

Sprinkler System at Michael Adler's Place – Lovett Bay

This document details the recently installed house protection system at my place at Lovett Bay. The house is a timber structure two stories high, stepping up the slope. It is approximately 16 m above the mean sea level in Pittwater. Some details of the sizes of the various parts of the installation, as well as the suppliers are provided.

There are impact sprinklers installed at the four corners of the house with the intention of slowly saturating both the roof and gutters as well as the surrounding ground/bush. When run at full pressure each sprinkler will wet the surrounding ground for a distance of some 8 m out from the sprinkler. The spread from the four sprinklers essentially overlap each other, wetting the entire house roof area and the adjacent bush.



Sprinkler Protruding Above Roof



Saturated Front Deck

Because the house steps up the hill the front, southern, sprinklers are some 3 m lower than the two back, northern, sprinklers. This difference in head is important if I attempt to run the sprinklers using only gravity feed.

There is a water distribution system under the centre of the house. Access is via the east side of the property. This includes a 2,000 litres holding tank, connection to a 50,000 litres water tank up the top of the block, an electric pump for house water pressure, a manifold for controlling the flow to the four sprinklers, portable petrol pump, hoses etc.



Water Distribution System Under House

The sprinklers can be driven using water either from the large 50,000 litre fresh water tank at the top of the property or from the 2,000 litre holding tank which can work as a 'dam' being continuously filled with salt water from Lovett Bay. In the later case another, but old, portable pump located on the jetty can be used to pump the salt water up to the holding tank via a series of three 38 mm percolating hoses laid on the slope.

There are three potential sources of pressure to force the water through the sprinklers, these are –

PORTABLE PUMP – Located under house

This is a Aussie Fire Chief (Honda) 5.5 HP pump, max head 75 m (750 kPa). This also has a 38 Storz fitting attached as well as two standard garden hose size output fittings. Input is via a suction hose connected (via 38 Storz) to both the holding & upper tanks. The pump is capable of running all four sprinklers at their max. flow rate, plus also it can drive a live reel or 38 mm hose attached.



Portable Pump Under House + Storz & Hose to Sprinkler Outlets

ELECTRIC HOUSE PUMP – Located under house

This requires mains or generator electricity. It has a maximum head of 44 m (440 kPa). The pump is just capable of running all four sprinklers at very much reduced flow rates. Or it can run the two front (southern) sprinklers at near full flow rate.



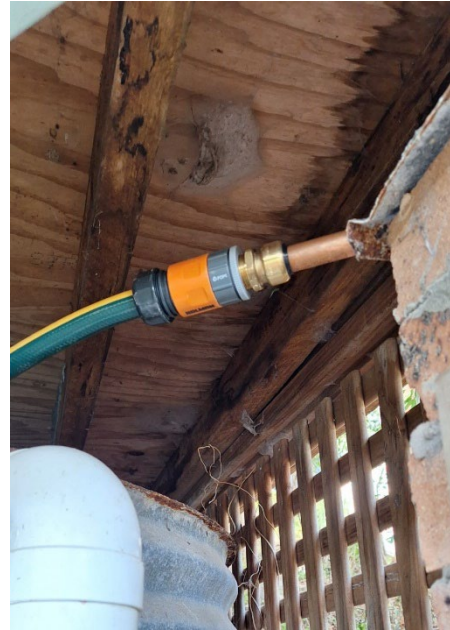
Electric Pump Under House

GRAVITY FEED – From large tank up at top of property

The base of this 50,000 L tank is 8 m above the level of the holding tank located under the centre of the house. The water level is 10 m above this level when the large tank is full. So, the head at the holding tank level under the house can be between 8 & 10 m (between 80 & 100 kPa) depending on how much water is in the tank. With a 9 m head this is enough to drive the front (southern) sprinklers at say half capacity, but it will not drive the back (northern) sprinklers – only a pathetic trickle, due to the 3 m difference in level. The upper tank is connected to the distribution system via a buried large diameter plastic pipe.

Sprinklers & Hose Distribution System

The sprinklers are brass Rainmaker Bushfire single port Full Circle impact sprinklers. They each use 4 litres per minute (lpm) at a head of 15 m, or 5 lpm at a head of 30 m. They are attached to 20 mm copper pipes running up the outside of each corner of the house (see photo of sprinkler above). At the bottom end there is an approximately 1 m length of copper pipe running under the house which is attached to the distribution hoses, see below.



Copper Pipe Connection to Hose

The hoses are standard heavy duty garden hoses, 18 mm diameter (NOT the normal 12 mm typical garden hose). This larger size is to allow a greater flow to the sprinklers. The 18 mm hoses run to a controlled manifold under the house which is then connected to either the portable pump, or the

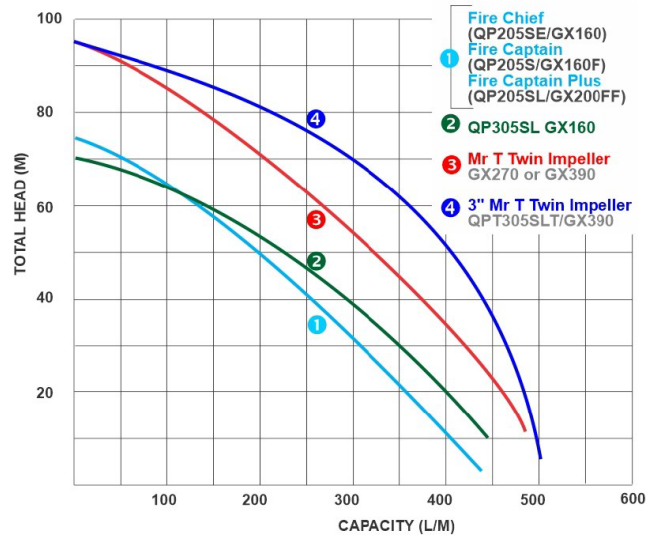
electric pump or by gravity feed. There are control valves for all four hoses going to the sprinklers. The manifold is located under the holding tank.



Controlled Manifold Connected to Sprinklers

Experience has shown that even small amounts of dirt getting into the system can block the sprinklers or at least stop them rotating. At my place it is very difficult to get to the sprinklers to clean out the sprinkler head with a piece of wire as they are high up in the air. It is very important to keep the system clean and flush it out as much as possible before running water up the last bit of the copper pipe connected to the sprinklers. I also have three down market sprinklers (Pope brass sprinklers from Bunnings) that I can attach to a star picket and place anywhere around the house that needs particular protection. I have a number of simple large diameter garden hose type fittings that allow me to easily connect these to the hose at the bottom of the copper pipes, or even connect directly to the portable pump.

It is important when assessing the capacity of a pump to feed a sprinkler system to ensure that there is sufficient flow capacity at the head required for the sprinklers to function. The plot below is for Aussie pumps (the light blue line is for my Fire Chief pump). This shows the pump flow rate versus the head, the performance curve.



Performance Curve for Aussie Fire Chief Portable Pump

From this it is obvious that at a head of say 70 m the pump has essentially zero flow rate. Now for a head of 30 m each sprinkler needs a flow rate 5 lpm, or a total of 20 lpm for all four combined sprinklers. Whereas the pump has a capacity of 300 lpm at 30 m head, so it is more than capable of running the sprinklers plus say a live reel or even a 38 hose. In comparison my electric pump only has a capacity of about 10 lpm at 30 m head so it struggles to run four sprinklers at the same time.

The above calculations do not take into account the difference in head level between the pumps and the sprinklers, or the losses in all the connections which are particularly leaky. I have no problems with leaky connections as they help to spread water around to protect the system during a fire.

Costs and Sources for Equipment

The full system cost me some \$3,000 (September 2023) which includes \$1,000 for the new portable pump and fittings.

There are many distributors for the Aussie pumps, I got mine from Hills Irrigation, Castle Hill (02 9659 9659), They have lots of parts to make up drafting hoses and other connections, the main person there was knowledgeable.

I got the sprinklers from Rainmaker Bushfire Sprinklers in Wollongong (0403 851 399), rainmaker.bushfire@yahoo.com. \$40/sprinkler, including delivery.

You can buy everything else from Bunnings. Though if you get 20 mm copper pipe in 6 m lengths then maybe use Gainfords at Mona Vale as they delivered for free, located next to Whitworths (02 9979 7001). The heavy duty 18 mm hose is \$130/30 m at Bunnings. All the connecting parts etc. really add up.