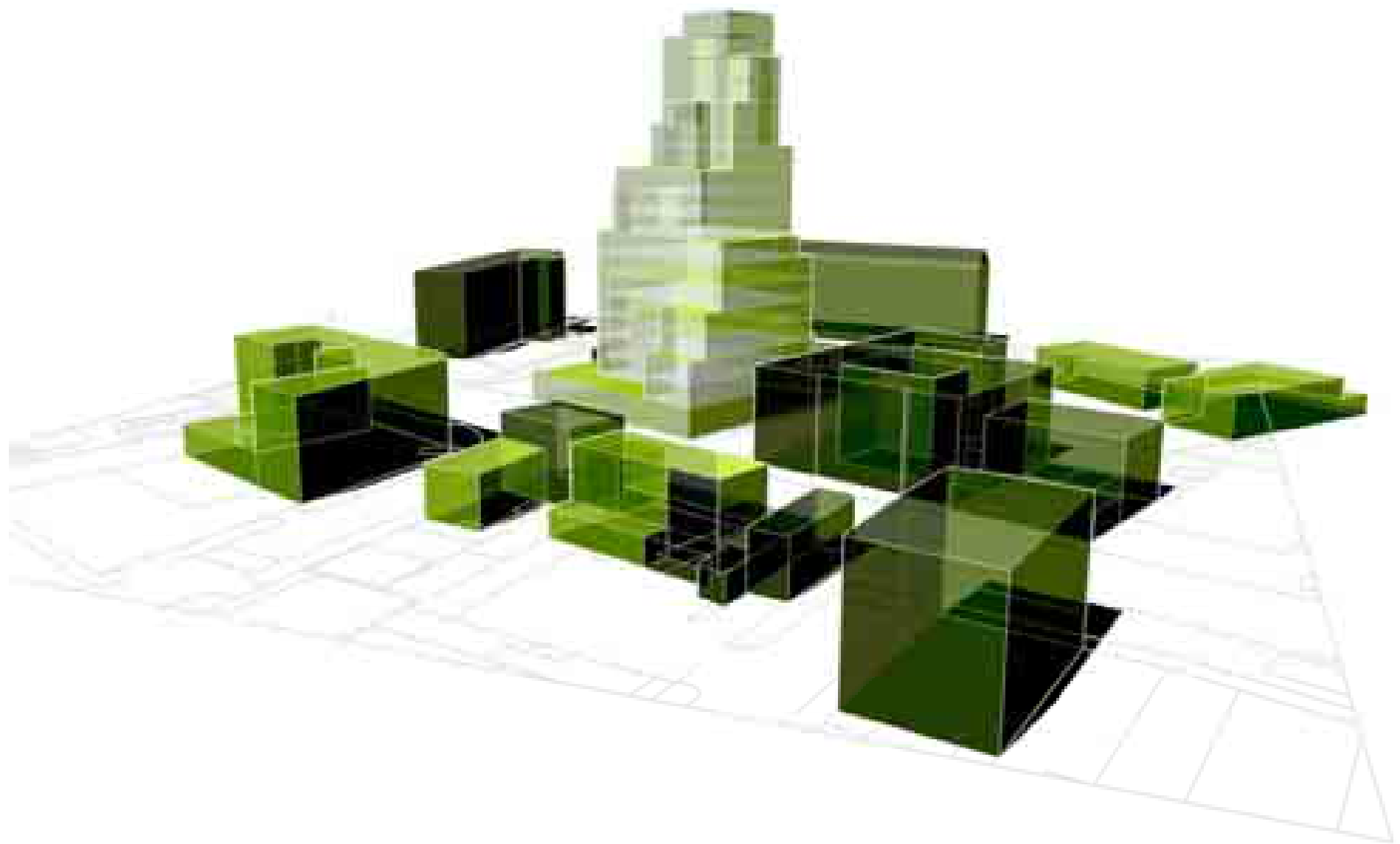


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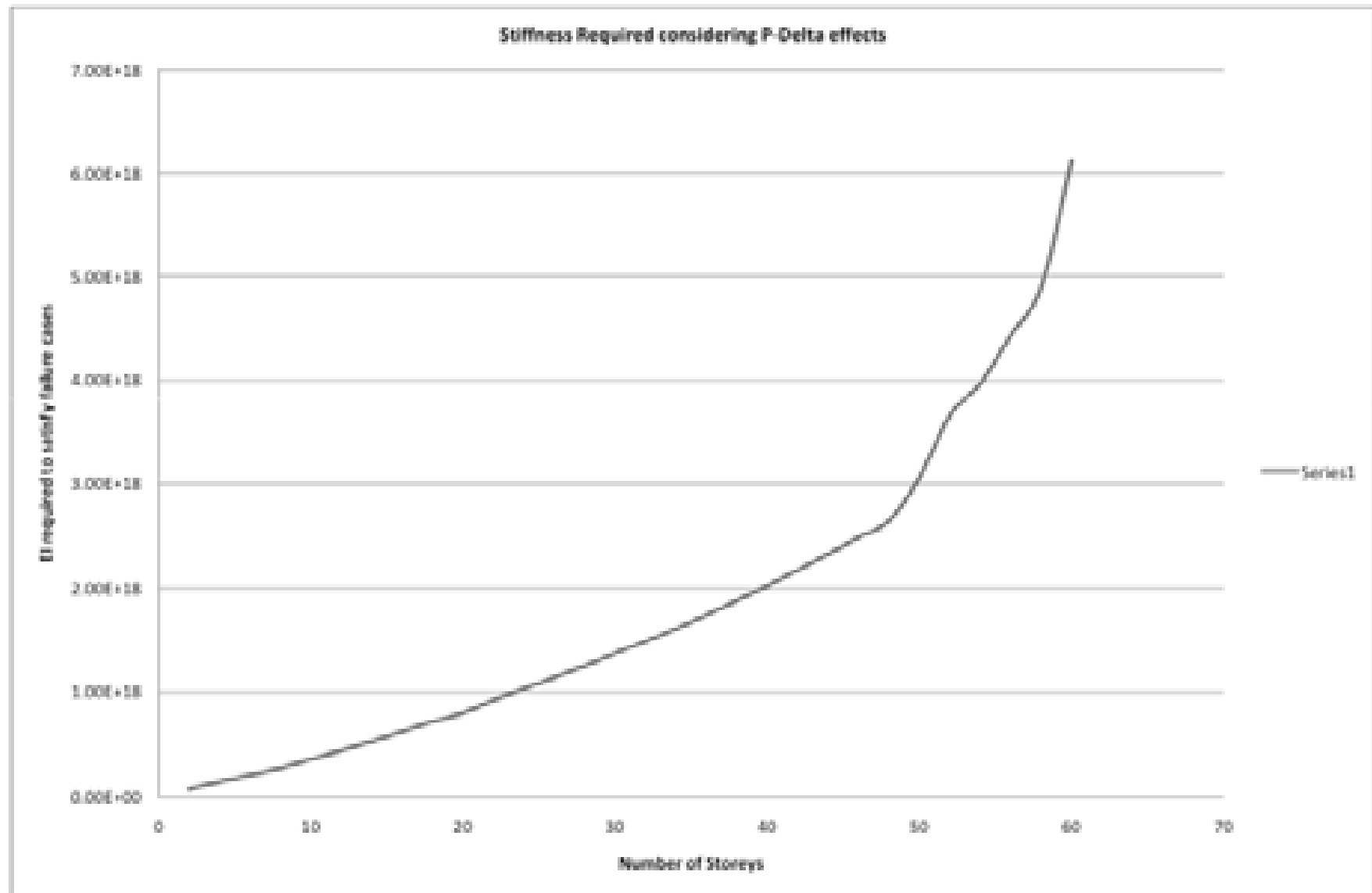


Figure 1- Ratio between Number of Storeys and Weight to Floor Area

