

## **PILOT PROJECT:**

# **DESIGN STRATEGIES FOR ENHANCING SERVICE DELIVERY IN SOLID WASTE MANAGEMENT AT DOORNBACH, CAPE TOWN**

## **Report on Community Design Workshop and Exploratory Design Proposals**

**9th April 2014**



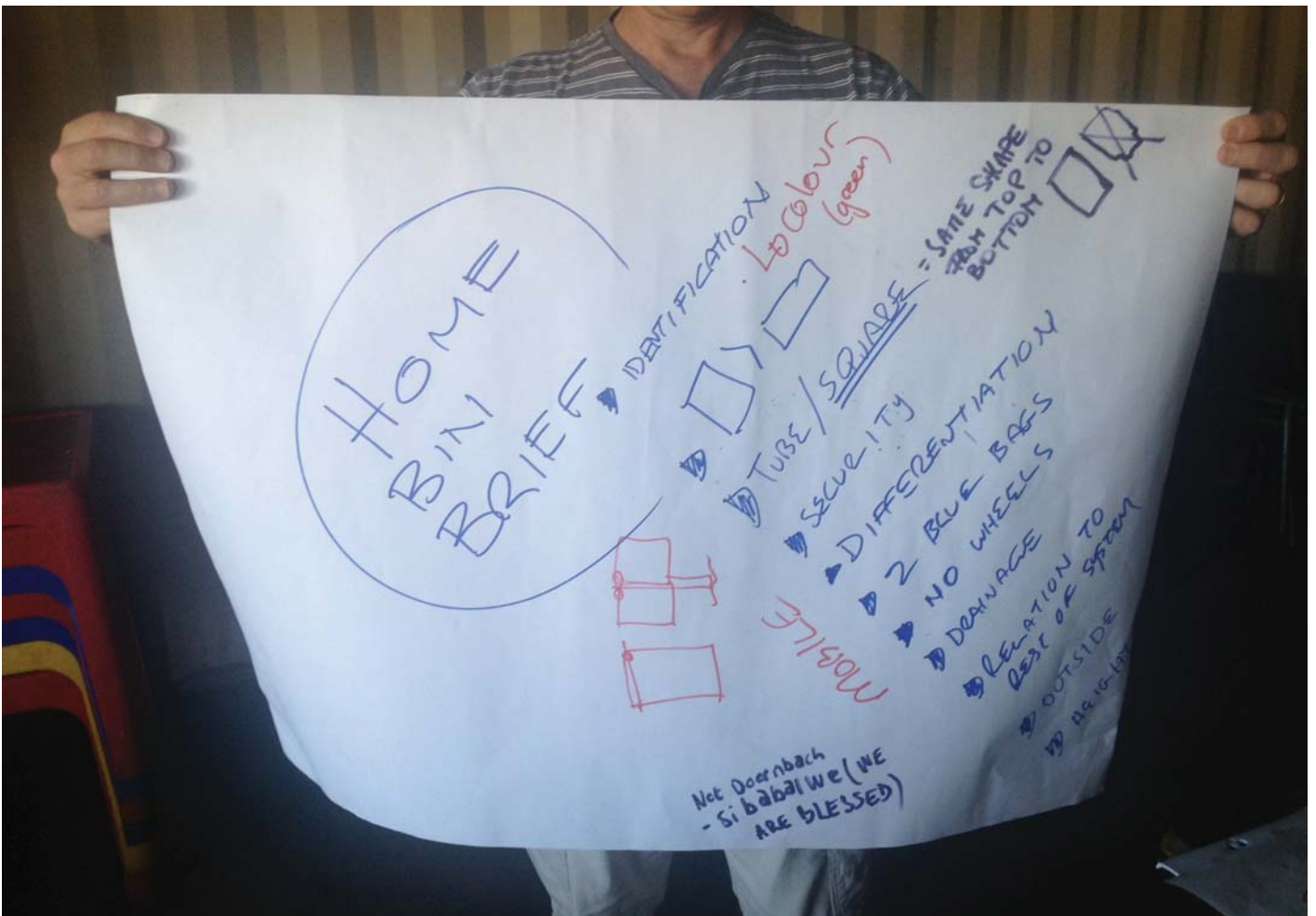
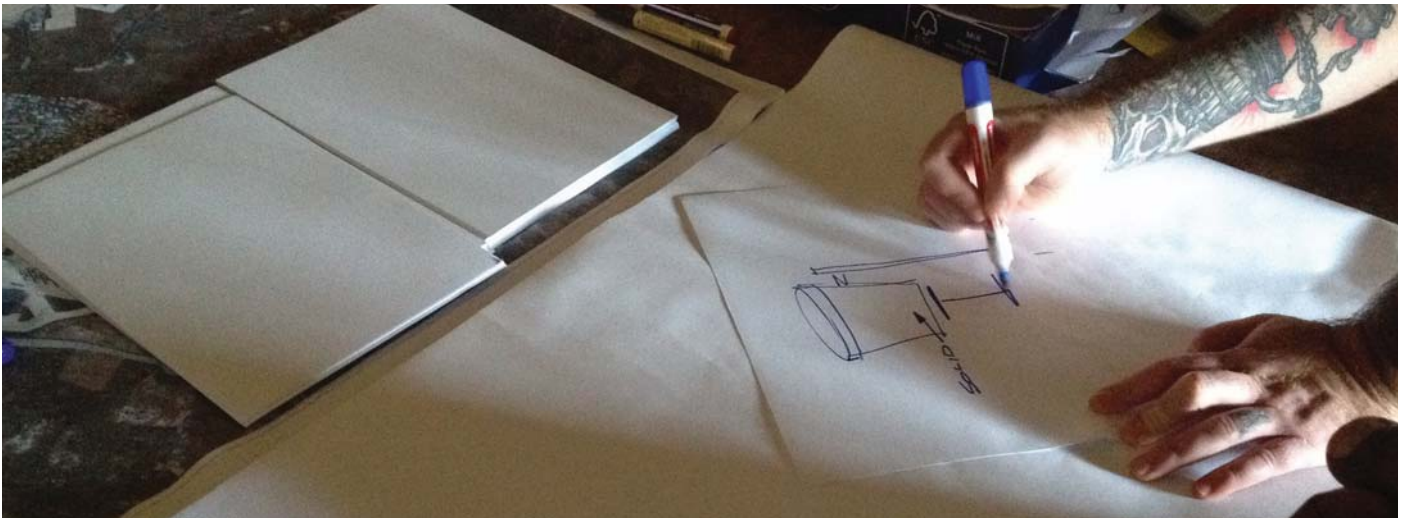
## COMMUNITY DESIGN WORKSHOP 4 - 6 MARCH 2014



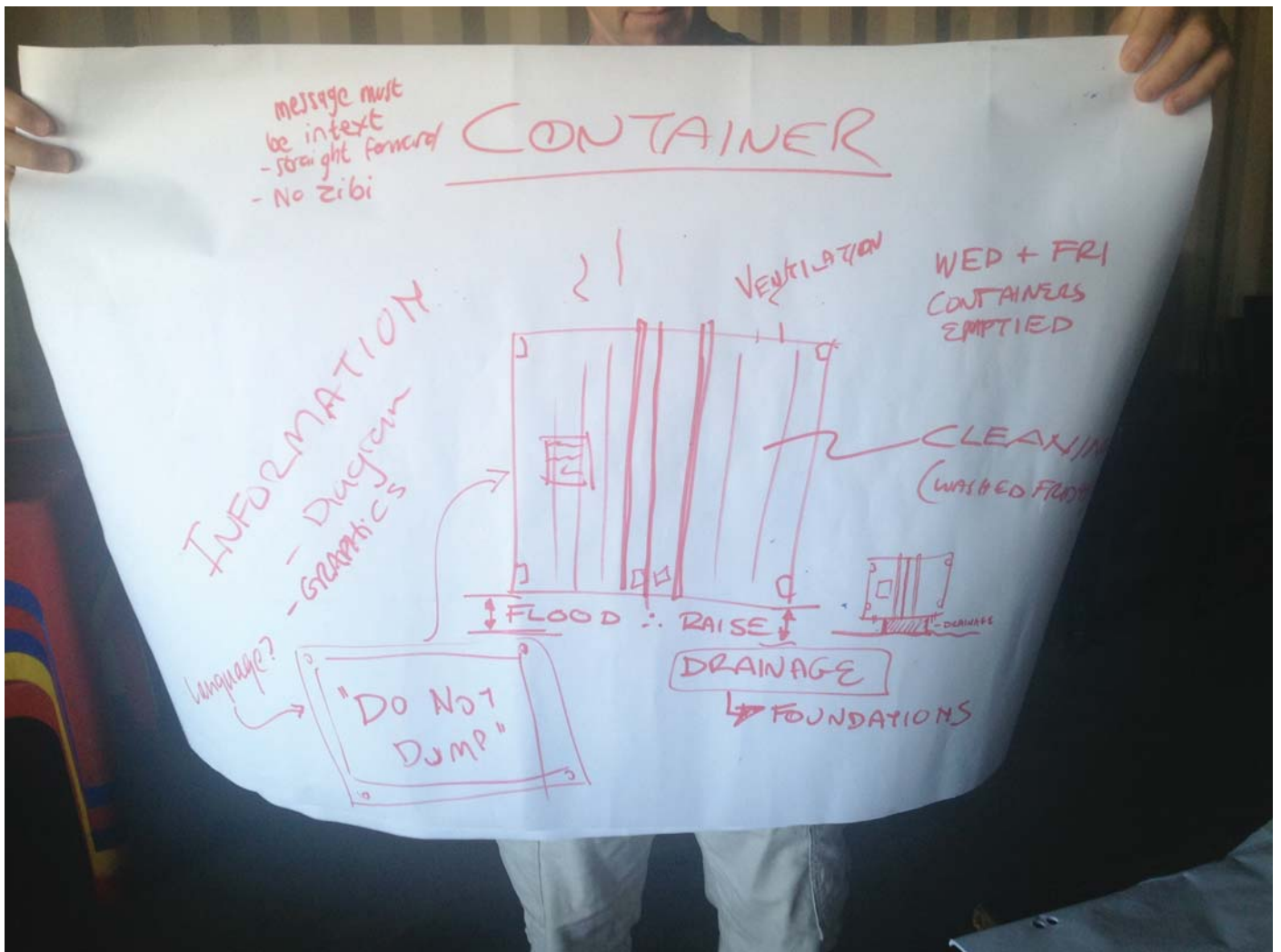


















## Certificate the Community Design Workshop 4 - 6 March 2014.

(23 participants from the community)



*imagine***that**\*



inspire



connect



design

### Community Design Workshop 4 - 6 March 2014

Certificate of Participation  
awarded to

***Alice Sokupha***

Having attended a Workshop in Design strategies  
for enhancing Service Delivery in Solid Waste Management  
Doornbach, Cape Town.

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Mugendi K. M'Rithaa  
Coordinator: Postgraduate Studies in Design  
Faculty of Informatics & Design  
Awarded on 6 March 2014



Cape Peninsula  
University of Technology



## COMMUNITY DESIGN WORKSHOP: WHAT WE LEARNT:

People use improvised plastic buckets for the blue bag (typically 20m litre capacity ones), there is space only for one bag at a time, and typically, if it rains the residents make holes at the base of the blue bags in order to allow water to go drain through them.

When the plastic bucket is filled up prior to the house-to-house pick-ups by the designated contractors, the residents deposit the blue bags to the container on their own. Generally speaking, this is not a problem during the day because the containers are open and accessible. However,

in the early mornings and evenings when the containers are closed, the lack of access leads to dumping near or at the container (or other locations in close proximity to the households). This causes littering and poses a health and safety hazard as children and pets may have access to the solid waste in the blue bags.

The research team also discovered that the residents are often unaware of the communication by the Solid Waste Department (like Zibi mascot). Only the community leaders are aware of the rules on the collection schedules of solid waste and how the system works. Generally the people seem unaware of the hazard of leaving the blue bags at or near the closed containers that they consider to be perfectly normal.

The containers are cleaned twice a week, but no provision is given to the draining off of the run-off water – this often exacerbates the corrosion. Additionally, some of the residents complained that the waste in the plastic bucket is often collected before the blue bags are completely full. There were mixed responses around the number of blue bags allocated to the households – some felt that they were adequate (at two bags a week per household) whilst others felt that they should receive additional bags in view of greater demand (either because of having more members

in their households, or where small babies were resident). It is recommended that this matter be taken up directly between the Department of Solid Waste Management and the Doornbach Community members (or their recognised representatives/community leaders).

## HOUSEHOLD BINS ISSUE:





## ISSUES IDENTIFIED AT THE CONTAINERS:



## ISSUE AROUND CLEANSING SERVICE:





## **HOUSEHOLD BINS:**

- 1) an adequately sized bin (20-40 litres capacity) should be made available;
- 2) wheels are not required on the bins – this could also help prevent against vandalism and misappropriation;
- 3) a suitable mechanism (or affordance) to lock the bin securely to the shack would help prevent pets and children from interfering with the waste;
- 4) it would be desirable to use the current shack numeration system deployed by the City to prevent theft;
- 5) the redesigned bins should have a stable base (or secure anchoring mechanism) that works on irregular/corrugated surfaces;
- 5) the bins should incorporate suitable drainage holes at the base to prevent foul odours; and
- 6) the bins should ideally be differentiated from the regular black one and have a branding as Doornbach or 'Sibabalwe' ("We are Blessed" in isiXhosa) to prevent theft and repatriation to other informal settlements prior to the official rollout of the proposed solution.

### **Specs for Sibabalwe Bin**

Tough rotationally moulded LLDPE, 4mm wall thickness

30ltr capacity

3.3kg total weight

Lip for securing bag

Allowances to secure to wall in various ways off the ground

Angled lid ensures weather resistance

Angled base, slim profile and soft corners reduce chance of injury

Integrated hinge reduces cost and increases durability

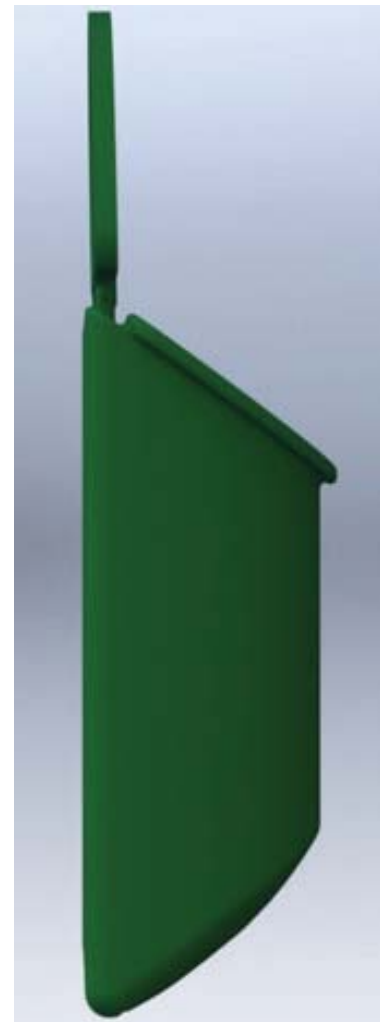
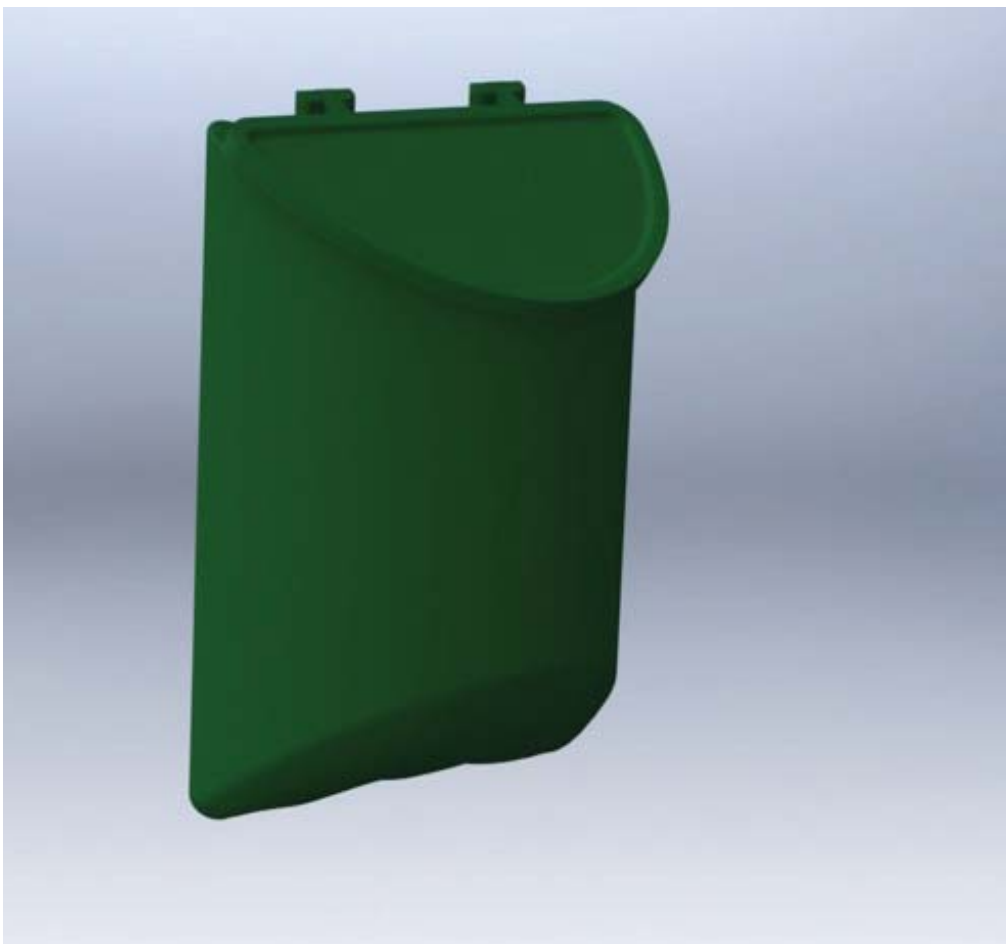
Space allowance for signage or advertising on the lid

### **Basic mould costs and unit costs:**

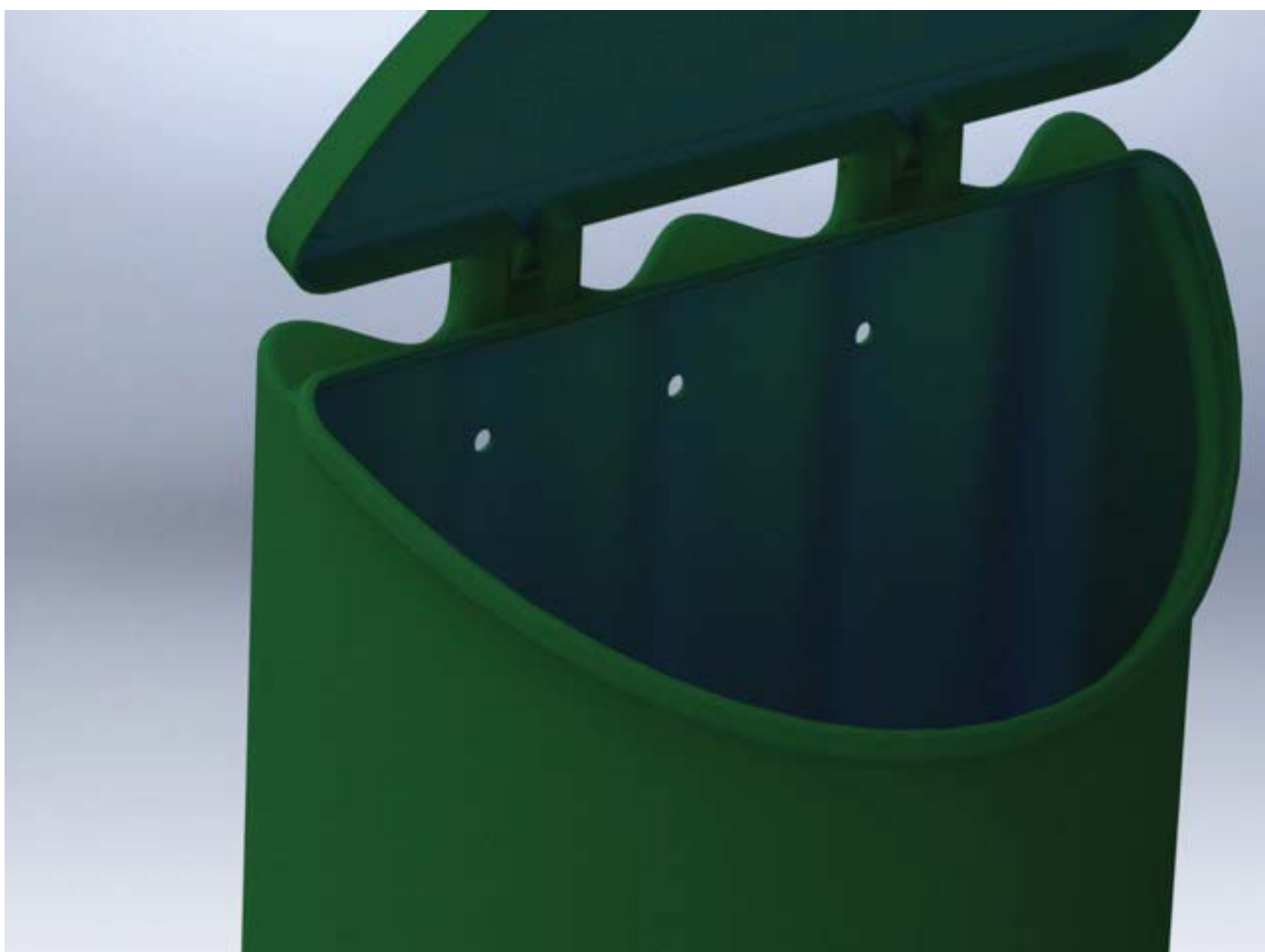
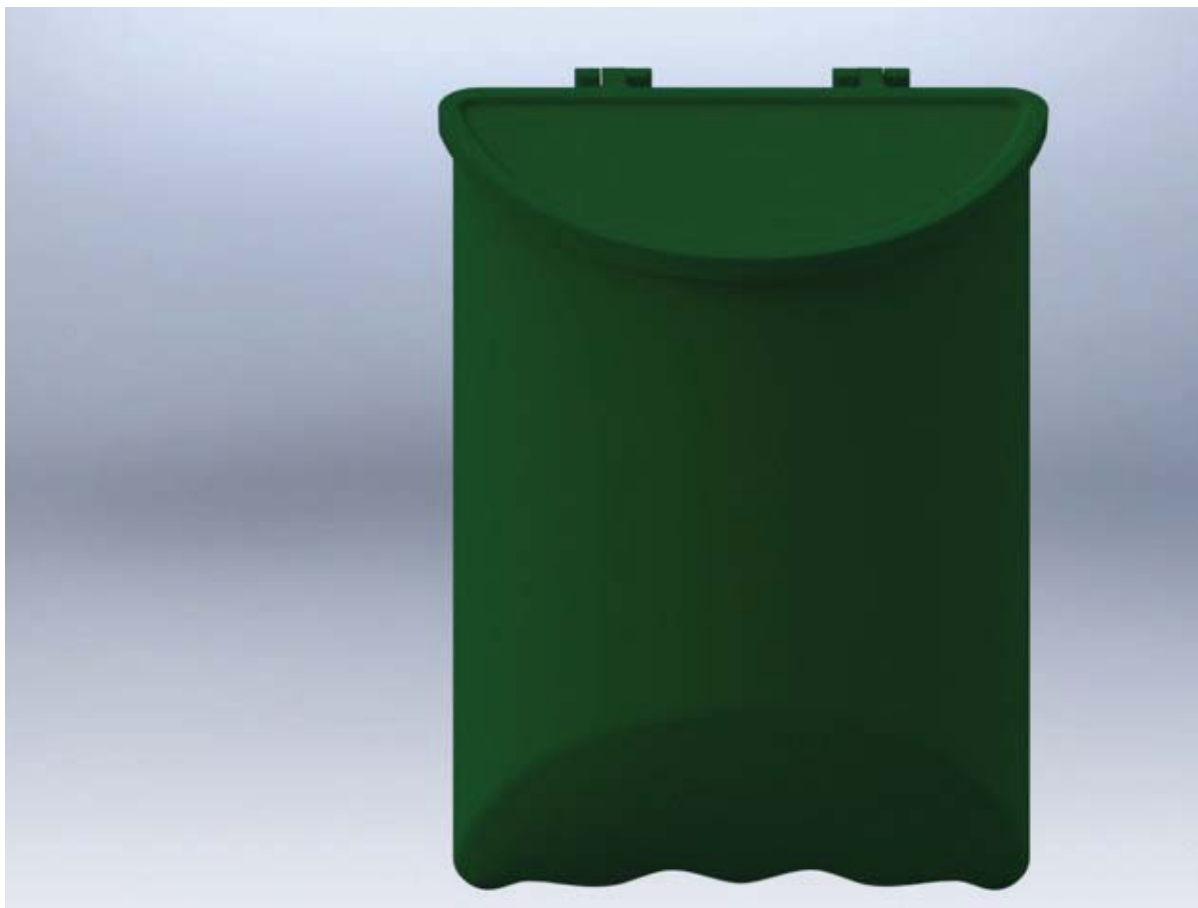
**Mould costs excl. VAT R72,500 (lid R 19,500 body R 53,000)**

**After the mould cost the unit prices are R248.00 vat exclusive**











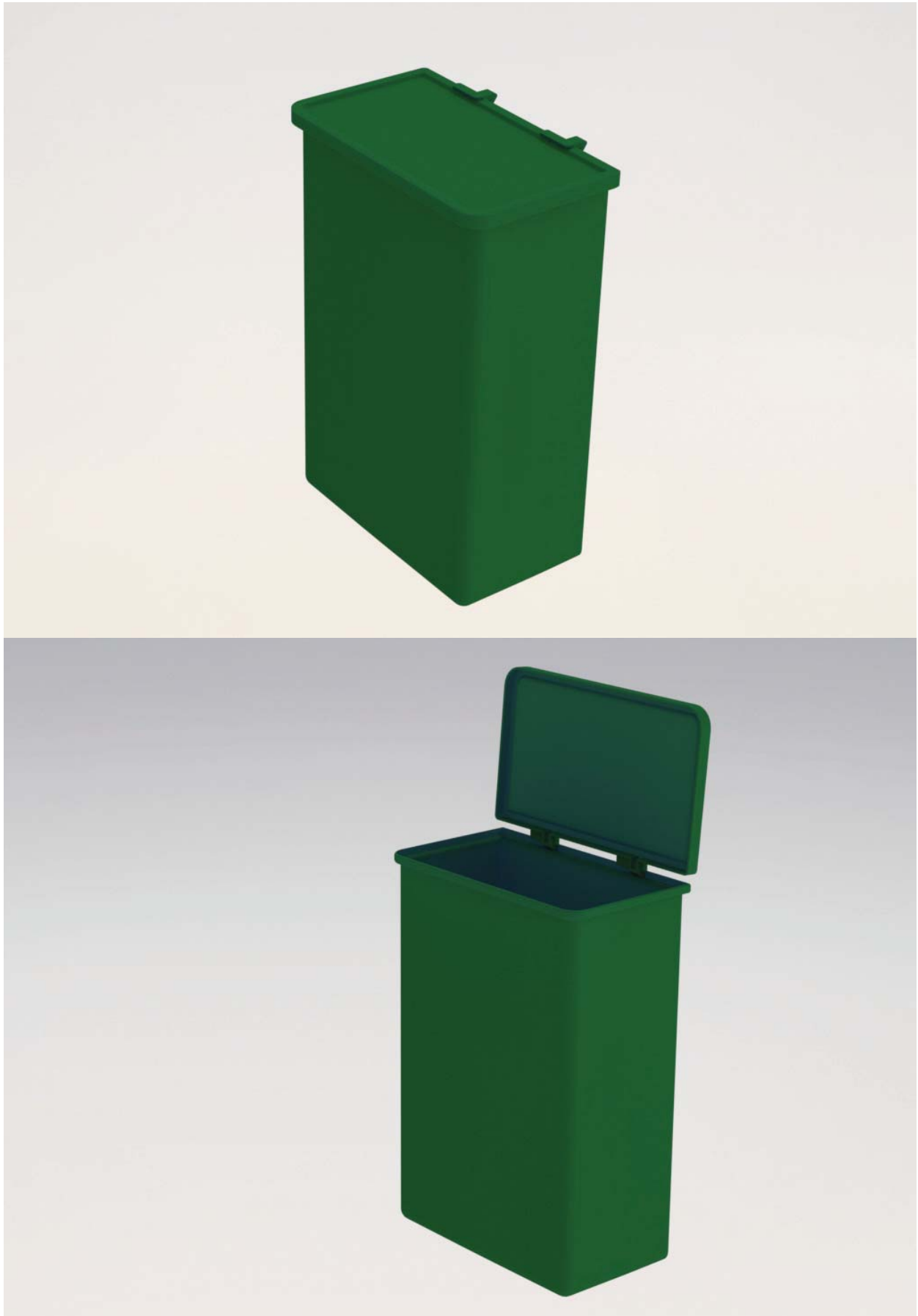


## VALUE OPTION

Sibabalwe value bin will be a approximately R65,000 for the body and lid

After the mould cost the unit prices are

Bin - R225.00 vat exclusive



## **BINS/TROLLEYS USED FOR THE WASTE COLLECTION FROM THE SHACKS TO THE CONTAINERS**

1) the bins/trolleys should be ergonomically designed to reduce occupational safety and health complaints by encourage correct posture and use.

### **OTHER CONSIDERATIONS**

- 1) some residents requested more (than the two currently allocated) blue bags; and
- 2) improvements need to be made in both the designated site for the collection of large waste, as well as the frequency of the collection of the large waste at the container site.

### **SPECS FOR THE TROLLEY**

Rotationally moulded LLDPE, 5mm wall thickness, double walled body ensures a very robust unit  
150ltr capacity

24kg total weight

Handle front and back for push / pull or securing trolley

Based on a wheelbarrows basic dimensions and moment calculations

Unit size designed to manoeuvre in tight spaces

2 x wheelbarrow wheels

Space allowance for signage or advertising on side of the body

#### **Basic mould costs and unit costs:**

**Mould costs will be between R105,000 - R115,000 excl. VAT**

**After the mould cost the unit prices are R895.00 excl. VAT**





## VALUE OPTION

Sibabalwe value trolley will be approximately R 82,000

After the mould cost the unit prices are

Trolley – R620.00 vat exclusive





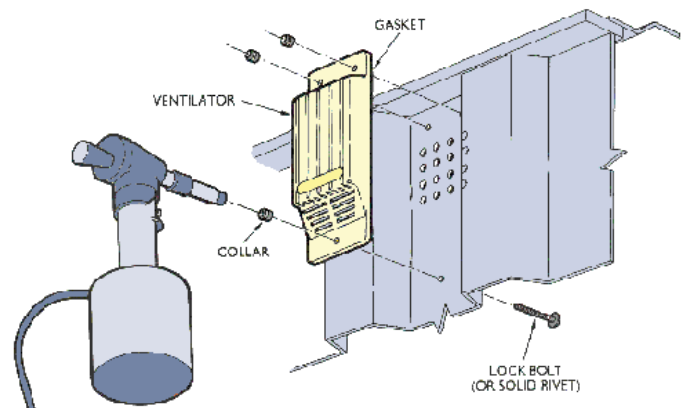
## CONTAINER-SPECIFIC INTERVENTIONS:

- 1) should be elevated (possibly on a concrete slab or plinth);
- 2) should include ramps for ease of ingress and egress with bins;
- 3) should incorporate an appropriate vandal/tamper-proof system of ventilation;
- 4) should incorporate practical drainage to allow for the washing (yet reduce corrosion); and
- 5) should incorporate an enclosure nearby for holding large waste generated from the informal settlement.

## SIGNAGE ON CONTAINERS:

- 1) a serial number should be clearly displayed for tracking and management purposes;
- 2) an SMS number should be provided for submission of complaints;
- 3) a form of 'community board' for updates and key information should be incorporated;
- 4) the days on which the emptying of containers is carried out should be displayed prominently;
- 5) the day and time for the cleaners to work in the area should also be indicated; and
- 6) the designated area for large waste should be clearly directed.

## Container Ventilation Covers



### Characteristics:

Material: Nylon 6.6

Keeps away rain and splash water from the container

Easy to revarnish

Heat- and frost resistant at temperatures from -50° to +200° Celsius

Composition out of EPDM (ethylene-propylene diene terpolymer, synthetic rubber)

Ozone- and acid resistant

Anti-rust and anti-corrosion

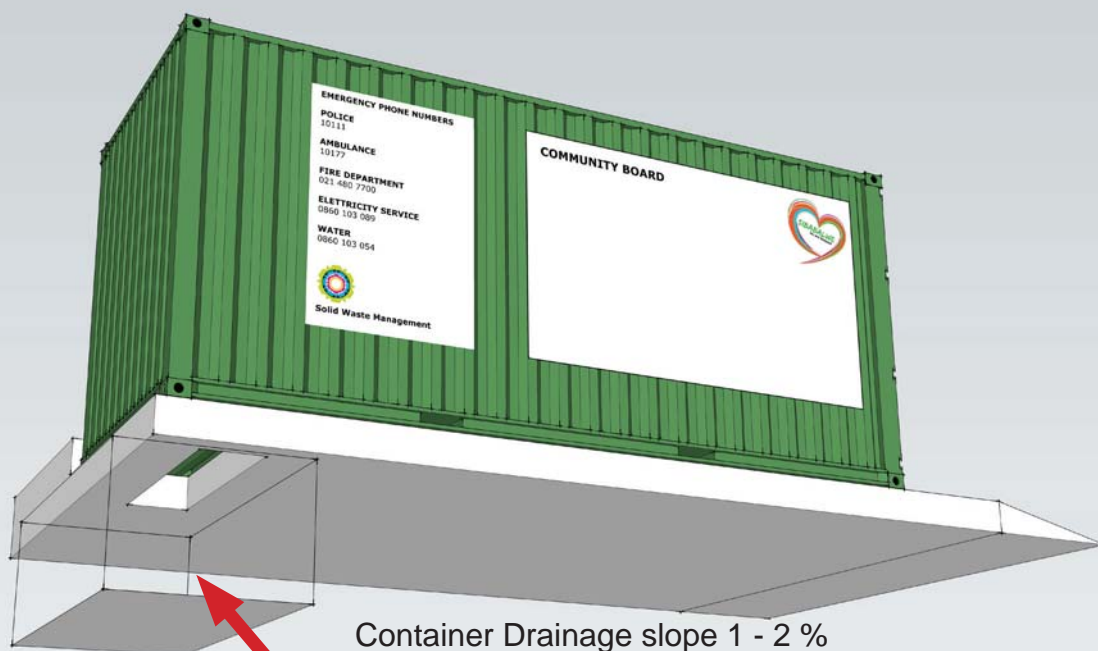
Very durable

Cost: R 50 +- R 90 each



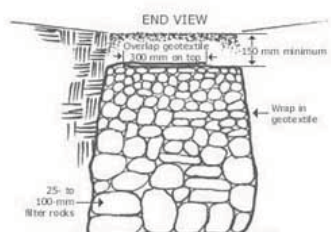


Concrete construction  
Cost estimate: R 40.000



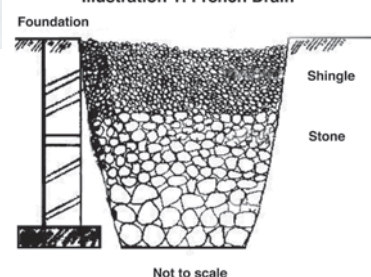
Container Drainage slope 1 - 2 %

#### French Drain or Rock Underdrain



**French Drain**

#### Illustration 1: French Drain





## PUBLIC BINS NEAR TO SHOPS



## SIBABALWE, A NEW NAME

The community refers to Doornbach informal settlement by the aspirational name of 'SIBABALWE' that means: "we are blessed" in isiXhosa.

During the Community Design Workshop the research team and participating community members co-created a possible logo reflecting this new name.

**Sibabalwe**  
we are blessed

**SIBABALWE**  
we are blessed

**Sibabalwe**  
we are blessed

**SIBABALWE**

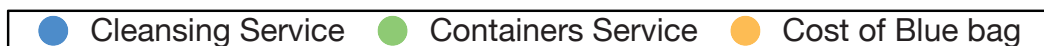
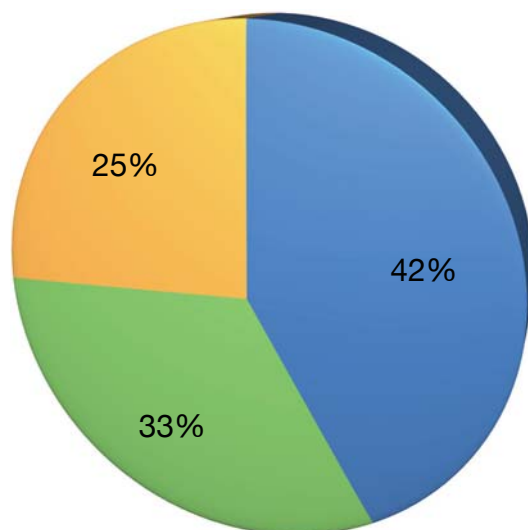


**Sibabalwe**



## ANNEXES 1

DOORNBACH				
		Weekly	Monthly	Years
Total dwelling serviced	3112			
Cleansing Service	R14,97		R46 586,64	R559 039,68
Containers Service	R11,88		R36 970,56	R443 646,72
Total Blue bag distribution	7500			
Cost of Blue bag	R0,88	R6 600,00	R28 380,00	R340 560,00
<b>TOTAL</b>				<b>R1 343 246,40</b>
Shipping Container in Doornbach	9			
Container cost	R26 922,83	<b>R242 305,47</b>		





## ANNEXES 2

