CARSON SCHWAB

INDUSTRIAL DESIGN
PORTFOLIO

RECYCLING ROVER

This rover is the first step toward a fully automated recycling system for cities. Metadata collection is integral to improving the failing US recycling system.

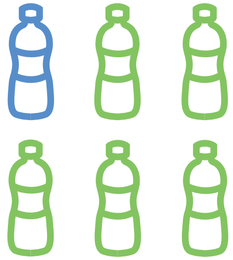
RESEARCH

- The US uses a single-stream recycling system (factories sort materials). This reduces system efficiency.

- Germany uses a multi-stream system (materials sorted prior to disposal). This reduces waste sent to the landfill.

- Lack of feedback prevents recyclers from knowing if they have properly recycled their materials.

People don't know what they should and shouldn't recycle.

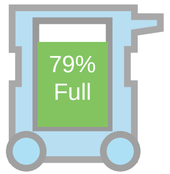


"Recycling factories discard 1 in 6 items" - David Steiner (CEO of Waste Management)

75% of U.S. waste is recyclable, however, only 21% is recycled.

METADATA NEEDS

Pick-up Map

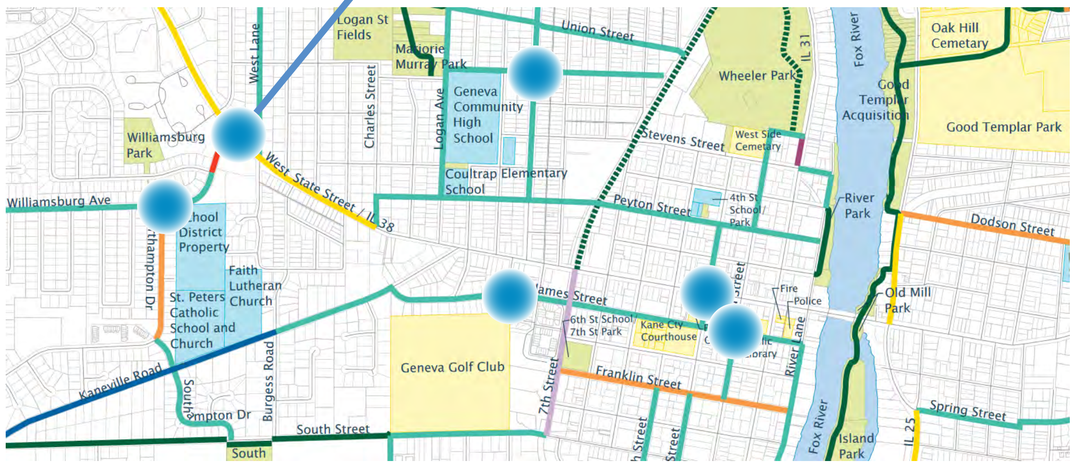


Plastic - 79% full

Paper - 88% full

Metal - 43% full

Glass - 23% full

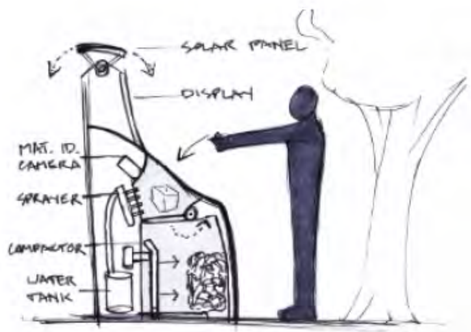


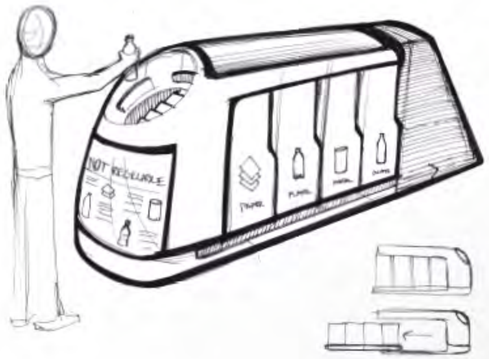
Users- Get feedback on recycling habits

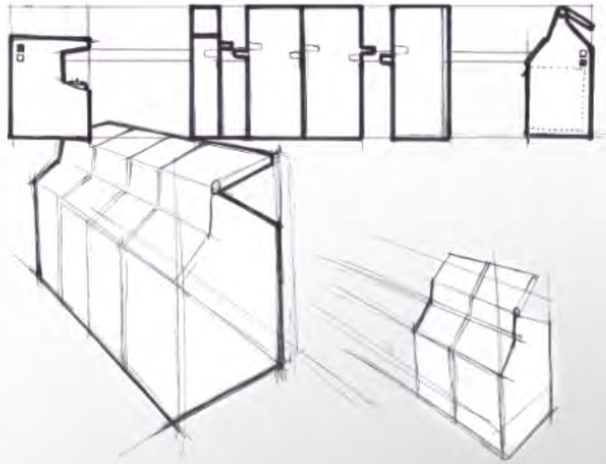
City- See what areas need to be serviced

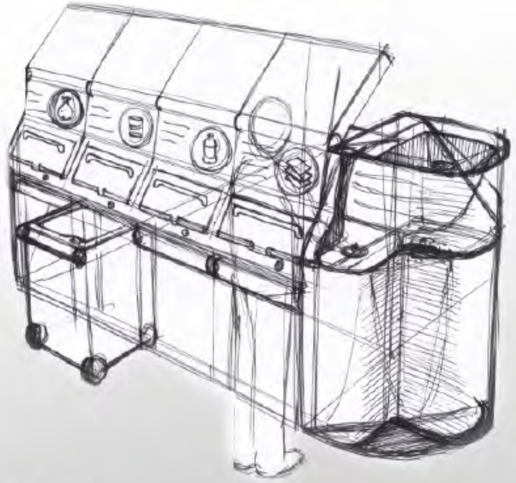
Factory- Sees what areas produce what

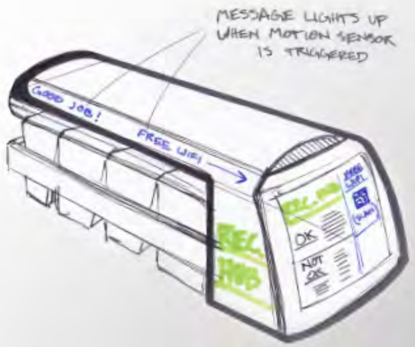
PROCESS

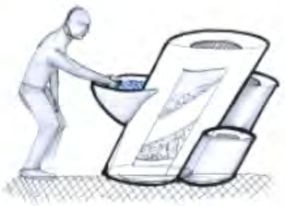

SOLAR PANEL
DISPLAY
MAT. ID. CAMERA
SPRAYER
COMPACTOR
WATER TANK

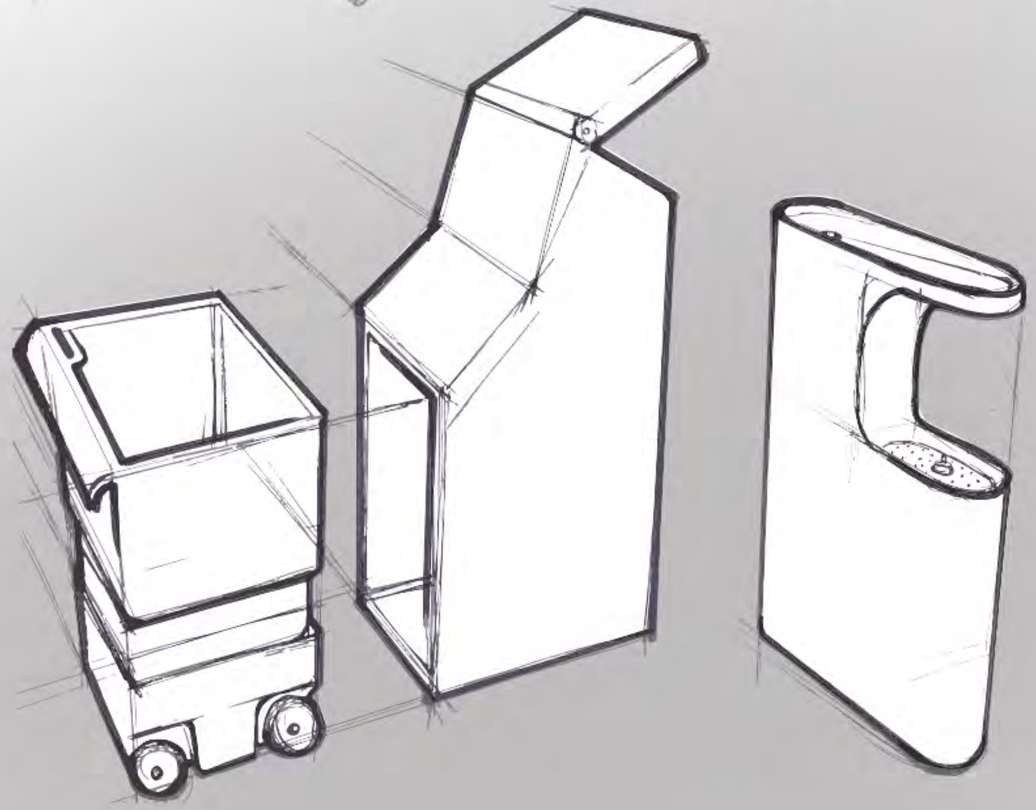

NOT RECYCLABLE

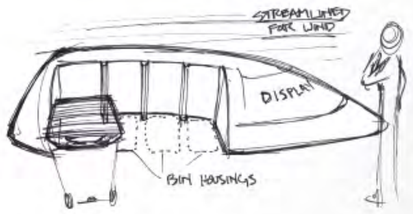




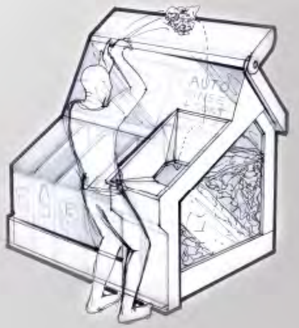

MESSAGE LIGHTS UP WHEN MOTION SENSOR IS TRIGGERED
GOOD JOB!
FREE WIFI
OK
NOT OK



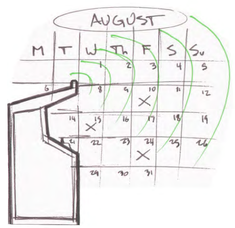



STREAMLINED FOR WIND
DISPLAY
BIN HOUSINGS

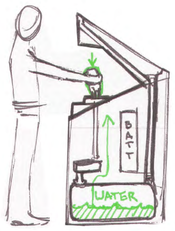

SORT YOUR WASTE!



HOW IT WORKS



Wifi route GPS bins

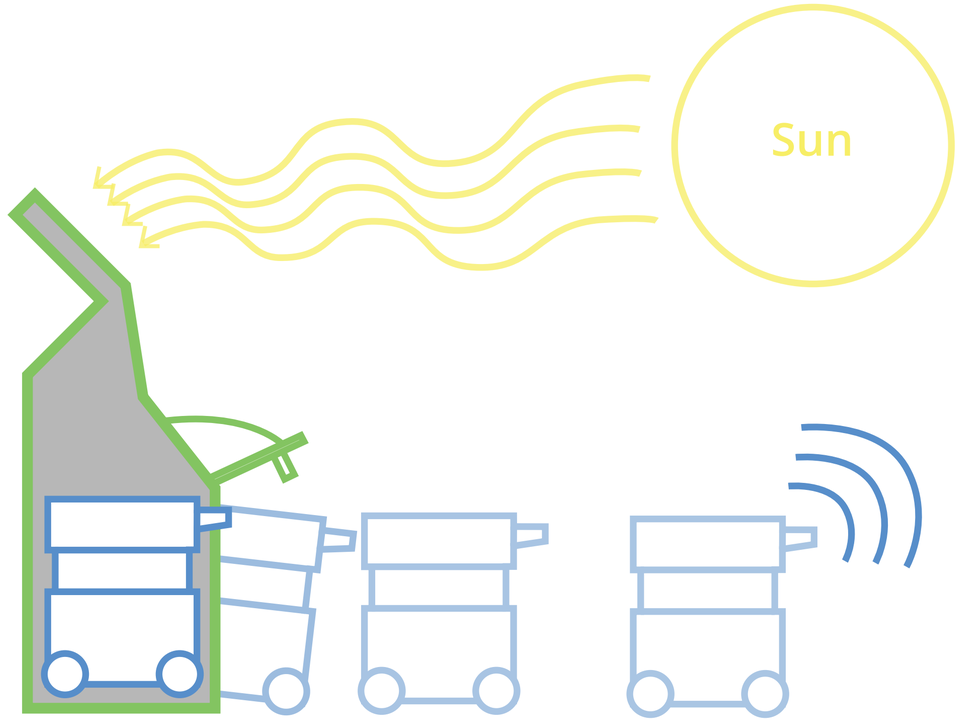


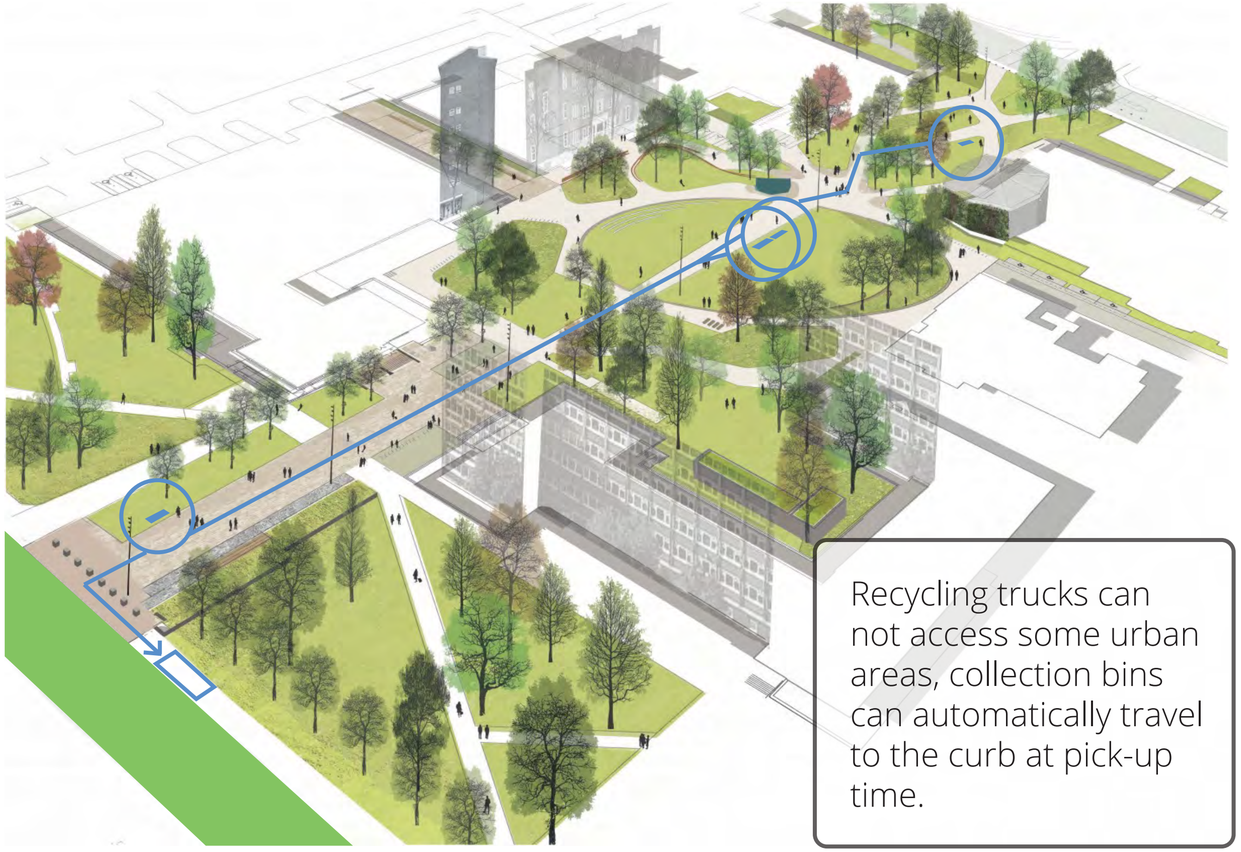
Rinse and sort

Get the app

See your history

Recycling Rover is a wifi connected recycling hub that reduces waste and educates the public about recycling. This recycling system also allows city workers to route bins remotely: to travel to the curb for pick-up, back to its housing unit, or to a higher priority housing unit. This allows citys to continuously adjust where rovers are located based on where they are needed most (i.e. public events).





Recycling trucks can not access some urban areas, collection bins can automatically travel to the curb at pick-up time.

SOLUTION

Rain catch collects water for rinsing spout.

Solar panels charge roving bins and enable power features (wifi, display guides, and a water pump.

Eye level displays help users sort their materials with a helpful materials guide.

Manual locks allows workers to empty bins even when solar power is depleted.

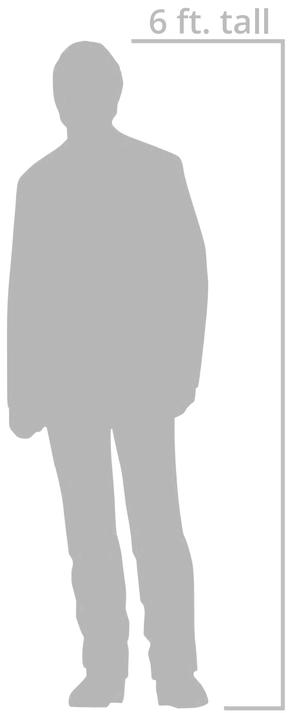
Recycling depository

Power bus allows speedy configuration of modular units. Rover units can easily be reconfigured to meet recycling collection needs.

Rinsing spout allows users to clean their plastic, metal, or glass waste. Recycling factories often send materials to the landfill if they are diffucult to clean.

A three-pronged charging mechanism fits into a port on the back side of collection bins.

Roving bins are equipped with batteries, wheel motors, and a wifi-enabled GPS unit .



EMERGEN-SKI

A reboot of the rescue toboggan used to help transport injured skiers or snowboarders safely to the bottom of the ski slopes.

PARAMETERS

What is it?	A stretcher that works like a sled.
Where is it used?	Snowy areas, usually mountain slopes.
Who uses it?	Ski-patrol, injured skiers, paramedics.
When is it used?	Emergencies, cold weather, storms, day/night.
Why is it important?	Prevents further injury while descending the mountain.
How is it used?	Ski patrol brings it up the hill, secures skier inside, steers them down the mountain to safety.

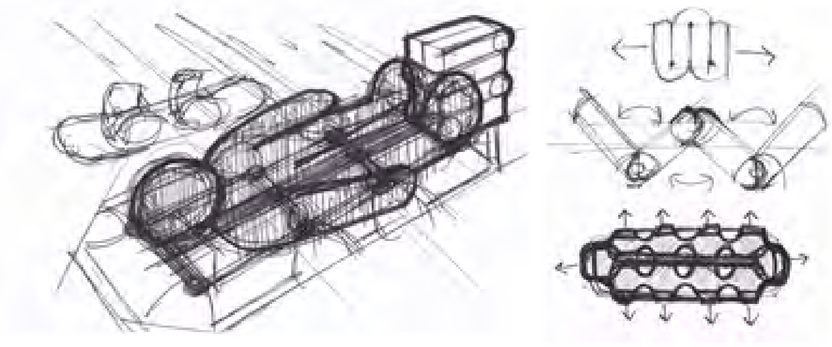
PROBLEM:

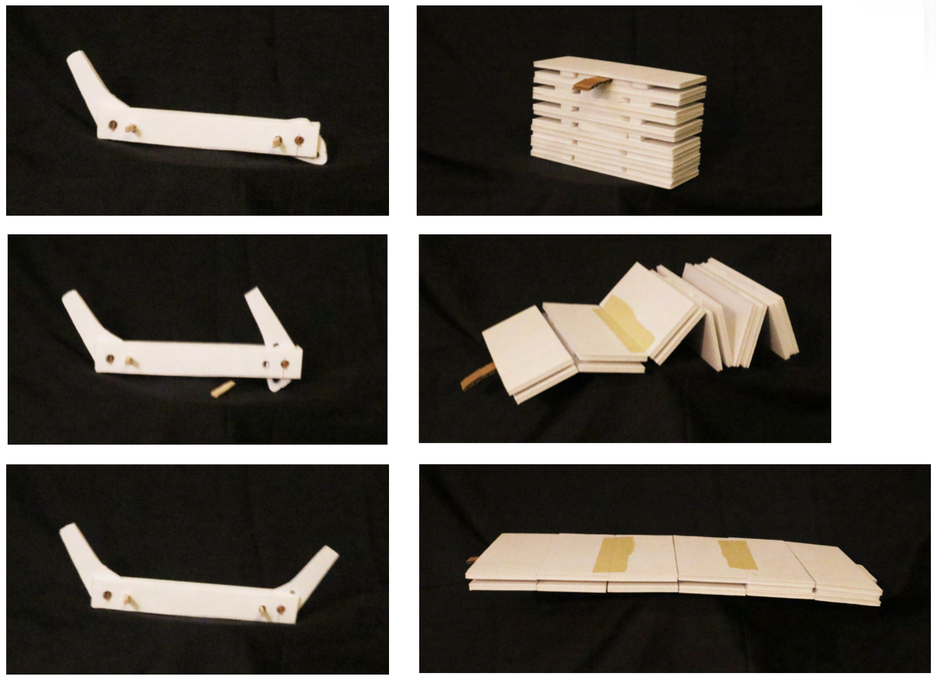
Current E-toboggans are so bulky that ski-patrol must haul it uphill with a snowmobile. Due to hazardous terrain, this can take longer than the ski-lift! This is problematic since response time may be critical for the injured person.

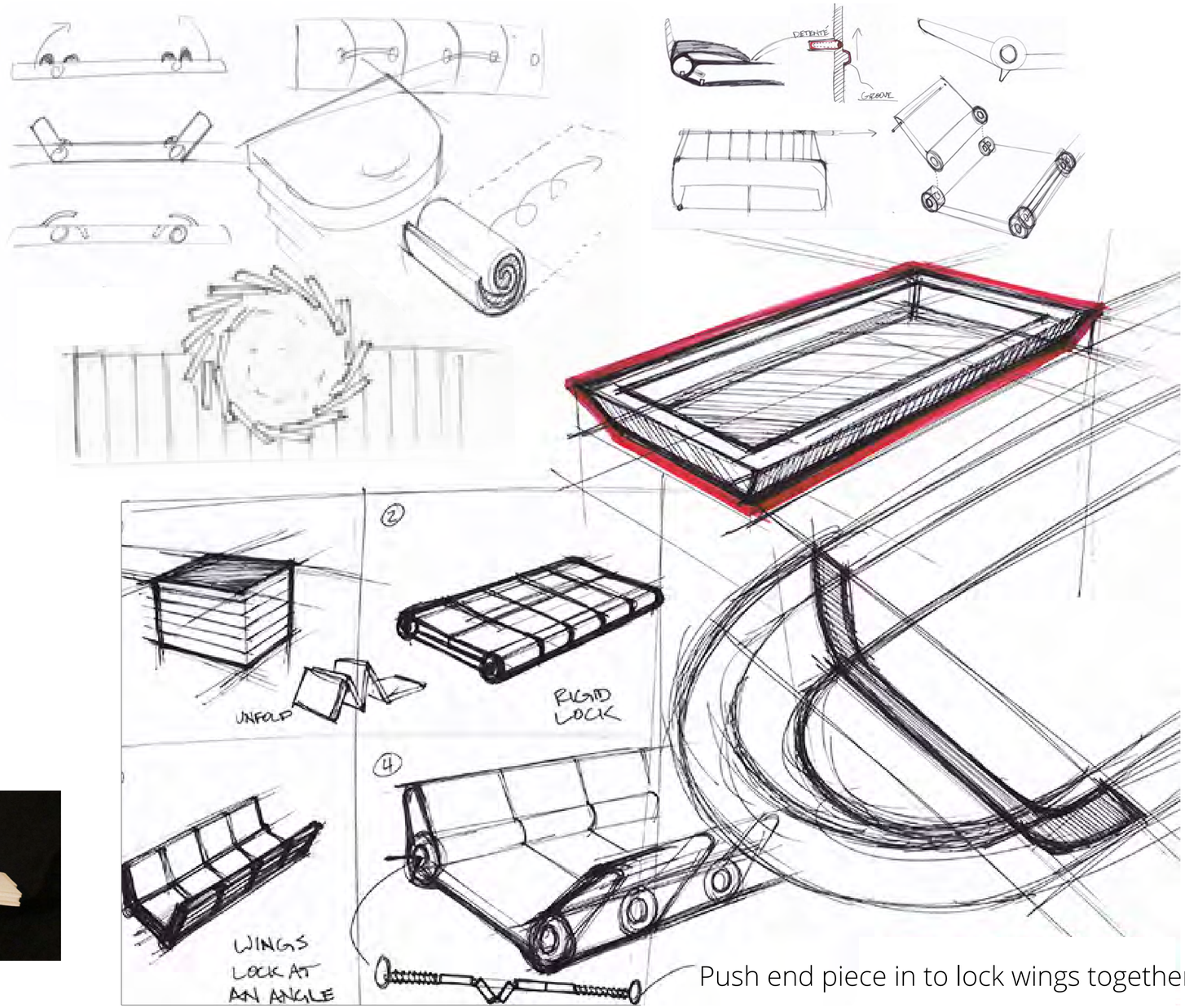
GOAL:

The proposed E-toboggan should be easier and faster to transport, allowing ski patrol to use the ski lift to reach injured people on the mountain. Additionally, it should be easy to tote in dangerous areas to protect patrol members while they are trying to reach skiers.

PROCESS

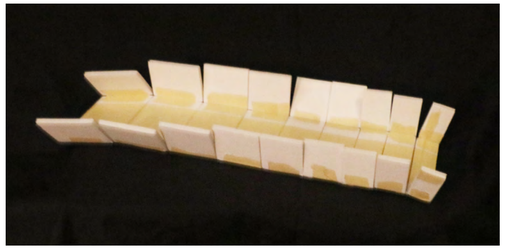


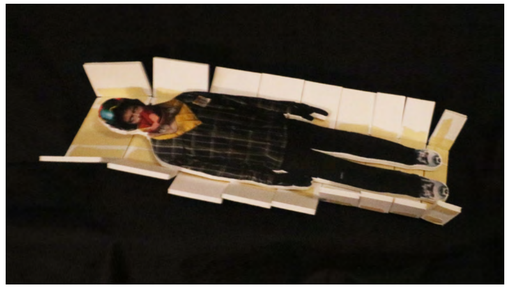


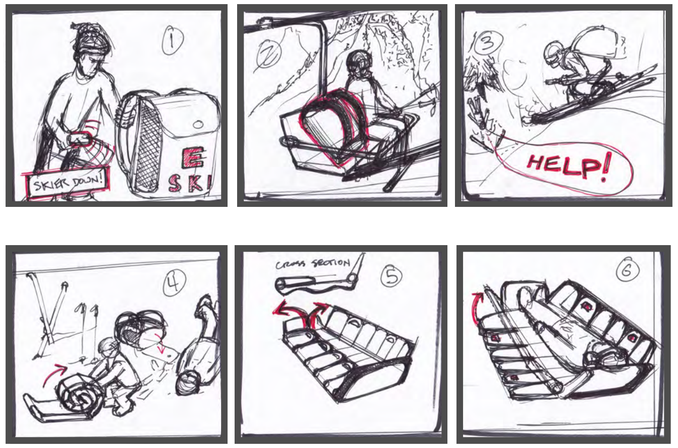


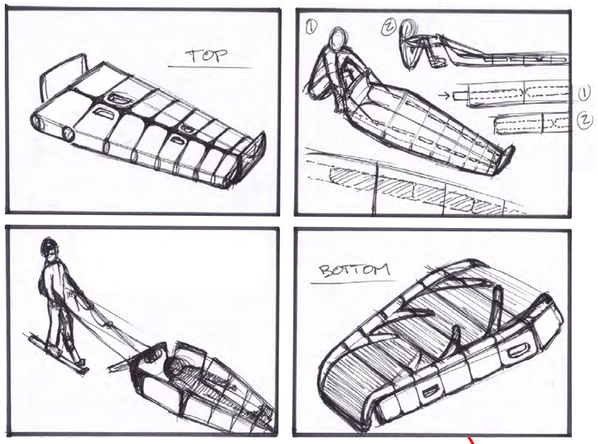
Push end piece in to lock wings together.

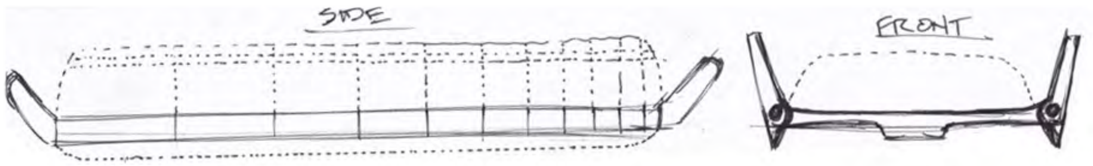
FINAL CONCEPT



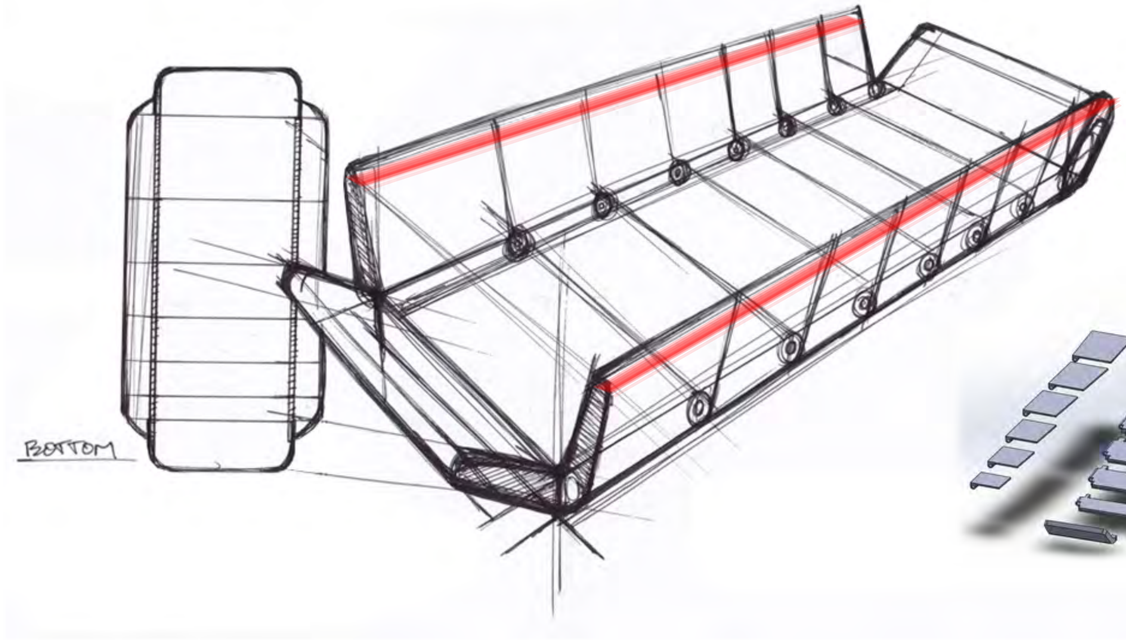




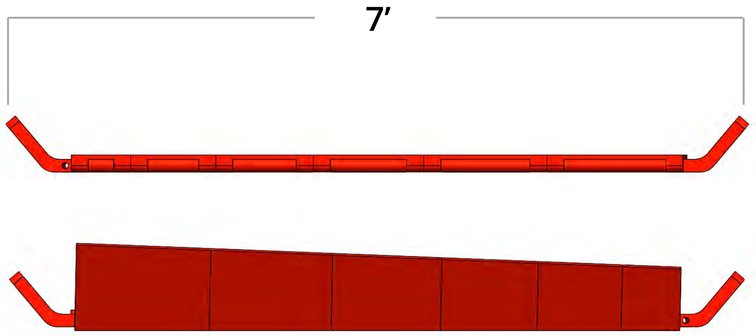




Runners automatically slow sled, or serve as a parking brake when the sled is reversed.

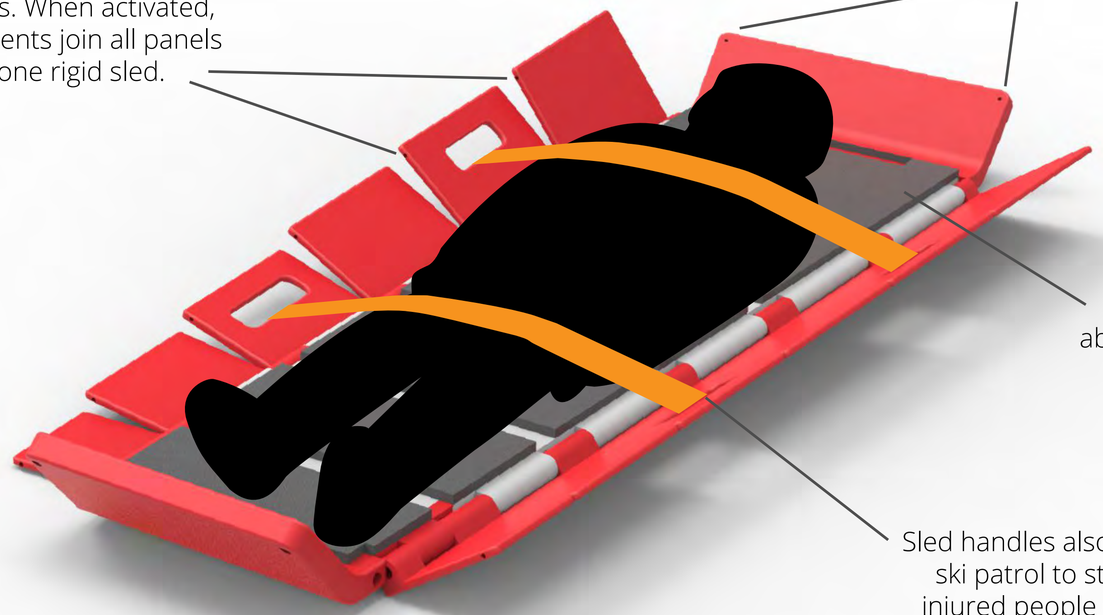


SOLUTION



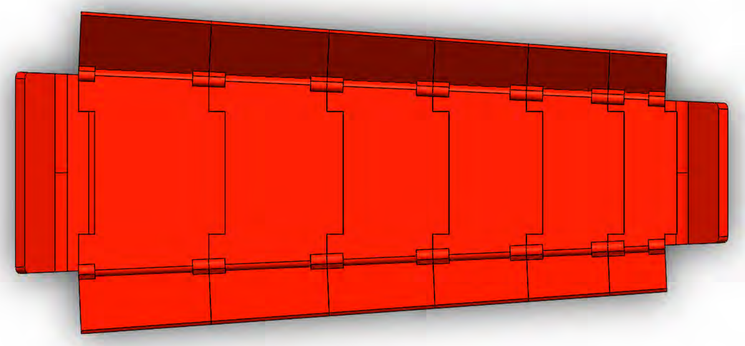
Wing panels have embedded connector rod segments. When activated, rod segments join all panels into one rigid sled.

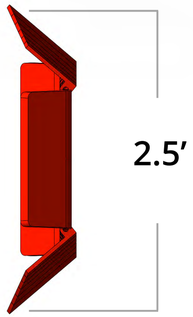
Ski patrol attaches leash here

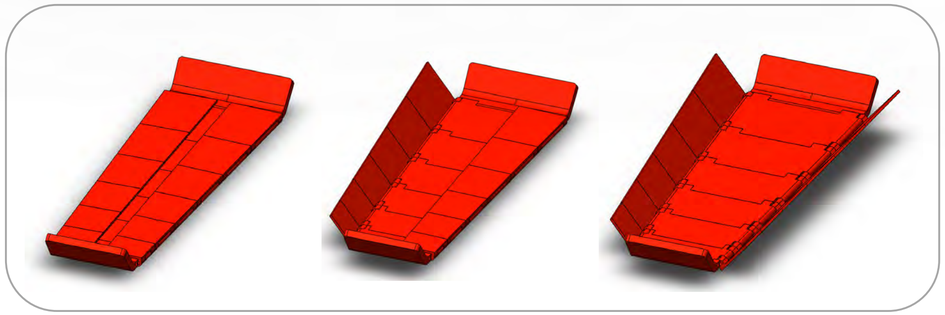


Foam pads absorbs impact

Sled handles also allow ski patrol to strap injured people onto the sled.





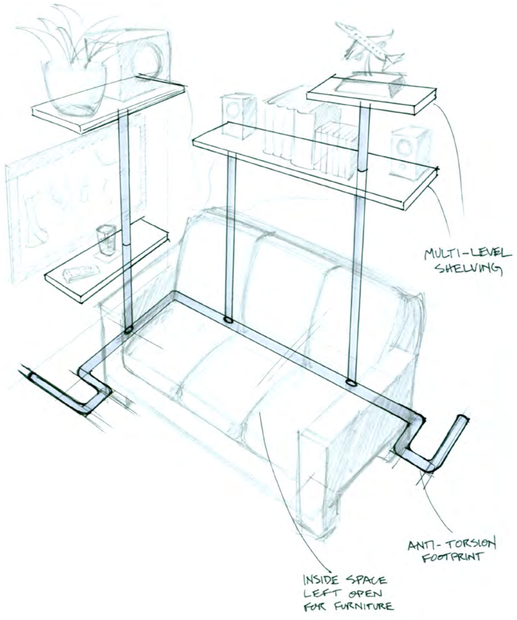


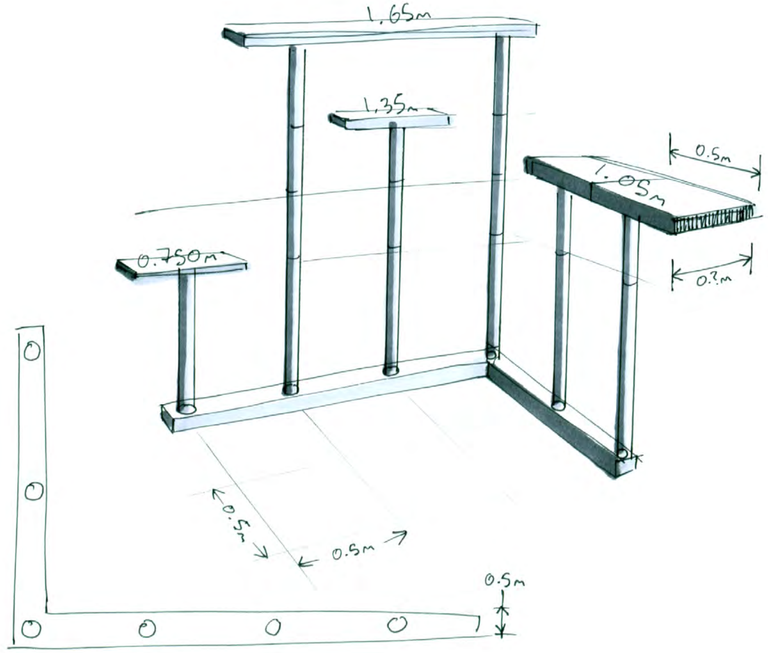
FLOATING SHELF

This project focuses on providing a shelving solution for spatially constrained living spaces while maintaining an edgy style.

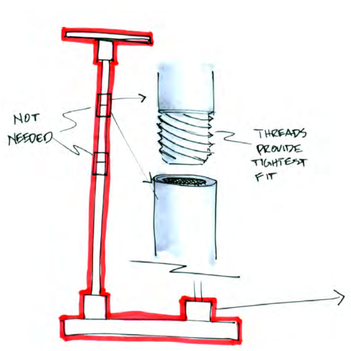
CONCEPT

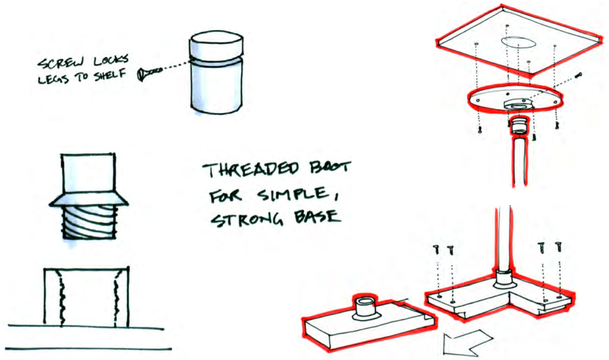
A “floating” shelving system. This style of shelving can be adapted to any living space, even in cramped spaces behind furniture. It is non-invasive to walls so it is ideal for renters. Modular design allows for customizable heights and configurations.

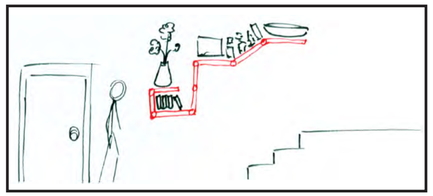


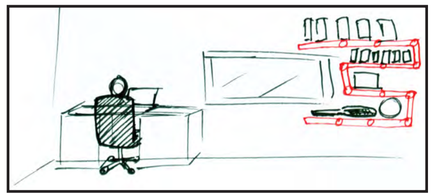


MODELS

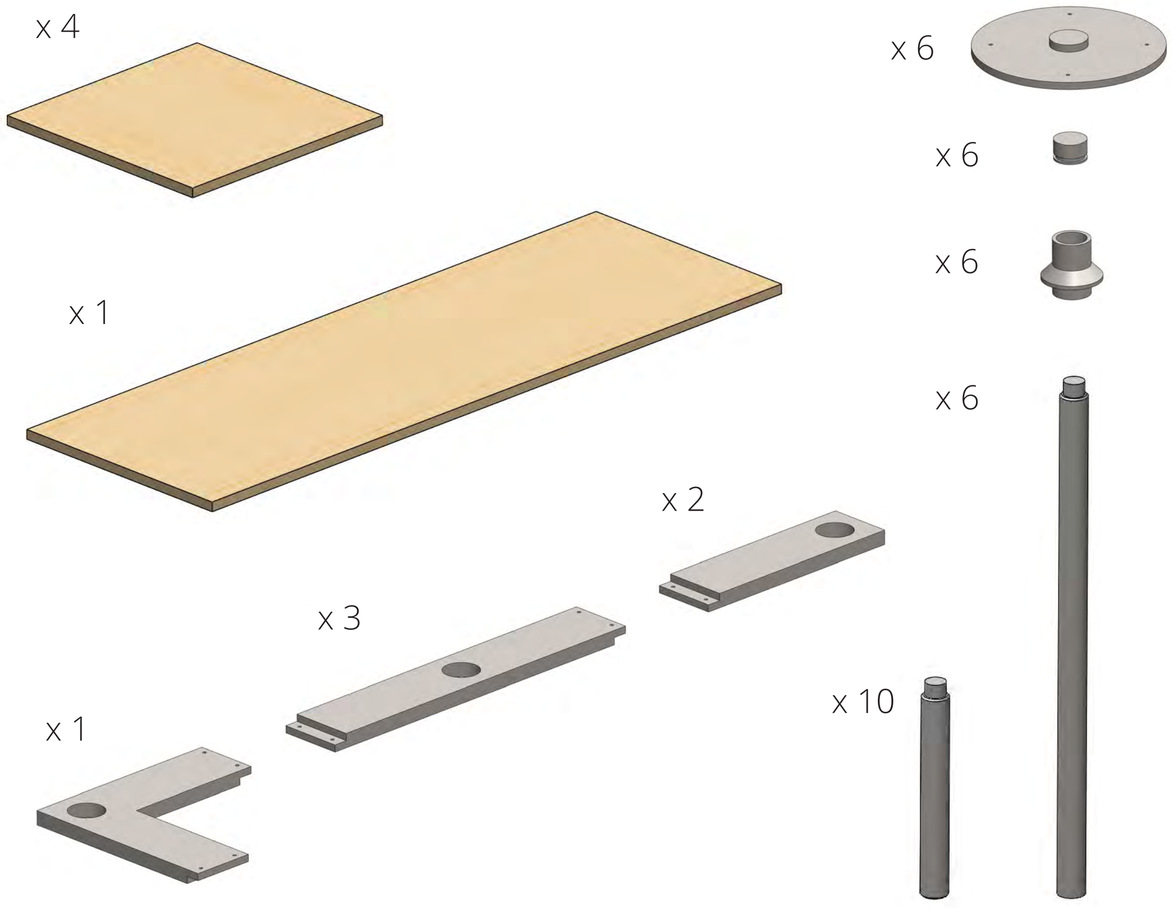








PARTS CATALOG



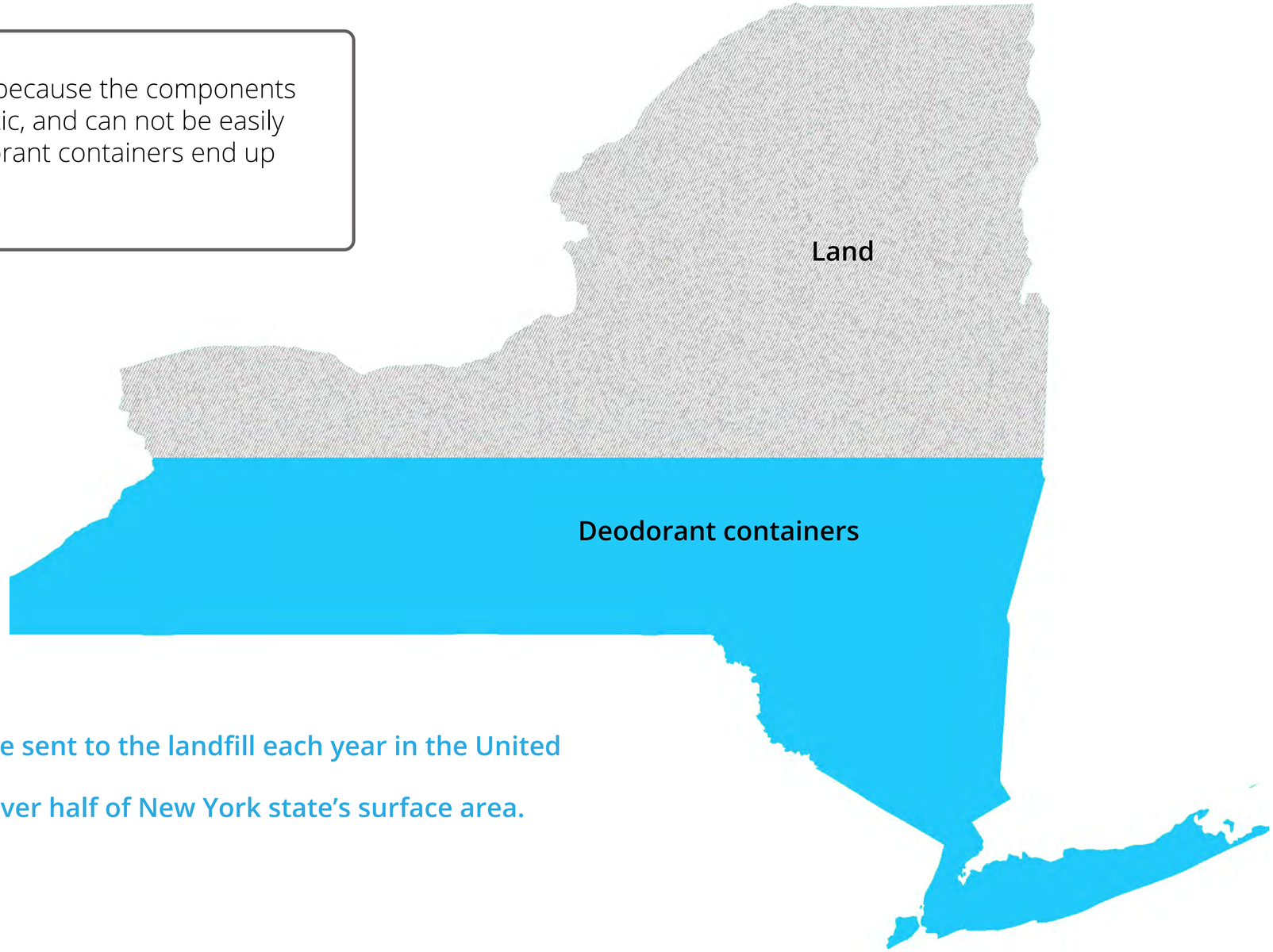
CONFIGURATIONS + DETAILS

ECO DEO

A fully recyclable deodorant stick. This product was designed for a Cradle to Cradle design competition.

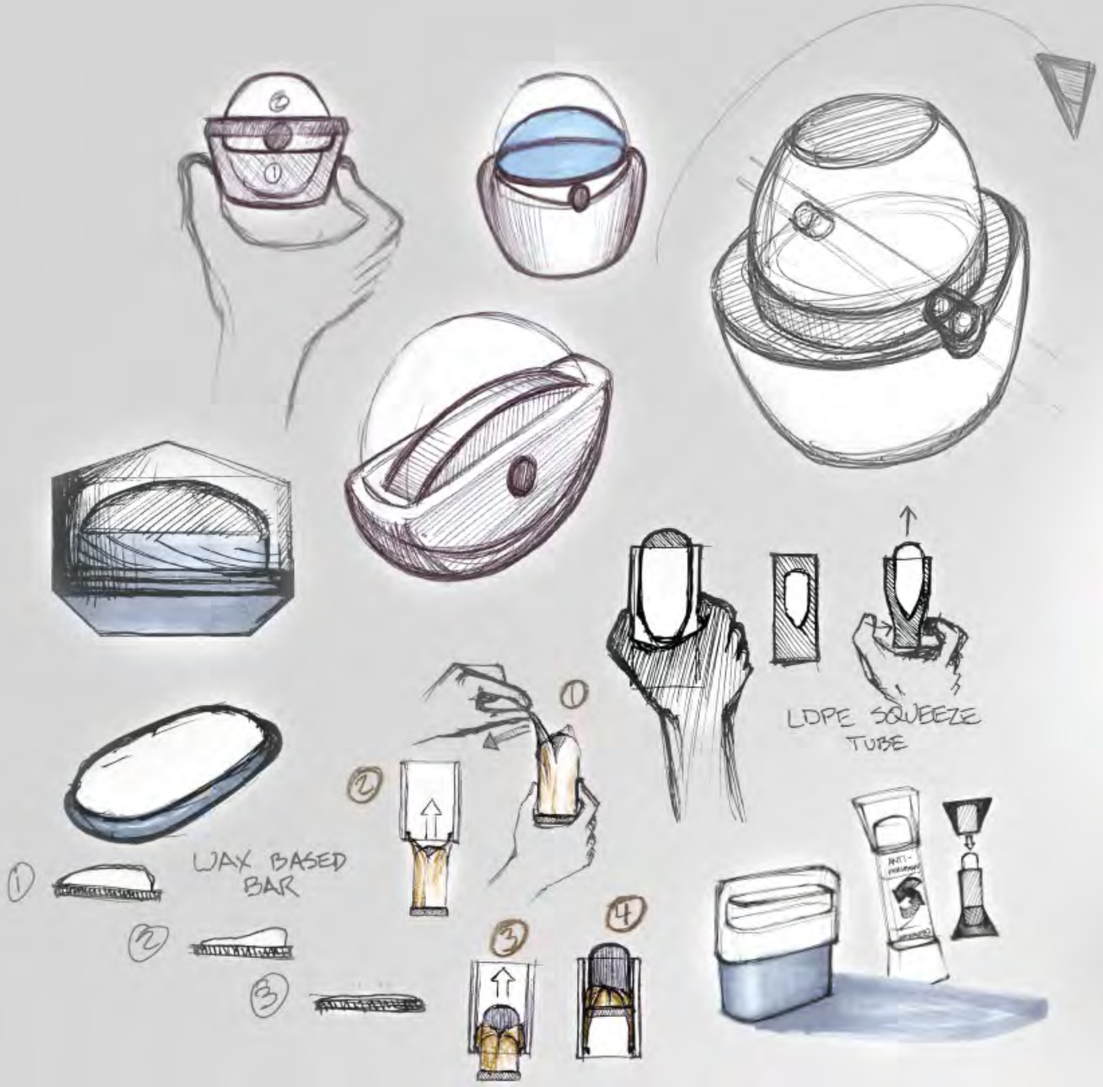
RESEARCH

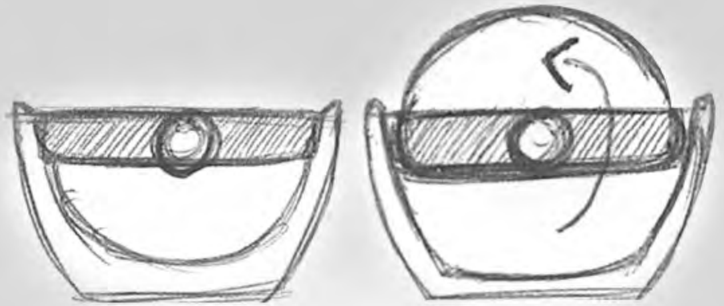
Deodorant containers can not be recycled because the components are manufactured from many types of plastic, and can not be easily separated. Because of this, nearly all deodorant containers end up being sent to the landfill.

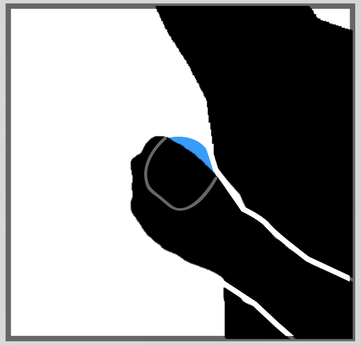


357 million stick-deodorant containers are sent to the landfill each year in the United States. Laid side to side, they would cover half of New York state's surface area.

PROCESS





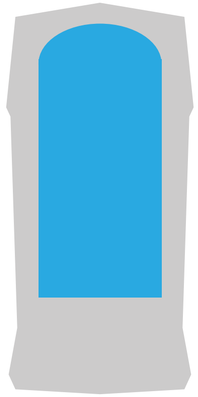


In-hand size context

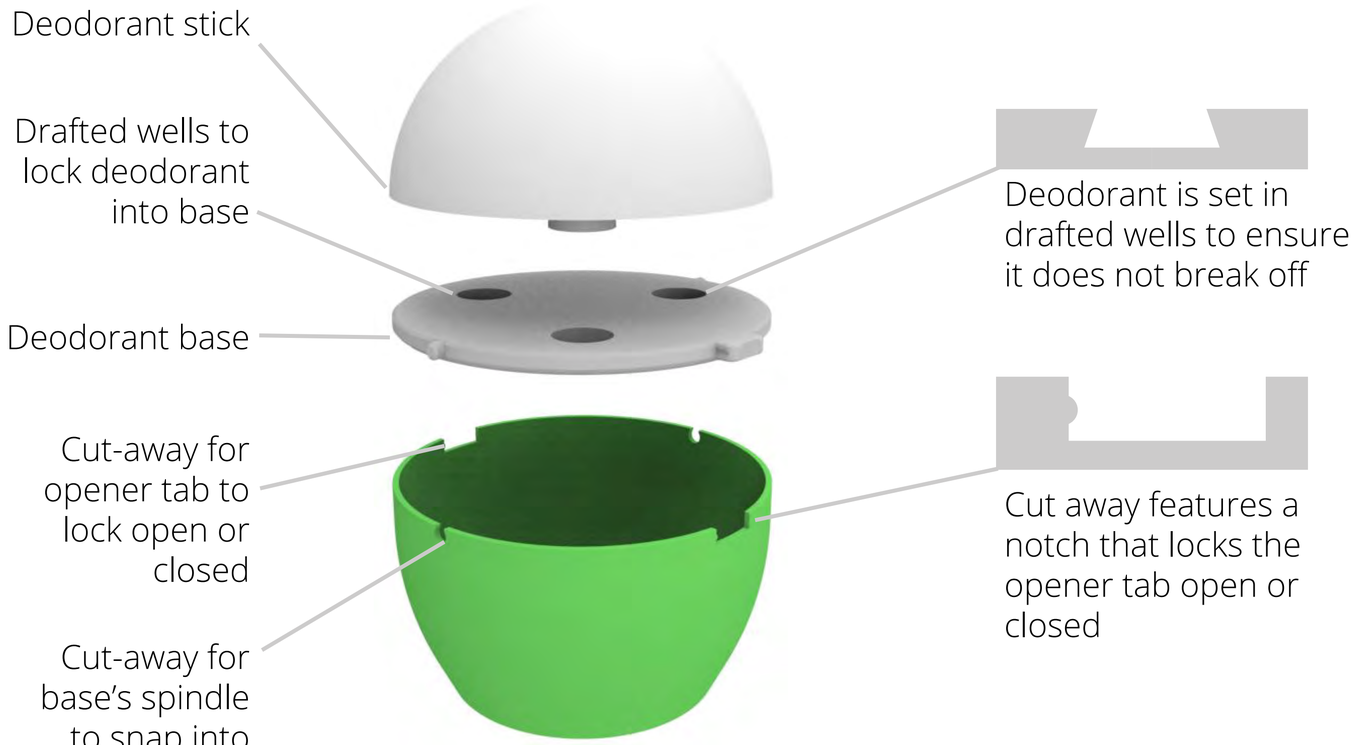
SOLUTION

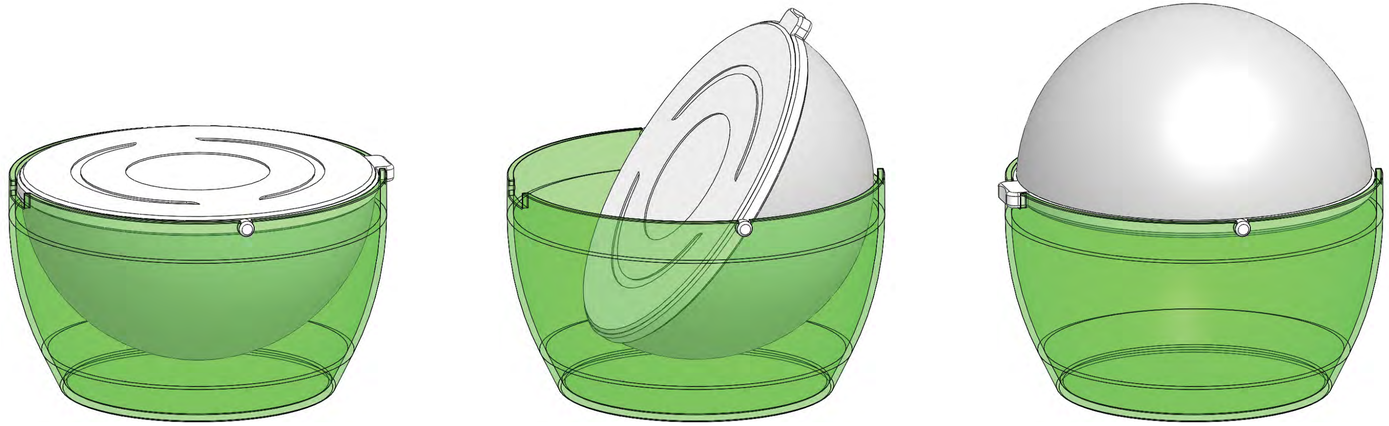
ECO DEO is specially designed to be simple and reyclable. This deodorant stick consists of two plastic parts that pop apart easily to ensure that it can be recycled. Its production also requires less plastic to package the same amount of deodorant.

ECO DEO
Deodorant to container ratio = 3.75



LEADING BRAND
Deodorant to container ratio = 1.8





SKETCH SAFE

The designer’s carrying case.
Works for both engineering
and design equipment.

USER PERSONA

Andy Williams

Andy is a student who needs to lug lots of design equipment to and from class, and to his off-campus housing. He struggles to keep his papers together, occasionally he even damages an important drawing! He likes to draw while taking public transport but he can rarely do so comfortably.

Age: Early 20's

Job: Student

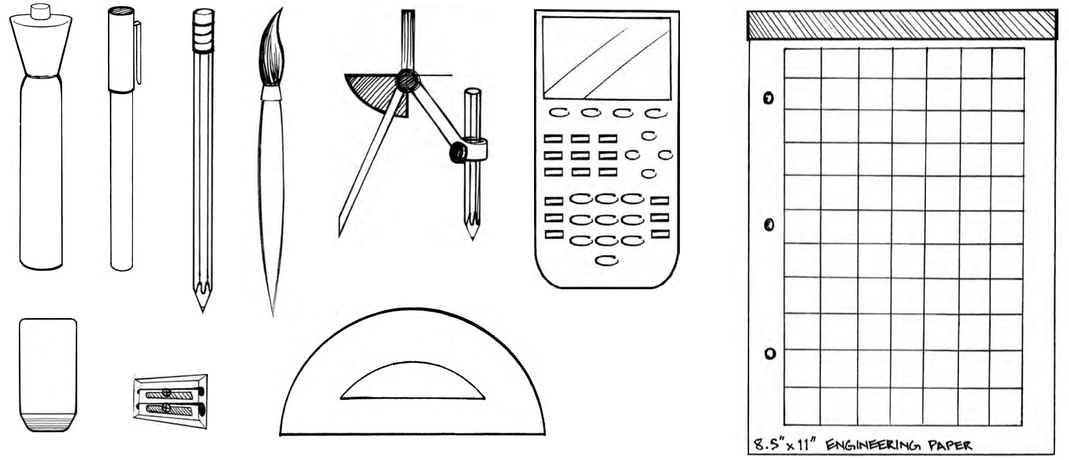
Income: $7000/yr

Status: Single

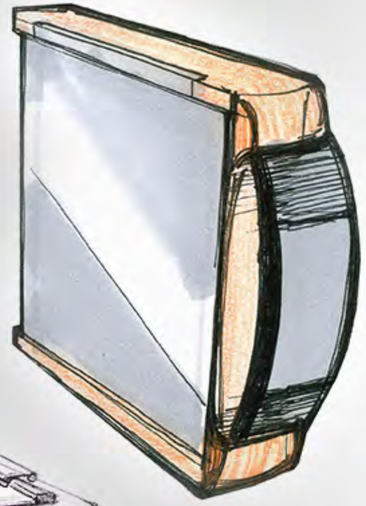
Location: NYC

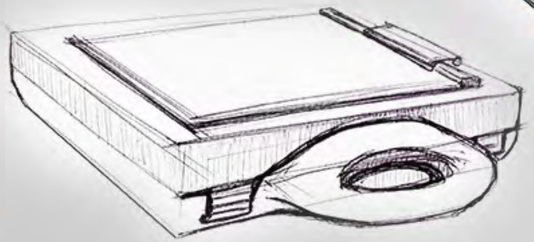
Needs:	Frustrations:
- Paper protector	- Drawing on the bus
- Clip board	- Disorganization
- Organizer	- Damaged drawings
- Drawing tool case	- No all in one design tote
- Straight edge	- Current tote not waterproof

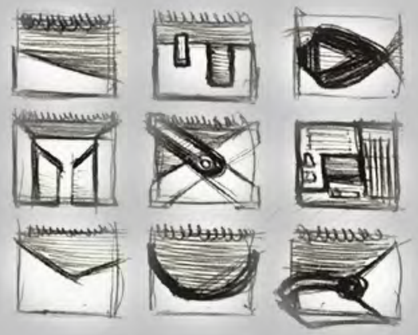
COMMON ENGINEERING AND DESIGN TOOLS

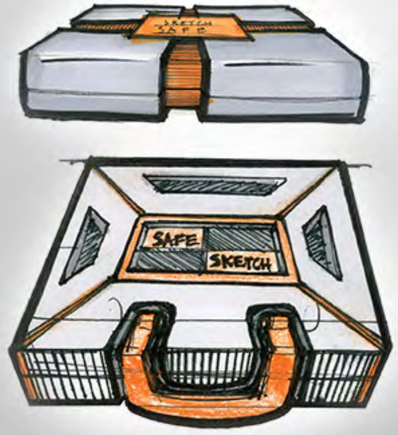


PROCESS



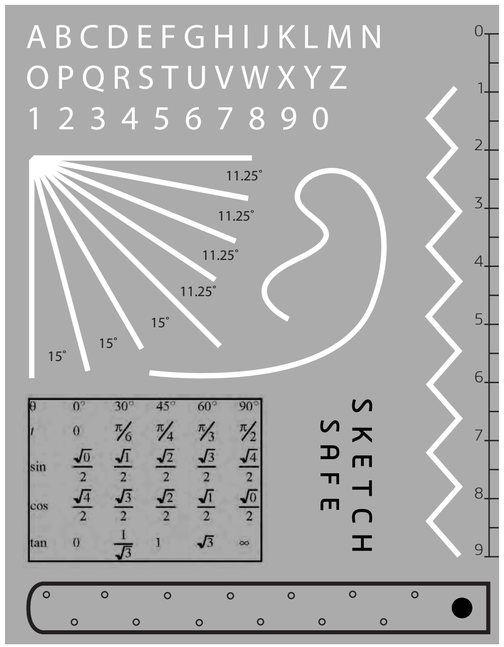


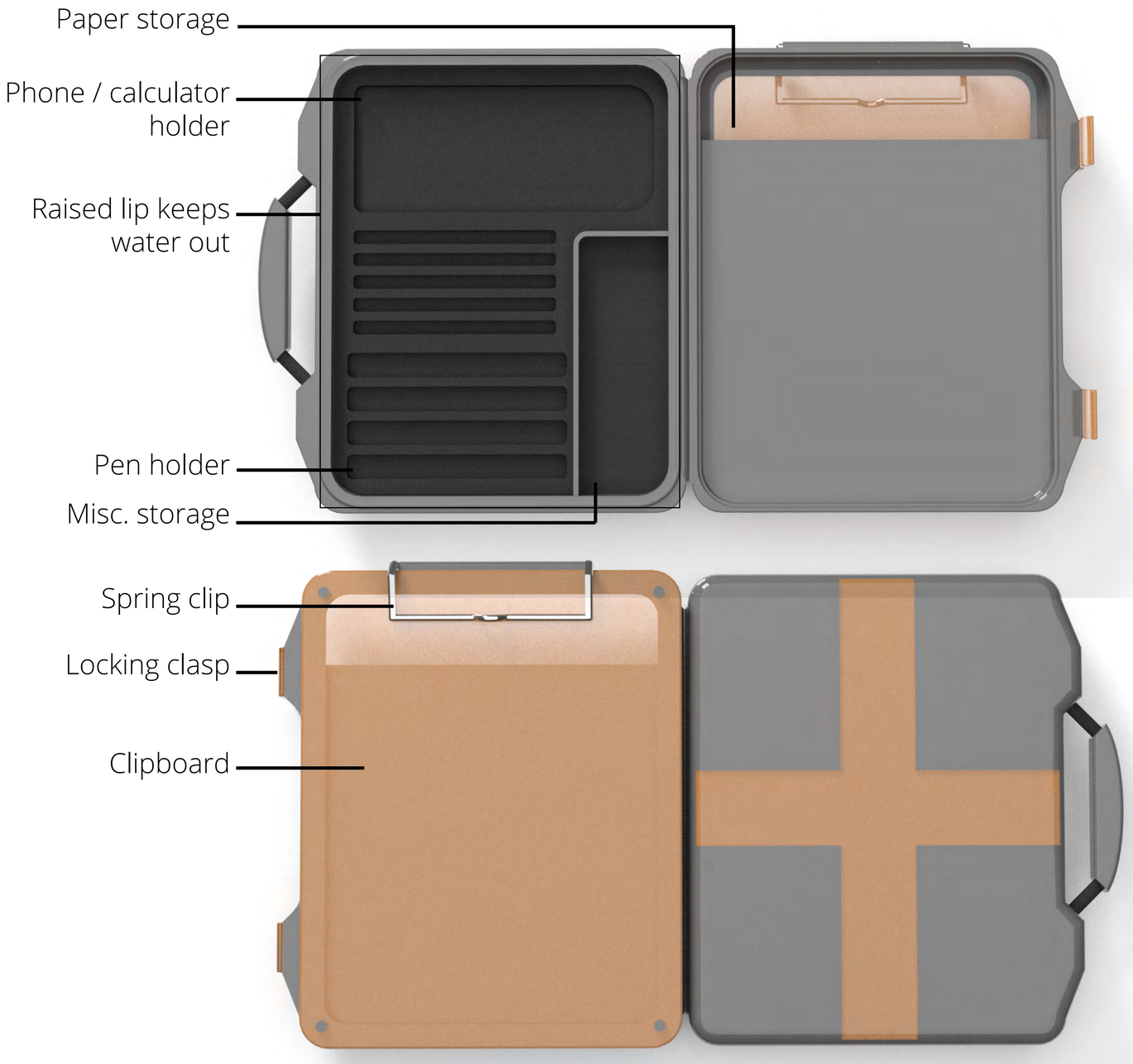




FINAL DESIGN

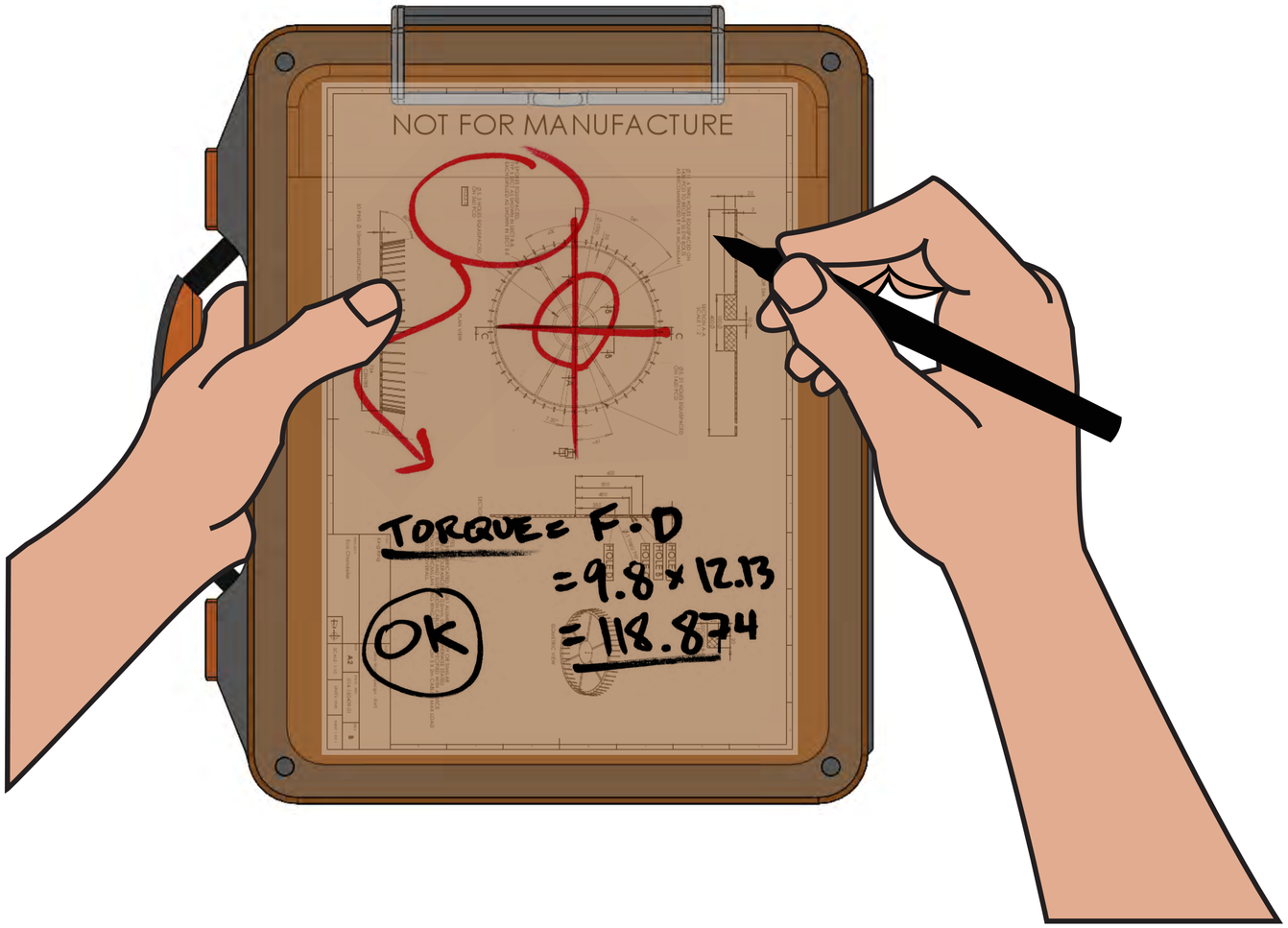
Easy to use template is a compact alternative to engineering and design tools. Includes: stencil, protractor, french curve, break line, ruler, straight edge, compass, and chart for trigonometry rules.





DETAILS

See-thru clipboard doubles
as an overlay whiteboard.



Three layer cut-away view.