
Level 2 Surfboard Term 1 | Sam Whitley

Situation

- ❖ *throw away society*: an item that is needed to be thrown away instead of being fixed as it costs less to get new than fix. It is bad because there is a lot of waste left over, make it out of pre-used wood or something else

Waste design products



recycled wood
for tail stringer



use more
recycled wood
for a stringer



layers of thin wood glued together
to make the fins

leash plug drill
the centre of a
small piece of
wood



HAUORA



Spiritual:

- Goals achievement
- Buzz

Social:

- Participate with mates
- New friends

Mental:

- Dealing with hold downs
- Stress

Physical:

- Bronze
- Core
- Shoulder
- Stretching

surfing is good idea because it helps with the all of the aspects of hauora

Building Methods

Method	Complexity (fulltime)	Price	Availability	Skill	Aesthetics	Performance
EPS	1 Week	Foam 30 Glass 25 Parts 10	readily available	easy to build, difficult to shape	mainstream	light, unknown strength
COMP / SAND	1 Week	Foam 30 Wood 50+ Parts 10	some of the wood is hard to find,	similar^ only get on chance to vacuum bag	nice and natural wood is not everybodys cup of tea	light, durable, cruiser
Hess	2 Weeks	Wood 100+ Glass 25	cork, ceda, poplar, pine	quite difficult	V	great
Grain	1 Month	200	cedar not cheap	dif unless its kit	can look spectacular	bit heavy but boyant

I'm choosing the hess method as it looks real cool as i like the look of it

Primary And Secondary Stakeholders

Parents

Mates

Musta

Orewa College

secondary

primary

primary

secondary

we want something
that is safe and that
you are going to use

he wants us to make
something that is safe,
durable, that we use
it,

Surfer Ability

Skill: 1 / 10 never surfed before	weight: 62kg height: 1.78m	area: red beach/ orewa	motivation for surfing: i want to start to get fit in other ways than football	aesthetics: i like the look of the hess method,	transport limitation: dont have a drivers licence so i am not able to drive my self
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i am designing a hess board like the kunkle board which has already been designed

Key Components Hess

part	size	quantity	approximate cost
leash cup	25 mm	1	\$2
side wood	per sheet	1	free
cork	per square meter		\$30
fiberglass	a meter	4x	\$4
deck wood			free
gorilla glue		1or2	\$17
resin	a litre		\$18
poly/ foam	a sheet		\$30
approx cost			\$113

i will probably have to find some cheaper alternatives as it goes above the price list

Key Components

fin type	pros	cons
fcs-hex screws	might not lose your fin	damage to f/boy
futures- press fit	dont damage the board	could lose your fin
glass on	performs the best	trickier to do
ofsh press fit	no need for tools	could be easy to break
lock box		

fins

feature

thoughts

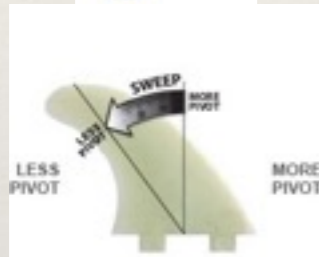
y/n



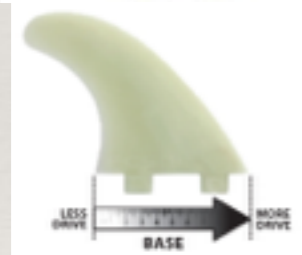
longer the fin more hold



thinner the fin more flex



more pivot helps with turning



the longer the length the more speed

- The longer the fin the more hold(grip), you want longer fins if you are wanting to go faster.
- Shorter fins means more skate like. and you don't go as fast.
- Thiner fins make it harder to turn, but it makes it more forgiving if you ride into the shore.
- stiffer fins make it more responsive so it is easier to turn.
- more pivot means more sweep, so it makes it much easier to turn as it is already on an angle
- base length = speed

Rails, Rocker and Contour

Rails

Down Rails: A rail coming to an edge at the bottom of the board

50/50: A description of the point where the bottom of the rail meets the top. This indicates the meeting point is in the middle of the rail.

Rocker

Nose Rocker: Similar to the front of a boat's hull, this is designed to keep you from digging into the bumps of the wave.

Tail Rocker: With more tail curve, the easier the board squats.

Contour

Concave Bottom: The purpose for this shape is to contain water flow through the length of the board rather than allowing the water to release from the rails

Flat bottom: The design is efficient for planing on top of the water.

basic brief

I am going to design a surf craft with following.

Attributes-it will have a fish tail. the type of rocker i will have is relaxed rocker. i will be making my own wooden leash plug and the graphics i will be having on it is plain with maybe a small logo at the chin area.

Specs- It must be able to support my weight 63kg. It must be suitable for my height 178 cm(5ft8). Comes in under budget <\$100. Should a dual fin configuration.

brief

I am going to design a surf board and will be using the hess method. It will be used by myself. I will take into consideration my surfing ability the hight and by measuring. Its dimensions are important because it might be to thin and could just sink. It could be built out of wood and cork. Durability will be a factor because i don't want to throw it away as soon as i get it finished. As for the buoyancy and performance, it will depend on how well it works and how it is made according to my highly developed design. Outline is a consideration because i it need to look good. Tail shape is a consideration because of the turning i will do. Fins are a consideration because it helps me with the speed i want to good. Valves are a consideration because if it water logs. Rails are a consideration because of how easy it is to turn. My Budget of \$120 is a consideration because we might not be able to get the best woods. My skill set during construction is a consideration because I'm not good at all as i haven't ever surfed before. Finally some of the aesthetic considerations I have are leaving it plan and maybe just adding a small logo.

term 2 design

sam whitley

Term 2 Gantt Chart

jobs term 2	1	2	3	4	5	6	7	8	9	10
finish getting the shape			■							
				■						
hollow out some of the rail			■							
				■						
make a curve shell					■					
					■					
glue the rail supports together						■	■	■	■	■
						■	■	■	■	■

Time i
thought it
would take

time taken

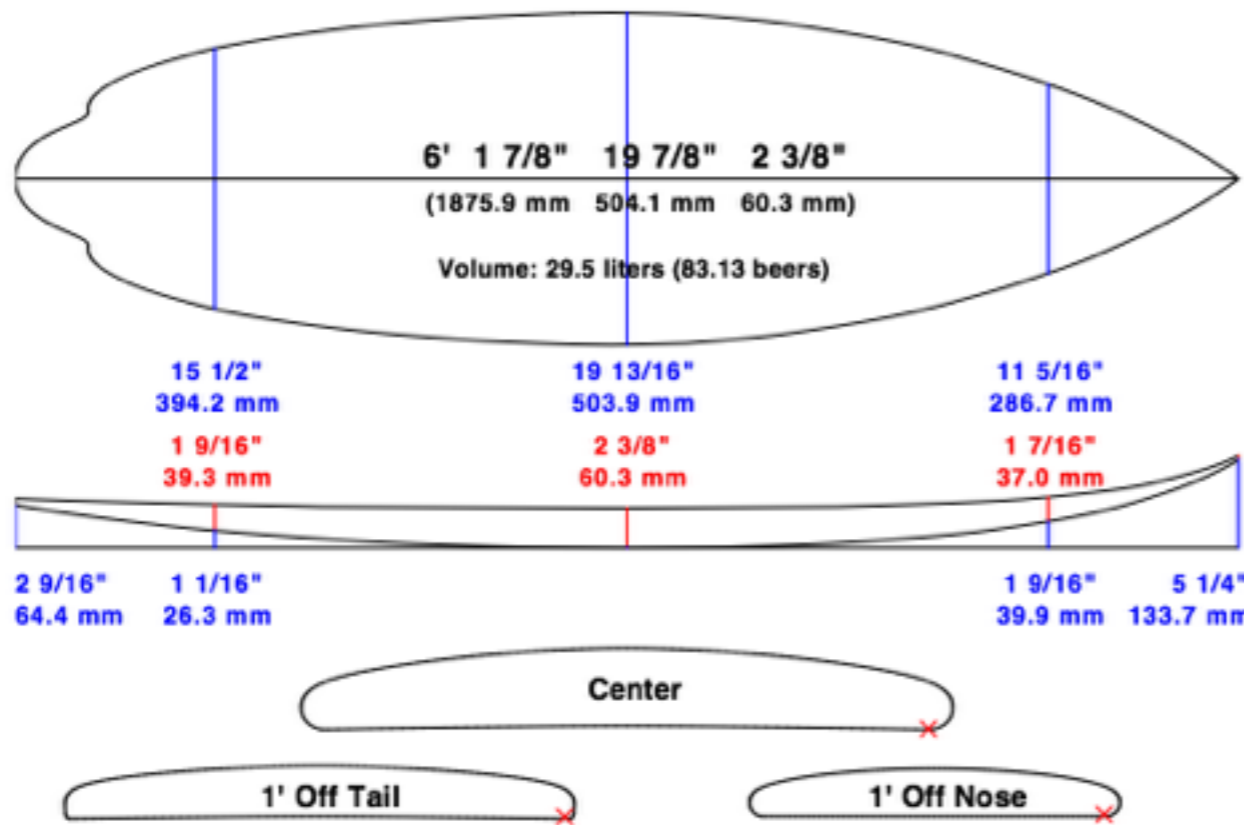
Broken Tail



Customer:
 Date: 7/05/2015
 Length: 6' 1 7/8" (1875.9)
 Width: 19 7/8" (504.1)
 Thickness: 2 3/8" (60.3)
 Tail Stop: 43 5/16" (1100.0)

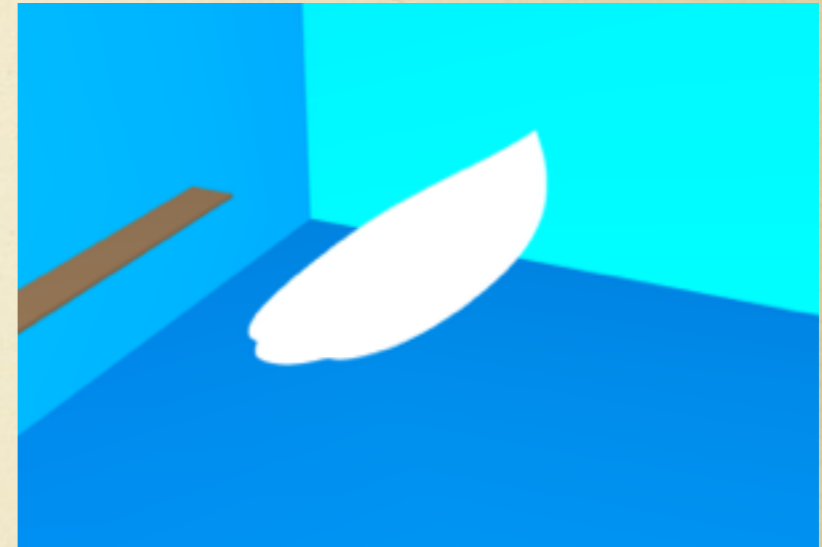
Designed by: AKU

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Measurements are center, one foot in and one foot back, over curve.

Comments:



broken tail: it looks like the tail has been squished back into the board. this board is the thinnest of the boards i have designed. this is also the shortest board i have design making it probably the lightest of the three.

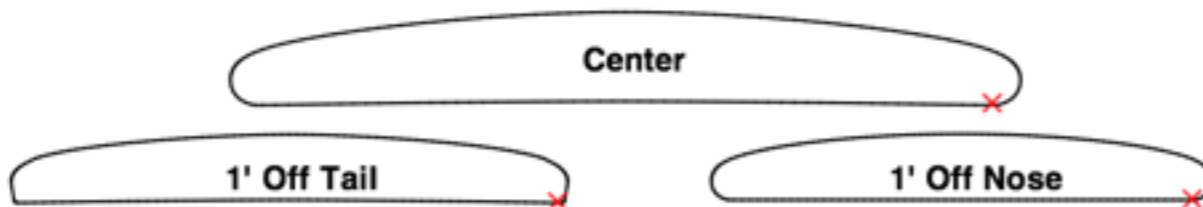
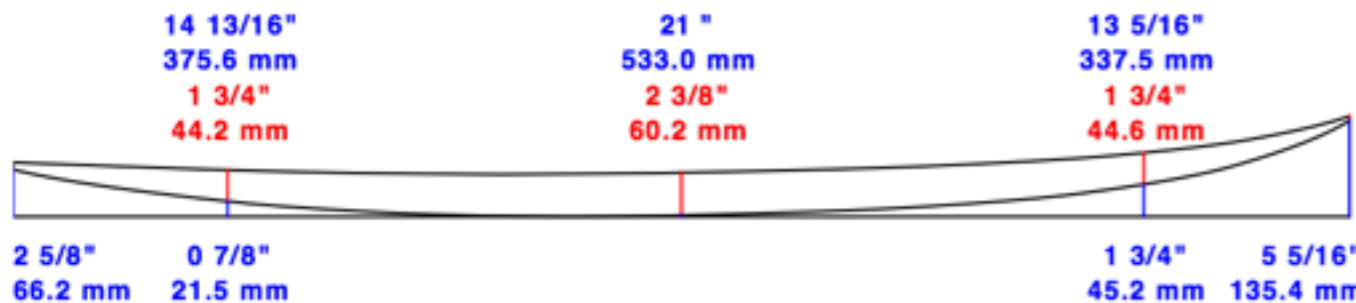
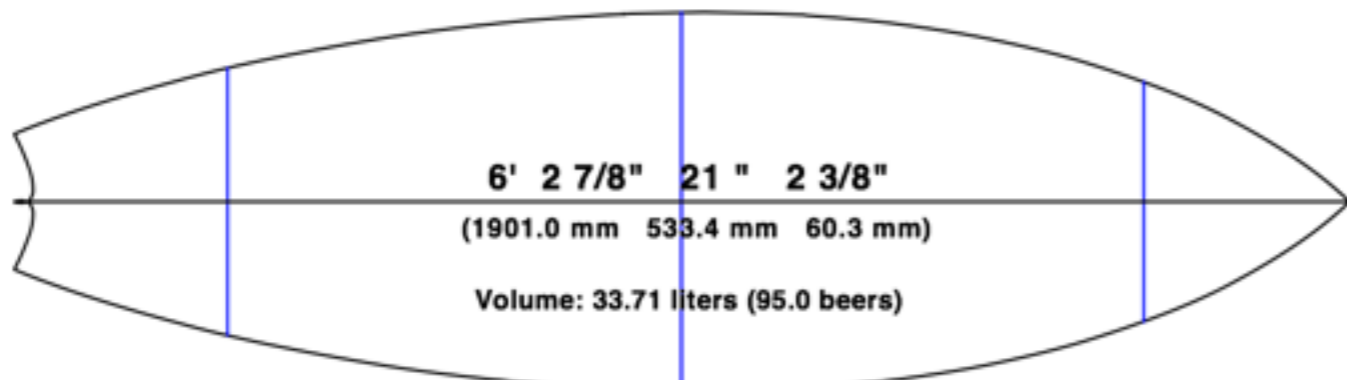
The Bat



Customer:
 Date: 5/05/2015
 Length: 6' 2 7/8" (1901.0)
 Width: 21" (533.4)
 Thickness: 2 3/8" (60.3)
 Tail Stop: 43 5/16" (1100.0)

Designed by: AKU

File:
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Measurements are center, one foot in and one foot back, over curve.



The Bat: this gets the name from its tail kind of looking like the bat man symbol. With a more egg shaped board and the second widest and also the longest board making it probably slightly lighter than el toro

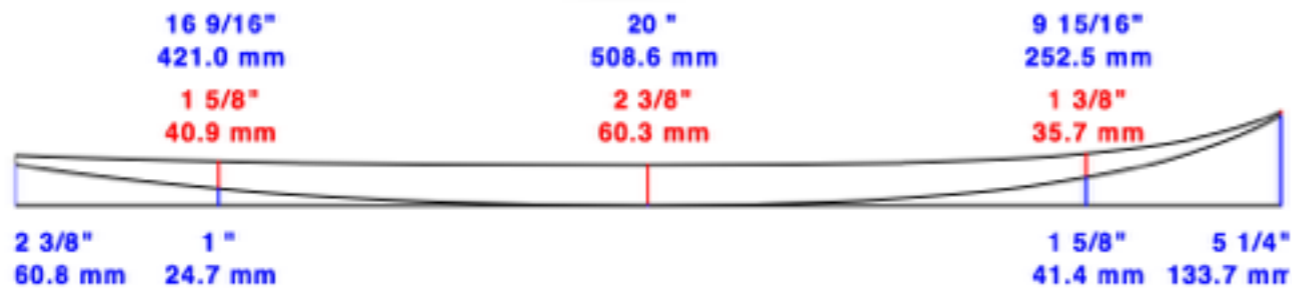
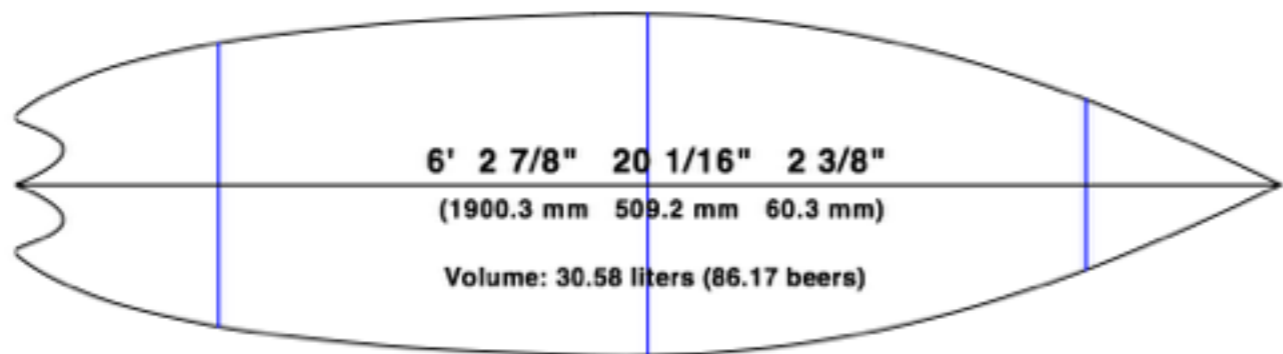
El Toro



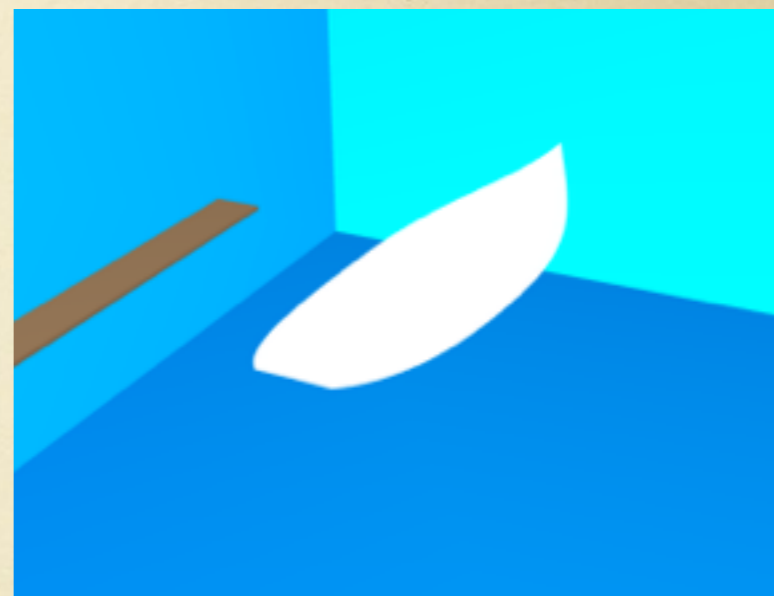
Customer:
 Date: 7/05/2015
 Length: 6' 2 7/8" (1900.3)
 Width: 20 1/16" (509.2)
 Thickness: 2 3/8" (60.3)
 Tail Stop: 43 5/16" (1100.0)

Designed by: AKU

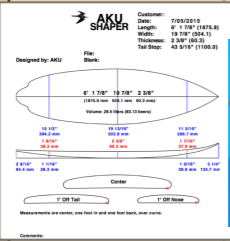

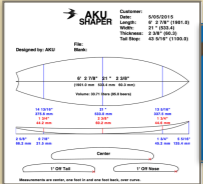

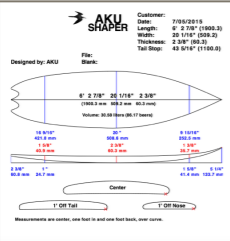

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Measurements are center, one foot in and one foot back, over curve.



El Toro: The tail looks kind of like the outline of bull horns so that's what has given it the name of .With a noticeably pointier nose, and the widest of my three concepts. making it most likely the heaviest of the 3

concept	working drawing	3d model	spec 1 Weight	spec 2 Height	spec 3 Budget	spec 4 Fin	spec 5 Transportable	spec 6 Fish tail	spec 7	spec 8	total
1 Broken Tail			5	7	7	2	9	0			30
The Bat			7	9	7	2	7	9			41
El Toro			9	9	7	2	7	9			43
Winner	el toro		3	2/3	1/2/3	1/2/3	1	2/3			3

Concept Summary

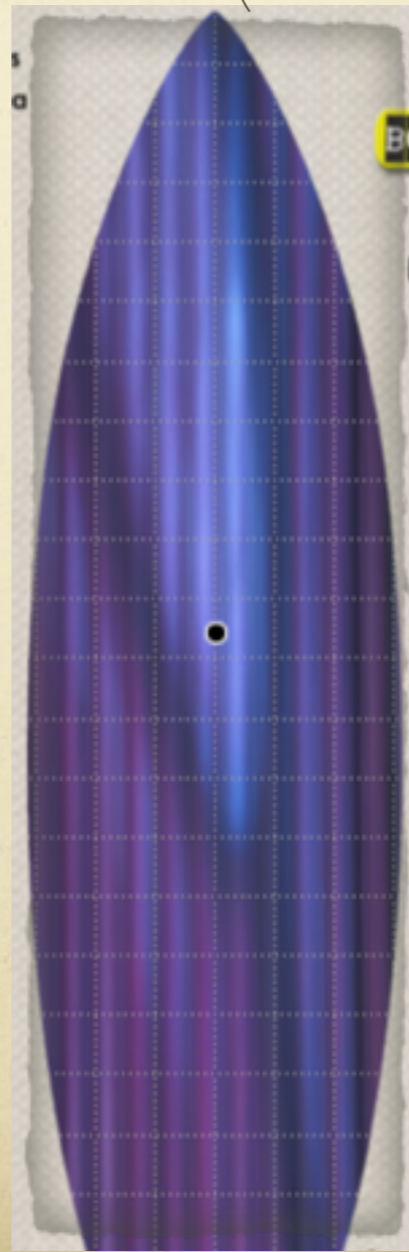
The board I will be doing is The Shield, it was not one of the three that i first design but i decided to continue working on the group board that we did not have time to finish because of it needing all the fine tuning to get it perfect.

design developments

Painted (tinted)



plain wood







plain wood
with pyro or
rice paper

Board Aesthetics Summary Table:

	<p>  </p> <p>  </p>	<p>  </p>	
<p>in</p>			<p>small logo 3/4 above the centre</p>
<p>class vote</p>			
<p>stakeholders vote</p>	<p>3rd</p>	<p>2nd</p>	<p>1st</p>
<p>comments</p>	<p>Im not to fond on painting the board up, although it does look good and i would consider do this kind, and its not masking any of the natural materials</p>	<p>I wouldn't mind just leaving it plain, as i think the natural look is pretty cool, as it is not hiding any any of the material.</p>	<p>I personally like the simple logo the best, it doesn't really mask any of the natural material , and it looks good and it will help me to start learn as I'm only a beginner.</p>

Board Aesthetics Summary Table:

	Images	Findings
Ricepaper		the rice paper looks the cleanest as it has been painted
Tints		
Stains		this is
Pyrography		the pyro is the other choice instead of doing rice paper.

body/fin template & Gluing Jig:

Outline - it was good because it was precise and accurate, so that it is symmetrical, it is easy to trace off of it, it saves time if you are making multiple boards, can refine the shape of the board, easy makes it easy fix if you cock up you're board as it puts in the lines for shaping.

Rail Press - it saves time so you don't have to shape the rails as much, it does take a lot of time and effort with getting it to the right shape of a board.

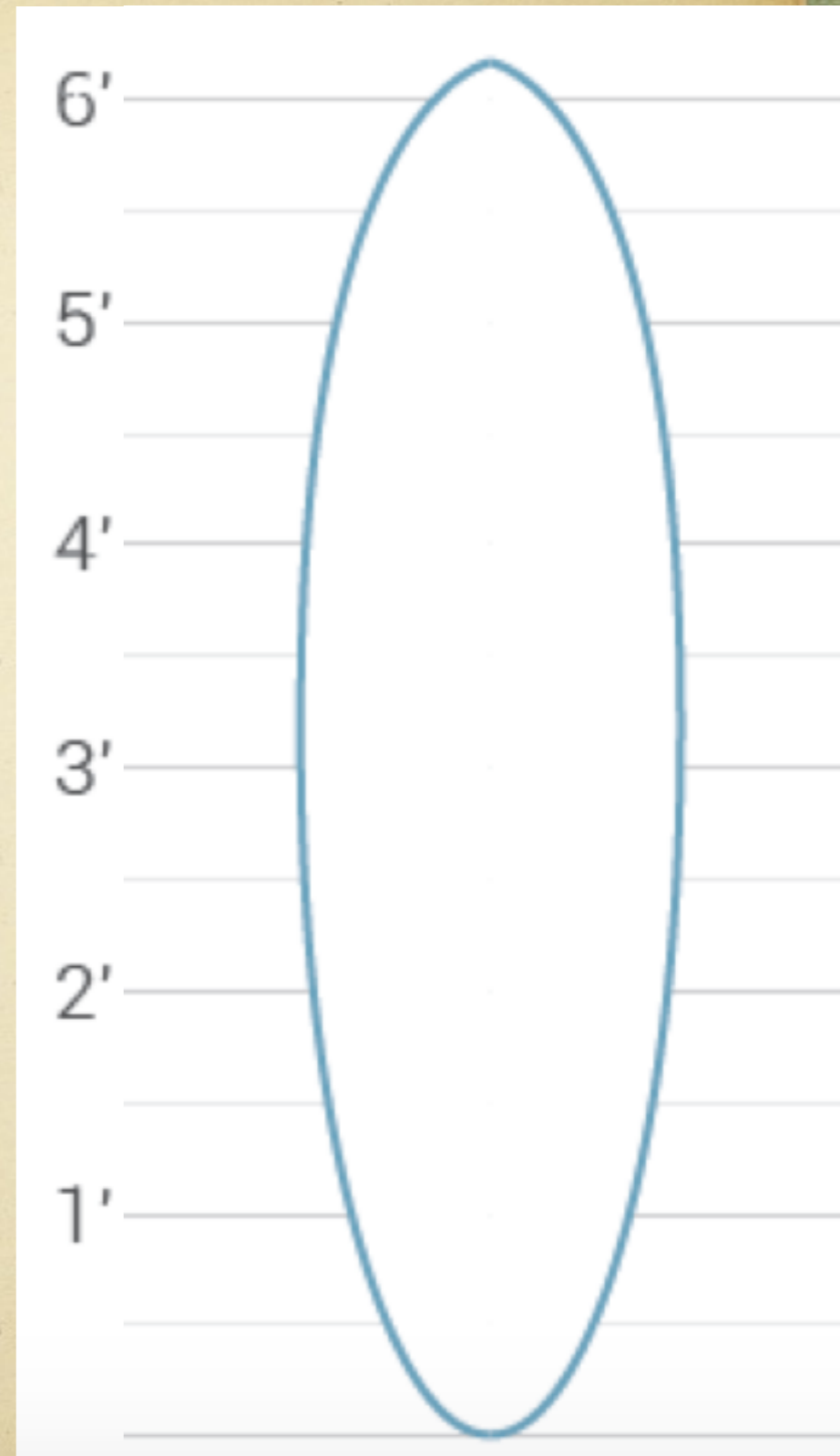
FCS Plug Template - so that we know how far apart the standardised plug is set up.

Fin Template - to ensure that the fin will fit into the plugs (standardising), foil template so that you know how far in you need to go each time.



Rail Template - so that we can get as much wood with out waste, so that it has some rocker before you stick it on the blank

scale drawing

I haven't used a scale drawing a because we started the board as a group, but i have been continuing trying to get it finished, i have also changed the board out line slightly by making the nose wider than it is on the scale drawing.



understanding of how my technological modelling supports risk management & decision-making

	Pic of model	Information gathered from modeling	Advantages	Disadvantages	How this supported my decision
concepts		I decided I want a plain wooden board with a small logo at chest high on the board.	It will help me to learn how to surf.	it takes away some of the natural look.	It has shown me that I need a small logo.
aku		I had to change my aku because of the limited shape of what the press was capable of.	I got an idea of what I had to look forward to.	I didn't get to have the shape of the board I wanted.	I had to change my mind about what I wanted.
model		It showed me what it would kind of look like.	I got an idea of what I had to look forward to.	I didn't get to have the shape of the board I wanted.	Helped me think of where i wanted the fins to go and how many i wanted.
fin template		types of fins to use	i can design my own fin	might break	i chosen to make my own keel fins (2)
outline		it showed me what shape i would have	i could see the length and general width of the board	it could be not what i wanted	i would see the shape of my board before its down

term 1 brief

I am going to design a hess surf board . It will be used by myself. I will take into consideration my surfing ability the hight and by measuring. Its dimensions are important because it might be to thin and could just sink. It could be built out of wood and cork. Durability will be a factor because i don't want to throw it away as soon as i get it finished. As for the buoyancy and performance, it will depend on how well it works and how it is made according to my highly developed design. Outline is a consideration because i it need to look good. Tail shape is a consideration because of the turning i will do. Fins are a consideration because it helps me with the speed i want to good. Valves are a consideration because if it water logs. Rails are a consideration because of how easy it is to turn. My Budget of \$120 is a consideration because we might not be able to get the best woods. My skill set during construction is a consideration because I'm not good at all as i haven't ever surfed before. Finally some of the aesthetic considerations I have are leaving it plan and maybe just adding a small logo.

term 2 brief

I am working on the same board that we started when we were working in groups, (hess method) the first new specification is the rails, they are going to be rounded until about half way which the start to become 90° so that i can turn cleanly and sharp. The second specification is the nose and i will have it rounded as thats what i have to work with because of the press shape that we used to make the rails. The third specification is going to be the tail of the board which will be semi pointy semi sharp because of the press we used to make the rails i am limited to the shape of the board, unless i want to cut of the end and add a solid piece of wood. The fourth specification is the number of fins and the type i will be using on my board, which is a dual fin set up and the type of fins i will be using is keel fins. The next specification is the design which it is a egg shape, and i would like to leave it plain so it looks more natural than other board types. another specification is the weight which it must be buoyant and light enough for me to surf it and it also must be able to withstand my weight. The eighth specification is the length of the board which is important as it needs to be able to keep me out of the water, and it do not have much choice in the length as it is been made to a specific size due to the rail press. The ninth specification is the type of materials i will use which is bamboo ply and cork. The last specification is making it good enough and leak proof so that it does not get water logged and sink when I'm taking it out for a surf.

term 3 course work

sam w

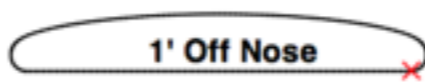
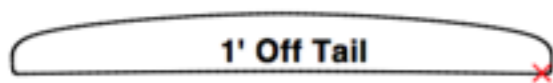
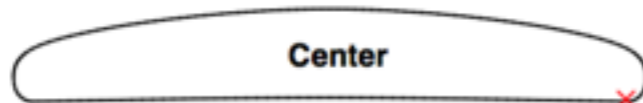
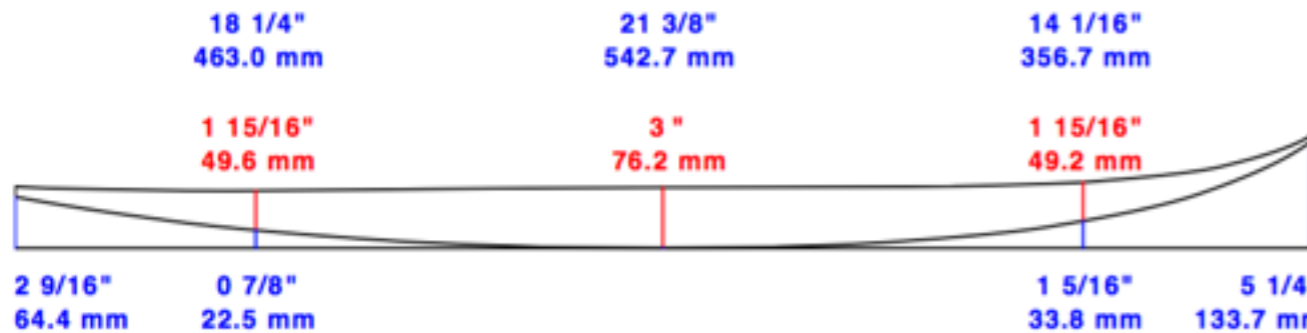
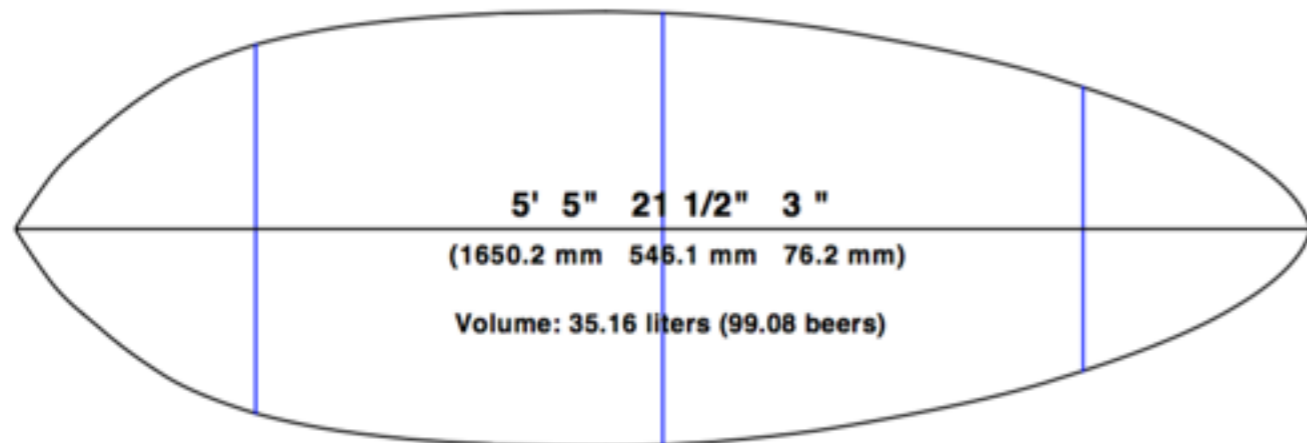
board construction- working drawing/plan



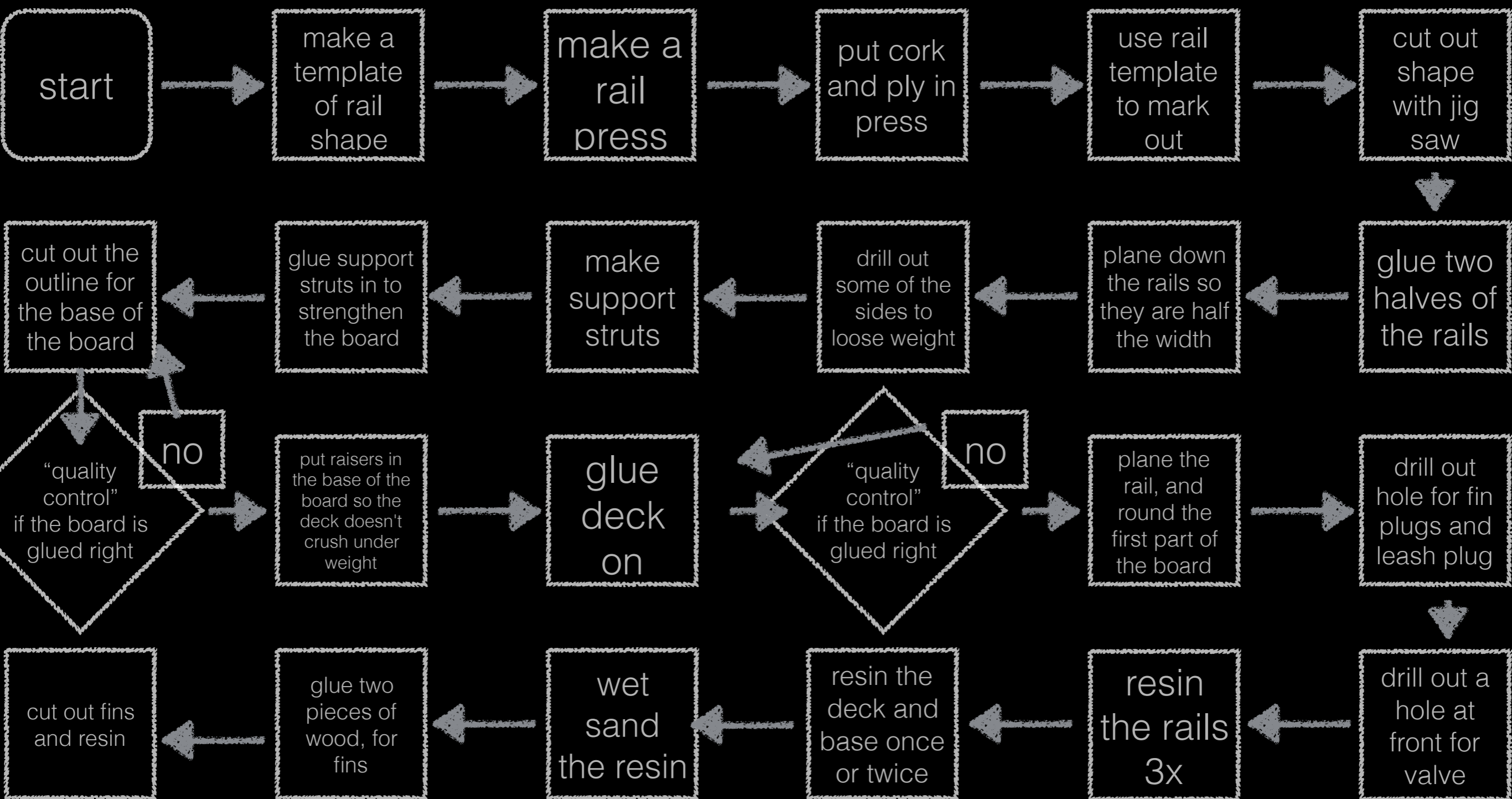
Customer:
 Date: 28/10/2015
 Length: 5' 5" (1650.2)
 Width: 21 1/2" (546.1)
 Thickness: 3" (76.2)
 Tail Stop: 43 5/16" (1100.0)

Designed by: AKU

File:
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my board construction - flow chat



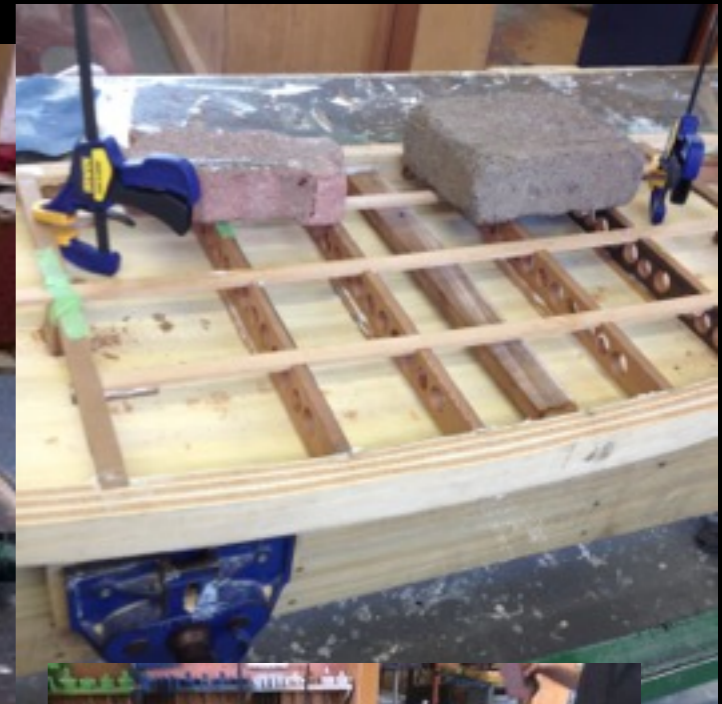
step by step

- make jig with a template of outline of a surf board (half). Harry, Graydon and i, all start the board but i had enough patents to finish it.
- put the materials in to jig to glue.
- use template to cut out the basic width.
- glue two halves together.
- plane the halves down so they aren't as high. this is when i started to do it by my self with help on the way.
- drill out the rails with the forstner bits.



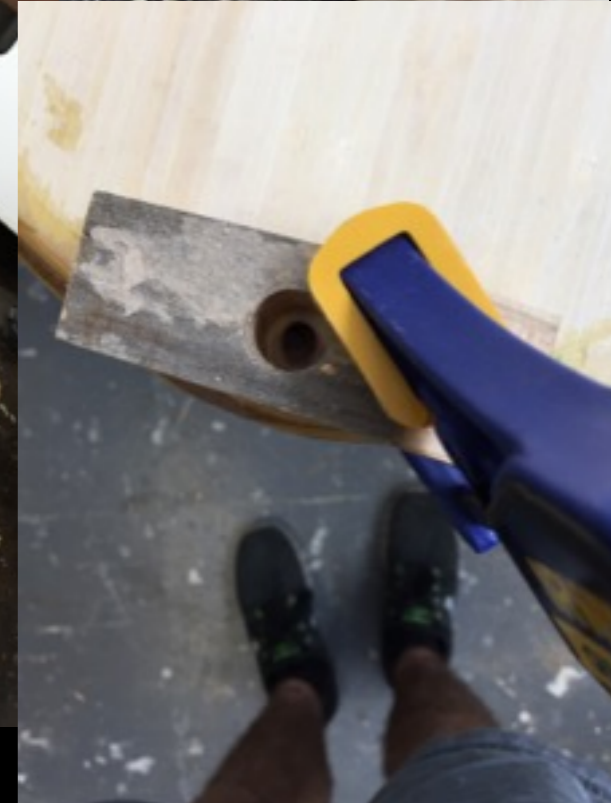
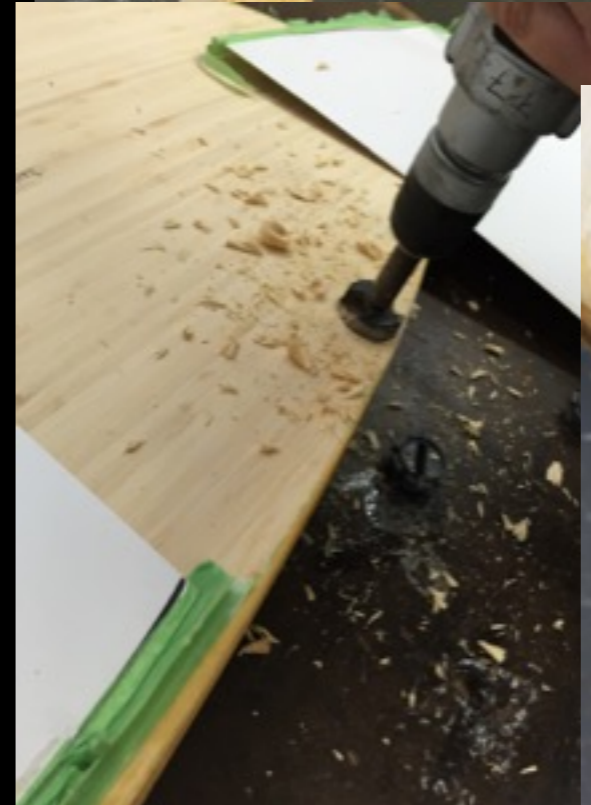
step by step

- glue base of the board on to the rail (bamboo ply). **make sure the line on the ply are going straight up or else it looks off.**
- cut the light wood out, for the support struts. then glue them in.
- glue the deck of base on the board



step by step

- plane the rails so that they are rounded.
- sand the rails so they are the right shape.
- drill out the fin plugs.
- drill out a hole at the front of the board for a valve so you can let out the air.



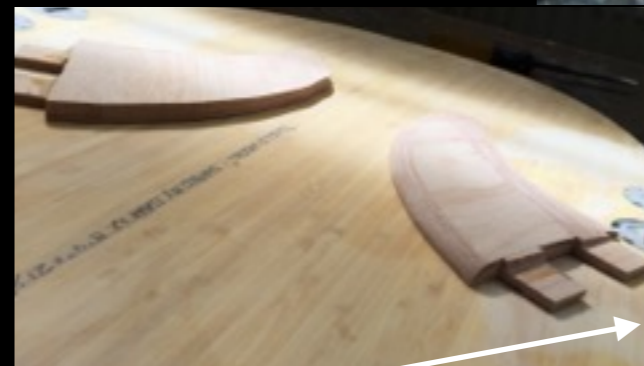
step by step

- glue in the plugs and valve.
- tape the rails and around the shape so i can resin the base.
- resin the rails and the deck/
base of the board.
- wet sand the resin so that you
get rid of the bumps and so its
nice and smooth.



step by step

- cut out the shape of fins on 4 pieces of ply.
- glue the two pieces of together so it has more thickness and it is easier to shape.
- use rasp on the fins to shape.
- sand the fins so they look nicer than just being rasped.



Step by step

- put fins in the fin box.
- take the board out for a shred.



Specialist Tools And Equipment

name of tool	jobs it did	reasons for use	safety precaution
forsener bit	hollowing out parts in the board to make it lighter	so that it can cut holes	glasses, check its in tightly
jig saw	cutting the outline of the rails before glueing them together	quicker and can cut bends	ear muffs glasses
drop saw	cutting the support struts inside of the board	pretty much instant	ear muffs glasses
thumb plane	starting the curve on the rails	cuts quicker than sandpaper but more precise than electric plane	glasses
table saw	cutting the width of the bamboo ply	pretty much does it instantly	ear muff glasses
electric plane	cutting the rails down to a lower hight	takes to long to do it by hand	ear muffs glasses
brush/roller	painting the resin on to the board	easier to spred the resin	jacket gloves
sand paper	rounding the rails and smoothing the resin	more precise than electric plane	dust mask
linblade	scraping off the bumps on the resin	a lot safer than a craft knife	hands behind the blade
vertical drill	drilling a hole in my brass to make a valve	easier with out moving	glasses ear muffs
masking tape	mark off the resining/ holding things in place for gluing	stoping the resin from making bubbles	none
grolla glue	strong glue that expand and makes strong bonds	it is strong and it expands so it covers the holes to stop water from getting in	overalls
spray bottle	to help the glue expand	helps the glue to expand	none
rasp	making it easier to sand the fins, because it rips the wood away	it rips threw the wood making it easy to shape fins	none
spoke shave	helped to cut the wood, cork from the rails	cuts threw the wood like a plane but you have your whole weight behind it	glasses

Faults With My Prototype

- Considering i continued the group board the centre line was not it the centre.
- There was dents in the rails from where the jig had more pressure in places that other points.
- The valve was glued shut so it didn't let air out (the whole purpose was of the valve would be pointless).

Refining/ Fixing My Prototype

- I had to re-find the centre line on the board because in the gluing stage (when we did it as a group) it wasn't glued up square.
- don't put glue in the hole for the valve put it around the outside so it doesn't stop the air from escaping or ventilating.

What would i do in the immediate future to my Prototype?

- i would make the jig to a better standard so that there was no pressure points (were there were dents in the rail)

What would i do in the distant future to my prototype?

- make sure the centre lines are always in the centre.
- don't glue the valve straight away. (make sure its clean)

Resources And Key Stages

key stages

- glueing the two rails together.
- glueing the top deck on.
- resining the board.
- making the fins (drawing the outline, cutting, shaping, resining).
- taking the board out for a float test



Testing In Context

As i do not know how to surf i only just put the board in to the water at red beach, it work as well as i could of hoped (it did not sink and it held my weight) this shows that i have succeed in making a prototype.

Final Brief

I am working on the same board that we started when we were working in groups, (hess method) the length of the 5'4" x21 1/2" x3", The first specification that i used was the rails. The second specification that i have used is the nose and i have rounded it because that was what the board we started as a group. The third specification is going to be the tail of the board which will be semi pointy semi sharp because of the press we used to make the rails i was limited to the shape of the board, unless i want to cut of the end and add a solid piece of wood. The fourth specification that i used for my board is the number of fins and the type i of fins have tried using on my board, which is a dual fin set up and the type of fins i have used are keel fins. The next specification is the design/ Aesthetic of the board which it is a egg shape, and i have left it plain so it looks more natural than other board types. The eighth specification is the length of the board which is important as it needs to be able to keep me out of the water, and i did not have much choice in the length as it is been made to a specific size due to the rail press. The ninth specification is the type of materials i will have used which is bamboo ply and cork and some cedar. The last specification is that i made it at a good enough quality so that it doesn't crack, break, become water logged.

Final Photos

