

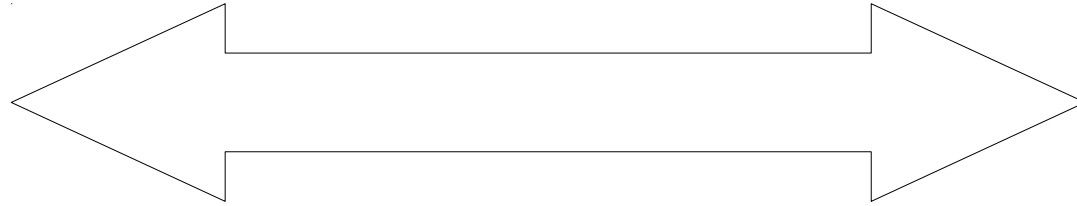
Building a Better New Zealand

3-5 September 2014

*Is a digital revolution possible for the
construction industry?*

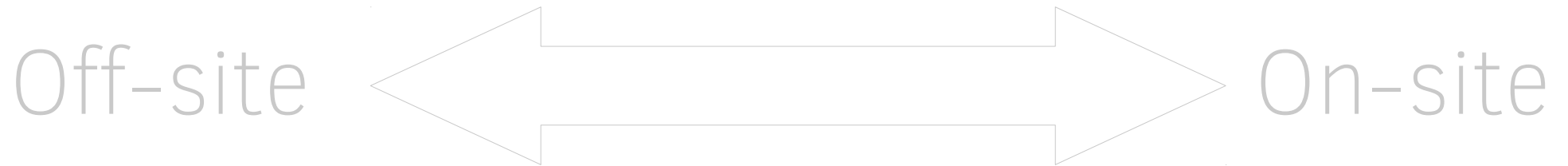
John Chapman, Dermott McMeel, Manfredo Manfredini and Yusef Patel [BRANZ PhD
Scholar] Paola Leardini and Gary Raftery

Off-site



On-site

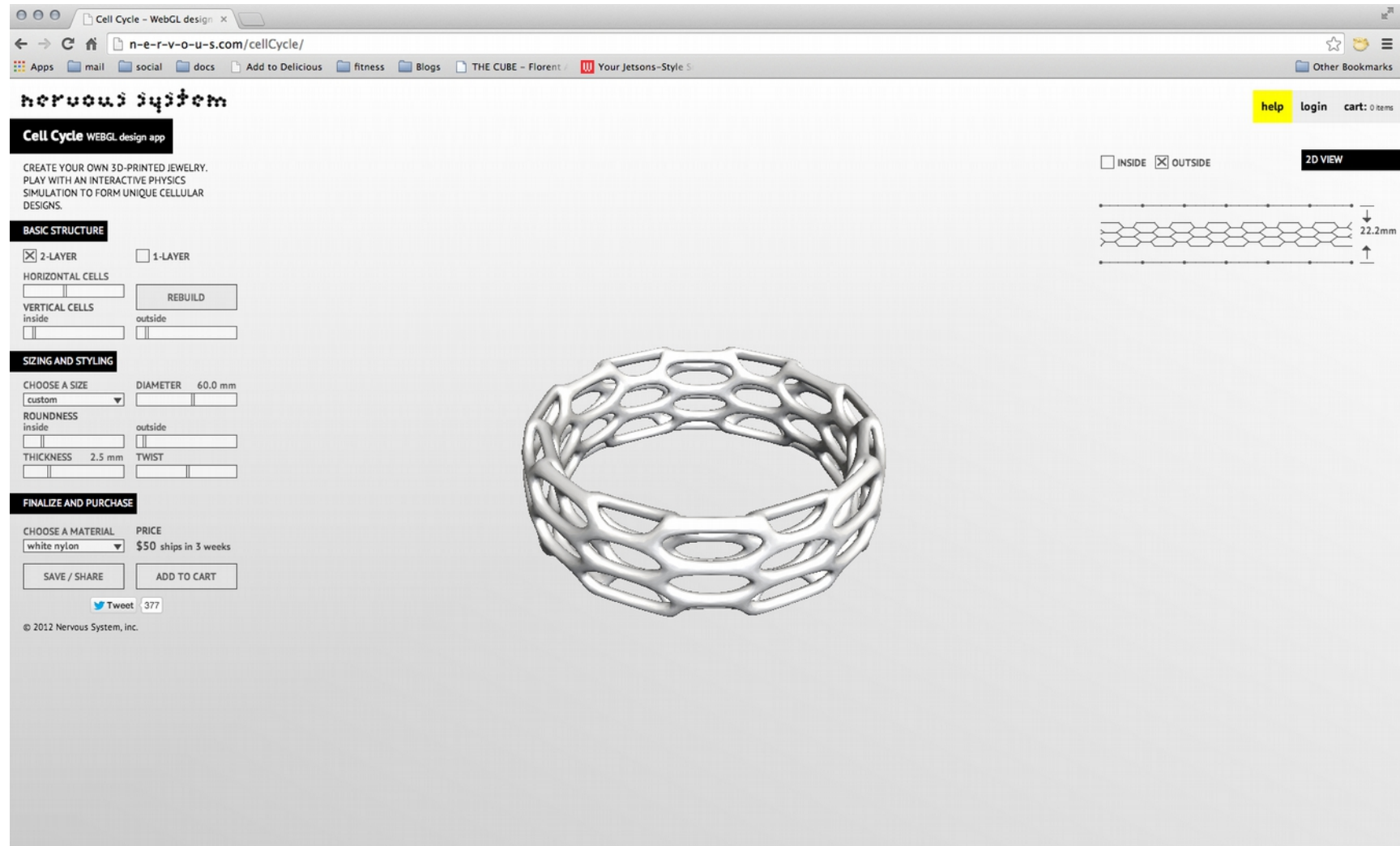




**TECHNOLOGY =
PEOPLE REMOVED**



Participation



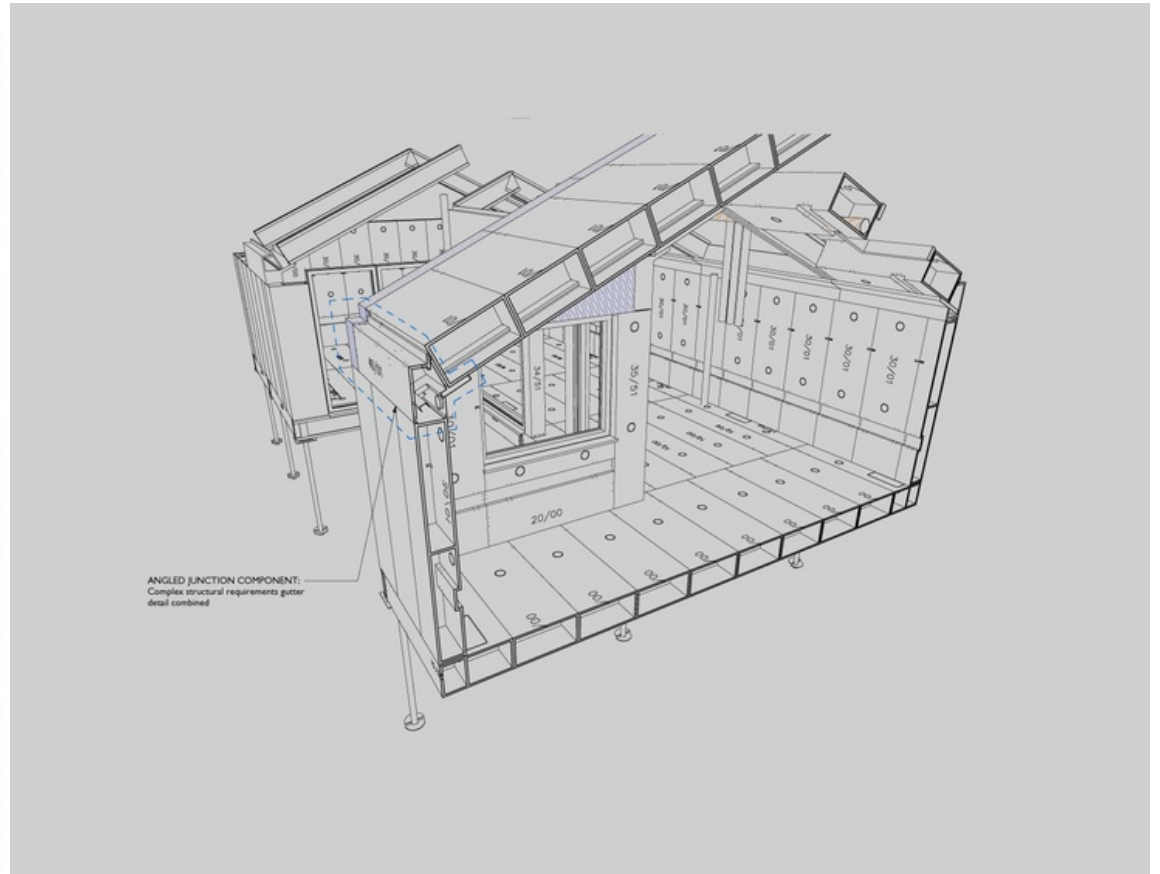
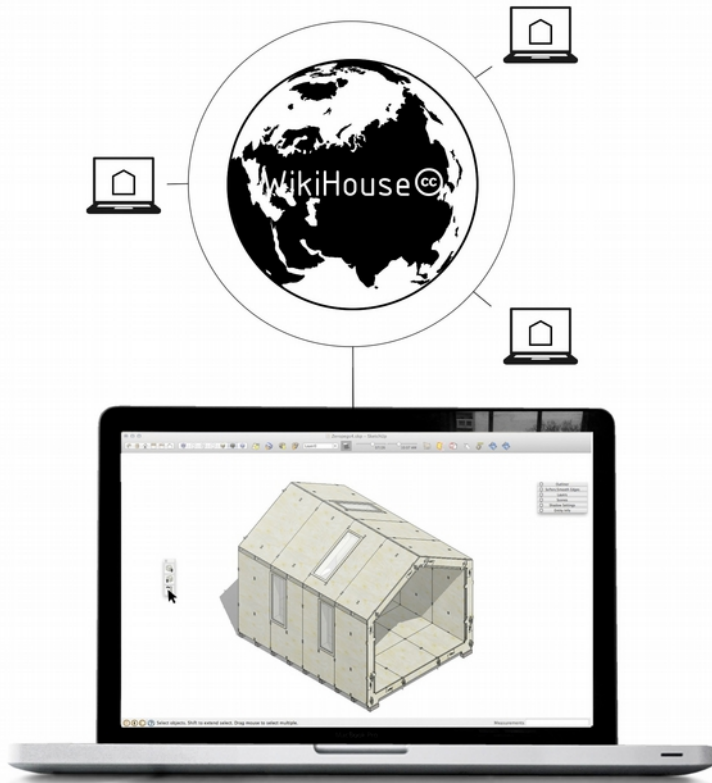
Courtesy of n-e-r-v-o-u-s system

Consolidation



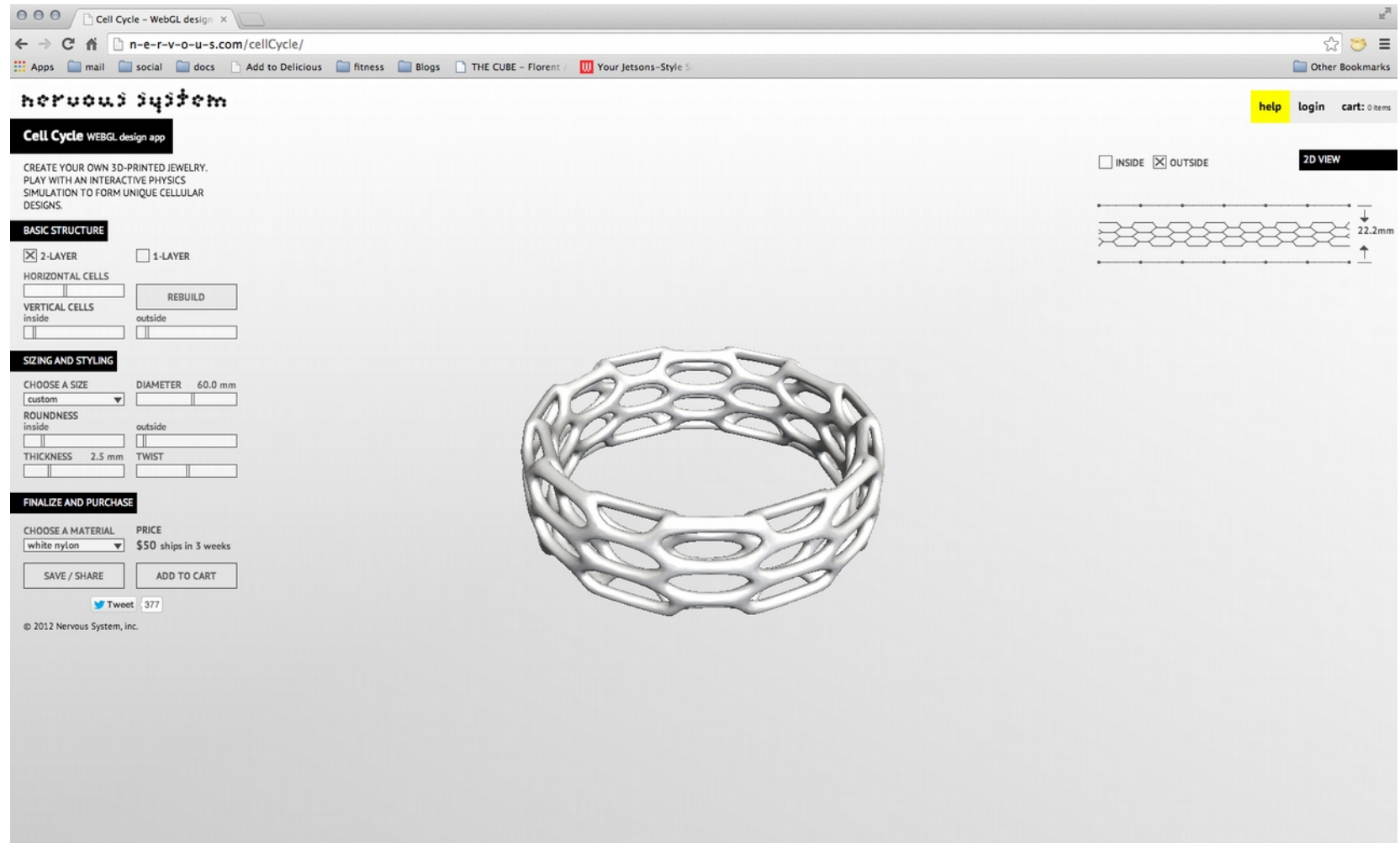
Courtesy of n-e-r-v-o-u-s system

Tech for people centred building



WikiHouse + Facit Homes
Community building + High quality building

If we want to go here...



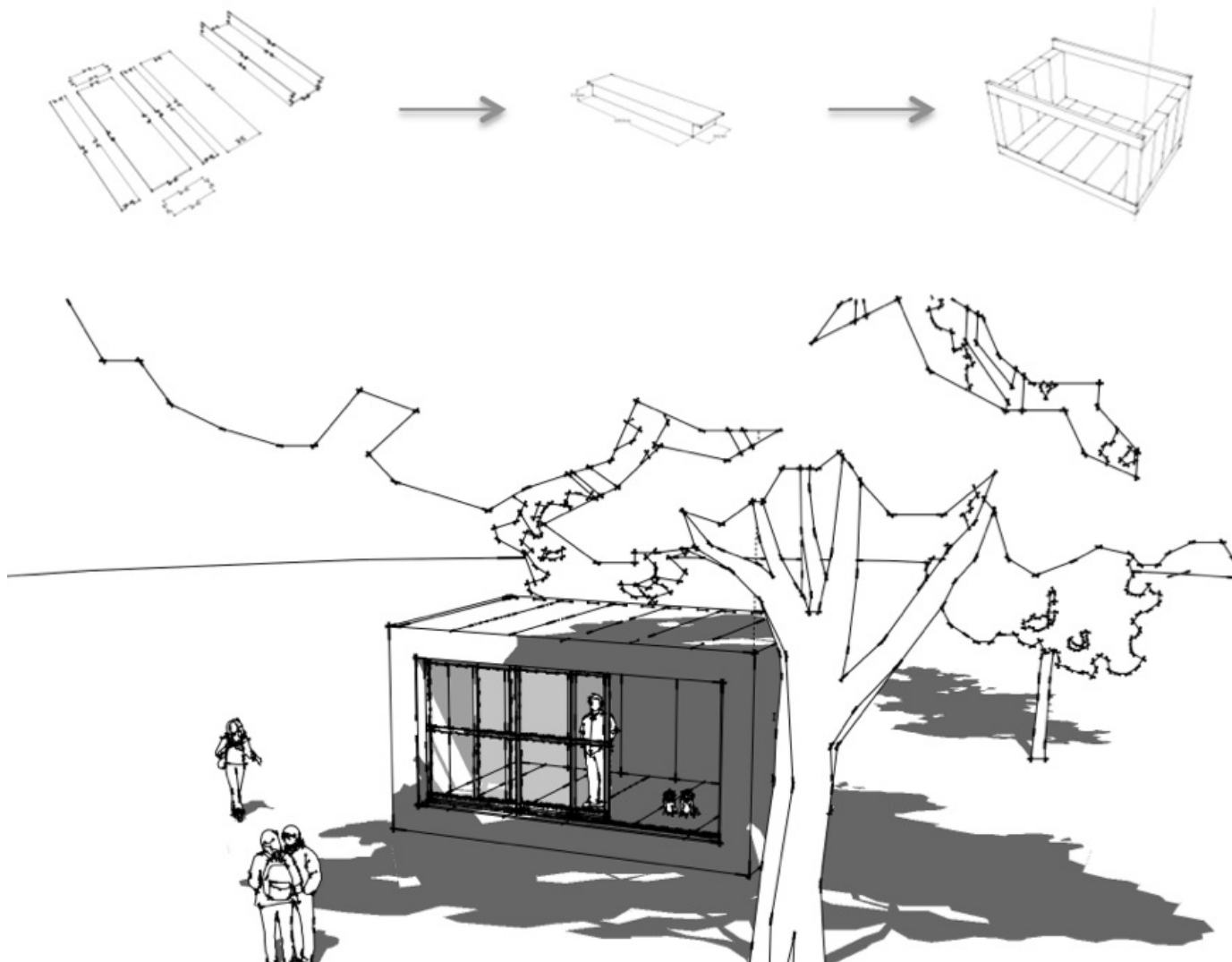
Technological implementation that
lowers threshold of time, cost and
skill for **designing + building**

Technological implementation that
lowers threshold of time, cost and
skill for **designing + building**

What are opportunities + obstacles?

EDFAB

Eco Digital FABrication



EDFAB - Construction

Floor, walls and ceiling made from close fitting 'box modules.'

Cut by high precision CNC machining.

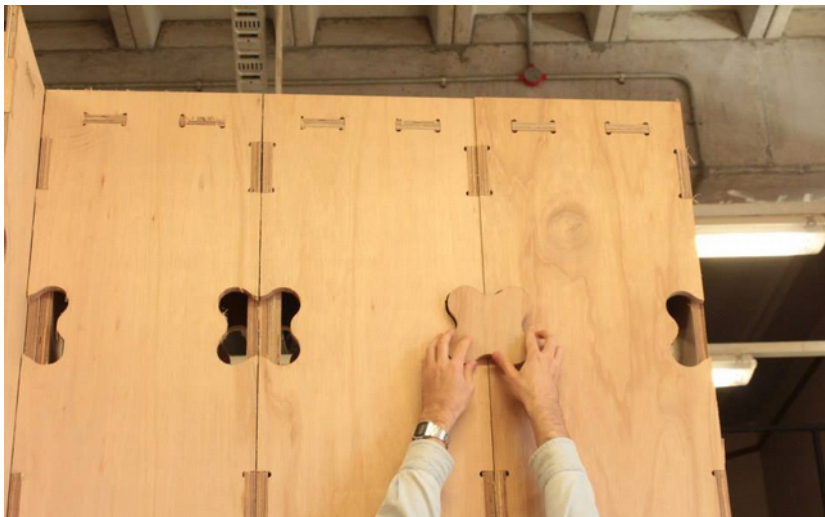
Fit together easily and accurately.



EDFAB - Construction

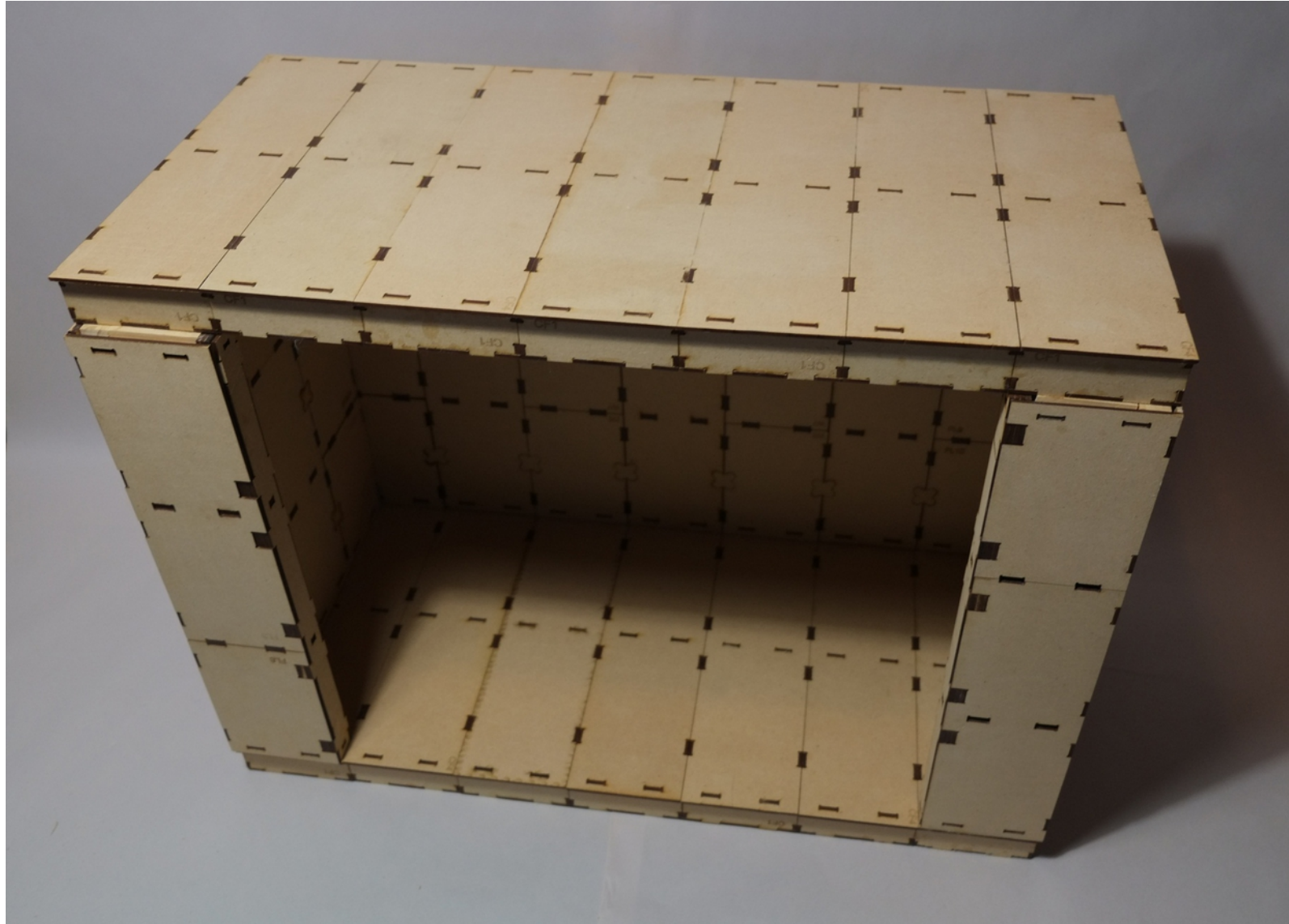
Modules are connected along edges with 'butterfly' cleats.

Does not requiring steel fixings.



EDFAB – Construction

Model of the ‘modules’ for the prototype building.



EDFAB - Construction



Top and bottom of wall modules share a common timber plate.

Aligns panels.

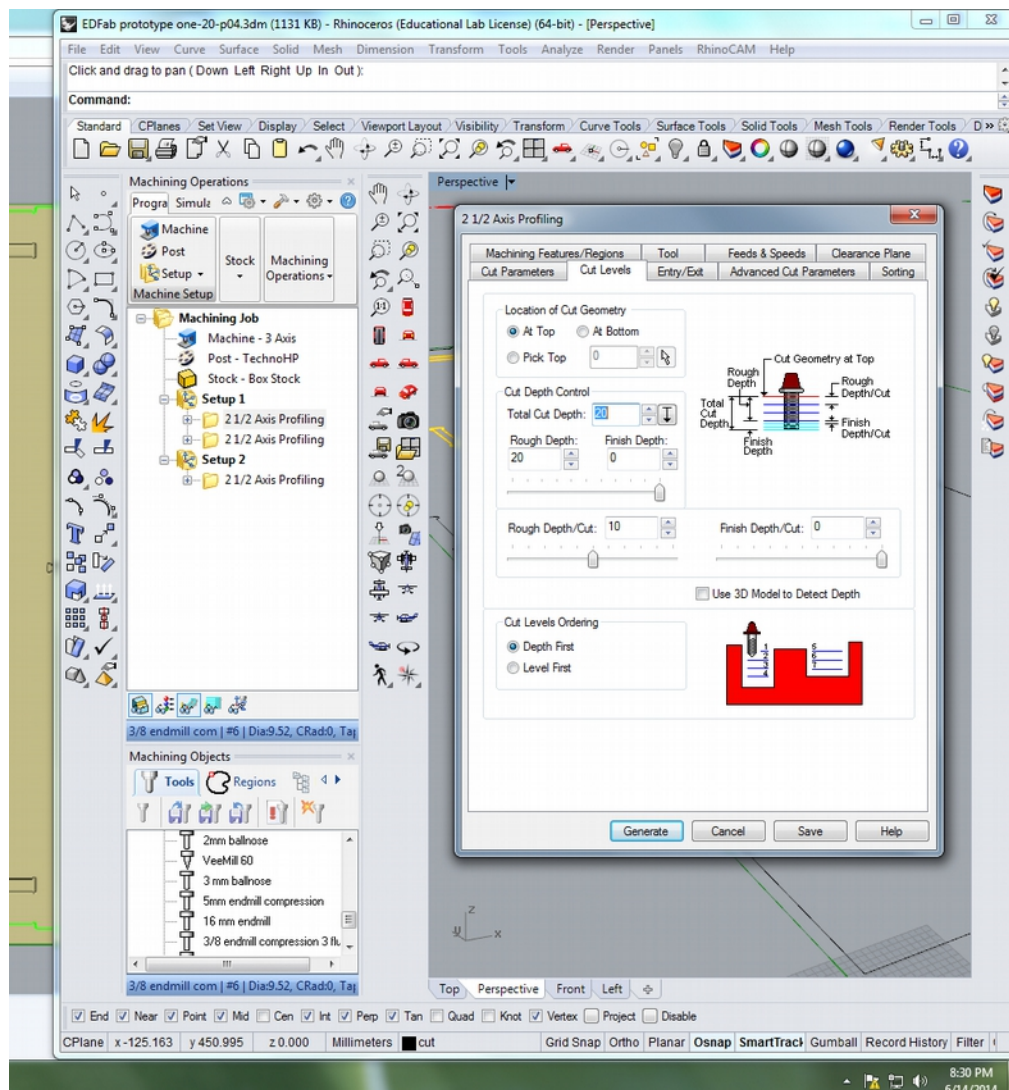
LH Image: shows bottom plate for wall panels.

Ends of roof and floor panels also have plates.

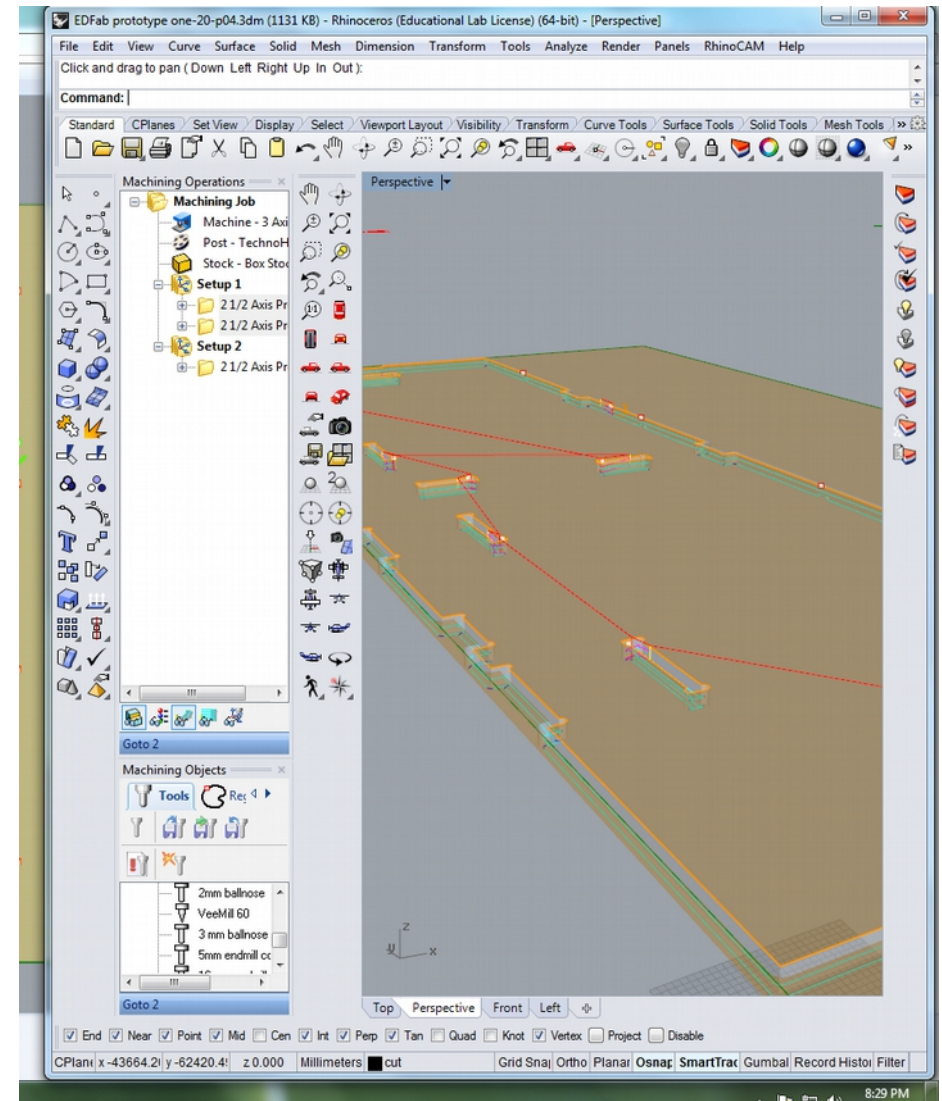


Arrangement showing end walls and associated floor and roof panels for the prototype building

Rhinocam software links the design and the CNC machine



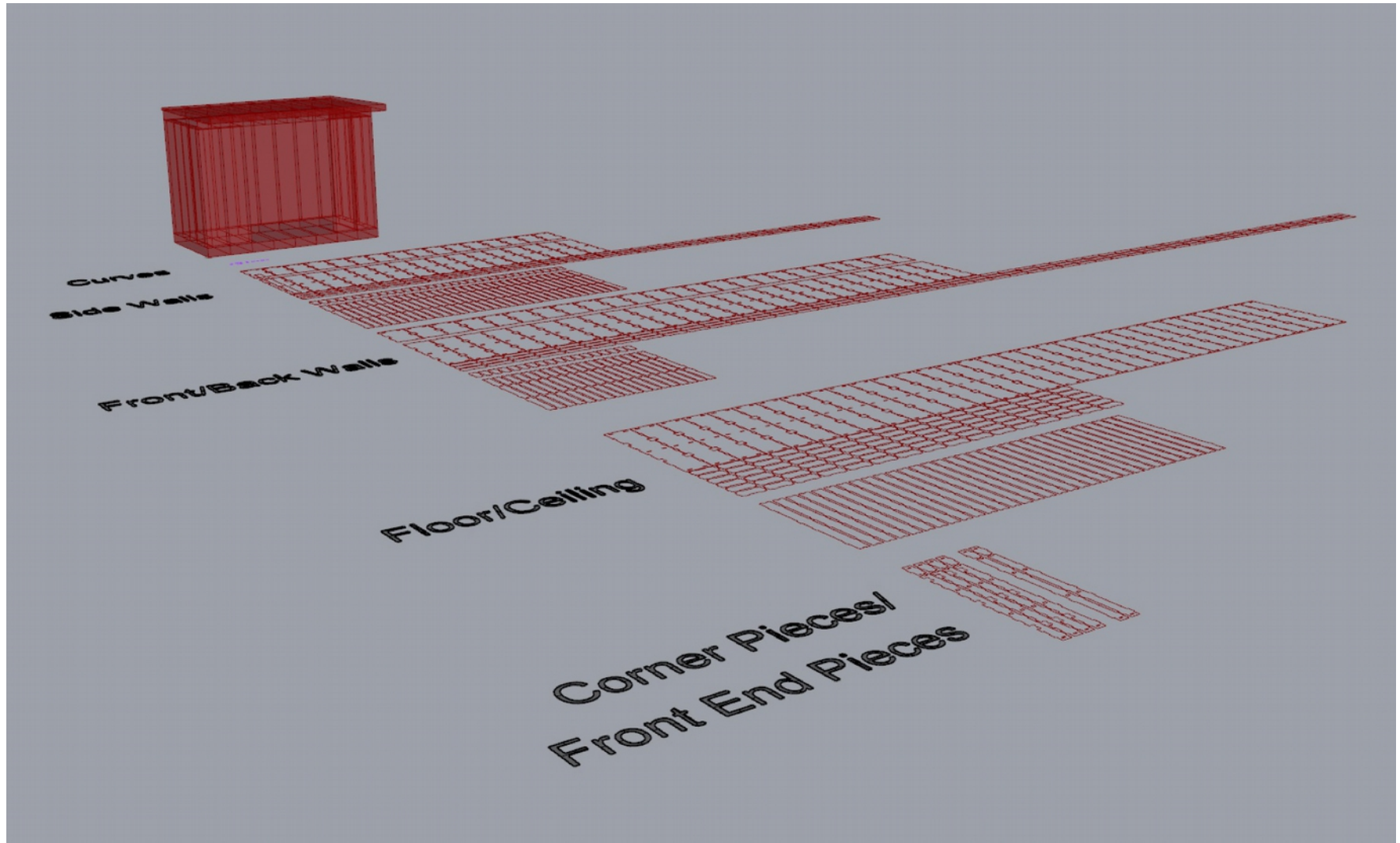
Rhinocam creates tool – paths for driving the overhead router on the CNC machine



EDFAB - Expert Interface

Building with Rhinos, Grasshoppers
and Spaghetti

Xi

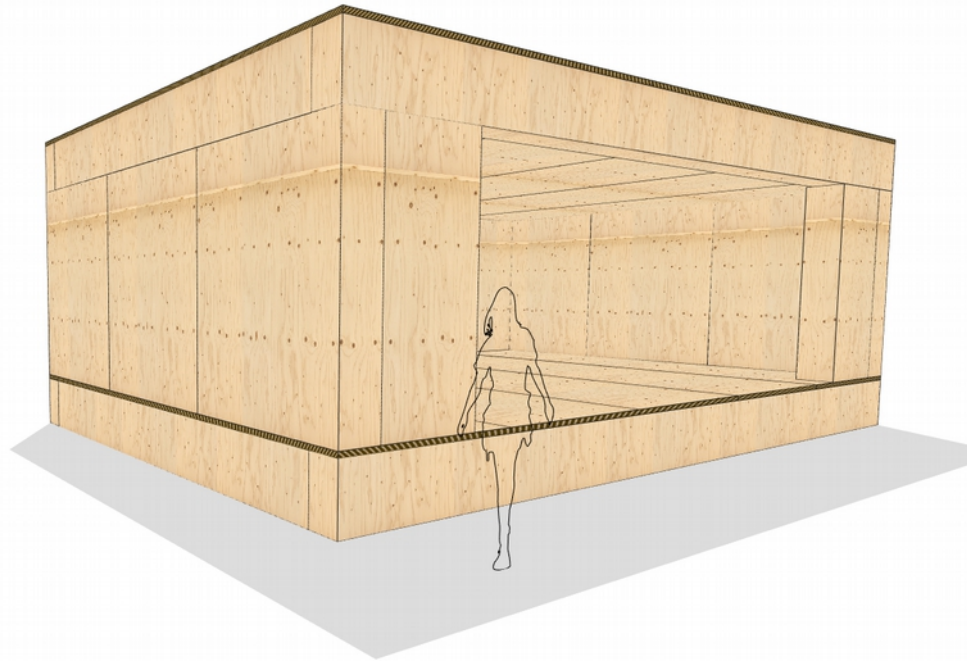
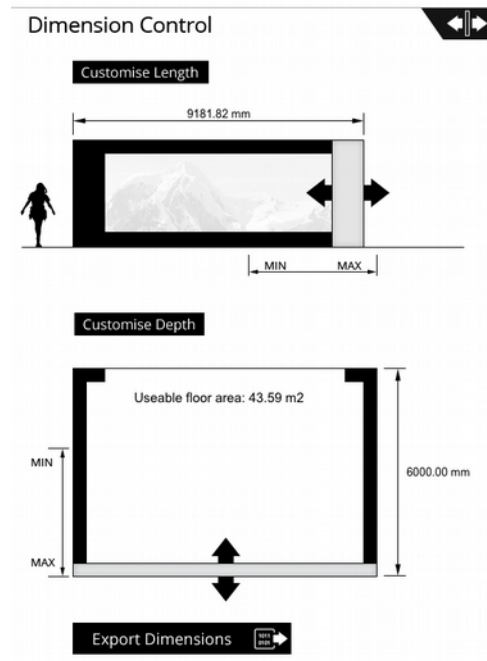


EDFAB Xi by Sindre Johnsen
Automatically creates parts for any sized unit

EDFAB – User Interface

// ED Fab

design . build . deliver

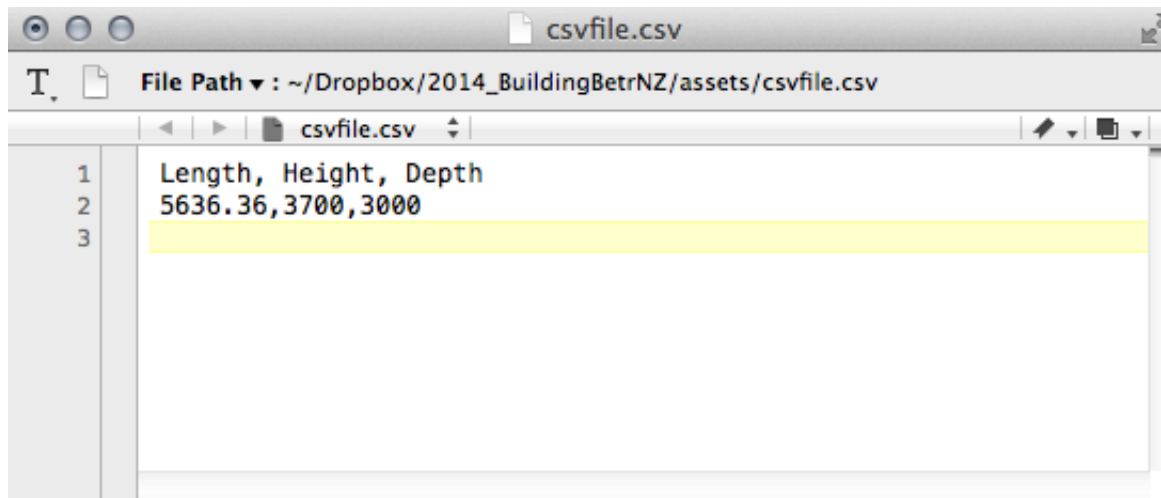


EDFAB app by Kent Van Velden
Structural requirements encoded
Cannot be altered to not conform to building code

Xchange + ecosystem

```
<?xml version="1.0" encoding="utf-8"?>
```

```
<dimensions length="8090.90918" height="3500"  
depth="4000"/>
```



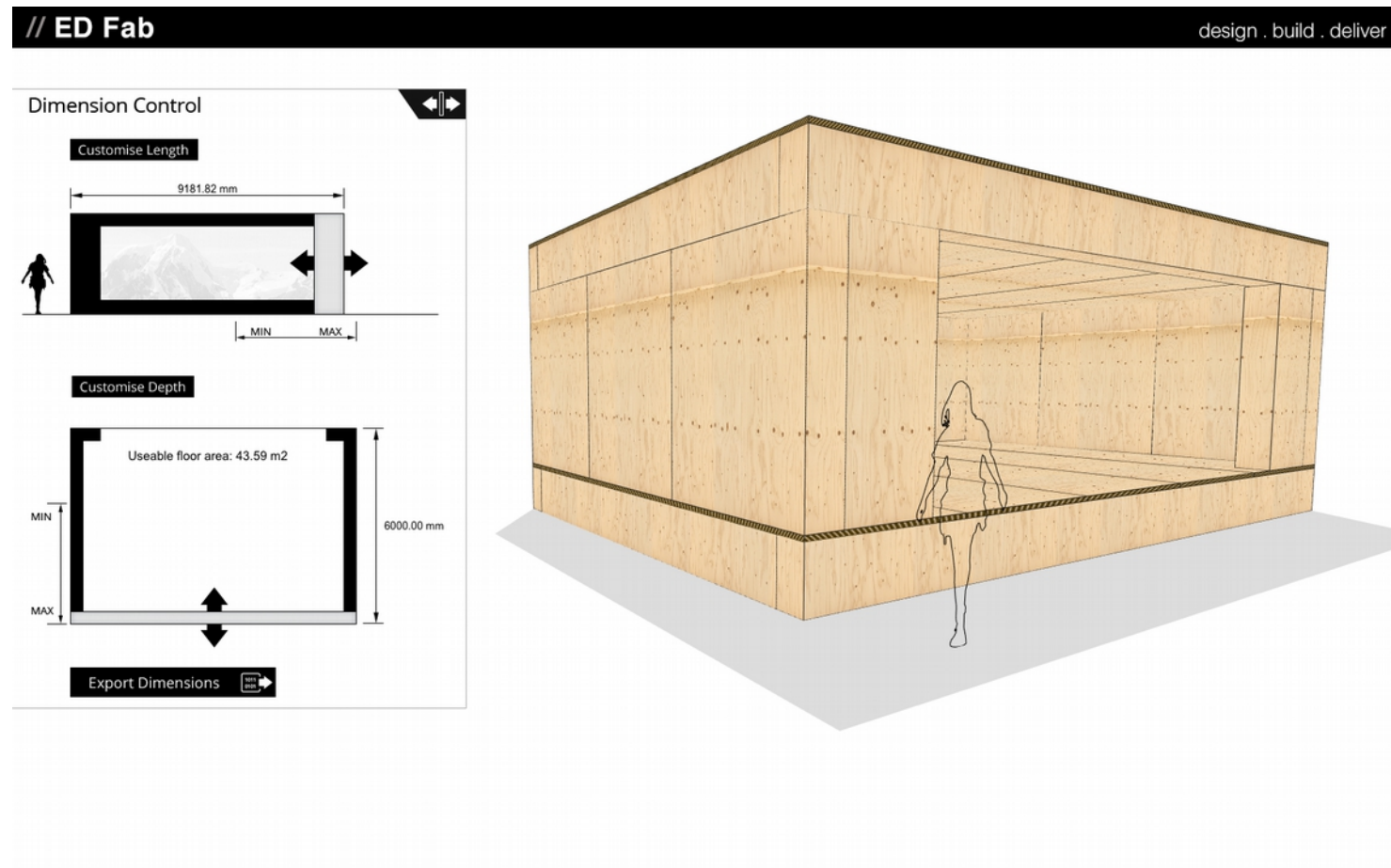
A screenshot of a text editor window titled 'csvfile.csv'. The window shows a CSV file with two rows. The first row contains the headers 'Length, Height, Depth'. The second row contains the values '5636.36, 3700, 3000'. The second row is highlighted in yellow. The file path is shown as '~/Dropbox/2014_BuildingBetrNZ/assets/csvfile.csv'.

	Length, Height, Depth
1	5636.36, 3700, 3000
2	
3	

EDFAB futures...

Online consenting

Building codes encoded for automatic checking.



EDFAB futures...

Relationship between on-off site assembly.

What can be factory off-site built and how does it relate to on-site building.



EDFAB futures...

Skills

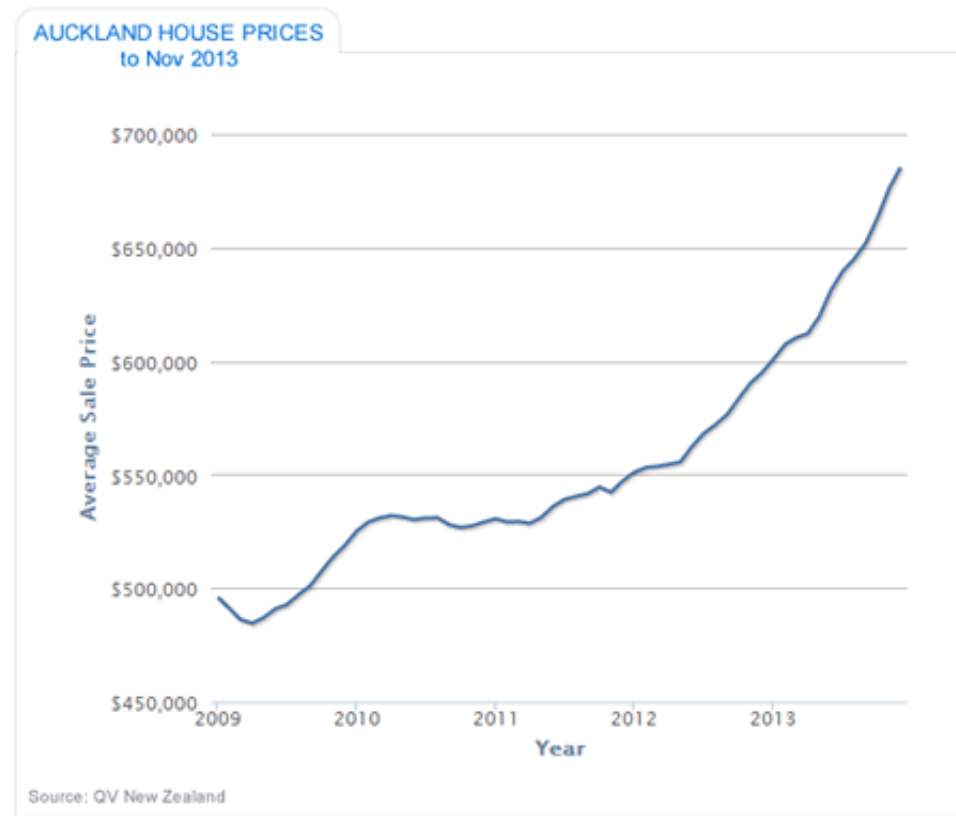
Skills are important, lower the threshold for on-site participation. Implications for labour costs.



EDFAB futures...

Home Ownership

Make designing/building unique high quality, healthy dwellings accessible to more than the 1%.



EDFAB

are

John Chapman, Dermott McMeel, Manfredo Manfredini and Yusef Patel [BRANZ PhD Scholar]
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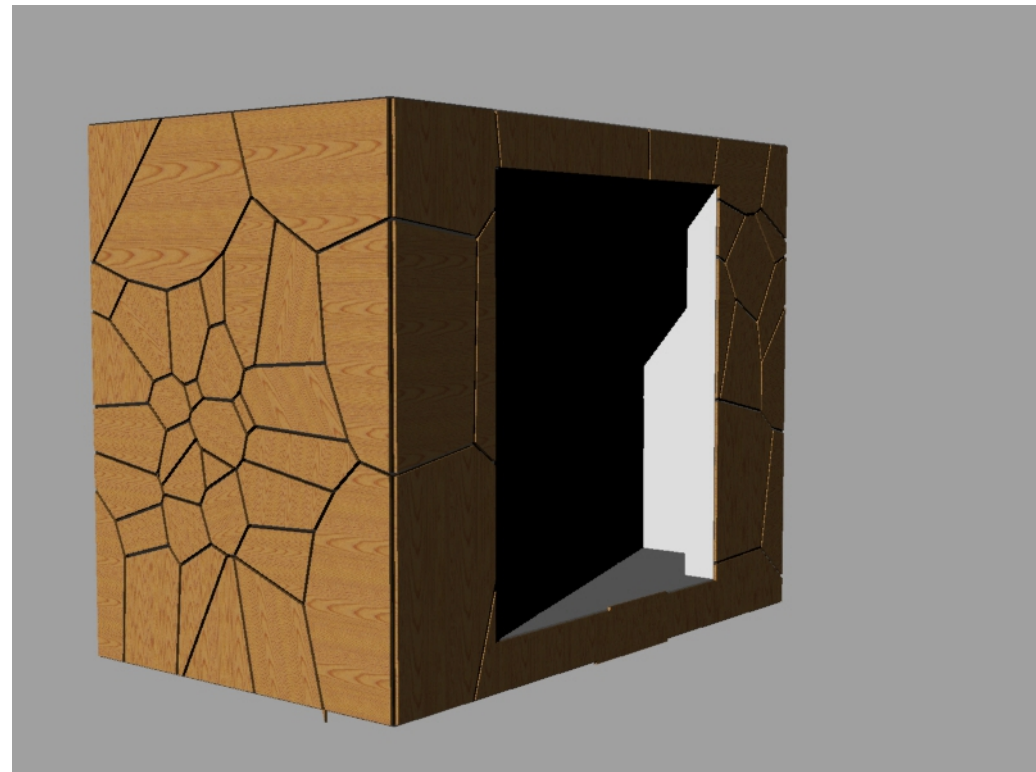
EDFAB is being constructed as part of
the Whau Arts Festival taking place in
Avondale 16 -19 October 2014

Come and join us building!

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Te Whare Wānanga o Tāmaki Makaurau