

PROJECT PORTRAIT

Low cost fencing for a pre-school
#30 (2013)

What is this project about?

This is an engineering study requested by the *New World Foundation*. A team from *Engineers without Borders*, a student agency at UCT, looked at designing and building a low cost fence for a playground at their pre-school in Lavender Hill. The objective was to provide affordable fencing that would overcome the challenges of theft that the community faces. The conditions for the material was that it should not have fuel usage value such as wood, no scrap material value and it should not block visibility.

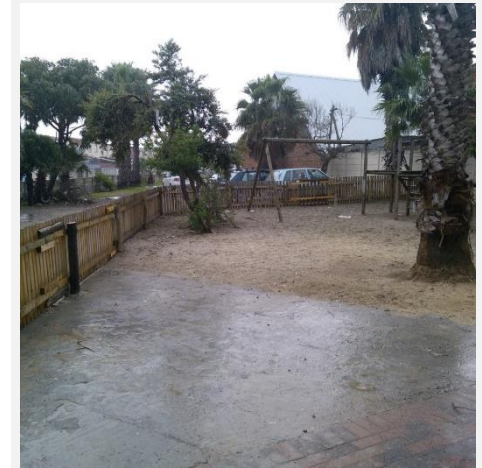
The challenge

The purpose of the project was to design a fence that would be: safe for children; inexpensive and preferably eco-friendly; made of materials that

have no fuel usage value; able to provide visibility to surrounding areas (so that the fence cannot hide criminal activity); and easy to erect but hard to remove once installed.

What did the project team suggest?

The researchers looked at possible low cost materials that could be used in constructing the fence. The fence design eventually came down to making use of PVC pipes with concrete compressed in its column. These would serve as poles for the fence. PVC pipes are the cheapest kind of recycled pipes and because much load is not expected, a small pipe diameter could be used. Together with concrete, the researchers concluded that these poles would be easily prepared and would provide a suitable structure for the project.



Current fencing at the NWF pre-school play area

What you need to know:

Social context is important in achieving a usable engineering design. In low-income communities an “unstealable” fence design is desirable to avoid it being stolen.

Engineering students are able to come up with creative ideas to resolve practical needs in communities.

For the netting, the researchers decided on plastic netting. Although more expensive than the traditional wire netting, plastic netting is not as vulnerable to crime and would also look appealing and safer to children in the playground.

Cricket netting was also considered as an alternative to plastic netting. The only difference between the two in application is that if the cricket netting is not properly secure, it could be stolen and sold to cricket clubs. Netting can be easily secured using plastic straps.



The cost

Cost estimations for the proposed design came up to R5 366 for 30 m of fencing. The study concluded that the design proposed by the researchers is mechanically suitable and makes financial sense. The proposed fence is also more favourable than the wood that is currently being used in terms of appeal. Life span ranges from four to five years which is worth the investment.

Using the design

Many facilities in low-income areas are faced with a similar challenge as the pre-school in this study. Fencing that is attractive, sturdy enough yet not valuable enough to steal and cannot be used as fuel has many applications in South African townships and at community facilities.

The project was completed in **Oct 2013**.

Want to know more?

Research was carried out by Mashudu Makhado (project leader), Mufarisi Manyuha, Abhilash Alex, Stephane Masamba Ma-Kiese, Damian Naidoo, Alexa Bessinger and Mashudu Muridili at the of Engineers without Borders, University of Cape Town. This summary is based on the report: "Low cost fencing project 2013 Funding Proposal/Report: Engineers Without Borders (EWB) – University of Cape Town". The report will be made available on the Co-op website.

Keywords: Affordable fencing, recycling, social context

To **reference** this Project Portrait, cite UCT Knowledge Co-op as the author.

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