Schools water efficiency and awareness project

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Background

The City of Cape Town's Water Demand Management (WDM) department has been involved in school projects for several years, although these have generally been restricted to educational activities during Water Week and school competitions, due mainly to limited resources.

Cape Town is a water scarce area, and although the per capita water consumption appears to have dropped slightly over the past three years, this could be attributed to the aggressive media campaign in 2000/2001 and tariff increases. Schools are one area where there can be substantial water use (and/or abuse) and the City's Water Demand Management team therefore initiated its Schools Water Efficiency Project in February 2003, which supports several of the City's Water Demand Management Strategy objectives and is aligned with the IDP. All schools within the Cape Metropolitan Area (approximately 850) are to be incorporated in 3-5 years, including follow-up visits and assessments.

Purpose

The purpose of the project is to empower schools within the City's boundaries to bring their water efficiency up to an acceptable level within a five year period, thereby substantially reducing the amount of potable water wastage in this area. (It can be noted that removal of automatic flushing urinals (AFUs) alone in schools can save up to R8 000 on the annual water account, as was achieved at Marine Primary).

Obectives

The objectives of the project are:

- To establish a supportive relationship with schools/learning institutions
- Initiate savings from day one with the installation of Hippo bags in cisterns (see illustration on p 94)
- To establish a schools database with information collected
- Initiate talks with the Department of Education to negotiate and facilitate empowerment mechanisms for schools to carry out recommended retrofitting and/or repairs
- To provide schools with an Action Plan for improved water efficiency.

Establish a supportive relationship with schools/ learning institutions

A newsletter was developed and sent round to all schools to explain the project and offer support and advice. A small team of two facilitators (who are ex-school teachers) visit schools to raise awareness, capture information and demonstrate how to install the Hippo bags into the cisterns. Should a caretaker not have basic plumbing skills (i.e. changing of tap washers), this service can be offered at the City's Water Services Training Centre.

Initiate savings from day one with the installation of Hippo bags

In an immediate effort to assist and motivate the schools, Hippo bags are provided for each toilet cistern, so the water savings can begin from day one. At this stage other simple advice is given, for example: advising the turning off of AFUs after school hours.

To establish a schools database with information collected, and Initiate talks with Department of Education to negotiate and facilitate empowerment mechanisms for schools

A schools database has been established, which identifies the water use facilities in each school and indicates what needs to be done to bring each school up to an acceptable water efficiency level. This will give the WDM department the necessary information to begin to work more closely with the Departments of Education and Public Works to ensure the necessary mechanisms are in place to enable the recommended works/repairs and/or retrofitting to be carried out.

To provide schools with an action plan for improved water efficiency

Action plans are drawn up for each school visited which are given to schools on the follow up visit. The plan offers suggestions and specifications to achieve optimum water efficiency.

Benefits

In the process of striving towards water efficiency, the schools will find many benefits. The school environment improves as leaks and drips are identified and eliminated; awareness levels of the Care-taker are raised; awareness levels of the Head and the learners are raised as the project develops as the project is linked to future Water Week activities; and co-operative partnerships between the City, Department of Education and Department of Public Works will be supported and strengthened.

In the majority of cases the cost of the work needed could be recovered within a few months, thus releasing more funds for other important things such as text books, stationery and other necessary

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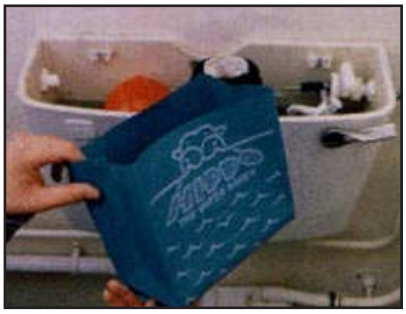
A Hippo bag is a heavy duty plastic bag, which sits under the ball cock in a toilet cistern. It displaces a certain amount of water (which depends on the cistern in which it is installed). There are two small holes in bag, which allows for the water to slowly come out after flushing and also allows for water to go back into the bag as the cistern is filling. This keeps the water fresh, but also retains it long enough so that the water in the bag does not flush into the pan - thus saving the amount of water held behind (2.5 to 3.5 ℓ per flush).



1. Put both hands inside the Hippo and push out corners to a box shape

2. Place open end of Hippo over cistern float then turn over and fully immerse in water

3. Flush toilet in normal manner whilst simultaneously pouring about 4 ℓ of water into Hippo

equipment. The cost of the work will therefore not be an additional burden on any of the partners. Depending upon whether the school is a Section 20 or Section 21, it will merely be a question of either the Board of Governors re-directing funding or the Department of Education re-directing funding, or putting mechanisms into place to enable this process.

Results so far

Essentially, the project only ran for four and a half months, between February and June 2003, taking into account the school term breaks. During this period 206 schools were visited, predominately in the south of the City and 6 213 Hippos installed. A total of 6 816 toilets and 524 AFUs were identified in these schools. The total users are 160 293 (including staff and learners)

From the schools visited to date the WDM department was able to build up a picture of the general condition of the schools. 110 schools (53.4%) were in a 'mixed' condition i.e. requiring some repair, and only 11 schools (5.3%) were in 'poor' condition i.e. having obvious leaks and/or broken water devices, one of these schools had been vandalised generally, and would need substantial repairs to be carried out. 84 of the 206 schools (40.8%) were in 'good' condition i.e. no obvious leaks or repairs needed. Some 226 toilets were found be unused for one reason or another, which were not all due to bad repair.

Potential savings with installation of Hippos

Schools generally in Cape Town have the black Shires 13l cisterns fitted, which are conducive to being fitted with a Hippo Bag. The projected water savings, allowing a conservative 1.5 flushes (5 ℓ) per person per day, based on 200 schools days per annum, is 1 Kℓ per person per annum. With 160 293 users, this equals 160 293 Kℓ which could be saved with this simple step. Translating this saving into rands @ R5.93/kℓ (which conservatively includes the 70% sewerage charge but not the fixed charge) equals R950 537.

Projected savings with removal of AFUs

Potential savings through the removal of the 524 AFUs is considerable. Based upon 'logged' use in the Vanguard Primary School pilot project, the water flow in these systems was 135 ℓ per hour, which equates to 1182.6 Kℓ per AFU. Therefore the total water used in 524 AFUs would be 619 682.4 Kℓ per annum. By replacing the AFUs with a demand mechanism a 95% saving was achieved in Vanguard Primary School, and there is no reason why this saving could not be replicated. This saving would be 588 698.28 Kℓ per annum @ R5.93/Kℓ, this equates to potential savings of R3 490 980.00 to schools/Department of Education per annum.

The potential for even greater savings, once all schools have been covered with Hippo bags is significant. The amount of water that can be saved with the 206 schools (160 293 Kℓ) is actually 0.06% of the total annual water distribution of 260 000 000 Kℓ or million cubic metres. If we consider, across the City of Cape Town's boundaries, there are ± 960 000 users in schools, then these savings will increase to 0.37% of the total annual water distribution. Add this percentage to the potential savings through the removal of AFUs and we are looking at 0.6%.

If the schools are enabled to fit low flow shower heads or fit reducers to showers and all sink taps, then the potential savings increase still more. Once all the leaks are indentified and fixed, then the result will be water efficient schools.

Conclusion

The savings to schools/Department of Education, with the fitting of the hippos alone, are almost 400% more than the cost of the project. This project although small, illustrates how local authorities can assist some of the larger water users. This alone should justify the City's commitment to promote partnerships and uplift and empower schools to manage their own resources more effectively and efficiently.

This is a project, where it would seem that everyone can be a winner. It is a low-cost project with immediate and long-term benefits for all parties, which could be successfully replicated across the country by any local authority.

Bibliography

Water Services Development Plan, *City of Cape Town,* approved by Executive Committee on 23 April 2002.
SWEAP Database.