

Productecture: Design for Remanufacturing

Masters Thesis: Harvard Design School 2002
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Existing Conditions, Disposable Architecture.



Given:

At current rates of construction the entire developed world could be replaced in 100 years.

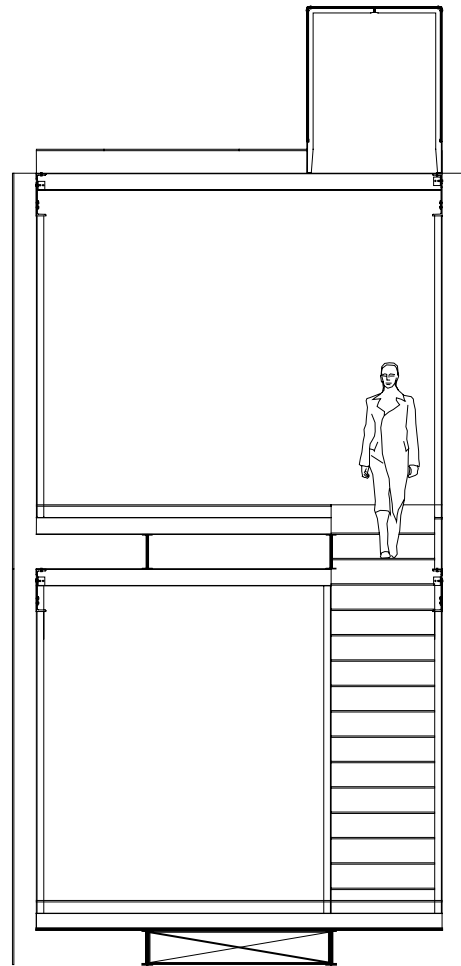
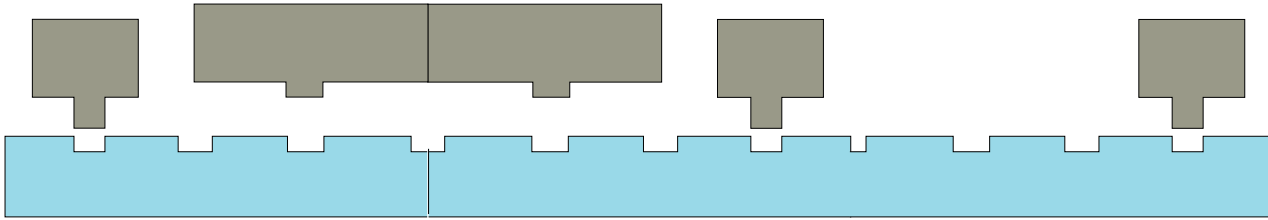
Product stewardship should be brought to architecture.

Productecture is a system that is non-disposable; it is designed for *remanufacture*.

Thesis Model Photo - Productecture:



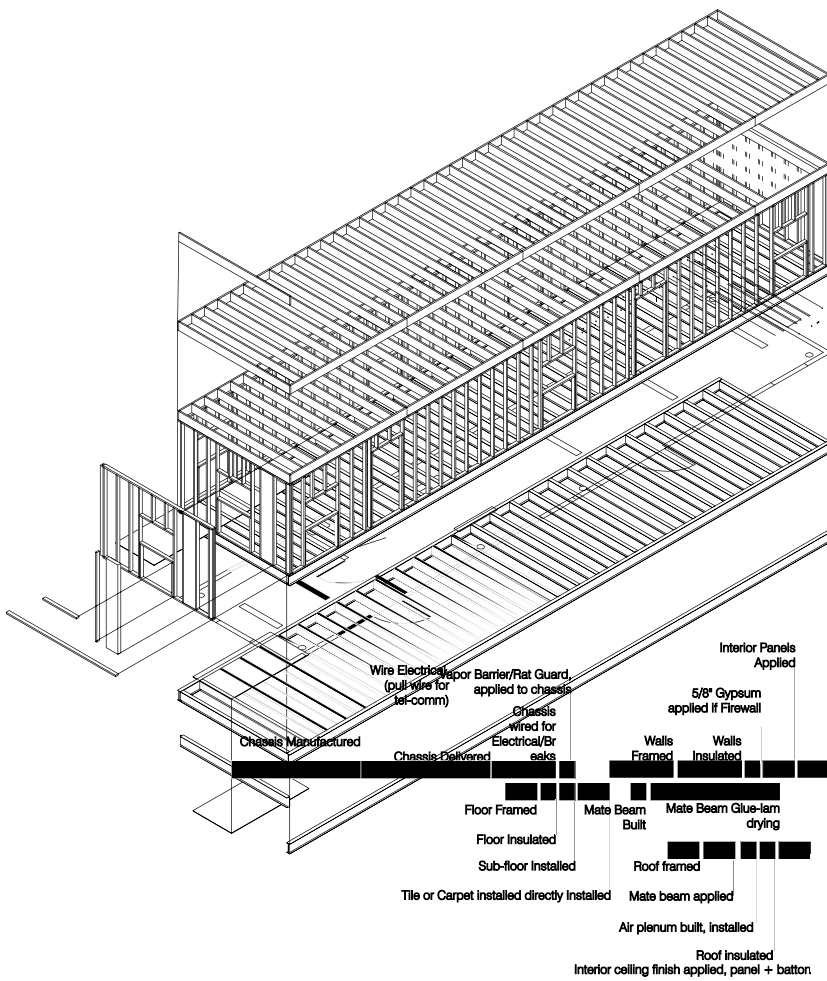
Diagram of “bus modularity” - the type of modularity employed in final *Productecture* design. One “bus” supports a variety of add-ons for customization, in this case: skylights and specialty architectural elements.



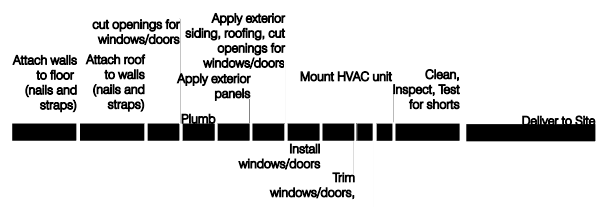
Model photograph, final *Productecture* design

A steel frame provides rugged durability and bolted connections for flexibility. Steel connections are designed to daisy chain, and allow for the maximum variety of openings. Wood wool slabs are attached to the exterior, exposing the construction to the interior. The skylights are designed as if microcosms of the system as a whole.

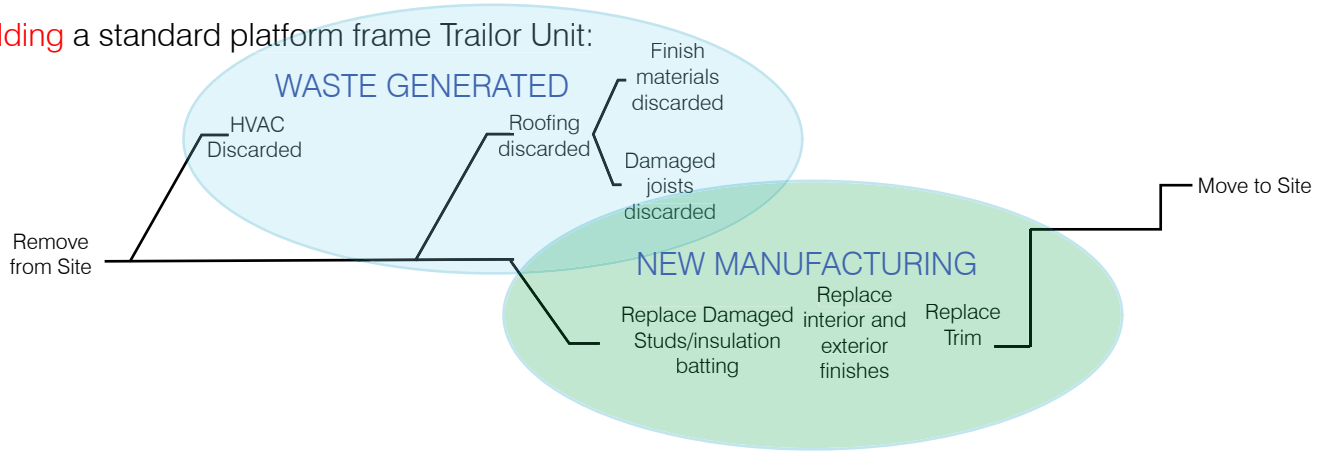
Axonometric - Platform Frame Trailer, from Site Visit, Factory Built Buildings, Thesis Preparatory Research.



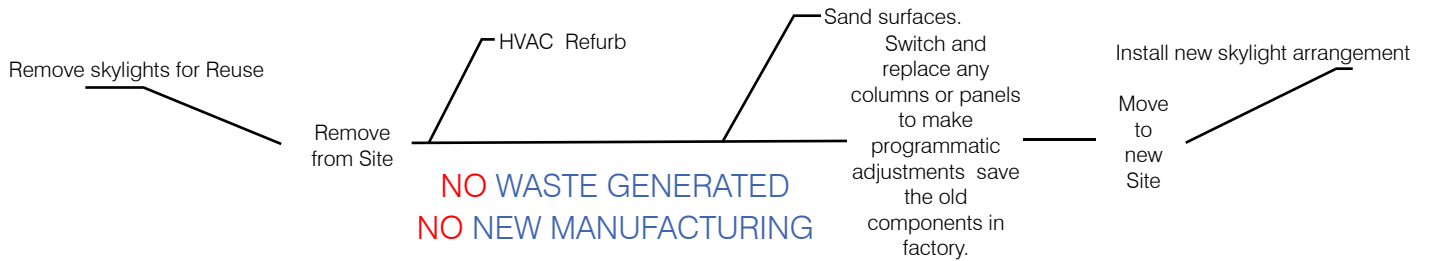
Steps to Building a Trailer:



Unbuilding a standard platform frame Trailer Unit:

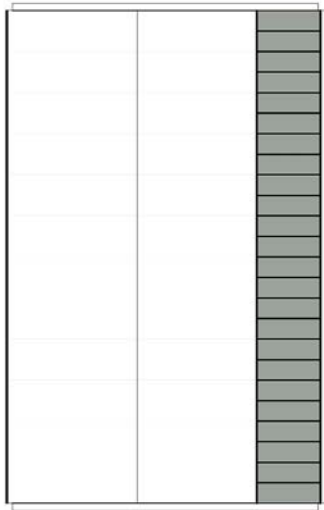


Unbuilding a Productecture Unit:

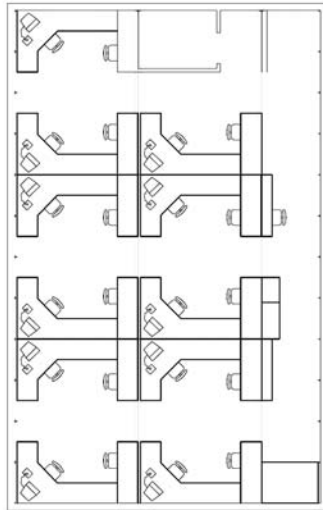


Sample Deployment: *The Growing Office*, 2 phases of life for a growing office space.

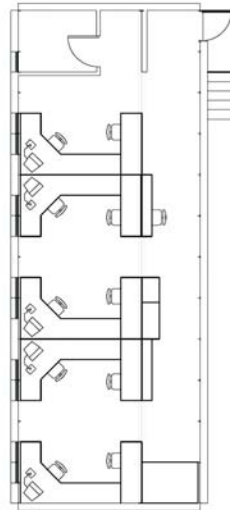
This is one example of common uses for Productecture which include: Office, Retail, Light Industry, Worship, and Classroom



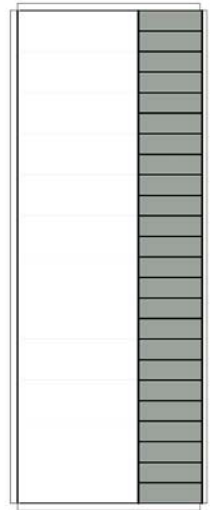
Phase II Roof Plan



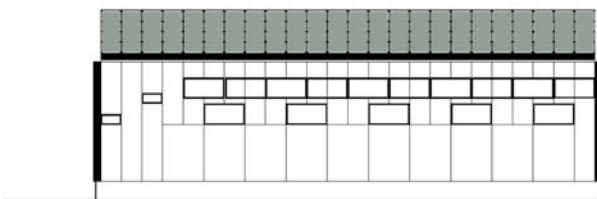
Phase II Plan



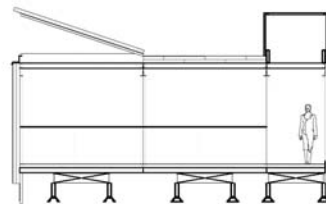
Phase I Plan



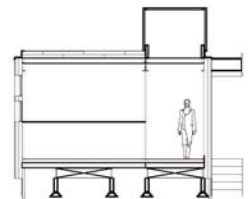
Phase I Roof



Phase I/II Elevation



Phase II Section



Phase I Section

Final model shows flexibility of configurations:

2 base models side by side



2 base models stacked

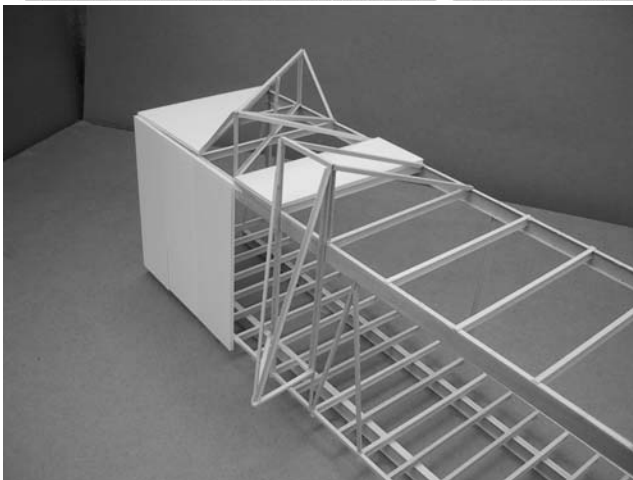
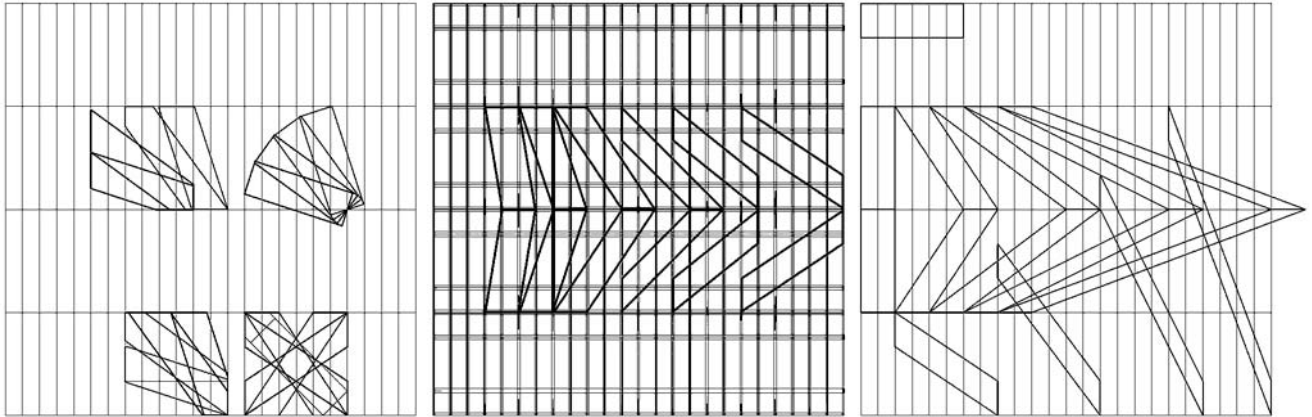


2 base models end to end



Skylight Studies:

Plan tests show variations of how parts attach to the frame and photographs of process models look at the spatial implications of canted skylights. The skylights aim to be flexible enough to capture sunlight from any direction, because the siting may include a poor relationship to the sun. They are designed to attach to the steel frame of the building below at several angles of the compass.



Frame Configuration Studies:

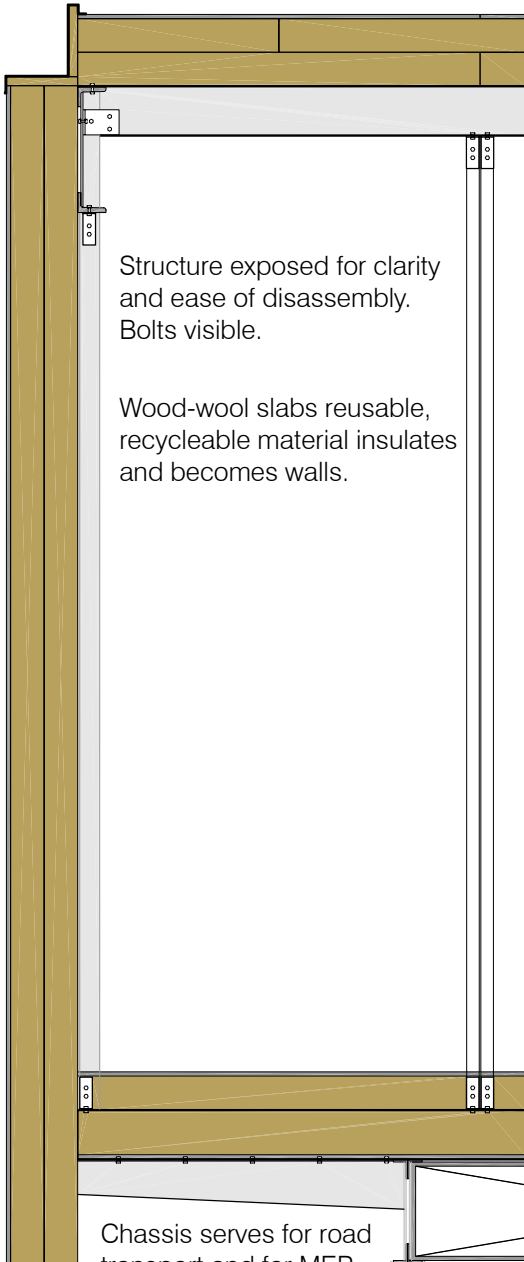
Model tests show variations of how frame could be constructed using standard steel shapes. The final version is a simple column and beam frame, although several structural systems were explored.



Disposable system to be replaced:



Transverse Section
final design

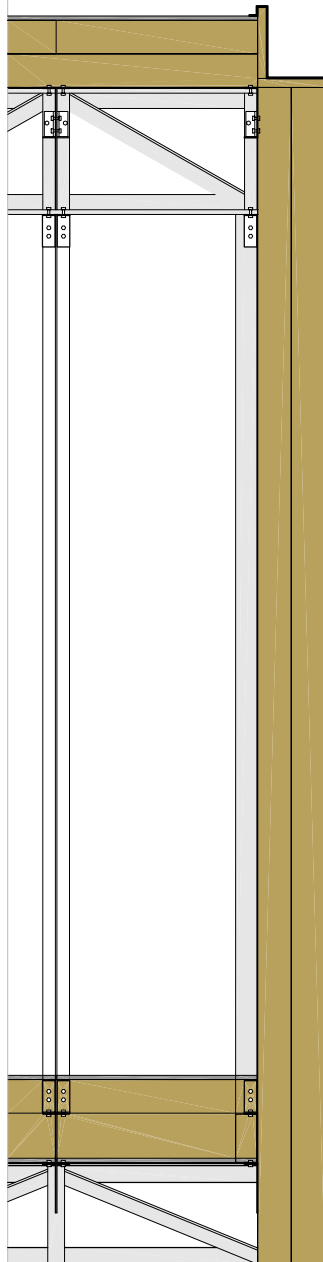


Structure exposed for clarity
and ease of disassembly.
Bolts visible.

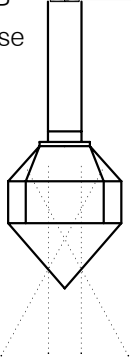
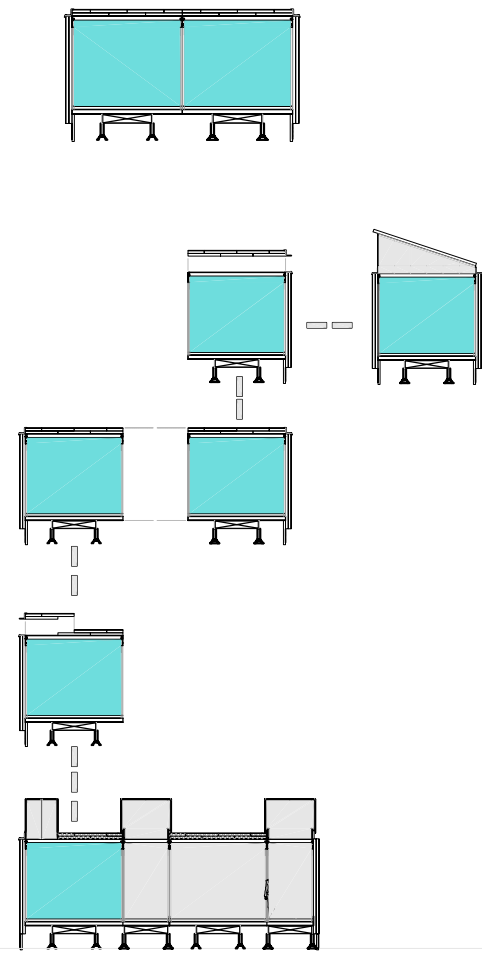
Wood-wool slabs reusable,
recycleable material insulates
and becomes walls.

Chassis serves for road
transport and for MEP
systems delivery chase

Longitudinal Section
final design



New reusable, recyclable system:



Pin foundations used for
semi-temporary
applications. Leaving the
site relatively undisturbed.

Disposable Typology to be Replaced:



Final Physical Model:

