
Hempcrete Eco-Builds
MJECT & Co.
Build with
Hempcrete

Quotations & Pre-Ordering

Start your Rapid Eco-Build in 3 Easy Steps . . .

Step 1: Submit your project drawings & timeframes (1-2 days)
Step 2: Get your project approved & quoted for (3-6 days)
Step 3: Confirm your order & Start your Eco-Build (1-2 days)

Submit your project doc's to: ecobuilds@mject.org
For support please contact: +44 (0) 7 932 652 427

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2. Build with Hempcrete
3. Properties of Hempcrete
4. Finished Product Test Reports
5. Completed Projects

Hempcrete Eco-Builds

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1. Growing & Processing of Industrial Hemp

Phase 1:
Growing Industrial Hemp

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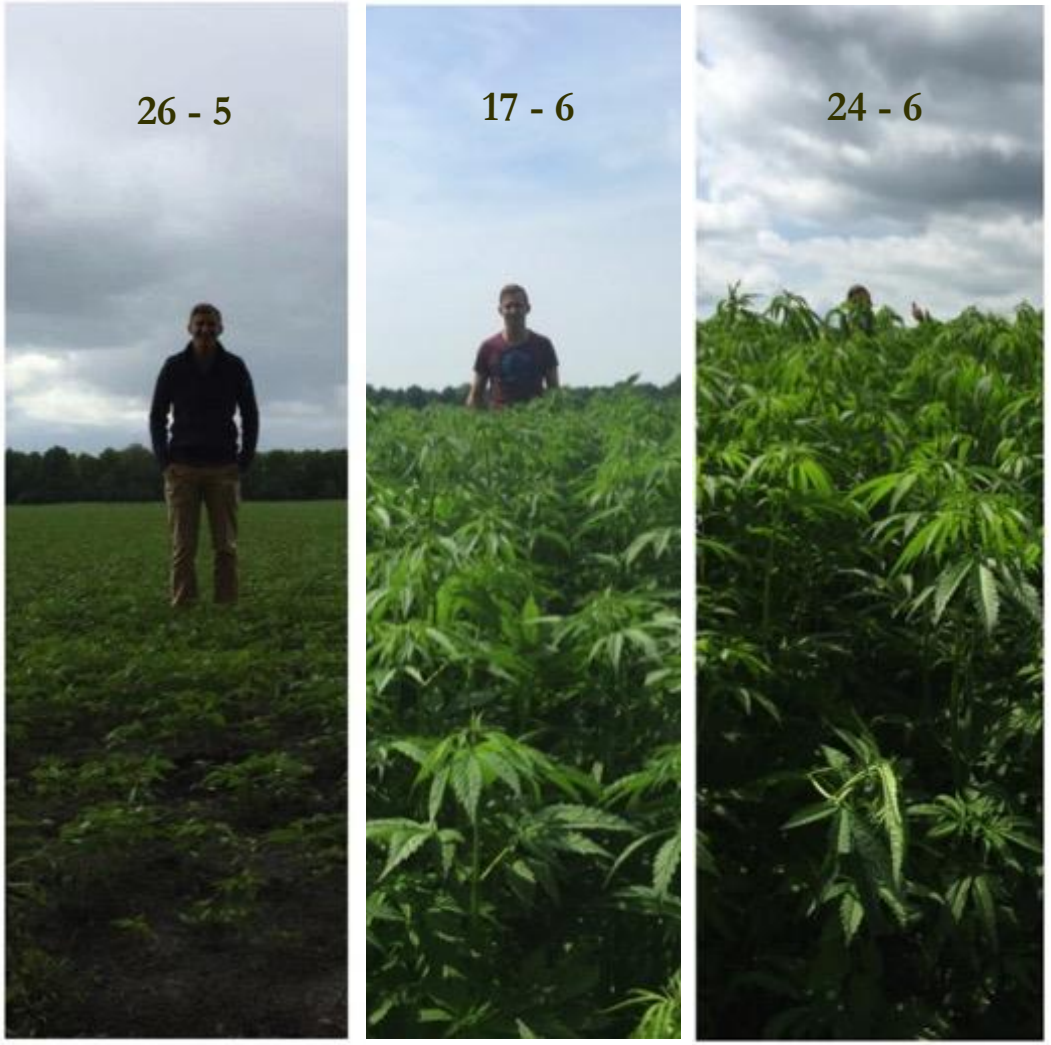
- No Agro-chemicals
  Resilient crop, eco friendly for bio-diversity
- Phytoremediation
  Unmatched improvement in soil quality
- Carbon Negative
  13-22 tonnes per hectare/season
  26-44 tonnes per year (2x seasons)
- Optimal Yield-Time Efficiency
  Fast growing crop
  3-4 meters every 3-months
  2 Seasons per year



Phase 2:
Mowing Industrial Hemp

Phase 3:
Processing & Prefabrication of Industrial Hemp

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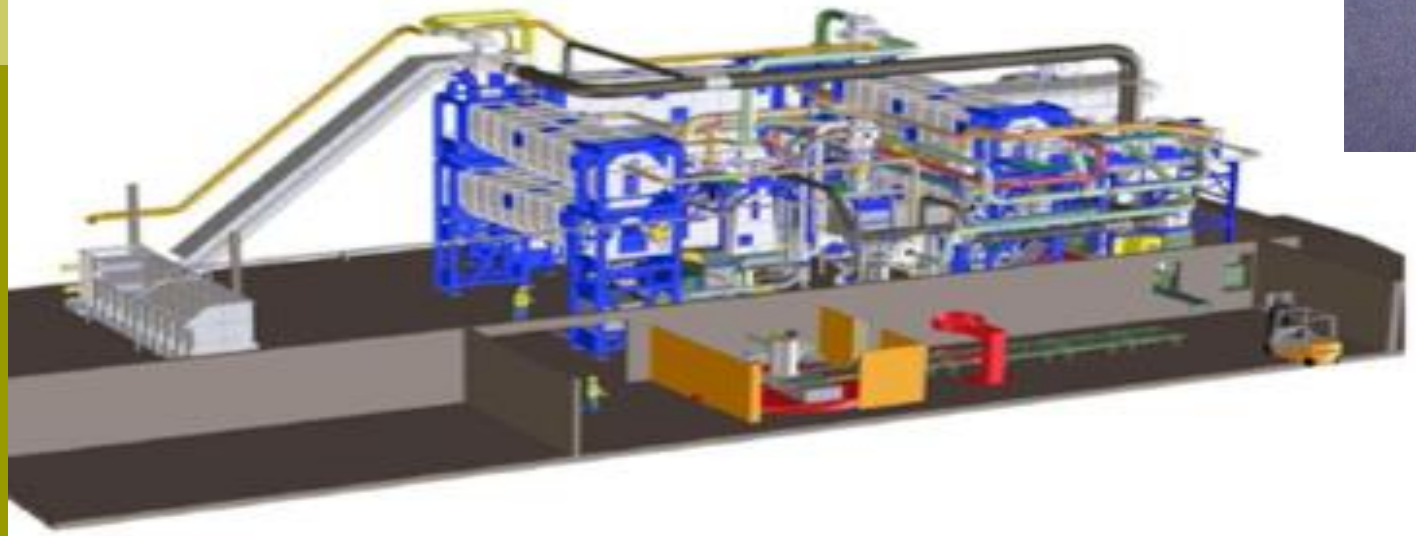
- Established unique manufacturing line – First of its kind in the world with highly tailorable finsih.

- Separates hemp strawl into:
  - **fibres**
  - **shives**



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2. Build with; ‘Hempcrete Elements’

Ingredients

Hemp shives is mixed with a natural binder (Vicat lime) and water, which creates Hempcrete

- Prefab Hempcrete Panels have a timber frame construct.
- Hempcrete is pressed into a customized form including frames.
- Sizes up to 6m x 3m
- Weight Approx 270 kg/m3

Plumbing & Electical Piping

Piping for water, electrics and mechanical installments are included in the Panel element manufacutiring process

– As per your design request.

The Curing Process

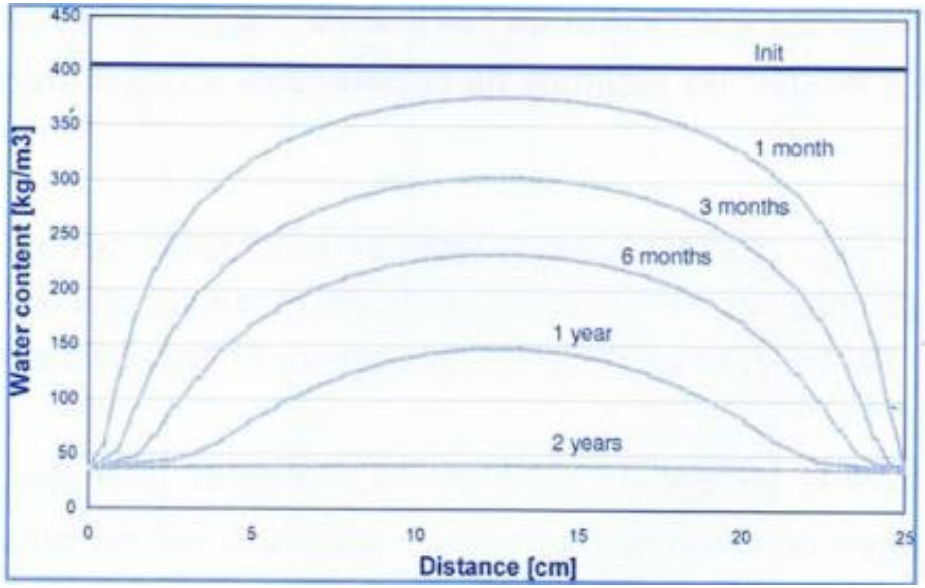
Average time of 70 days to set after custom pressing.
Once delivered to site, Your pannels can be installed instatnly with zero on site drying time, ready for tradesman handover & finish.

Drying Time

- The drying time in a natural way is approximately 2 years. However, after 2 months from fabrication, stucco & face finsihing work can be applied as the moisture at the surface has evaporated.

- The curing process for the elements are done in factory before being delivered and fully insalled straight away on site.

- Further drying out happens when the home is occupied. Increasing in structural soundness with each day.



After the drying period, the prefab panels are delivered to site and are mounted directly on to the foundations of the new build.
A process that would typically take months with conventional methods/materials - now complete in less than a single week.
Resulting in mass optimisation of labour time efficiency.

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Many options are available for finishing...

The owners of this property have chosen for a finish with brick strips and Rockpanel.

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3. Properties of Hempcrete

1. Conventional Breathability

- Very commonly - many insulation materials close the house and induce an unhealthy indoor climate which results in Damp, Mold & Microresidue etc... Causing a greate additional expense & unwanted warranty accounts.

1b. Breathability of Hempcrete

Humidity and air quality in the building is regulated in an optimal and natural way.

- Vapor-open, solid construction
- No more foils needed
- No balanced ventilation required
- Condensation can no longer occur due to the vapor-open micro-structure
- Moisture transport can take place

Result:

- Vastly improved air quality = Healthier Indoor Climate

2. Thermal Properties

- Hempcrete has a very high insulation value:

Thickness	λ-Value	Rd Value
300 mm	0,075	4
400 mm	0,075	5,3
500 mm	0,075	6,6
600 mm	0,075	8

- The wooden framework in the Hempcrete elements will not create a Thermal Bridge which commonly results in loss of heat.
  Our panels are fully sealed with hempcrete, so no heat is lost which is reflected in the buyers utility bills.

Thermal Comfort

- Thermal comfort is an important factor in the way people experience buildings. People feel colder or warmer due to the slight temperature fluctuations in buildings.

- Hempcretes thermal effusivity is low:

	STEEL	CONCRETE	MINERAL WOOL	CELLULAR CONCRETE	BRICK	WOOD	HEMP CONCRETE
D [mm^2/s]	40000	2000	-65	265-340	425-800	350-535	145-215-245-460

- Hempcrete elements provide the benefits of a lightweight material with the properties of a heavyweight material

- **It keeps the cold out and the warmth in with flexible solid consistency.**

3. Environmentally Friendly
Production Crop – CO2

- During the growth cycle, the hemp fiber absorbs a lot of CO2:
  13-22 tonns per hectare on avg. Depending on conditions.

- A Hempcrete house with a volume of 120m3:
  Locks in approximately 14 tonns of CO2.

- A conventionally built house with a volume of 120 m3:
  Emits approximately 25 tonns of CO2 into the atmosphere.

- Hempcrete is therefore a highly viable material for the eco-economy:
  Carbon negative - absorbing more CO2 then it produces.

Conclusion:

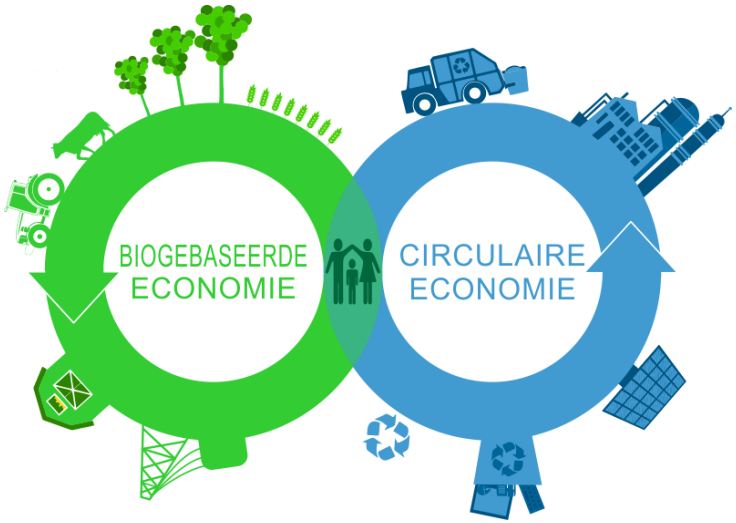
- When switching to Hempcrete Elements with MJECT & Co. –
  The project will on average absorb 14 tonns of atmospheric carbon and sequester 25 tonns of carbon from a simple design change.
  Total CO2 Sequesteration = 39 tonns of CO2 per 120 m3

3b. Environmentally Friendly
Production Crop – Circulair

- **Reusable:**
  There is zero waste when building with hempcrete elements for all "waste" can be reused in the next mix/casting.

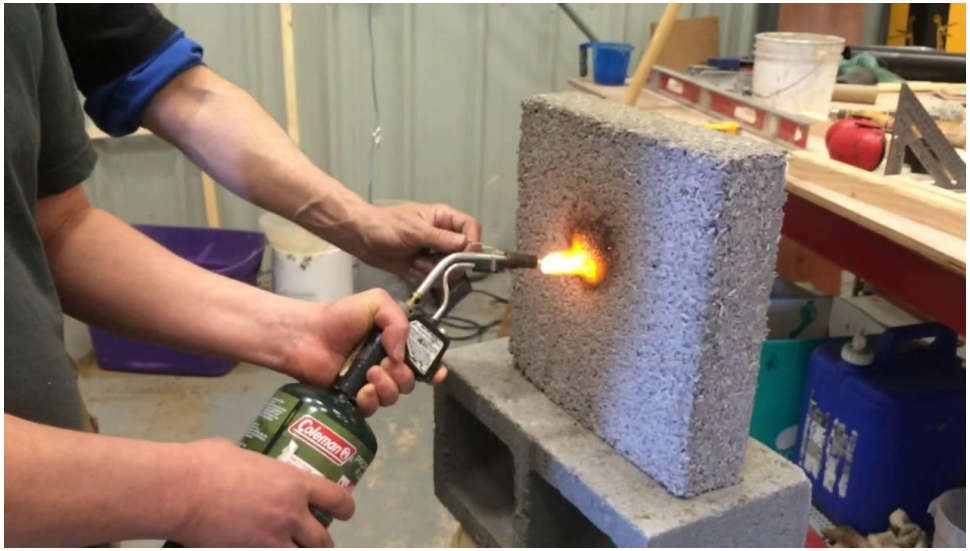
- **100% Biodegradable:**
  Hempcrete is a non-toxic/non-hazardous substance to both the worker and the environment.

- **Energy Efficiency:**
  Less water & electricity is required to produce hempcrete in comparison to concrete and any of its counter parts.



4. Fire Resistance – Optimal

- Highly fire resistant – Example:
  Wall thickness of 300 → WBDBO of 73 min.
- This means that it amply meets the requirements of the building decree.
- Since we assume a wall thickness of 400 to 500 with another plate on the inside – Making the product fire-resistant for an additional 60 minutes.



5. Pest & Mold Resistant

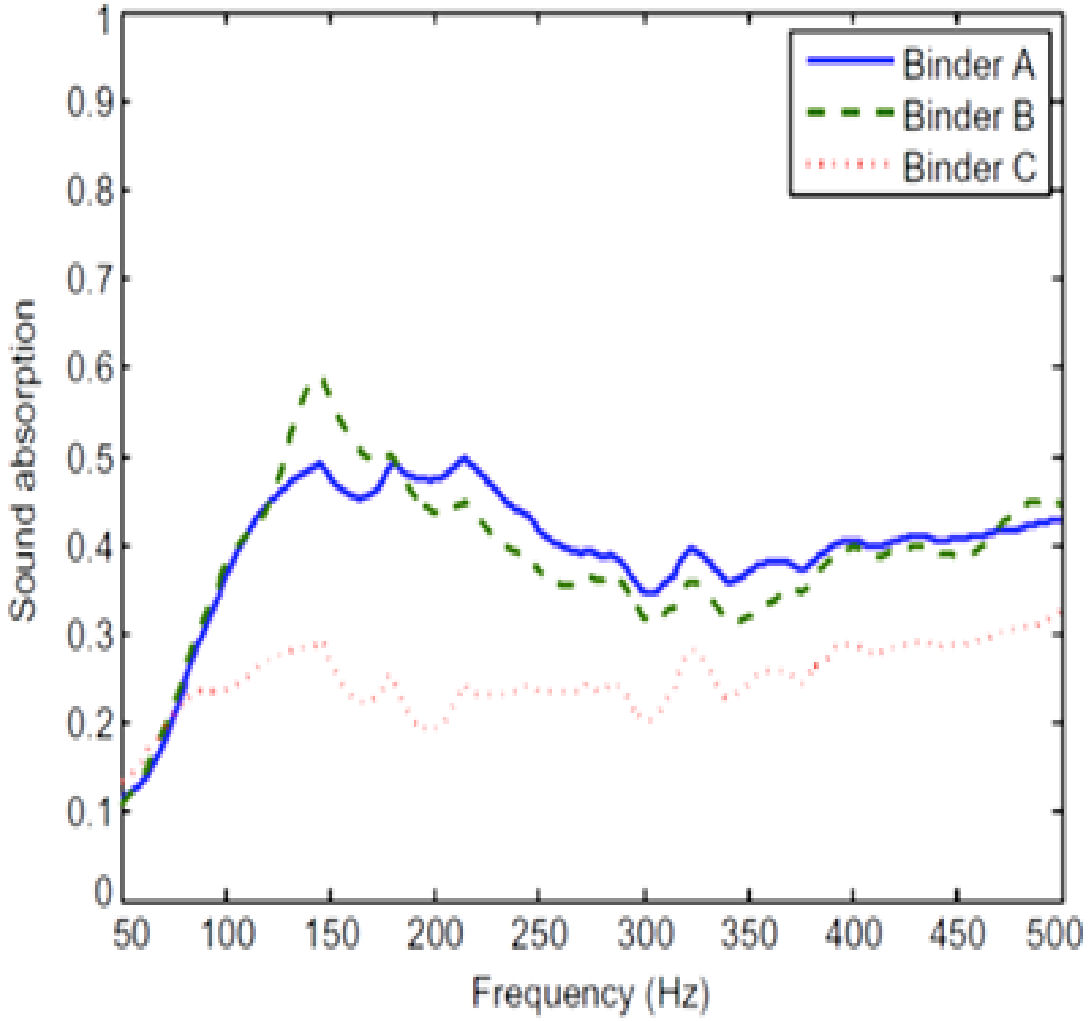
- When fungi in a building can spread, this can have health consequences, such as asthma, lung infections & allergies.
- Hempcrete has a natural defense mechanism against pests and fungi thanks to its naturally ventilating microstructure.
- Making our prefab pannels and blocks highly damp and pres resistent.
- Resulting in long warrenty and quality guarantee for both the developer and the buyer.

6. Non-toxic construction

- Hempcrete pannels & blocks do not contain any irritants nor toxic substances. A certified non-hazerdass material.
- Only natural materials are used which are easy to dispose of & recycle.
- Clean construction process for the environment, workers, and residents all round.

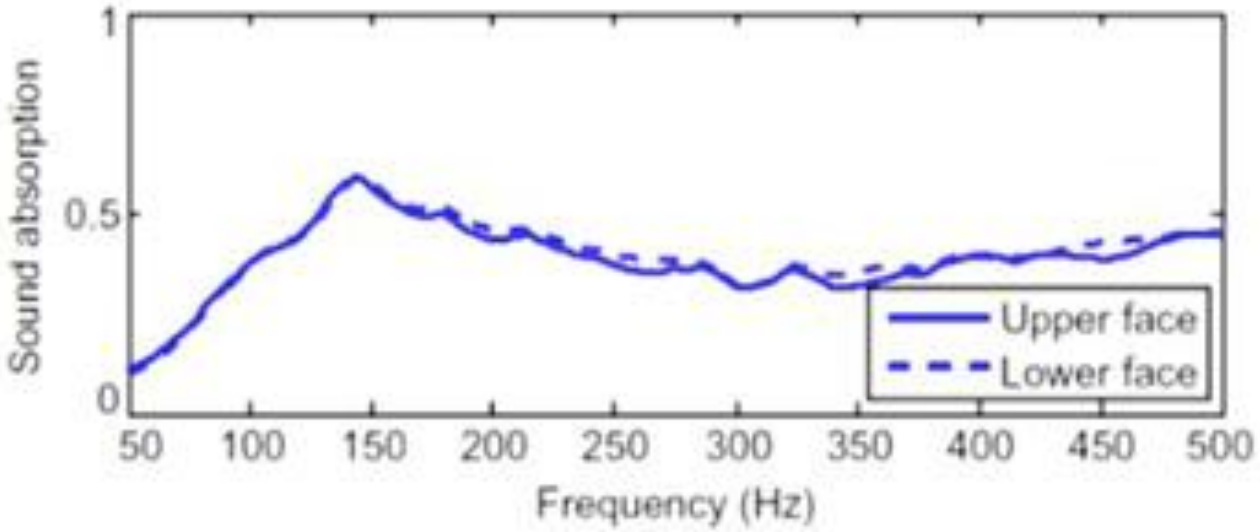
7. Acoustic Properties

- Because Hempcrete has an irregular structure, it is difficult for sound to penetrate through.
- Hempcrete therefor has natural sound proofing properties included.
- Cement based on slate (A & B) works better than Portland cement (C)



7b. Acoustic Properties

- Results from the noise test proved consistent with regard to the top and bottom surfaces:



8. Design Possibilities

- Hempcrete is highly flexible and can be pressed into most architectual shapes / curves etc...

- Wide variety of wall finishes are possible:
  - Stucco.
  - Brick slips.
  - Wooden wall finish.
  - Full core plate.
  - Zinc.
  - Sedum (rood).
  - + More etc...

9. Mechanical Properties

- Hempcrete is not typically a load-bearing material, but with our design combining a timber framework, it becomes a strong load bearing material.
- Hempcrete elements will make major contribution to the disk effect, which usually comes from the plating.
- Hempcrete has a low density – approx. 10 – 15% relative to concrete.
- Hempcrete has a compressive strength of 06 – 07 Mpa.
- Hempcrete has an elastic strength of >15 Mpa.
- Hempcrete has flexible composite elements, so it will not break easily and only improves in structural soundness / stability over time.

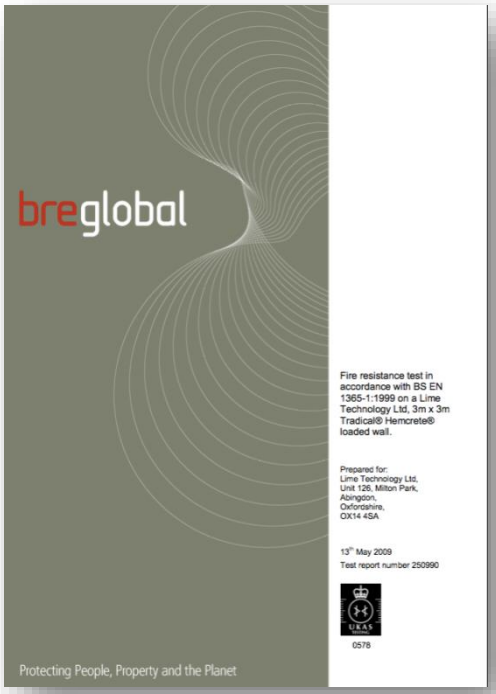
  Making the property highly resistant to 100 year old movement.

  This is why it is the reccomended material by safety regulators to be used in earthquake prone areas.

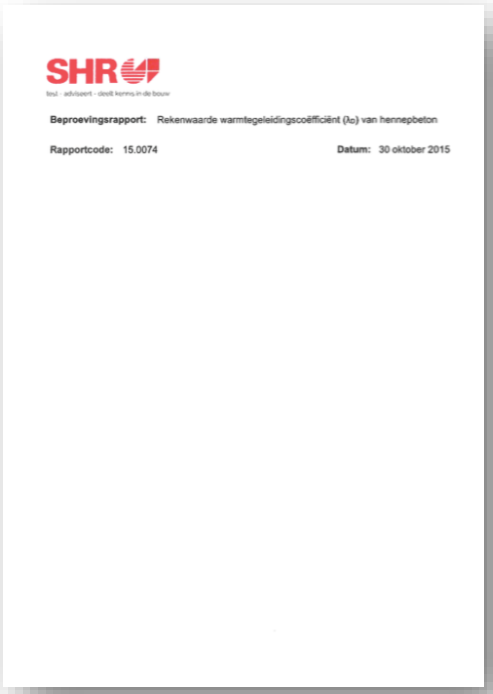
Conclusion

- Hempcrete has vast machanical, logistical, health and environmental benefits and more...
- Hempcrete construction by hand (casting on site) has proven itself for years, but with some inconsistencies determined by weather conditions...
- With MJECT & Co's highly innovative prefab & pre casted techniques - Hempcrete is ready to be used extensively in conventional construction for both domestic and commercial developments.
- Providing an "all in one" solution, from a multipurpose material with carbon negative properties and profound safety qualities.
  Not to mention that all important - impeccable cost and time efficiency which the industry has been waiting for.

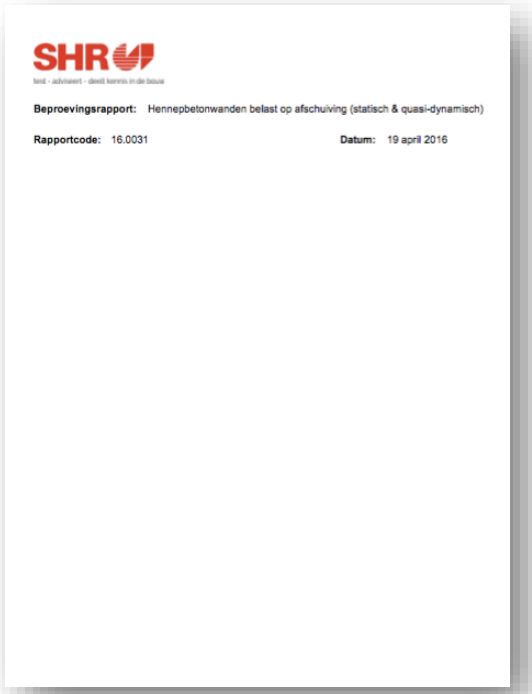
Test Reports



Test report
Fire resistance



Calculation value heat co-efficient hemp concrete



Test for wall strenght and earthquake resistance (Q-value 3)

Reports available on request

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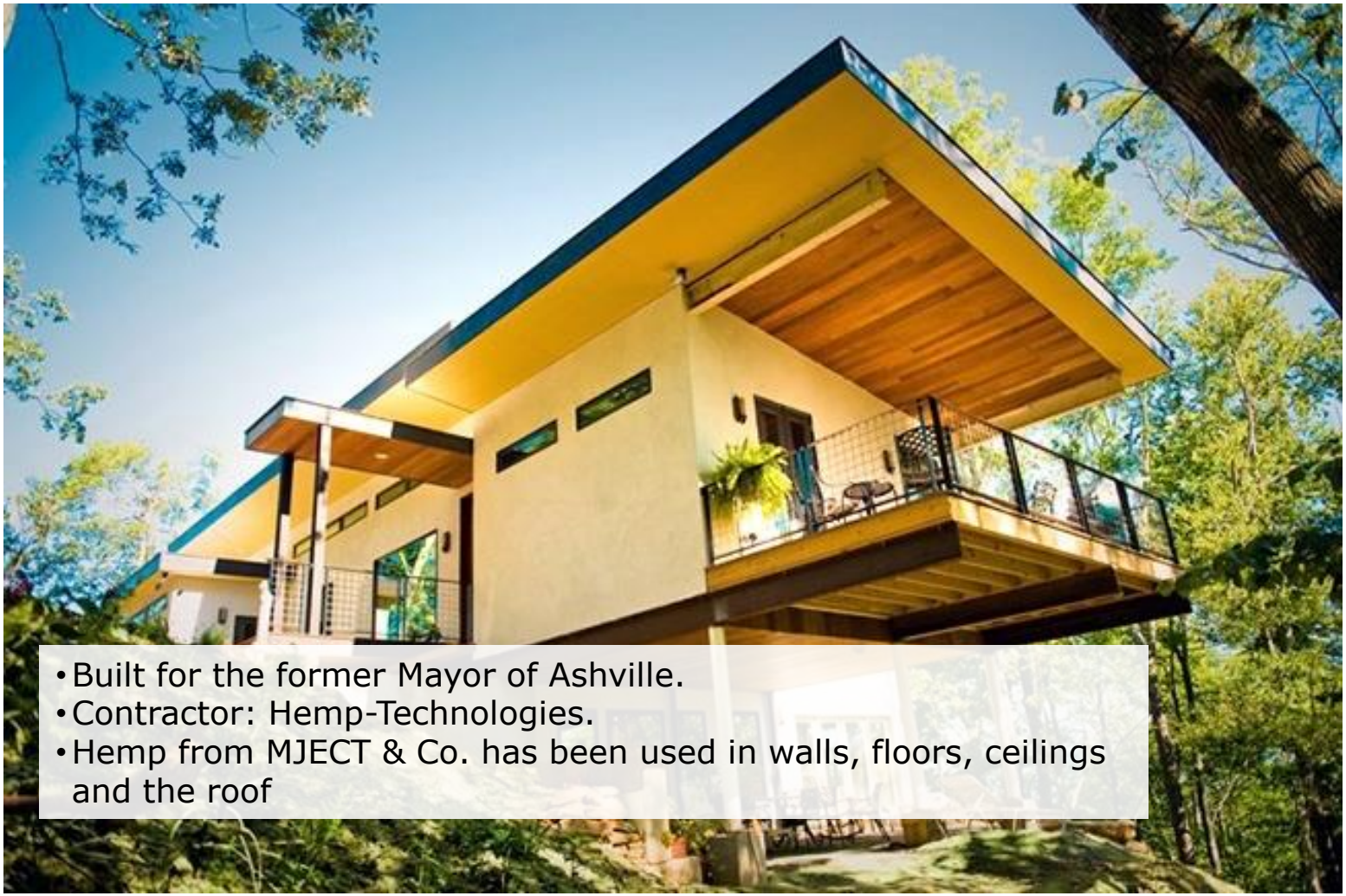
5. Examples of finished Hempcrete Building

House – Ashville, 2010



- Built for the former Mayor of Ashville.
- Contractor: Hemp-Technologies.
- Hemp from MJECT & Co. has been used in walls, floors, ceilings and the roof

House - Tasmanie, 2009

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- Hemp from MJECT & Co. has been used for walls, floors, ceilings and the roof.
- Wooden beams and frames.

Hemp Building, Beer Brewery

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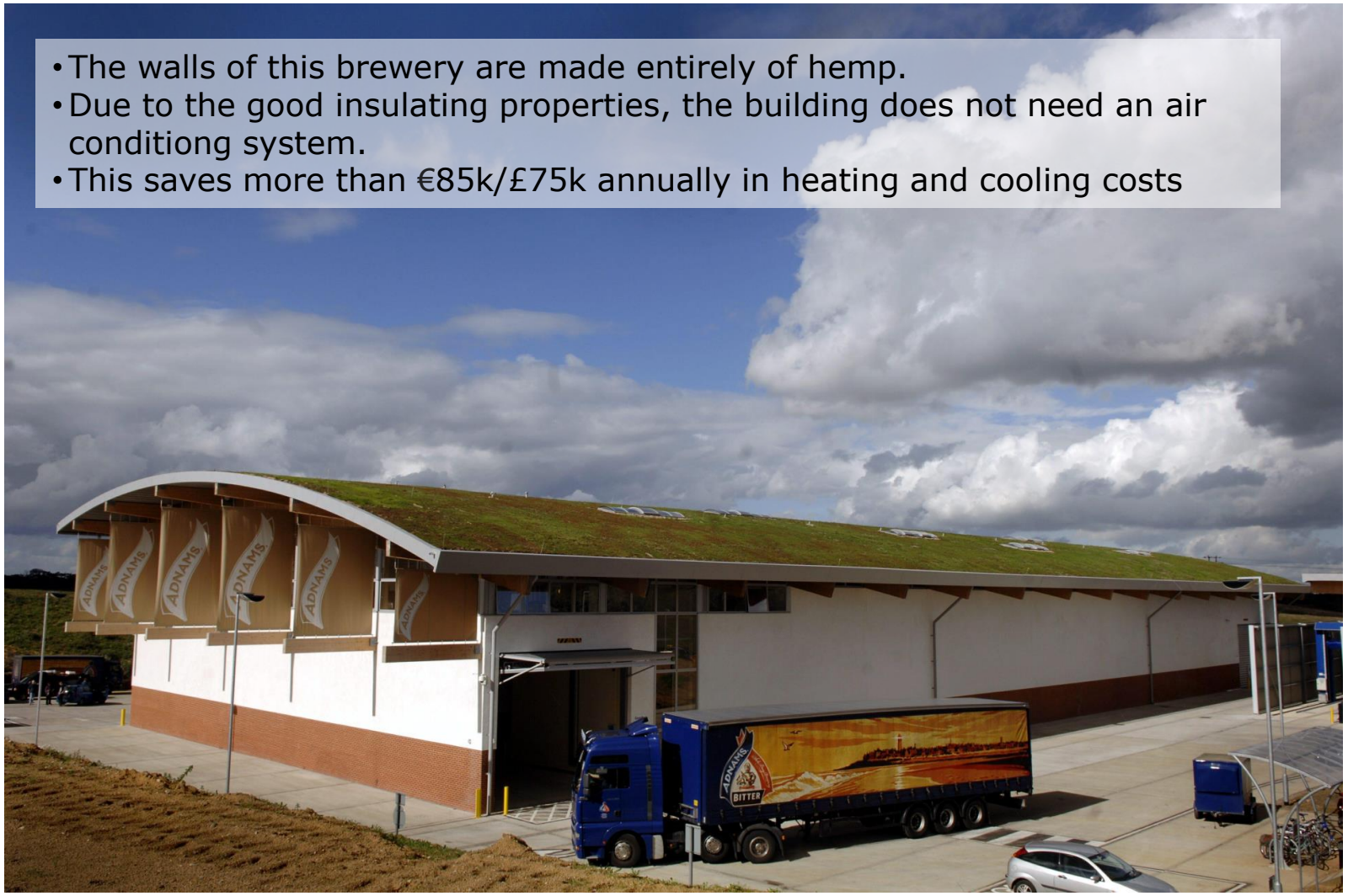

- The walls of this brewery are made entirely of hemp.
- Due to the good insulating properties, the building does not need an air conditiong system.
- This saves more than €85k/£75k annually in heating and cooling costs

Hemp house Oude Pekela,

- Built by: Dun Agro
- HempCal side walls, ceilings and roof. Together with the wooden skeleton it forms a stable load-bearing whole.
- Separate from the as, heated by heat pump. The electricity is generated with solar panels.

Apartments - Swindon, UK

Sociocultural Centre – Frankrijk

Panel House – South Africa

Apartments - Ile de France

Work in progress/ Structural Engineering Model

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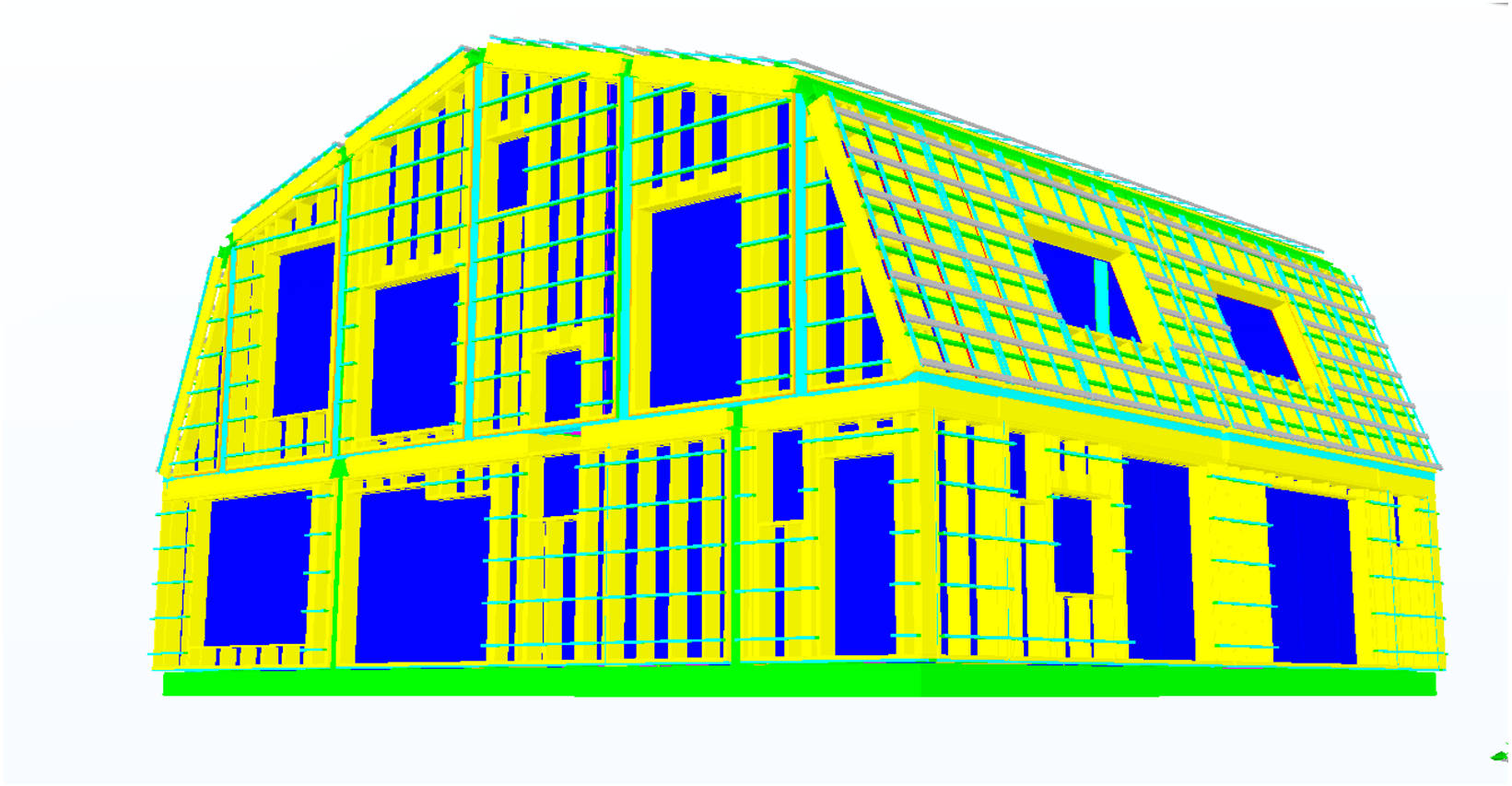
Newly built double house in Rotterdam



Work in progress/ Structural Engineering Model

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Delivery of façade elements for 36 Ecovillage Boekel homes

Work in progress/ Structural Engineering Model

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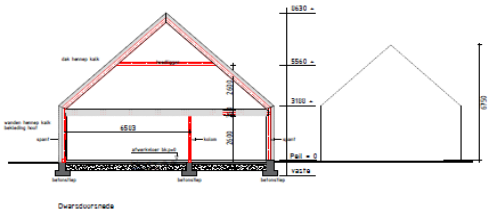
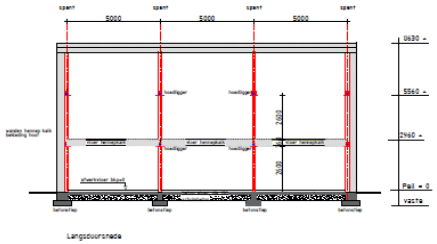
Newly built house in Sappemeer





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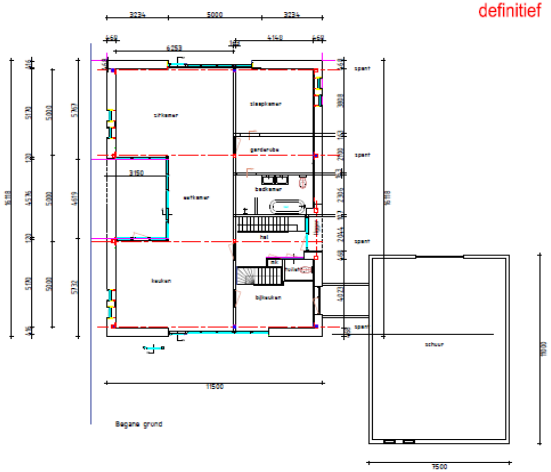

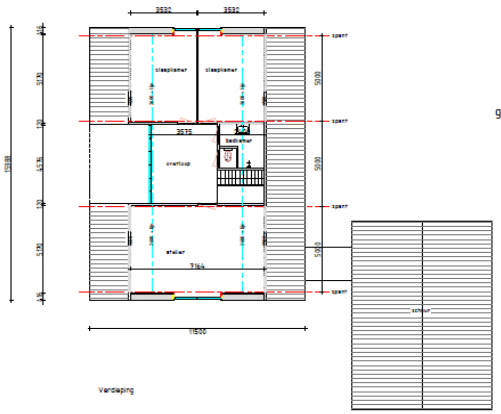

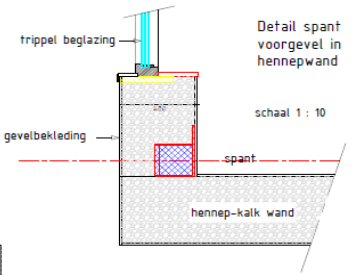

Voorstel tekening 1 tussensteun

PROJECT : A, van Hoorn

DUNAGRO - Bouw

Work in progress/ Structural Engineering Model

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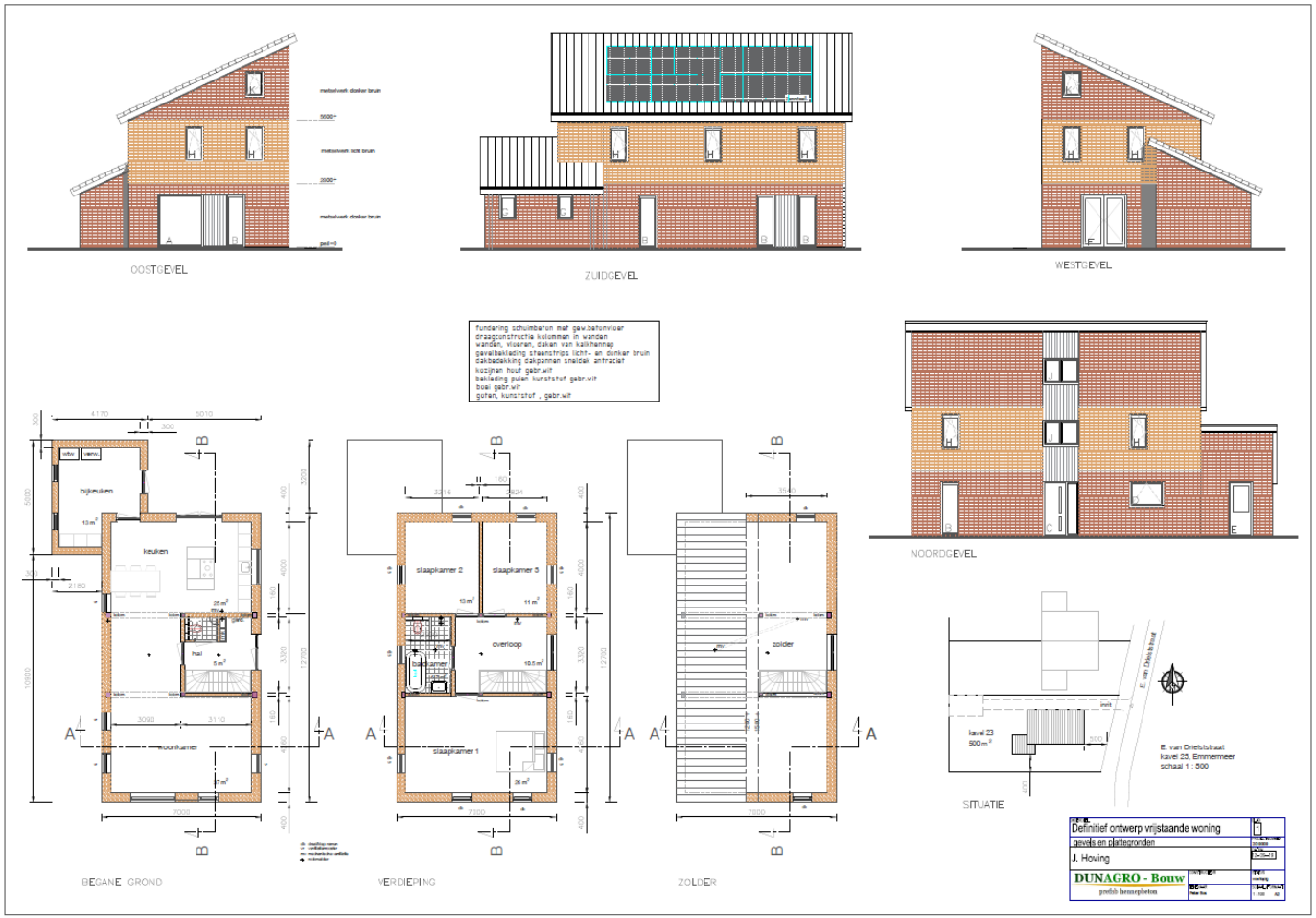
Newly built house in Emmen



Work in progress/ Structural Engineering Model

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New-build Solar innovation and experience center in Emmen

Work in progress/ Structural Engineering Model

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Flex houses

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