BushProof SARL

MAXIMUM HUMANITARIAN IMPACT - INNOVATIVE SOLUTIONS FOR DIFFICULT ENVIRONMENTS

TECHNICAL TRAINING IN WATER INFRASTRUCTURE

"This training was unquestionably one of the most useful I have ever attended. It combined a very strong theoretical grounding with numerous practical exercises that ensured that participants were able to know how water and sanitation solutions are both developed and implemented. It was intensive, information-rich and supported by extensive documentation including manuals, policies and research findings. The key to the success of the training was the fact that the trainers were both highly experienced in the field, and that they were passionate about the subject."

- Save the Children participant, September 2013

OVERVIEW

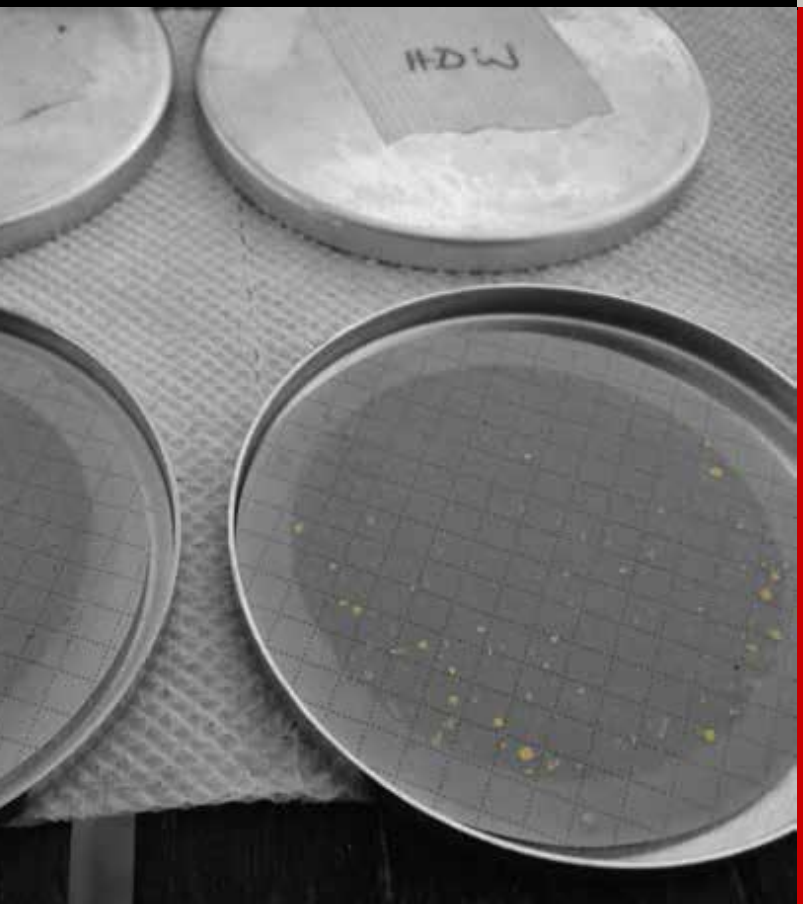
The BushProof Technical Training in Water Infrastructure is a broad, intense 6-day course with a heavy practical bias, providing a rare opportunity to learn through both theoretical and hands-on practical sessions. The training is invaluable to both those who need more technical input for their work, as well as for those in management who find they have become more and more involved in water programmes, but lack the basic technical and theoretical background.

PRACTICAL SESSIONS

The training is intense and is given through a range of practical and theoretical sessions. While several theoretical courses are available elsewhere, practical, hands-on field experience is difficult to obtain. The BushProof training therefore focuses heavily on these sessions, which include the following:

- Manual drilling;
- Coagulation & chlorination jar tests;
- Biosand filter construction;
- Water testing (physio-chem, bacteriological);
- Field topographical surveying;
- Various practical calculations as part of theoretical sessions, including well design, pipe design (pumping & gravity) and rainwater catchment.

Participants are expected to get involved with all practical sessions – prepare to get dirty!



THEORETICAL SESSIONS

In addition to the practical sessions, the course will provide a broad overview of the theoretical aspects of water infrastructure. Theoretical issues are linked to real life field experiences of the facilitators throughout the course.

TEACHER-STUDENT RATIO

We will never have more than 20 participants per course, and therefore have a high teacher-student ratio, which we find is essential to allow individual feedback and tuition.

LANGUAGE

The course will be conducted in English, but since the BushProof course facilitators speak French they can help francophone participants to understand any technical terms.

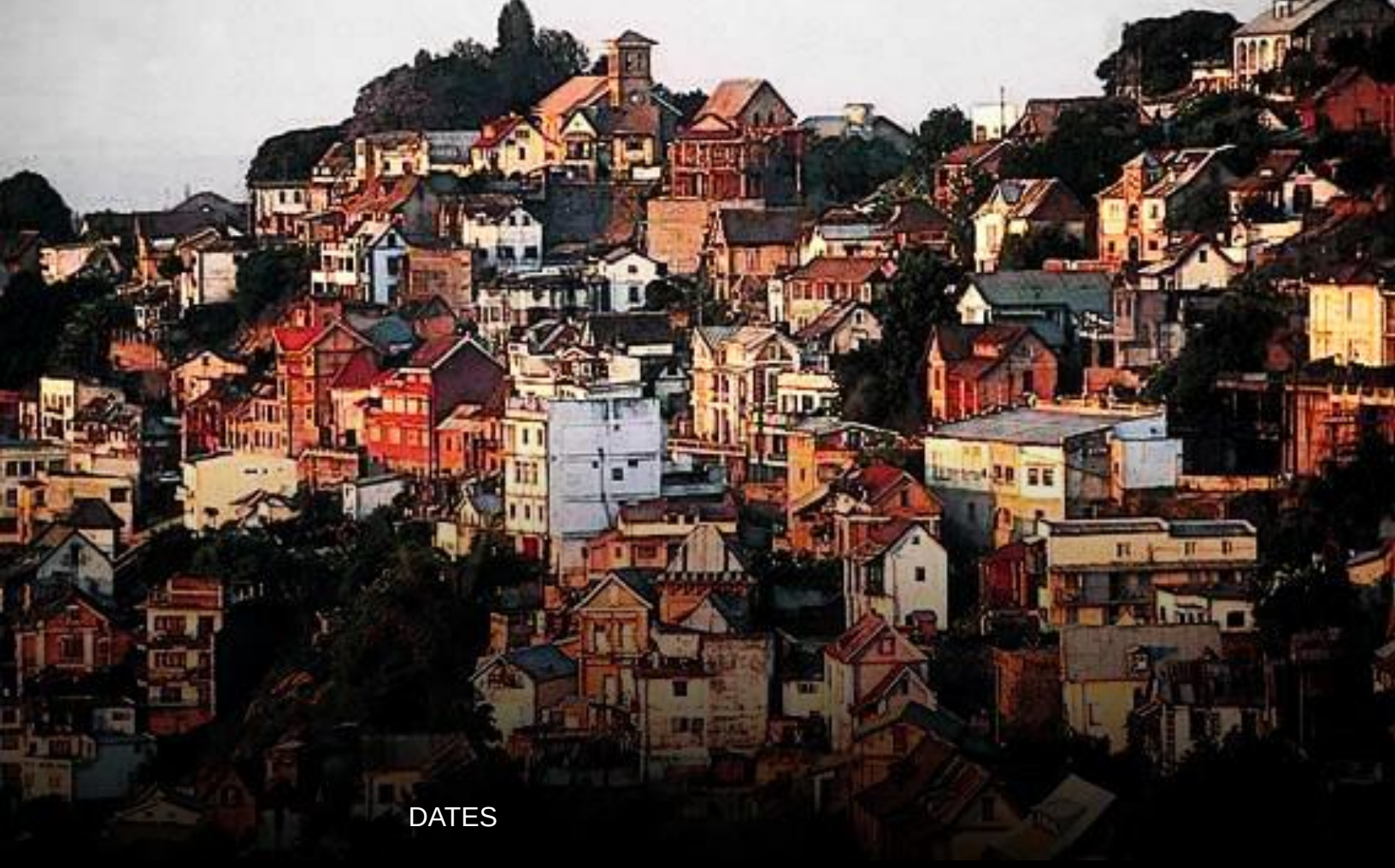
“At the beginning, I thought the content of this course was a bit too technical for me. However, I’ve gradually digested it and learned quite a lot that I could not have imagined initially. This learning is definitely going to help to increase the effectiveness of my work.”

- Unicef participant, September 2016

SCHEDULE

DAY	TIME	MAIN SUBJECTS	DETAILS
Day 1	Monday		
	08.00 - 09.00	Introduction & welcome	Introduction to the course. Book review & technical response services - where to look for information.
1	09.00 – 10.30	Field hydrogeology	How groundwater works – overview of aquifer types, technical terms related to hydrogeology, geology overview.
		Coffee break	
2	11.00 – 12.30	Shallow groundwater sources	Overview of shallow groundwater sources, including manual drilling, hand-dug wells, riverbed wells, infiltration wells, infiltration galleries, sub-surface dams.
		Lunch break	
3	14.00 – 15.30	Hand dug wells	Overview of hand dug well construction using in-situ lining with curved blocks and cutting ring for caissoning.
		Coffee break	
4	16.00 – 17.30	Spring protection	Spring protection techniques & construction guidelines.
Day 2	Tuesday		
5	08.00 – 09.30	Drilling 1: options	Overview of machine drilling options.
		Coffee break	
6	10.00 – 12.00	Drilling 2: borehole design	Overview of technical borehole installation methods used during rotary mud flush drilling, including information on screens & slot size, borehole logs, development, pumping tests, what to supervise in contracted boreholes.
		Lunch break	
7	13.30 – 17.30	Drilling 3: manual drilling (**Coffee during practical**)	**Practical**: manual drilling of shallow borehole including: manufacture of screens, gravel pack sieve analysis, annulus calculation, gravel pack sieving, screen & gravel pack installation, development. Explanation of jetting technique.
Day 3	Wednesday		
8	08.00 – 09.30	Water quality testing 1: overview	Water quality standards - when to test water, what is most important to test for, core and secondary tests. **Practical**: showing chemical testing kits.
		Coffee break	
9	10.00 – 12.00	Water treatment 1: Coagulation, flocculation & sedimentation	Product types & effectiveness, calculating 1% alum solution. **Practicals**: making 1% alum solution & doing jar test, natural coagulants (*Moringa*).
		Lunch break	
10	13.30 – 15.30	Water treatment 2: Chlorination	Product types & effectiveness, calculating 1% chlorine solution. **Practical:** making 1% solution & doing jar test.
		Coffee break	

11	16.00 – 18.00	Water treatment 3: Household biosand filter	Biosand filter overview. **Practical**: construction & operation of biosand filter.
Day 4	Thursday		
12	08.00 – 10.00	Water quality testing 2: bacteriological testing	**Practical**: collecting samples, carrying out membrane filtration & incubation of samples using Delagua kits (including sample from SODIS demonstration).
		Coffee break	
13	10.30 – 13.00	Field visit: surveying	**Practical**: topographical measurement using Abney level & laser methods.
		Lunch break	
14	14.30 – 17.30	Gravity flow water systems (**coffee during practical)**	**Practical calculation**: how to design a simple gravity flow system.
Day 5	Friday		
15	08.00 – 08.30	Water quality testing 3: bacteriological test results	**Practical**: reading water test results from previous session.
16	08.30 – 09.30	Rainwater collection 1	Rainwater collection system, guttering & storage tank options.
		Coffee break	
17	10.00 – 11.30	Water treatment 4: Household Water Treatment	Rationale for promoting household water treatment, review of pros & cons of household vs bulk treatment, overview of selected technologies. **Practical**: demonstration of ceramic filter, SODIS, household chlorination, PuR / WaterMaker, solar distillation, biosand filter.
18	11.30 – 12.00	Water treatment 5: Household biosand filter	**Practical**: removing biosand filter mould, curing of concrete.
		Lunch break	
19	13.30 – 15.00	System curves: water flow in pumped pipe systems	Hydraulic theory, pipe friction tables & system curves. **Practical calculation**: how much water flow to expect in a pumped system with various elevations and for various pipe types, sizes & lengths.
		Coffee break	
20	15.30 – 17.30	Motor pump types & pump choice	Different pump options. **Practical calculation**: choose a pump based on pump efficiency and power requirements that fits system curve from practical.
Day 6	Saturday		
21	08.30 – 10.30	Rainwater collection 2	**Practical**: design of rainwater catchment at office.
		Coffee break	
22	10.30 – 13.00	Group work 1: gravity & pumping design	**Practical**: using topographical data from field visit to design a gravity and pumped water system.
		Lunch break	
23	14.30 – 16.00	Group work 2: gravity & pumping design	**Practical**: using topographical data from field visit to design a gravity and pumped water system. Reporting of results.
		Coffee break	
24	16.30 – 17.30	Review, recap & evaluation	Filling evaluation forms, going over contents of USB stick, Sphere Quiz prizes, giving out certificates.



DATES

See website www.bushproof.com for details.

LOCATION

Antananarivo (Tana) is the capital city of Madagascar and the largest city on this big island in the Indian Ocean. The city is situated inland, about 90 miles from the East coast. Tana was founded in the early 1600's and its position on top of a high ridge made it easy to defend against enemy attack. Antananarivo means "the city of a thousand", a reference to the 1000 soldiers that supposedly protected the newly founded city during the reign of King Andrianjaka. In 1895, the French took over and expanded it greatly to include many new buildings and roads. Madagascar gained its independence from the French in 1960 and today the city offers a wonderful panoramic of different cultures and eras.

Tana will surprise you with its rice paddies, intricate canal systems, numerous stairs up steep hills, palaces, narrow cobbled streets, oxcarts and churches. It is not quite Africa or Asia but a curious mixture of both with a touch of French influence. It is the starting place for adventures throughout the island.

VENUE

The training will be held at (or near) the BushProof office in Antananarivo. The venue is near the airport and is in a pleasant, uncrowded part of town with easy access to a range of hotels and restaurants. The office has a wireless internet connection.

HOW TO BOOK

Go to www.bushproof.com and click on Products > Training and Consultancy > Booking. Here you will find booking procedures and application forms. Please contact us if you experience any difficulties.

RESOURCES

Participants will receive a USB key with a wealth of expertise in the form of documents and articles. A certificate will be presented to participants on completion of the training.

COURSE FEES AND DURATION

The duration of the course is 6 days. The cost is 1800 Euros

The course fee includes:
Tuition, handouts, USB key with resources, coffee breaks, lunch on training days and field visits.

The course fee does not include the following:
International & domestic airfares, travel or medical insurance, visa, accommodation, breakfast / evening meal and taxi cost from the accommodation to the training centre every day.

An arrival guide to hotels in Antananarivo will be sent to all applicants together with the invoice. This allows participants to choose and organize their own accommodation and includes telephone and email contacts. Please read this information carefully as it will contain all you need to know. However, BushProof will help participants if they are really having difficulties in arranging things, but note that we are primarily a training organization, not a logistical one. Daily expenses (hotel, taxi, etc) will likely be in range of 20 To 50 Euro – further details are in the arrival guide. In addition, there will be some compulsory reading for all participants prior to the training – this is to ensure a basic understanding of some of the more involved topics."

Please note: even if you have booked onto a training, please confirm with us prior to paying for international flights. This is because we require a minimum attendance to make the course viable, and in exceptional circumstances we may have to cancel the course. The latest we would make a yes/no decision would be 1½ months prior to the course start date, but an earlier go-ahead is likely.

CONTACT DETAILS

Telephone: +44 (7814) 788 846 (UK) or
+261 (33) 11 997 56 (Madagascar - French)
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HEALTH ADVICE

Prior to travel to Madagascar, please ensure that you take relevant precautions. Visit your doctor before travelling.

Special notes:
Make sure you are fully vaccinated. A yellow fever vaccination certificate is sometimes needed when entering the country. Malaria risk, predominantly in the malignant falciparum form, exists all year throughout the country and is highest in coastal areas. Resistance to chloroquine has been reported. Chikungunya, which is a similar virus to Dengue has hit coastal Madagascar around the area of Tamatave (half way up the east coast) in the past. There is no vaccination against it, and the best way to prevent it is by preventing mosquito bites, even during the day (early morning, late afternoon) when the vector mosquito is especially active.

For advice on how to prevent insect bites:
http://www.nathnac.org/pro/factsheets/iba.htm

Bilharzia (schistosomiasis) is present in fresh water. Although health advice is to avoid swimming and wading in fresh water, during fieldwork or tourist activities, it is sometimes unavoidable (note that there is no risk from activities during the training). Therefore if you have had contact with open fresh water during your visit, you should get an Elisa antibody test together with an antigen test 6 weeks or more after you return home (6 weeks, because if infected, the antibodies need to develop first and won't show on the test otherwise). Dysenteries and diarrhoeal diseases are common. Attention to what you eat, and perhaps more importantly to hygiene (e.g. washing hands) is therefore especially important. Rabies is present in Madagascar. Vaccination before arrival should be considered.

VISAS

For all nationalities it is possible to obtain entry visas for 1 month at the airport on arrival. Equally, visas can be obtained at Madagascar consulates prior to travel. Applications can be made to the consulates by post. You can check out this link for further information on visas:

http://www.madagascar-consulate.org/visainfo.html

INTERNATIONAL TRAVEL

Getting to Madagascar can be expensive. Please contact us if you are having difficulties, and we can recommend some options for you.

Graphic design: Luke John Paul Barrett