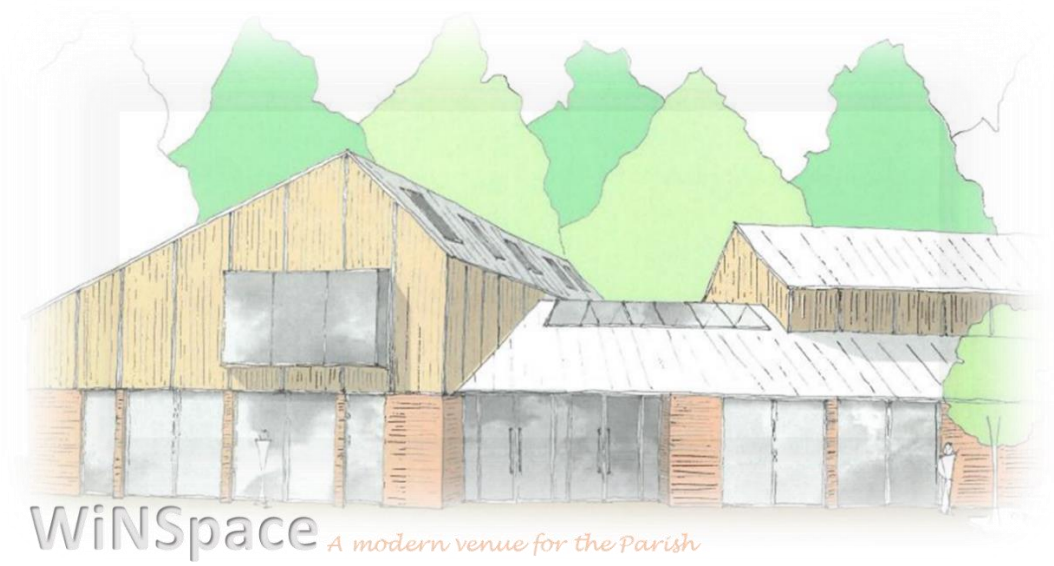
Winscombe Community Association ('WCA')

Surface Water and Sustainable Drainage (SUD) Strategy WiNSpace Summary

Winscombe New Space: 'WiNSpace' Project



Summary Prepared by

Mike Turner

Member of the WiNSpace Committee

Original Report issued by

Jenkins & Potter

Surface Water & SUDS Drainage Strategy report MD18.21-001SUDS

March 2021

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Issue No:- 1	Author: Mike Turner	Issue Date:- 19/03/21

1 Introduction

As part of the new building design the Architects have employed the services of a Consultant Engineering Company called Jenkins & Potter. This provided the strategy to ensure the new building and old buildings avoid being flooded and that the development does not impact surrounding neighbours or properties downstream.

This document has been written by the WiNSpace committee to provide a layman's guide to the consultant's assumptions, strategy, and conclusions. It also includes additional information and conclusions made by the WiNSpace committee to help understanding of the risk of flooding. Technical information and assumptions have been taken from the Surface Water & SUDS Drainage Strategy report MD18.21-001SUDS.

2 Conclusions

The WiNSpace Committee have concluded that the strategy is robust since.

1. The strategy does not intend to assume that no external flood water will enter the site but by design, allows it to enter in a controlled manner and via profiling the hardstanding, it is led away from the buildings on to the field
2. Using storm water storage, directing and controlling flood & drainage water on site, the community centre buildings will be flood resilient.
3. By reducing the Community Centre's dependency on storm sewer capacity, it will assist in the management of storm water in the local area
4. The rainfall volumes used in the analysis far exceed the rainfall quantities that occurred during the 2012 flooding event.
5. The ground on site is assumed to be impermeable. However, the risk could be further reduced if water does soak into the ground under the Carpark and the Wells Close culverts are correctly maintained.
6. Overall the scheme looks to significantly improve the drainage capacity and reduce the flooding risk of the site and local area.

3 What does the Local Planning Authority require in a Drainage and Flood Strategy

- Demonstrate that the new building is not susceptible to flooding or increase the risk to flood of local properties.
- Show, that if flooding was to occur, what is the defined ground floor level of the building which avoids ingress of flood water.
- To design a system which limits the release of water into the storm sewers
- To design a system which does not affect the ground water quality as we are located within Environment Agency source protection zone 2

4 Description of the current site and flooding risk

The strategy has utilised the Government and Environment Agency best practice guidance and flood risk data, providing the following information. Please refer to Figure 1 for location of items discussed.

- The site is currently and will be in the long term, in an area that is at a low probability (1 in 1000) of flooding from sea or river. This means that there is a 0.1% chance of a river or sea flood affecting the site each year.
- The site is currently between a low to medium risk of surface water flooding. The car park and the position of the building is deemed to be low (between 0.1% to 1% chance of flooding per year). Whereas, the field to the north of the building and the strip of land to west up to the railway embankment is deemed as "medium" risk. This means that there is a 1% to 3.3% chance of flooding in the field each year with the highest chance of flooding in the north west corner of the field.
- Surface water flooding, which can originate from a number of sources, will lead to 'ponding' of water in the field. The most likely source of this flooding will be as a result of a lack of maintenance of the culvert inlet near the school at the top of Well Close (H).
- The site is at no risk from flooding from reservoirs.
- Below the site the underlying Mudstone and Halitestone bedrock is likely to have "low" to "very low" permeability. This means that the permeability and infiltration potential of the ground will likely be marginal. This implies that rain soakaways or swales will not provide a solution for surface water flooding.
- The existing building roof and hardstanding combined area is estimated to be 2310m^2. Using a rain fall intensity of 35mm/hr the amount of rainwater which enters the storm sewer via the on-site drains has been calculated at 22.5 litre per second

5 Description of the site re-development and what the strategy takes account of

- The calculated area with the re-development, which we need to take account of, is 3150m^2. (This includes the retained building at 380m^2, all hardstanding & adjacent areas at 2095m^2 and new building at 675m$^{2)}$.
- As the site has been assumed to be impermeable, the buildings and all hardstanding areas are included in the drainage calculation.
- The site design needs to take account of external flood water which can enter the site as well as drainage of rainwater which falls directly on to the site. Any release of water into the storm sewer needs to be controlled to 5 Litre per second.
- By examining different rain fall events, assuming climate change, a worse-case scenario has been derived. This 'critical storm' is a once in 100 year event and assumes 76.8mm (3 inches) of rain will fall in 4 hours
- If flooding on the field occurs what does the ground floor level of the building need to be to avoid ingress of water
- Diversion of a minor sewer which crosses the WCA land, this is not part of the drainage strategy but needs to be reported.

6 Flood Strategy Summary

To help minimise the flood risk from external sources the following is proposed

1. An Increase of the crossover height of the relocated driveway entering the site from Sandford Rd (marked A1) and reprofiling of the crossover by the shed (Marked A2) to ensure flood water is directed toward storm drains in Sandford Road rather than entering the site. However, if flood water enters the site it does so in a controlled manner.
2. To provide provision, in the form of shallow, dished surface around the edge of the car park and new community centre building (marked B), to direct any surface water exceedance flows from Sandford Rd to the low lying land to the rear of the proposed new building (marked G).

7 Drainage Strategy Summary

To deal with 'on site rainwater' the following is proposed:

1. The carpark to be made of a permeable surface (marked C) with additional rain traps (marked D - 10off).
2. Underneath the carpark paving there will be a high-void permeable sub-base. This sub-base will allow water to cascade down the site, below the paving, with mini dams to trap and control.
3. The water will finally run into a attenuation tank, 71m^3 in size, through a geo-textile membrane. This is in front of the building. This tank (marked E). will also collect water from the Community Centre roofs.
4. There will be a flow control valve (marked I) to release water at a constant rate of 5 litre per second which will be fed into a small pond on the south side of the building (marked F) and from there into the storm sewer. The total rainwater storage on site is assumed to be 180m^3 when the carpark sub-base is included.
5. Suitable trapped gullies with silt traps will be used to ensure debris does not enter the tank and compromise the volume and effectiveness of the system.
6. If the tank ever became full, the overflow would be directed to the rear of the building to the lower-lying grasses and wooded area adjacent to the Strawberry Line embankment to the west of the site (marked G)

8 Flood and Drainage Strategy Conclusions

- Using typographical survey data, Gov.uk data and the strategy set out above, a maximum flood level height of 34.9m (above mean sea level - AOD) has been derived by the consultants (1% Annual Exceedance Probability surface water flood level – the worst likely flood in 100 yrs).
- This has allowed B2 Architects to establish a ground floor level of the new building to be 35.2m (above mean sea level - AOD). This is 300mm above the flood level, with the front entrance 200mm above the carpark to ensure flood water does not wash into the new building after running down the carpark

9 Does the WiNSpace Committee believe this is adequate.

The WiNSpace committee are not flood drainage engineers, which was why the Architects employed the services of a Consultant but it is important that we understand the strategy. However, it will be the local planning authority who makes the final decision and decides whether it meets local and government guidelines. In the following statements a qualitive assessment of the strategy is made to allow our conclusions to be drawn.

1. By storage, directing and controlling flood & drainage water on site, the community centre will be flood resilient.
2. The strategy does not intend to assume that no external flood water will enter the site but by design, allows it to enter in a controlled manner and via profiling the hardstanding , it is led away from the buildings on to the field
3. If a flood water level of 34.9m AOD was reached, you would need to imagine half the field being under water to a water depth of between 0.6m and 1.2m along the WCA and Millennium Green boundary (G). It is also noted that, if the water went any higher than this, flood water would be released to the other side of the railway embankment either via Woodborough Road or the substation access in Holmfield Close.
4. The quantity of water, which is going to be stored on site, has increased from zero to 180m3 (180,000 litres). This quantity of water is enough to fill a bath in every household in Winscombe and Sandford (2300 baths).
5. During the rain fall event, which occurred on the 24 September 2012 (leading to 36 flooding incidents in Winscombe and Sandford) 53mm of rain was recorded in Blagdon during the day (24 hours). This compares to the assumption of 76.8mm of rain in 4 hours used in the calculations.
6. Allowing for 180m^3 of drainage water to be stored on site, it will significantly reduce the likelihood of water ponding at the rear of the building.
7. By reducing the flow of water into storm sewers on the WCA site from the current 22.5 litre per second to 5 litre per second, it will reduce the risk of flooding downstream of the Community Centre and allow storm water from Sandford Rd and others to utilise this additional capacity of the storm sewer.
8. The risk of flooding could be reduced further if; an allowance is made that water will soakaway under the permeable carpark surface to a limited extent, that the risk of external flooding occurring could be reduced by better maintenance of the culverts (which is currently on the Parish Council radar) and the pond will increase water storage capacity further.
9. The WiNSpace committee and Trustees are aware that the strategy does come with significant additional costs but believe it is necessary to provide a flood resilient design and meet local authority planning rules. However, this will provide a robust solution for the flooding and drainage issues on the WCA site for many years to come.
10. A maintenance schedule will be needed to ensure that the strategy remains robust. This is not expected to be significant but will involve annual inspections of certain items on site.

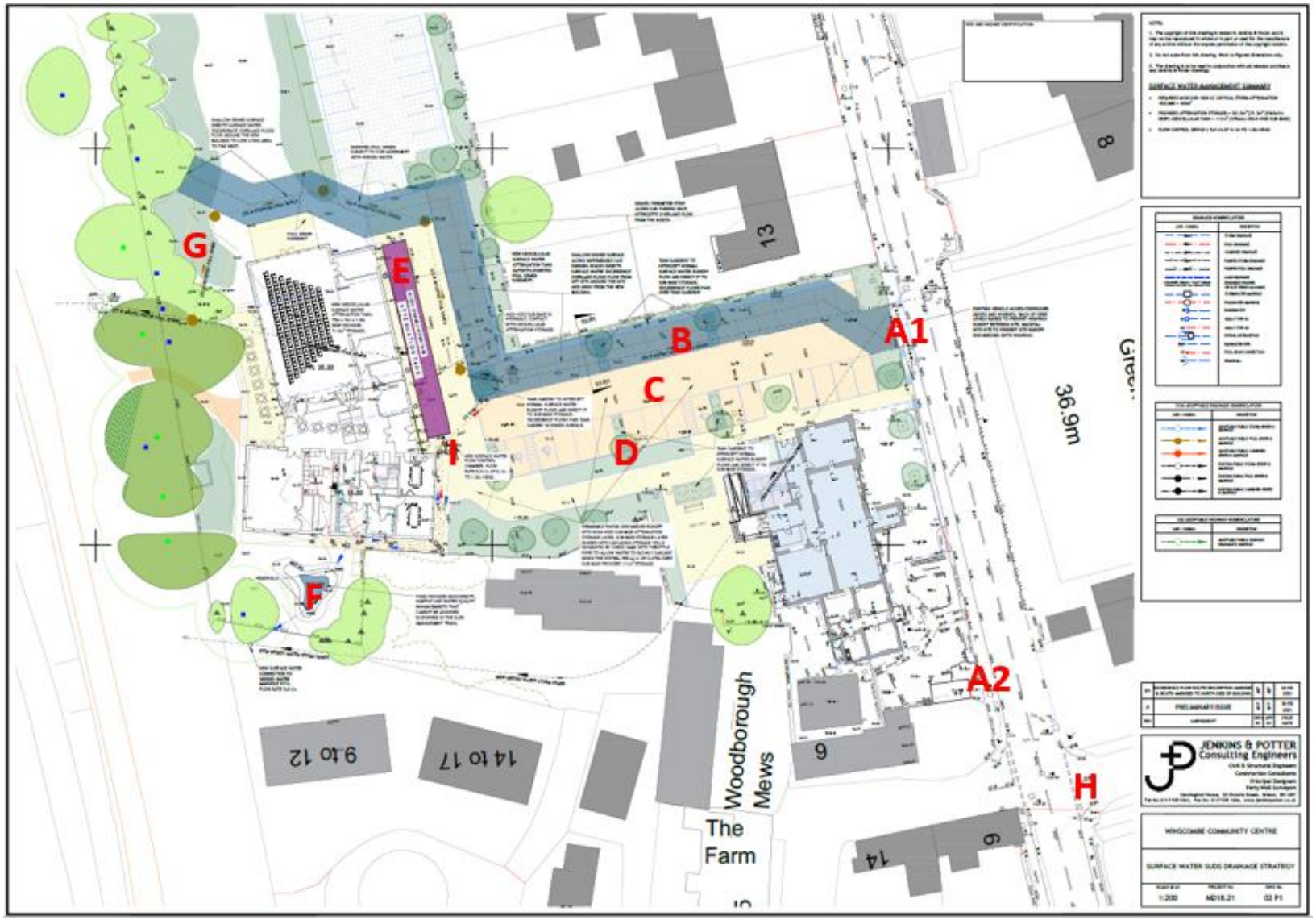

Figure 1: Surface water and Sustainable Drainage Strategy (Jenkins Potter)