FRC AQUIFER
TECHNICAL MANUAL

RCPA
THE AUSTRALIAN PIPE COMPANY

Fast. Smart. Proven. Strong.

FRCAQUIFER
1.0 Introduction

FRCAQUIFER
Subsoil Drainage System

The strength and versatility of **FRC**AQUIFER and its associated components is recognised and has been utilised in rail, residential, commercial and environmental projects where reliable subsoil drainage management is required. All components of the system have been manufactured with a commitment to quality, design and importantly strength.

The System

This innovative subsoil drainage system encompasses the following key components that can be implemented as a complete system or in individual components.

Slotted Pipe

FRCAQUIFER slotted pipes are manufactured using the same process and materials as **FRC** concrete pipes. They possess the same core attributes as **FRC**Pipes, longer lengths, lighter weight proven strength.

Swale Pit Systems

The innovative **FRC**AQUIFER Swale Pit has been designed to allow the integration of roof water from dwellings and other impermeable surfaces.

Soakwell Pit Systems

Used in sandy soil conditions, **FRC**AQUIFER Soakwell slotted pits are used to allow roof water to infiltrate into the soil, retaining roof water on site and recharging natural aquifers.

System Features:

- Allow water from surrounding soil to seamlessly enter promoting an efficient drainage environment.
- Resist blocking when combined with filter materials providing a long-lasting solution to groundwater management.

Applications:

- Ballast drainage for railway infrastructure
- Permeable pavements
- Household treatment drains
- Ground de-watering
- Water Sensitive Urban Design (WSUD)

FRCAQUIFER
2.0 Slotted Pipe Systems

The slotted **FRC**AQUIFER Subsoil Drainage pipes maintain high strength and are the ideal answer to ground dewatering in a variety of applications, including load-bearing situations such as railway ballast drainage.

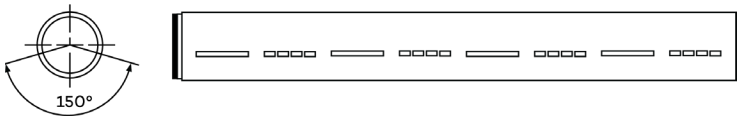
The strength class of **FRC**AQUIFER pipes is listed in the specification table, the slotting of the pipe results in an approximate strength reduction of 10%.

Designers should consider this when determining the required load carrying capacity of the **FRC**AQUIFER pipe.

Nominal Pipe Size DN (mm)	Strength Class (AS3725)
225	4
300	4
375	4
450	2
525	2
600	2
675	2
750	2

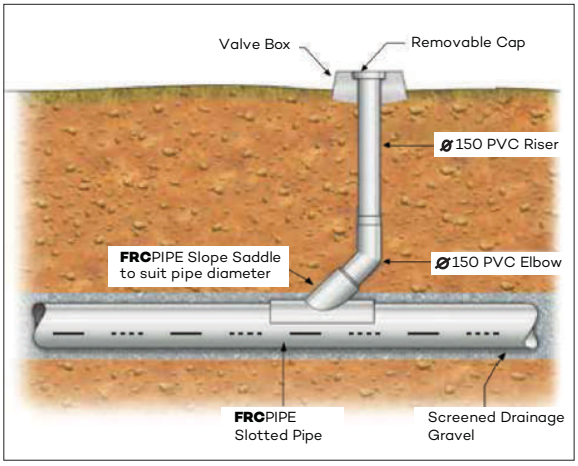
Total Slots per pipe	Rows per pipe	Slot length	Slot Width	Total slot area per pipe	Approximate proportion of Full Pipe Flow below slots	
					Slots Down	Slots Up
8	2	300mm	5mm	11.800 mm^2	25%	80%

Notes:
- All dimensions are nominal
- **FRC**AQUIFER subsoil drainage comes with Precision Joint Technology



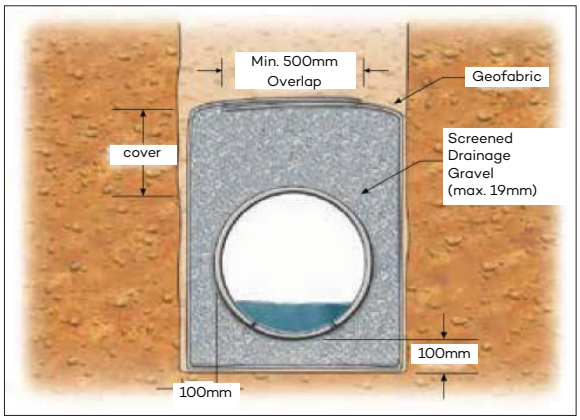
Trenches should be as narrow as practical, with a minimum of 100mm clearance at each side of the pipe. For maximum drainage into the slotted pipe, and to prevent blocking of the slots a suitable filter material should be used for bedding and fill material. **RCPA** recommends a single-size screened drainage gravel with a nominal size of between 10- 19mm for use in most firm ground situations.

A layer of non-woven geofabric should be used to completely envelop the drainage gravel to prevent migration of fines into the trench.



Flushing Point

Access for maintenance should be considered, and a suggested method is detailed below using a **FRC**PIPE saddle with a fully sealed rubber-ring connection to a DN150 PVC flushing riser to an access point located at the surface.



It is suggested that distances between flushing points be a maximum of 60 metres.

FRCAQUIFER
3.0 Swale Pit Systems

The innovative **FRC**AQUIFER Swale Pit has been designed to allow the integration of roof water from dwellings and other impermeable surfaces.

Design Options

Water sensitive urban design allows for the use of overland swale flow to retain and provide treatment of stormwater prior to entry to underground pipe systems.

FRCAQUIFER Swale Pits are ideal for incorporating roof water pipe connections to a below ground initial infiltration drainage system, with the capability for excess flows to be discharged to a runoff swale.

Swale Pits provide two options for handling excess flows, with a simple surcharge pit sending high volume flows to the overland swale, while a discharge pit allows medium flow volumes to be diverted to a piped drainage system and only high flow volumes in excess of the pipe capacity to be diverted to the overland swale.

Pit Type	Product Code	Pit Depth (mm)	Weight (kg)
Surcharge	402970	600	18
Discharge (top)	402770	300	14
Discharge (bottom)	402810	300	10

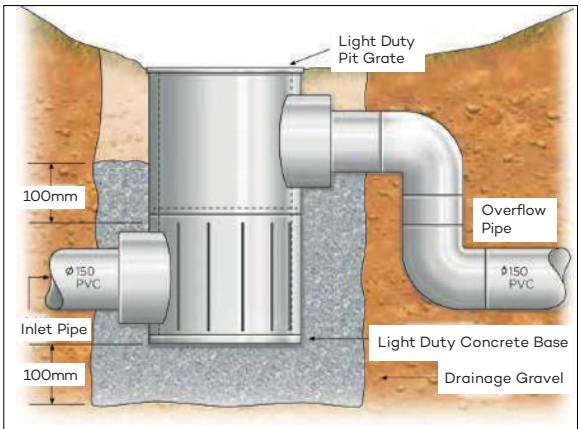
Pit Type	Product Code	Weight (kg)
Light Duty Grate with chain	300134	29
Light Duty concrete base	303030	15

Flushing Point

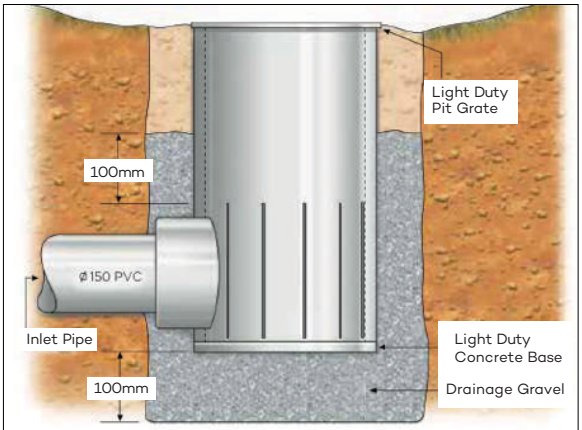
After excavation of the pit location, a 100mm layer of free- draining gravel should be placed and levelled. A light duty concrete base should be placed into position, and the Swale Pit placed onto the base. The pit should not be attached to the base with epoxy or mortar to allow drainage of the pit to the surrounding soil.

The inlet pipe can then be connected to the socket on the pit, and the pit excavation can be backfilled with drainage gravel to 100mm above the pit drainage slots. Native soil can then be used to fill the excavation to finished surface level.

A geofabric liner may be placed into the pit base and secured with a 50mm layer of drainage gravel to improve ease of maintenance. Once complete, a light duty grate with locking chain is then placed onto the pit.



FRCAQUIFER Discharge Pit



FRCAQUIFER Surcharge Pit

FRCAQUIFER
4.0 Soakwell Pit Systems

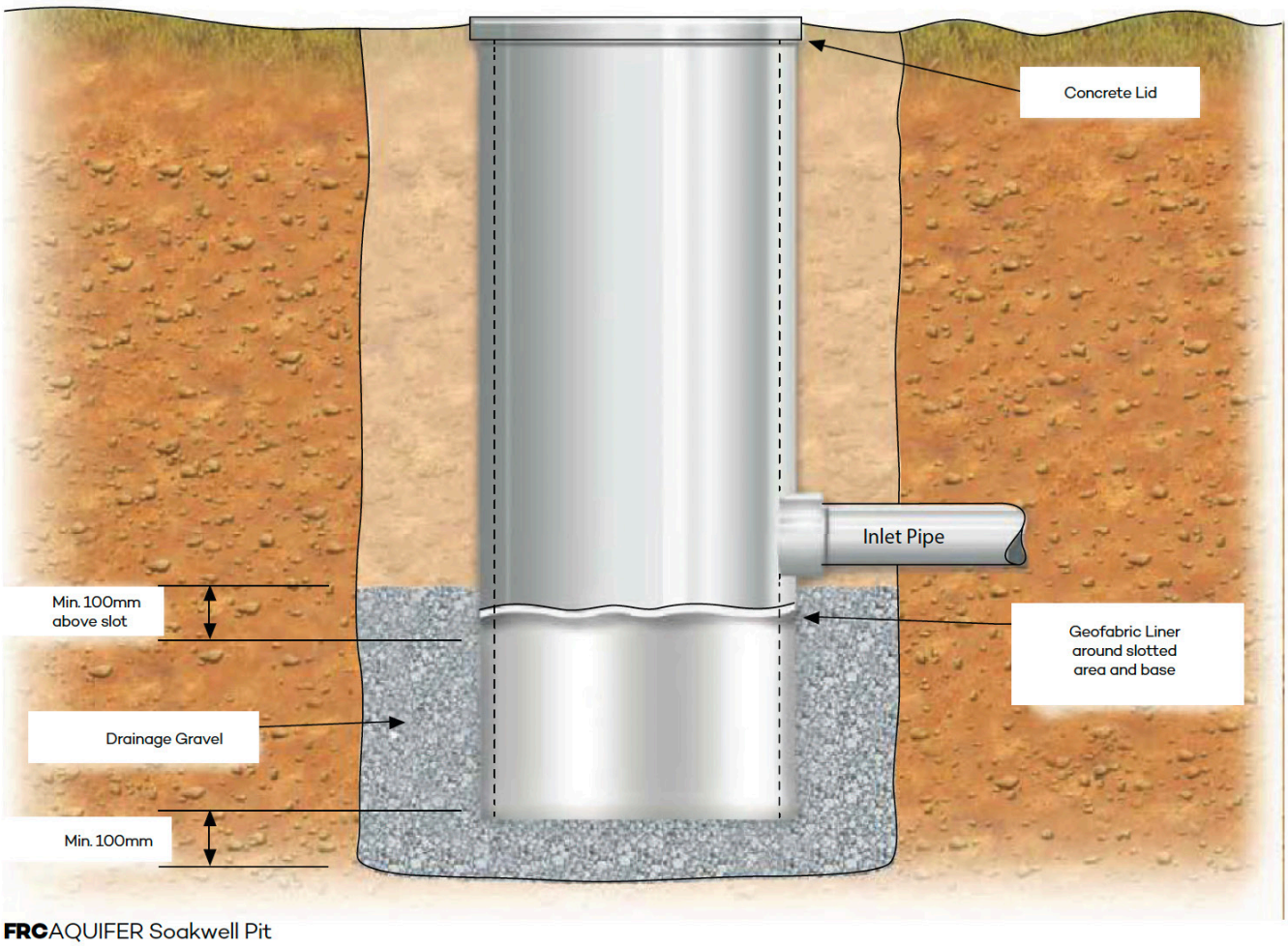
FRCAQUIFER Soakwell Pits are constructed from the durable **FRC**PIPE concrete composite material, with a series of slots placed around the base of the pit.

Used in sandy soil conditions, Soakwell slotted pits are used to allow roof water to infiltrate into the soil, retaining roof water on site and recharging natural aquifers.

Design Options

When installing sub-surface drainage products such as soak- wells the following aspects should be considered:

- Soil type – for example sandy soils will provide excellent infiltration but clay soils will become waterlogged.
- Soil depth – ensure here is sufficient depth of infiltration soil
- Sediment load- high volumes of sediment can block sub-surface infiltration systems
- Local Council Regulations



FRCAQUIFER Soakwell Pit

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