

# HOW TO PLAN FOR BETTER FARM DRAINAGE

Effective farm drainage systems will remove excess surface and sub-surface water from paddocks within 24-48 hours of a rainfall event.

Rapid removal of surface flooding and excess sub-surface water helps to:

- prevent excessive soil water levels
- protect soil quality
- eliminate stock and crop losses
- enhance overall farm productivity.

The right farm drainage system also ensures compliance with environmental regulations.

Trying to design and implement an effective drainage system can seem overwhelming with the demands of farm management and day-to-day operations, but the key is to break the process into manageable steps and to make a plan.

## ASSESS THE PROBLEM

Right after a heavy rainfall event is a good time to assess the drainage needs of your farm - the rainfall will highlight problem areas for surface flooding, boggy ground and runoff.

To assess your drainage needs, ask yourself:

- Is **surface or subsurface water** (or both) causing my problems? Where is the water coming from?
- How big is the affected area or **affected areas**? (Make a note of your worst affected areas.)
- **How often** am I dealing with excess surface or sub-surface water? How long does it take to resolve each time?
- What is my **full list of drainage requirements**, to resolve all my flooding/excess water issues?
- What are my **priority areas** for drainage? (Rank all your drainage requirements so you can work through them over time.)

- Do I need help to develop a plan for my farm drainage systems? There is help available, including **free drone assessment** and **custom drainage planning services** from P&F Global.

Mapping your farm with a free drone assessment can provide critical insights on your specific drainage requirements and identify the right pipe size, length and capacity.

*Drainage recommendations from a P&F Global drone assessment.*

### Distance

Label	Title	Horizontal Length	Surface Length	Slope	Vertical Height
1	Drain 1	313.19 m	315.56 m	4.03°, 7.05%	22.12 m
2	Drain 2	250.39 m	254.52 m	3.89°, 6.81%	17.09 m

### Area

Label	Title	Area	Surface Area
3	Drain 1 Catchment area	6.04 ha	6.17 ha
4	Drain 2 Catchment area	3.91 ha	3.98 ha



## DESIGN YOUR DRAINAGE SOLUTION

Mapping your farm is a great foundation for your farm drainage plan. You can outsource this step with P&F Global's free drone assessment and drainage planning service. When mapping existing on-farm drainage, it is important to note:

- Existing sub soil drains
- Open drains – manmade and natural
- Size of catchment area
- Soil type – how permeable is it?
- Whether your land is taking on any runoff from neighbouring land
- Any drainage and/or environmental or remediation regulations for the area?
- Winter water levels for any streams or culverts your drainage is flowing into.

When you have completed your assessment of drainage issues and mapped your farm, you are in a strong position to design an effective drainage solution.

A comprehensive farm drainage plan should cover:

- Drain type
- Drain size & capacity (drainage coefficients)
- Topography and layout
- Drain depth
- Use of drain filter cloth (socks)
- Environmental impacts & regulatory requirements
- Installation quality
- Implementation schedule

## SUB-SURFACE DRAINAGE OPTIONS

Using buried pipe for drainage is a smart option because of the low maintenance requirements and the more effective use of available land.

Open drains or channels occupy land that could be used for crops and grazing, and they restrict the use of farm machinery. Open drains often require additional bridges and culverts for road crossings and access to the fields, they can present health and safety risks to farm staff and stock, and they have higher maintenance requirements including weed control and stabilising earthworks.

Initial installation costs for buried pipes can be higher but the lifetime costs are significantly lower.

HDPE (high density polyethylene) pipes - including EUROFLO twin-wall slotted pipe - offer a super durable and lightweight solution. EUROFLO slotted pipe is maintenance and rust free, and resistant to chemically aggressive soil conditions. The lightweight quality of the pipe reduces labour and machinery requirements for transport and installation.

EUROFLO slotted pipe comes in seven different sizes from 160mm outside diameter through to 630mm. The long 5.8 metre lengths each have a socket on one end for easy joining.

The larger pipes have more slots. The total slotted angle is 240°. When laid with the slots facing up this allows water collection around the pipe and fast flow along the non-slotted bottom.

Stock is held onsite in stores throughout New Zealand and supplied from three central stock hubs in Auckland, Christchurch and Invercargill.

## PIPE DRAINAGE – CHECKLIST FOR SUCCESS

If you decide to install pipes for your farm drainage, use this checklist to ensure you select the right pipes and installation methods for the best drainage outcomes:

- ☑ Select a pipe capacity that can take your average farm runoff at 50-70 % full
- ☑ Choose a twin-wall pipe with smooth internal walls
- ☑ The larger the trench the longer it will last
- ☑ When you dig the topsoil out, pile it to one side of the trench to use for the final backfill
- ☑ Use clean or washed gravel to lower the chance of sediment filtering into the pipe and causing blockages over time
- ☑ Install your pipes with a 0.3% or greater gradient (more if ribbed internal pipe)
- ☑ For optimal flow bring the small subsoil drainage into the side at 45 degree angle with a junction
- ☑ For the best drainage outcomes, wrap filter cloth underneath the pipe and put some AP40 gravel around then wrap overtop as well
- ☑ Before laying gravel over/around the drainage pipe, cover the top with straw as this helps to create a barrier between the soil and the pipe
- ☑ For areas with springs turn the pipe upside down (slots facing down) then turn the correct way up (slots facing up) and carry on down. If you get a dry patch you can turn the pipe upside down again to let some water out along the way.

