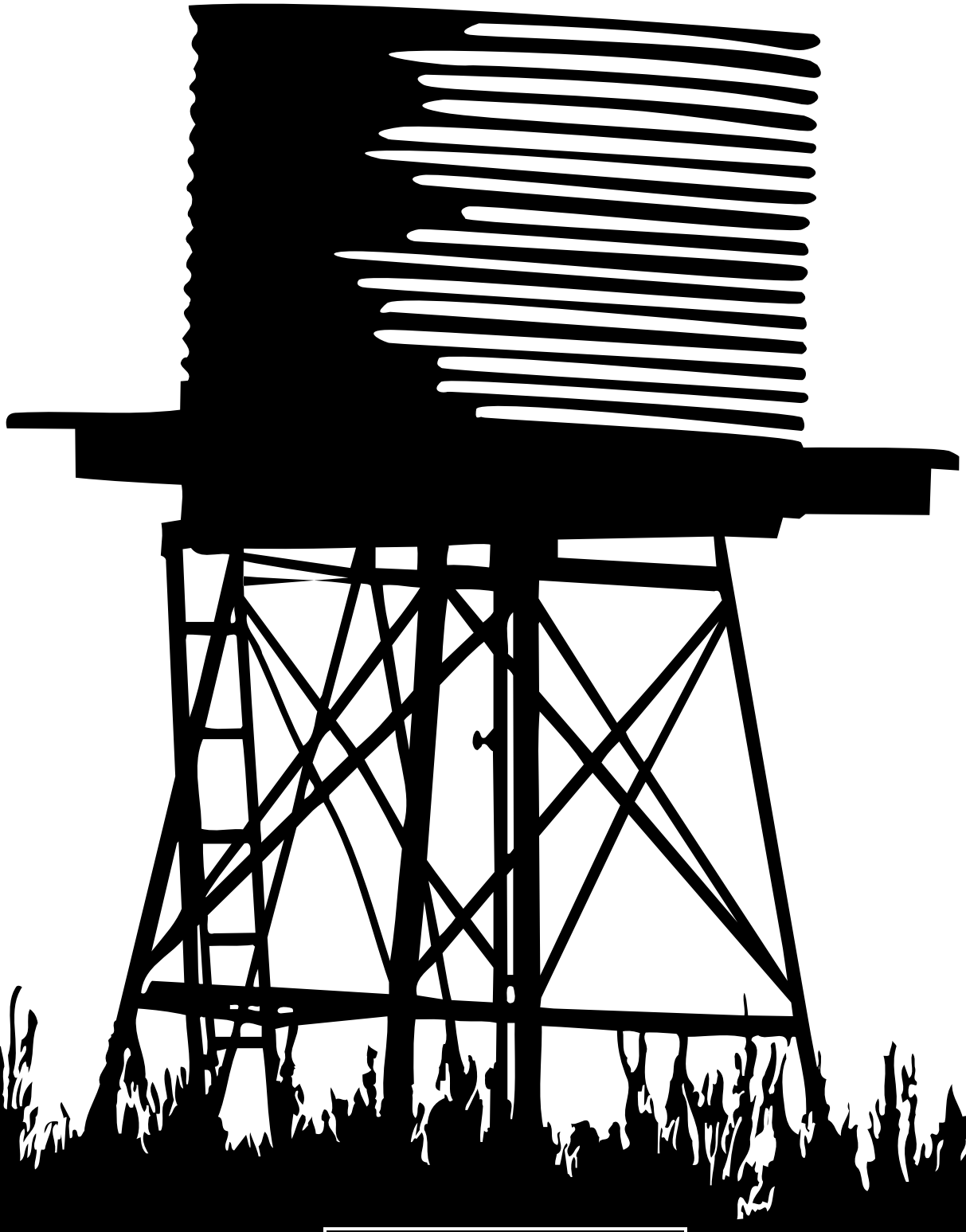
The Glockemann Pump

Site & Installation Guide



GLOCKEMANN PECK
ENGINEERING

CONTENTS

SITE & INSTALLATION GUIDE

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1. What type of site is suitable for a Glockemann Pump*

The Glockemann Pump requires a constant flow of water, i.e. a creek or stream a drop in the creek of at least half a metre and a flow rate of at least one litre per second. Ideally you should look for a site with a natural drop in your creek over a short distance, approx. eight metres. ***(See Figure 1)***

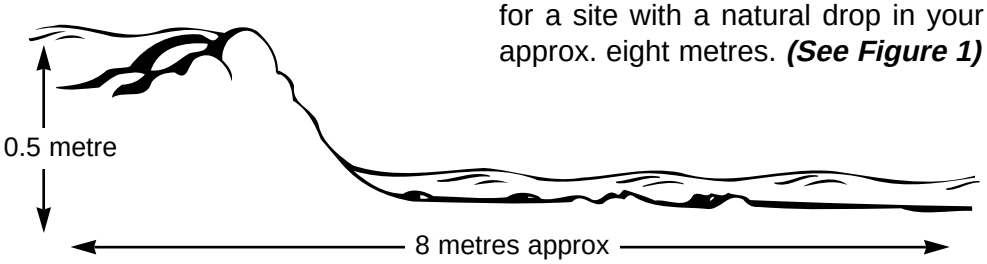


Figure 1

All that is needed at the site above is a small weir to create a pool of water deep enough to cover the drive tube inlet. (note: the drive tube must have no air in it, so the drive tube inlet must stay well under water.) ***See figure 2***

figure 2

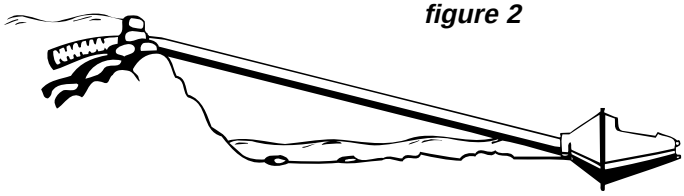


Figure 3

Figure 4

When looking for a possible site keep in mind that moving rocks or other obstacles downstream may sometimes create a larger drop. ***(See figure 3 & 4)***

If your creek has no natural step drops or rapid sections you may need to build a larger weir across the full width. ***(See figure 5)***

Figure 5

2. Long Drive Tube Method

If you are unable to create enough drop using the examples in diagrams 2, 3, 4 & 5, but there is enough drop in your creek over a longer distance you may be able to use a longer drive tube. This method uses a length of larger diameter pipe or other container standing upright from a 'T' piece in the drive tube to create a head. The container is put 10 metres from the pump and must stand higher than the upper water level. ***(see figure 6)***

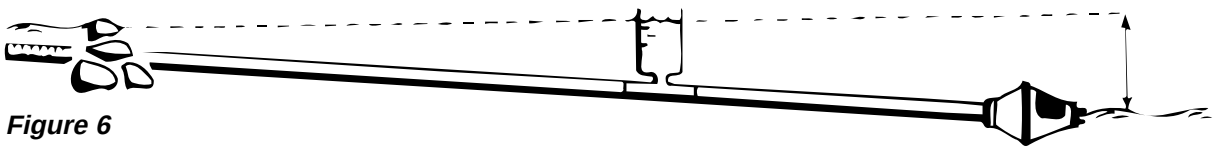


Figure 6

*Patented or patent pending world wide.

3. Siphon Method

If your site has a drop which is formed naturally by water flowing from a pool over a solid rock face and it is not possible to build a weir to raise the water level above the drive tube inlet you may use the siphon method.
see figure 7

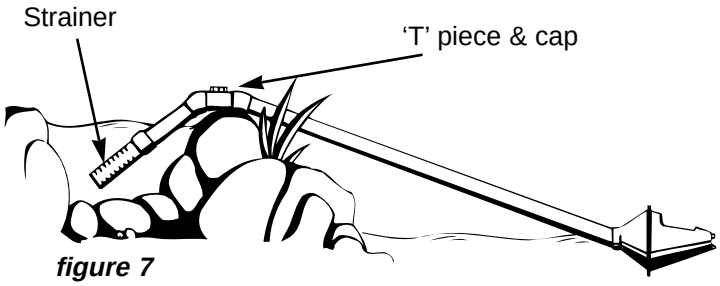


figure 7

The diagram shows a 'T' piece sewer fitting with a rubber sealed cap at the top of the drive tube. To remove the air in the drive tube, slip off the drive tube strainer and screw on a rubber sealed cap (sewer pipe fitting), remove the cap from the 'T' piece and fill the drive tube with water from a bucket. This will create an air free siphon to feed your pump.

4. Measuring the Flow Rate in Your Creek

The Glockemann Pump is capable of operating on a very small flow of water. If it is obvious that your creek has plenty of flow proceed to the next paragraph. If your creek has a smaller flow of water a good way of measuring the flow is by putting a 10 litre bucket under a small waterfall, ***see figure 8*** and timing how long it takes to fill. Then divide 10 (litres) by the filling time, the result is the flow rate.

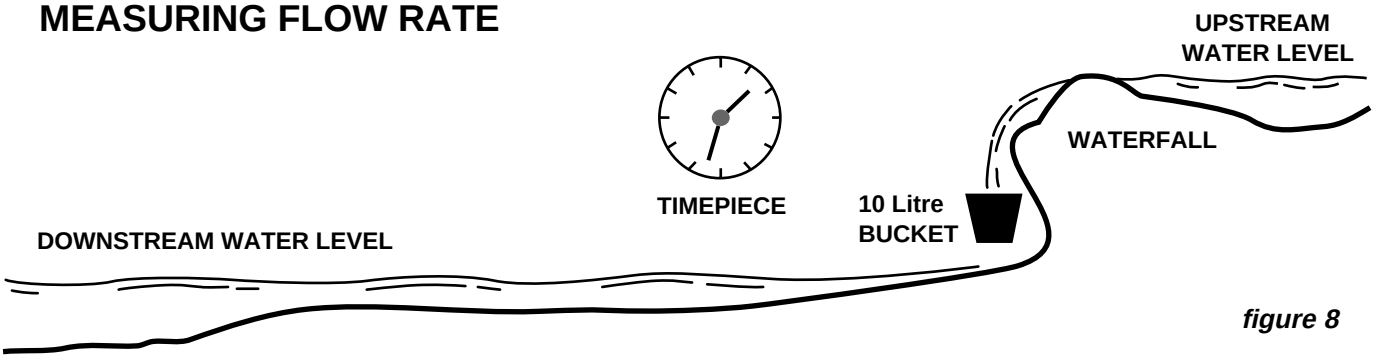


figure 8

If there is no natural waterfall, it may be possible to create a temporary 'spout' by arranging the river stones or using sand bags to form a temporary weir, **(*see figure).***

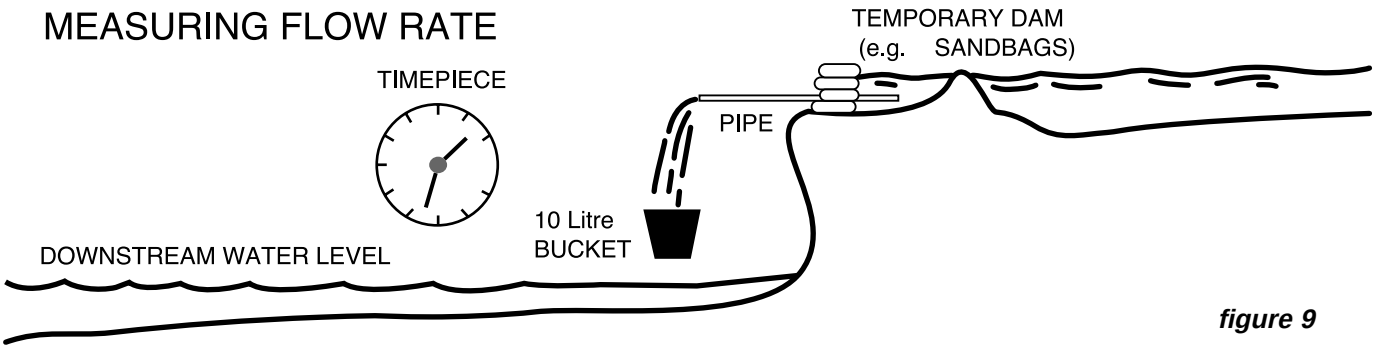


figure 9

5. Measuring the Delivery Head

This is the height from the creek water level to the storage tank. Note: The **vertical** height only, not the overall linear distance from the pump to the tank.
One way of finding out your delivery head is by referring to a topographical map (contour map) on which your property is marked, another way is to use a stick or pole approx. 2 metres long, marked clearly with graduations, and a spirit level resting on a stick. By working your way uphill step by step and adding all the measurements together you will have a good idea what your delivery head is. (***See figure 10)***

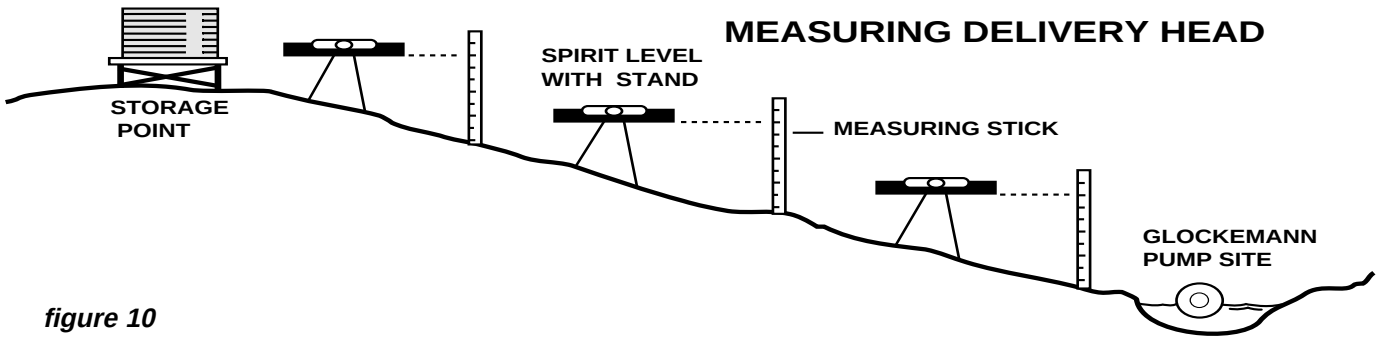


figure 10

6. Measuring the "Drop" in Your Creek

A good way of measuring your drop is to use a clear plastic tube long enough to reach from the upstream water level down to the place you will put your pump. A garden hose with a small length of clear tube attached may be easier. Place one end under water upstream and draw the air out of the lower end creating a siphon, hold the lower end up slowly until the water level in the clear tube levels out, measure from the creek water level to the level in the clear tube. ***(see figure 11)***

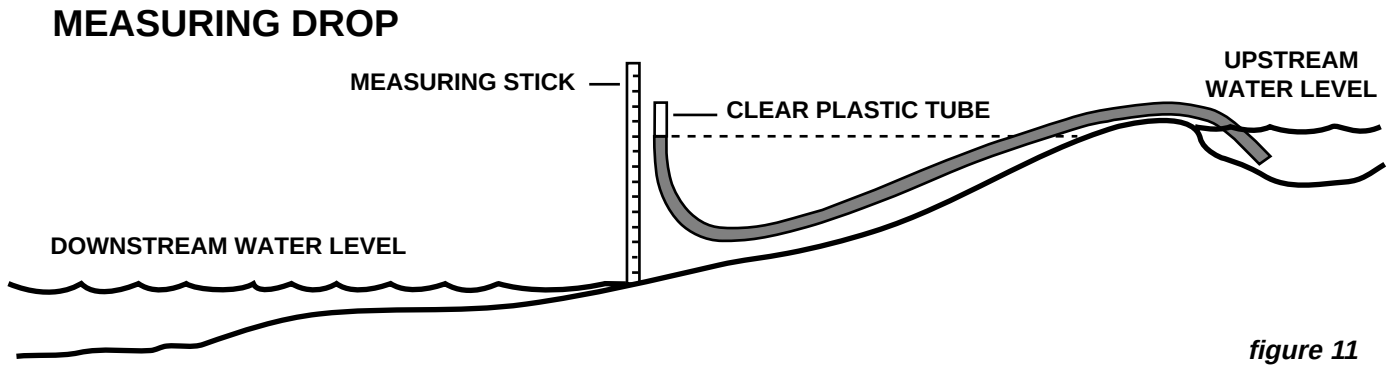


figure 11

It is important to know at this point that the drop is measured from the surface of the upper water level to the surface of the lower water level (see figure 12), except if the pump is above the lower surface level, then the drop is measured from the upper level to the pump (see figure 13). The drop is **not** increased by the pump being **below** water level (***see figure 14***).

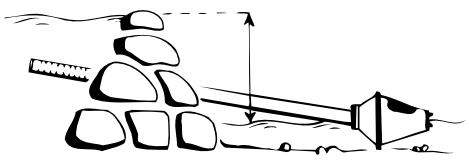


figure 12

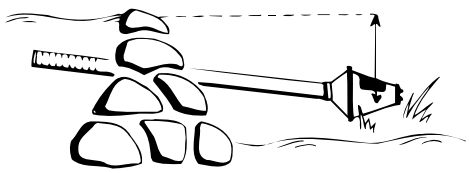


figure 13

figure 14

7. Selecting your Bore

You should now have the 3 measurements you need to work out how much water your site will provide - the **Delivery Height**, the **Flow Rate** and the **'drop.** By looking at the 'Performance Statistics Chart' in your brochure you will be able to see your expected output. The Glockemann Pump has different bore sizes for different site statistics, it is important to select the right 'bore' for your site. Selecting the right bore is easy, take your expected output and compare it with the chart below.

'320' Model

A quantity of water up to	1849 Litres per day	use 36mm bore
1850	2999 Litres per day	use 48mm bore
3000	4499 Litres per day	use 60mm bore
4500	8499 Litres per day	use 73mm bore
8500	10299 Litres per day	use 86mm bore
10300	16999 Litres per day	use 98mm bore
17000	upwards	use 124mm bore

'160' Model

A quantity of water up to	1699 Litres per day	use 36mm bore
1700	3699 Litres per day	use 48mm bore
3700	upwards	use 60mm bore

For example, a site with a 50 metre delivery head, a 6 litre per second flow rate and a 1 metre drop would have an expected output of 3,000 litre per day for a '320' model (see performance statistics in your brochure). 3,000 litres per day is in the range of 3,000 - 4,499 litres per day on the '320' model bore chart. Therefore, a 60mm bore is correct.

8. Drive Tubes

The drive tube diameters for both models are:

'160 Water Dragon'	65mm	(PVC sewer pipe)
'320 Oasis'	100mm	(PVC sewer pipe)

We suggest using sewer pipe which is cheap and easy to install and repair. In some cases where rocks and large debris tumbling down the creek in floods may be a hazard, it may be necessary to upgrade to class 12 PVC or in extreme conditions, galvanised steel. However, we advise sewer pipe be used first up and upgraded later if it becomes necessary.

The length of your drive tube is important. When working out your site your drive tube should not be **shorter** than 6 times the drop and not **longer** than 10 times the drop. ***(see figure 15 & 16)***

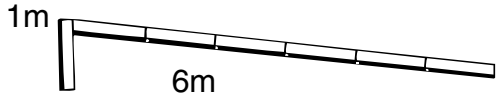


figure 15

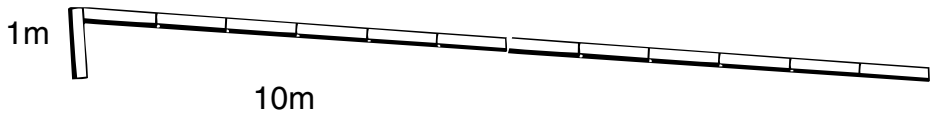


figure 16

Both the above examples have a 1 metre drop, therefore the drive tube will not be shorter than 6 metres (see figure 15) or longer than 12 metres ***(see figure 16)***

8. Drive Tubes cont.

If you intend building a small weir the following diagrams show how to position your drive tube.

Figure 17 is the most common method, note the drive tube positioned half way up the weir to make sure there is plenty of water above the drive tube inlet and strainer.

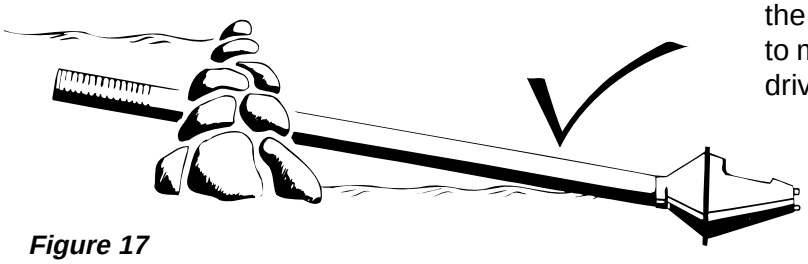


Figure 17

If the strainer is too close to the surface it may draw air into the drive tube by creating a whirlpool ***(see figure 18)***. Make sure you allow plenty of clearance.

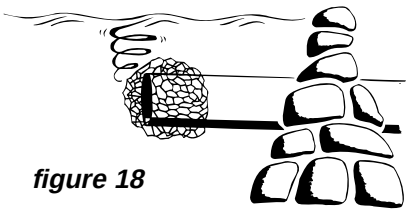


figure 18

As long as the drive tube is the correct length it does not matter if most of the drive tube is in front or behind the weir ***(see figure 19 & 20)***.

figure 19

In figure 20 most of the drive tube length is behind the weir under water.

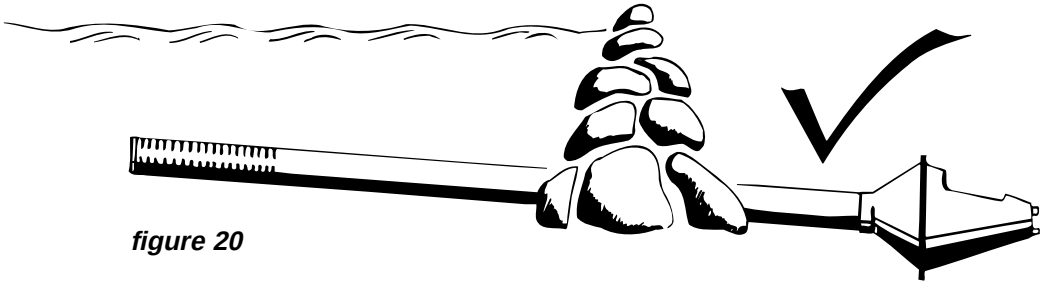


figure 20

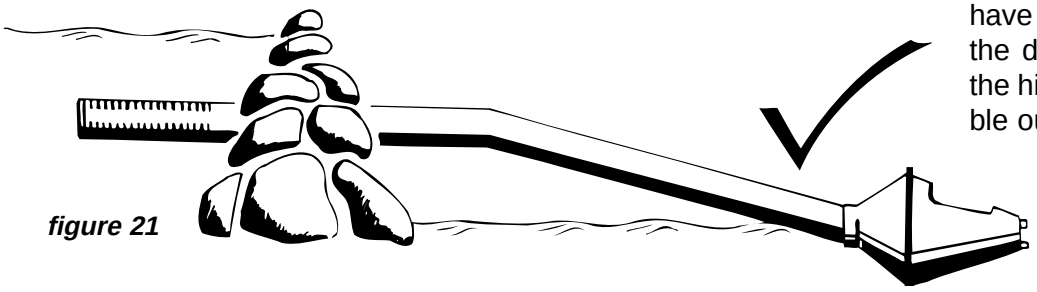


figure 21

If necessary the drive tube may have more than 1 slope, however, the drive tube strainer **must** be at the highest point to allow air to bubble out. ***(see figure 21)***

The drive tube in figure 22 is **wrong**, the drive tube strainer is **lower** than the bend in the drive tube. An air pocket will form in the bend with no way of escape and will stop the pump from working. ***(see figure 22)***

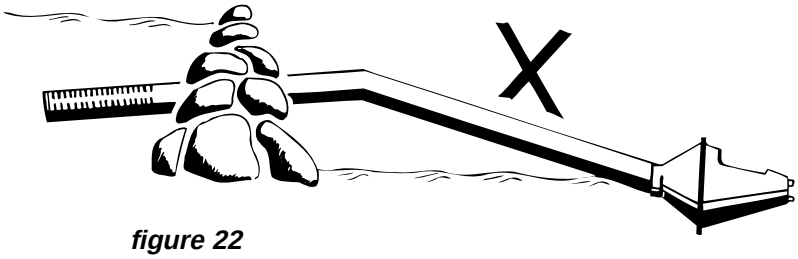


figure 22

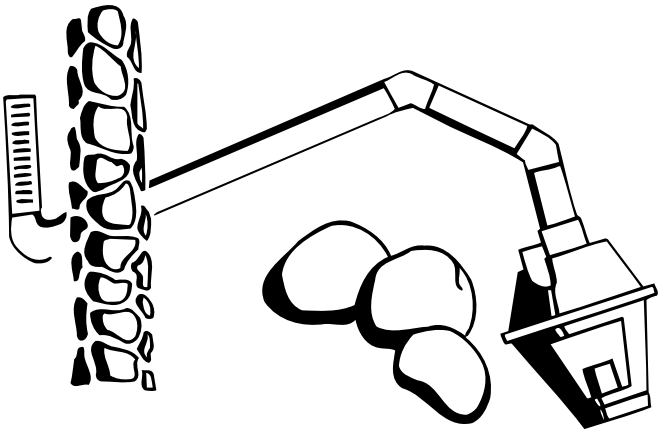


figure 23

The drive tube does not have to be straight, you may use elbow fittings to create a good protected position for your pump. Figure 23 is a view from above of the pump. ***(see figure 23)***

9. Weir Construction

There are 3 main types of weir contruction.
If your site has a naturally occurring drop, maybe a small waterfall or step drop, a small weir can be made by simply piling river stones across the top to form a weir. ***(see figure 24)***

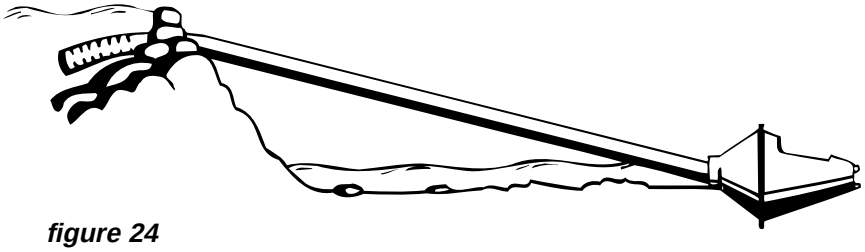


figure 24

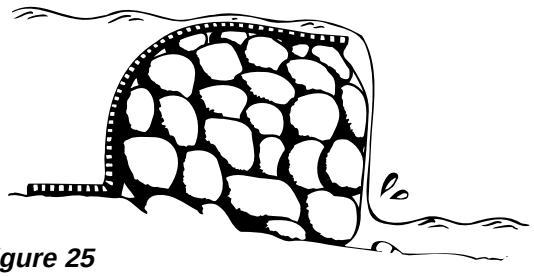


figure 25

Remember, your drive tube strainer must be well under water. You may also like to seal your weir with drainage filter media which is a felt like material available from plumbing suppliers, this material clogs up in a matter of hours and becomes impervious to water. ***(see figure 25)***

9. Weir Construction cont.

figure 26

If your site requires a larger or stronger weir there are 2 excellent options.

1. Hessian bags filled with sand and cement (dry for ease) can be stacked and molded into position, they will set well with very little cement seepage downstream. ***(see figure 26)***

Your hessian bag weir can also be strengthened by driving reinforcing bars through the bags before they set. ***(see figure 27)***

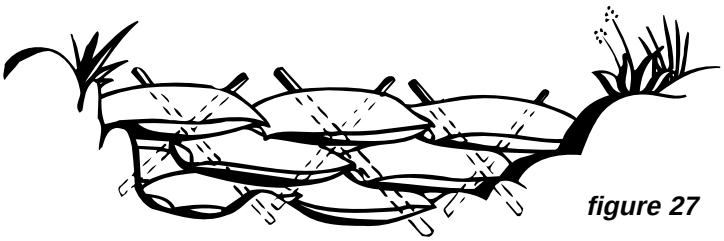


figure 27

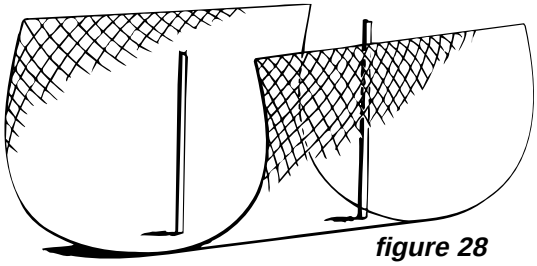


figure 28

2. A very strong weir system employed by the Dept. of Water Resources and the construction industry in general is the 'rock sausage'. For this method use 3mm gauge double galvanised chain mesh, ask your hardware or fencing supplier, form the mesh into a 'U' shape across the stream and secure with star pickets. ***(see figure 28)***

Pile the mesh with river stones, some larger ones at the base will give added support, creating a solid weir. ***(see figure 29)***

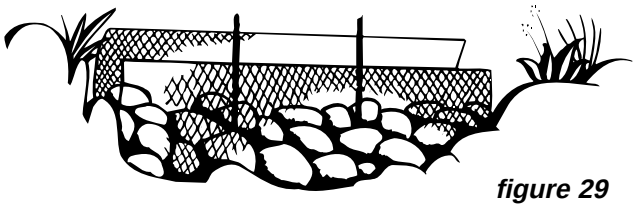


figure 29

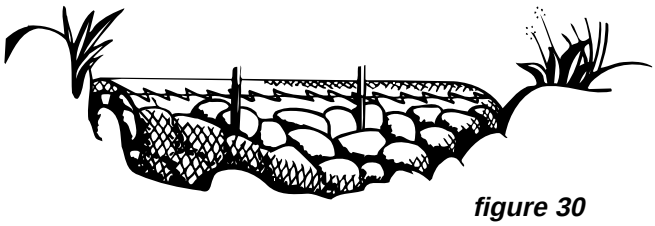


figure 30

When complete, fold the chain mesh over the weir and wire securely. The rock sausage may then be sealed with drainage filter media. (see figure 30)

Important Note:

When you are making a weir, it is important to position your drive tube during construction. You may prefer to put a length of larger diameter pipe through the weir as you are building it and feed your drive tube through this pipe later on. For example, if you are using 100mm drive tube, put a length of 150mm pipe through the weir. Also, if you intend feeding your pump inlet from your weir as in ***figure 31*** below, put a length of 50mm pipe through weir as you build it and feed your inlet pipe through the 50mm pipe later. The method shown in figure 31 is the suggested ideal for your pump inlet.

figure 31

10. Installing Pump & Drive Tubes

Your pump and drive tubes should be anchored securely for protection during floods.

There are brackets on your pump which 4mm or 6mm galvanised chain can be attached. Secure the chain to a large rock or nearby tree, perhaps using bolts and brackets drilled into the rock. If there are no secure rocks or trees available star pickets driven **deep** into the ground will provide an anchor. The drive tube should have chain wound tightly around and also be anchored to a rock or tree.

11. Delivery Pipe Diameter

'320 Oasis'	'160 Water Dragon'
36mm bore ~ 25mm pipe 48mm bore ~ 25mm pipe 60mm bore ~ 25mm pipe 73mm bore ~ 25mm pipe 86mm bore ~ 40mm pipe 98mm bore ~ 40mm pipe 122mm bore ~ 50mm pipe	36mm bore ~ 25mm pipe 48mm bore ~ 25mm pipe 60mm bore ~ 25mm pipe

For delivery pipe longer than 2km in length use one size larger than suggested, to lessen friction.

12. Pump Models & Specifications

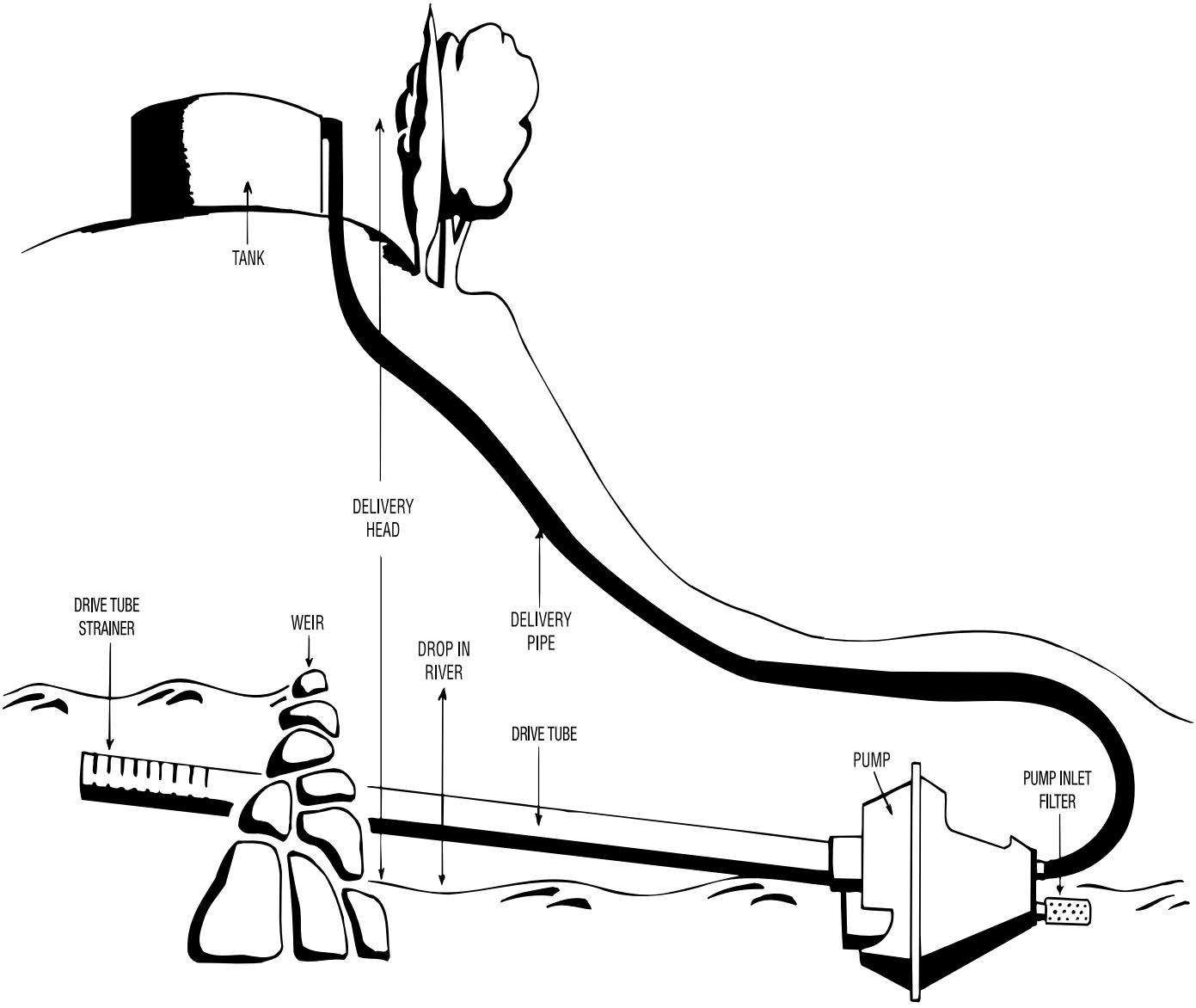
Drive Tube Flow Capacity	**Min Flow Required**	**Max Flow Used**
'320 Oasis'	1.5 Litres/sec	6.0 Litres/sec
'160 Water Dragon'	0.5 Litres/sec	2.0 Litres/sec
Min/Max supply 'drop'	**Min Drop Required**	**Max Drop Allowable**
'320 Oasis'	0.4 metres	1.6 metres
'160 Water Dragon'	0.5 metres	3.0 metres

Model Dimensions	**Length**	**Height/Width**	**Weight**
'320 Oasis'	50cm	40cm	60kg
'160 Water Dragon'	57cm	20cm	10kg

When correctly installed your Glockemann Pump will provide a reliable, trouble free water supply with minimal maintenance for many years.

If you require assistance with information to ensure correct installation please contact Glockemann Peck Engineering or your local distributor.

Glockemann Pump Site Plan



Illustrations by Sue Gibson