Research and Development For Sustainability

In Collaboration with BuildMe and Guidehouse

1.1 About KONN

KONN Technologies is a construction technology company

our vision is to lead the way into the future of living with the safest and most sustainable homes.

We believe in technology as an enabler of better lives for all people

We integrate technology throughout our systems to ensure quality and consistency for all communities.

We believe that people's health and safety are the utmost priority

from construction, manufacturing and assembly processes to the home product itself, our homes are designed with our people in mind.

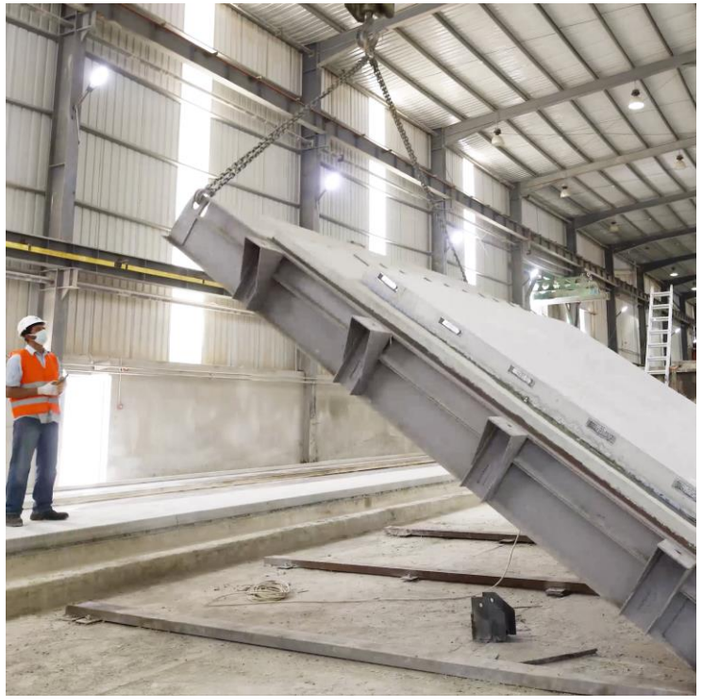
2.1 Sustainability

A sustainable design can be achieved when its simultaneously enhancing economic growth, social progress, and environmental protection, where the combination satisfies both present needs and future needs.

2.1.1 The Design

based on the gathered data, the built environment is responsible for an estimated **40%** of all greenhouse gas emissions due to the high energy and resources required for constructing, operating and maintaining buildings.

Konn Technologies is committed to positively impact its surrounding environment by manufacturing and constructing clean homes, that can be at the core of achieving sustainability for our communities and reducing emissions.



2.1.2 Specifications of the Building Envelope

1. Exterior Walls:

Components

- Precast concrete interior wall - 120mm
- Extruded polystyrene insulation board - 70mm
- Precast concrete exterior wall - 60mm
- **Thermal transmittance**
- U Value = 0.45-0.5 W/m²K.

2. Roof and Floor

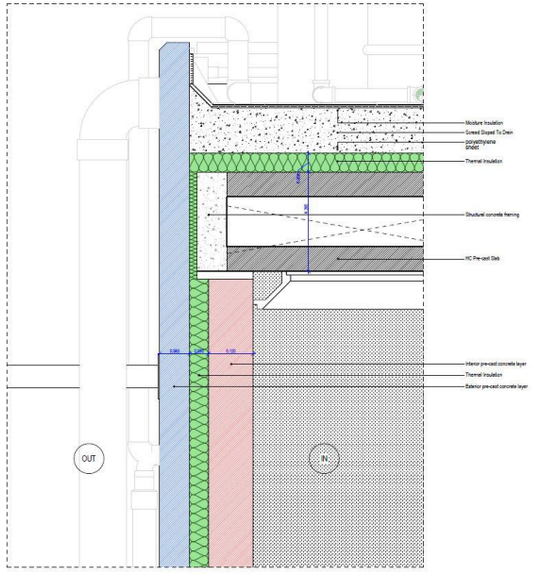
Components

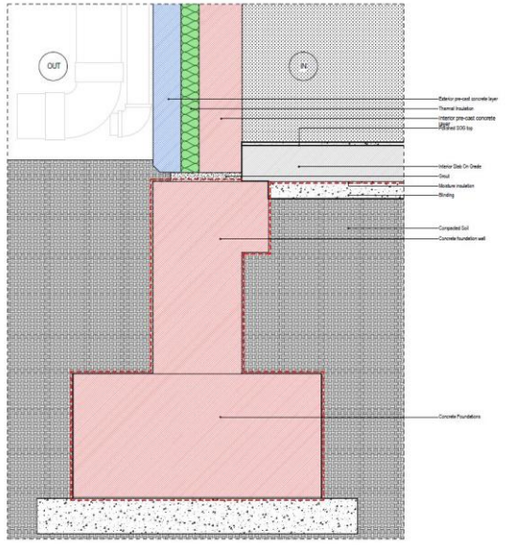
- Hollow Core Slab - 265mm
- Extruded polystyrene insulation board - 50mm
- Polyethylene sheets
- Sloped Screed - 100mm
- Moisture Insulation
- **Thermal transmittance**
- U Value = 0.40-0.45 W/m²K.

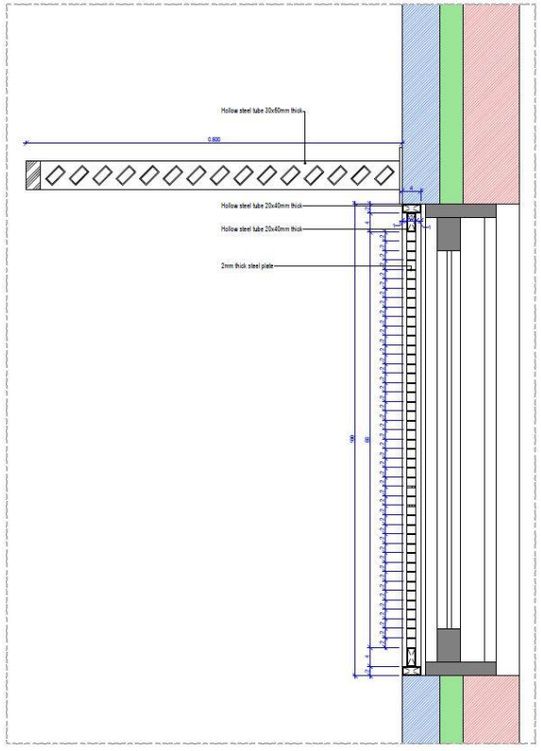
3. Windows

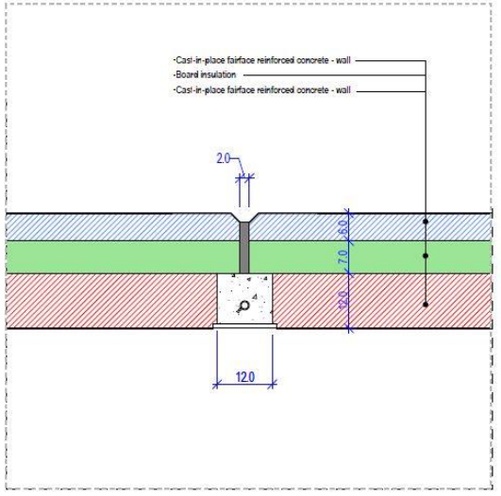
Components

- Double glazed aluminum windows (6 mm clear glass + 12 mm void + 6 mm low E glass)
- **Thermal transmittance**
- U Value = 1.8 W/m²K.





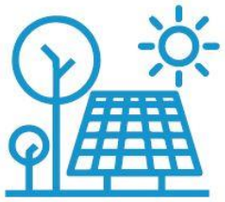




2.1.3 Material Selection & Sourcing

1. Water Solar Heater

Reduces energy consumption



2. Photovoltaic System

Reduce energy consumption, generate clean energy

3. Insulated Walls and Windows

Reduce energy consumption from heating and cooling systems, eliminate dampness, provide sound insulation

4. Interior Paint

Provide long-term healthy living conditions, by reduced volatile organic compounds and dampness, and providing heat insulation

5. Energy-saving Home Appliances

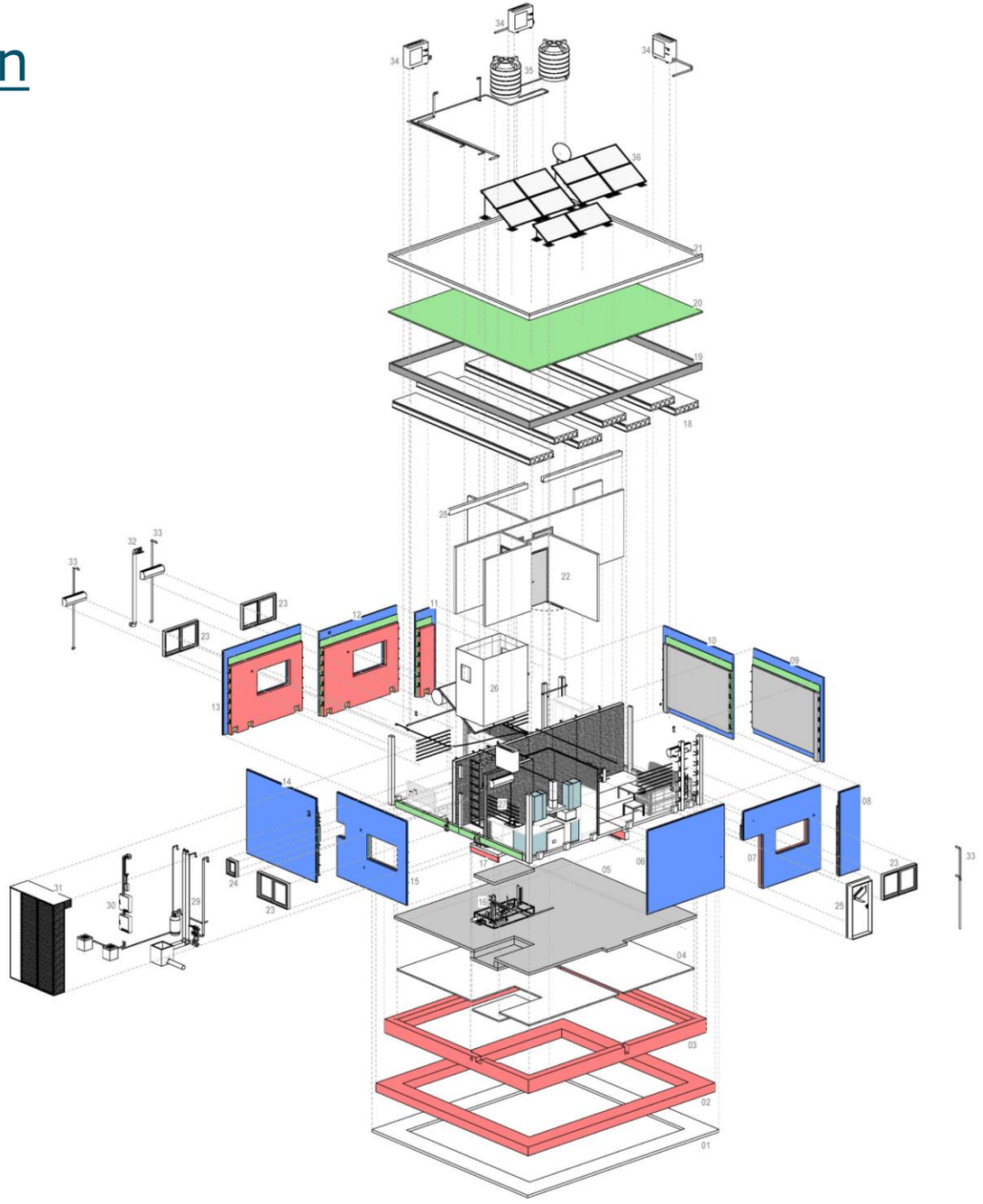
Reduced energy consumption, and lower electricity bills

2.1.4 Offsite and Modular Construction

01 Design

1- Reducing material waste production through constant process optimization and finely tuned supply chain management

2- Simulated processes for maximum utilization of resources



02 Prototyping

1- Validates virtual design

2- Allows for early phase problem-solving and troubleshooting which prevents high level damage

3- Sets process parameters and allows for constant improvement

03 Manufacturing

1- Many defects present in traditional construction, can be addressed in a controlled repetitive manner

2- The use of factory-produced pre-engineered building units allows for optimal results, every single time

3- Allows for the easy reuse and upscaling of materials at the factory, and prevents waste

04 Assembly and Finishings

Coordination between structural, MEP, and finishing works guarantees:

1- Drastic reduction of on-site works, for a much easier construction process

2- High level safety measures on construction sites

3- Minimal on-site waste production

4- Minimized natural site disruption

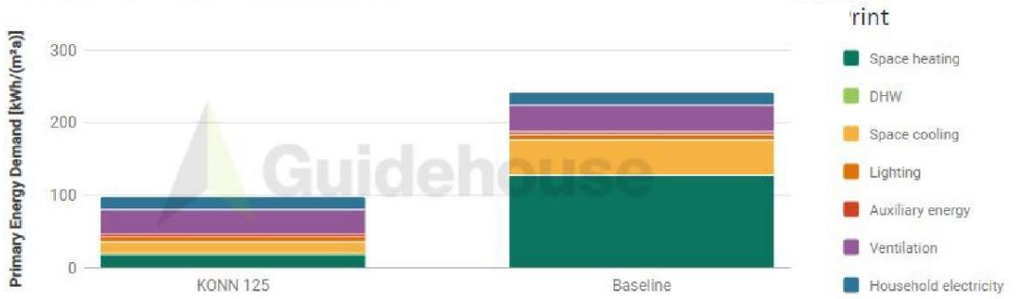
3.1.1 Building energy performance tool by Guidehouse

Heating: 10.50 kWh/(m²a) | Cooling: 8.48 kWh/(m²a) | Other: -6.04 kWh/(m²a) | Σ Total: 12.94 kWh/(m²a) | Performance: A+

ENERGY & ENVIRONMENT

Primary energy by energy use | *Final energy by energy use* | *Final energy by energy carrier* | *Emissions*

Primary energy demand split in energy use



	kWh/(m²a)		
	KONN 125	Baseline	Delta
Space heating	18.84	127.52	-85%
DHW	1.40	-	-
Space cooling	15.21	48.39	-69%
Lighting	7.86	7.86	0%
Auxiliary energy	3.26	3.99	-18%
Ventilation	33.73	36.23	-7%
Household electricity	18.19	18.19	0%
Total	98.49	242.18	-59%
Total incl. PV	23.22	242.18	-90%

FINANCIAL

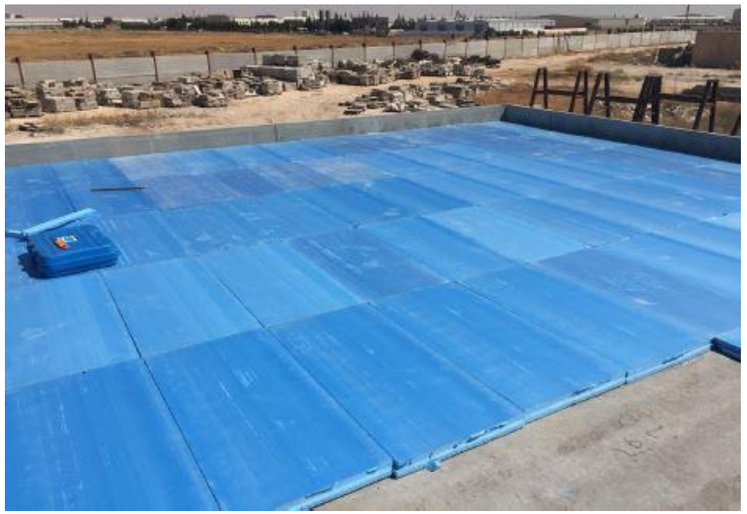
Specific cost | Total cost | Specific investment cost

Specific cost

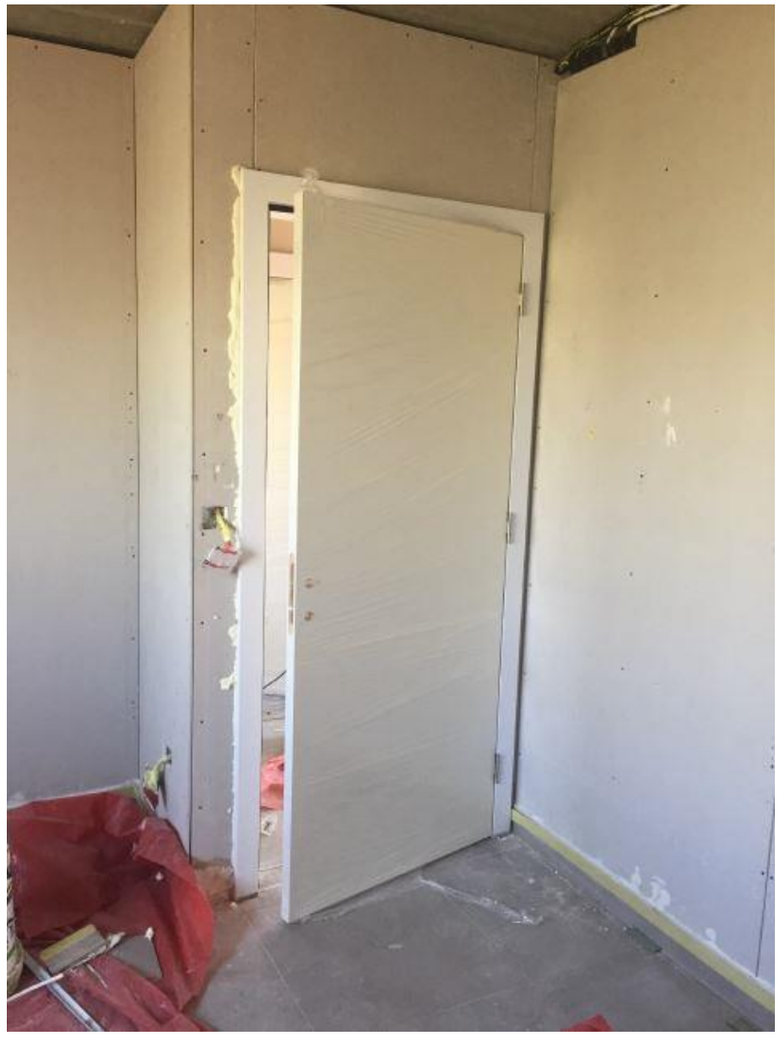
	in €/m²		
	KONN 125	Baseline	Delta
Investment	184	164	+13%
Replacement	65	47	+38%
Residual	-17	-17	-3%
Energy	30	207	-85%
Inspection & maintenance	16		
Global cost (total)	280	417	-33%

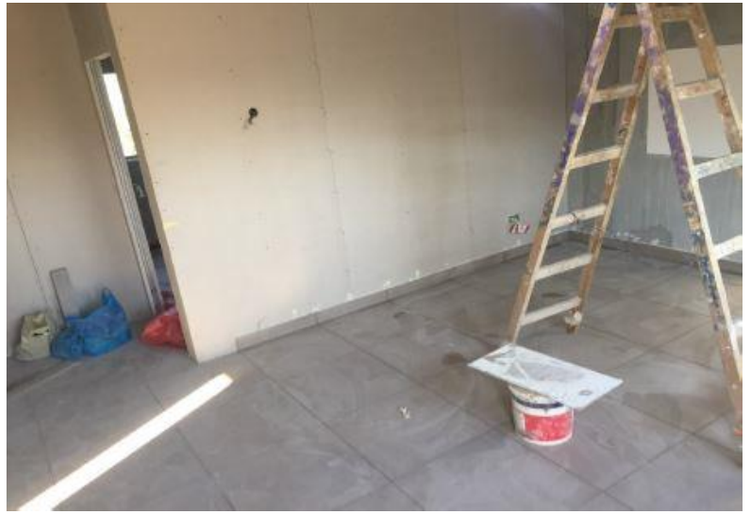
4.1 The process - Production & Assembly

5.1 The assembly - Exterior finishing



6.1 The assembly - Interior finishing





7.1 KONN projects

Thank You

www.konn.tech