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COMMUNITY PLUMBING CHALLENGE



Diepsloot, South Africa

9th – 15th July, 2016

BRIEF



PART 1

HEY DIEPSLOOT... WASSUP?

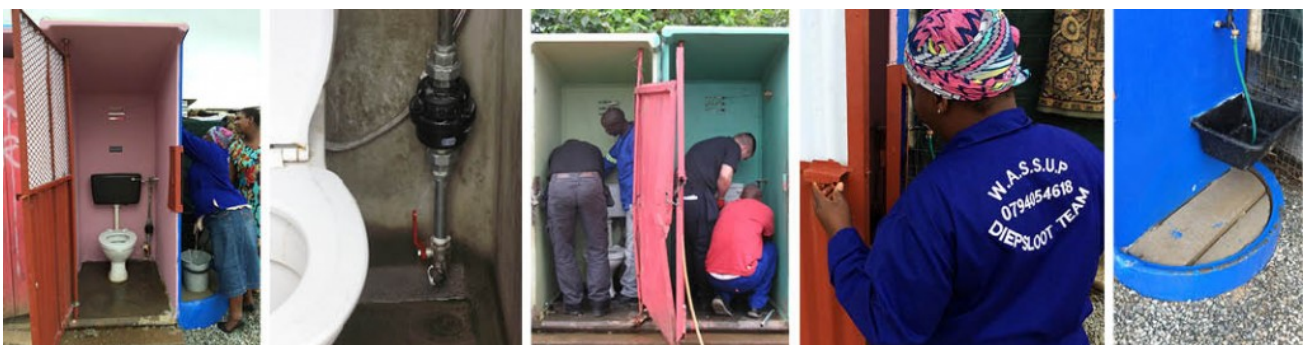


WASSUP – the Water, Amenities and Sanitation Services Upgrading Programme – is a community organization that repairs and maintains communal toilet facilities, taps and drains in the township of Diepsloot.



In joining Community Plumbing Challenge 2016, Teams will experience first-hand the testing but inspirational work which is carried out by WASSUP – and other skilled community groups like them – in townships across South Africa, every day.

Teams will be asked to offer creative solutions for upgrade and upkeep of these communal toilet facilities, assembling and testing their new designs, then supporting WASSUP to install these solutions for local residents across Diepsloot.





OVERVIEW

YOUR CHALLENGE

- **Demonstrating best practice in sustainable design, material selection, technology, and construction, each Team will upgrade two communal toilet units:**
 - **The first unit will be ‘freestyle’ design, prepared before arrival in South Africa. This unit will be built offsite at the CPC Hub, Diepsloot, on days 1–2.**
 - **The second unit will be a collaborative design, utilizing the best ideas from all Teams. This unit will be built offsite at the CPC Hub, Diepsloot, on days 2–3.**
- **Following completion of these two units, Teams will collaborate with WASSUP to install them onsite in the Extension 1 neighbourhood of Diepsloot, on days 4–6.**
- **Each team will install water meters and data loggers to monitor water usage for both the cisterns and water collection points, over the three months following the CPC event.**

This Brief has five parts:

- 1** – Full design solution for a ‘freestyle’ toilet unit (pre-arrival)
- 2** – Quality construction / assembly of one ‘freestyle’ and one ‘collaborative’ toilet unit (day 1–3, CPC hub)
- 3** – Team presentation of design solutions to Diepsloot group (day 2)
- 4** – Installation of unit pairs (day 4–6, in township)
- 5** – Design and construct a trolley/cart (day 4–6, in township)

Please refer to the following Supporting Documents (separate files):

- Full individual unit plans (filename: CPC2016_Unitplans.pdf)
- Photos of individual units (filename: CPC2016_Photos.pdf)

General tips:

All presentations and activities prepared should attempt creative means of interaction with the WASSUP Team and other local residents/users, in order to overcome language and literacy barriers.

Flip charts will be available, if required. All other printed material should be prepared in advance.



PART 1

FULL DESIGN SOLUTION FOR TOILET UNIT (FREESTYLE UNIT)

Timeframe:

This must be completed during the period 25 April to 23 June, 2016 (pre-arrival to South Africa).

All work must be submitted to the CPC Organizing Team by close of business on Friday, 24 June 2016.

Requirement:

Provide a proposal to improve the access and functionality of a modular flush toilet, water collection point, hand washing and clothes washing facilities for communal use. The number of people who will use each facility will range from a minimum of 125 people to a maximum of 250 people. The hours of usage are from 5am to 10pm. At maximum usage (250 people) this equates to 18 people per hour, for 14 hours.

The proposal is to utilise existing precast concrete toilet cubicles, which were removed from Diepsloot in March 2016 (see attached photos: CPC2016_Photos.pdf). Consideration is to be given to existing penetrations for water connections, waste connection to mains sewer, top and bottom door pivot, trough fixings, built in wall vent and lifting holes (for craning to site).

You must deliver:

- **Rationale document (how it works).**
- **2D/3D design files based on templates provided.**
- **Installation and maintenance guide for the solution, including required toolkit.**
- **Material costing/budget in order to implement the solution.**



PART 1 (CONTINUED)

Each unit, as a minimum, must provide residents access to the following facilities:

1) Flush toilet

You must ensure:

- Connection is provided for mains sewer.
- A stop valve for the toilet cistern is installed to allow the cistern to be turned off for maintenance.
- There is an external inspection opening for maintaining the toilet drain.
- Drains are minimum 100mm diameter in ground, with reduced drain sizes for troughs rising only above floor / ground level and where they are accessible.
- Vent pipes are securely fixed.
- The pan is properly bedded and securely fixed to the floor.
- Cistern and pipes are securely fixed to the wall.

You should also consider:

- Providing a place to store toilet cleaning equipment.
- The toilet facility design uses locally available materials. If not, explain the supply chain for making materials available.

2) Door and Lock

You must ensure:

- There is a door that provides privacy, that is robust, that is fitted with a privacy lock that can be unlocked from the outside in an emergency, and that can be padlocked from the outside at night.
- The door provides the cubicle with natural light and ventilation.

You should also consider:

- The door design uses locally available materials. If not, explain the supply chain for making materials available.



PART 1 (CONTINUED)

3) Water collection point

- a) **Allow residents to fill a 20lt water container** (300mm diameter and 400mm deep)
- b) **Allow residents to wash hands after using the toilet**
- c) **Allow residents to wash clothes**

You must ensure:

- There is a hand washing facility, either a basin or trough, immediately outside the toilet cubicle.
- There are tap/s for filling 20lt water containers.
- There is a waste outlet for emptying large tubs of grey water.
- There is a securely mounted laundry trough.
- That all parts of the selected tap, including the handle, are made of durable materials suited to local water conditions.
- Inlet of tap is ½" male thread.
- Tap ware is standardised for easy maintenance.

You should also consider:

- Benefits of anti-vandal tap handles that are less likely to work loose and fall off the fitting.
- Using a chain to secure the trough/basin plug.
- Providing a soap holder or shelves for washing powder, near the trough but out of reach of children.

Finally, each Modular unit is to be fitted with water meters and data loggers (supplied) for monitoring water usage

You must ensure:

- Separate water meters are fitted to the water supply of the cistern and to the water collection point.
- There is provision for securely mounting a data logger (approx. size 250 x 150 x 100mm), within 500mm of the water meters.

Note:

Your solutions should be realistic: achievable to build within one day intensive work onsite during the CPC and acknowledging similar variables as those typically experienced by 'residents and users'. This process must be clearly explained in your Rationale.

If your design uses materials or parts that are not readily available, locally, you must outline the respective supply chain(s) that *would* make them realistically available (e.g. for ongoing maintenance).



PART 1 (CONTINUED)

Indication of Costs:

Cost per toilet unit, as confirmed during WASSUP-Healthabitat Sanitation Studio project in March 2016:

	QTY. PER TOILET	COST (EACH)	TOTAL COST
Concrete unit	1	ZAR 2,971.75	ZAR 2,971.75
Concrete Trough	1	ZAR 203.14	ZAR 203.14
Cistern	1	ZAR 798.00	ZAR 798.00
Tap	1	ZAR 36.48	ZAR 36.48
Delivery Pennyware	1	ZAR 42.86	ZAR 42.86
Flexible connector to cistern	1	ZAR 32.72	ZAR 32.72
Nipple ½"	7	ZAR 3.00	ZAR 21.00
Elbow F-F ½"	5	ZAR 6.05	ZAR 30.25
Elbow M-F ½"	4	ZAR 6.05	ZAR 24.20
Union ¾"	4	ZAR 40.50	ZAR 162.00
Water Metres (Kent) ¾"	2	ZAR 355.95	ZAR 711.90
Reducing bush ¾" x ½"	4	ZAR 5.90	ZAR 23.60
Tee ½"	1	ZAR 7.68	ZAR 7.68
Thread tape	2	ZAR 5.80	ZAR 11.60
Pan	1	ZAR 290.00	ZAR 290.00
PVC solvent cement	1	ZAR 10.00	ZAR 10.00
Isolation valve ½"	1	ZAR 90.00	ZAR 90.00
Horn bend 100mm	1	ZAR 73.70	ZAR 73.70
Screws for Pan	4	ZAR 6.25	ZAR 25.00
Epoxy for Pan	0.1	ZAR 490.00	ZAR 49.00
Pipe clamps to wall	1	ZAR 50.00	ZAR 50.00
Pan collar	1	ZAR 40.32	ZAR 40.32
S' Trap	1	ZAR 62.40	ZAR 62.40
20mm Gal pipe 6m	0.2	ZAR 130.50	ZAR 26.10
Threading oil	1	ZAR 5.00	ZAR 5.00
110mm PVC pipe	0.5	ZAR 74.40	ZAR 37.20
Vent valve	1	ZAR 42.40	ZAR 42.40
40mm PVC pipe	1	ZAR 25.32	ZAR 25.32
Pan connector	1	ZAR 49.59	ZAR 49.59
PVC Reducer 40mm–110mm	1	ZAR 52.44	ZAR 52.44
Polyfiller	0.1	ZAR 120.00	ZAR 12.00
		TOTAL	ZAR 5,992.64



PART 2

TOILET UNIT CONSTRUCTION

Timeframe:

This must be completed during days 1–3 (Sun 10 to Tue 12 July, 2016).

Requirement:

Construct your freestyle design in a predetermined used concrete unit at the CPC Hub.

Teams will be assessed for the quality and robustness of the fixings for all install items (e.g. pans, pipework, doors, cisterns, troughs, tap ware etc.)

On completion all units will be pressure tested, and teams will be assessed for leaks in water supply pipes, in addition to leaks in cisterns, troughs etc.

You must deliver:

- **A functioning toilet upgrade, based on your freestyle design.**

Consider:

Poor quality construction is a large cause of toilet failure in Diepsloot. This part of the CPC will examine the quality of construction used by each team during the fit-out of each freestyle modular toilet unit.

Note:

Teams may bring their own tools with them, if desired.

Teams may also bring their own materials for their freestyle unit, including door lock, pan, cistern, isolation valve, tap and water meter.

The Organizing Team are on hand to discuss tools and materials in the lead-up to the event.

Teams should consider the availability of these tools or materials for future construction and, most importantly, ongoing maintenance.



PART 3

DIEPSLOOT PRESENTATION

Timeframe:

This must be completed during the period 25 April to 23 June, 2016 (pre-arrival to South Africa).

All work must be submitted to the CPC Organising Team by close of business on Friday, 24 June 2016.

The design solution/proposal will be delivered to WASSUP and other local residents/users at the start of day 2 (Mon 11 July, 2016).

Requirement:

Each Team will be given 20 minutes to present, followed by 10 minutes for questions, answers and discussion on their proposal. All Teams will be present throughout this process.

You must deliver:

- **A one-page outline for Judges, explaining your Team presentation plan and structure.**
- **A max. Twenty-minute presentation by your Team to WASSUP and other local residents/users, explaining your design solution for the toilet facility.**

Note:

WASSUP, taking into account the freestyle solutions presented by each individual Team, will identify the best collaborative design. Teams will then work together to build this solution on day 3 (Tue 12 July, 2016). Each Team will install their freestyle unit plus their collaborative design unit in Diepsloot during the remaining days (see page 10).



PART 4

ONSITE INSTALLATION

Timeframe:

This must be completed during days 4–6 (Wed 13 to Fri 15 July, 2016).

Requirement:

Teams will collaborate with WASSUP to install newly upgraded units at predetermined sites around Diepsloot.

Tasks will include, but are not limited to:

- Removing old units from predetermined site.
- Disconnecting waste to units.
- Capping off water supply.
- Levelling the base for new units.
- Placing units on pads.
- Connecting water supply to units.
- Connecting waste to unit.
- Testing all operations of units.
- Levelling ground in the area around the units.

All works will be supervised by a member of the CPC Organizing Team.

Note:

For safety on site, a limit of four Team Members and one Team Leader for the installation will be imposed.



PART 5

TROLLEY/CART DESIGN AND CONSTRUCTION

Timeframe:

This will be completed during days 4–6 (Wed 13 to Fri 15 July, 2016).

Requirement:

Teams will collaborate with WASSUP to discuss and design a trolley/cart to meet the needs of the WASSUP team and other local residents/users. The purpose of the trolley/cart will include, but is not limited to, the transport of tools and equipment during ongoing maintenance and upgrade works, plus ability to store securely and efficiently.

A test unit will be constructed and critiqued until a final design is decided.

Note:

No pre-design work is needed. The WASSUP team will brief all Teams on day 4 (Wed 13 July).

Teams will be supported in this design process by the Digital Fusion Design Hub.