

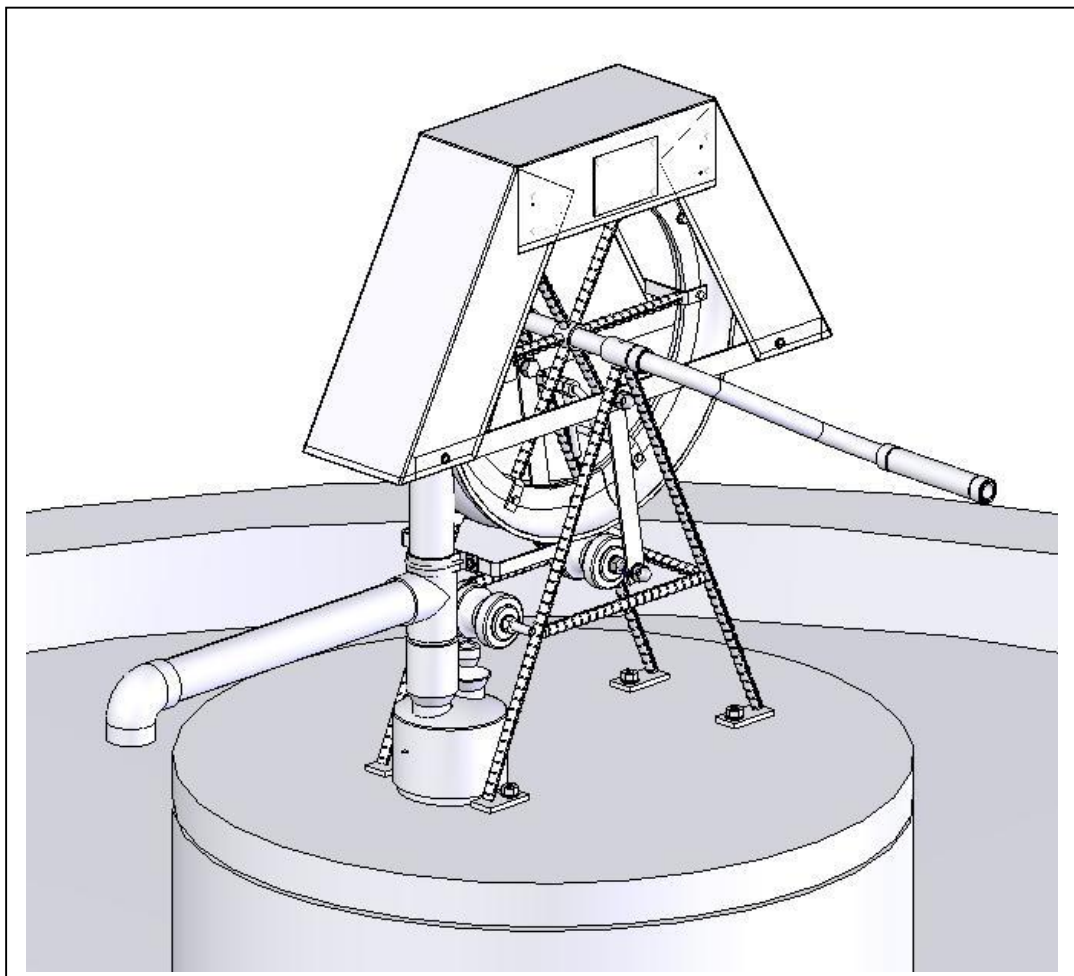
Ideas at Work (IaW)
#5, Street 21,
Tonle Bassac,
Phnom Penh



Phone : +855 (0)23 350 911
Mobile: +855 (0)12 700 482
Email : info@ideas-at-work.org
Web : www.ideas-at-work.org

THE 'ROVAI' HANDPUMP - RP6

(The Cambodian version of the Rope Pump)



CEMENT COVER MANUAL

V. Whitehead, December 2007

Introduction

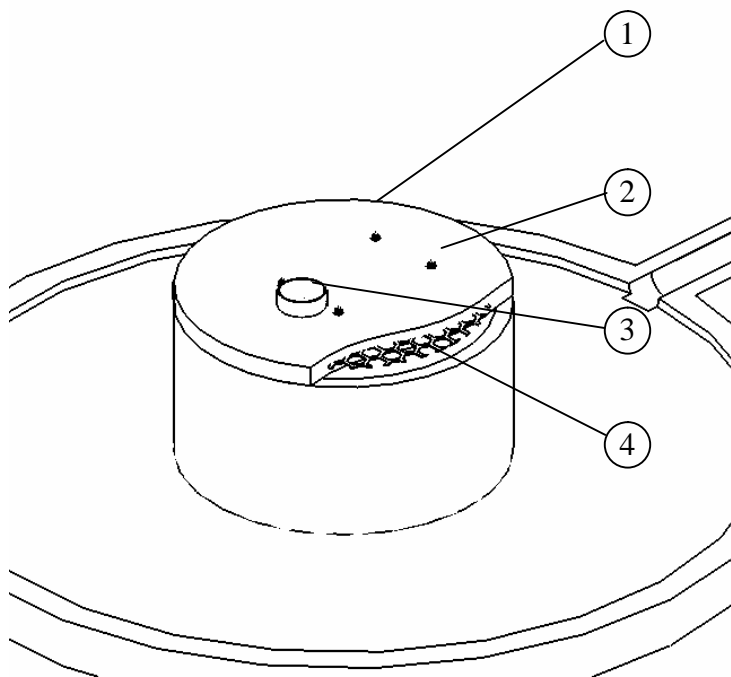
This manual gives step by step instructions for making a cement cover for mounting the RP6Rovai Pump. It will assist the Rovai pump installer to give precise instructions to anyone contracted to make a high quality cement cover.

If several covers are required at one village it will probably be more economical to manufacture several covers at or near the site of installation rather than making and transporting them from a more distant location. However if only a single cover is required then this may be made in advance and transported to site on the same vehicle as the pump.

Cement cover components

Below is a 'cutaway' sketch of the cement cover fitted to the top of a ring well to show the components.

1. The cement cover components



1. Cement cover (cutaway)
2. Clamp frame bolts
3. PVC locator pipe
4. Wire mesh (inside cover)

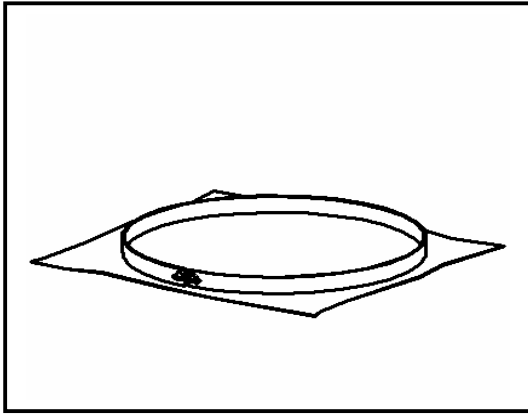
Before starting make sure that:

All of the items listed below are on site before construction starts

Materials	ü	Equipment/Tools	ü
Clamp frame		Cement ring mould – (size to suit cement rings on well)	
Locator pipe (100mm diameter PVC)		Template (to position locator pipe)	
Wire mesh (12 -16mm mesh size)		Tape measure	
Sand		Shovel	
Cement		Buckets	
Clean water		Trowel	
		Plastic sheet (or old rice bags)	
		Wire cutters	
		Cloth (for covering cement covers)	
		Vegetable oil & brush	

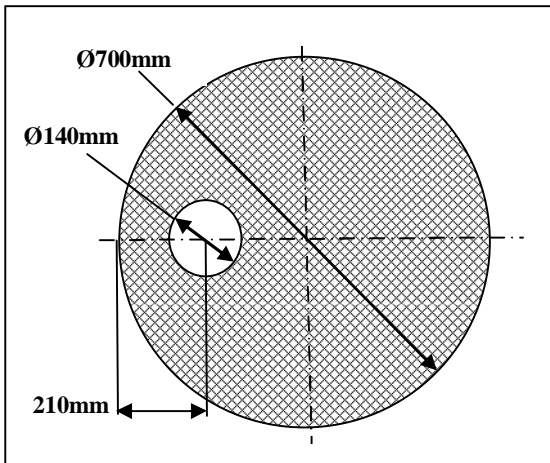
ROPE PUMP CEMENT COVER INSTRUCTIONS

1. Prepare or make a clean flat surface to mix and make the cement covers (a cement or concrete floor for example).

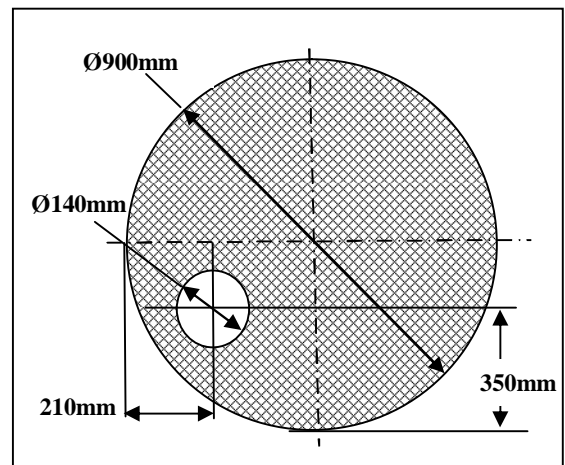


2. Put a plastic sheet on the floor (old clean dry rice bags for example) and put the ring mould on top of this. Make sure the plastic is larger than the diameter of the ring mould. Apply some vegetable oil to the inside surface of the mould with a brush.

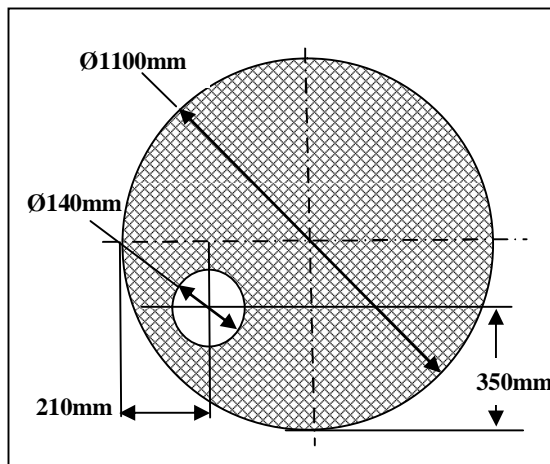
3. Cut the outside diameter of the wire mesh (approx 12mm mesh holes size) so that it is 100mm less than the diameter of the cement ring mould. Example if the ring is 1m diameter the mesh should be cut to 900m diameter. See below for the position of the 140 mm hole.



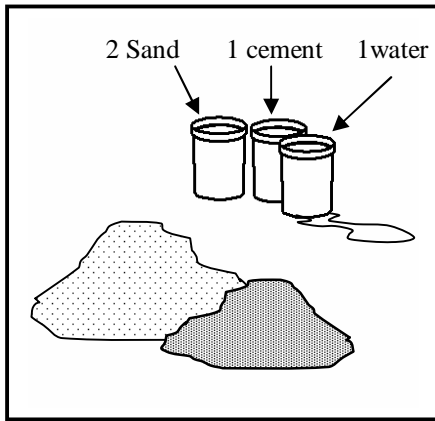
1] Wire mesh dimensions for a $\text{Ø}0.8\text{m}$ diameter cement cover



2] Wire mesh dimensions for a $\text{Ø}1.0\text{m}$ diameter cement cover



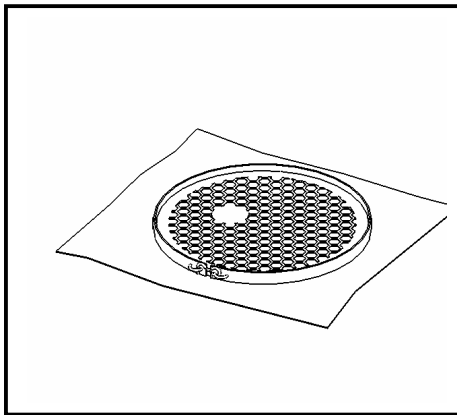
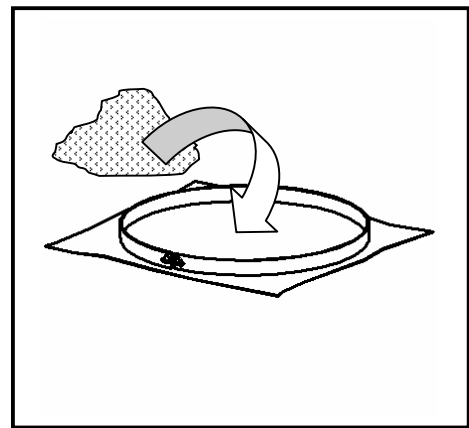
3] Wire mesh dimensions for a $\text{Ø}1.2\text{m}$ diameter cement cover



4. The sand, cement and water for the cover should be measured by volume in the ratio of 2 sand, 2 cement and 1 water. This should make a 'stiff' mix. This is required so that the clamp frame and mesh does not sink to the bottom of the mould.

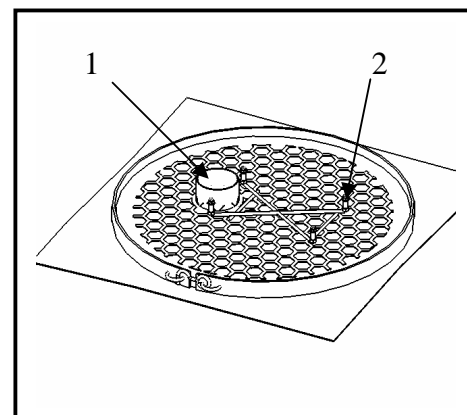
NOTE: only use clean water for mixing with the sand and cement, using dirty water will reduce the strength of the cover.

5. Fill the mould up with the cement mix until it is 22mm deep (almost half full).



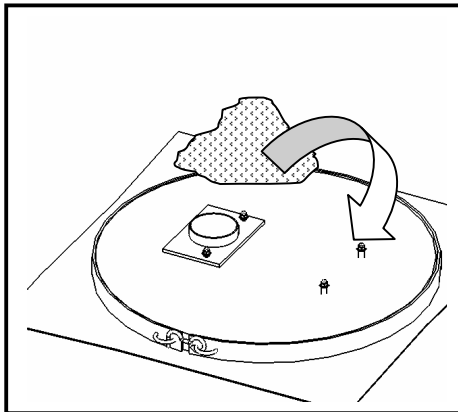
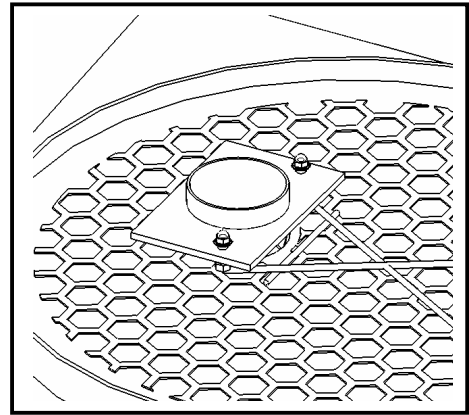
6. Then put the wire mesh on to the top of the concrete mix. Make sure that there is an even gap of 50mm all round the edge.

7. Remove some of the concrete mix from the 14cm diameter hole in the wire mesh and put the locator pipe (1) into the hole. Make sure that it is level with the floor. Next put the clamp frame (2) and on to the mesh. See page 5 for different positions for varying sizes of cement cover diameter.



- Fit the plastic template on to the PVC locator pipe and on to clamp frame as shown opposite. Add some cement mix under the template. Then temporarily remove the template without moving the frame.

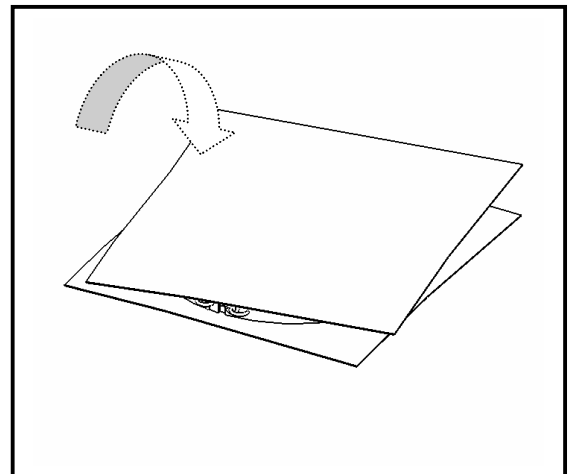
NOTE: The template is used to make sure that the rope and pistons will line up with the hole in the cover and that the rope will be central in the riser and return pipes.



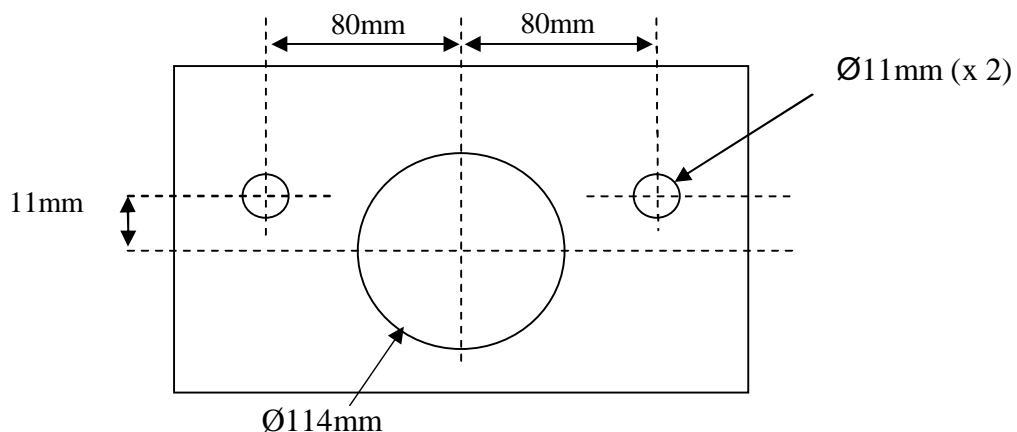
- Add more cement mix until it reaches the top of the ring mould. Re-fit the template on to the locator pipe and the clamp frame to check that it has not moved. Also check that the bolts extend at least 25mm beyond the top of the concrete cover.

- Remove the template ready for the next cover. Smooth the top surface of the concrete cover then put a wet cloth or plastic sheet over the mix to prevent it from drying out. - keep this wet at all times

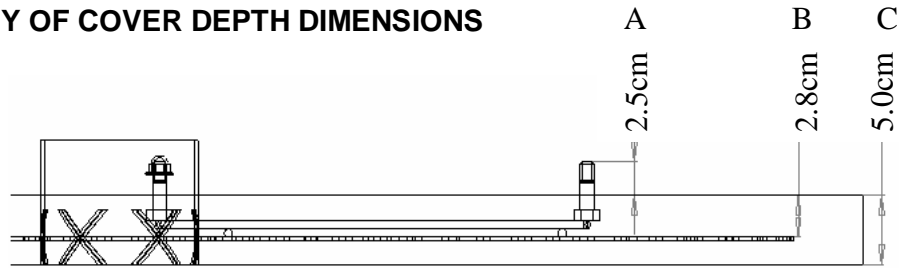
- Leave at least three days** before transporting or using the covers. If they are moved before this they may not have enough strength and are likely to break during transport.



TEMPLATE DIMENSIONS FOR LOCATOR PIPE (supplied by pump manufacturer)



SUMMARY OF COVER DEPTH DIMENSIONS



Cross section of the cement cover showing height and depths of parts

'A': Bolt height above top of cement cover = 2.5cm

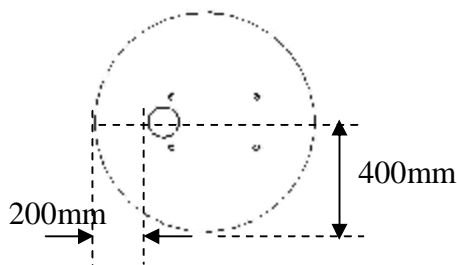
'B': height from top of wire mesh to top of cement cover = 2.8cm

'C': Height of cement cover = 5cm (if diameter of ring is between 1.0 and 1.2m make 6cm high, and 7cm high for diameter larger than 1.2m)

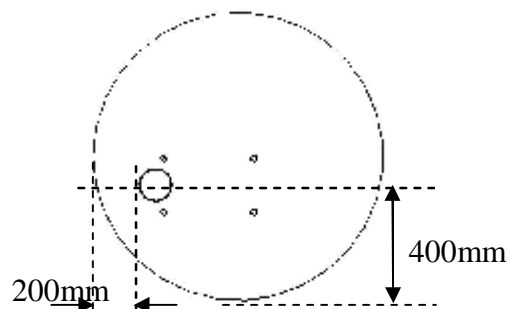
Suggested positions of locator pipe for different sizes of cement ring covers

Fitting the Rovai pump in the right place on different covers is important so that users can reach the pump easily. For the three common sizes of cement covers in Cambodia the following suggested dimensions are used. ..

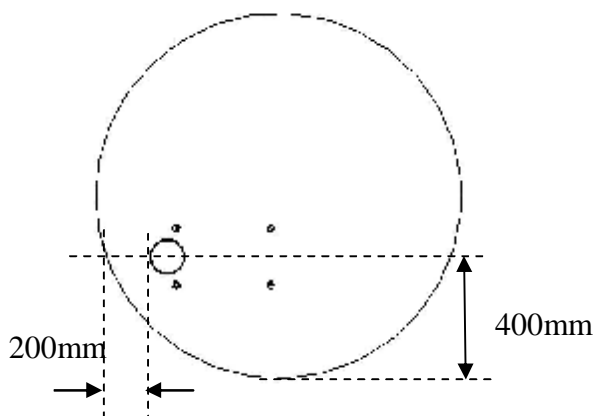
1] 0.8m diameter cement ring



2] 1.0m diameter cement ring cover



3] 1.2m diameter cement ring/cover



Note: The dimensions given here are suggested because when the Rovai pump is fitted to the well the end of the handle is approximately level with the side of the well. This makes sure that people can reach the handle easily from the side and it prevents it from sticking out beyond the side of the well. This will help prevent it hitting a small child's head with the edge of the handle

NOTE: After making the cover refer to the 'RP6 Installation manual' for fitting the Rovai pump