Jake White

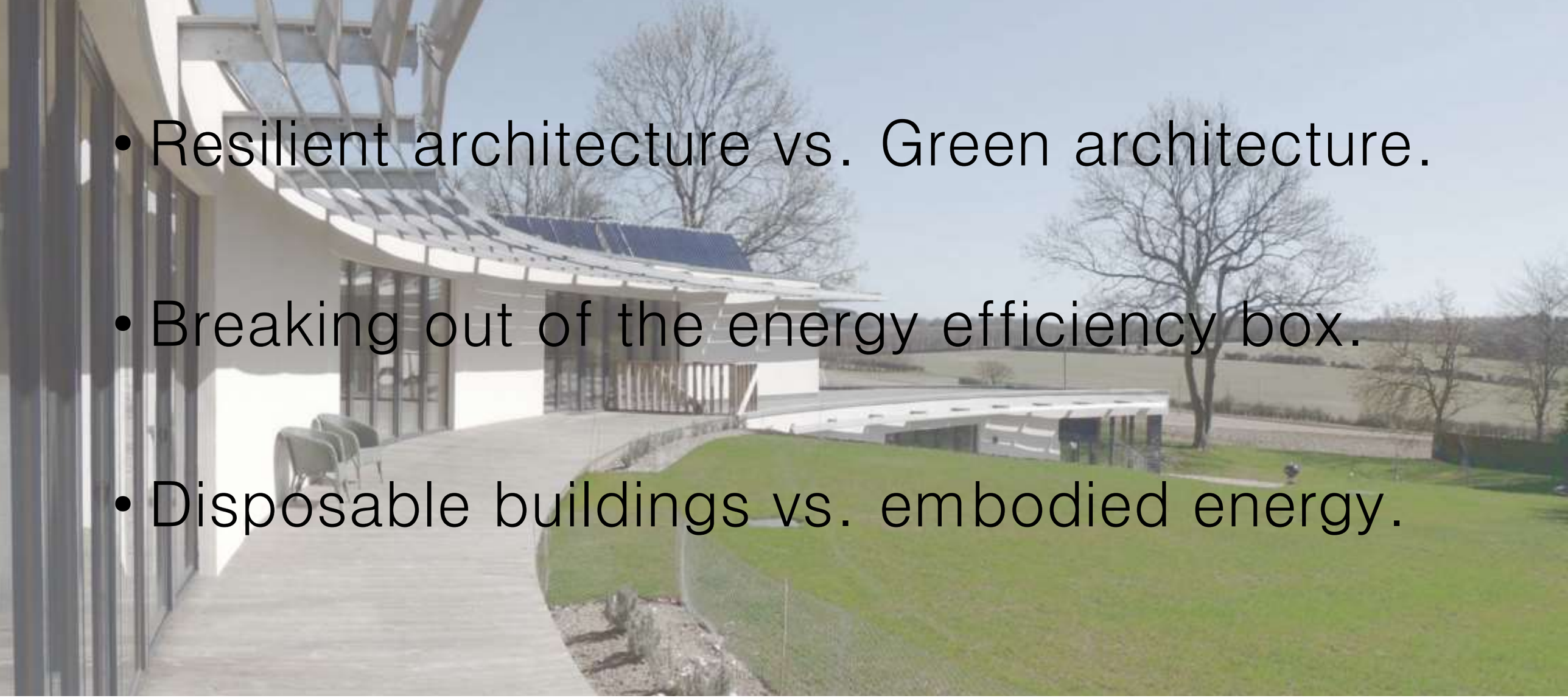
Director

Ecotecture

The Curly House

ecotecture

ECOLOGICAL ARCHITECTURE



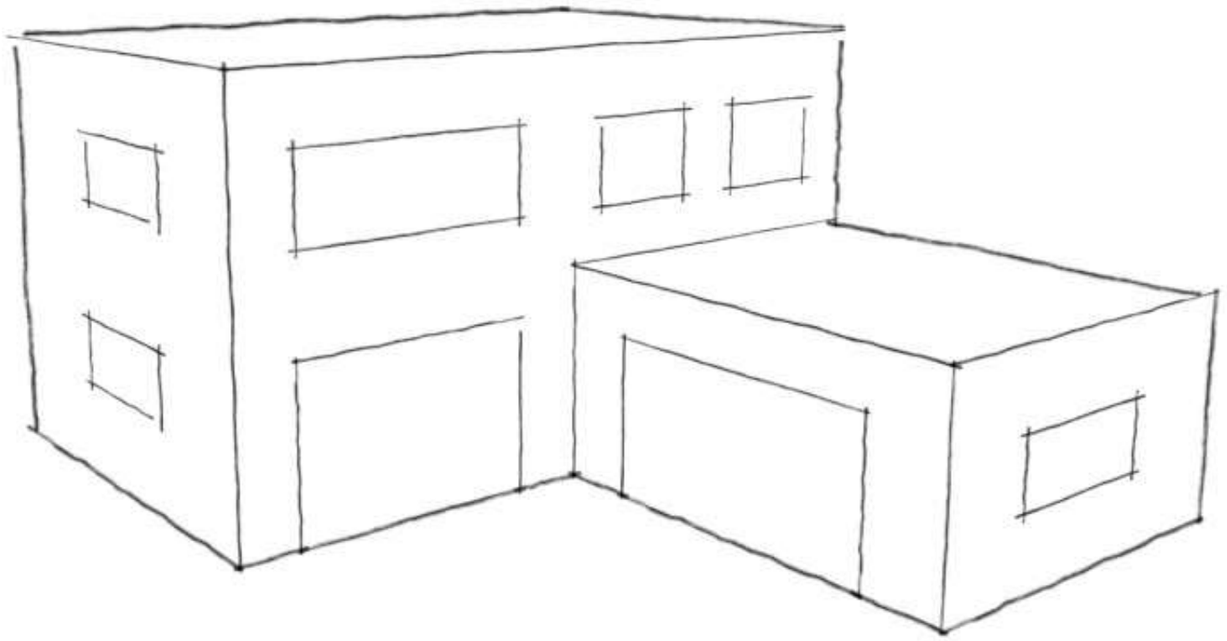
- Resilient architecture vs. Green architecture.
- Breaking out of the energy efficiency box.
- Disposable buildings vs. embodied energy.

The Curly House

ecotecture
ECOLOGICAL ARCHITECTURE

Retro-fit or Re-build?

ecotecture
ECOLOGICAL ARCHITECTURE

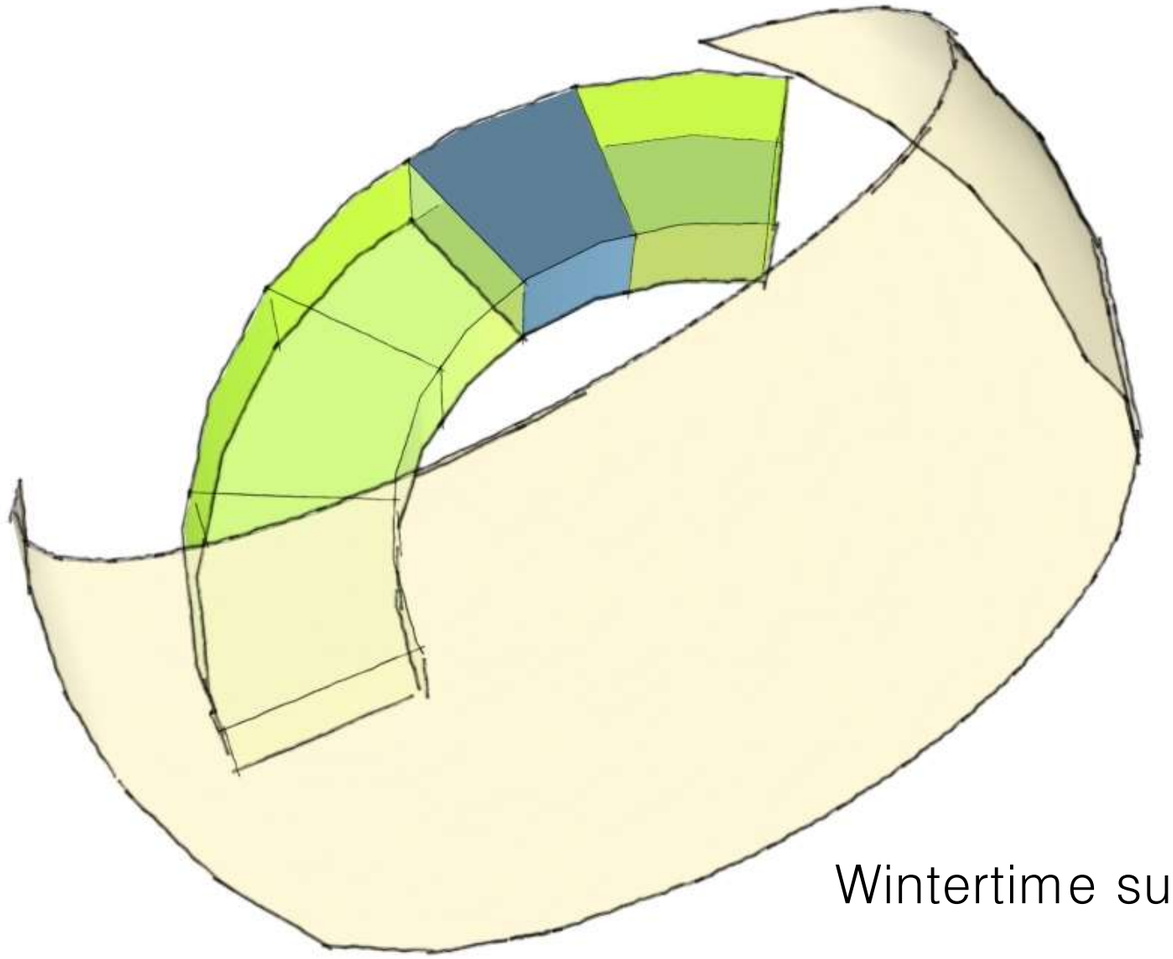


Typically ‘ultra low’ energy homes can be a little “boxey” to keep the surface area to volume ratio down low.

The energy efficiency box

ecotecture
ECOLOGICAL ARCHITECTURE

Summertime sun

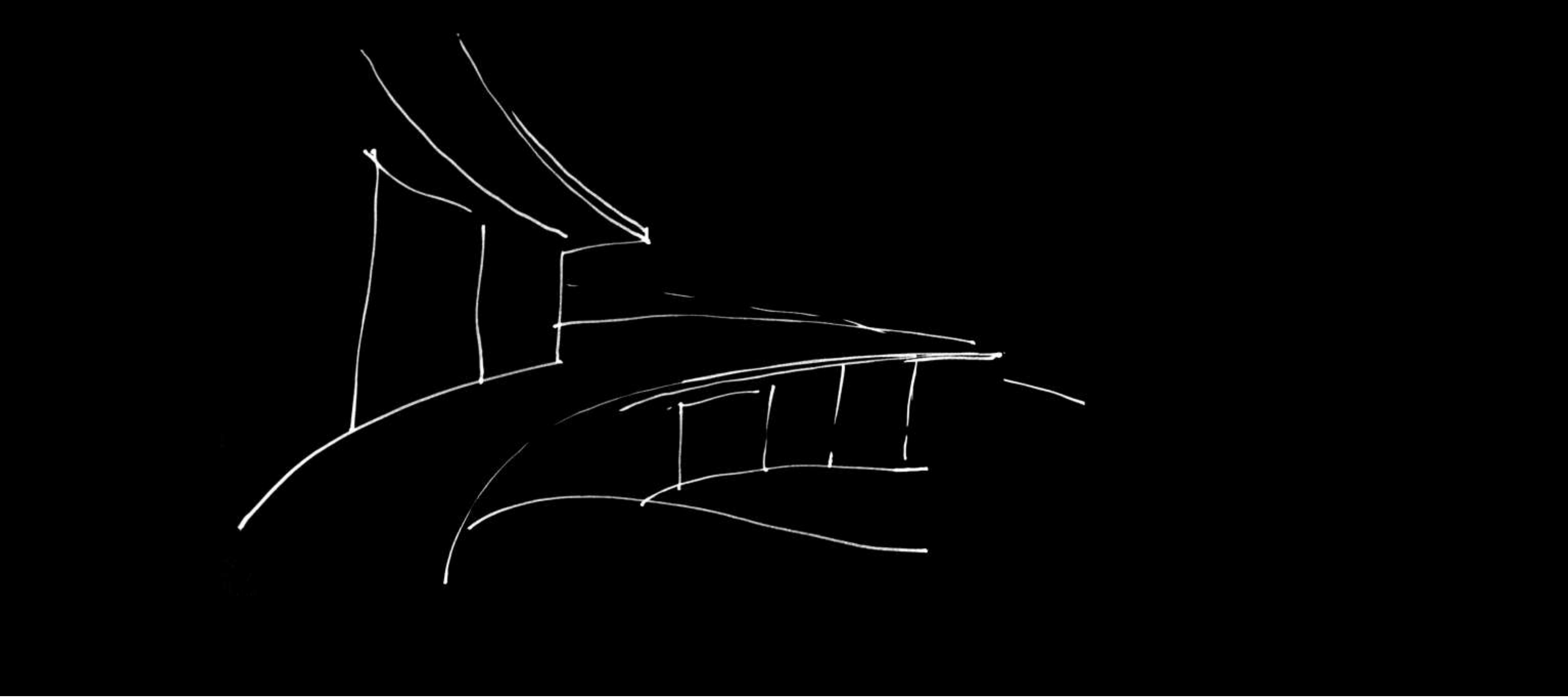


Wintertime sun

Each segment along the arc or crescent has good solar orientation, and would function independently as a low energy building.

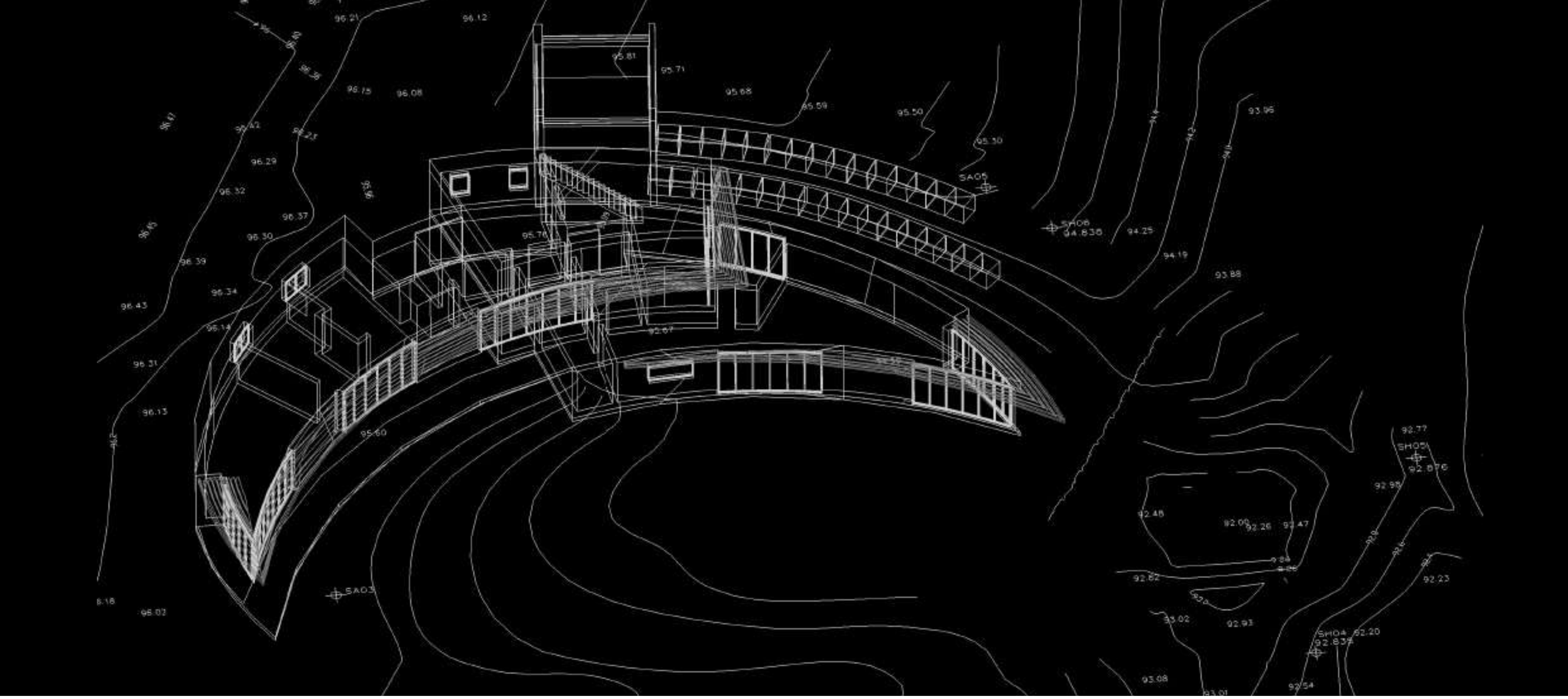
Concept development

ecotecture
ECOLOGICAL ARCHITECTURE



Concept sketch

ecotecture
ECOLOGICAL ARCHITECTURE



Assessing construction types

ecotecture
ECOLOGICAL ARCHITECTURE

Ground works

ecotecture
ECOLOGICAL ARCHITECTURE

ICF Superstructure

ecotecture
ECOLOGICAL ARCHITECTURE

Horns of crescent being formed

ecotecture
ECOLOGICAL ARCHITECTURE

Project completed – Front entrance

ecotecture
ECOLOGICAL ARCHITECTURE

View from the road side

ecotecture
ECOLOGICAL ARCHITECTURE

View from the south west

ecotecture
ECOLOGICAL ARCHITECTURE

View from the south east

ecotecture
ECOLOGICAL ARCHITECTURE

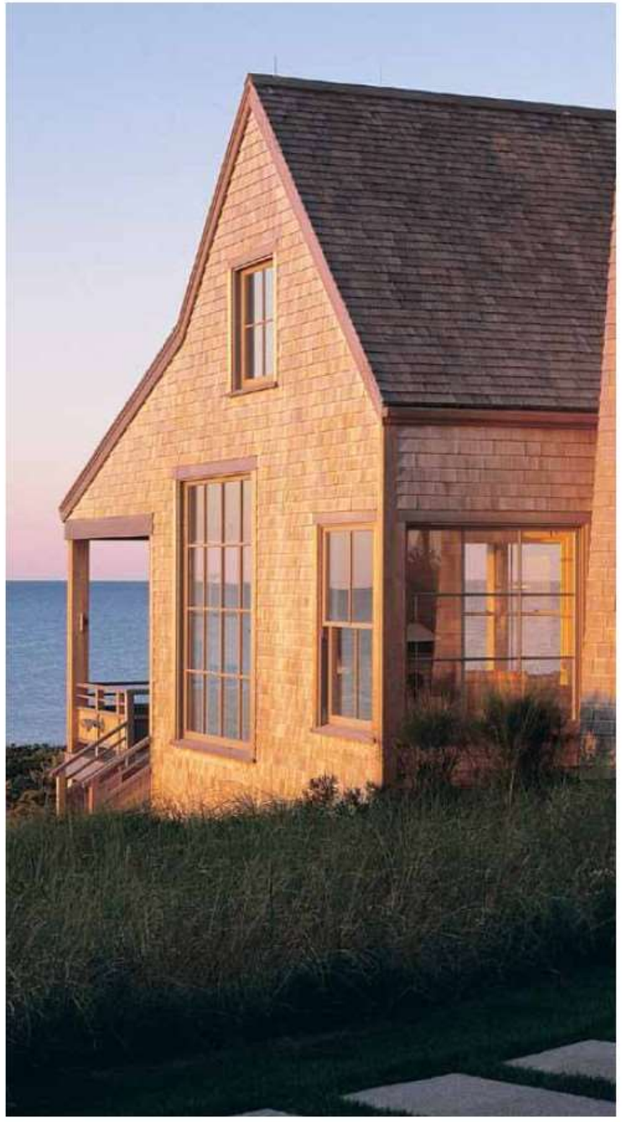
View from the east

ecotecture
ECOLOGICAL ARCHITECTURE

Internal shots

ecotecture
ECOLOGICAL ARCHITECTURE

Source: International building series No.4

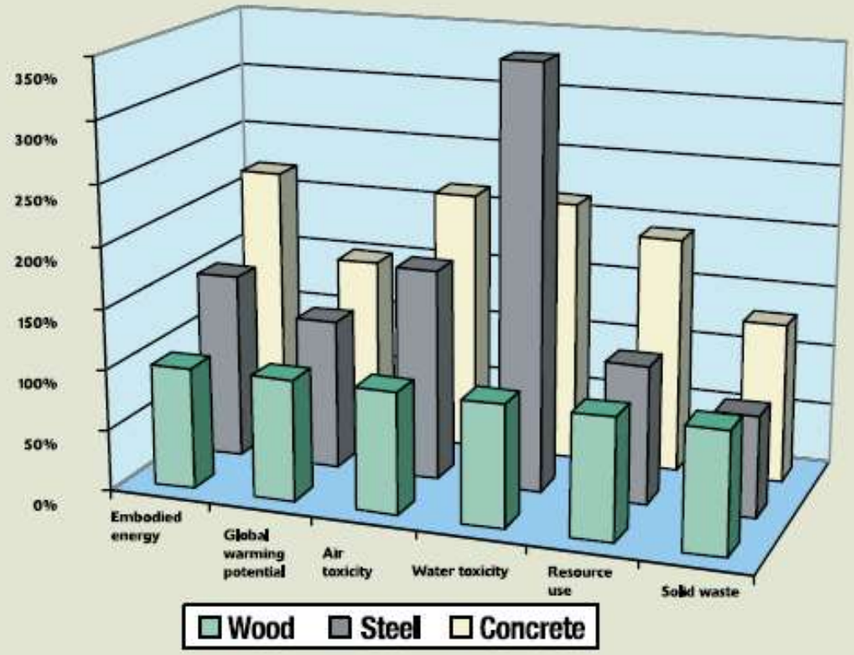


Sustainability and Life Cycle Analysis

for Residential Buildings

INTERNATIONAL Building series NO. 4

FIGURE 1: Environmental Impacts of Housing Types

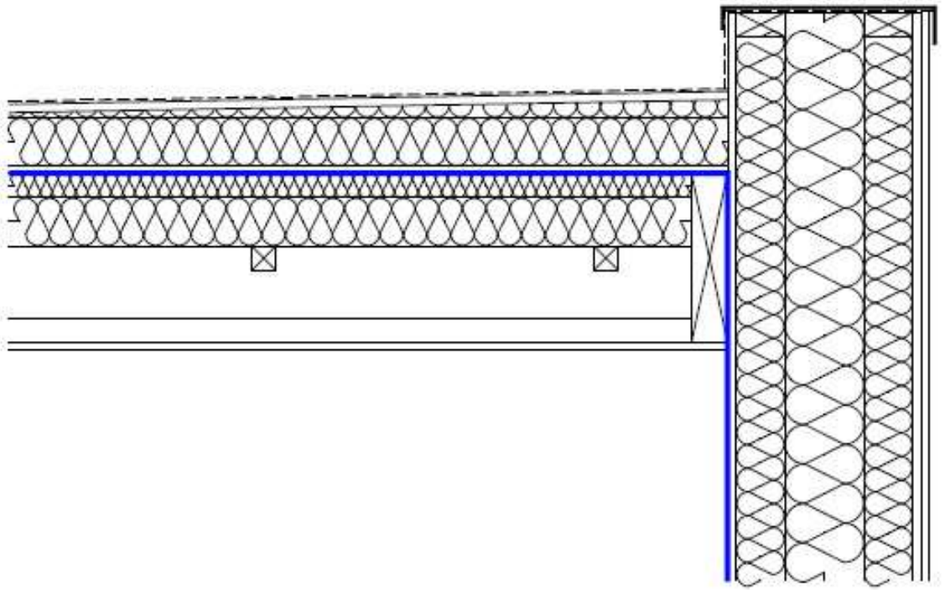


Environmental impact relative to a typical wood-frame home (the 100% baseline) is shown for an equivalent house in light-gauge steel and an equivalent in insulated concrete forms. Data addresses the life-cycle portion from resource extraction through construction and does not include environmental impacts of building occupancy and demolition.

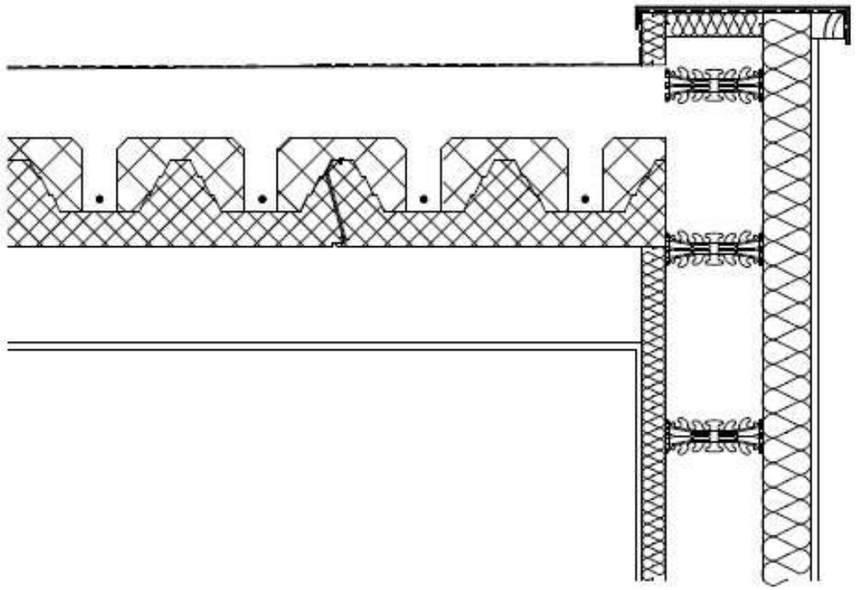
Comparison of LCA with alternatives

ecotecture
ECOLOGICAL ARCHITECTURE

Timber construction



Nudura ICF construction



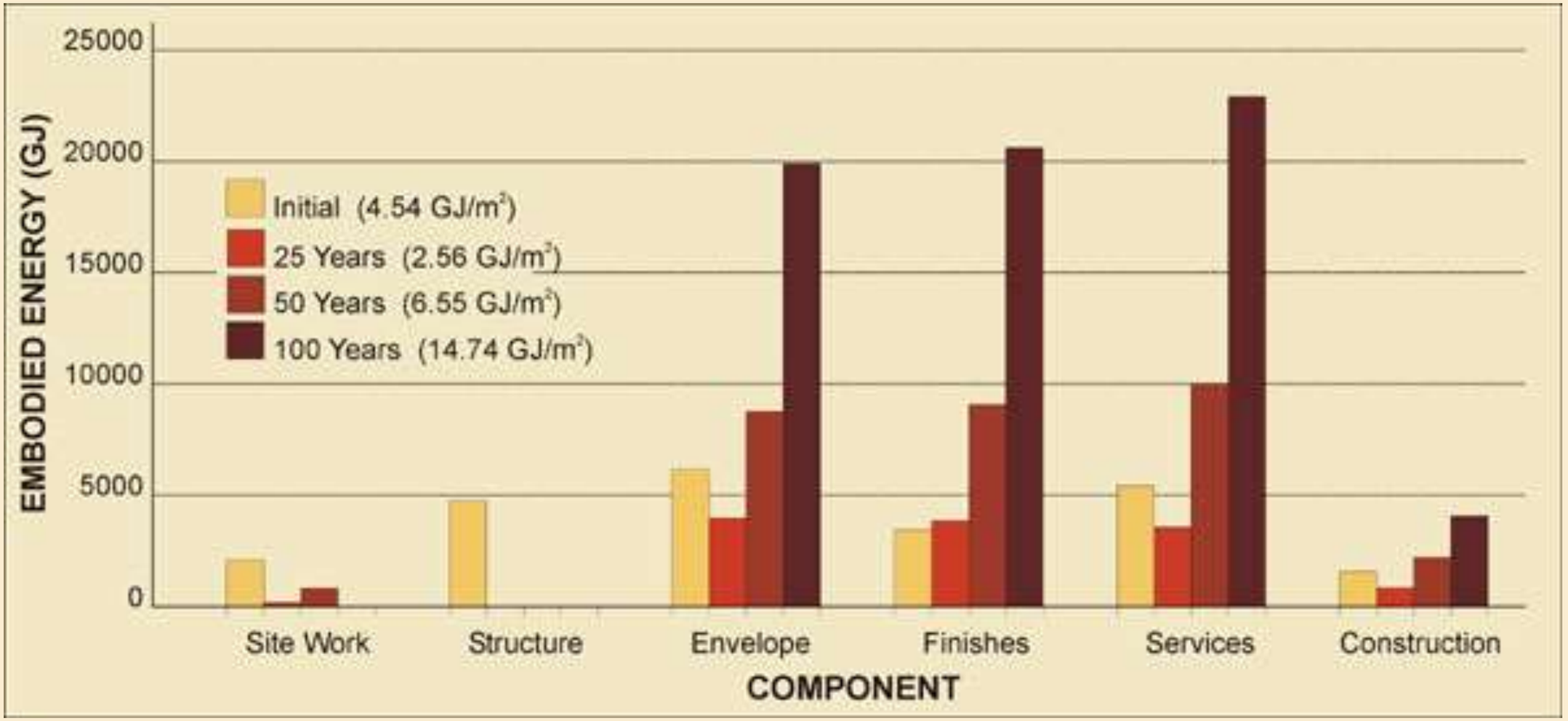
Air tightness barrier comparison

ecotecture
ECOLOGICAL ARCHITECTURE

The Curly House

ecotecture
ECOLOGICAL ARCHITECTURE

Source: www.canadianarchitect.com (Cole & Kernan,1996)



Recurring embodied energy

ecotecture
ECOLOGICAL ARCHITECTURE

Regular replacement (between 20 and 50 years)	Regular replacement (between 50 and 100 years)	Minor maintenance (100 years and well beyond)
Roof coverings	Ductwork for MVHR	Foundations
Windows (When replaced, must be reinstalled to air tightness standard)	Replastering (minimal impact on air tightness)	Superstructure - walls, floorslab, roofdeck & structural beams (Air tightness is retained inherantly within the structure)
Internal joinery and oak flooring	Polished screed flooring finish.	Insulation levels
Kitchen units	Wall cappings	Solar shading devices
Electrical appliances & wiring	External rendering	
MVHR fans		
Renewable energy		

Projected refurbishment path

ecotecture
ECOLOGICAL ARCHITECTURE

Do use…

When building on sites which are highly exposed, where alternate construction solutions will degrade quickly.

When designing more complex buildings.

When clients brief is for longevity.

Do not use…

When building in low lands near current sea level.

When building in densely populated areas, where adaptations to existing structures happen more regularly.

When extending existing properties, if the lifespan of the existing structure has potential to limit lifespan of the whole.

Consider carefully…

When building at perimeter of dense development. Infrastructure projects of the future may require early demolition of structures, and lead to considerable waste.

And remember to…

Design structures with obsolescence, to reduce the need for future structural alterations.

Design in easy access to service runs, to allow simple affordable renovation in the future.

Our criteria for appropriate use

ecotecture
ECOLOGICAL ARCHITECTURE

The Curly House

ecotecture
ECOLOGICAL ARCHITECTURE