END-USE WATER DEMAND MONITORING OF COMMUNITY ABLUTION BLOCKS

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The project of monitoring the end-use water demand of Community Ablution Blocks (CABs) is currently undertaken at Frasers informal settlement outside of Tongaat, north of Durban. The settlement is home to less than 500 households and is being provided with five CAB facilities, which are each monitored in order to investigate the usage patterns within these communal facilities in order to optimise the future design of the water supply and wastewater treatment to similar facilities - namely the peak factors and total water demand requirements of these facilities. CABs have been rolled out to informal settlements throughout the eThekwini municipal area and consist of male and female facilities constructed out of retro-fit used shipping containers. Each container is internally provided with a number of toilets, hand wash basins, and showers in both male and female facilities and urinals in the male facilities. Externally, the CABs provide laundry washing basins.

Monitoring of the end-use water demand is achieved by measuring the water consumption of each type of fitting (toilets, showers, laundry, hand wash basins, urinals) in the male and the female containers using domestic water meters (9 water meters in total for the CAB facility). These water meters are then connected to telemetric data loggers which record the data at 15-minute intervals and transmit the data on a daily basis to an internet based server where it can remotely be accessed and analysed. The data loggers can monitor up to three water meter inputs (requiring a total of 4 data loggers per facility). The monitoring equipment is stored in a concrete enclosure with a lockable manhole cover to secure it from vandalism and theft.

Although most of the informal settlements are located within the waterborne edge – where waterborne sanitation is economically viable, there are settlements located outside the waterborne edge where there is a need for decentralised, on-site treatment through the provision of septic tanks or anaerobic baffled reactors. These decentralised treatment systems are being piloted in the Frasers informal settlement. The quantitative understanding of the end-use demand patterns will provide guidelines which will enable optimisation of the design of these decentralised treatment facilities for communal water and sanitation facilities.

The CAB and the concrete enclosure used to house the water monitoring equipment, the water meters and data loggers.

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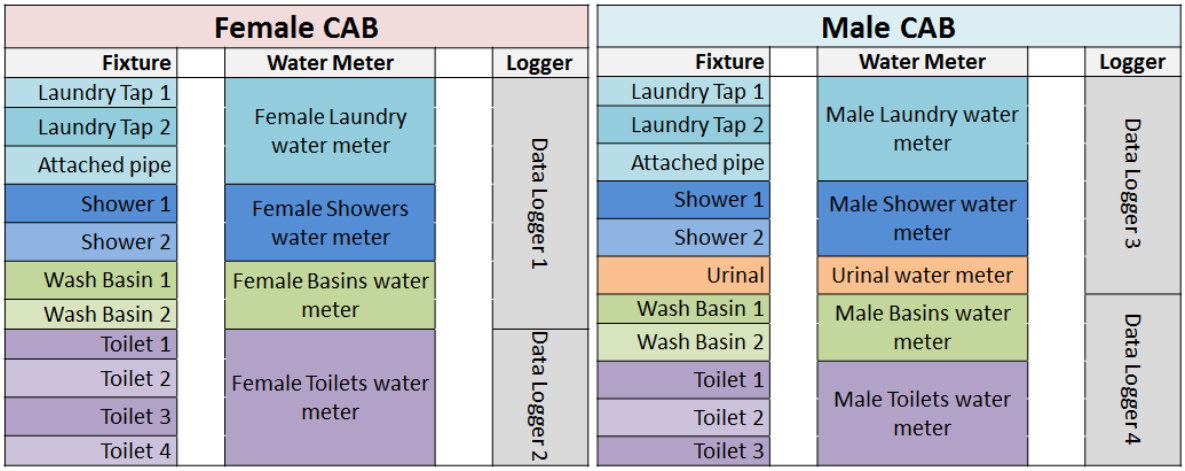
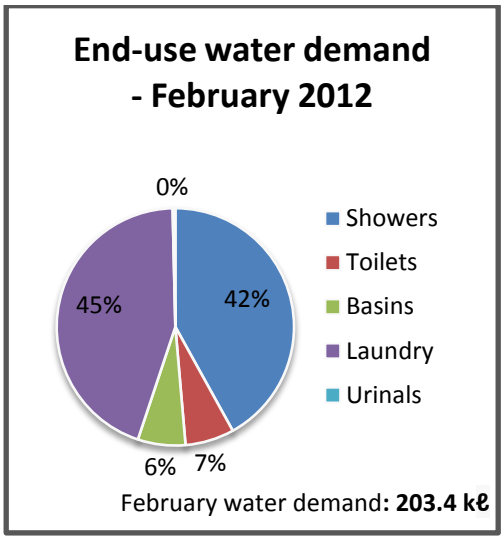
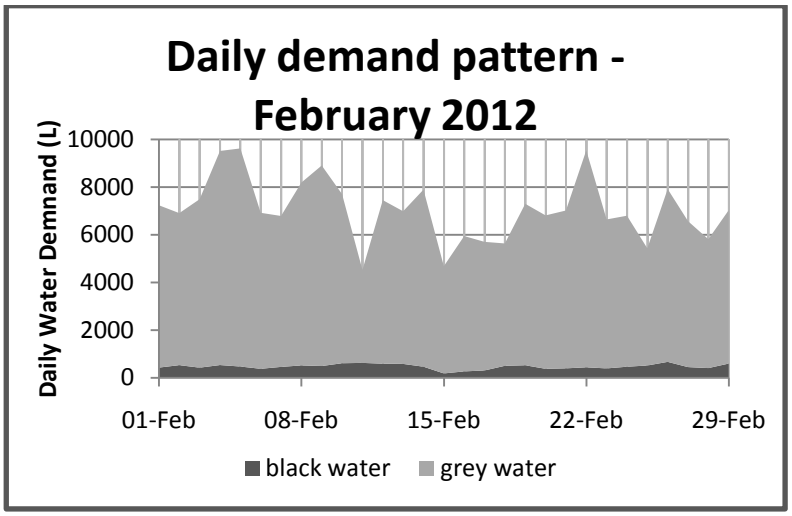


The end-use demand monitoring configuration for the CABs in Frasers informal settlement

The initial results have indicated that the grey-water demand is considerably higher than the black-water demand, constituting more than 90% of the total water demand of the CABs. These findings are significantly different to domestic water demand patterns, with typical domestic water demands of 60% grey-water and 40% black-water. Further, the preliminary results have indicated a daily peak factor of 1.4 and a 15-minute peak factor of 6.1 for the month of February 2012. The other results are shown in the following graphs.





The graphs indicate the end-use water demand of one CAB in the Frasers informal settlement (male and female facilities combined) serving approximately 50 households (120 – 150 people).

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