

SELLING SANITATION PROGRAM RECOMMENDED DESIGN DIRECTIONS IFC | WSP | MoH

WHAT IS THE SELLING SANITATION PROGRAM?

Selling Sanitation is a market transformation initiative that aims to help millions of people across Africa get access to the household sanitation products they want and can afford. The approach is being piloted in Kenya by IFC, WSP and the Kenya Ministry of Health, with planned expansion to other African countries by 2014.

About 600 million people in Africa – 70% of the continent's population – do not have access to a hygienic household latrine. Despite the clear need, very few affordable products and services exist for

low-income households looking to upgrade from a poor quality latrine or build new sanitation facilities.

The opportunity to improve sanitation products and services has proved largely untapped for private businesses. This is due to a range of market barriers, including a lack of robust information on consumer product preferences and corresponding product design needs.

RESPONDING TO CONSUMER NEEDS

In response to this market barrier, a first step under the Selling Sanitation initiative was to work with a pool of manufacturers that had expressed interest in investing in household sanitation, and support these firms to undertake the consumer research and product development needed to develop affordable and desirable sanitation products.

This presentation summarizes the outcomes of the product development phase which was informed by earlier consumer research (see the *Consumer and Supply Chain Insights* presentation). Danielle Pedin led the consumer research, and Jeff Chapin led the product design and development. Lewnida Sara and Jecinter Hezron from WSP coordinated the work with the

Ministry of Health and contributed significantly to both the consumer research and design efforts.

Four manufacturers participated in and assisted the design process: Kentainers, RotoMolders, PolyTanks and SilAfrica.

The design phase ran from June through October 2012 and resulted in design directions for four models of plastic slabs that can be retrofit to existing timber, mud or concrete slabs or integrated into a new-build toilet. The goal of this document is to visually describe the products, including key features and design intent, and to link user insights to product design.

PRODUCT PORTFOLIO

There are four products included in the Selling Sanitation product portfolio:

- Small Collar
- Small Slab
- Large Slab
- Seated Slab

They all provide different levels of sanitation benefit, comfort, durability, cleanability and aesthetic value. They are also intended to offer market access to improved sanitation at different pricepoints.

All of the slabs also incorporate a lid to help control flies and smell.

SMALL COLLAR

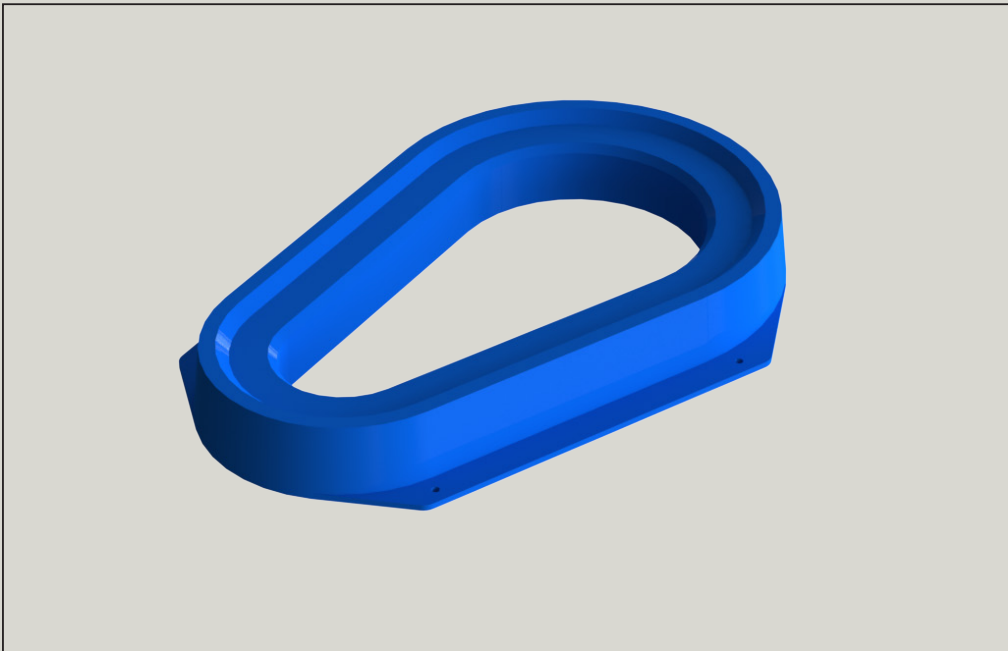
The Small Collar is a small-sized insert that can be retrofit into existing mud or timber slabs or integrated into a new installation. It provides a durable & cleanable surface around hole that is not eroded by urine and does not harbor pathogens.

Given its small size, the Small Collar only makes sense as an injection or blow molded product to enable fast cycle times and lower product costs. The design will change slightly per the process chosen.

Expected Weight 600g (Injection or Blow)

Target Manufactured Price: 270 Ksh

Target Retail Price: 375 Ksh



Final model



Installation of earlier prototype

SMALL SLAB

The Small Slab is a medium-sized, self-supporting slab that can be easily retrofit onto existing mud or timber slabs or integrated into a new installation. It provides a durable and cleanable latrine floor with raised foot areas and self-draining surfaces.

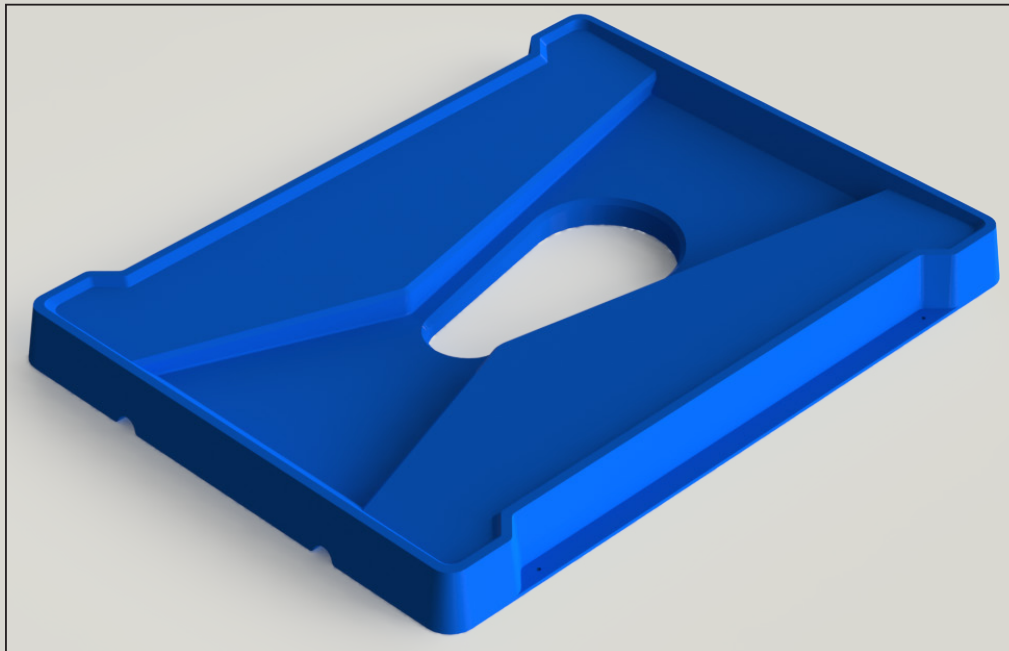
The Small Slab can be roto-, injection or blow molded depending on the manufacturer preferences. The design will change slightly per the process chosen.

60cm x 80cm

5.1 kg / 3.8 kg (Roto / Blow & Injection)

Target Mftr Price: 1550 Ksh / 1250 Ksh

Target Retail Price: 2150 Ksh / 1700 Ksh



Final model



Installation of earlier prototype. Note mud slab area surrounds plastic, as slab is smaller than needed for full latrine floor coverage.

LARGE SLAB

The Large Slab is a full-scale stand-alone slab that supports itself over a pit. It can be used as a retrofit but is perhaps best used in new build solutions. It offers a more cleanable, more durable, more affordable alternative to a concrete slab.

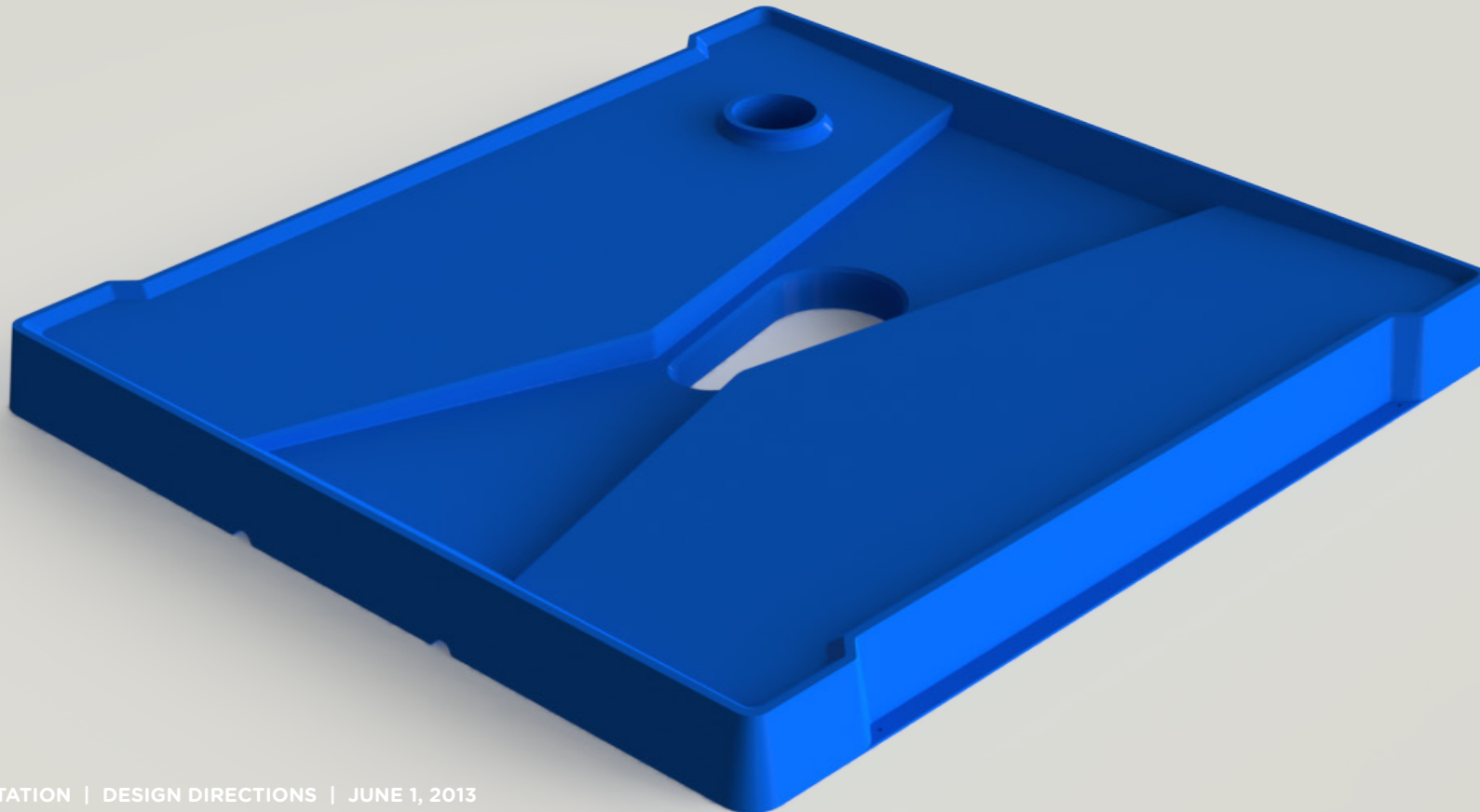
Due to the large tooling required, the Large Slab only makes sense as a roto or blow molded product. The design will change slightly per the process chosen.

1.2m x 1.2m

14 kg / 12.4 kg (Roto / Blow)

Target Mftr Price: 5000 Ksh / 3700

Target Retail Price: 7000 Ksh / 5100 Ksh



SEATED SLAB

The Seated Slab is a niche market product for the elderly and infirm. A seated area is integrated with a small slab for easier installation, improved hygiene and better cleanability. A matching lid helps ensure control of flies and smell.

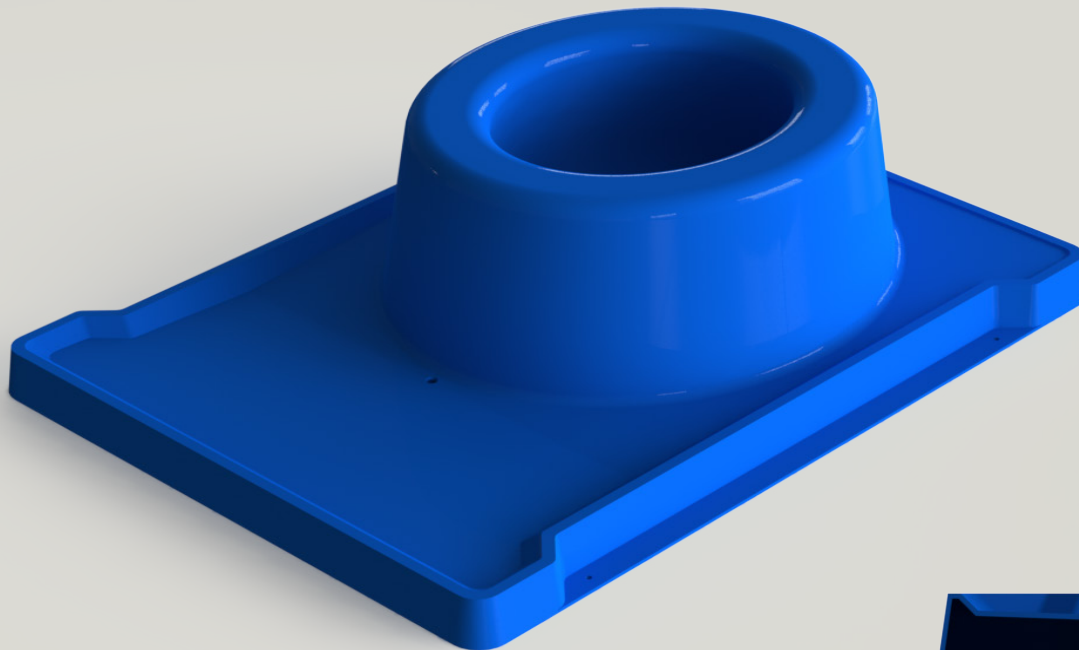
Due to the smaller volumes expected, the Seated Slab only makes sense as a roto-molded product.

50cm x 70cm

4.1 kg (Roto)

Target Mftr Price: 1600 Ksh

Target Retail Price: 2200 Ksh



PRODUCT PRICING

In estimating the prices of the slab options, we used the following cost assumptions for the different manufacturing processes we were considering. All prices shown earlier include the lid pricing:

Manufactured Cost

Rotomolding: 350Ksh/kg*
Injection & Blow: 300Ksh/kg

Retail Cost

Mftr'd Cost x 16% VAT x 20% Retail Profit

** 1 USD = 85 Ksh | June 1, 2013*

KEY FEATURES

The four slabs each integrate key features that improve performance, hygiene and user desirability.

The larger, more expensive slabs offer more features, but all offer some level of improved sanitation.

Butterfly Footrests

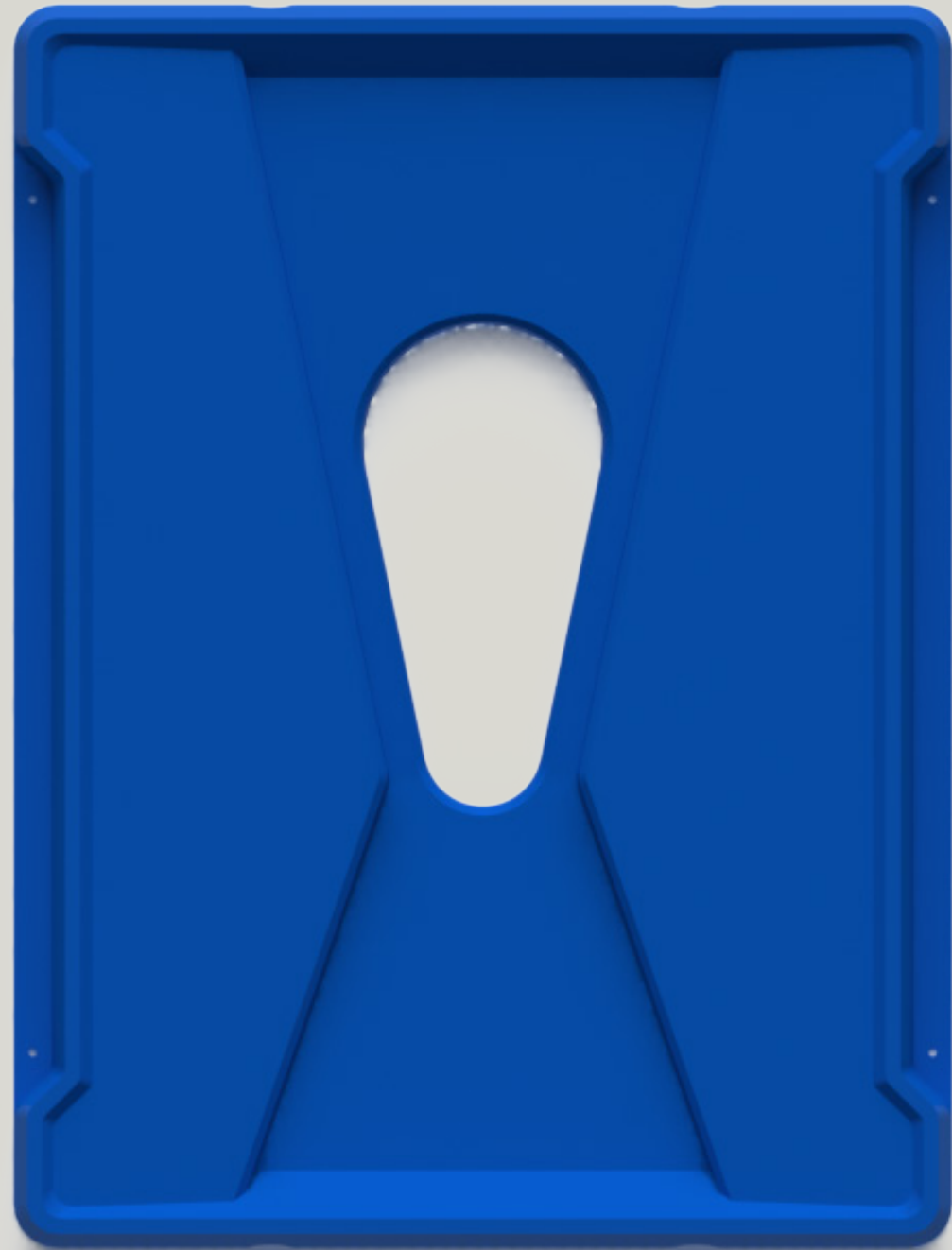
Butterfly-shaped footrests are amazingly popular with villagers, with unanimous preference for this shape over other options. The level of excitement over this feature is hard to explain but will be a great selling point.

Reflects commonly-built shape in concrete slabs (in health clinics, government buildings, etc.) and is very recognizable by households

Allows flexibility in foot position and use by children.

Enables self-draining surface.

Few nooks and crannies to collect dirt.



Self Draining

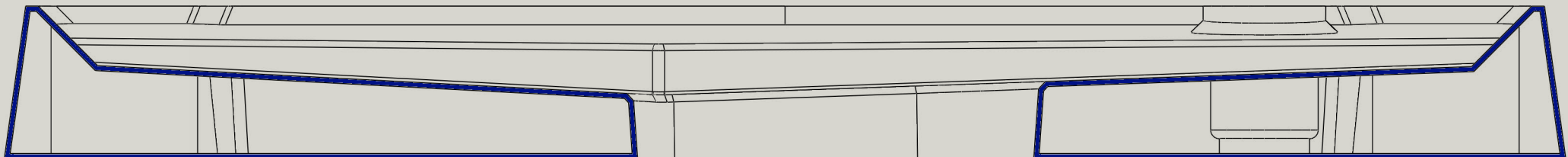
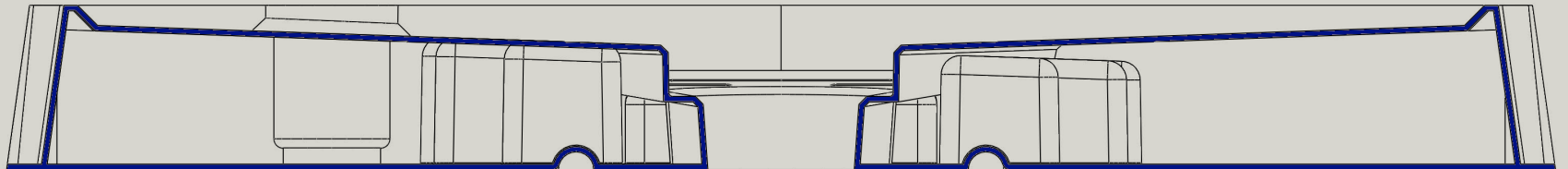
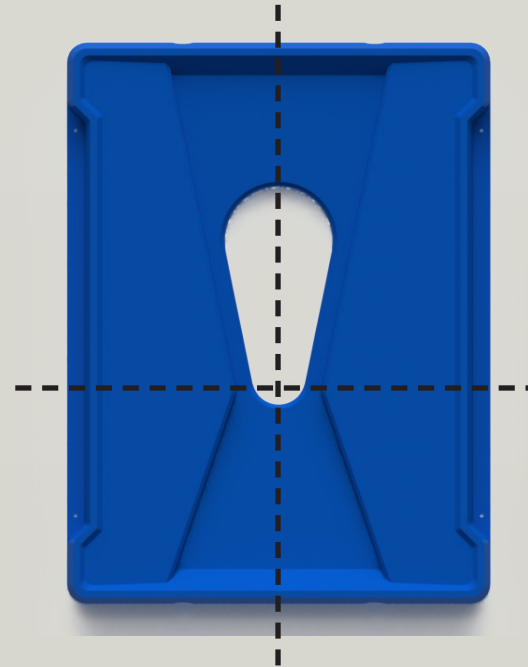
When possible, every surface on the slab should slope towards the center hole. Self-draining was highly requested by households, and they expressed a strong preference for slab prototypes that had variations on a self-draining surface.

Prevents pooling of urine, wash water or bath water.

Makes cleaning easier.

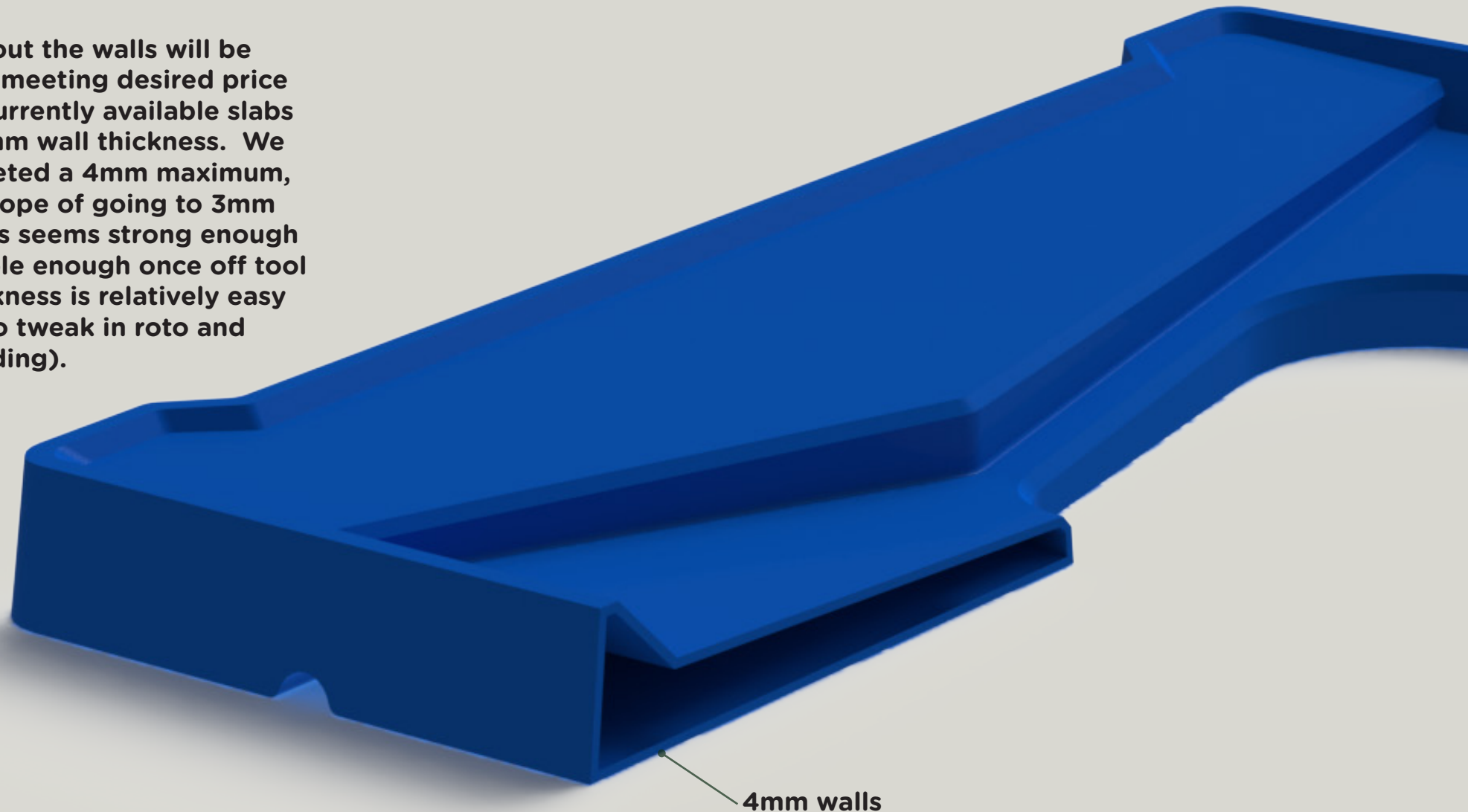
Helps keep slab dry.

Keeps slab cleaner.



Thin Walls

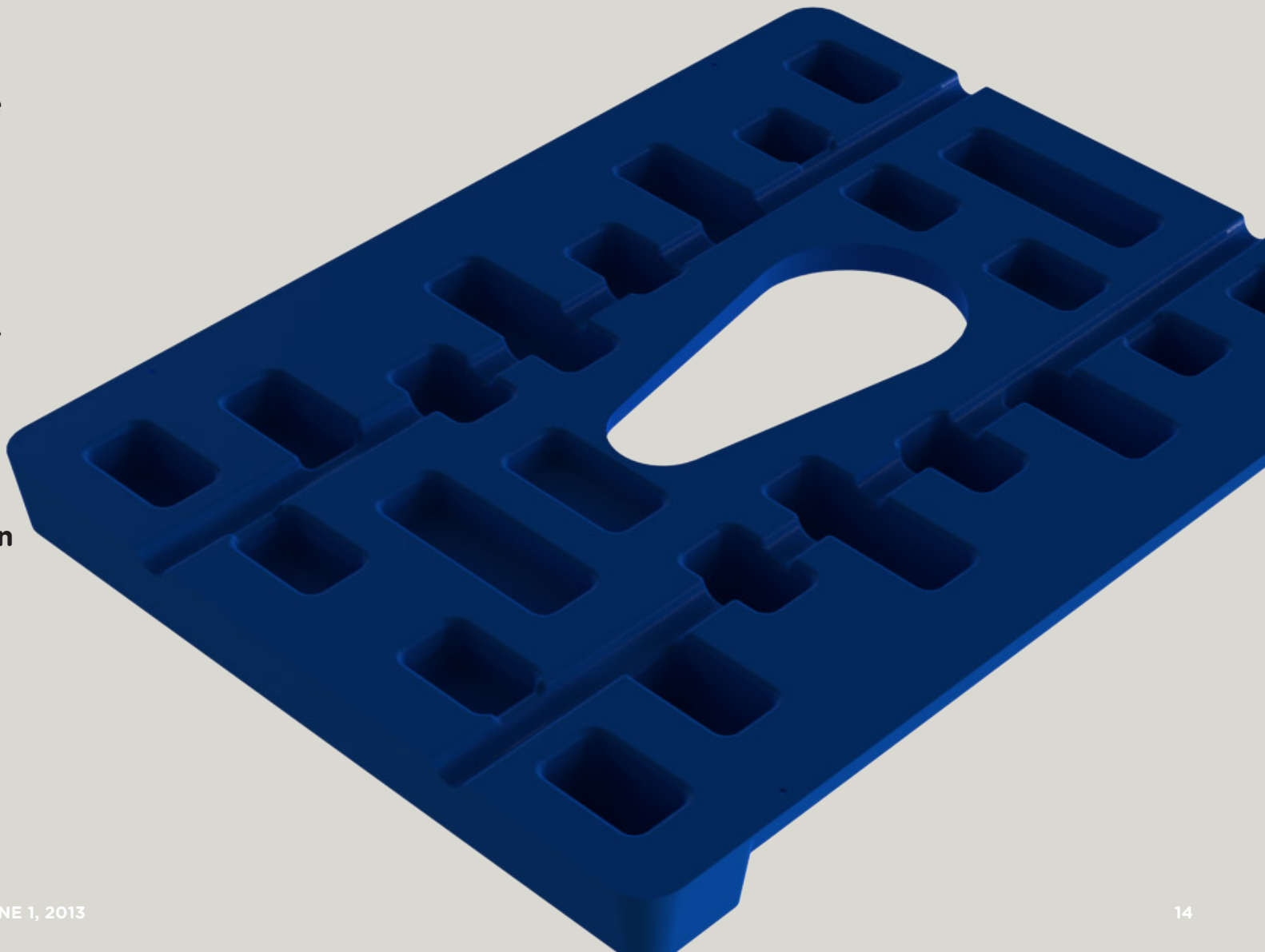
Thinning out the walls will be critical to meeting desired price points. Currently available slabs have 6-7mm wall thickness. We have targeted a 4mm maximum, with the hope of going to 3mm if the slabs seems strong enough and durable enough once off tool (wall thickness is relatively easy variable to tweak in roto and blow molding).



Better Touch Offs

An increased number of better placed touchoffs will enable us to move to thinner walls while still retaining the strength of the slab and the stiffness of the top surface. They should preferentially support the foot placement area. It is most desirable if the touchoffs actually contact the top plane as this will give us the greatest overall strength per weight.

Note that some manufacturers have switched to round touchoffs, instead of the rectangular-shaped touchoffs shown, in order to improve manufacturing reliability.



Standardized Modified Keyhole

Even though the far majority of households have square or slightly rectangular holes in their current toilets, nearly all requested an elongated hole to accommodate 'short' and 'long' calls. They did express great concern over the risk of children falling in, so the size must be kept minimal.

Though hard to manage, it is ideal for all manufacturers to settle on a standard keyhole and lid shape in order to enable any lid to fit any slab. This will simplify the supply chain and provide cost savings for households.

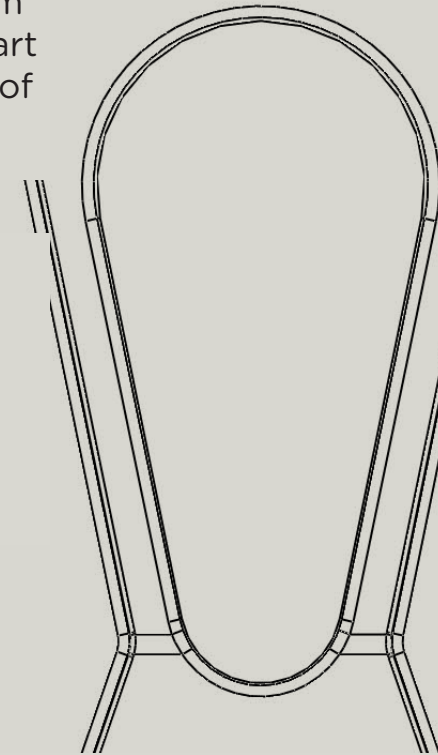
Maximum Diameter

Though there will never be complete consensus, 7" seemed the maximum acceptable diameter for the rear part of the hole in order to prevent risk of children falling in.



Target Length

12" seemed the ideal overall length in order to accommodate female urination while still minimizing risk from falling in.



Modified shape

Developed based on extensive studying of defecation and urination process. Also, simpler to manufacture.

Large Slab Vent Hole

The Large Slabs provides affordance for a vent pipe. Most households requested one and/or showed preference for slab prototypes with a vent hole. PHOs and CHEWs insisted on the presence of one. Smaller slabs and collars do not need one because a vent pipe could be installed in the additional slab mud/timber/concrete area surrounding the plastic (furthermore, the products are not large enough to accommodate a vent pipe without interfering with the user).

Improves smell and fly control.

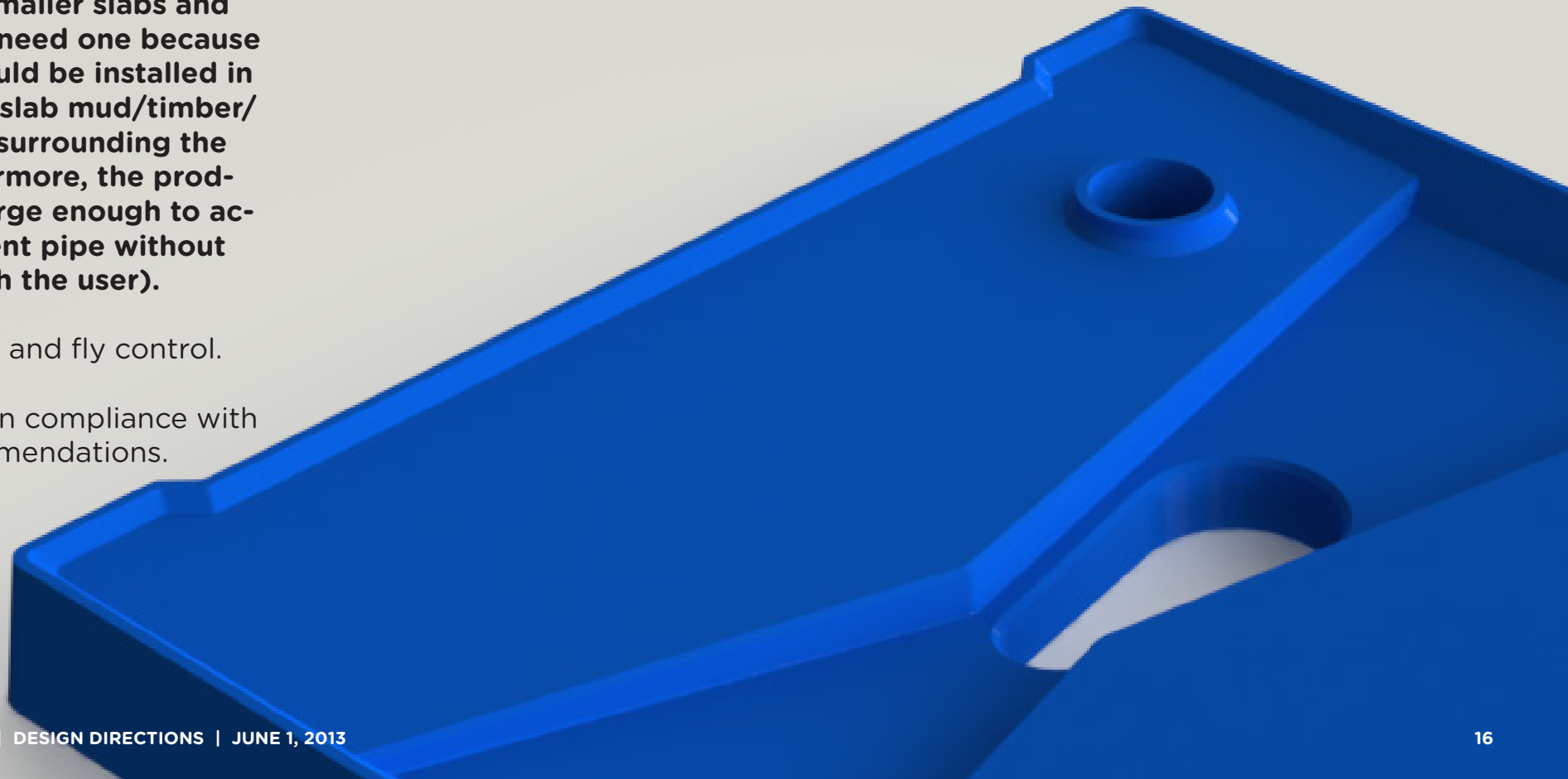
Needed to be in compliance with MOPHS recommendations.

Pipe size

4" is the general rule in Kenya, though 3" will be more affordable for consumers and be adequate for functionality.

Adequate spacing

Vent pipe hole is inset a minimum of 8" from edges in order to provide space for slab to overlap edges of pit.



Thick Edged

Households expressed a strong preference for the thicker-edged prototypes (i.e. prototypes with a greater overall height). Many would ‘size up’ a slab by resting it on its side, grabbing the edge and trying to bend or twist the slab. Slabs and collars are designed to be as thick as is reasonable to improve sales and performance.

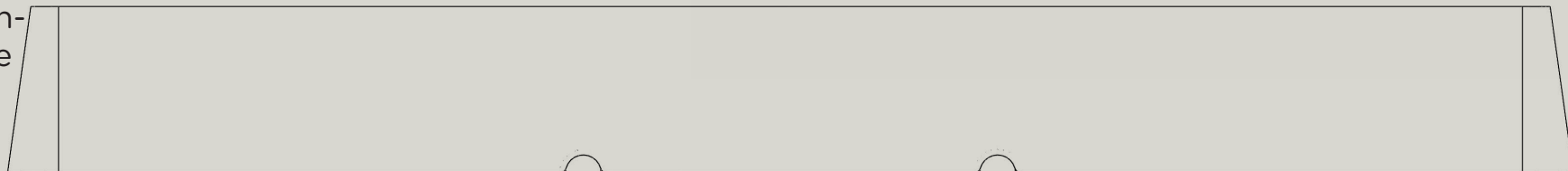
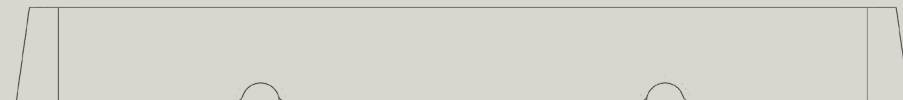
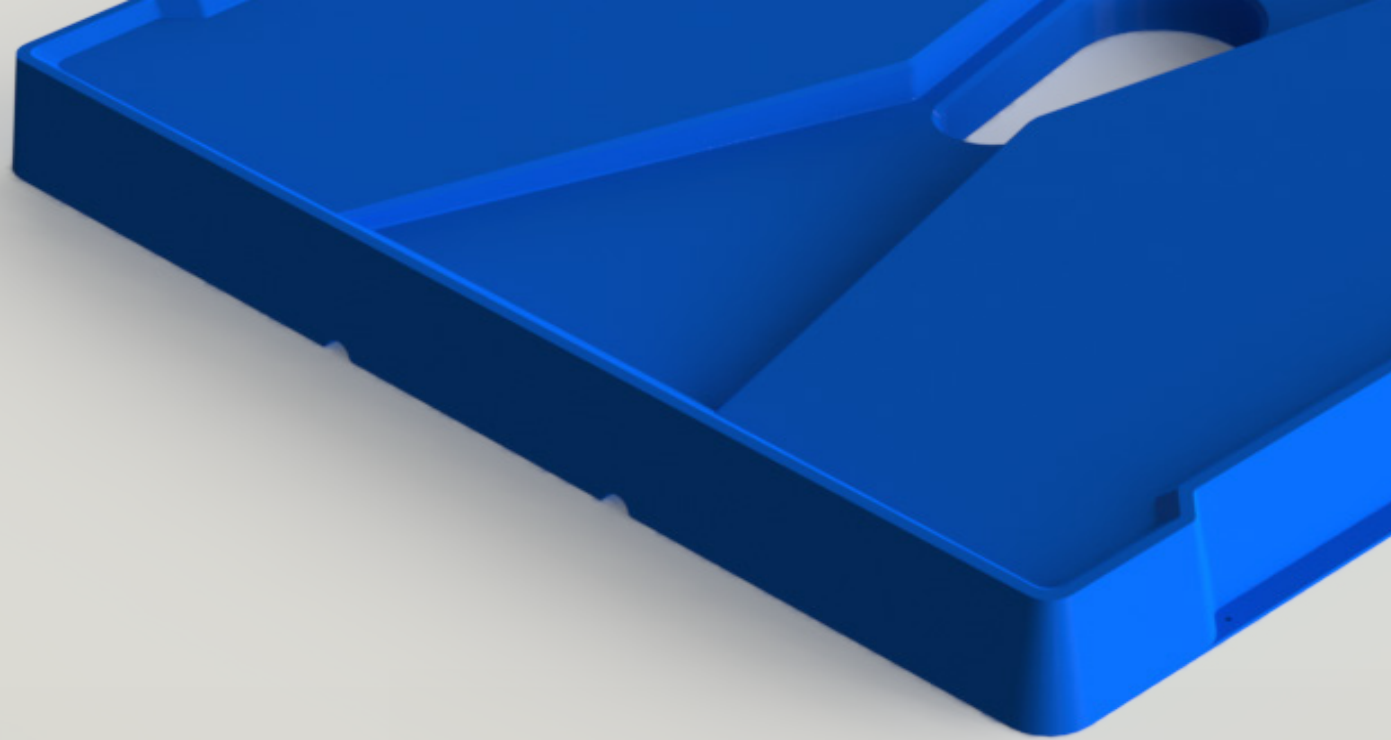
Provides impression of strength and durability.

Improves overall structural stiffness at very little cost. (Stiffness increases as the cube of the slab thickness.)

Makes installation with surrounding mud cleaner as it allows for some clearance between mud surface and edge of slab.

Dimensions

Target 2-3” in thickness for small slabs and 5-6” in thickness for large slabs.



Fastening Features

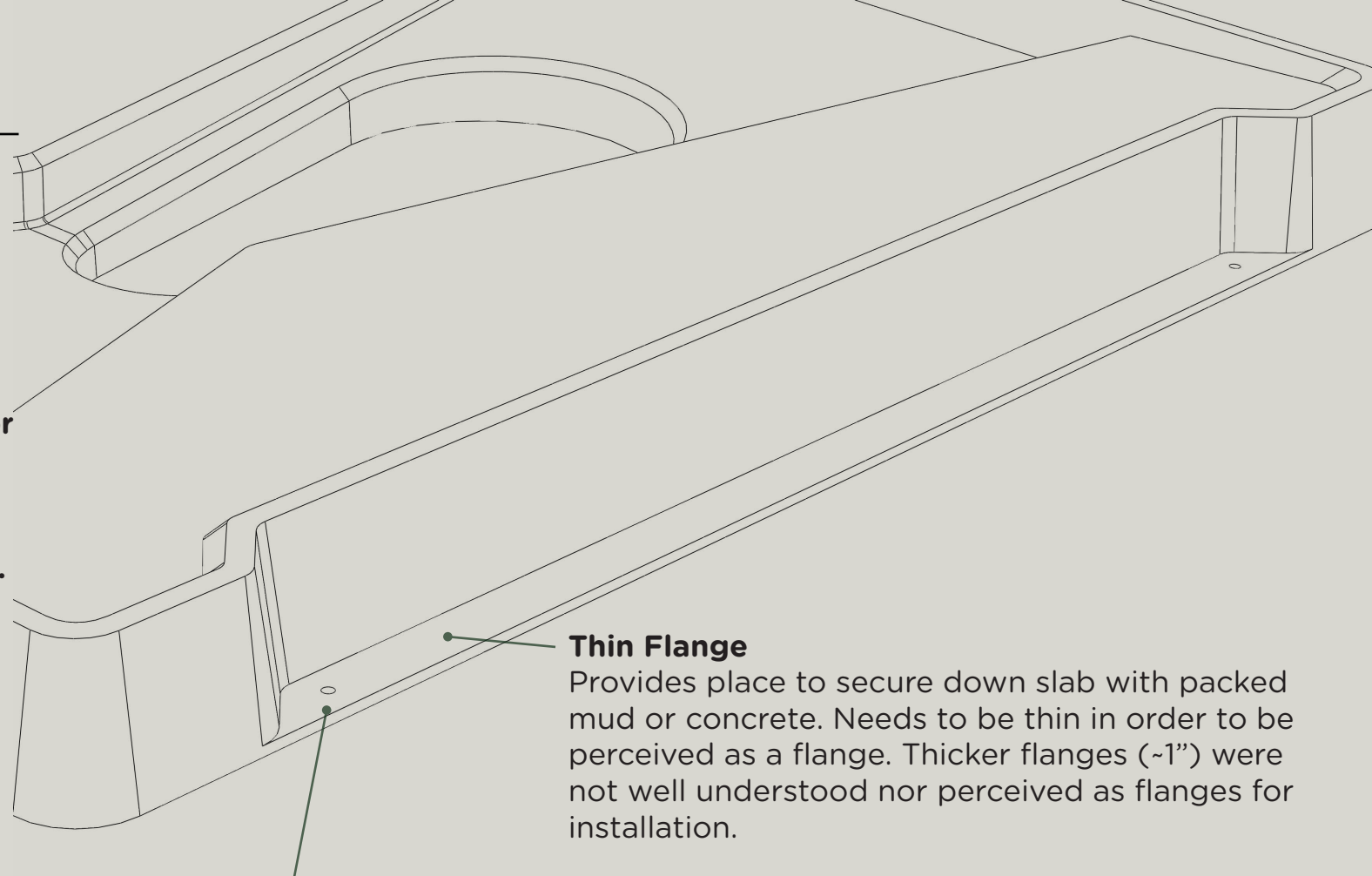
Households struggled to understand how slabs without fastening features would be installed or what they would look like once properly installed. Households often expressed that they didn't know what to do with such slabs. However, prototypes with fastening features were much more clearly understood and the function of the features quickly perceived.

Makes installation process more intuitive so slabs are more often correctly installed and slab function is better understood at point of sale.

Better enables self-installation which will keep costs lower.

Provides a more stable slab when properly fastened down.

Makes slabs more theft-resistant.



Thin Flange

Provides place to secure down slab with packed mud or concrete. Needs to be thin in order to be perceived as a flange. Thicker flanges (~1") were not well understood nor perceived as flanges for installation.

Holes

Provides place to secure down slab with screws, nails or ties. Holes are fairly small (~3mm in diameter) to fit commonly-available nails and screws. Households can expand hole sizes if needed.

Holes on Flange

Holes are placed on flange (not on main slab surface) in order to reinforce proper installation process and to keep slab surface free of depressions or other features that may collect dirt.

Reinforcement Affordance

Most households and fundis expect to support the slabs with timber or metal bars. The small and large slabs are made self-supporting without such reinforcement in order to save cost (of purchasing and transporting timber or steel) and to improve longevity (timber reinforcement will fail). Yet some affordance for such reinforcement is provided to acknowledge, accommodate and steer the likely installation approach.

Half-Rounds

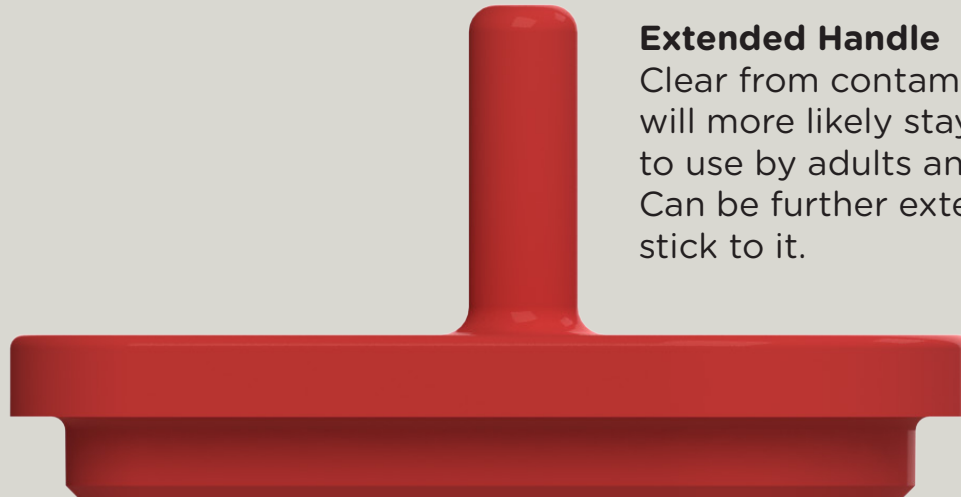
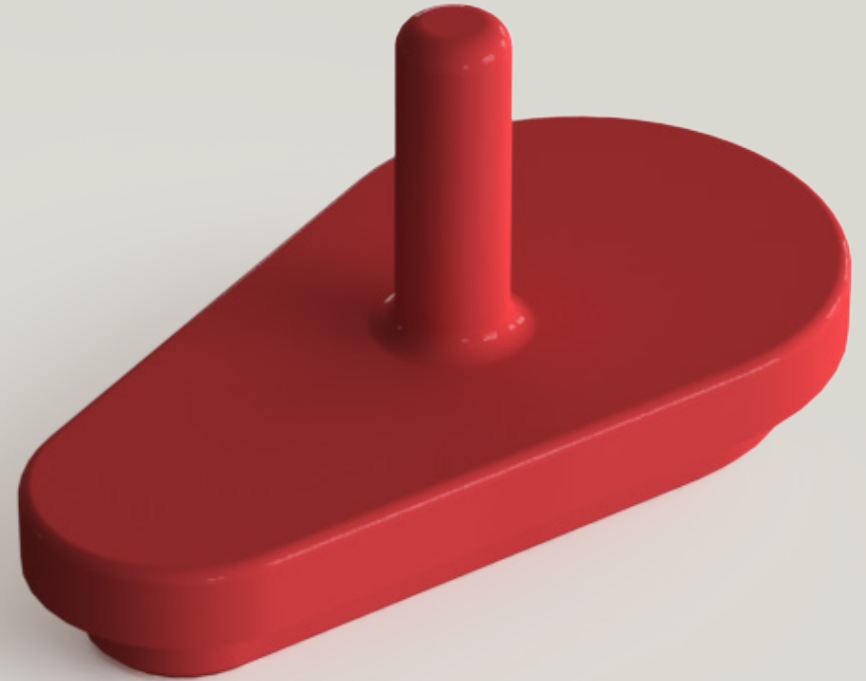
Should accommodate 3/4" bars which should be sufficient for supporting a user with an adequate safety factor while still remaining affordable.

Manual Lid

Initial research seemed to indicate that households preferred a hand-operated, removable lid over foot-operated and/or hinged lids.

Easy operation for adults and children.

Handle separated from contaminated area.



Extended Handle

Clear from contaminated area, handle will more likely stay clean and is easy to use by adults and children alike. Can be further extended by tying stick to it.

Foot-Operated Lid

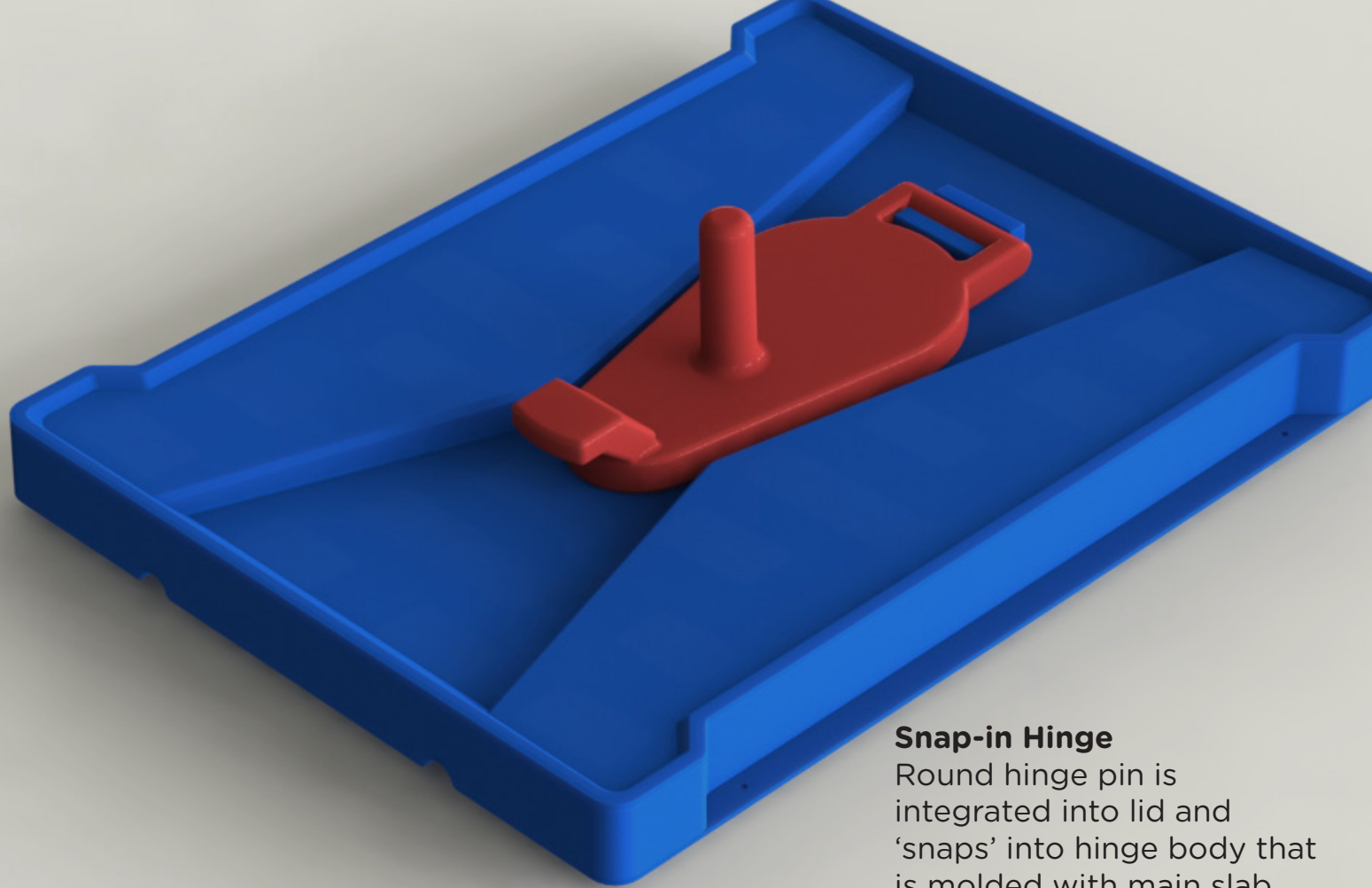
But more extensive research by Synovate actually showed the opposite--that the majority of households would prefer a foot operated lid. This lid is designed to flip back during use. The final lid design is still under development.

Foot or hand options with handle separate from contamination.

Easy operation for adults and children.

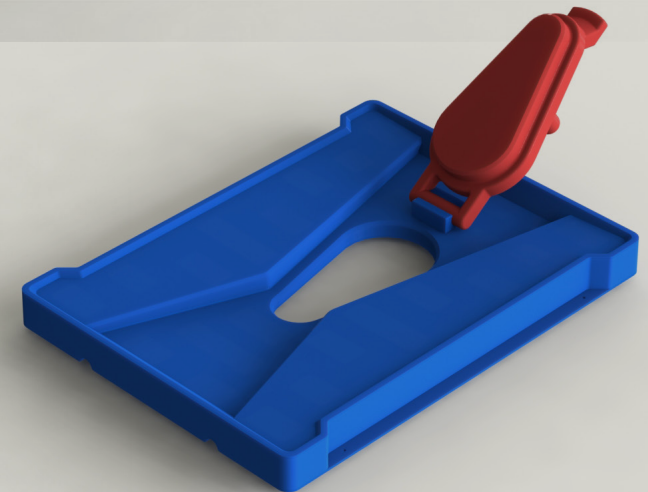
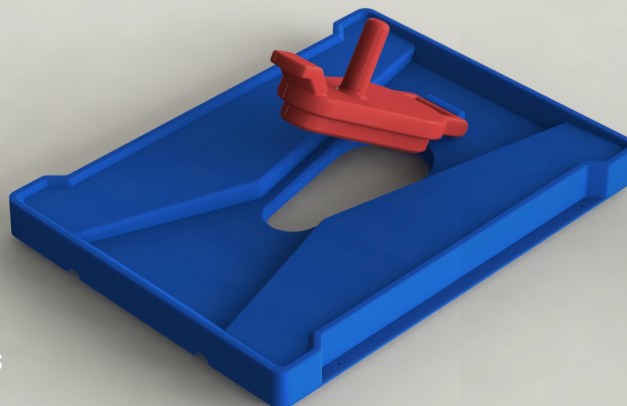
Robust, large hinge for durability and easy cleanability.

Can continue to function even if hinge fails.



Snap-in Hinge

Round hinge pin is integrated into lid and 'snaps' into hinge body that is molded with main slab.



WHY THE NEW DESIGNS?

The new slab and collar designs offer a hygienic alternative to mud, timber and concrete slabs that are

- More cleanable
- More durable
- More transportable
- More aspirational
- Nicer to use
- Reusable in case of pit collapse

They also include features that offer significant improvements over existing plastic slabs that are sold to the NGO market:

Improved user desirability and sale-ability:

- Butterfly Footrests
- Self Draining
- Thick-edged (overall height)
- Installation features
- Desirable lid

Lower costs and retail prices:

- Thinner walls
- Improved Touch-offs

** See quantification of these benefits and others in the Kenya Market Intelligence Report*

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