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Drainage: technical details for proposed plastic clad tunnel structures at Norfolk House Farm, Gedney Marsh, Spalding PE12 9PB.



1. Background

The proposed development comprises a block of plastic clad greenhouses in a field currently in continuous arable production.

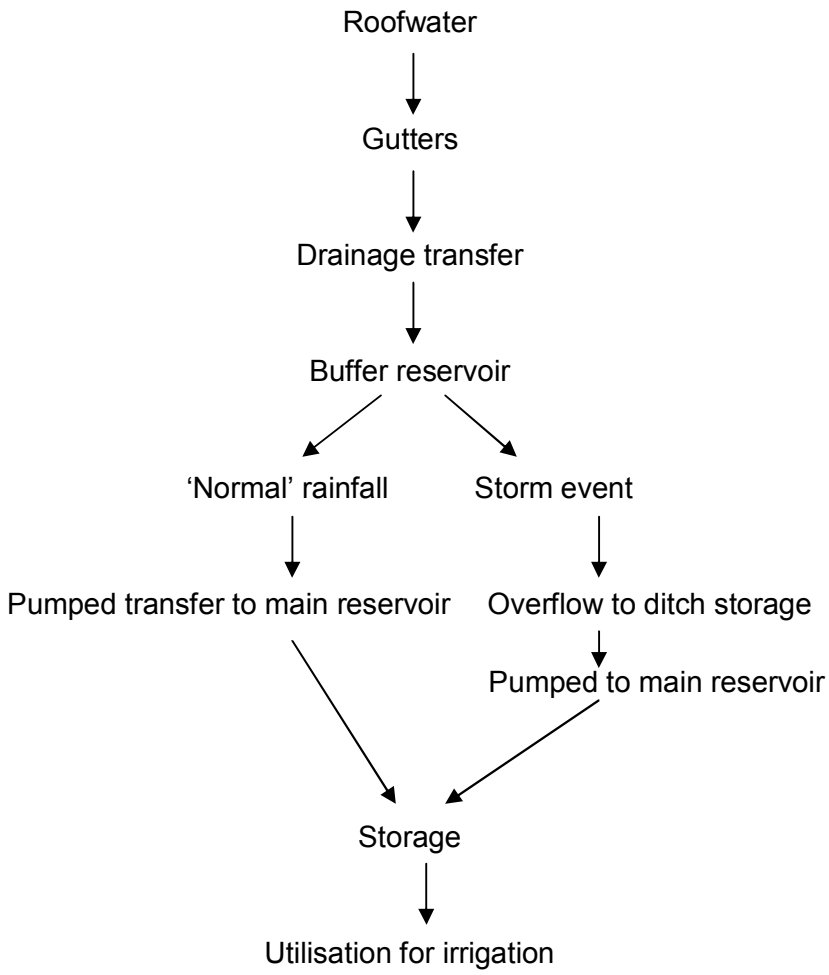
This report is to be read in conjunction with the following drawings:

- Site plan
- Buffer reservoir
- Drainage layout

2. Water collection

Roof gutters are connected to a storm water drainage system that collects the water and brings it to the proposed buffer reservoir. The gutter collection system will utilise the normal greenhouse approach of buried pipes with an ‘up and over’ feeder to the reservoir, and a sump pump to drain down the flooded pipes after a rainfall event so that they remain empty other than during rainfall, thus ensuring that there is no static water to reduce initial start dates (no hydraulic surcharge).

The schematic of the drainage system is shown below.



See drawing: "Drainage layout"

3. Water storage and pumping

The buffer reservoir will comprise a excavated section with earth embankments from the excavations, giving a total depth of 2.1m (1.5m below ground).
Buffer reservoir capacity (allowing for 300mm freeboard) = 1,400 m3

See drawing "Reservoir".

The transfer pump to the main reservoir is rated as below.

Operating discharge 140 m3.h
Operating pressure 14m head

eg Sykes P3001V 10.8kW motor

Pump to be operated on float switch to ensure that buffer reservoir remains empty other than during rainfall events.

The ditch retention system comprises the modified field dyke which will be dammed as shown, and have a sump installed as detailed. The capacity of this retention ditch is 1,500m3.

4. Rainfall events and system match

The buffer reservoir / pump system alone can cope with the following rainfall events without overflowing to the ditch retention system.

1 hour event of 61mm
6 hour event of 15mm/hr

This total system copes with the M100 + cc storm event of 105mm, which gives a run-off volume of 2,604m3.

Total storage volume	1,400 + 1,500m3
Total run-off	2,604m3
Surface fall on storage system	288m3
Total required water storage	1,892m3
Pass?	YES

5. Main storage reservoir.

The pumped water will be stored in the main storage reservoir with capacity 22,500m3. This also connects with other reservoirs on site via the internal distribution system, with total capacity in excess of 100,000m3.

6. Backup pump

In addition to the installed electric pump the applicant has further diesel driven pumps of higher capacity which could be used in the event of power or pump failure.

7. Field surface run-off

A shallow ditch will be dug to intercept field surface run-off, and this will connect to the existing dykes after the proposed dam.

8. Utilisation.

The farm has an extensive field irrigation system, and is always short of water for irrigation for field crops.

Additionally the tunnels themselves will need irrigation throughout the period when they are covered.

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