BridgIT Water Foundation

Water Project January 2011
Cochabamba - Bolivia

Project Date:	**10th January – 5th February 2011**
Location:	**Cuidadela Sedeges Children's Home**

PROJECT & EQUIPMENT OUTLINE

Background

The Cuidadela Children's facility is a government built and government funded and operated institution in Cochabamba in Bolivia.

The centre houses some 80 to 100 children of varying ages and circumstances as well as staff.

Cuidedala has struggled for a viable and secure water supply for some years due to the government department beuarocracy to maintain and upgrade basic infrastructure in place.

In September 2010 the aging water system in place collapsed and left the centre with no on site water at all. The residents of the Centre have been collecting rain water in buckets and relying on scraping the money together to purchase water and have it delivered. If they have not had the money then there is no water for drinking, bathing, cooking or anything else.

Water has continued to get to the Centre in limited supply purely due to the combined efforts of Projects Abroad and the Australian NGO Tia International.

Current water storage at the Centre due to the breakdown of the pump in September 2010. The Centre has been without water since then awaiting the arrival of the BridgIT Water Foundation 2011 water project and their team of dedicated volunteers.

The Water Issues (BEFORE)

The Cuidadela facility had very basic water infrastructure in place which consisted of a shallow borehole equipped with a pump that transferred water into two elevated water tanks that sat on (6) metre high stands, water then was fed under gravity to the various buildings at the Centre.

BEFORE

2 x Elevated Water Tanks on 6mtr High Stands

Original Borehole & Pump (now decommissioned)

The water distribution network (that is, pipes, faucets & toilets) was poorly planned and completely without maintenance.

The typical issues were such things as:

- Pipe systems were broken and leaking water
- Taps were broken and allowing water to flow directly to waste
- Toilet valves were damaged and allowed water to flow from the cistern to the pan and directly to waste on a 24 hour basis
- Taps were left to run 24 hours a day directly to waste

Pipe systems broken & leaking

Taps broken wasting water

Toilet cisterns damaged wasting water

There appears to have been a breakdown shown by the Centre management and the responsible department as to how to manage water. This is apparent by a lack of ownership or responsibility by staff to life's most basic requirement – management of water.

The major issues revolved around three (3) areas:

1. **Inadequate and poorly planned water resource**
2. **Lack of any maintenance**
3. **Lack of training, education or ownership by residents as to the importance of looking after the available water**

The sole water source was a borehole that was some 22 years old and had basically had the steel casing rust away and the hole had subsequently collapsed.

The borehole itself was prone to run out of water on a regular basis and it was quite obvious that when it was drilled it had been terminated in the first water gallery or water lense that was struck – this would indicate that cost was the driver behind the bore development.

The pump was capable of providing a flow of just on 20 ltrs / minute to a fibre-glass header tank with a capacity of some 6,000 ltrs of storage.

The electrical installation to the site was of an extraordinarily poor quality and it is an absolute wonder that in the twenty or so years it was there that people or children were not harmed.

BEFORE

Unsafe pump electrical connection

Fibre-glass elevated tank in disrepair

It was discovered that the main elevated tank was damaged and was beyond repair. As such it is feasible to think that the tank may have been profusely leaking water for some time prior to the final failure of the bore pumping system. There was not a deep appreciation for the effect on the water supply of such things as a leaking tap or a broken pipe.

The Solution

The project consisted of the following components:

1. NEW BORE & BORE PUMP

Drill a new bore to a greater depth and screen and complete it correctly.

- New Bore Depth – 60mtrs
- New Bore Casing Diameter – 150mm nominal
- It is screened at all four (4) water galleries intersected
- Bore Production Capacity - three (3) ltrs / second
- Current Bore Draw – one (1) ltr / second

  (as such the bore is not stressed in any way and should remain viable for anything up to thirty (30) years.

2. WATER STORAGE

A ground level storage of 22,000 Litres was established so that there is adequate water to cover the Centre's needs for about ten (10) to fourteen (14) days if there is a break-down of the bore pump.

A new elevated storage tank of 5,000 Litres capacity was installed to replace the damaged fibre-glass tank.

3. PRESSURE PUMP

A small pump was installed at the ground level storage to pump water to the elevated storage tank.
This small pump is also capable of providing water for future vegetable garden projects that may be undertaken.

4. ELECTRICAL SYSTEM

The electrical system was completely changed and made more secure and safe.

5. PIPING SYSTEM

The reticulation piping system at the bore and around the tank site was completely upgraded.

6. CONCRETE PADS

The BridgIT Water Foundation does its very best to ensure as much work and as many materials can be sourced from within the project area as possible.

In the case of this project there were two (2) concrete pads that needed to be built that consisted of approximately (10) cubic metres of concrete.

It was estimabed that even at a steady pace using shovels and mattocks and hand mixing the concrete it would take no more than three days to complete this task. It was amazing to find that the concreting techniques employed were very different to our own and what may have taken (3) days here ended up taking almost (10) days to complete.

1. 

2. 

7. VALVING

There has been some careful thought put into valving the entire water system in such a way that water wastage can be minimized.
Every tank, every water branch and every off-take has at least one means of isolation or diversion fitted.

A further disappointment occurred in that the ground level tank system that was ordered and due for delivery within seven (7) to ten (10) days actually took twenty-four (24) days to deliver and even then only one tank was received.

The BridgIT team and the volunteers that were involved did a very professional job on all aspects that were undertaken and key to the effort was to leave behind a job that not only worked, but, that was extremely robust, would last for many years and looked great.

Due to the time frame required to complete the concreting and the delay in tank delivery the project became a real stop and start affair which ended up with only 80% completion being achieved when the time came to leave Bolivia and return home.

Completion is now in the hands of a paid contractor in Cochabamba.

The water system will not work in automatic mode until the final tank hook ups are complete. Currently the elevated tank is being filled by a by-pass that runs from the bore pump to the tank inlet. As such the Centre does now have a reliable, clean water source.

Despite the frustration and disappointment of not completing the project in the time frame it was still an overwhelmingly emotional moment when we were able to get water into the tank and then run it to the Centre. The reaction of the children is beyond describing. Needless to say they were just a little bit on the happy side.

The Future

The major concern for the future of the water system is based on management and maintenance.
It is essential that the basics are tightly controlled. Such things as water leaks need to be addressed quickly, even simple things like checking the condition of the tanks must be completed regularly.
A maintenance and water management regime will be formulated by BridgIT Water Foundation for the Centre. At this stage comprehensive written instructions are being put together so that there is a guide in place for people at Cuidadela to follow.
If the simple things are performed correctly and diligently the system will perform admirably for many years into the future.

Lessons Learnt

Each project that the BridgIT Water Foundation has been involved with has served up its own particualr lessons and wisdom.
The Cuidadela project has been true to form and provided a number of useful tips of its own.
Possibly the key lessons are as follows in no particular order:

1.	Things must be allowed to happen at a pace to suit the rhythm at which business in the area operates. Time is a concept that definitely takes different forms. It is essential that full investigation is undertaken into just how things are done in the area e.g. concreting techniques.
2.	Always visit the sites that are proposed for assistance prior to arriving with a crew of willing bodies and a pocket full of money. This applies to not only the work site, but also to the businesses and institutions that will be in a position to provide equipment and services.
3.	Always get a feel for the quality (or lack thereof) for the local materials, for instance when you arrive at the site to start and see people rolling roofing iron into a 6" diameter cylinder for ease of transport is not the time to think "Oh bugger, this is going to be interesting".
4.	Do not assume that the local suppliers or that the local way of doing things will not be effective. Local people know how to work with the materials at hand – it is for all of us to learn.
5.	Have local people that will be involved with the project after its completion along for the construction and installation. Pay them a wage to properly gain their attention. Train them correctly.
6.	Take the time to fully outline the project to all involved, particularly the unskilled and inexperienced that will be there to help. Instruct and supervise – all on the same page running into a chapter and before you know it a book is written.
7.	There needs to be a clearly defined "Project Leader" that will make the final decisions in critical areas.
8.	It is particularly good idea to acquire the services of a good translator when dealing in a country that does not count English as its first language OR learn basics of the language.
9.	It is really useful to have at least one and preferably two experienced or trade qualified personnel to work on each project.

It is essential that all involved with the projects have the correct mind-set once at site.

Realistic Outcome

Despite the project not being fully completed while BridgIT personnel were at site it was still quite a remarkable success.

There were a number of things that were beyond the control of those on-ground and to be honest the local contractors and suppliers did their very best to accommodate the project despite the vast differences in culture and expectations.

As an overall rating the project is worthy of a score of 7 / 10 taking the manana, manana (tomorrow) culture into consideration.

There are sufficient very capable people in place in Cochabamba that will ensure that not only will the project be completed, but that it will be well looked after into the future.

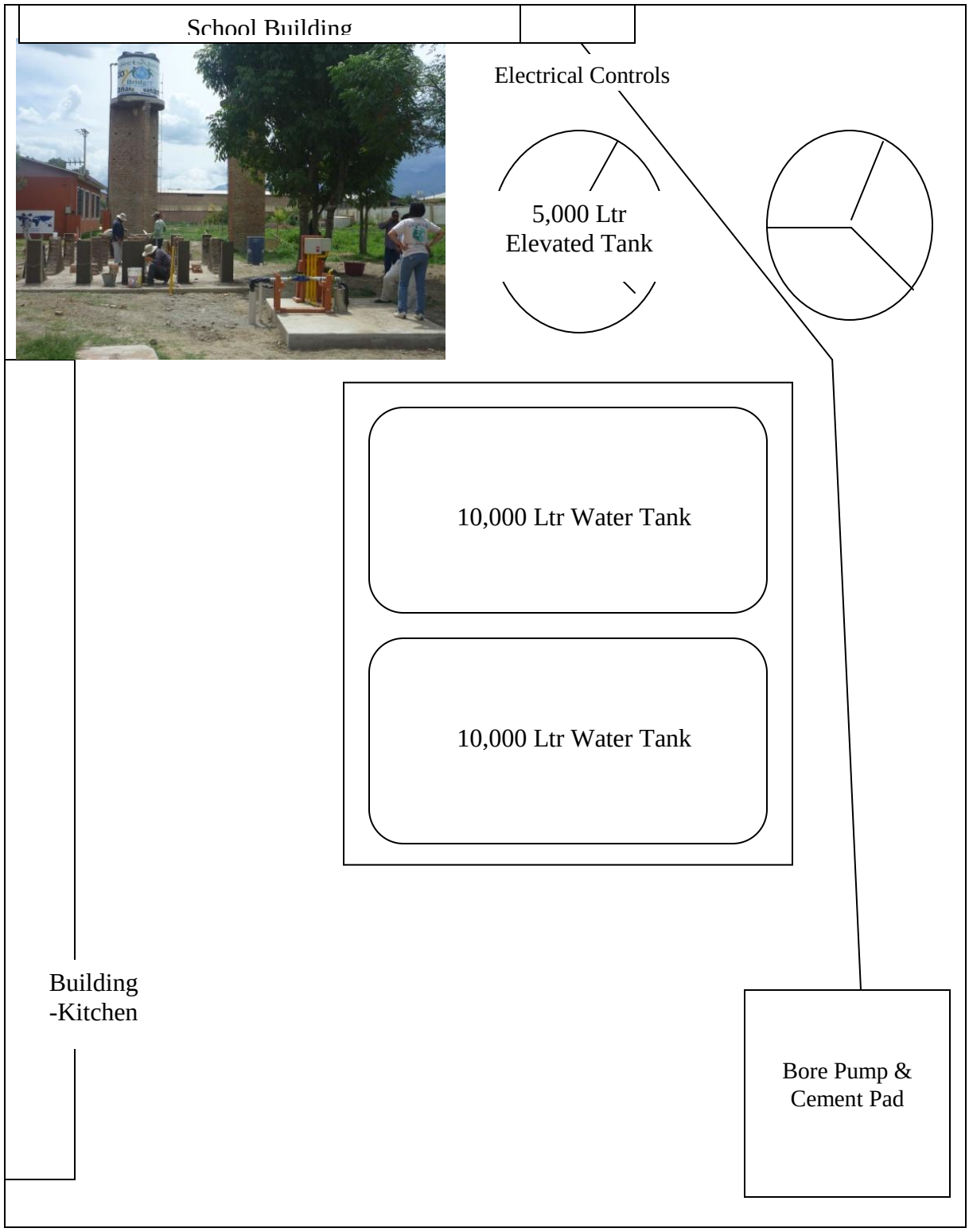
Project Costing

Costing for the project as below:

Item	Description	Supplier	Total Cost AUD$	BridgIT Funds AUD$	Other Funding Amounts
1	Drilling of Borehole	San Rafael	$15,500.00	$8,000.00	$7,500.00
2	Bore Pump & Accessories Pressure Pump & Accessories	San Rafael	$1,825.00	$1,825.00	$5,000.00
3	Electrical & Controls	SEDEGES			$2,000.00
4	Concrete Pad for Tanks Ground Level Storage Tanks	Karlo Tardic	$12,000.00	$12,000.00	$2,660.00
5	Elevated Tank, 5000Ltrs	Ombel SRL	$900.00	$900.00	
6	Tools, Miscellenous Equipment	Various	$3,500.00	$3,500.00	
	TOTALS		**$33,725.00**	**$26,225.00**	**$17,160.00**

General Layout

General layout for the project as below:



Thank You

The BridgIT Water Foundation projects would not be possible without the help and co-operation of a lot of people.

A huge thank you goes to the following people (in no particular order).

1.Founders	Mark & Wendy Tisdell Thanks for the expertise, organization and funding.
2. Volunteers	Christian Tisdell, Stephanie Tisdell, Kirsten Richerzhagen, Wayne Fradley & Jeff, David Millar, Jean-Christophe Icard  The Team
3. Projects Abroad	A great acknowledgement has to go to Daniela Viljoen from Projects Abroad for her on the ground and in–country support. Projects Abroad grease the wheels that need greasing and basically keep our organization on the straight & narrow in a foreign land with a foreign culture.Thanks for all the translation & everything Dani!!
4. Special Thanks	Thank you to Tessa (a fellow Aussie) and Tia International. Great work and appreciate your joint venture involvement and on-ground support.
5. Donors/Funding	Thank you to all the many, many people that have supported the BridgIT Foundation in so many ways leading up to the Bolivian Project. Donations from Kirsten, Grundfos Pumps and Escuelita Cochabamba.

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6. Finally	Thank you to the children of Cuidadela SEDEGES. **Our hope is that this system that is now in place makes your life that little bit easier.**  Our gorgeous little old man Fernandito (middle front)

Compiled by Wendy Tisdell

(Founder/Director – BridgIT Water Foundation)