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Farrington Golf Club

Farrington Park, Farrington Gurney, Bristol, BS39 6TS

Flood Risk Assessment and Drainage Strategy

Google earth image of site

7th December 2017 V2

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The consultant has followed accepted procedure in providing the services, but given the residual risk associated with any prediction and the variability which can be experienced in flood conditions, the consultant takes no liability for and gives no warranty against actual flooding of any property (client's or third party) or the consequences of flooding in relation to the performance of the services.

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Contents

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1. Introduction

Farrington Golf Club proposes to develop the offer and improve the attraction at Farrington Park with a new driving range, new academy course, 10 letting rooms, extension of car park, new spa with 12 additional letting rooms, new golf holes creating a second 9 hole course and a touring caravan park.

The majority of the site is located in Flood Zone 1 at low risk of fluvial flooding, with a very minor part, outside the development area, in Flood Zones 2 and 3. The site is shown to be at very low risk from surface water flooding.

This Flood Risk Assessment and Drainage Strategy considers flood risk to the site and off-site, and describes the surface water drainage strategy using sustainable drainage techniques which make the site safe for its lifetime and also reduces flood risk off-site. This report also assesses the foul water drainage of the site and the proposed development.

2. Site Location and Setting

The site is located to the east of the A37, off Marsh Lane, Farrington Gurney, Bristol BS39 6TS.

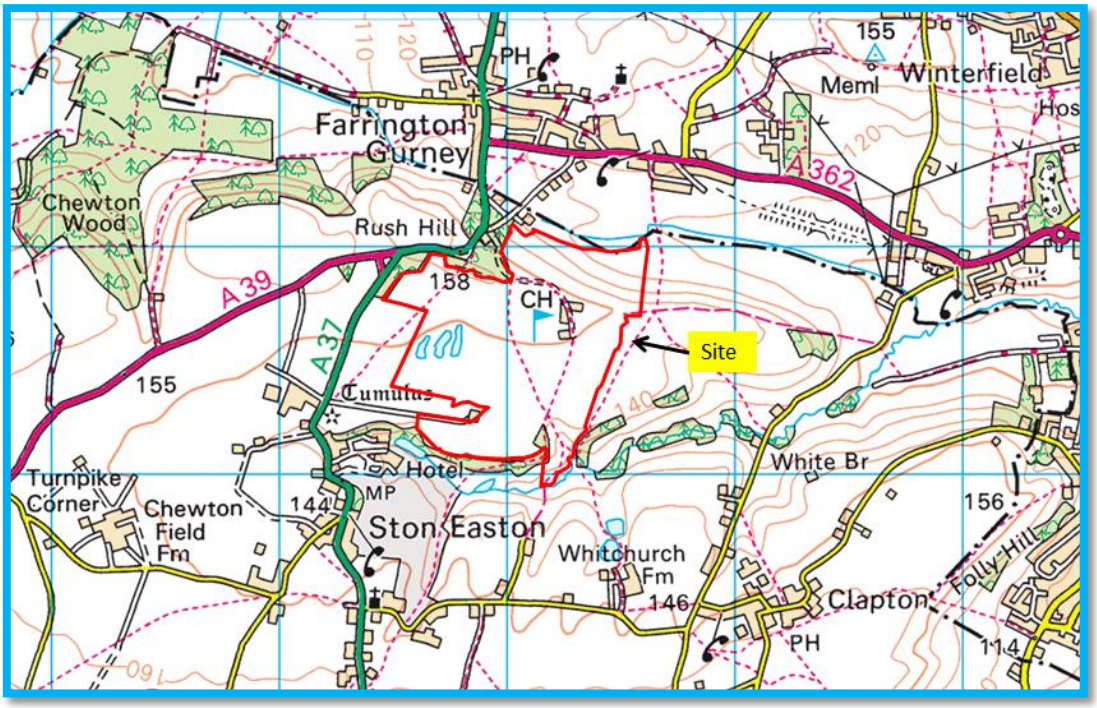

Fig 1 Site location in comparison to Farrington Gurney (Streetmap).

The site is in the following setting:

- North of the site is a tributary of the Wellow Brook (on the boundary), beyond which the land rises through arable fields leading to the A362 and the village of Farrington Gurney.
- To the east is mixed farmland on falling land to the Wellow Brook, beyond which is mixed residential and commercial development leading into Midsomer Norton.
- To the south the land slopes steeply down through a thin strip of woodland to Wellow Brook. Beyond the land rises through farmland to Ston Easton.

- To the west is open farmland including the A37 and a short ribbon of housing, beyond which is arable on the low ground to the north and grazing on the higher ground to the south leading into areas of woodland.

The overall setting therefore is within an extensive rural area on a ridge with land falling to the north, east and south, with watercourses dividing the site from existing development, which is all on risking land.

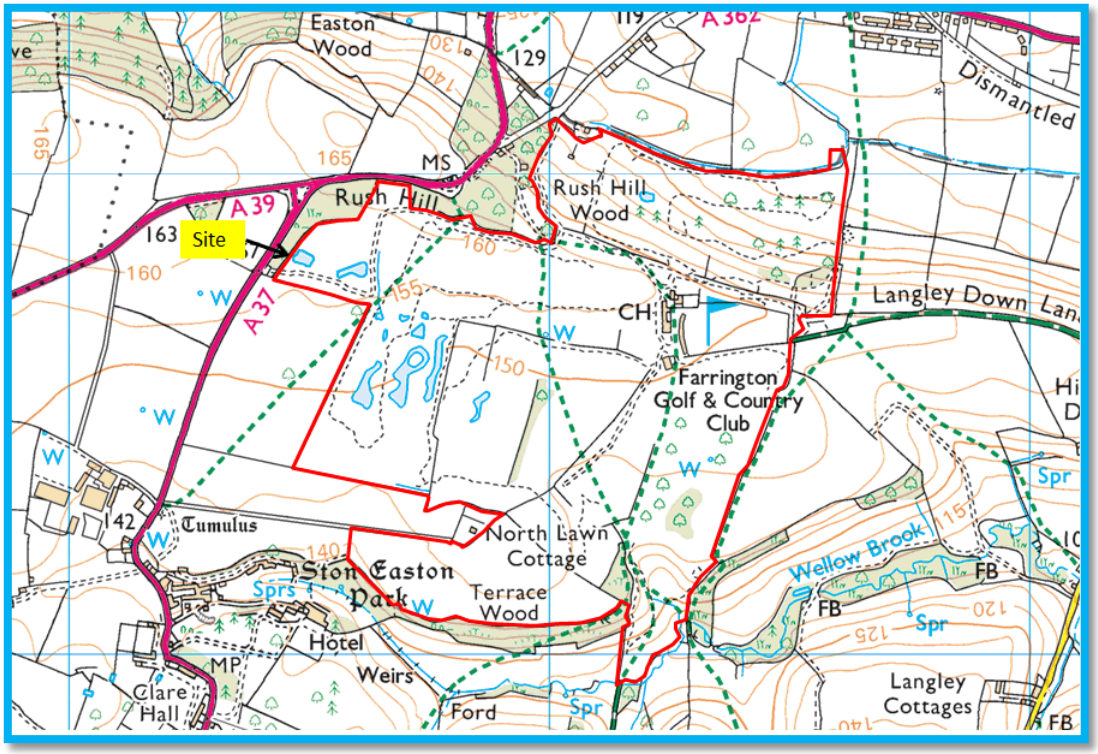

Fig 2 Local area around the site; note the many ponds within the golf course (Streetmap).

3. Existing Development and Ground Conditions

The site is irregular in shape, but approximately 1,100mm north-south and 1,100m east-west with a total area of approx. 82 ha.

The site includes the existing Farrington Golf Club with club house, car parking, driving range and golf course. The site contains two open fields unused for golfing purposes in the north-west and one in the south. The golf course contains the expected features including sand bunkers, lakes/pons, lawns and trees.

A detailed topographic survey has been undertaken of individual areas within the site including the north golf course and club house and driving range. The site is located on a ridge falling from west to east causing the majority of the land to slope down to the south, with some falling east and south, drained by boundary watercourses. The existing club house is at approx. 151.5m AOD.

The British Geological Survey viewer shows the underlying geology of the majority of the site to be Mudstone and interbedded Limestone, but in the north the bedrock is solely Mudstone. A brickworks is shown to have been located at the northwest corner of the site.

According to the Cranfield University Soilscapes viewer, the soil in the south of the site tends to be loamy over limestone with good drainage but the north is loamy and clayey with impeded drainage. With a mudstone underlying geology, the ground will have low permeability.

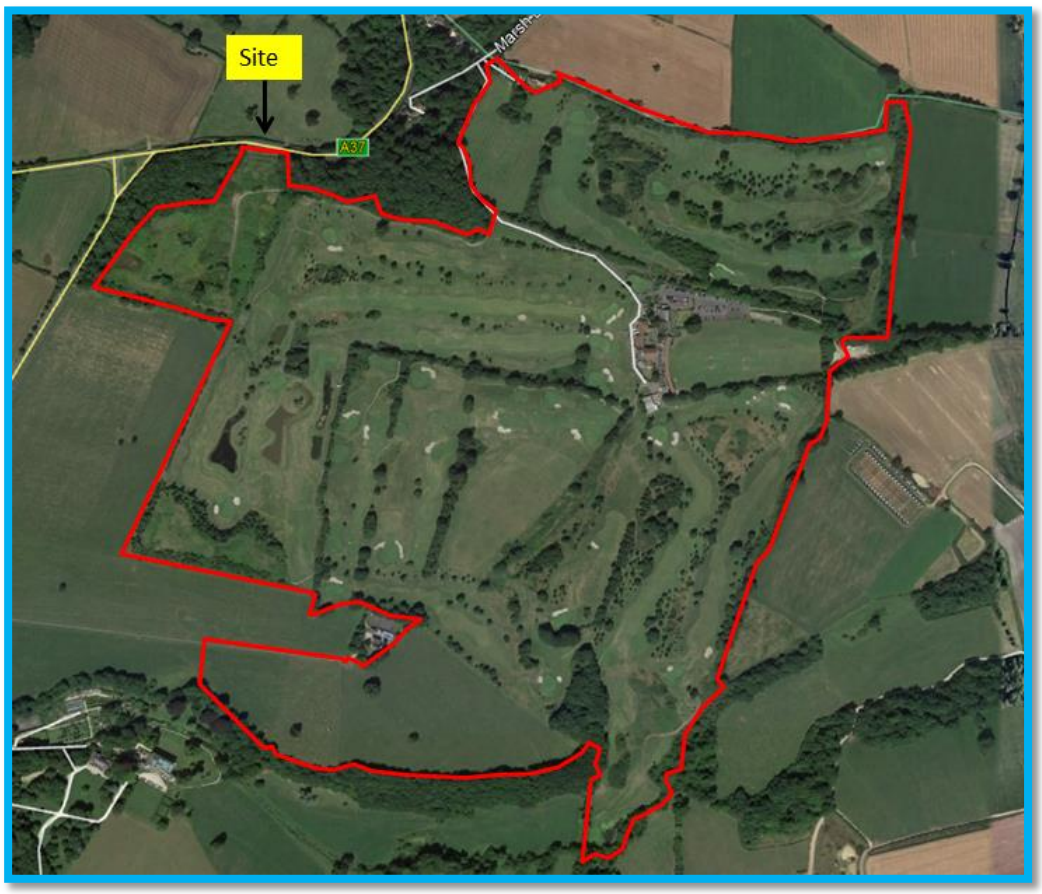

Fig 3 Satellite view of site (Google Earth).

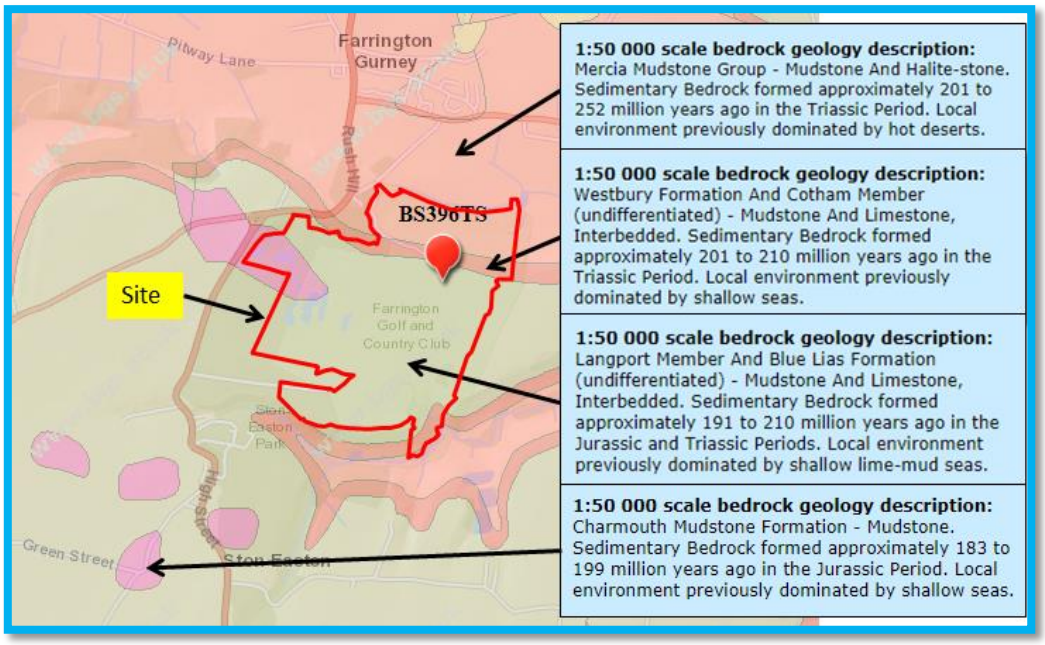

Fig 4 An extract from the British Geological Survey viewer showing the bedrock in the local area of the site.

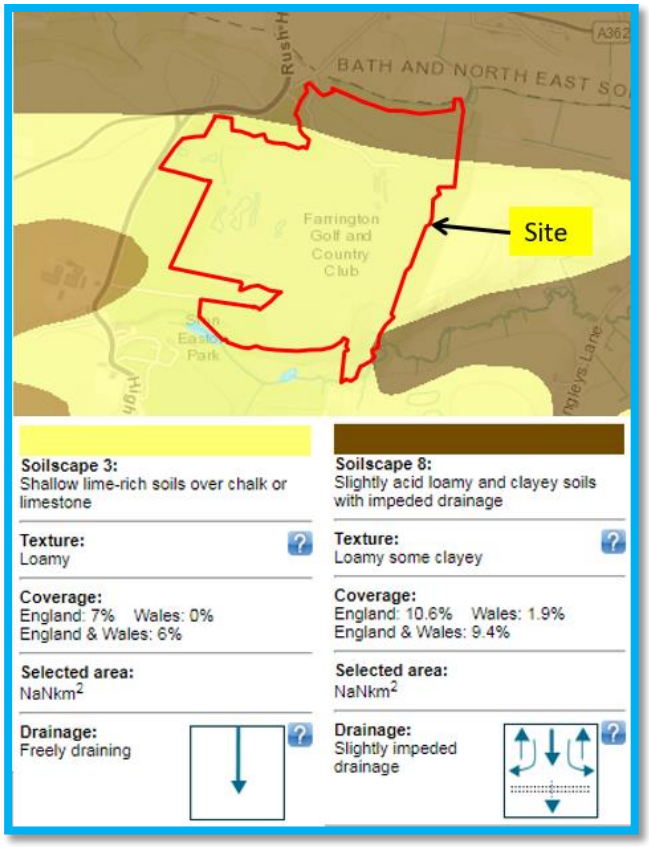

Fig 5 Soilscapes map of the site (Cranfield Univeristy).

4. Proposed Development

Multiple developments are proposed within Farrington Park to improve and increase the offer available making Farrington Golf Club a more family oriented facility.

The existing Front 5 Holes in the north of the site will be converted into a full 9 Hole Course and the open field in the northeast will be developed into an Academy Course. The open fields in the east and south of the site will be developed with additional holes for the existing golf course. An area in the middle of the existing golf course will be converted into a driving range with new reception building.

The existing driving range will be converted into a spa and a new car park is proposed to accommodate the increased traffic from visitors. A touring caravan park is proposed in the east of the site which will provide 17 pitches with a reception/toilet block.

Good effective drainage is very important for golf courses, and the proposals consider the concerns of golfers about slippery ground etc (see Design and Access Statement (DAS)). The ground will therefore be prepared suitably and vegetated to encourage good natural drainage management to satisfy the golfers and other visitors and allow rapid return to use after heavy rain.

Car parks will be formed in permeable construction and adjacent roofs will generally be drained into the permeable car park construction to maximise the infiltration area.

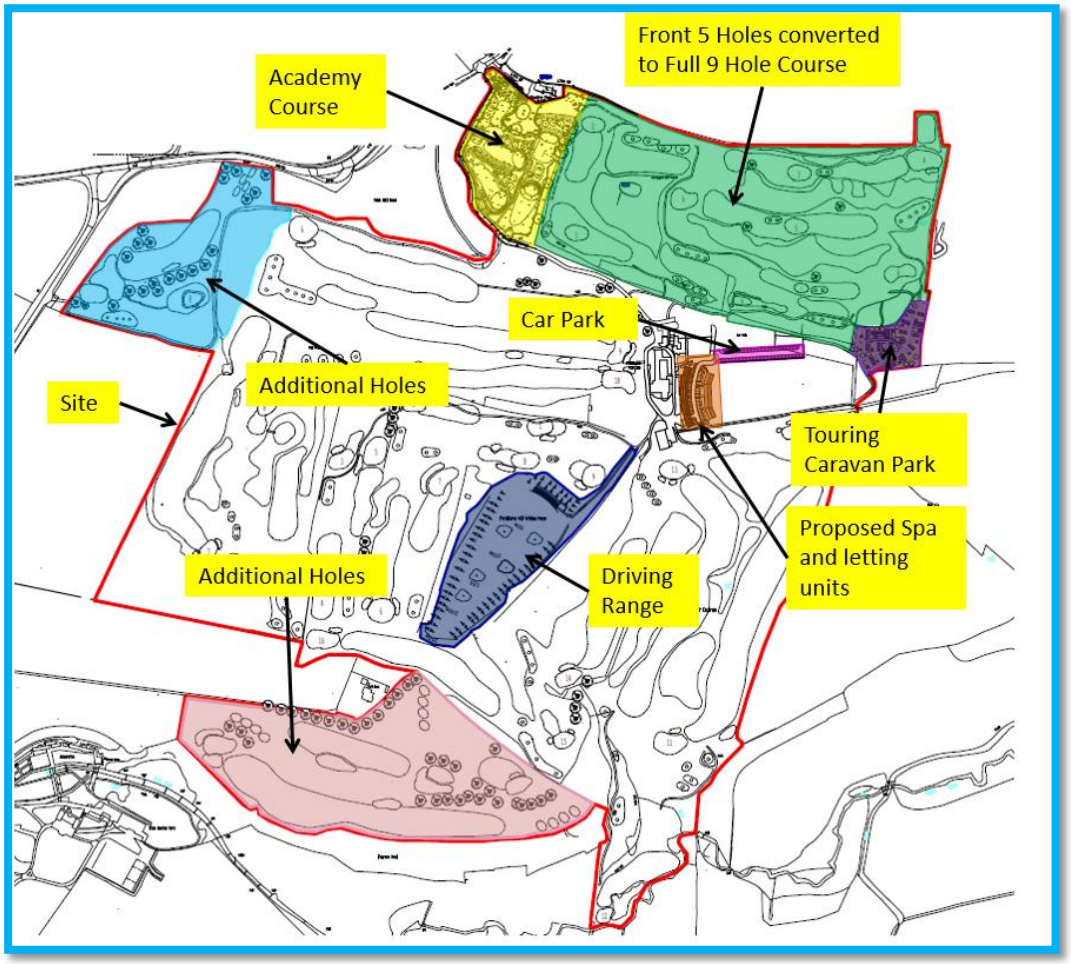

Fig 6 Proposed development layout showing the location of the proposals.

Fig 7 Indicative plan of the Touring Caravan Park. The drives will be formed in permeable gravel and where not, grass the pitches will be formed in permeable gravel or permeable construction.

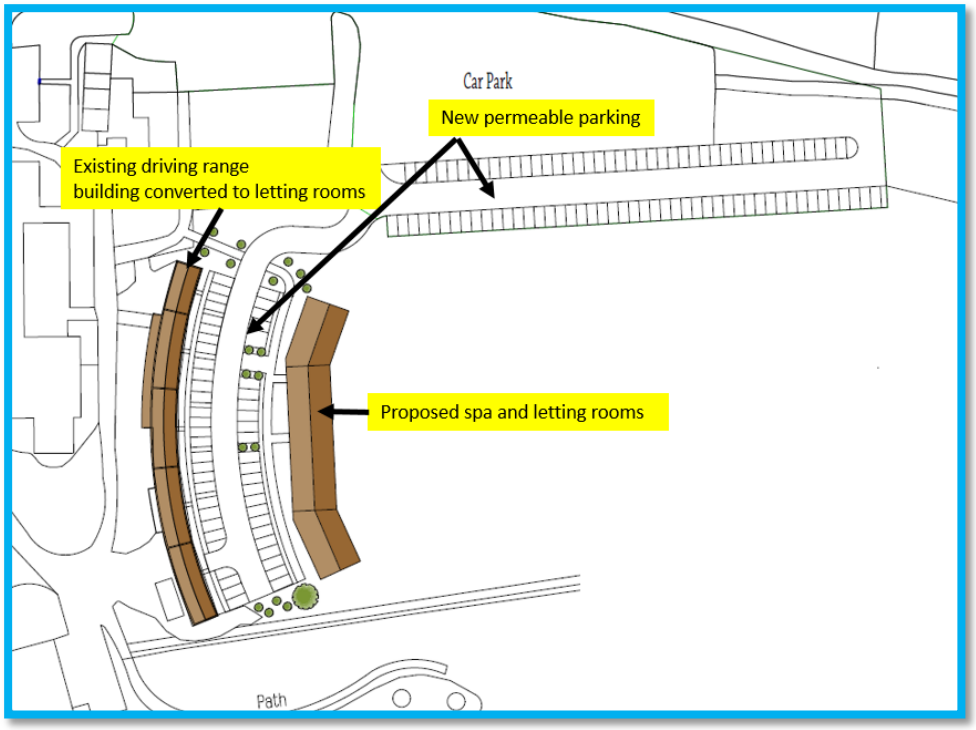

Fig 8 Proposed plan of the spa and car park.

Fig 9 Proposed driving range location left, with typical cross-section right. The DAS describes the banking etc.

5. Flood Risk and Existing Hydrology

According to the Environment Agency (EA) Flood Map for Planning the majority of the site is located in Flood Zone 1, at low risk of flooding, so the proposed development is appropriate. The very south of the site is in Flood Zone 2 and 3, but this area is not part of the proposed development area.

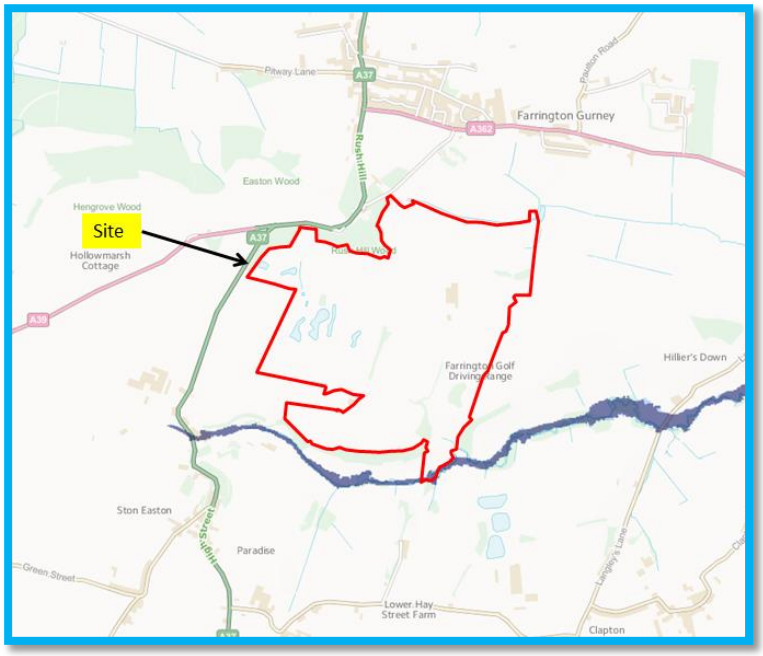

Fig 10 EA Flood Risk Map for Planning shows the majority of the site in Flood Zone 1, at low risk of flooding.

The EA Surface Water Flooding Map shows the site to be at very low risk of flooding. The only higher risk areas shown are the existing ponds on the site and a small area around Wellow Brook which is not affected by the proposed development.

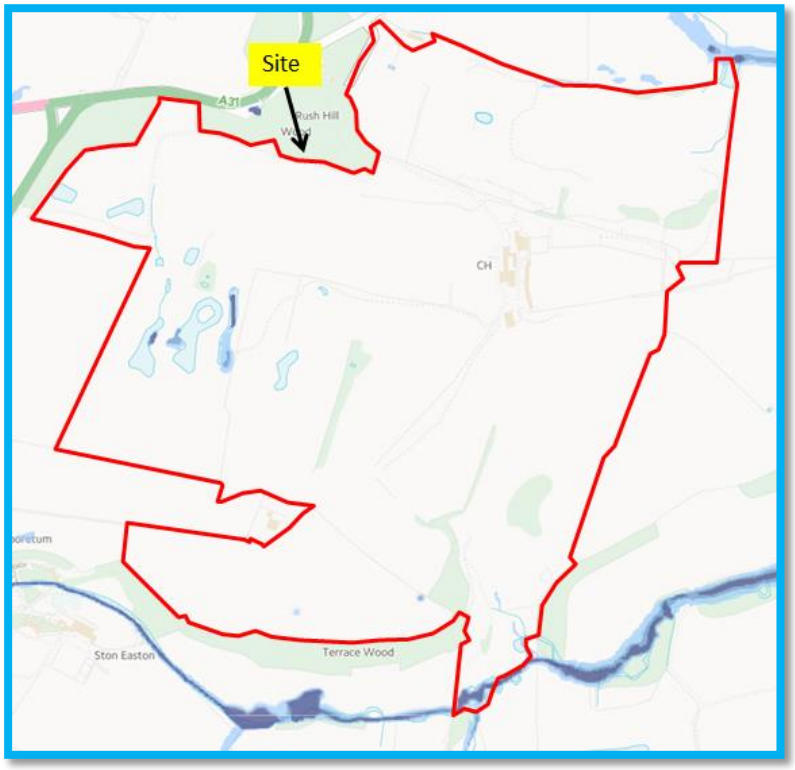

Fig 11 EA Surface Water Flooding Map showing the site to be at very low risk of flooding.

The site is on sloping land and is not vulnerable to groundwater flooding, and there are no signs of springs in the area.

In summary the site is shown to be at very low risk of flooding from all sources.

6. Surface Water Drainage

The topographic surveys have been considered and the drainage of the site considered.

The runoff from the site infiltrates into the soil across the whole site as no streaming is seen on the EA Surface Water Flood Map, even in extreme events.

The soil and grass vegetation manages the rainfall through its natural processes. On occasions in localised areas this makes pedestrian access difficult, as acknowledged in the DAS, but it is clearly doing what it should.

The proposals have considered the conditions and directed development to areas less prone to softening in rain.

The site contains ponds which form part of the golf course features, and minor drainage ditches occur in the extreme north east, south east and northwest, as can be seen on the EA Surface Water Flooding Map.

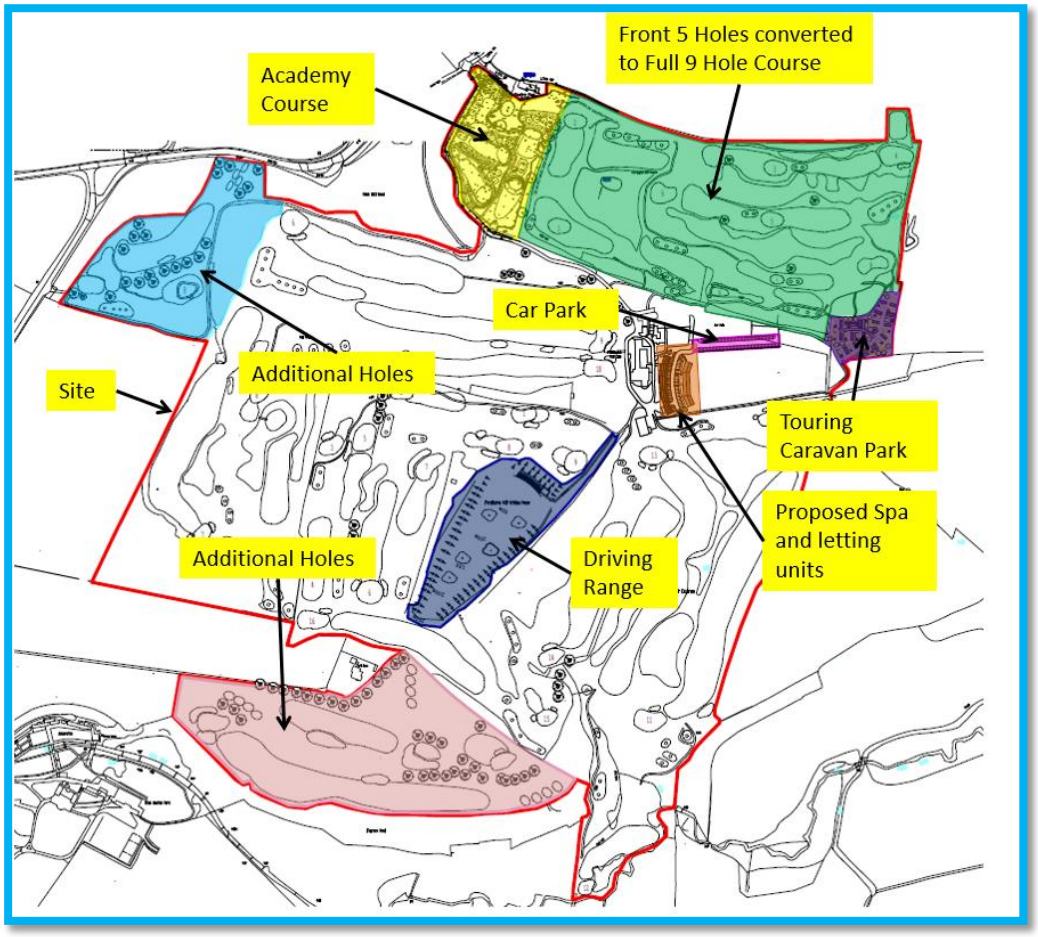

Fig 12 Proposed development areas (copy of Fig 6 for reference).

Referring to the features in turn and describing the drainage management;

North golfing areas – the Additional Holes, Academy Course and 9 Hole Course will be formed into the natural landscape and formed in prepared topsoil and vegetated with grass to effectively manage rainfall. The lie of the land will not be varied such that potential runoff from the site will be varied from the existing localised drainage characteristics. Through the improved soil structure, the runoff rate will be reduced and infiltration/management by the soil will be increased.

Touring caravan site – This will be formed with permeable access drives and permeable pitches. The permeable construction will increase the capacity of the ground to contain rainwater and disperse this into the underlying and adjacent soils during and after rainfall. The runoff from the area will consequently reduce

Proposed spa and letting rooms, with parking – The parking will be formed in permeable construction to manage rainfall events and allow water to percolate slowly into the underlying soil. Runoff from the proposed roof will be discharged by proprietary distributor boxes into the permeable construction, thus forming part of a large wide-area shallow soakaway. The permeable construction will have a greater capacity to manage rainfall than the existing soil, and therefore reduce potential runoff and nuisance.

Driving Range – The proposed driving range will mainly be formed in grassland, which will be improved where changes are made, as described above. Runoff from the building roofs will be Distributed into an area of permeable gravel below the range to infiltrate the soil into the underlying soil.

South Additional Holes – The additional holes will be formed into the existing landscape as described above and the characteristics of potential runoff from the site will not be changed. The runoff leads through a wood directly into the Wellow Brook, so no property is potentially affected and through the soil improvements runoff will be reduced.

7. Foul Water Drainage

The existing clubhouse drains to a treatment works which distributes the effluent into the soil by way of infiltration. There are no reports of nuisance from this system.

Wessex Water has been consulted and inspection of the sewer record plan shows that there are no sewers within the vicinity of the golf course which are suitable for connection.

The only new facilities using water are the small toilet block for the touring caravans and the spa with letting rooms.

Modern low water use appliances will be specified generally and the spa will routinely recycle water, to minimise water supply and waste treatment.

The detailed design will consider the foul flow quantities and a separate proprietary treatment works will be provided for the two sites. The works will be supplied with a guarantee to meet the required water quality criteria, and the waste will be distributed to drainage fields designed to suit the local ground conditions, following an appropriate percolation test, in accordance with the Building Regulations. The golf course (and specific locations) have large areas of open landscape to ensure effective system which do not cause nuisance for the visitors.

8. Management and Maintenance

The works will be undertaken in suitable weather conditions relevant for the particular element and stage, and appropriate silt fences included to avoid silt runoff during the works. The Contractor will be required to prepare a method statement to ensure that the appropriate precautions with regard to water quality, quantity and runoff routes are achieved.

The site is managed by the ground staff for the golf club, who have experience of the ground conditions and are skilled in managing the golf course vegetation etc. This will continue.

Detailed designs for the projects will include detailed information about the management of drainage and will include appropriate silt traps etc for easy inspection and maintenance.

A maintenance schedule will be prepared by the designer describing the importance of effectively managing drainage runoff, and will highlight the maintenance requirement of the gulleys, silt traps, permeable construction and other infiltration systems.

The system will be maintained effectively to ensure safe operation minimising flood risk off site and nuisance within the site for the lifetime of the project.

9. Conclusions & Recommendations

Farrington Park proposes to improve the facilities Farrington Golf Course with a new golf course, academy course, additional holes, driving range, spa, lettings and touring caravan park.

The site is located in Flood Zone 1 at low risk of flooding, and is therefore suitable development according to the NPPF. Surface water flooding does not affect the site, therefore the site is at very low risk from all sources of flooding.

Small part of the extremities of the site are affected by the boundary watercourses, but these are in open landscape, are water compatible, are not required to support the development and they do not therefore trigger the need for the proposal to pass the Sequential Test

No surface water streaming is shown, consistent with most of the site having free-draining soil, but if runoff does occur it drains north and south to Wellow Brook.

Minimising nuisance from rainfall is a fundamental need for a golf course, to ensure that users do not get hindered by slippery areas and can return to play soon after wet periods.

The proposals will be drained by infiltration which is the highest target in the SUDS hierarchy, and the ground conditions will be improved with suitable preparation and vegetation where changes are made. Roofs and paved areas will be drained to infiltration features to minimise nuisance in wet periods.

The works will be undertaken to ensure easy inspection and maintenance, and the experienced ground staff will undertake the works.

Foul drainage will be minimised by installing modern low water use appliances, and will be treated and dispersed in accordance with the Building Regulations – there is ample space for drainage fields etc.

The consequence of the development will be to increase the amenity of the Golf Club, improve management of rainfall, improve infiltration and thus reduce the potential risk of runoff.

As the proposal meets the highest target in the SUDs hierarchy it also meets the objectives of the National Planning Policy Framework by providing betterment in terms of flood risk and the environment, and there can be no objections on grounds of flood risk or drainage.