

CASCADING WOOD

Group 9 TUDelft



CASCADING / MAXIMIZING MATERIAL FLOW STEPS / RE-, UP-, DOWNCYCLE

- How can the life of construction materials be extended beyond their first implementation?
- Could processing of building components retrieve value and store carbon for longer?

Cascading Wood:

Cascading wood is the method of utilizing wood resources, then repurposing them for lower-grade uses, and ultimately considering energy recovery.



Photos by Uabio:

<https://uabio.org/en/materials/analytics/11327/>



Recycling



Downcycling



Upcycling

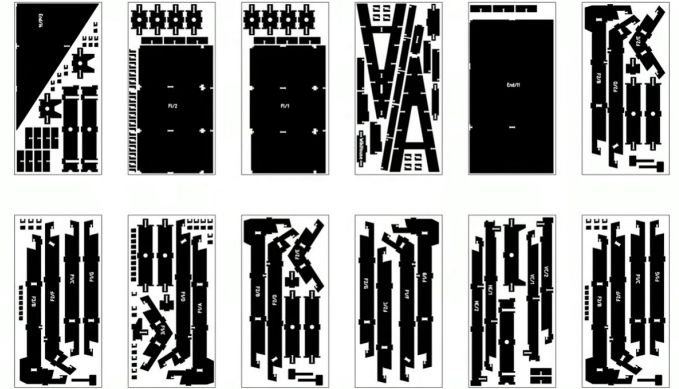
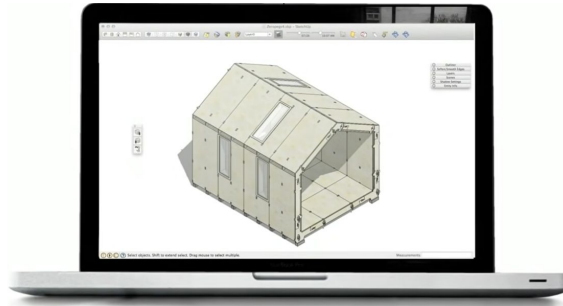
Upcycling improves the quality of waste materials, recycling converts waste into new products, and downcycling results in products of lower quality.

Wikihouse



Wikihouse is a open-source construction initiative that seeks to revolutionize the way we build homes and structures. The project provides downloadable plans for self-build wooden houses. The project encourages the use of digital design and collaborative sharing of knowledge, aiming to create an open source knowledge base to build more sustainable wooden housing.

All parts of the house are made from the same wood. The parts can be found and downloaded from the open source website. Then the plans can be made and the house easily adapted. Finally all the parts are cnc cut and the house can be built.



Photos by Wikihouse: <https://www.wikihouse.cc/>

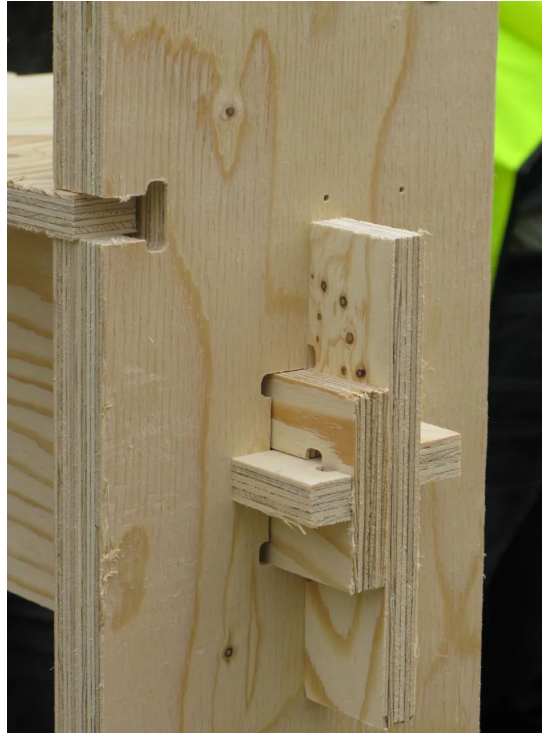


The houses are designed to be demountable. This means that the houses are very easy to dismantle and the parts can be reused in other building projects. Wikihaus say that their design allows 80% of the parts to be reused in new construction projects, where a normal brick house would only allow 10% to be reused.

Photos by Stadzaken:
<https://stadzaken.nl/artikel/3372/walhouse-almereers-debuut-zorgt-voor-wereldwijde-interesse>

The joints are designed to minimise the use of materials other than wood. This ensures that when the structure is discarded, all the materials can be easily collected and reused.

Wikihouse has also created a community where parts can be made and old parts can be traded for reuse.



Photos by Makezine:

<https://makezine.com/article/workshop/woodworking/interview-with-wikihouses-alastair-parvin-and-nick-ierodiaconou/>



Stunt Upcycle Campus Delft

This foundation assists young people and adults who are dependent on state benefits due to any circumstances. In various workshops, participants make unique products from waste materials for business clients.

The mission of Stunt is to give people and materials a new chance.



A circular renovation of the workshop

With the goal to make it more sustainable.

Looking at their own mission, they preferred to use leftover, rejected or already used products for the renovation.



Photo by luzarchitecten: <https://www.luzarchitecten.nl/projecten/stunt-upcycle-campus>

A circular renovation of the workshop

Through CirQ Wood (supplier of reclaimed wood and production residues), they ordered 10 pallets full of PlatoWood Fraké production residues.



Photos by CirQWood: <https://cirqwood.nl/portfolio-items/wandbekleding-upcycle-campus-stichting-stunt-delft/>

Platowood Fraké

By platonising the wood, they reinforce the characteristics of the wood in an environmentally-friendly manner, without adding any chemicals. Making sure it has a long lifespan.



It's a patented process which consists of three important steps: hydro-thermolysis, drying and curing.



Used for façade cladding and window frames and doors.

Waste Waste round table



Piet Hein Eek

A well known Dutch Designer. Famous for using salvaged material to craft beautiful furniture and artworks.



"It's made of the leftovers from the leftovers,"

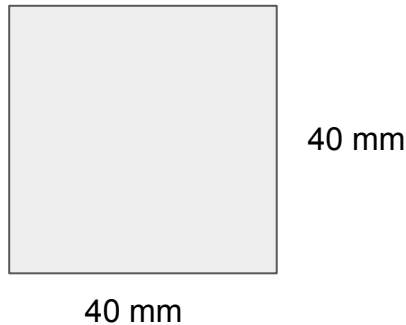
Piet Hein Eek takes the material as the starting point of his design.

"Waste is often not waste, but degenerates into waste because labour is so expensive" Piet Hein Eek. This was the inspiration for a series of 'waste products'



40 x 40 mm

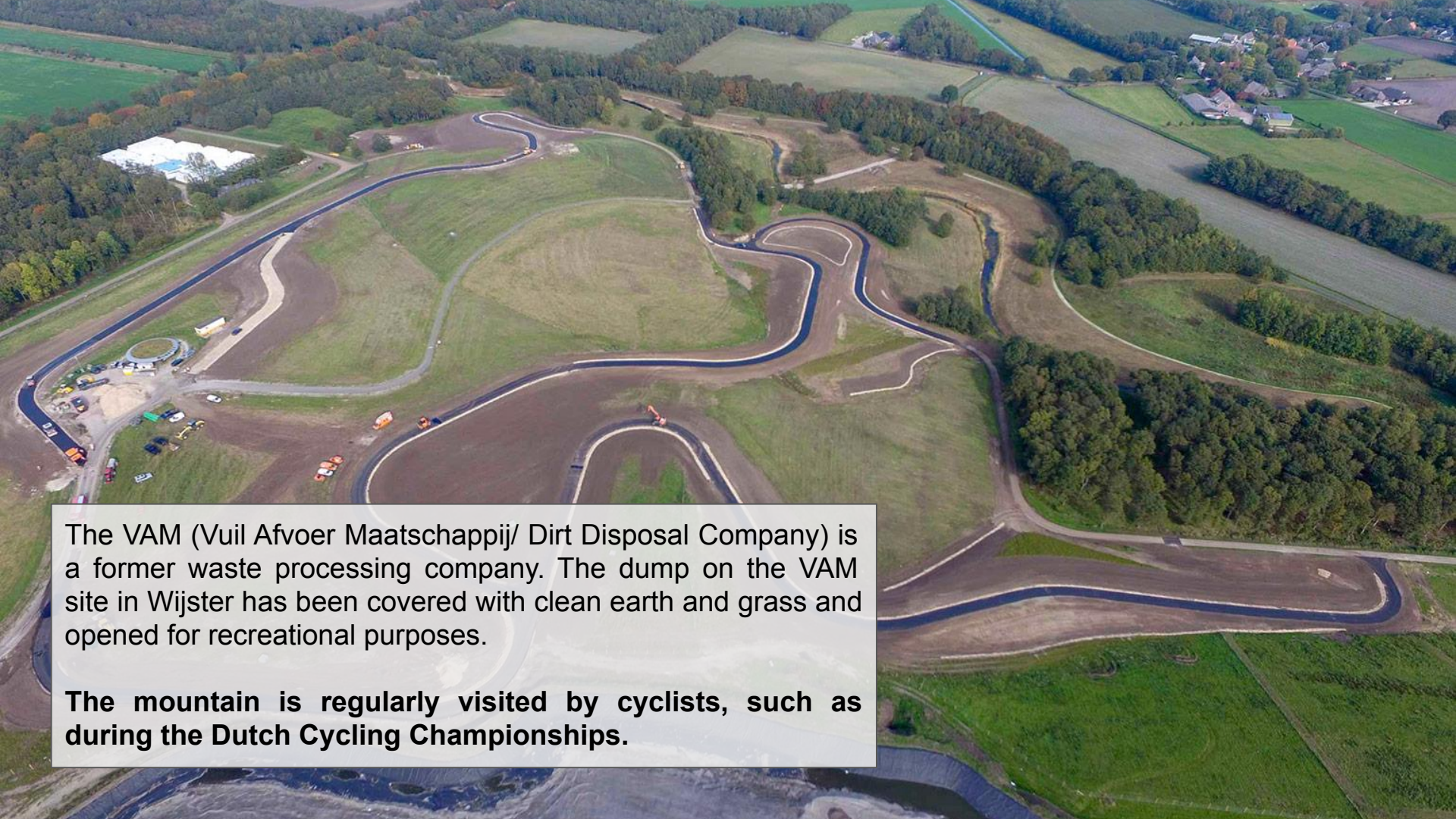
Using a fixed size of 40 x 40 mm. This size, combined with the choice to use the material only as a skin instead of stacking it, is extremely decisive for the appearance of the products. Straight shapes are created that are always a multiple of 40 mm and round is therefore not round.



VAM-berg

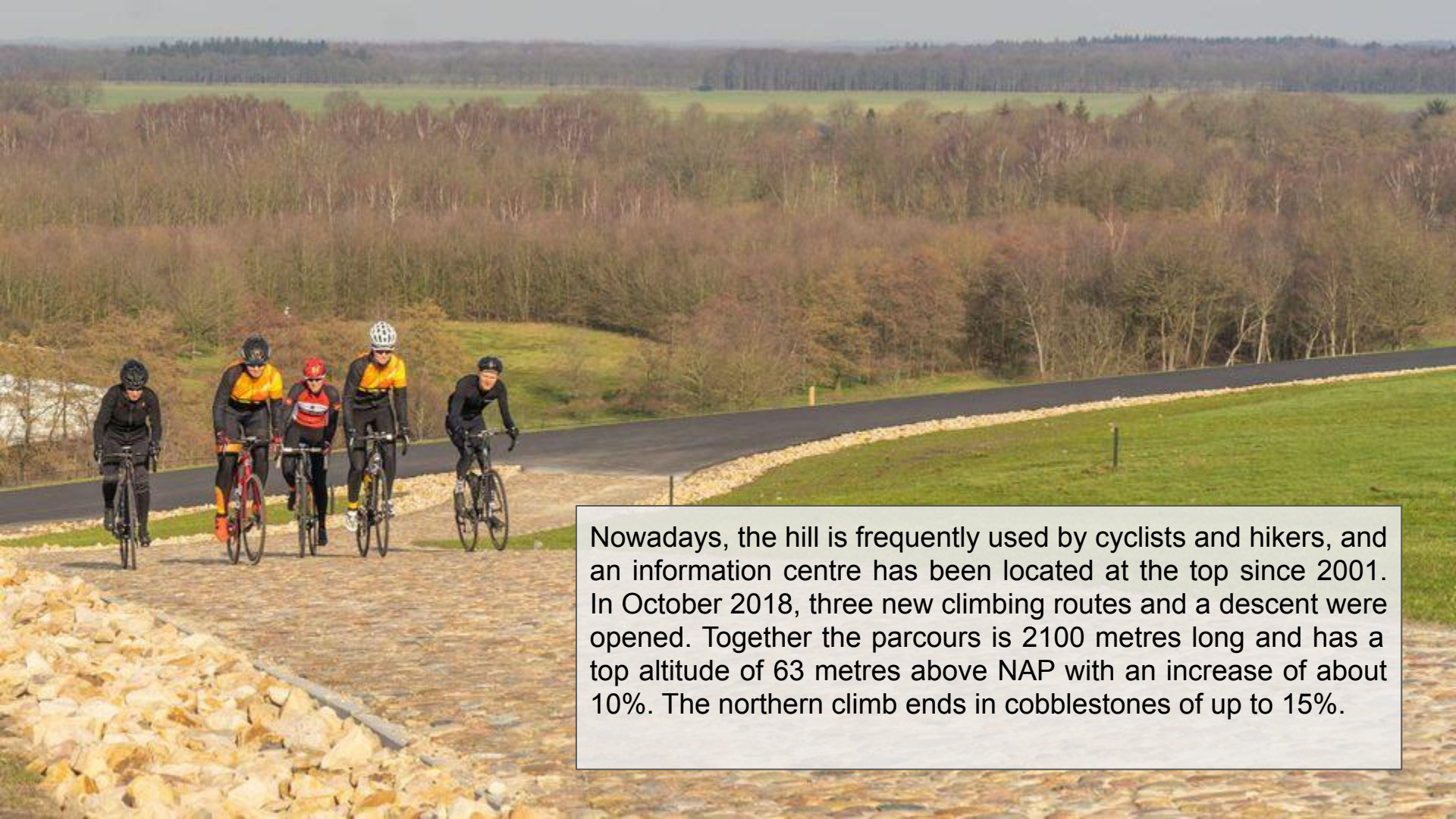
Col du VAM
(Altitude 4800 cm +NAP)





The VAM (Vuil Afvoer Maatschappij/ Dirt Disposal Company) is a former waste processing company. The dump on the VAM site in Wijster has been covered with clean earth and grass and opened for recreational purposes.

The mountain is regularly visited by cyclists, such as during the Dutch Cycling Championships.



Nowadays, the hill is frequently used by cyclists and hikers, and an information centre has been located at the top since 2001. In October 2018, three new climbing routes and a descent were opened. Together the parcours is 2100 metres long and has a top altitude of 63 metres above NAP with an increase of about 10%. The northern climb ends in cobblestones of up to 15%.

Takeaways

Creativity: Cascading wood requires innovative design and creative solutions to ensure that the material remains useful and valuable over multiple cycles.

Economic benefits: Adopting cascading wood practices can create new business opportunities and encourage green entrepreneurship.

Life cycle analysis: Understanding the full life cycle of wood products can help make more informed decisions about sustainability and material use.