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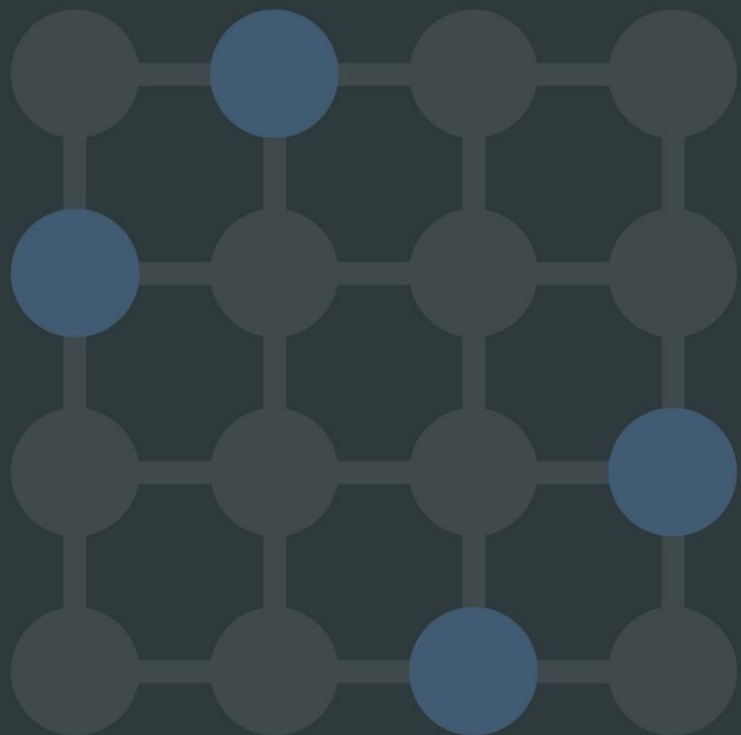


Colerne Industrial Estate (The Project)

Kemble Business Park LLP

Flood Risk Assessment & Drainage Strategy

July 2026





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1 Introduction

Background

- 1.1 The purpose of this Flood Risk Assessment & Drainage Strategy (FRA & DS) is to assess the risk of flooding to the proposed development and where possible provide sufficient mitigation to demonstrate that the future users of the development would remain safe throughout its lifetime, that the development would not increase flood risk on site and elsewhere and, where practicable, that the development would reduce flood risk overall.

Description of Proposed Development

- 1.2 This report has been produced in support of an Outline application (with all matters reserved except access) for the demolition of existing buildings and structures and the erection of up to 150 dwellings (Use Class C3), with associated vehicular access from Bath Road and associated works including internal estate roads (illustrative), infrastructure, open space, landscaping and other works.. A copy of the proposed development drawings are included within **Appendix A**.

National Planning Policy

- 1.3 The National Planning Policy Framework (NPPF) sets out the Government's national policies on different aspects of land use planning in England. The following summarises the most recent (17/08/26) policy requirements in relation to flood risk.
- 1.4 In line with policy F4 of the NPPF (Chapter 18: Managing flood risk and coastal change), a site-specific Flood Risk Assessment is required for proposals:
- a) *for all development in Flood Zones 2, 3a and 3b, as defined in Annex F, Table 1 of the NPPF;*
 - b) *in Flood Zone 1, where the proposal involves:*
 - i. *sites of one hectare or more;*
 - ii. *land identified by the Environment Agency as having critical drainage problems; and*
 - iii. *land identified in a strategic flood risk assessment or the Flood Map for Planning as being at risk of flooding from any source, whether now or in the future.*
- 1.5 A summary of Table 1 from Annex F is provided below:
- a) Zone 1 – Low probability: less than 0.1% annual probability of river or sea flooding (< 1 in 1000 years);
 - b) Zone 2 – Medium probability: between 1% and 0.1% annual probability of river flooding, or between 0.5% and 0.1% annual probability of sea flooding;
 - c) Zone 3a – High probability: 1% or greater annual probability of river flooding, or 0.5% or greater annual probability of sea flooding; and



- d) Zone 3b – Functional floodplain: land having a 3.3% or greater annual probability of flooding (with any existing flood risk management infrastructure operating effectively), or land designed to flood as part of a flood attenuation scheme.
- 1.6 Policy F5 refer to the sequential test, a tool used to steer development to the areas with the lowest risk of flooding from any source. Where the test applies, development proposals should not be located in areas at risk of flooding where alternative sites, appropriate for the development, are reasonably available in areas with a lower risk of flooding. Further details surrounding the sequential test, and exceptions test where relevant (Policy F6), are set out in a later section.
- 1.7 The NPPF further sets out policies required to ensure a development is safe from flooding (refer to Policy F7). It sets out that proposals should not present a flood risk to potential occupiers, users, or visitors and should also not increase flood risk elsewhere. It further expresses where a development is proposed in a location known to be at risk from any form of flooding, now and in the future, it should be refused unless:
- a) *Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons which justify a different arrangement;*
 - b) *The development will be safe throughout its lifetime taking account of the vulnerability of its users;*
 - c) *Any residual risk can be safely managed, and safe access and escape routes are included where appropriate, as part of an agreed emergency plan;*
 - d) *The development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment; and e. It can be demonstrated that flood risk will not be increased elsewhere.*
 - e) *It can be demonstrated that flood risk will not be increased elsewhere.*
- 1.8 This assessment considers the risks of all types of flooding to the site including tidal, fluvial, surface water, groundwater, sewer and artificial sources and provides mitigation measures to ensure that the flood risk to the site is minimised and that flood risk off-site is not increased.
- 1.9 This FRA aims to provide sufficient flood risk information to satisfy the requirements of the NPPF, PPG and regional/local government plans and policies.

2 Existing Site & Hydrology Characteristics

Site Location & Composition

- 2.1 The site is located to the north east of the village of Colerne, some 10.40km west of the town of Chippenham and 9.40km north east of the city of Bath (**Figure 2.1**). The site is bound to the north by the former RAF Colerne airbase, to the east by agricultural land, to the south by an unnamed highway, with residential dwellings beyond, to the west the site is bound by further agricultural land. The approximate co-ordinates for the centre of the site are E: 381479; N: 171397, with the nearest post code of SN14 8HT.
- 2.2 The current site is some 7.10ha in area and comprises of previously developed hardstanding, associated with the existing hangars located on site, some areas of undeveloped land are also present on site.



(Source: OpenStreetMap)

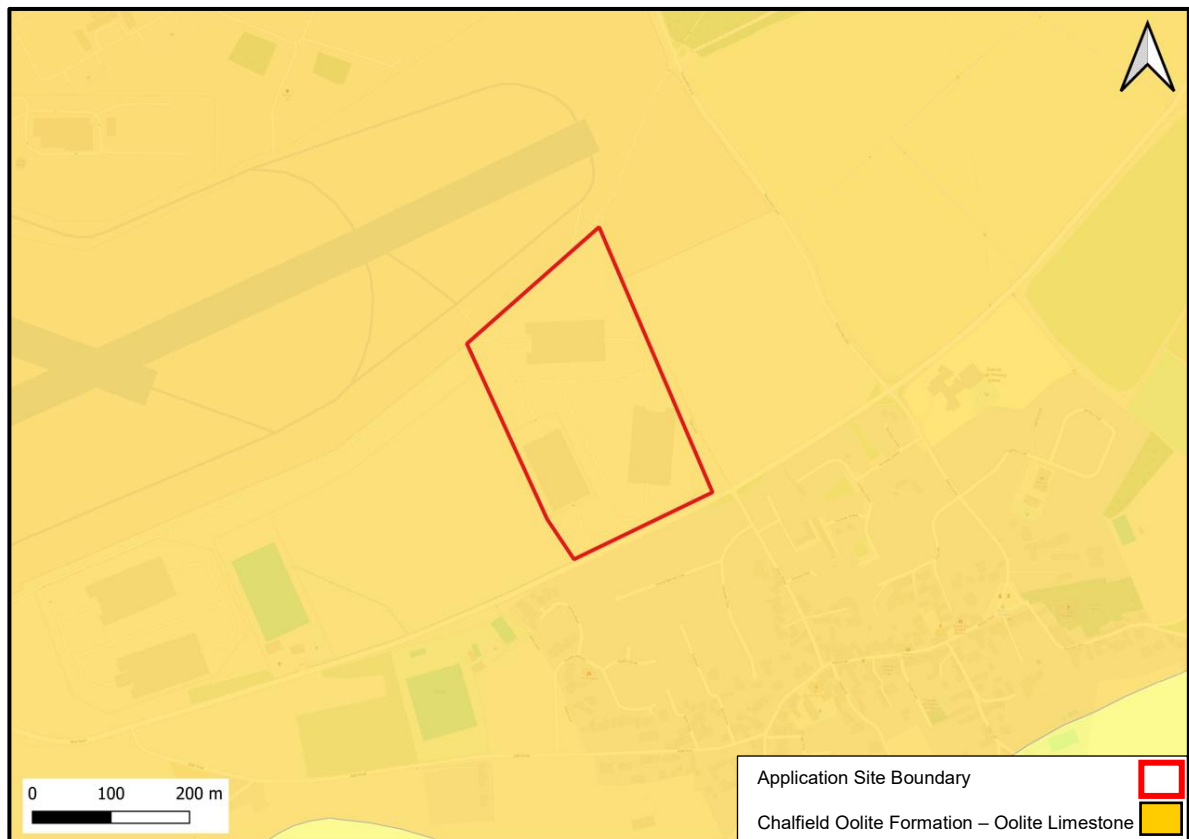
Figure 2.1 Site Location

Topography

- 2.3 A detailed topographic survey of the site is included within **Appendix B**. The survey indicates that existing ground levels across the site generally fall from south to north across the site, with a secondary fall across the northern boundary of the site from west to east. The highest points onsite are located in the south eastern corner where existing ground levels are indicated to be 167.94m AOD. Lowest ground levels are indicated to be located at the north eastern corner of the site, with existing ground levels indicated to be at 163.80m AOD.

Ground Conditions

- 2.4 Geological data held by the British Geological Survey (BGS)¹ shows that the bedrock geology underlying the site is consistent – namely Chalfield Oolite Formation – Oolite-limestone. No superficial geology has been identified as underlying the site. Refer to underlying geology within **Figure 2.2**.



(Source: OpenStreetMap /BGS)

Figure 2.2 Underlying Bedrock Geology

- 2.5 Soils mapping² indicates that underlying soils across the site are consistent. Soils underlying the site are identified as shallow lime-rich soils over chalk or limestone and are considered freely draining, refer to **Figure 2.3**.
- 2.6 An intrusive site investigation was undertaken on site in October 2016. Trial pits on site confirmed underlying geology comprises of gravel to depths of 1.0mbgl underlain by limestone to depths of 3.0mbgl. Refer to Trial Pit Results within **Appendix C**.

¹ <https://geologyviewer.bgs.ac.uk/>

² <http://www.landis.org.uk/soilsmap/>



(Source: Soilsmap)

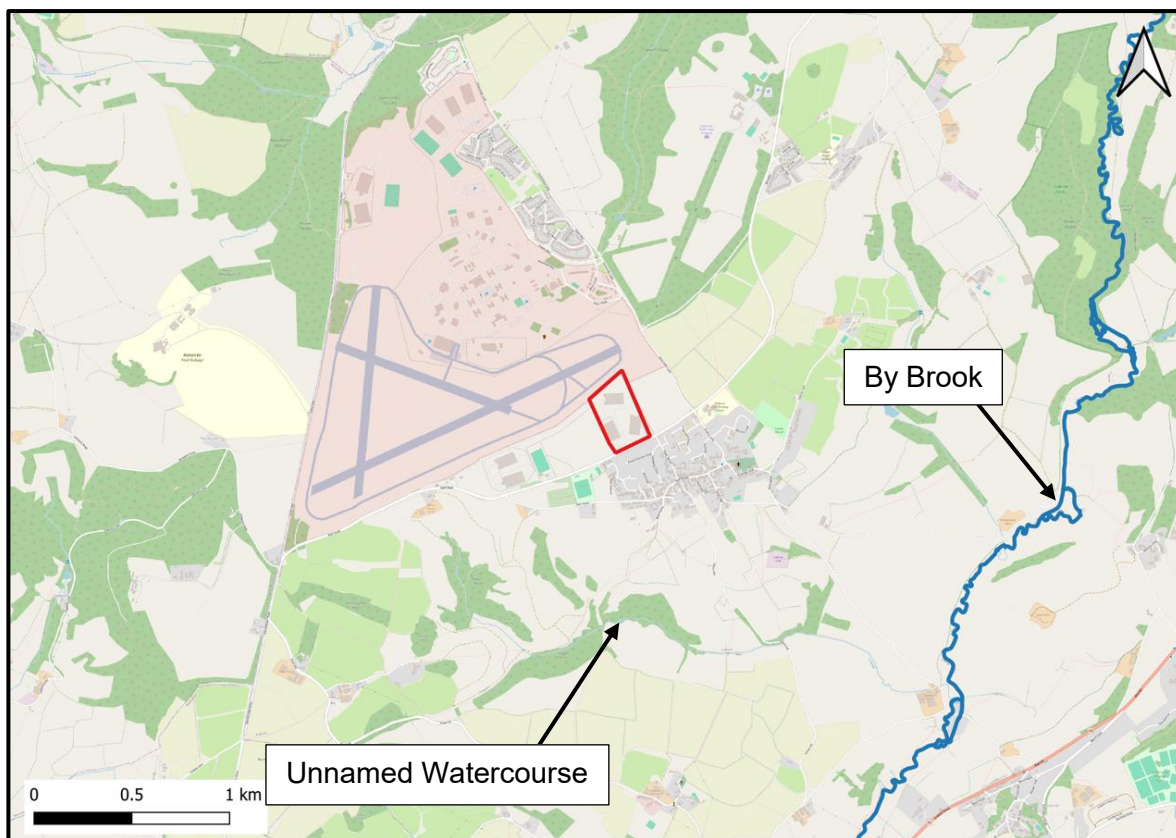
Figure 2.3 Underlying Soils

- 2.7 Department for Environment, Food & Rural Affairs (DEFRA) Magic Service Mapping³ shows the site is not located in a groundwater Source Protection Zone (SPZ).

Existing Drainage & Hydrology

- 2.8 There are no EA designated Main Rivers located in close proximity to the site, with the closest being the By Brook, located some 1.8km south east of the site at its closest point. There is an unnamed watercourse located some 1.2km east of the site, this unnamed watercourse is a tributary of the By Brook. Refer to **Figure 2.4** below.

³ <https://magic.defra.gov.uk/MagicMap.aspx>



(Source: Environment Agency/ OpenStreetMap)

Figure 2.4 Main River Map

- 2.9 Wessex Water sewer records indicate that there are no public surface water sewers in the vicinity of the site. A 150mm diameter public foul water sewer is shown to be located within Silver Street, to the south east of the site, and shown to flow in a southerly direction away from the site. Wessex Water sewer records indicate a number of private surface water sewers located within the site. It is assumed that these existing private surface water sewers serve the existing buildings located on the site. Refer to public sewer records within **Appendix D**.



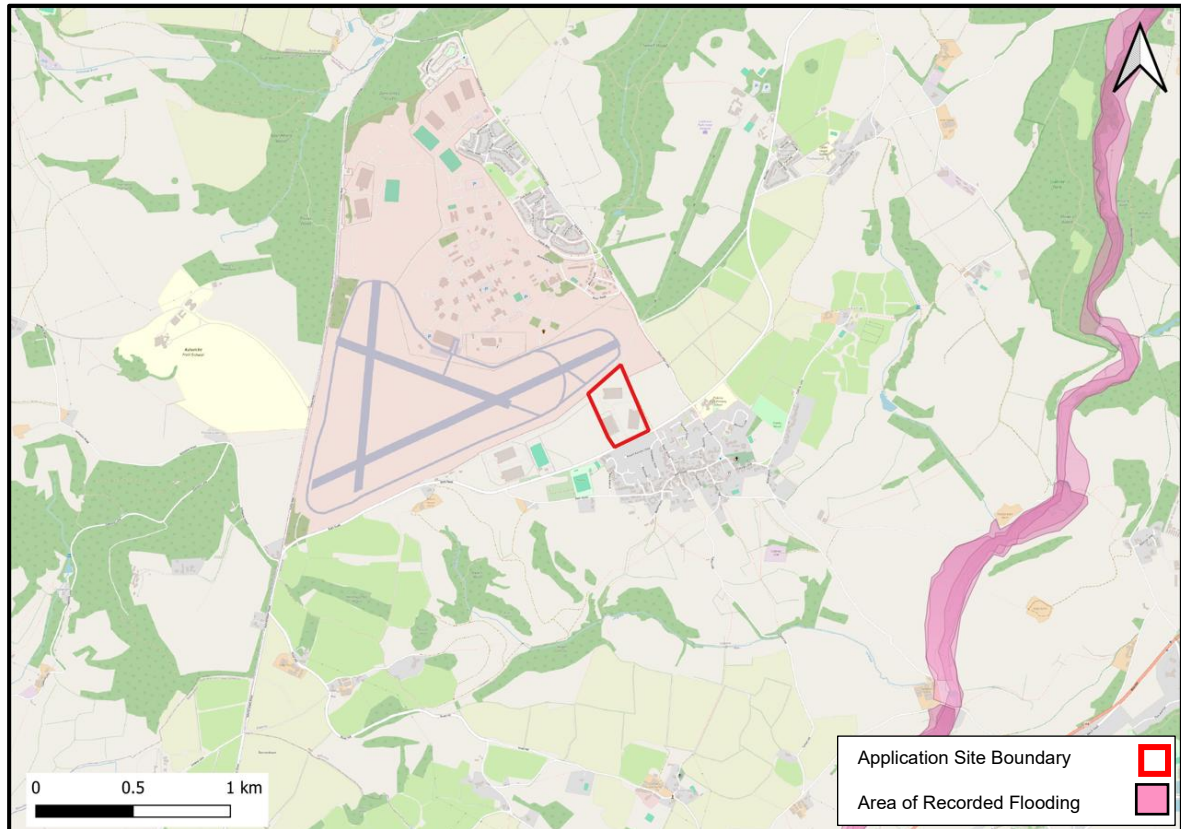
3 Site Specific Flooding

National Planning Policy Framework

- 3.1 As set out in a previous section Table 1 from Annex F of the NPPF, categorises flood zones into:
- a) Zone 1 – Low probability: less than 0.1% annual probability of river or sea flooding (< 1 in 1000 years);
 - b) Zone 2 – Medium probability: between 1% and 0.1% annual probability of river flooding, or between 0.5% and 0.1% annual probability of sea flooding;
 - c) Zone 3a – High probability: 1% or greater annual probability of river flooding, or 0.5% or greater annual probability of sea flooding; and
 - d) Zone 3b – Functional floodplain: land having a 3.3% or greater annual probability of flooding.
- 3.2 In accordance with the NPPF, this FRA considers all sources of flooding including:
- a) Tidal flooding – from sea;
 - b) Fluvial flooding – from rivers and streams;
 - c) Pluvial flooding – overland surface water flow and exceedance;
 - d) Groundwater flooding – from elevated groundwater levels or springs;
 - e) Flooding from sewers – exceedance flows from existing sewer systems; and
 - f) Artificial sources – reservoirs, canals etc.
- 3.3 The latest National Planning Policy Guidance for Flood Risk defines a “design flood” as a flood event of a given annual flood probability, which is generally taken as:
- a) river flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year); or
 - b) tidal flooding with a 0.5% annual probability (1 in 200 chance each year); or
 - c) surface water flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), plus an appropriate allowance for climate change.

Historic Flooding

- 3.4 The Environment Agency's records of historic flooding incidents show that no area of the site has been recorded to experience significant flooding in the past. EA mapping does indicate that areas in close proximity to the By Brook have experienced historic flooding. Refer to **Figure 3.1** below.



(Source: OpenStreetMaps/Environment Agency)

Figure 3.1 Historic Flood Incidents

- 3.5 The Wiltshire Council Level 1 Strategic Flood Risk Assessment (SFRA) (JBA Consulting, November 2024) lists significant flood events across the district from 1959 – 2012, and makes specific reference flood incidents occurring within Amesbury, Wootton Bassett, Cricklade, Chippenham, Melksham, Salisbury and Malmesbury.
- 3.6 The SFRA also contains mapping which illustrates incidents of flood risk across the borough. SFRA mapping indicates that while there has been some record of surface water flooding within Colerne, the site itself was not affected. Refer to SFRA mapping within **Appendix E**.

Climate Change

- 3.7 The development should be designed to be resistant/resilient to flooding from all sources accommodating safe access and egress routes for the below events detailed as the 'design flood' events:
- 1 in 100 (1%) fluvial flood event accounting for the local climate change allowance

- 1 in 100 (1%) pluvial flood event accounting for the local climate change allowance
- 3.8 The probability of flooding from almost all sources is projected to increase because of climate change. As such, the impact of climate change must be assessed in terms of the estimated lifetime of the proposed development. The National Planning Policy Framework (NPPF) dictates the design life of this development (residential) is 100 years and should be assessed on this basis.
- 3.9 **Tables 3.1 - 3.2** below are the EA's latest guidance on climate change for fluvial and pluvial flood modelling.

Table 3.1 - Climate change allowances for fluvial watercourses in the Avon Bristol and North Somerset Streams Management Catchment

Epoch	Central	Higher	Upper
2020s	10%	15%	27%
2050s	12%	19%	38%
2080s	26%	39%	71%

Table 3.2 - Climate change allowances for peak rainfall intensity in the Avon Bristol and North Somerset Streams Management Catchment

Epoch	Central allowance	Upper end allowance
Higher central	25%	40%
Upper end	25%	45%

Tidal Flooding

- 3.10 Inundation of low lying coastal areas by the sea may be caused by seasonal high tides, storm surges and storm driven wave action. Tidal flooding is most commonly a result of a combination of two or more of these mechanisms, which can result in the overtopping or breaching of sea defences. River systems may also be subject to tidal influences.
- 3.11 There are no tidally influenced watercourses in the vicinity of the site. Therefore, flood risk from this source is considered to be negligible.

Fluvial Flooding

- 3.12 Flooding from watercourses occurs when flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain.
- 3.13 EA mapping indicates that the entire site is located within Flood Zone 1 (Low Risk). This indicates that the site has a <0.1% chance of fluvial flooding occurring across the site. Refer to **Figure 3.2** below.



(Source: OpenStreetMaps/Environment Agency)

Figure 3.2 Environment Agency Flood Map for Planning

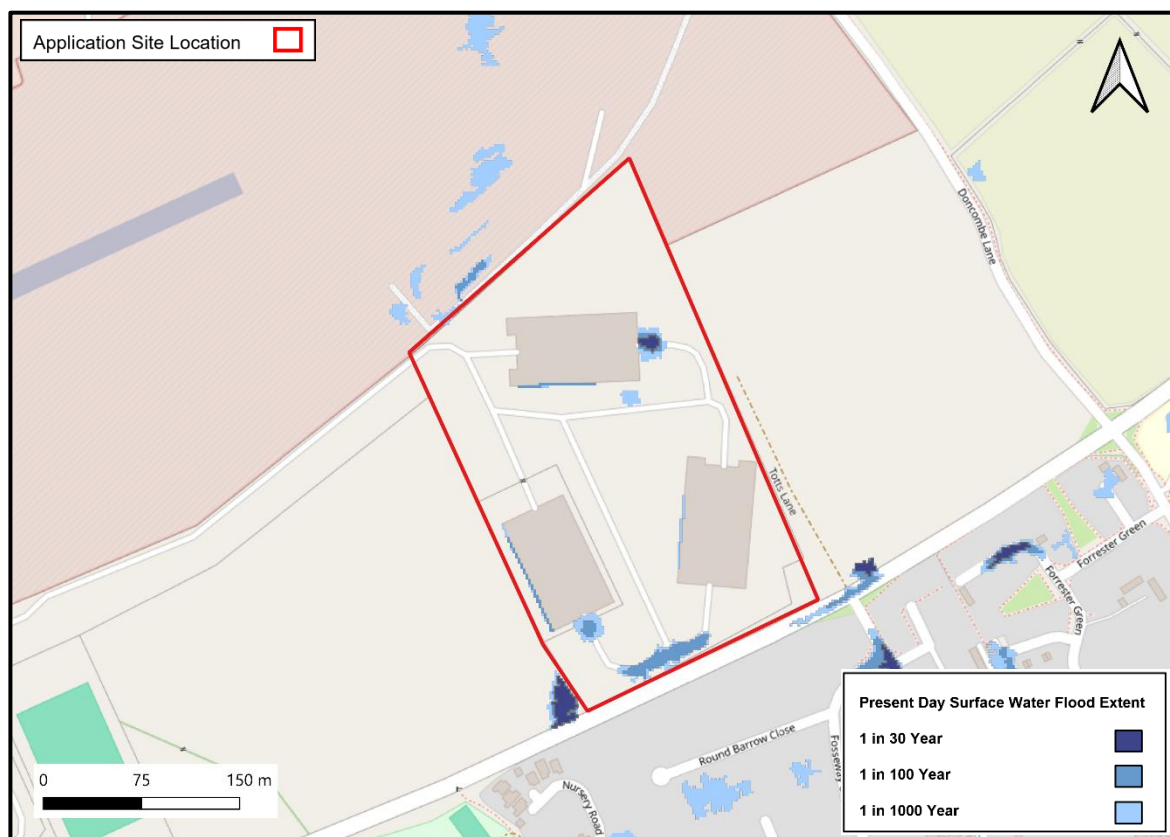
- 3.14 Flood risk from this source is therefore considered to be low risk.

Pluvial Flooding

- 3.15 Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.
- 3.16 Risk of flooding from surface water mapping has been prepared⁴, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead.

⁴ <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

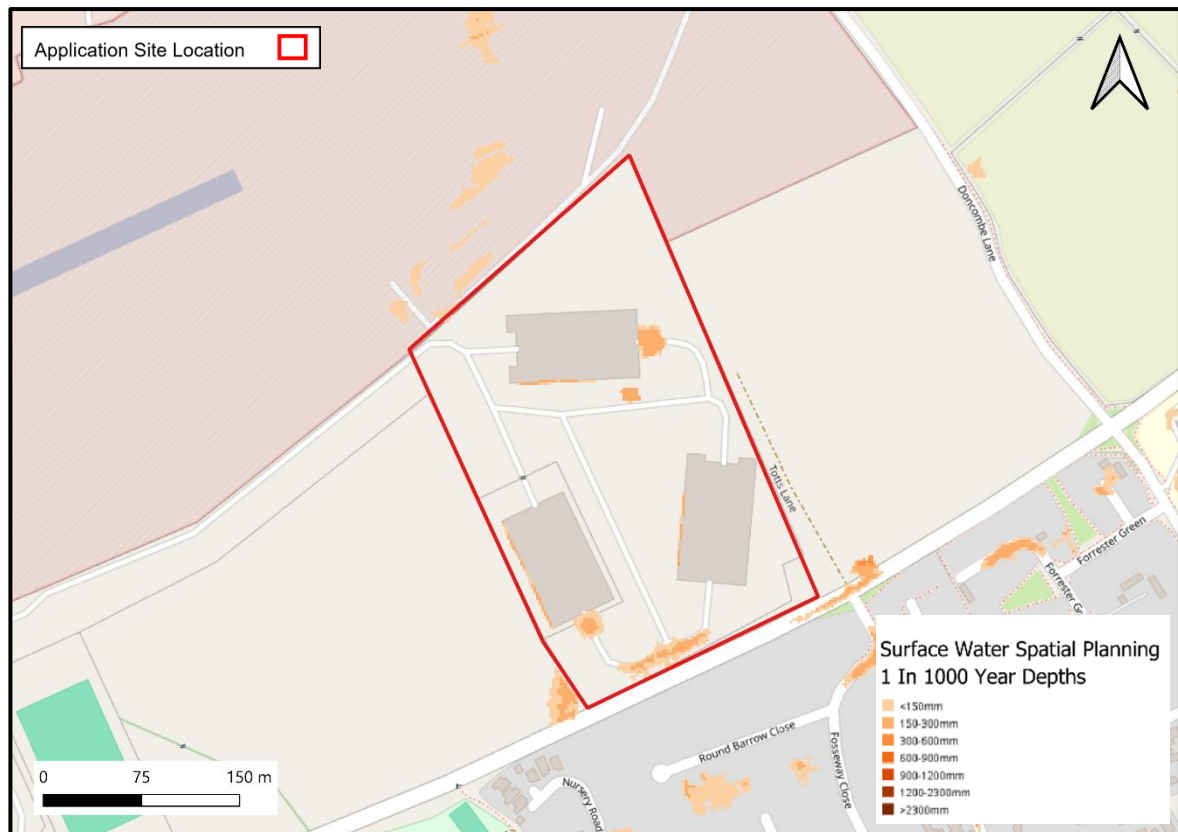
3.17 The EA's Surface Water Flood Risk Map (**Figure 3.3**) indicates that the majority of the site is at very low risk of pluvial flooding. Isolated areas of low to high risk have been identified across the site associated with the existing buildings and hardstanding.



(Source: OpenStreetMap/Environment Agency)

Figure 3.3 Pluvial Flood Extents

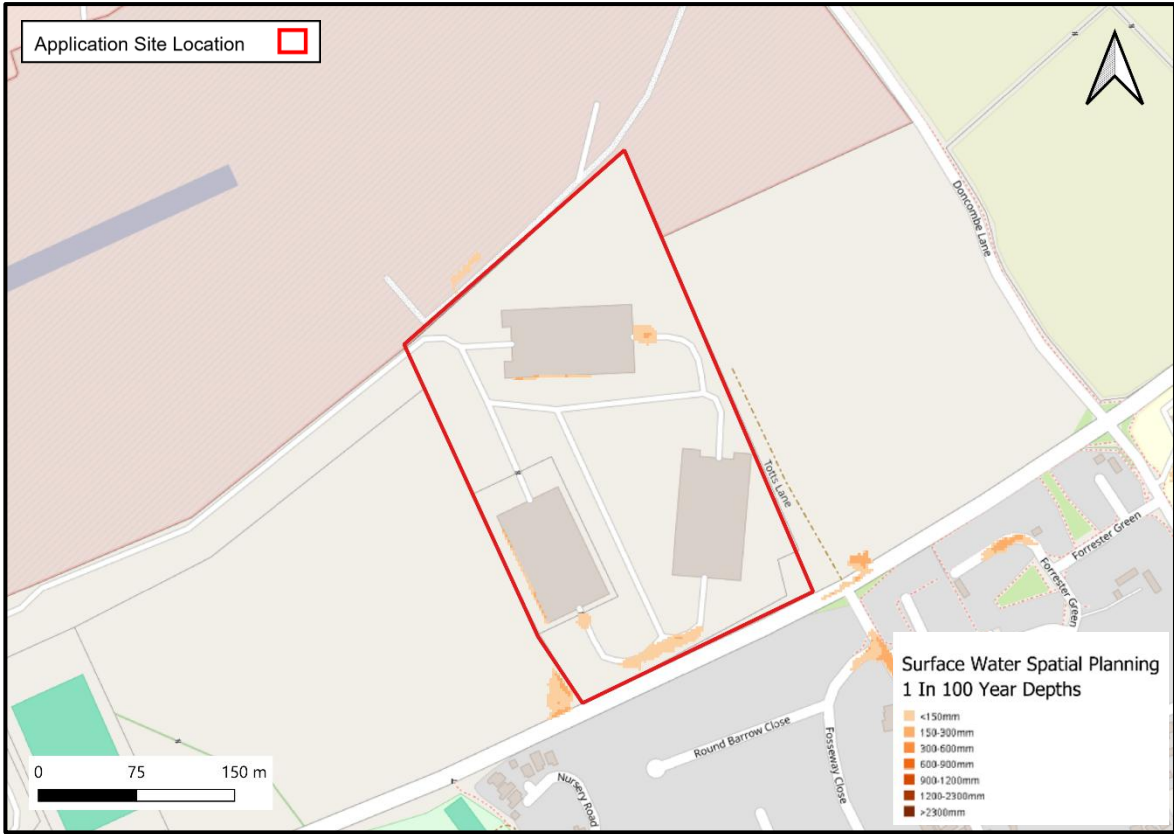
3.18 In the present day 1 in 1000-year (low risk) event, surface water risk has been identified in close proximity to Hanger 19 associated with existing hardstanding surrounding the structure. Therefore, it can be assumed that surface water risk occurs within these areas due to existing depressions in the predeveloped topography. The depths associated with these areas of risk are shown to be shallow reaching a maximum of 300 mm (**Figure 3.4**).



(Source: OpenStreetMap/Environment Agency)

Figure 3.4 Pluvial Flood Depths – 1000 Year Event

- 3.19 The EA mapping shows extents and depths reduce significantly as the return period increases (i.e., the 30-year extents are lesser than that of the 100 year). The 1 in 100-year (medium risk) is shown in **Figure 3.5** and 30-year (high risk) is shown in **Figure 3.6**.
- 3.20 Specifically, in the 100-year event (**Figure 3.5**) depths are shown to be on average a maximum of 150 mm across the site with only smaller pockets reaching depths of 300 mm, with both of these depths considered shallow and not a risk as such. In the 30-year event (**Figure 3.6**) as aforementioned depths are shown to decrease further with only one very small, shallow pocket of high-risk water shown in the northeast of site reaching maximum depths of 150 mm. Any surface water risk on site is considered a product of the existing depressions in the predeveloped topography and thus not a risk as such.



(Source: OpenStreetMap/Environment Agency)

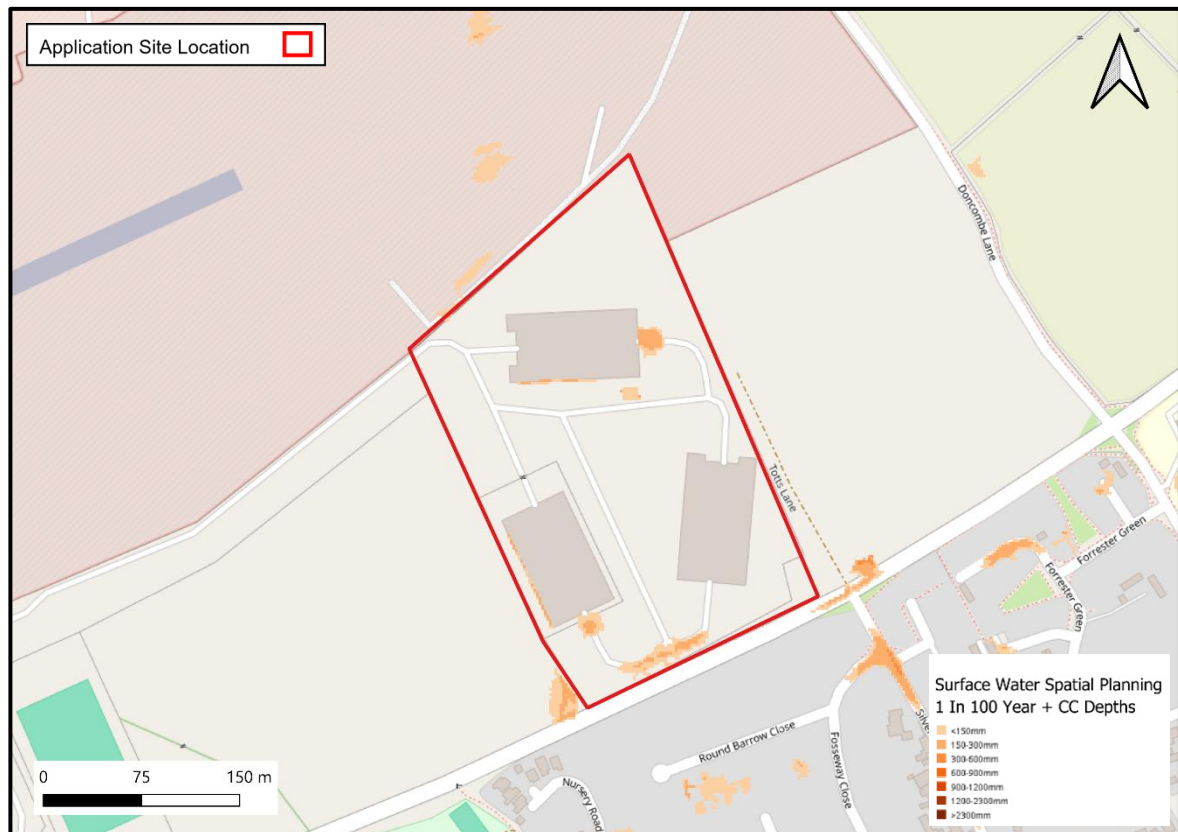
Figure 3.5 Pluvial Flood Depths – 100 Year Event



(Source: OpenStreetMap/Environment Agency)

Figure 3.6 Pluvial Flood Depths – 30 Year Event

- 3.21 The EA's mapping also allows for an assessment of pluvial risk to be taken for a climate change scenario. Specifically, the mapping is representative of the upper end (95th percentile) climate change allowance for the 2070s epoch (2061 – 2125). The design event (100 year plus climate change) is shown in **Figure 3.7**.



(Source: OpenStreetMap/Environment Agency)

Figure 3.7 Pluvial Flood Depths – 100 Year + Climate Change Event

- 3.22 Even with climate change accounted for depths associated with the pluvial risk on site is shallow reaching maximum depths of 300 mm. The extents and depths of the design event are similar to that of the 1000-year event (with no climate change included) and again show the areas of risk to be associated with the isolated depressions within the predeveloped topography.
- 3.23 Due to the nature of the surface water maps, the presence of existing surface water drainage systems is something that EA mapping does not account for. The flooding shown within the mapping is a conservative estimate of pluvial flood risk, in reality the existing surface water drainage system on site would provide mitigation and reduce the likelihood of these areas of ponding occurring.
- 3.24 Flood risk from this source is therefore considered to be low.

Groundwater Flooding

- 3.25 Groundwater flooding occurs when the water table rises above ground elevations. It is most likely to occur in low lying areas underlain by permeable geology. This may be regional



scale chalk, sandstone aquifers, or localised deposits of sands and gravels underlain by less permeable strata.

- 3.26 The SFRA states how “*groundwater flooding in Wiltshire is primarily due to flooding mechanisms in the chalk and occurs mainly in the south and south-east of the county*”. SFRA mapping indicates that the site is located within an area where “*flooding from groundwater is not likely*”. Refer to SFRA mapping within **Appendix E**.
- 3.27 An intrusive site investigation was conducted on site in October 2016, 8 trial pits and 10 windowless sampler boreholes were excavated on site. No groundwater was encountered within any of these trial pits or boreholes. Refer to Trial Pit logs within **Appendix C**.
- 3.28 Therefore, flood risk from groundwater at this stage is considered to be low.

Sewer Flooding

- 3.29 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or because of a reduction in capacity due to collapse or blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.
- 3.30 Wessex Water sewer records indicate that an existing public foul water sewer is located to within Silver Street highway to the south east of the site. Existing ground levels within the highway are shown to be lower than those within the site. Therefore, if sewer flooding were to occur flows would be contained within the highway corridor and not enter the site itself.
- 3.31 The risk of sewer flooding to the site is therefore considered to be low. All public sewer records are shown in **Appendix D**.

Flooding from Artificial Sources

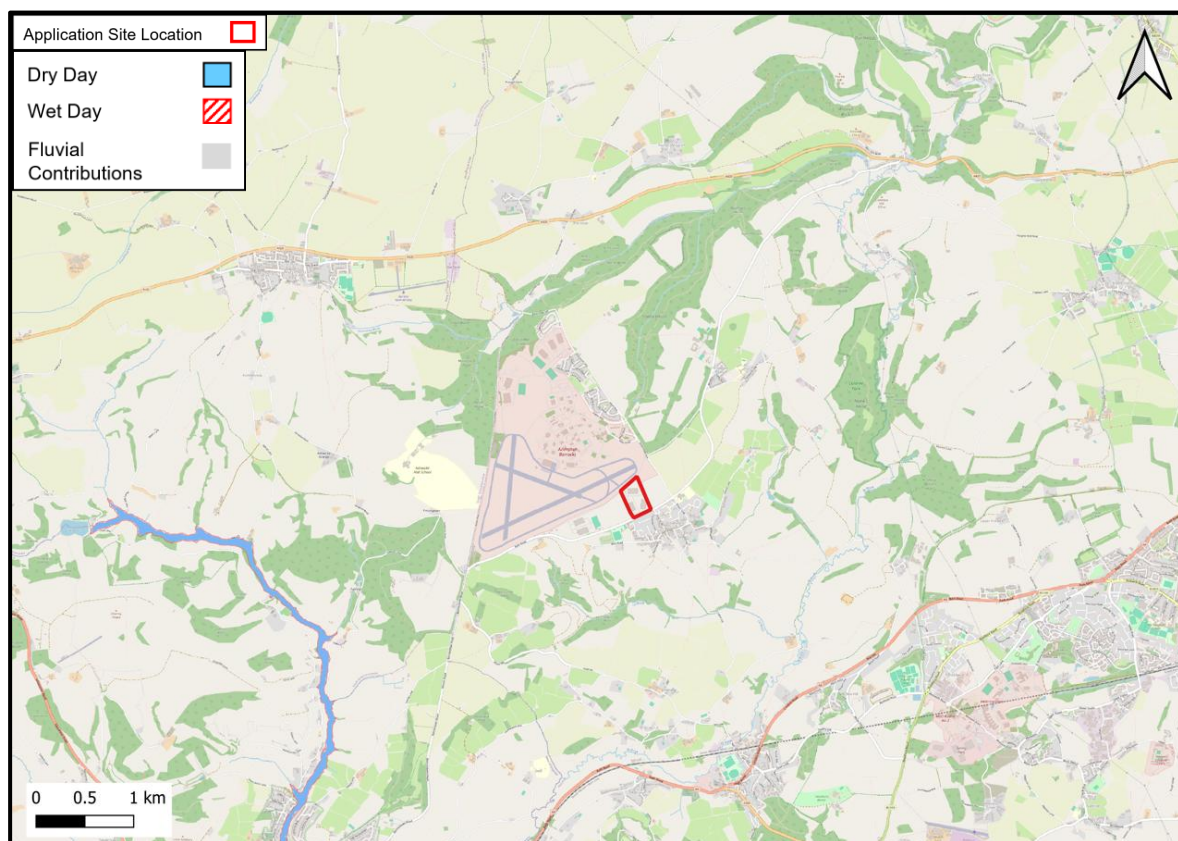
Reservoirs

- 3.32 Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain water in times of flooding. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.
- 3.33 To help identify this risk, reservoir failure flood risk mapping has been prepared⁵, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst-case scenario and is only intended as a guide. This identifies the site is not at risk from this source. Refer to **Figure 3.8** below.

⁵ <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>



3.34 The development is at negligible risk of flooding from reservoirs.



(Source: OpenStreetMaps/Environment Agency)

Figure 3.8 Reservoir Flood Extents

4 NPPF Requirements

Sequential Test

- 4.1 Based on the EA Flood Map for Planning, the development proposals are located entirely within Flood Zone 1.
- 4.2 The NPPF considers this development as ‘more vulnerable’ in terms of flood risk vulnerability as shown in Annex 3 of the PPG⁶. The proposed development will be located entirely within Flood Zone 1. The NPPF Flood Risk Vulnerability and Flood Zone Compatibility matrix (**Table 4.1**) confirms that a ‘more vulnerable’ development is deemed appropriate within Flood Zone 1 and therefore meets the requirements of the Sequential Test.
- 4.3 Following the update to the PPG (17/09/25), a Sequential Test is also not required “where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design and mitigation measures would ensure occupiers and users remain safe from current and future surface water flood risk for the lifetime of the development, without increasing the risk elsewhere.”
- 4.4 The assessment has confirmed that the site is at low risk from pluvial flooding. As such the sequential test is not required. This position is agreed with Q+A Planning as the planning consultant for the project.

Exception Test

- 4.5 The proposed development is considered to be ‘More Vulnerable’ in terms of its land use type flood risk vulnerability as shown in Annex 3 of the PPG .
- 4.6 **Table 4.1** shows the matrix indicating the flood risk vulnerability types of development that are acceptable in different flood zones based upon the Flood Map for Planning and where an Exception Test is not required as shown in Table 2 of the PPG⁷. The tick marks in the table show where the principle of a development proposal is acceptable. The cross marks indicate where development would not be permitted.

⁶ <https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>

⁷ <https://www.gov.uk/guidance/flood-risk-and-coastal-change#para77>



Flood Zones/ Vulnerability	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	Exception Test Required	✓	✓	✓
Flood Zone 3a~	Exception Test Required~	✗	Exception Test required	✓	✓
Flood Zone 3b*	Exception Test Required*	✗	✗	✗	✓*

(Flood Risk Table 2)

Table 4.1 Flood Risk Vulnerability and Flood Zone Compatibility

“~” In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

“*” In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- a) remain operational and safe for users in times of flood;
- b) result in no net loss of floodplain storage;
- c) not impede water flows and not increase flood risk elsewhere

- 4.7 The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in the situations where development is proposed in a location known to be at risk from any form of flooding, now or in the future.
- 4.8 The Exception Test requires two additional elements to be satisfied (as set out in Policy F6 of the National Planning Policy Framework) before allowing development to be allocated or permitted in situations where suitable sites at lower risk of flooding are not available following application of the Sequential Test.
- 4.9 There are two parts to the Exception Test. It should be demonstrated that proposed development:
- a) Provides wider sustainability benefits to the community that outweigh the flood risk;
 - b) Be safe for its anticipated lifetime in accordance with guidance within Paragraph F7 of the NPPF; and
 - c) Not increase flood risk elsewhere and, where possible, reduce flood risk overall.
- 4.10 The NPPF states how the application of the exception test should be informed by site-specific flood risk assessment. The exception test does not need to be applied:
- a) To those forms of development, or in those circumstances, where the sequential test is not required, as set out within Paragraph F5 of the NPPF; or
 - b) Where development is proposed on a site allocated in the development plan to which the exception test was applied at the plan-making stage, unless there has been a significant increase in the risk of flooding to the site subsequently, or the nature of the development itself has changed significantly from that which was allocated so as to introduce a more vulnerable use.



- 4.11 All proposed development will be located within Flood Zone 1, this is an area where all forms of development are considered acceptable. That being said, through the proposed design, the elements of the Exception Test have been satisfied by adopting a design for exceedance approach through setting, where practical, FFLs of the proposed residential dwellings are to be a minimum of 150 – 300mm above surrounding ground levels.
- 4.12 The Drainage Strategy details included in Section 5 will detail how development drainage will be managed to ensure flood risk is not increased elsewhere. Following guidance set out above and within the NPPF, as a Sequential Test is not required on site, an Exception Test is also not required.

Access & Egress

- 4.13 Safe pedestrian access/egress to the site is available to the south onto the unnamed highway. This highway is both located within Flood Zone 1 and identified to be at low risk of surface water flooding and therefore an acceptable hazard and in line with guidance.

Mitigation Measures

- 4.14 In order to mitigate flood risk on site it is proposed that Finished Floor Levels (FFLs) within proposed dwellings across the site will be raised by between 150 - 300mm above surrounding ground levels. Additionally, ground raising would be proposed to deal with any surface water ponding that may occur throughout the site and ensure that this could be managed within the development to ensure proposed development meets planning policy.
- 4.15 For areas where localised surface water flooding is predicted (i.e. those with no connectivity to the wider area), these would be addressed through the proposed surface water drainage strategy for the site and/or localised land raising. Given these areas are effectively 'self-generated' flows, these would be attenuated within the site prior to a controlled discharge off site.



5 Proposed Drainage Strategy

Introduction

- 5.1 Consideration of flood issues is not confined to the floodplain. This is recognised in the NPPF and associated guidance. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in a catchment, particularly flooding downstream; and replacing permeable vegetated areas with low permeability roofs, roads and other paved areas will increase the speed, volume and peak flow of surface water runoff.
- 5.2 A surface water management strategy for the development is proposed to manage and reduce the flood risk posed by surface water runoff from the site. The surface water drainage arrangements for any development site should be such that the volume and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the proposed development unless specific off-site arrangements are made and result in the same net effect.
- 5.3 An assessment of the surface water runoff rates was undertaken to determine the surface water options and attenuation requirements for the site and is discussed below.
- 5.4 Following the August 2026 update to the NPPF proposed drainage systems are required to adhere to guidance set out within The National Standards for Sustainable Drainage Systems (SuDS)
- 5.5 The National Standards for Sustainable Drainage Systems (SuDS) outline 11 key principles for the effective management of surface water within new developments. These 11 principles are to be addressed through the application of 7 Standards, with the goal of reducing flood risk, improving surface water management, quality, amenity and biodiversity throughout the lifecycle of the SuDS features.
- 5.6 If a Standard cannot be met because of site-specific restrictions or other constraints, the design approach should still aim to achieve the greatest level of compliance possible. Justification for not fully complying with a Standard is to be provided to the LLFA, who may then agree to a departure.
- 5.7 The following sections of the drainage strategy shall now present the requirements of each Standard, taken directly from the Guidance document, and subsequently provide evidence to support the compliance of each.

Standard 1: Runoff Destinations

Requirements

- 5.8 *A 'SuDS approach' shall be adopted to address the management of surface water by the development and where it should be discharged. Runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development on flood risk, the morphology and water quality of receiving waters and the associated ecology.*
- 5.9 *Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:*



- *priority 1: collected for non-potable use*
 - *priority 2: infiltrated to ground*
 - *priority 3: discharged to an above ground surface water body*
 - *priority 4: discharged to a surface water sewer, or another piped surface water drainage system*
 - *priority 5: discharged to a combined sewer*
- 5.10 *To utilise a lesser priority final destination, appropriate evidence shall be provided that demonstrates all higher priority final destinations have been utilised to the maximum extent practicable. Higher cost alone shall not be a reason to utilise lower priority final destinations.*
- 5.11 *Where more than one final destination is utilised, each final destination's ability to accept runoff shall be maximised in order of priority.*

Compliance

Priority 1 – Water Reuse

- 5.12 The proposed development provides an opportunity to reuse surface water through the provision of rainwater harvesting products. This opportunity could be considered at the detailed design stage.
- 5.13 Rainwater butts should be provided at suitable locations where feasible, to reduce the volume of water entering the underground drainage system and the demand on the water supply network.
- 5.14 Harvested rainwater may be utilised for non-potable uses where a pressurised hose connection is not required. Stored rainwater also provides a source of clean water when hosepipe bans are in effect.
- 5.15 However, due to the nature of the development being residential, it is not possible to rely only on priority 1 as a runoff destination.

Priority 2 – Infiltration

- 5.16 An intrusive site investigation was undertaken on site in February 2026. Land Information Service (LandIS) notes shallow lime-rich soils over chalk or limestone. These are described as freely draining.
- 5.17 3 of the 4 nearby borehole logs available from the British Geological Survey (BGS) located at RAF Colerne were recorded as dry, with shallowest recorded groundwater in the 4th log at 14.3m depth.
- 5.18 The Phase 1 Geo-Environmental Desk Study Report (Earth Environmental & Geotechnical (Southern) Ltd Report Ref: B5482/25/DTS) shown in **Appendix F** notes the site is located within an area of Very Low risk of ground dissolution of soluble rocks.



- 5.19 BRE365 infiltration testing undertaken in three locations across the site in February 2026. Infiltration rates varied from 1.420E-04 m/s to 1.563E-03 m/s. Taking the lowest rate to be conservative, this is greater than 1E-06 m/s and therefore rates are deemed favourable for infiltration. Testing report shown in **Appendix G**.
- 5.20 As an infiltration based drainage strategy is proposed on site, priority 2 can be met accordingly and therefore highlights how the proposed development complies with Standard 1.

Standard 2: Management of Everyday Rainfall (interception)

Requirements

- 5.21 Apply a 'SuDS approach' so that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems.
- 5.22 Evidence shall be provided that the approach to managing runoff from 'everyday' rainfall has been developed alongside and in support of the management of runoff quality (standard 4) and the delivery of amenity and biodiversity benefits (standards 5 and 6).
- 5.23 For developments that incorporate rainwater harvesting so no runoff leaves the development for lower order design storm events, the surface water drainage system is deemed compliant with standard 2. Evidence of this approach shall be provided in the form of calculations to BS EN 16941.
- 5.24 For developments that infiltrate entirely to ground so no runoff leaves the development for storm events with a 1 in 1 or greater chance of occurring each month, the surface water drainage system is deemed compliant with standard 2. Evidence of this approach shall be provided in the form of calculations and infiltration testing results.
- 5.25 Interception shall be delivered within the development for the first 5mm of rainfall for the majority of rainfall events, for both winter and summer seasons. This is to prevent runoff from the site for the majority of small (frequent) rainfall events and for the initial depth of rainfall for larger events. For compliance to be demonstrated, 80% interception shall be achieved during the summer (May to October) and 50% in winter (November to April).
- 5.26 Evidence shall be provided to demonstrate that the runoff from each positively drained surface, for at least 5mm of rainfall, is either collected for use, infiltrated into the ground, or else captured, conveyed and stored within SuDS features. These features shall naturally absorb or retain runoff and from these the runoff will be 'lost' to soils or the atmosphere and will not discharge off the site.
- 5.27 Demonstration of compliance should be provided with the use of industry recognised guidance, adherence to relevant policies that are within adopted publications, and using hydraulic models, which model infiltration and evapotranspiration, to demonstrate the effectiveness within any drainage design for meeting the interception requirements.
- 5.28 When undertaking the assessments where hydraulic modelling software is not being utilised, a simplified approach to delivering interception may be acceptable with the agreement of the approving body. Where an individual feature or a combination of features listed below are delivered, this shall be considered compliant with standard 2.



- 5.29 In circumstances where individual SuDS features do not provide adequate capacity for interception on their own, additional capacity can be provided by downstream features. Detailed calculations shall be provided to demonstrate compliance in these circumstances.
- 5.30 The interception methods below shall be considered to be compliant for zero runoff for the first 5mm rainfall for 80% of events during the summer and 50% in winter, with the presumptions for each system detailed below.

Compliance

- 5.31 With respect to Standard 2 of the SuDS standards (management of everyday rainfall) and the approach for at least the first 5mm being intercepted a high level assessment has been undertaken based off the proposed impermeable area being 1.762ha.
- 5.32 It should be noted that the final impermeable area and associated drainage mitigation features will be defined at Reserved Matters stage, and that the purpose of this report and the calculations shown in **Table 5.1** below is to establish the principles of the development to be applied at this stage.
- Unlined infiltration basin with an infiltration rate of $>1 \times 10^{-6}$ m/s – can take 25x the base area
- 5.33 Should soft SuDS features not be sufficient to achieve the first 5mm criteria, then hard SuDS can be applied.
- Lined Permeable Paving – Can serve itself but not take any additional area.

SuDS Structure	Lined/Unlined	Infiltration	Compliant with Standard 2	Anticipated Base Area (m ²)	Multiplier	Total Area (m ²)
Infiltration Basin	Unlined	Yes	Yes	813.9	x25	20,347.5
Permeable Paving	Lined	No	Yes	5,582.5	x1	5,582.5
SuDS Totals						25,930
Proposed Impermeable Area						17,620

Table 5.1 Standard 2 Calculations

- 5.34 The National SuDS guidance document states: *“Interception shall be delivered within the development for the first 5mm of rainfall for the majority of rainfall events, for winter and summer seasons”*. The national standard clarifies that the term shall *“indicates a performance or method-based requirement of the standards which can only be varied through a departure agreed with the approving body.”*
- 5.35 As highlighted above within **Table 5.1** the proposed SuDS on site are Standard 2 compliant and can adequately manage the entirety of the first 5mm of rainfall associated with the proposed impermeable area on site.



Standard 3: Management of Extreme Rainfall and Flooding

Requirements

- 5.36 *The 3.1 A 'SuDS approach' shall be adopted to address the management of development runoff during extreme rainfall, including allowances for climate change and urban creep to:*
- *protect people and property on the development from flooding of the surface water drainage system*
 - *mitigate any increased flood risk to people and property adjacent to or downstream of the development*
 - *protect the receiving water body from morphological damage or minimise the impact on sewer capacity*
- 5.37 *When discharging to an infiltration feature, the system shall be appropriately sized to accommodate the design event based on ground conditions and contributing areas.*
- 5.38 *When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water runoff (rate and volume) for the 1% annual exceedance probability (AEP) event shall be controlled to ensure the runoff from the development does not increase flood risk elsewhere.*
- 5.39 *When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water runoff rate for the 50% AEP event shall be controlled to ensure development runoff from an event of this magnitude has no negative impact.*
- 5.40 *Any flooding from the surface water drainage system for events up to the 1% AEP event shall be managed within the development.*
- 5.41 *Any flooding from off-site sources for the 1% AEP event should be managed on site or safely routed through the site, ensuring any downstream risks are not increased compared to the pre-development scenario.*
- 5.42 *The risks (both on and off the development) associated with flooding from the surface water drainage system for exceedance events greater than the 1% AEP event shall be appropriately managed.*

ComplianceExisting Drainage

- 5.43 Due to the existing greenfield nature and ground conditions of the site, rainfall is considered to drain via natural infiltration.

Surface Water Management

- 5.44 Sustainable drainage system measures (SuDS) should be used to control the surface water runoff from the proposed development site, thereby managing the flood risk to the site and surrounding areas from surface water runoff. These measures will also improve the quality of water discharged from the site.



Proposed Drainage

- 5.45 It is proposed to implement soakaways within gardens to discharge roof drainage. These should be offset a minimum of 5m from buildings and 2m from fences.
- 5.46 Permeable paving is proposed for private driveways and parking bays to collect runoff from impermeable areas in the frontages. It is assumed Wiltshire Highways will require an offset from any permeable paving/ soakaways from the Public Highway network. As the majority of private permeable paving will be located directly adjacent to the public highway, it is assumed much of the permeable paving will need to be lined and run via pipe downstream for discharge. Surface water can discharge to ground via soakaway beneath permeable paving where there is sufficient offset from house and road foundations. These locations are to be determined at detailed design stage.
- 5.47 Tree pits areas are proposed adjacent to the primary road. It is proposed for these to also intercept runoff from adjacent footway areas.
- 5.48 An infiltration basin is proposed at the lowest part of the site in the north to discharge surface water runoff from the private and adopted road network. A positive drainage system comprising gullies, pipes and manholes shall convey surface water runoff from the roads to the basin.
- 5.49 A landscape-led design approach has been taken on the outline drainage strategy. Sufficient offsets have been allowed for from existing hedgerows, and the basin has been designed to sit outside existing tree root protection zones.
- 5.50 Site topography is a shallow gradient, falling from south to north. Below ground pipes will require suitable gradients to achieve self-cleansing velocity of the surface water. The base of the basin is therefore anticipated to be approximately 2 to 3m below existing ground level in the north of the site. It is proposed this is stepped down, with a walkable slope down to a 3m wide maintenance strip surrounding a 1.5m deep basin. This will be designed to have minimum 300mm freeboard in the 100 year storm event (plus 45% climate change). Drainage calculations for the main driveways and roads network are included in **Appendix H**. For the purposes of these calculations, and to be conservative in the sizing, all private driveways are assumed to discharge to the adopted basin.
- 5.51 To demonstrate that the necessary storage volumes can be accommodated on the site an illustrative drainage layout has been prepared and has been included as **Appendix I**.
- 5.52 Due to the presence of the airfield to the north, a conservative factor of safety of 10 has been applied to the measured infiltration rate in accordance with BRE 365 principles. This results in a calculated drain-down time of approximately 24-30 hours during the 1 in 100 year rainfall event. In practice the infiltration basin is expected to drain more rapidly. No permanent standing water is proposed and the basin is intended to operate as a normally dry feature.
- 5.53 Areas of open water remaining for periods greater than 72 hours may increase the potential to attract large and/or flocking bird species. Even with the conservative factor of safety of 10 applied, the calculated drain-down time remains well below this threshold. The proposed system is therefore considered to minimise bird-attraction and reduce birdstrike risk.



- 5.54 The final layout and design of the surface water drainage network including detailed sewer runs, refined surface water storage volumes/areas and source control SuDS locations will be determined at reserved matters and detailed design stage.

Exceedance Events

- 5.55 The proposed drainage system and all SuDS features within the development have been designed with a capacity up to a 1 in 100-year (plus 45% climate change) event, with a 10% allowance for urban creep and a Cv value of 1.0.
- 5.56 A storm event in excess of this design standard would be extreme and would cause the systems to backup and would then shed overland following the topography of the site and flow towards the infiltration basin in the northeast corner.
- 5.57 Noting the airfield to the north, a factor of safety of 10 has been applied to the drainage calculations for sizing the attenuation basin.
- 5.58 The above demonstrates compliance with Standard 3.

Standard 4: Water Quality

Requirements

- 5.59 Apply a 'SuDS approach' that protects surface waters, groundwater and coastal waters by managing the quality of the surface water runoff to adequately address water quality risks from the development.
- 5.60 The proposed SuDS management train(s) shall be based on a robust water quality risk assessment, appropriate to the pollution hazard and sensitivity of receiving waters, reflecting industry recognised guidance or other quantitative assessment as agreed with the approving body and permitting requirements.

Compliance

Water Quality

- 5.61 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices. For this site contaminant risks come from individual property driveways, residential car parks and low traffic roads.
- 5.62 To ensure that adequate treatment is provided the SuDS mitigation indices for the development must be equal to, or exceed, the pollution hazard indices. Surface water runoff from roof runoff and individual property driveways, residential car parks and low traffic roads is considered to present a **Low** hazard, surface water runoff from residential roads is considered to present a **Medium** hazard.
- 5.63 To ensure a suitable mitigation index is achieved, the affected stormwater system has been assessed. This showed for satisfactory water quality is achieved for both networks.



		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Network 1	Roof Runoff	Low	0.2	0.2	0.05
Network 2	Individual property driveways, residential car parks, low traffic roads	Low	0.5	0.4	0.4
Network 2	Residential Roads / Parking	Medium	0.7	0.6	0.8
MAX			0.7	0.6	0.8
Network 1	Soakaways		0.7	0.6	0.5
Network 2	Permeable Paving		0.7	0.6	0.7
Network 2	Infiltration Basin		0.7	0.6	0.5
Network 1 Checks	Soakaway > Roof Runoff		0.7 > 0.2 PASS	0.6 > 0.2 PASS	0.5 > 0.05 PASS
Network 2 Checks	(Permeable Paving + (Infiltration Basin)/2) > Residential Roads		0.7 + (0.7/2) = 1.0* >0.7 PASS	0.6 + (0.6/2) = 0.9 >0.6 PASS	0.7 + (0.5/2) = 0.95 >0.8 PASS

(As per C753 The SuDS Manual)

Table 5.2 Water Quality Indices

*Total SuDS Mitigation Indices cannot equal greater than 1.0

5.64 The above demonstrates compliance with Standard 4.

Standard 5: Amenity

Requirements

5.65 A 'SuDS approach' shall be adopted that maximises benefits for amenity through the creation of multi-functional places and landscapes.

Compliance

5.66 It is important that SuDS features provide amenity within the proposed development. The proposed infiltration basin and tree pits proposed on site will provide some form of amenity while remaining green strips on site will be left to accommodate tree and shrub planting to enhance the scheme as much as possible.

5.67 All SuDS features are designed and will be delivered to ensure compliance with The SuDS Manual (CIRIA C753).

5.68 The above demonstrates compliance with Standard 5.

Standard 6: Biodiversity

Requirements

5.69 A 'SuDS approach' shall be adopted to ensure the surface water drainage system maximises biodiversity benefits throughout the development lifecycle.



5.70 *The surface water drainage system shall add biodiversity value by:*

- *Creating diverse, self-sustaining, resilient local ecosystems which contribute to net gains in biodiversity*
- *Supporting and promoting natural local habitat and species, for example, through local nature recovery strategies (LNRS)*
- *Contributing to the delivery of local biodiversity strategies*
- *Contributing to habitat connectivity.*

Compliance

5.71 The proposed tree pits and infiltration basin offer an area of water conveyance features to aid water compatible planting and therefore aid biodiversity and interest.

5.72 Through the use of engineered soils and vegetation, the inclusion of proposed tree pits and infiltration basin creates and enhance habitats for wildlife, introducing an opportunity to aid biodiversity metrics.

5.73 Across the site remaining green strips are left to accommodate tree and shrub planting where possible which will further promote a diverse wildlife within the area.

5.74 The above demonstrates compliance with Standard 6.

Standard 7: Design of Drainage for Construction, Operation, Maintenance, Decommissioning and Structural Integrity

Requirements

5.75 *A 'SuDS approach' shall be adopted to ensure that surface water drainage systems are designed so they can be easily and safely constructed, operated and maintained taking account of the need to minimise negative impacts on natural resources and the environment.*

5.76 *The designer shall provide a management and maintenance plan that supports the design objectives detailed in standards 1 to 6 and ensures the performance of the surface water drainage system with regards to runoff destinations, everyday and extreme rainfall, water quality, amenity and biodiversity is maintained throughout the lifetime of the development.*

5.77 *Surface water drainage design shall examine for the likelihood and consequences of potential failure scenarios that may occur during the operation phase and safely manage the associated risks.*

5.78 *The surface water drainage system shall be designed to ensure structural integrity of all components under anticipated loading conditions for the design life of the development so that it does not affect the structural integrity of any existing or proposed components within, or adjacent to, the development.*

Compliance



- 5.79 The proposed drainage is to be constructed using appropriate materials and construction methods, compliance with the Design and Construction Guidance (DCG), specified by Water UK, Building Regulations and NHBC standards.
- 5.80 The responsibility of maintaining the SuDS features will lie with a third-party management company to be appointed by the Client.
- 5.81 The table below (**Table 5.3**) outlines the proposed maintenance requirements for the proposed drainage. These requirements are compliant with The SuDS Manual (CIRIA C753) and therefore demonstrates the proposed drainage strategy is compliant with Standard 7.

Maintenance Regime

- 5.82 Maintenance of SuDS features are essential to ensure that the surface water drainage system operates effectively and that flooding of the site and surrounding areas is prevented.
- 5.83 The responsibility of maintaining the private surface water and foul water drainage components would lie with the landowner of the site, who may delegate responsibility to an appointed external private management company. Areas of shared drainage is intended to be offered for adoption.
- 5.84 A full maintenance regime should be carried out to ensure that the drainage system remains operational over its lifetime. **Table 5.3** summarises an initial maintenance plan for the drainage components proposed within the development. The SuDS Manual (CIRIA C753) and manufacturer's guidelines should be referred to for further maintenance information.

Drainage Component	Required Action	Typical Frequency
Pipework, manholes, flow control chambers, catch pits and silt traps	Stabilise adjacent areas	As required
	Remove weeds	As required
	Clear any poor performing structures.	As required
	Inspect all structures for poor operation	Three monthly, 48 hours after large storms in first six months
	Monitor inspection chambers. Inspect silt accumulation rates and determine silt clearance frequencies	Annually
	Clear perforated pipework of blockages	As required
Permeable Paving	Brushing and vacuuming	Once a year or as required
	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required.



	Inspect for evidence of poor operation and/or weed growth	3 monthly, 48 hours after large storms in first 6 months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually
Infiltration Basin	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, the as required)
	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking technique if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc. for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation. Establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

(As per C753 The SuDS Manual)

Table 5.3 Initial Operation and Maintenance Plan

Foul Water Management

- 5.85 A new foul water connection to manhole ST81716203, at the head of the Silver Street foul sewer system, has been identified as the preferred point of connection by Wessex Water. Refer to existing sewer records within **Appendix D**.
- 5.86 It is proposed that foul water from the proposed development shall be collected through a traditional gravity drainage system before being directed, via a pumped connection, to a new connection point to the existing public foul water sewer. An illustrative strategy can be found in **Appendix I**.
- 5.87 Capacity within the existing network is limited. Should planning permission be granted, Wessex Water will undertake an impact assessment to determine what improvement works are necessary to accommodate the additional flows. These works will be carried out at Wessex Water's cost.



6 Conclusions

- 6.1 This assessment has considered the risks of all types of flooding to the site including tidal, fluvial, surface, groundwater, sewer and artificial sources and provides mitigation measures to ensure that the flood risk to the site is minimised and that flood risk off-site is not increased.
- 6.2 This assessment has confirmed that flood risk from all sources is considered negligible/low. EA mapping indicates the entire site is located within Flood Zone 1 and that flood risk from this source is considered to be low. Flood risk pluvial sources is also considered to be low with EA mapping indicating pluvial flooding on site will not reach $\leq 0.3\text{m}$ in depths.
- 6.3 The raising of proposed finished floor levels by 150- 300mm above surrounding ground levels will provide sufficient mitigation against residual flood risk on site.
- 6.4 The Sequential Test is not required. This is because the proposal is deemed to be 'More vulnerable' in terms of flood risk and More vulnerable development is deemed appropriate to be located within Flood Zone 1.
- 6.5 As per Policy F5 of the NPPF, the proposed development will be located within an area in which the form of development is considered acceptable. Additionally, the Proposed Drainage Strategy details how development drainage will be managed to ensure flood risk is not increased elsewhere. As such, the Exception Test is not applied.
- 6.6 Surface water runoff from the proposed development is to be discharged via infiltration to ground. This shall be in form of soakaways in rear gardens for individual plots, and permeable paving and infiltration basin for the surface water runoff from driveways and roads. The proposed SuDS on site will provide sufficient attenuation up to the 100 year event + 45% climate change allowance. The SuDS will also provide water quality treatment.
- 6.7 Foul water from the site will be discharged via a pumped connection to the existing public foul water sewer to the south. This proposed connection is subject to Wessex Water approval.
- 6.8 In compliance with the requirements of the National Planning Policy Framework, and subject to the mitigation measures proposed, the development will not cause or be subject to significant flood risk issues.

Appendix A – Proposed Development Drawings



Illustrative Masterplan

Rev	Date	Details	Rev	Status
Project	Stage	Drawing	Rev	Status
3746	2	1204	F	PLANNING

Scale	Size	Drawn	Check	Creation
1:1250	A2 P	MD	MB	



Hangars 18, 19 and 20
Colerne

Illustrative Masterplan



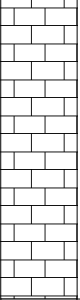
THIS DRAWING IS COPYRIGHT ©
Responsibility is not accepted for errors made by others in scaling from this drawing
All construction information should be taken from figured dimensions only
Discrepancies must be reported to the Architect before proceeding

Appendix B – Topographical Survey



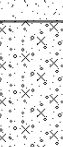
Appendix C – Trial Pit Logs

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Hangers 18-20, Colerne Industrial Park		Project No.: 11882		Borehole No.: WS1 Sheet 1 of 1	
Location: Colerne				Client: Savills		Coordinates:		Hole Type: WLS	
Equipment: Tracked Windowless Sampler Rig				Diameter of Casing:		Level:		Scale 1:50	
Diameter of Boring: 101mm				Depth of Casing:		Dates 20/10/2016 - 20/10/2016		Logged By: LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.30		Loose to medium dense black grey sandy gravel. Gravel is fine to coarse angular of limestone aggregate.		
							Medium dense light orange yellow brown slightly clayey slightly sandy GRAVEL. Recovered as very weak fine to coarse tabular angular oolitic limestone gravel		
		1.00	C	N=20 (3,4/6,5,5,4)	1.00			Very weak highly weathered oolitic LIMESTONE. Recovered as very weak fine to coarse angular to subangular gravel in a slightly clayey sandy matrix.	1
		1.50	D						
		2.00	C	N=11 (3,3/3,2,3,3)					2
		3.00	C	N=16 (1,1/2,3,5,6)	3.00			No Recovery	3
		3.50	C	N=18 (2,3/1,2,6,9)	3.50		End of Borehole at 3.50 m		
		4.00	C	N=26 (8,6/6,6,6,8)					4
	4.50	C	N=40 (14,14/40 for 290mm)					5	
								6	
								7	
								8	
								9	
								10	

Remarks: 1. Borehole terminated at 3.5m bgl. 2. Continuous CPTs from 3.5m to 4.5m.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name:		Project No.:		Borehole No.:	
		Hangers 18-20, Colerne Industrial Park		11882		WS10 Sheet 1 of 1	
Location:		Client:		Coordinates:		Hole Type:	
Colerne		Savills				WLS	
Equipment:		Diameter of Casing:		Level:		Scale	
Tracked Windowless Sampler Rig						1:50	
Diameter of Boring:		Depth of Casing:		Dates		Logged By:	
101mm				21/10/2016 - 21/10/2016		LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15			Concrete Floor Slab	
		0.80	C	50 (10,14/50 for 180mm)	1.00			Medium dense brown yellow silty sandy GRAVEL. Gravel is fine to coarse angular to subangular of oolitic limestone.	
							End of Borehole at 1.00 m		1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks: 1. Borehole terminated at 1m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation	
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Hangers 18-20, Colerne Industrial Park		Project No.: 11882		Borehole No.: WS2 Sheet 1 of 1	
Location: Colerne				Client: Savills		Coordinates:		Hole Type: WLS	
Equipment: Tracked Windowless Sampler Rig				Diameter of Casing:		Level:		Scale 1:50	
Diameter of Boring: 101mm				Depth of Casing:		Dates 20/10/2016 - 20/10/2016		Logged By: LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			Tarmac Hardstanding. Made Ground: Loose black grey sandy silty gravel. Gravel is fine to coarse angular of limestone aggregate. Medium dense to dense brown yellow clayey sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of oolitic limestone.	
					0.30				
		1.00	C	N=47 (5,7/9,12,11,15)	1.00				
		1.60	C	50 (10,25/50 for 135mm)	1.60				
								Very weak highly weathered oolitic LIMESTONE. Recovered as very weak fine to coarse angular to subangular gravel in a slightly clayey sandy matrix.	1
								End of Borehole at 1.60 m	2
									3
									4
									5
									6
									7
									8
									9
									10

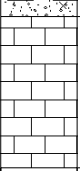
Remarks: 1. Borehole terminated at 1.6m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Hangers 18-20, Colerne Industrial Park		Project No.: 11882		Borehole No.: WS3 Sheet 1 of 1	
Location: Colerne				Client: Savills		Coordinates:		Hole Type: WLS	
Equipment: Tracked Windowless Sampler Rig				Diameter of Casing:		Level:		Scale 1:50	
Diameter of Boring: 101mm				Depth of Casing:		Dates 20/10/2016 - 20/10/2016		Logged By: LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10		Tarmac Hardstanding		
					0.30		Made Ground. Black grey sandy silty gravel. Gravel is fine to coarse angular of limestone aggregate.		
					0.80		Medium dense brown yellow slightly clayey sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of oolitic limestone.		
							Very weak highly weathered oolitic LIMESTONE. Recovered as very weak fine to coarse angular to subangular gravel in a slightly clayey sandy matrix.	1	
		1.00	C	N=28 (2,5/8,5,6,9)					
		1.00	D						
		1.70	C	50 (9,21/50 for 70mm)	1.70			End of Borehole at 1.70 m	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks: 1. Borehole terminated at 1.7m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Hangers 18-20, Colerne Industrial Park		Project No.: 11882		Borehole No.: WS4 Sheet 1 of 1	
Location: Colerne				Client: Savills		Coordinates:		Hole Type: WLS	
Equipment: Tracked Windowless Sampler Rig				Diameter of Casing:		Level:		Scale 1:50	
Diameter of Boring: 101mm				Depth of Casing:		Dates 20/10/2016 - 20/10/2016		Logged By: LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15		Concrete Floor Slab		
		0.40	ES		0.40		Loose to medium dense brown gravelly sand. Gravel is fine to medium of limestone aggregate.		
		1.00	C	N=35 (8,10/10,9,8,8)	1.00		Medium dense to dense yellow white silty slightly clayey gravelly SAND. Gravel is fine to medium angular to subangular of oolitic limestone.	1	
		1.50	C	N=50 (9,16/50 for 265mm)			Very weak highly weathered oolitic LIMESTONE. Recovered as very weak fine to coarse angular to subangular gravel in a clayey sandy matrix.		
					2.00		End of Borehole at 2.00 m		2
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks: 1. Borehole terminated at 2m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Hangers 18-20, Colerne Industrial Park		Project No.: 11882		Borehole No.: WS5 Sheet 1 of 1	
Location: Colerne				Client: Savills		Coordinates:		Hole Type: WLS	
Equipment: Tracked Windowless Sampler Rig				Diameter of Casing:		Level:		Scale 1:50	
Diameter of Boring: 101mm				Depth of Casing:		Dates 20/10/2016 - 20/10/2016		Logged By: LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		1.00	C	50 (8,11/50 for 180mm)	0.20		Concrete Floor Slab.	1	
					0.40		Loose to medium dense brown sandy gravel. Gravel is fine to medium angular of limestone aggregate.		
							Medium dense yellow white slightly clayey silty sandy GRAVEL. Gravel is fine to coarse angular of oolitic limestone.		
					1.00		End of Borehole at 1.00 m	1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks: 1. Borehole terminated at 1m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Hangers 18-20, Colerne Industrial Park		Project No.: 11882		Borehole No.: WS6 Sheet 1 of 1	
Location: Colerne				Client: Savills		Coordinates:		Hole Type: WLS	
Equipment: Tracked Windowless Sampler Rig				Diameter of Casing:		Level:		Scale 1:50	
Diameter of Boring: 101mm				Depth of Casing:		Dates 21/10/2016 - 21/10/2016		Logged By: LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10		 Tarmac Hardstanding.  Loose to medium dense black grey sandy gravel. Gravel is fine to coarse of limestone aggregate.  Medium dense to dense yellow white silty sandy GRAVEL. Gravel is fine to coarse angular to subangular of oolitic limestone. End of Borehole at 0.40 m		
		0.50	C	50 (20,26/50 for 105mm)	0.20				
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks: 1. Borehole terminated at 0.4m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name:		Project No.:		Borehole No.:	
		Hangers 18-20, Colerne Industrial Park		11882		WS7 Sheet 1 of 1	
Location:		Client:		Coordinates:		Hole Type:	
Colerne		Savills				WLS	
Equipment:		Diameter of Casing:		Level:		Scale	
Tracked Windowless Sampler Rig						1:50	
Diameter of Boring:		Depth of Casing:		Dates		Logged By:	
101mm				21/10/2016 - 21/10/2016		LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.10		Tarmac Hardstanding	1	
				0.40	Black grey sandy gravel. Gravel is fine to coarse angular of limestone aggregate.				
		1.00		50 (10,24/50 for 170mm)	1.00		Medium dense to dense brown yellow white sandy silty GRAVEL. Gravel is fine to coarse angular to subangular of oolitic limestone.		
							End of Borehole at 1.00 m	1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks: 1. Borehole terminated at 1m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name:		Project No.:		Borehole No.:	
		Hangers 18-20, Colerne Industrial Park		11882		WS8 Sheet 1 of 1	
Location:		Client:		Coordinates:		Hole Type:	
Colerne		Savills				WLS	
Equipment:		Diameter of Casing:		Level:		Scale	
Tracke Windowless Sampler Rig						1:50	
Diameter of Boring:		Depth of Casing:		Dates		Logged By:	
101mm				21/10/2016 - 21/10/2016		LW	

Well	Water Strikes	Samples & In situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES		0.10			Tarmac Hardstanding	
		0.50	D		0.40			Black grey sandy gravel. Gravel is fine to coarse of limestone aggregate.	
		0.90	C	50 (12,23/50 for 85mm)	0.80			Medium dense brown yellow white clayey sandy GRAVEL. Gravel is fine to coarse angular of oolitic limestone.	
								End of Borehole at 0.80 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks: 1. Borehole terminated at 0.8m bgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation	
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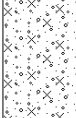
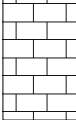
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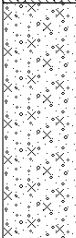
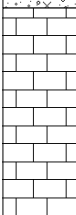
APPENDIX D

TRIAL PIT LOGS

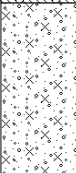
 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Hangers 18-20, Colerne Industrial Park			Project No.: 11882		Trial Pit No.: TP1 Sheet 1 of 1	
Location: Colerne			Client: Savills			Logged By: LW		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions 1.80m			
Date Excavated: 21/10/2016			Level:			Depth : 1.40m 0.70m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.10	ES					Grass onto brown silty slightly clayey slightly gravelly sand with rootlets.			
			0.20			Loose to medium dense white brown silty sandy GRAVEL. Gravel is fine to coarse angular to subangular of oolitic limestone.			
			0.60			Very weak yellow white thinly to medium bedded subhorizontal highly weathered oolitic LIMESTONE. Recovered as very weak fine to coarse tabular gravel in a silty slightly clayey sandy matrix.			
			1.40			End of Trialpit at 1.40 m			
Remarks: 1. Trial pit terminated at 1.4m bgl due to slow progress. 2. Soakaway test undertaken			Groundwater: Groundwater not encountered. Stability: Stable			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			

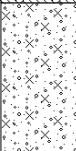
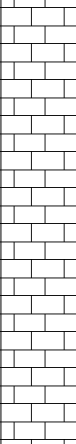
 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Hangers 18-20, Colerne Industrial Park			Project No.: 11882		Trial Pit No.: TP2 Sheet 1 of 1	
Location: Colerne			Client: Savills			Logged By: LW		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions 1.80m			
Date Excavated: 21/10/2016			Level:			Depth : 1.40m 0.70m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.10	ES					Grass onto brown silty slightly clayey slightly gravelly sand with rootlets.			
			0.20			Loose to medium dense brown clayey slightly gravelly SAND.			
			0.60			Very weak to weak yellow white thinly bedded subhorizontal oolitic LIMESTONE. Recovered as very weak fine to coarse tabular of limestone in a slightly clayey sandy matrix.			
			1.40			End of Trialpit at 1.40 m			
Remarks: 1. Trial pit terminated at 1.4m bgl due to slow progress. 2. Soakaway test undertaken.			Groundwater: Groundwater not encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Stable						

Intégral Géotechnique Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Hangers 18-20, Colerne Industrial Park			Project No.: 11882		Trial Pit No.: TP3 Sheet 1 of 1	
Location: Colerne			Client: Savills			Logged By: LW		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions 1.80m			
Date Excavated: 21/10/2016			Level:			Depth : 1.10m 0.70m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
1.00	D		0.30			Grass onto brown silty slightly gravelly sand with rootlets.			
						Loose yellow brown silty sandy GRAVEL. Gravel is fine to coarse angular of tabular oolitic limestone.			
						Very weak thinly to medium bedded subhorizontal oolitic limestone. Recovered as very weak to weak fine to coarse subangular tabular oolitic LIMESTONE in a sandy matrix.			
						Possible service trench within trial pit at 0.90m.			
						End of Trialpit at 1.10 m			
Remarks: 1. Trial pit terminated at 1.10m bgl due to slow progress.			Groundwater: Groundwater not encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
Stability: Stable									

Intégral Géotechnique Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Hangers 18-20, Colerne Industrial Park			Project No.: 11882		Trial Pit No.: TP4 Sheet 1 of 1	
Location: Colerne			Client: Savills			Logged By: LW		Scale 1:25	
Equipment: JCb 3CX			Coordinates:			Dimensions 1.80m			
Date Excavated: 21/10/2016			Level:			Depth : 1.80m 0.70m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
			0.30			Grass onto brown silty slightly gravelly sand with rootlets.			
						Medium dense white brown silty slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to subangular of oolitic limestone.			
						Very weak off white thinly bedded subhorizontal oolitic LIMESTONE. Recovered as very weak to weak fine to coarse tabular oolitic limestone in a silty sandy matrix, with occasional cobbles.			
			1.80		End of Trialpit at 1.80 m				
Remarks:			Groundwater:			Key:			
1. Trial pit terminated at 1.8m bgl due to slow progress.			Groundwater not encountered.			D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Stable						

Intégral Géotechnique Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Hangers 18-20, Colerne Industrial Park			Project No.: 11882		Trial Pit No.: TP5 Sheet 1 of 1	
Location: Colerne			Client: Savills			Logged By: LW		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions 1.80m			
Date Excavated: 21/10/2016			Level:			Depth : 1.50m 0.80m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.10	ES		0.30			Grass onto brown silty slightly gravelly sand with rootlets.			
			0.60			Loose to medium dense white brown silty sandy GRAVEL. Gravel is fine to coarse angular to subangular of limestone.			
						Very weak to weak off white thinly bedded subhorizontal oolitic LIMESTONE. Recovered as very weak to weak fine to coarse tabular oolitic limestone in a silty slightly clayey sandy matrix,.			
1.50	D		1.50			End of Trialpit at 1.50 m			
Remarks:			Groundwater:			Key:			
1. Trial pit terminated at 1.5m bgl due to slow progress.			Stability: Stable			D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			

 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Hangers 18-20, Colerne Industrial Park			Project No.: 11882		Trial Pit No.: TP6 Sheet 1 of 1	
Location: Colerne			Client: Savills			Logged By: LW		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions 1.80m			
Date Excavated: 21/10/2016			Level:			Depth : 2.50m 0.70m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
0.10	ES					Grass onto brown silty slightly gravelly sand with rootlets.			
			0.30			Medium dense, locally loose white brown silty sandy GRAVEL. Gravel is fine to coarse angular of angular oolitic limestone.			
			0.90			Very weak yellow white thinly bedded subhorizontal oolitic LIMESTONE. Recovered as very weak to weak fine to coarse tabular oolitic limestone in a silty sandy matrix, with occasional cobbles.	1		
			2.50			End of Trialpit at 2.50 m	2		
							3		
							4		
							5		
Remarks: 1. Trial pit terminated at 2.5m bgl.			Groundwater: Groundwater not encountered.			Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
			Stability: Spalling of pit sides.						

 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com			Project Name: Hangers 18-20, Colerne Industrial Park			Project No.: 11882		Trial Pit No.: TP7 Sheet 1 of 1	
Location: Colerne			Client: Savills			Logged By: LW		Scale 1:25	
Equipment: JCB 3CX			Coordinates:			Dimensions 1.80m			
Date Excavated: 21/10/2016			Level:			Depth : 2.30m 0.60m			
Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
Depth (m)	Type	Results							
			0.30			Grass onto brown silty slightly gravelly sand with rootlets.			
			0.80			Medium dense, locally loose brown white silty clayey sandy GRAVEL. Gravel is fine to coarse angular to subangular tabular of oolitic limestone.			
			2.30			Very weak to weak off white thinly bedded subhorizontal oolitic LIMESTONE. Recovered as very weak to weak fine to coarse tabular oolitic limestone in a silty sandy matrix.			
						End of Trialpit at 2.30 m			
Remarks:						Groundwater: Groundwater not encountered.			
1. Trial pit terminated at 2.3m bgl.						Stability: Spalling of pit sides.			
						Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample W - Water sample			
									

APPENDIX E

SOAKAWAY TEST RESULTS

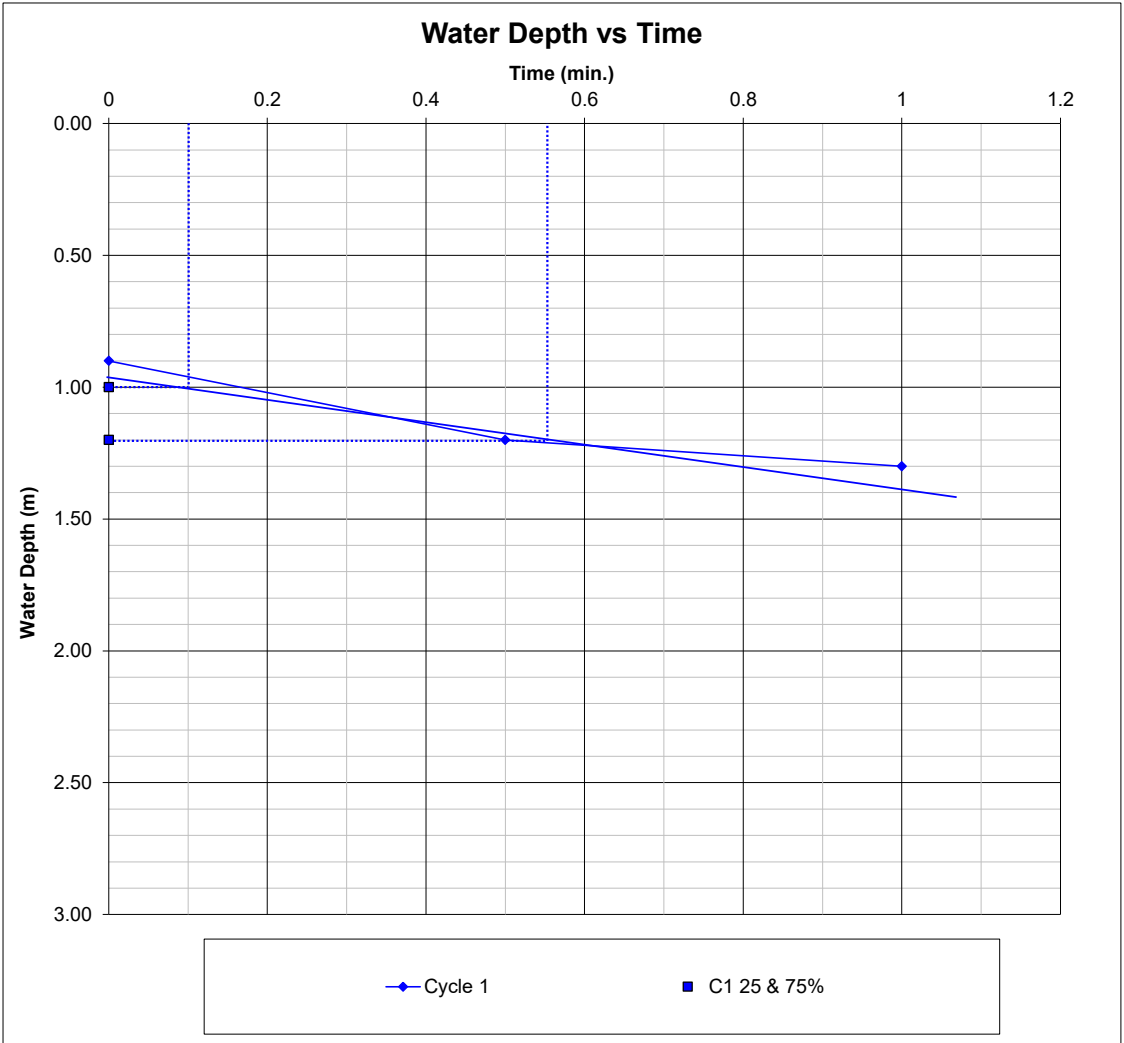
BRE365 SOIL INFILTRATION RATE TEST - TP1

11882 Hangers 18-20, Colerne Industrial Estate

Trial Pit Information	
Length (m)	1.80
Width (m)	0.70
Depth (m)	1.40
Groundwater	Dry
Weather Conditions	Dry
Date	21-Oct-16

[illegible]

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	1.30		
Water Depths (m)			
Water depth at start of test	0.90		
Water depth at end of test	1.30		
Effective depth (measured)	0.40		
% Effective storage depth	1.00		
Effective Storage Depths (m)			
Effective storage depth (100%)	0.40		
Effective storage depth (75%)	0.30		
Effective storage depth (50%)	0.20		
Effective storage depth (25%)	0.10		
Outflow Time (min)			
Time for measured outflow	1		
Time for 100% outflow	1		
Time for 75-25% outflow	1		
Volume of Outflow (m³)			
Over measured effective depth	0.50		
Over 100% effective depth	0.50		
From 75% - 25% effective depth	0.25		
Surface Area (m²)			
For 100% effective storage	3.26		
For 50% effective storage	2.26		
Over measured depth	3.26		
Soil Infiltration Rate (m/s)	Cycle 1	Cycle 2	Cycle 3
Over 100% effective depth	2.6E-03		
Over measured depth	2.6E-03		
Over 75% - 25% effective depth	3.7E-03		



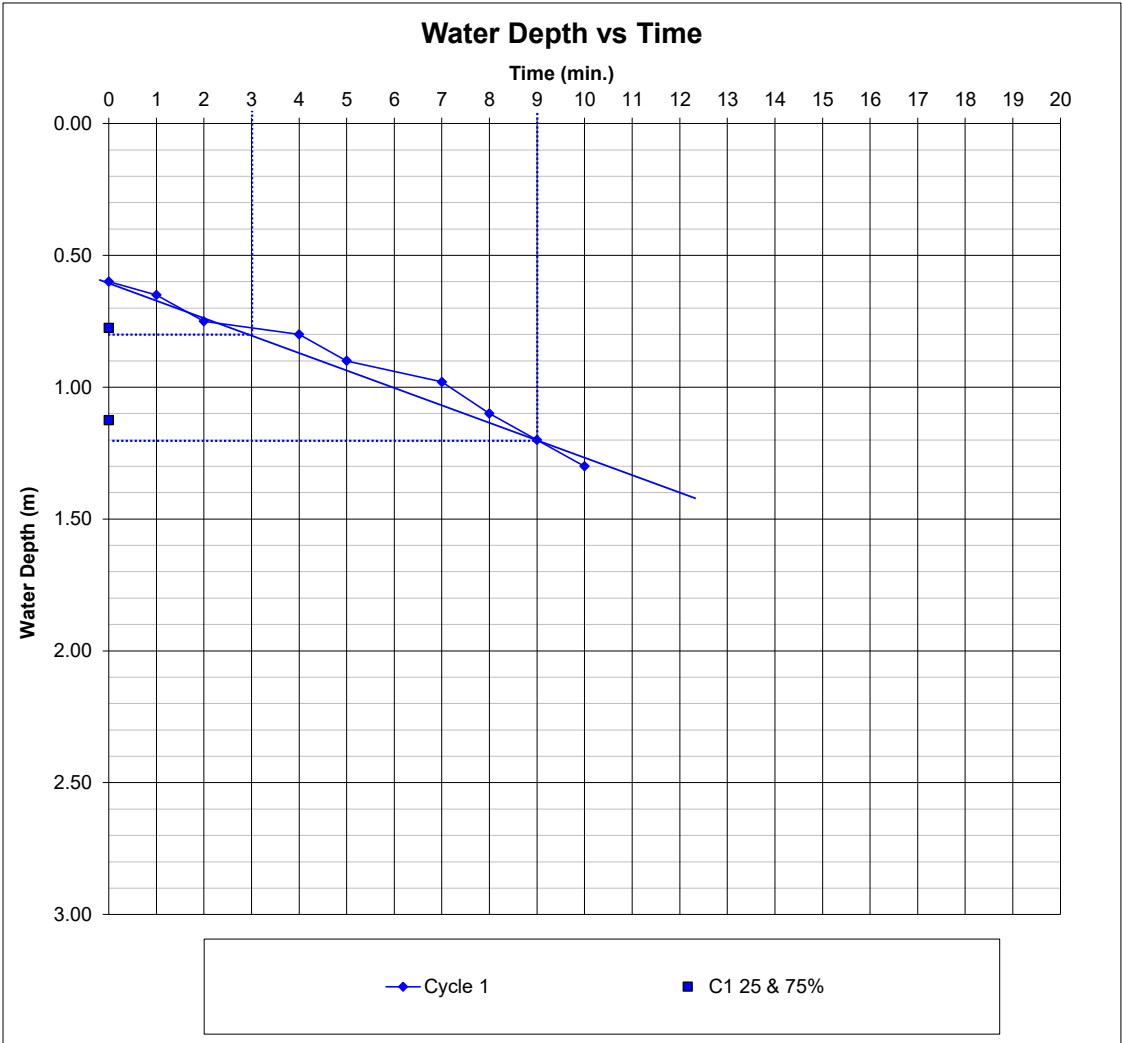
BRE365 SOIL INFILTRATION RATE TEST - TP2

11882 Hangers 18-20, Colerne Industrial Estate

Trial Pit Information	
Length (m)	1.80
Width (m)	0.70
Depth (m)	1.40
Groundwater	Dry
Weather Conditions	Dry
Date	21-Oct-16

Remarks

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	1.30		
Water Depths (m)			
Water depth at start of test	0.60		
Water depth at end of test	1.30		
Effective depth (measured)	0.70		
% Effective storage depth	1.00		
Effective Storage Depths (m)			
Effective storage depth (100%)	0.70		
Effective storage depth (75%)	0.53		
Effective storage depth (50%)	0.35		
Effective storage depth (25%)	0.18		
Outflow Time (min)			
Time for measured outflow	10		
Time for 100% outflow	10		
Time for 75-25% outflow	6		
Volume of Outflow (m³)			
Over measured effective depth	0.88		
Over 100% effective depth	0.88		
From 75% - 25% effective depth	0.44		
Surface Area (m²)			
For 100% effective storage	4.76		
For 50% effective storage	3.01		
Over measured depth	4.76		
Soil Infiltration Rate (m/s)	Cycle 1	Cycle 2	Cycle 3
Over 100% effective depth	3.1E-04		
Over measured depth	3.1E-04		
Over 75% - 25% effective depth	4.1E-04		



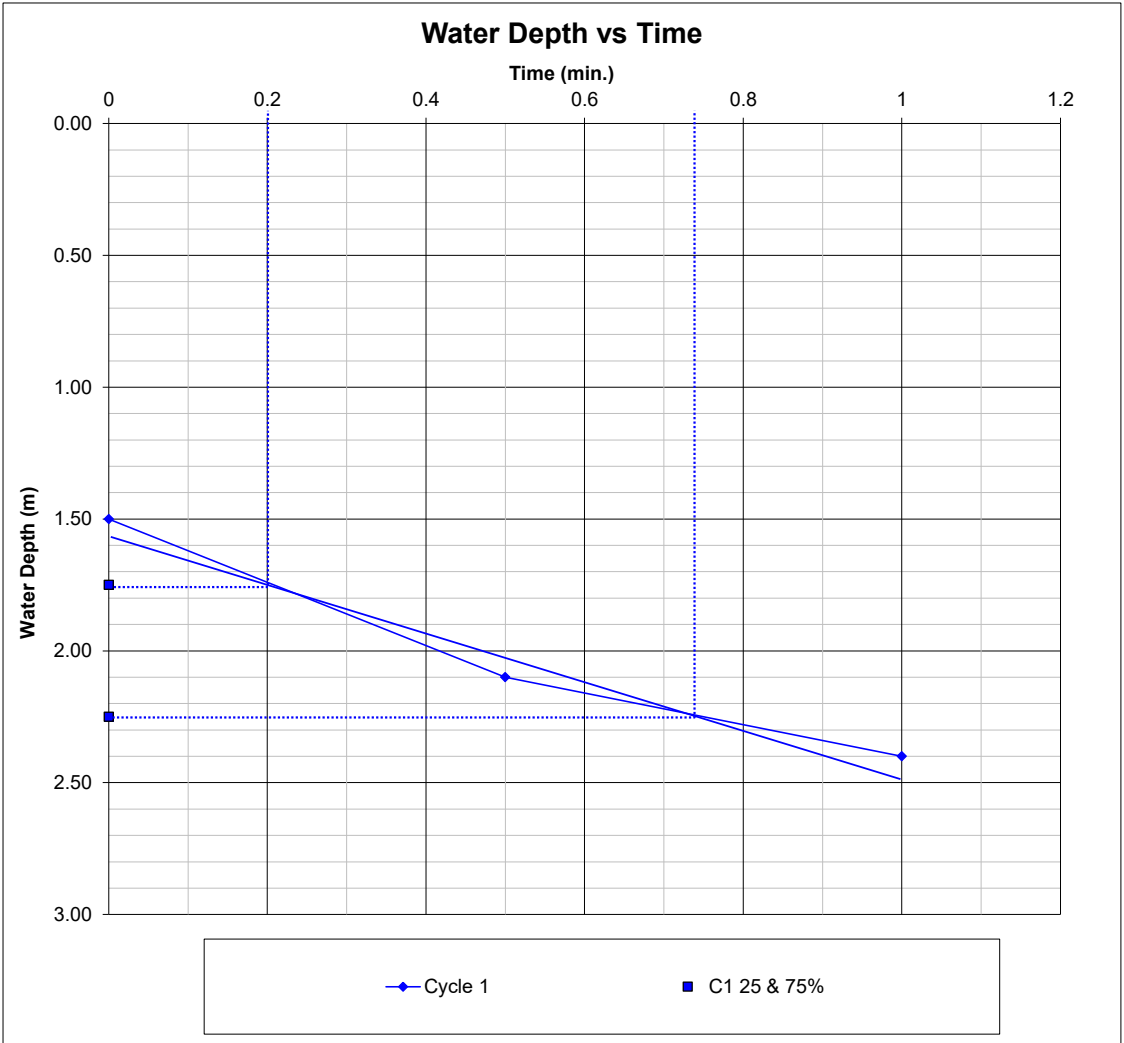
BRE365 SOIL INFILTRATION RATE TEST - TP6

11882 Hangers 18-20, Colerne Industrial Estate

Trial Pit Information	
Length (m)	1.80
Width (m)	0.70
Depth (m)	2.50
Groundwater	Dry
Weather Conditions	Dry
Date	21-Oct-16

[illegible]

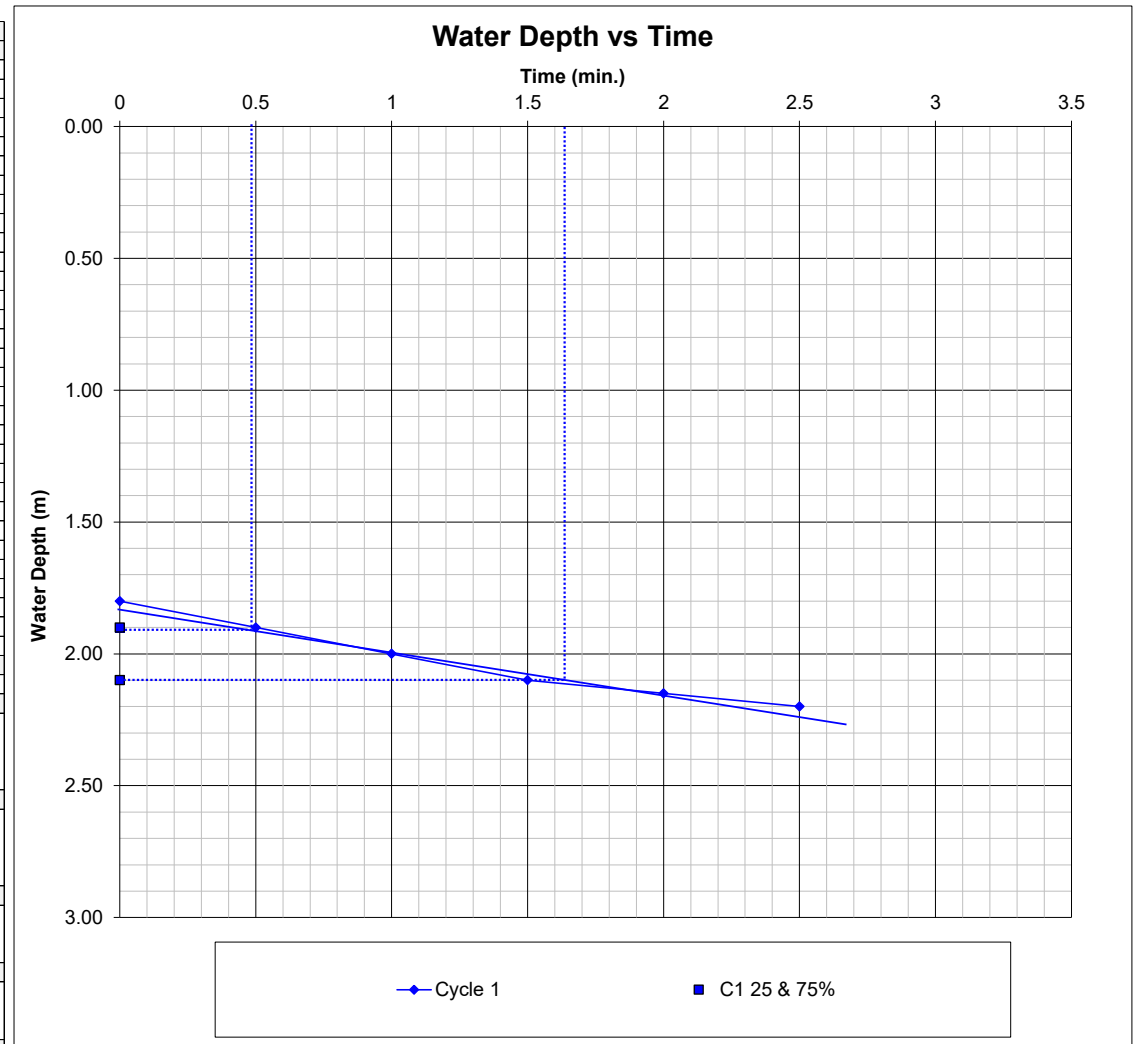
Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.50		
Water Depths (m)			
Water depth at start of test	1.50		
Water depth at end of test	2.40		
Effective depth (measured)	0.90		
% Effective storage depth	0.90		
Effective Storage Depths (m)			
Effective storage depth (100%)	1.00		
Effective storage depth (75%)	0.75		
Effective storage depth (50%)	0.50		
Effective storage depth (25%)	0.25		
Outflow Time (min)			
Time for measured outflow	1		
Time for 100% outflow	1		
Time for 75-25% outflow	1		
Volume of Outflow (m³)			
Over measured effective depth	1.13		
Over 100% effective depth	1.26		
From 75% - 25% effective depth	0.63		
Surface Area (m²)			
For 100% effective storage	6.26		
For 50% effective storage	3.76		
Over measured depth	5.76		
Soil Infiltration Rate (m/s)	Cycle 1	Cycle 2	Cycle 3
Over 100% effective depth	3.4E-03		
Over measured depth	3.3E-03		
Over 75% - 25% effective depth	5.1E-03		



11882 Hangers 18-20, Colerne Industrial Estate

Remarks

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.20		
Water Depths (m)			
Water depth at start of test	1.80		
Water depth at end of test	2.20		
Effective depth (measured)	0.40		
% Effective storage depth	1.00		
Effective Storage Depths (m)			
Effective storage depth (100%)	0.40		
Effective storage depth (75%)	0.30		
Effective storage depth (50%)	0.20		
Effective storage depth (25%)	0.10		
Outflow Time (min)			
Time for measured outflow	3		
Time for 100% outflow	3		
Time for 75-25% outflow	1		
Volume of Outflow (m³)			
Over measured effective depth	0.50		
Over 100% effective depth	0.50		
From 75% - 25% effective depth	0.25		
Surface Area (m²)			
For 100% effective storage	3.26		
For 50% effective storage	2.26		
Over measured depth	3.26		
Soil Infiltration Rate (m/s)	Cycle 1	Cycle 2	Cycle 3
Over 100% effective depth	1.0E-03		
Over measured depth	1.0E-03		
Over 75% - 25% effective depth	1.9E-03		



APPENDIX F

LABORATORY CHEMICAL TEST RESULTS (SOILS)



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Analytical Report Number : 16-30993

Project / Site name:	Hangers 18-20, Colerne	Samples received on:	25/10/2016
Your job number:	11882	Samples instructed on:	25/10/2016
Your order number:	11882	Analysis completed by:	02/11/2016
Report Issue Number:	1	Report issued on:	02/11/2016
Samples Analysed:	11 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 16-30993

Project / Site name: Hangers 18-20, Colerne

Your Order No: 11882

Lab Sample Number				648337	648338	648339	648340	648341
Sample Reference				WS1	WS1	WS4	TP1	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	1.50	0.40	0.10	0.10
Date Sampled				21/10/2016	21/10/2016	21/10/2016	21/10/2016	21/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	0.90	5.5	2.8	13	15
Total mass of sample received	kg	0.001	NONE	0.53	0.48	0.49	0.41	0.47

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.9	9.1	11.2	8.2	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1	-	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	400	-	1600	1100	930
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.041	0.0073	0.018	0.0098	0.0052
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	7.3	-	-	-
Sulphide	mg/kg	1	MCERTS	59	-	19	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	640	-	580	510	380
Total Organic Carbon (TOC)	%	0.1	MCERTS	2.9	-	0.1	2.4	0.9
Loss on Ignition @ 450°C	%	0.2	MCERTS	5.4	-	1.7	6.9	4.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	2.5	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	7.5	-	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	6.1	-	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	10	-	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	61	-	0.32	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	22	-	0.18	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	140	-	2.3	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	120	-	2.3	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	69	-	1.3	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	63	-	0.89	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	83	-	2.0	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	52	-	0.81	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	84	-	1.5	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	49	-	0.79	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	10	-	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	56	-	0.88	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	835	-	13.3	< 1.60	< 1.60
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	1.1	10	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.06	-	< 0.06	0.32	0.41
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	-	1.3	1.5	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	-	1.2	0.6	0.3
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	-	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.9	-	5.6	16	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	-	10	16	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	-	24	23	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.5	-	4.5	11	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	15	-	11	29	34
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	37	-	62	40	34



Analytical Report Number: 16-30993

Project / Site name: Hangers 18-20, Colerne

Your Order No: 11882

Lab Sample Number				648342	648343	648344	648345	648346
Sample Reference				TP3	WS6	TP5	TP6	WS8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.20	0.10	0.10	0.20
Date Sampled				21/10/2016	21/10/2016	21/10/2016	21/10/2016	21/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	2.2	14	10	3.2
Total mass of sample received	kg	0.001	NONE	0.48	0.53	0.48	0.48	0.49

Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.7	8.7	8.4	8.5	9.0
Total Cyanide	mg/kg	1	MCERTS	-	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	2400	820	1000	940
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0088	0.074	0.0062	0.0067	0.090
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	8.8	-	-	-	-
Sulphide	mg/kg	1	MCERTS	-	29	< 1.0	< 1.0	24
Total Sulphur	mg/kg	50	MCERTS	-	1000	340	360	590
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	2.4	0.8	0.9	1.9
Loss on Ignition @ 450°C	%	0.2	MCERTS	-	3.1	3.3	3.8	2.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	< 0.05	< 0.05	0.65
Acenaphthylene	mg/kg	0.1	MCERTS	-	0.15	< 0.10	< 0.10	2.7
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.10	< 0.10	< 0.10	2.7
Fluorene	mg/kg	0.1	MCERTS	-	< 0.10	< 0.10	< 0.10	3.4
Phenanthrene	mg/kg	0.1	MCERTS	-	0.25	< 0.10	< 0.10	26
Anthracene	mg/kg	0.1	MCERTS	-	0.16	< 0.10	< 0.10	8.9
Fluoranthene	mg/kg	0.1	MCERTS	-	0.72	< 0.10	0.66	83
Pyrene	mg/kg	0.1	MCERTS	-	0.86	< 0.10	0.66	79
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	0.65	< 0.10	0.32	38
Chrysene	mg/kg	0.05	MCERTS	-	0.50	< 0.05	0.26	30
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	1.2	< 0.10	0.40	46
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	0.84	< 0.10	0.27	16
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	0.96	< 0.10	0.34	37
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	0.84	< 0.10	0.21	20
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	0.22	< 0.10	< 0.10	4.2
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.98	< 0.05	0.20	23

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	8.29	< 1.60	3.32	420
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	110	11	10	4.4
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.09	0.26	0.27	< 0.06
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.6	0.9	1.2	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	2.6	0.4	0.4	0.7
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	5.0	14	13	4.6
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	12	14	16	6.6
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	170	15	17	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	9.1	11	9.6	2.5
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	12	26	25	5.9
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	210	32	29	62

Analytical Report Number: 16-30993

Project / Site name: Hangers 18-20, Colerne

Your Order No: 11882

Lab Sample Number				648347				
Sample Reference				WS8				
Sample Number				None Supplied				
Depth (m)				0.50				
Date Sampled				21/10/2016				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	4.4				
Total mass of sample received	kg	0.001	NONE	0.49				

Asbestos in Soil	Type	N/A	ISO 17025	-				
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8				
Total Cyanide	mg/kg	1	MCERTS	-				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0066				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	6.6				
Sulphide	mg/kg	1	MCERTS	-				
Total Sulphur	mg/kg	50	MCERTS	-				
Total Organic Carbon (TOC)	%	0.1	MCERTS	-				
Loss on Ignition @ 450°C	%	0.2	MCERTS	-				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-				
Acenaphthylene	mg/kg	0.1	MCERTS	-				
Acenaphthene	mg/kg	0.1	MCERTS	-				
Fluorene	mg/kg	0.1	MCERTS	-				
Phenanthrene	mg/kg	0.1	MCERTS	-				
Anthracene	mg/kg	0.1	MCERTS	-				
Fluoranthene	mg/kg	0.1	MCERTS	-				
Pyrene	mg/kg	0.1	MCERTS	-				
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-				
Chrysene	mg/kg	0.05	MCERTS	-				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-				
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-				
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-				
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-				

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-				
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-				
Boron (water soluble)	mg/kg	0.2	MCERTS	-				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-				
Chromium (hexavalent)	mg/kg	4	MCERTS	-				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-				

Analytical Report Number : 16-30993

Project / Site name: Hangers 18-20, Colerne

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
648337	WS1	None Supplied	0.10	Black sandy loam with gravel and rubble.
648338	WS1	None Supplied	1.50	Beige sand with gravel.
648339	WS4	None Supplied	0.40	Brown sandy loam with gravel.
648340	TP1	None Supplied	0.10	Brown loam and sand with gravel.
648341	TP2	None Supplied	0.10	Brown loam and sand with gravel.
648342	TP3	None Supplied	1.00	Light brown loam and sand.
648343	WS6	None Supplied	0.20	Grey sandy loam with gravel.
648344	TP5	None Supplied	0.10	Brown loam and clay.
648345	TP6	None Supplied	0.10	Brown loam and sand.
648346	WS8	None Supplied	0.20	Grey sandy loam with rubble.
648347	WS8	None Supplied	0.50	Light brown clay and sand.

Analytical Report Number : 16-30993

Project / Site name: Hangers 18-20, Colerne

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Iss No 16-30993-1 Hangers 18-20, Colerne 11882

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The results included within the report are representative of the samples submitted for analysis.

Page 6 of 6

APPENDIX G

LABORATORY GEOTECHNICAL TEST RESULTS



TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Integral Geotechnique
Client Address: 7 Beddau Way
Castlegate Business Park
CF83 2AX
Contact: Lowri Williams
Site Name: Hangers 18-20, Colerne
Site Address: Not Given

Client Reference: 11882
Job Number: 16-30997
Date Sampled: 21/10/2016
Date Received: 25/10/2016
Date Tested: 31/10/2016
Sampled By: Lowri Williams

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
648350	Not Given	WS1	1.5	Not Given	D	Yellowish brown gravelly clayey SAND. Gravel is sandstone	13
648351	Not Given	TP3	1	Not Given	D	Yellowish brown gravelly clayey SAND. Gravel is sandstone	11
648352	Not Given	WS8	0.5	Not Given	D	Yellowish brown gravelly clayey SAND. Gravel is sandstone	13

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Date Reported: 04/11/2016

Signed:

Mark Beastall
Geotechnical Commercial
Manager

for and on behalf of i2 Analytical Ltd

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The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."



TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Integral Geotechnique
Client Address: 7 Beddau Way
Castlegate Business Park
CF83 2AX

Contact: Lowri Williams
Site Name: Hangers 18-20, Colerne
Site Address: Not Given

Client Reference: 11882
Job Number: 16-30997
Date Sampled: 21/10/2016
Date Received: 25/10/2016
Date Tested: 02/11/2016
Sampled By: Lowri Williams

TEST RESULTS

Laboratory Reference: 648350

Sample Reference: Not Given

Description: Yellowish brown gravelly clayey SAND. Gravel is sandstone

Location: WS1

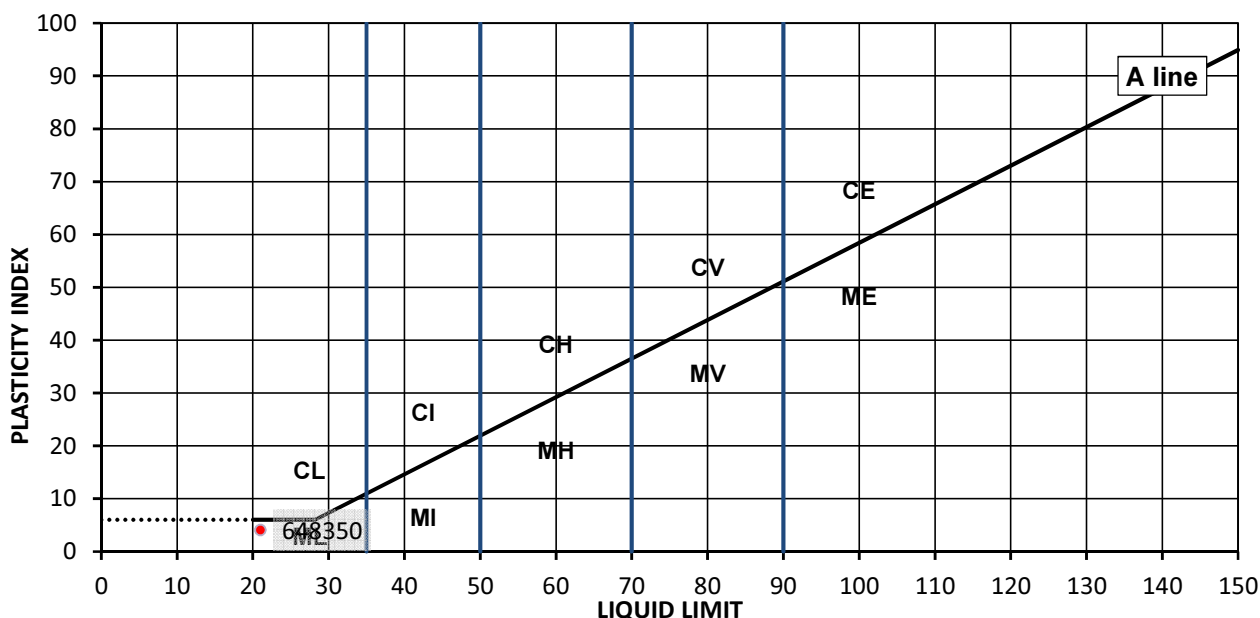
Sample Preparation: Tested after washing to remove >425um

Sample Type: D

Depth Top [m]: 1.5

Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
13	21	17	4	38



Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Mark Beastall
Geotechnical Commercial
Manager

Date Reported: 04/11/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Integral Geotechnique
Client Address: 7 Beddau Way
Castlegate Business Park
CF83 2AX

Contact: Lowri Williams
Site Name: Hangers 18-20, Colerne
Site Address: Not Given

Client Reference: 11882
Job Number: 16-30997
Date Sampled: 21/10/2016
Date Received: 25/10/2016
Date Tested: 02/11/2016
Sampled By: Lowri Williams

TEST RESULTS

Laboratory Reference: 648351

Sample Reference: Not Given

Description: Yellowish brown gravelly clayey SAND. Gravel is sandstone

Location: TP3

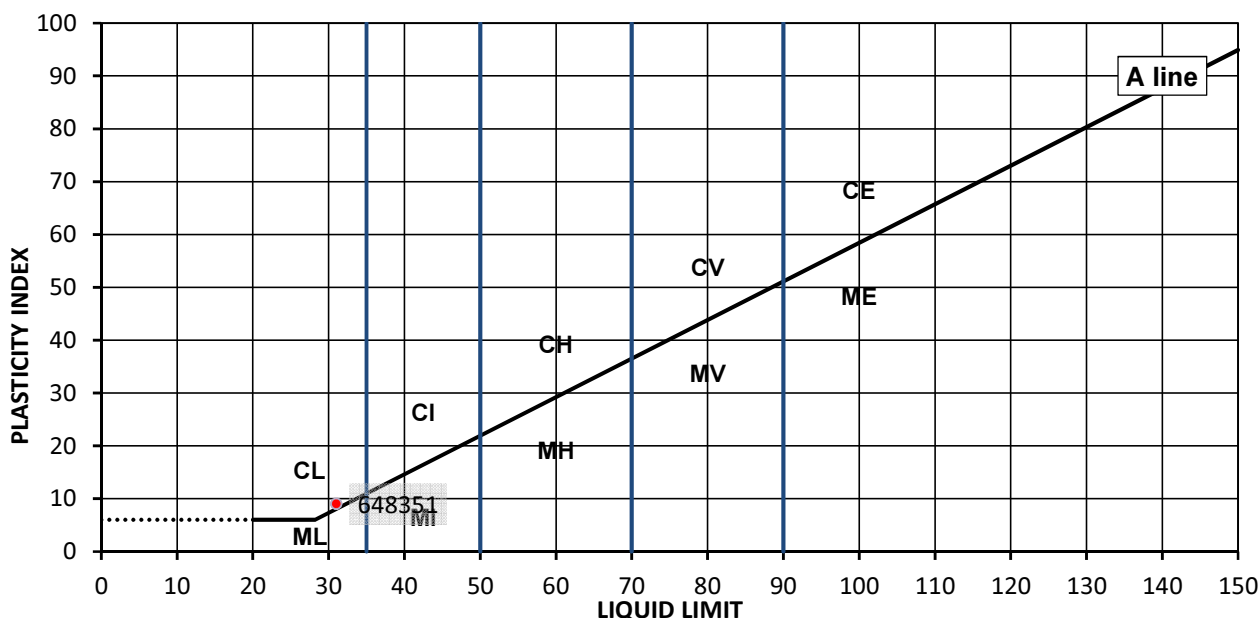
Sample Preparation: Tested after washing to remove >425um

Sample Type: D

Depth Top [m]: 1

Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
11	31	22	9	37



Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	
M	Silt	
	L	Low
	I	Medium
	H	High
	V	Very high
	E	Extremely high
	O	append to classification for organic material (eg CHO)
	Organic	

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Mark Beastall
Geotechnical Commercial
Manager

Date Reported: 04/11/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

4041

Client: Integral Geotechnique
Client Address: 7 Beddau Way
Castlegate Business Park
CF83 2AX

Contact: Lowri Williams
Site Name: Hangers 18-20, Colerne
Site Address: Not Given

Client Reference: 11882
Job Number: 16-30997
Date Sampled: 21/10/2016
Date Received: 25/10/2016
Date Tested: 02/11/2016
Sampled By: Lowri Williams

TEST RESULTS

Laboratory Reference: 648352

Sample Reference: Not Given

Description: Yellowish brown gravelly clayey SAND. Gravel is sandstone

Location: WS8

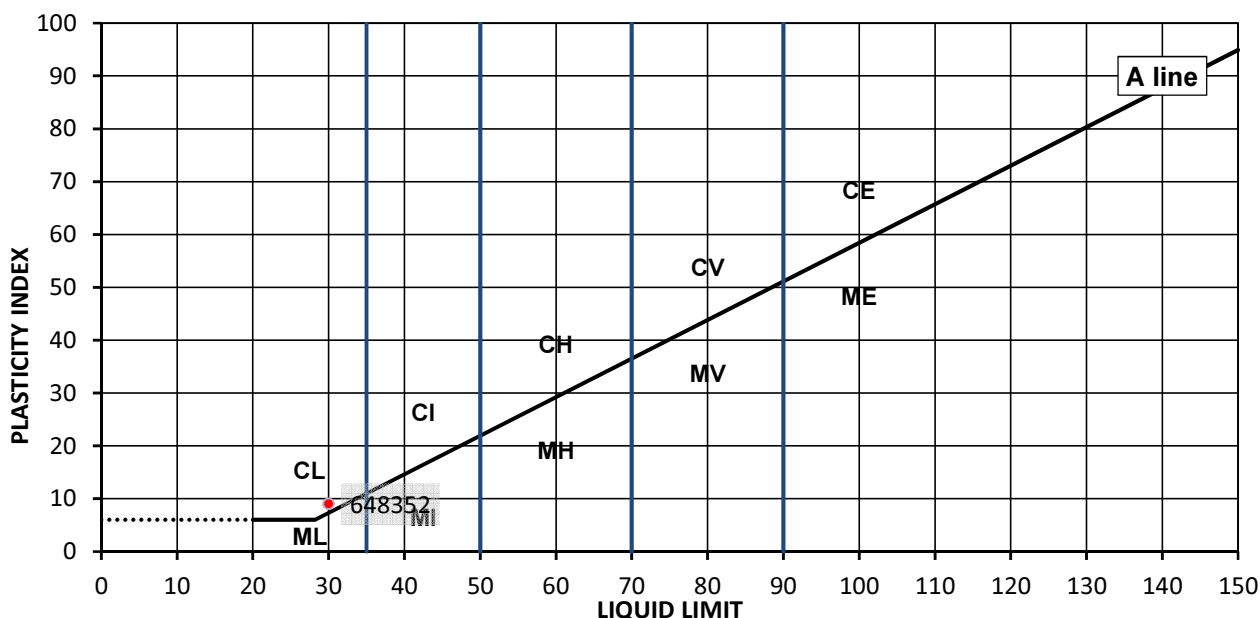
Sample Preparation: Tested after washing to remove >425um

Sample Type: D

Depth Top [m]: 0.5

Depth Base [m]: Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
13	30	21	9	41



Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

	Plasticity	Liquid Limit
C	Clay	below 35
M	Silt	35 to 50
	L Low	50 to 70
	I Medium	70 to 90
	H High	exceeding 90
	V Very high	
	E Extremely high	
Organic	O	append to classification for organic material (eg CHO)

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Mark Beastall
Geotechnical Commercial
Manager

Date Reported: 04/11/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Summary of Classification Test Results

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS



Client: Integral Geotechnique
Client Address: 7 Beddau Way
Castlegate Business Park
CF83 2AX
Contact: Lowri Williams
Site Name: Hangers 18-20, Colerne
Site Address: Not Given

Client Reference: 11882
Job Number: 16-30997
Date Sampled: 21/10/2016
Date Received: 25/10/2016
Date Tested: 02/11/2016
Sampled By: Lowri Williams

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Attenberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk	dry		% Passing 425um	LL	PL	PI	
							Mg/m3	Mg/m3						
648350	WS1	Not Given	1.50	Not Given	D	Yellowish brown gravelly clayey SAND. Gravel is sandstone	-	-	13	38	21	17	4	-
648351	TP3	Not Given	1.00	Not Given	D	Yellowish brown gravelly clayey SAND. Gravel is sandstone	-	-	11	37	31	22	9	-
648352	WS8	Not Given	0.50	Not Given	D	Yellowish brown gravelly clayey SAND. Gravel is sandstone	-	-	13	41	30	21	9	-

Comments:

Approved:

Mirosława Pytlak
PL Head of Geotechnical Section

Signed:

Mark Beastall
Geotechnical Commercial Manager

Date Reported: 04/11/2016

for and on behalf of i2 Analytical Ltd

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APPENDIX H

SUMMARY OF CHEMICAL RESULTS

SUMMARY OF LABORATORY SOIL TEST RESULTS

METALS AND SEMI-METALS

Job No.: 11882
 Site: Hangers 18-20, Colerne Industrial Park
 Soil Type: Made Ground and Topsoil
 Soil Organic Matter: 1%

No.	Location	Depth (m)	Arsenic (mg/kg)	Boron (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (Elemental) (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
1	WS1	0.10	< 1.0	0.2	0.06	0.8	7.9	< 4.0	24	13	< 0.3	9.5	< 1.0	15	37
2	WS1	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-
3	WS4	0.40	1.1	1.3	< 0.06	1.2	5.6	< 4.0	10	24	< 0.3	4.5	< 1.0	11	62
4	TP1	0.10	10	1.5	0.32	0.6	16	< 4.0	16	23	< 0.3	11	< 1.0	29	40
5	TP2	0.10	14	1.4	0.41	0.3	17	< 4.0	15	15	< 0.3	13	< 1.0	34	34
6	TP3	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-
7	WS6	0.20	110	0.6	0.09	2.6	5.0	< 4.0	12	170	< 0.3	9.1	< 1.0	12	210
8	TP5	0.10	11	0.9	0.26	0.4	14	< 4.0	14	15	< 0.3	11	< 1.0	26	32
9	TP6	0.10	10	1.2	0.27	0.4	13	< 4.0	16	17	< 0.3	9.6	< 1.0	25	29
10	WS8	0.20	4.4	0.4	< 0.06	0.7	4.6	< 4.0	6.6	17	< 0.3	2.5	< 1.0	5.9	62
Screening Criteria Value			37.0	290.0	1.7	26.0	-	21.0	2400.0	200.0	1.2	180.0	250.0	410.0	3700.0
Source of Screening Criteria Value			C4SL	S4UL	S4UL	C4SL	-	C4SL	S4UL	C4SL	S4UL	S4UL	S4UL	S4UL	S4UL

SUMMARY OF LABORATORY SOIL TEST RESULTS

INORGANIC CHEMICALS & OTHERS

Job No.: 11882
 Site: Hangers 18-20, Colerne Industrial Park
 Soil Type: Made Ground and Topsoil
 Soil Organic Matter: 1%

No.	Location	Depth (m)	Cyanide (mg/kg)	Loss on ignition, dried solids (%)	Moisture content at 30 C (%)	Phenol (mg/kg)	pH (pH units)	Water Soluble Sulphate (g/l)	Sulphate Total as SO4 (mg/kg)	Sulphide (mg/kg)	Total Sulphur (mg/kg)	TOC by Ignition in O2 (%)	Equivalent SOM (%)	Asbestos in Soil	Asbestos in Soil Identification Name	Asbestos Quantification (%)
1	WS1	0.10	< 1	5.4	0.90	< 1.0	8.9	0.041	400	59	640	2.9	4.99	Not-detected	#N/A	#N/A
2	WS1	1.50	-	-	5.5	-	9.1	0.0073	-	-	-	-	<0.1	-	#N/A	#N/A
3	WS4	0.40	< 1	1.7	2.8	< 1.0	11.2	0.018	1600	19	580	0.1	0.17	Not-detected	#N/A	#N/A
4	TP1	0.10	< 1	6.9	13	< 1.0	8.2	0.0098	1100	< 1.0	510	2.4	4.13	Not-detected	#N/A	#N/A
5	TP2	0.10	< 1	4.1	15	< 1.0	8.5	0.0052	930	< 1.0	380	0.9	1.55	Not-detected	#N/A	#N/A
6	TP3	1.00	-	-	12	-	8.7	0.0088	-	-	-	-	<0.1	-	#N/A	#N/A
7	WS6	0.20	< 1	3.1	2.2	< 1.0	8.7	0.074	2400	29	1000	2.4	4.13	Not-detected	#N/A	#N/A
8	TP5	0.10	< 1	3.3	14	< 1.0	8.4	0.0062	820	< 1.0	340	0.8	1.38	Not-detected	#N/A	#N/A
9	TP6	0.10	< 1	3.8	10	< 1.0	8.5	0.0067	1000	< 1.0	360	0.9	1.55	Not-detected	#N/A	#N/A
10	WS8	0.20	< 1	2.4	3.2	< 1.0	9.0	0.090	940	24	590	1.9	3.27	Not-detected	#N/A	#N/A
11	WS8	0.50	-	-	4.4	-	8.8	0.0066	-	-	-	-	<0.1	-	#N/A	#N/A
Screening Criteria Value			34.0	-	-	280.0	-	-	-	-	-	-	-	-	-	0.001
Source of Screening Criteria Value			ATRISK	-	-	S4UL	-	-	-	-	-	-	-	-	-	IOM

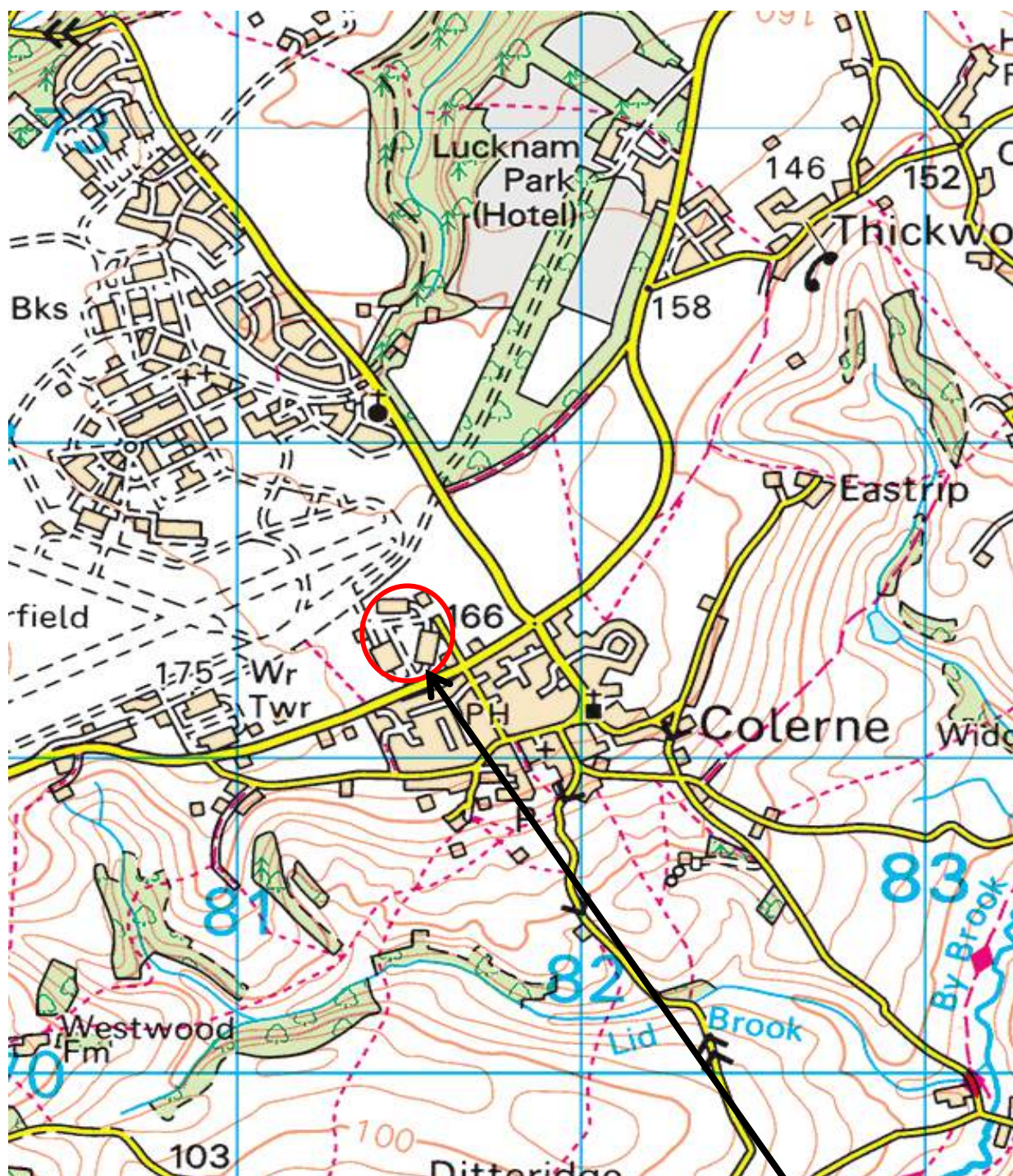
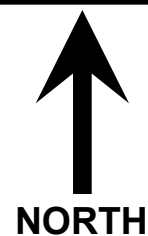
SUMMARY OF LABORATORY SOIL TEST RESULTS

POLYAROMATIC HYDROCARBONS (PAH)

Job No.: 11882
 Site: Hangers 18-20, Colerne Industrial Park
 Soil Type: Made Ground and Topsoil
 Soil Organic Matter: 1%

No.	Location	Depth (m)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(ghi)perylene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo(ah)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(123cd)pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
1	WS1	0.10	6.1	7.5	22	69	84	83	56	52	63	10	140	10	49	2.5	61	120
2	WS1	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	WS4	0.40	< 0.10	< 0.10	0.18	1.3	1.5	2.0	0.88	0.81	0.89	< 0.10	2.3	< 0.10	0.79	< 0.05	0.32	2.3
4	TP1	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.05	< 0.10	< 0.05	< 0.10	< 0.10	< 0.10	< 0.10	< 0.05	< 0.10	< 0.10
5	TP2	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.05	< 0.10	< 0.05	< 0.10	< 0.10	< 0.10	< 0.10	< 0.05	< 0.10	< 0.10
6	TP3	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	WS6	0.20	< 0.10	0.15	0.16	0.65	0.96	1.2	0.98	0.84	0.50	0.22	0.72	< 0.10	0.84	< 0.05	0.25	0.86
8	TP5	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.05	< 0.10	< 0.05	< 0.10	< 0.10	< 0.10	< 0.10	< 0.05	< 0.10	< 0.10
9	TP6	0.10	< 0.10	< 0.10	< 0.10	0.32	0.34	0.40	0.20	0.27	0.26	< 0.10	0.66	< 0.10	0.21	< 0.05	< 0.10	0.66
10	WS8	0.20	2.7	2.7	8.9	38	37	46	23	16	30	4.2	83	3.4	20	0.65	26	79
11	WS8	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Screening Criteria Value			210.0	170.0	2400.0	7.2	5.0	2.6	320.0	77.0	15.0	0.2	280.0	170.0	27.0	2.3	95.0	620.0
Source of Screening Criteria Value			S4UL	S4UL	S4UL	S4UL	C4SL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL	S4UL

FIGURES



**SITE
LOCATION**

Figure 1 - Site Location

Hanger 18-20, Colerne Industrial Park

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991
Fax: 029 2086 2176