



Civil Engineers & Transport Planners

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Harmondsworth

Drainage
Strategy

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APPENDIX A

Percolation Testing Results
 Thames Water Asset Location Search
 Drawing 20738-200 – Topographical Survey

1 INTRODUCTION

1.1.1 Lanmor Consulting has been appointed to prepare a drainage strategy for the site at Manor Court, High Street, Harmondsworth, West Drayton, UB7 0AQ. This report has been commissioned to advise on the technical feasibility of providing drainage for the development proposals.

1.1.2 This report will consider the proposed drainage regime for the site, an assessment of the runoff from the building and hard standings will be assessed along with the Greenfield runoff from the existing site to set the requirements for drainage strategy of the site. The foul flows will also be assessed from the proposed development and suitable method for the discharge considered.

1.1.3 The information and details within this report will be refined, modified and updated as the detailed design in progressed, post planning. The scope of works for this drainage strategy report is outlined below:

- Review available data relating to on-site drainage and other drainage networks in the vicinity of the site.
- Review of the sites ground conditions for suitability of SUDS
- Consider the use of Sustainable Urban Drainage Systems as an option for dispose of surface water runoff from the proposed development.
- Undertake drainage assessments to establish attenuation requirements to deal with the increased surface water runoff from the development.

2 SITE LOCATION AND DESCRIPTION

2.1 Location

2.1.1 The site is located in Harmondsworth, approximately 250m to the east of the Duke of Northumberland's River. The site is approximately 0.78 hectares in size. The site is currently occupied by offices and a 10 bedsit HMO. Figure 1 below shows the location of the proposed development.



Figure 1 – Location Plan

2.1.2 The site lies in Harmondsworth, to the north of the High Street, a road with a mixture of residential and retail units.

2.2 Proposed Development

2.2.1 The application seeks approval for the conversion of the existing offices, lodge and stables into 15 residential units. The proposals also include for a new parking court to the north of the stable block and an overspill parking area to the south of the Harmondsworth Barn and east of the office barn.

2.3 Geology

- 2.3.1 The British Geological Survey indicates that the site sits on a sedimentary bedrock formation of London Clay Formation, a mixture of clay, silt and sand formed approximately 34 to 56 million years ago in the Palaeogene Period. The bedrock formation is overlain with superficial deposits of Langley Silt Member, a mixture of clay and silt.
- 2.3.2 There are no available borehole logs within the vicinity of the site, therefore it is not possible to determine the depths of the soils beneath the site as well as the ground water level.
- 2.3.3 Infiltration testing has been undertaken on site to establish if the use of infiltration techniques will prove suitable for the discharge of any additional runoff generated by the proposals. Four tests were undertaken across the site in accessible open soft landscaped areas two to the east and two to the west.
- 2.3.4 The 2 tests to the east of the site did not return any results due to the impermeable nature of the soil on this side of the site. The western test returned infiltration rates of 5.49×10^{-5} and 3.13×10^{-5} . Copies of the test results are included in Appendix A.
- 2.3.5 Given the variable nature of the soils across the site it is considered appropriate to use a conservative estimate for any infiltration devices equal to half the lowest record rate. An infiltration of 1.6×10^{-5} is therefore considered appropriate for the design purpose, actual facility sizes should be based on test results to be undertaken at detailed design stage in the location of the facility.

2.4 Surrounding Watercourses

- 2.4.1 The nearest river is the Duke of Northumberland's River approximately 250m to the west of the site. The Duke of Northumberland's River is an artificial watercourse consisting of 2 sections, the western part running nearest to the site. The western section diverts water from the River Colne, approximately 450m to the northwest of the site to the east where it meets the River Crane around 6.3km to the south east of the site.
- 2.4.2 There are several lakes and reservoirs around the site, the nearest being the Saxon Lake approximately 200m to the north of the site. The reservoirs do not present a risk of flooding to the site according the EA flood maps for reservoirs
- 2.4.3 The site is also not shown to be in a fluvial flood risk area, the EA flood maps indicate the site to be within flood zone 1.

3 EXISTING DRAINAGE REGIME

3.1 Foul Water

3.1.1 The site comprises of Manor Lodge, 2 office buildings (barn & stables) and hardstanding's with an access track through the site on the eastern side, the remainder of the site is permeable.

3.1.2 Appendix A shows an abstract from Thames Water. The mapping indicates the presence of a 450mm pipe on High Street. This foul network carries discharges from Manor Court, Tithe Barn, St Mary's Church and all the commercial and residential units on High Street. The foul pipe then flows in a southerly direction.

3.2 Surface Water

3.2.1 The existing sewer network on site discharges to several soakaways located within the sites boundary. There are a total of four soakaways present and are believed to be in working order. The site has not been prone to surface water flooding in the past.

3.2.2 Drawing 20738-200 in Appendix A shows the topographical survey for the site. The topography shows the existing drainage network and soakaway locations. The office barn drains directly to soakaways to the north and south of the building.

3.2.3 The stable and lodge are believed the drain to two soakaways to the south of the stable block.

3.2.4 The impermeable areas for the roofs and hardstanding pre-and post development are tabulated below.

Existing Areas (m ²)		Proposed Areas (m ²)	
Roof	1,015	Roof	1,015
Paving/Hardstanding	2,667	Paving/Hardstanding	2,987
Total	3682	Total	4,002

Table 3.1 – Existing and Proposed Areas

- 3.2.5 As shown in the table above, the proposals will retain the same roof area however there will be an increase the paving/hardstanding areas by 320 square metres to provide for additional car parking. Despite the increase in hardstanding there will be no increase in the impermeable areas on site as the proposed car parks will be of permeable construction and will not increase the risk of flooding in the area.

4 PROPOSED SURFACE WATER DRAINAGE

4.1 Proposed Foul Water Drainage

4.1.1 There are various foul networks within the site which serve the existing buildings these discharge into the Thames Water foul sewer on the High Street and will be utilised for the proposed drainage.

4.1.2 A network of foul sewers is located to the west of the Lodge, as the Lodge is being to convert to 2 properties these will utilise the existing network. The Office Barn drains to a series of manhole along the western side of the building. The converted units in the office barn will use these points of discharge as per the current situation.

4.1.3 With regards to the stables, this will be converted into residential 5 units. There is currently a 100mm diameter sewer running along the eastern side of the building. The converted units will have new connections to the foul, the existing sewer is 100mm in diameter and will be able to cater for the discharge from the 5 units

4.2 Proposed Surface Water Discharge

4.2.1 Sustainable Urban Drainage systems (SUDs) were considered as part of this assessment for the disposal of surface water runoff from the proposed development. There will be on extensions or changes to the buildings, the buildings have pitched roof, so it is not possible to retrofit green roofs will not be necessary and has therefore been discounted as a SUDs method. The existing building are connected to soakaways which are a form of SUDs, so no changes to the drainage are considered necessary.

4.2.2 The only impact of the proposals will be an increase in parking, clearly green roof and rainwater recycling are not appropriate or necessary for a car park and have been discounted.

- 4.2.3 Next on the Sustainable Drainage Hierarchy is the use of ground infiltration techniques such as soakaways and infiltration basins. Soakaways have been investigated for the disposal of surface water runoff from the proposed development. Initial investigations have indicated the ground conditions may be suitable for infiltration as the underlying ground is sand and gravel. Percolation testing proved that infiltration techniques will be suitable for the surface water runoff towards the south of the site. The results of the testing are included in Appendix A.
- 4.2.4 The existing soakaways are to be retained on site it has not been possible to establish their dimension but they have served the existing building adequately. However, their age means they are unlikely to have been designed to cater for a 1 in 100-year storm and it would be doubtful if they would be able to accommodate additional runoff from the new parking areas.
- 4.2.5 Therefore, either new soakaways will be required, or the new parking areas could be formed of permeable paving. Permeable paving has been chosen for the parking areas as the most suitable form of SUDs.
- 4.2.6 There will be 2 new parking areas with a total of 320m², the first is for 6 parking spaces to the east of Harmondsworth Barn and west of the office barn with an approximate area of 90 square metres. The second area is for 8 spaces and located north of the stables with an approximate area of 230m².
- 4.2.7 The first area of 6 parking spaces will have a grasscrete finish. It will be permeable and allow runoff to soak in to the ground below. The second areas will have a permeable resin bound surface which again will allow the runoff to soak in to the under lying soil.
- 4.2.8 The percolation testing was carried out relatively close to the hardstanding areas and proved that the infiltration rates varied throughout the site therefore a conservative rate of 1.6×10^{-5} m/s was considered suitable for design purposes for the additional hardstanding areas.

- 4.2.9 Microdrainage calculations have been prepared for both cars based on the infiltration rate above. The calculation show that the first car park will need a 250mm gravel layer to accommodate a 1 in 100 + 40%CC storm event. The second car park needs a similar 250mm of gravel storage layer beneath the surface finish construction to be able to store the runoff from a 1 in 100 + 40% storm event

5 SUMMARY

- 5.1.1 The proposed change of use/conversion to residential at Manor Court, Harmondsworth will consist of a total of 15 residential units with associated landscaping and parking.
- 5.1.2 The Thames Water mapping outlines the presence of a foul pipe on High Street, this foul network discharges water from Manor Court, Tithe Barne and St Mary's Church as well as other commercial and residential units on High Street. The surface water currently drains to several soakaways on site which are in adequate working order the site has not been prone to surface water flooding in the past.
- 5.1.3 The proposed drainage strategy will therefore be to retain the existing foul and surface water regimes for the buildings and hardstanding areas as they will not change.
- 5.1.4 The increase in surface water runoff from the new parking areas will use permeable surfacing and a gravel storage layer to attenuate Surface water runoff from these areas to allow runoff to soak into the ground. Percolation testing proved that infiltration techniques are possible across parts of the site. One test was conducted relatively close to the hardstanding areas therefore it is considered the surface water runoff will be able to infiltrate through the permeable paving, but a conservative rate was assumed for infiltration to cover any variances in soils. Drainage calculations have proved the permeable paving is a suitable form of SUDs to cater for the new parking areas.
- 5.1.5 This report has found that an adequate drainage strategy can be provided for the proposed development at Manor Court in accordance with the Sustainable Drainage Hierarchy. Therefore, suitable foul and surface water drainage can be provided for the proposed development. For the reasons outlined within this drainage strategy, we see no reason to why planning permission should be refused on the grounds of there being insufficient capacity to discharge run-off from the development.