

1-3 castle crescent, reading

SUSTAINABLE DRAINAGE STATEMENT

MR R BROWN

SEPTEMBER 2015



1-3 Castle Crescent, Reading
Sustainable Drainage Statement

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Date:	15 September 2015
Document Reference:	A092 – Sustainable Drainage Statement 02

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1.0 Introduction

Context

- 1.1. This report has been prepared by Abley Letchford Partnership Limited, on behalf of Mr R. Brown, in relation to the proposed development of 13 residential flats on land known as 1-3 Castle Crescent, Reading. Hereby known as the Development.
- 1.2. **Appendix 1** shows the site in its local context

Scope of the Report

- 1.3. This report provides an assessment of the existing site with respect to drainage and flood risk.
- 1.4. The report outlines a strategy for the disposal of surface and foul water from the site once redeveloped for its intended residential purpose.
- 1.5. This report is not intended to provide a formal detailed drainage design, but to demonstrate the redevelopment can provide an acceptable means of surface water and foul water drainage disposal.

Report Structure

- 1.6. This report addresses the requirements of NPPF and considers the following aspects:
 - Section 2: Policy and Sources of Information – a review of policy relevant to the assessment and sources of information
 - Section 3: Baseline Environmental Conditions – a description of the site location, its topography and hydrology, and the development proposals.
 - Section 4: Flood Risk – the effect of flooding within the existing site layout from all sources.
 - Section 5: Drainage Strategy – flood risk from the Site and appropriate mitigation measures to protect the site post development including surface and foul water drainage strategies.
 - Section 6: Summary and Conclusions – a review of the suitability of the development proposals in the context of site vulnerability and the requirements of NPPF.

2.0 Policy and Sources of Information

Introduction

- 2.1. This chapter provides a review of policy relevant to the assessment and sources of information

National Planning Policy

- 2.2. National Policy in relation to flood risk is set out in Section 10 of the National Planning Policy Framework (NPPF) and Planning Practice Guidance ID:7 for Flood Risk and Coastal Change (PPG). Flood Risk is discussed at Paragraphs 99 to 104 of the NPPF. Paragraphs 99 and 100 set out Local Plan-making policy and is therefore, not considered relevant to the determination of this planning application.
- 2.3. Paragraphs 101 to 104 discuss the Sequential approach. Paragraph 101 makes reference to a Strategic Flood Risk Assessment that would form the basis of applying the Sequential Test for local authorities to allocate developments, whilst Paragraph 102 relates to Exemption Tests.
- 2.4. Paragraph 103 discusses the determination of planning applications stating:
Local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment following the Sequential Test, and if required the Exception Test, it can be demonstrated that:
- *Within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location: and*
 - *Development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and gives priority to the use of sustainable drainage systems.*
- 2.5. The notes accompanying Paragraph 103 state:
A site specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1; all purposes for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problem; and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding.
- 2.6. The Site is a Brownfield site, extends less than 1 hectare in total and is located within Flood Zone 1; therefore a site specific flood risk assessment is **not** required.
- 2.7. In addition current guidance on development and flood risk is contained within CIRIA (2004) Funders report CP/102 Development and Flood Risk – Guidance for the Construction Industry which identifies several key aims for a development to ensure it is sustainable in flood risk terms.



Environment Agency

- 2.8. The Flood and Water Management Act 2010 provides the Environment Agency a strategic overview role for all forms of flooding and coastal erosion. They also have direct responsibility for the prevention, mitigation and remediation of flood damage for main rivers and coastal areas. The Environment Agency is the statutory consultee with regards to flood risk and planning.
- 2.9. Environment Agency Standing Advice has been consulted and reviewed during this report.

Local Authorities

- 2.10. Planning guidance written by Reading Borough Council regarding flood risk and drainage was consulted to assess the mitigation policies in place. This included the Core Strategy, the Sites and Detailed Policies and the Level 1 Strategic Flood Risk Assessment (SFRA) (March 2009).
- 2.11. Reading Borough Councils Planning Applications Validation Checklist and Guidance (July 2015) provides for Sustainable Drainage System (SuDS) proposals to support the application including:
- Infiltration tests of the existing ground.
 - Design calculations to show that the runoff from the site post development is no greater than the existing runoff from the site for a 1 in 100 year, 6 hour rainfall event, that no flooding occurs anywhere on site for a 1 in 30 year rainfall event and no flooding occurs in any building (including basement) or any utility plant susceptible to water during a 1 in 100 year rainfall event.
 - Connection details to existing watercourse and drainage networks if infiltration methods are not used together with acceptance of these connections from the relevant approving body (EA, LFA, Canal and River trust, Sewage undertaker).
- 2.12. This report provides details to discharge the above criteria and enable validation of the planning application.

Thames Water

- 2.13. Thames Water is responsible for the disposal of waste water and supply of clean water within Reading.
- 2.14. Information with regards to sewer and water main flooding contained within the SFRA has been consulted as part of this Report. All Water Companies have a statutory obligation to maintain a register of properties/areas which are at risk of flooding from the public sewerage system, and this is shown on the DG5 Flood Register.

Other Sources of Information

- 2.15. General information regarding the site setting and hydrology of the application site was carried out using the Environment Agency, the Cranfield University and the Envirocheck data available online.





3.0 Baseline Environmental Conditions

Introduction

- 3.1. This chapter provides for a description of the site location, its topography and hydrology, and the development proposals.

Site Location

- 3.2. The site lies to the west of Reading town centre below the A4 Bath Road.
- 3.3. Castle Crescent forms the northern frontage of the site, with Garnet Hill forming the eastern boundary. Existing residential properties lie to the south and west.
- 3.4. The site covers approximately 0.287 hectares (Ha).
- 3.5. The site lies within the administrative area of Reading Borough Council.
- 3.6. The National Grid Reference of the site is 470938, 172795.

Development Proposals

- 3.7. The proposed development would be accessed via the existing access points on Castle Crescent.
- 3.8. It is understood the proposals are for the conversion of an existing listed building to 5 residential flats and the construction of a new building containing 8 residential flats. In addition to the residential dwellings there will be new car parking, communal open space and general landscaping.

Existing Site

- 3.9. The existing site is currently Brownfield, with a disused listed building, a disused outbuilding, a dilapidated garage block, areas of hardstanding in concrete, gravel or asphalt and areas of grass, trees and vegetation.
- 3.10. The site falls predominantly north to south with levels ranging from approximately 59.50 AOD on the northern boundary to approximately 58.80m AOD in the most southern corner.

Existing Drainage

- 3.11. It is understood the site currently drains by gravity sewers/drains to the adopted sewers in Castle Crescent and Garnet Hill.
- 3.12. The Thames Water asset plans indicate there is an adopted 225mm diameter Thames Water surface water sewer and an adopted 300mm diameter Thames Water foul water sewer in Castle Crescent.
- 3.13. There are manhole connection points to these sewers adjacent to the existing site access.
- 3.14. The Thames Water asset plans also indicate there are further adopted sewers in Garnet Hill to the south east of the site, which are an adopted 225mm diameter Thames Water surface water sewer and an adopted 225mm diameter Thames Water foul water sewer.
- 3.15. The Thames water records show only those sewers that are known to be maintained by Thames Water. Privately owned sewers are not shown on public records.



3.16. The sites topographical survey indicates a network of private drains within the existing site including yard gullies. It is understood the existing drains discharge offsite to the existing sewers in Castle Crescent.

3.17. The Thames Water records are provided in the Appendices.

Geology

3.18. The British Geological Survey record plans for the area indicates the Site is likely to be underlain by bedrock of London Clay, which has a thickness of approximately 21m.

3.19. The London Clay bedrock is indicated to be underlain by Lambeth Group over Chalk Formations.

3.20. Infiltration testing has not been carried out to date. However, experience of other development sites in the Reading area, the lack of infiltration type drainage on the existing site, and in the surrounding area, and the underlying London Clay indicates the site is **not suitable** to infiltration type techniques.

4.0 Flood Risk

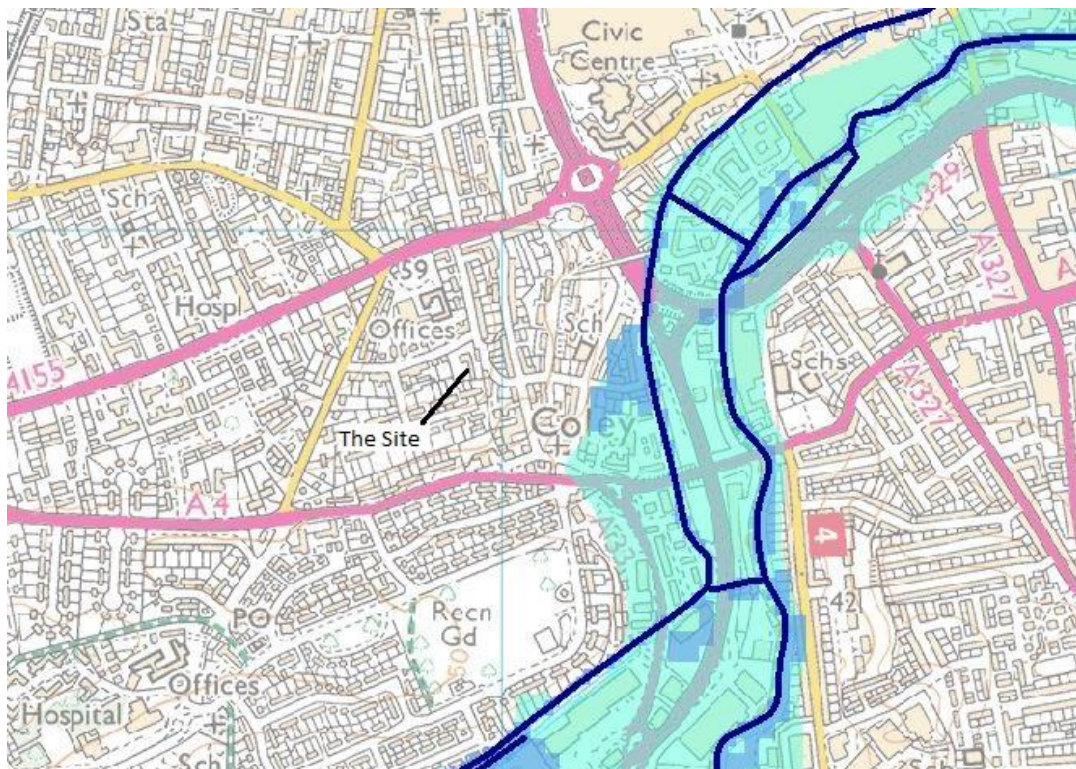
Introduction

- 4.1. This chapter examines the effect of flooding within the existing site layout from all sources, including fluvial, pluvial and external sources.

Flood Risk to the site from Fluvial Flooding Sources

- 4.2. According to the Environment Agency's Flood Zone Maps, the Site lies entirely within Flood Zone 1. This zone comprises land where flooding from rivers and the sea is very unlikely. There is less than a 0.1 per cent (1 in 1000) chance of flooding occurring each year.

Environment Agency's Flood Zone Map



Flood Risk to the site from Groundwater

- 4.3. The SFRA, EA website and local available documents indicate there is no history of flooding at the Site from groundwater.
- 4.4. Groundwater flooding tends to occur sporadically in both location and time. Groundwater flooding has not been a risk in the area and there is no reason to believe it would present a problem

Flood Risk to the site from Pluvial Flooding Sources

- 4.5. The SFRA, EA website and local available documents indicate there is no history of flooding at the Site from heavy rainfall events or overland flood routes.

4.6. The SFRA, EA website and local available documents indicate there is no existing flood risk from: reservoirs, sewers, canals or other artificial sources.

- 4.7. NPPF states that Local Planning Authorities allocating land for development should apply the Sequential Test to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed.
- 4.8. The Environment Agency Flood Zones and acceptable development types are explained in the Table below. All development types are generally deemed acceptable in terms of flood risk in Flood Zone 1.
- 4.9. PPG ID: 7 (Table 1) appropriate uses have been identified for the Flood Zones. Applying the Flood Risk Vulnerability Classification in Table 2 and 3 of PPG ID: 7, the proposed development is classified as 'more vulnerable'.

Flood Risk Vulnerability classification (see Table 1 PPG ID: 7)	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	Yes	Yes	Yes	Yes	Yes
Zone 2	Yes	Yes	Exception test required	Yes	Yes
Zone 3a	Exception test required	Yes	No	Exception test required	Yes
Zone 3b 'Functional Floodplain'	Exception test required	Yes	No	No	No

Key: Yes: Development is appropriate, No: Development should not be permitted.

4.10. It is therefore considered that, within the context of a site specific FRA, the Site passes the Sequential Test with respect to NPPF and is suitable for the type of development proposed.

Summary

4.11. Given the information that is available, it is considered that a 'low' level of flood risk is posed by all sources of flooding.



5.0 Drainage Strategy

Introduction

- 5.1. This chapter provides details on the surface and foul water drainage strategy and measures to drain the Development.

Management Strategy

- 5.2. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in the catchment, particularly flooding downstream. Changes of land use on previously developed land can have significant downstream impacts where the existing drainage system may not have sufficient capacity for the additional drainage.
- 5.3. A surface water management strategy for the development will be required to manage and reduce the flood risk posed by the surface water runoff from the site.
- 5.4. There are three possible options to discharge the surface water runoff in accordance with requirement H3 of the Building Regulations 2010. Rainwater shall discharge to one of the following, listed in order of priority:
- An adequate soakaway or some other adequate infiltration system; or, where that is not reasonably practicable,
 - a watercourse; or where that is not reasonably practicable,
 - a sewer
- 5.5. An assessment of the surface water runoff rates has been undertaken, in order to determine the surface water options and attenuation requirements for the site. The assessment considers the impact of the site compared to current conditions. Therefore, the surface water attenuation requirement for the developed site can be determined and reviewed against existing arrangements.
- 5.6. The surface water drainage arrangements for any development site should be such that the volumes 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.

Sustainable Drainage Systems – DEFRA

- 5.7. The document, Sustainable Drainage Systems – Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) (DEFRA), sets out non-statutory technical standards for sustainable drainage systems and should be used in conjunction with the NPPF and Planning Practice Guidance (PPG). The document states the following with regard to previously developed sites:
- S3. For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff

rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

- S5. Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.

Existing Drainage Conditions

- 5.8. The development site is approximately 0.287 hectares (ha) in area and is currently a mixture of permeable and impermeable surfaces.

	Existing Area (ha)	Proposed Area (ha)
Permeable	0.120	0.137
Impermeable	0.167	0.150
Total	0.287	0.287

- 5.9. It is assumed that the majority of rainfall currently discharges to the Thames Water sewers, situated in Castle Crescent, or drains to the permeable surface where it discharges by minimal infiltration and evapotranspiration. This is considered feasible given the soils which underlay the site.
- 5.10. An assessment of the existing surface water runoff rates has been undertaken, in order to determine the surface water options and attenuation requirements for the site.
- 5.11. In order to quantify any potential increase in surface water runoff, the existing Greenfield runoff rate from the site must initially be determined. The rates of runoff have been determined using the current 'industry best practice' guidelines as outlined in the Interim Code of Practice for SuDS. The recommended methodology for sites up to 50 hectares in area is the ICP SuDS method.
- 5.12. The following parameters have been incorporated into the runoff calculations:
- Catchment Area: 0.287 ha
 - Average Annual Rainfall (SAAR): 700mm/year
 - Soil: 0.150
 - Region No.: 6
 - CWI: 105
 - SPR: 10
- 5.13. Greenfield run off calculations for the existing site provide the following discharge rates and volumes

Annual Probability	Greenfield Pre-Development Runoff Rate (l/s)	Greenfield Pre-Development Volume (m ³)
1 in 1 year event	0.1	2.9
1 in 2 year event	0.1	3.6
QBar	0.1	
1 in 30 year event	0.3	8.5
1 in 100 year event	0.4	14.6

5.14. Calculation of the existing drainage regime, using Micro Drainage, for the 360 minute storm, as recommended by EA Report SC030219 Rainfall Runoff Management for Developments (Oct 2013), has indicated that the flows into the 225mm sewer, for the existing impermeable area, are:

Annual Probability	Brownfield Existing Runoff Rate (l/s)	Brownfield Existing Volume (m ³)
1 in 1 year event	4.5	28.7
1 in 2 year event	5.5	35.0
1 in 30 year event	10.0	63.9
1 in 100 year event	13.0	83.2

5.15. In order to represent the change in runoff at the site as a result of the proposed development, and to ascertain the required attenuation volumes, the urban rates of surface water leaving a developed site should be no greater than the rates prior to the proposed development, unless specific off-site arrangements are made and result in the same net effect.

5.16. All Micro Drainage outputs can be found in the appendices.

Sustainable Drainage (SuDS)

5.17. Sustainable water management measures should be used to control the surface water runoff from the proposed development site therefore, managing the flood risk to the site and surrounding areas from surface water runoff.

5.18. Current guidance, CIRIA (2004) Report C609, provides that a hierarchy of techniques should be identified, namely:

- **Prevention** – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
- **Source Control** – control of runoff at or very near its source (such as the use of rainwater harvesting).
- **Site Control** – management of water from several sub-catchments (including routing water from roofs and car parks to one/several large soakaways for the whole site).
- **Regional Control** – management of runoff from several sites, typically in a detention pond or wetland.



5.19. Given that infiltration type SuDS devices are not feasible on the site, albeit this will be subject to further infiltration testing at detailed design, the following SuDS options applicable to the site include:

- Permeable Paving (storage and filtration only)
- Underground storage (such as Cellular or oversized pipes)

Surface Water Drainage Strategy

5.20. Based on the proposed site layouts for the Development it has been estimated the impermeable area of the developed site will be approximately 52% impermeable (0.150 ha), as opposed to the 58% (0.167 ha) impermeable area of the existing site. In this case current site layouts show that the proposed development will **decrease** the impermeable area when compared to the existing condition.

5.21. A surface water management strategy for the proposed development has been developed so the drainage system will manage and reduce the flood risk posed by the surface water runoff from the site.

5.22. All designs would be in accordance with best practice as stipulated in EA Report SC030219 'Rainfall Runoff Management for Developments'.

5.23. To achieve the above, proposed discharge rates could be restricted to a rate similar to the existing Brownfield discharge rate for all storms up to and including the 1 in a 100 year storm event plus a 30% allowance for climate change. This would require on site attenuation to hold back flows controlled by an onsite control device, such as a Hydrobrake.

5.24. To comply with current best practice it would be desirable to restrict proposed discharge rates to a rate similar to the existing Greenfield discharge rate for all storms up to and including the 1 in a 100 year storm event plus a 30% allowance for climate change, or to a value of QBar for all storms. Again this would require on site attenuation to hold back flows controlled by an onsite control device, such as a Hydrobrake.

5.25. Notwithstanding the above it is impractical to restrict flows to a rate of less than 5 l/s. This rate is considered by current best practice to be the lowest maintainable rate using proprietary devices, such as a Hydrobrake, to restrict flows to.

5.26. Restricting flows to 5 l/s, for all storms up to and including the 1 in 100 year storm event plus 30% climate change, provides a discharge rate less than the existing calculated Brownfield discharge rates, closer to the desired Greenfield run off rates and below the Greenfield run off rates for the 1 in 30 and 1 in 100 year plus 30% climate change storm events.

5.27. In addition, restricting the discharge rates to 5 l/s, for the 1 in 30 and 1 in 100 year plus 30% climate change storm events, reduces the rate to below Greenfield run off rates and thus benefits the accepting system as a whole for the more critical flood event storms.

5.28. A Pre-Development enquiry form has been submitted to Thames Water and they have confirmed they will accept flows into the existing Thames Water sewer at a rate determined by the Local Authority, including the proposed 5 l/s.



5.29. The following summarises the key features of the surface water drainage design utilising 5 l/s for all design storms:

- Total attenuation with an outfall discharging at 5 l/s for the site will be up to 74m³.
- Flows attenuated for all storms up to and including the 1 in a 100 year storm event plus a 30% allowance for climate change.
- The attenuation requirement could be provided by an attenuation area located in the car parking such as permeable paving and/or underground cellular storage. However, further measures could be implemented on other parts of the development.
- The outfall will be a vortex control unit likely to route flows to the existing Thames Water manhole located in Castle Crescent.

Foul Drainage Strategy

5.30. The proposed development will create foul flows from the site, and it is anticipated that these foul flows will be discharged to the existing public foul sewer in Castle Crescent routing flows east to the existing sewerage treatment works.

5.31. A Pre-Development Enquiry has been submitted to TWUL and they have confirmed they will accept flows into the existing Thames Water sewer in Castle Crescent at the below rate.

5.32. In accordance with Sewers for Adoption (7th Edition), peak foul water discharge from a residential development can be considered to be 4,000 litres. Using this method, approximate foul flows can be calculated for the proposed residential development.

5.33. Peak foul flows from the proposed development is summarised in the below Table. The foul flow rates below are indicative only and should be established at detailed design.

Discharge Rate per Day (litres)	Number of Properties	Peak Foul Flow (l/s)
4,000	13	0.6

5.34. Based on the table above, a maximum flow of 0.6 l/s of foul flow can be anticipated to be discharged from the proposed development, assuming 13 residential units.

Site Drainage Summary

5.35. It has been demonstrated that both surface water and foul flows from the site can be managed such that flood risk to and from the site following development is not increased.

6.0 Summary and Conclusions

Introduction

- 6.1. This chapter summarises the previous chapters and assesses the suitability of the development proposals in the context of on and off site vulnerability.

Summary

- 6.2. This report presents a Sustainable Drainage Statement, in accordance with the NPPF and PPG, for planning permission for the construction of 13 residential dwellings and associated infrastructure, located on a site to the West of Reading town centre. This has included an assessment of the surface water drainage requirements of the site.
- 6.3. This report details the flood risk at the site and how this could be managed and mitigated to allow the site to be developed in support of the enclosed planning application. The proposed scale of development may present risks of flooding on-site and/or off-site if flooding is not effectively managed.

Assessment of Flood Risk

- 6.4. The report has demonstrated the following:
- The detailed flood map provided by the Environment Agency show that the site area is located within Flood Zone 1; outside the extent of the 1 in 1000 annual probability of flooding / <0.1% AEP.
 - In PPG ID: 7, the appropriate uses have been identified for the Flood Zones. The proposed development is classified as 'more vulnerable'. All development types are generally deemed acceptable in terms of flood risk in Flood Zone 1. Based on the above, the Sequential Test and the Exception Test should not be required.
 - There are no secondary flooding sources identified within the site

Site Drainage

- 6.5. In addition, the report has considered the potential impact of the development on surface water runoff rates.
- 6.6. The surface water management strategy for the proposed development will manage and reduce the flood risk posed by the surface water runoff from the site.
- 6.7. The site is approximately 0.287 ha in area and is currently a mixture of buildings and hard and soft landscaping. The impermeable area of the proposed development has been calculated at approximately 0.150 ha in area which is below the existing impermeable area. The attenuation volume required to reduce the post-application surface water runoff from the site to 5 l/s has been calculated as up to 74m³.
- 6.8. It is highly likely that infiltration type techniques will not be appropriate given the underlying ground conditions.



- 6.9. The attenuation requirement for the site could be met by either permeable paving and/or cellular storage in the car park and access area. Additionally, further SuDS techniques could be introduced over the wider site. Flows will be restricted by use of a control device, such as a Hydrobrake, and the outfall from the attenuation facilities will likely route flow to existing Thames Water adopted sewers in Castle Crescent.

Foul Water

- 6.10. Assuming a peak foul water discharge of 4,000 litres per property per day, for 13 residential units, the foul flow from the site will be approximately 0.6 l/s.
- 6.11. It is proposed that the foul flow will discharge to the existing Thames Water public foul sewer located within Castle Crescent routing flows east to the existing sewerage treatment works.

Conclusions

- 6.12. It is concluded that this Sustainable Drainage Statement demonstrates that the development satisfies NPPF and can be justified in the proposed location. Any increase in surface water runoff can be managed through the use of SuDS techniques.
- 6.13. In addition the report provides Sustainable Drainage Proposals in accordance with the Reading Borough Councils planning application validation information requirements.
- 6.14. This site specific Sustainable Drainage Statement has:
- Produced an assessment that meets the criteria set out in NPPF;
 - Assessed the risk posed to the site from flood events;
 - Assessed the risk posed to the site from the site storm water generation and the site storm water runoff management;
 - Assessed the risk the site poses to increase in flooding elsewhere.
 - Provided detailed designs for the proposed drainage system.
 - Assessed infiltration of the existing ground.
 - Provided calculations to show runoff from the site is no greater than the existing runoff and that no flooding occurs.
 - Provided connection details to existing drainage networks in lieu of infiltration.
- 6.15. The assessment demonstrates that by incorporating measures to accommodate flood risk within the development and by providing a sustainable surface water drainage strategy, the proposed development does not pose a flood risk.



Appendix 1 – Drawings

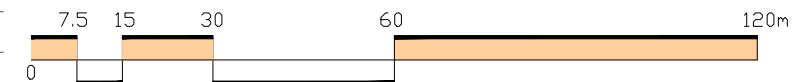
Site Location Plan

Site Masterplan



KEY

APPLICATION BOUNDARY



Project
1-3 CASTLE CRESCENT
READING

Drawing Title
SITE LOCATION PLAN

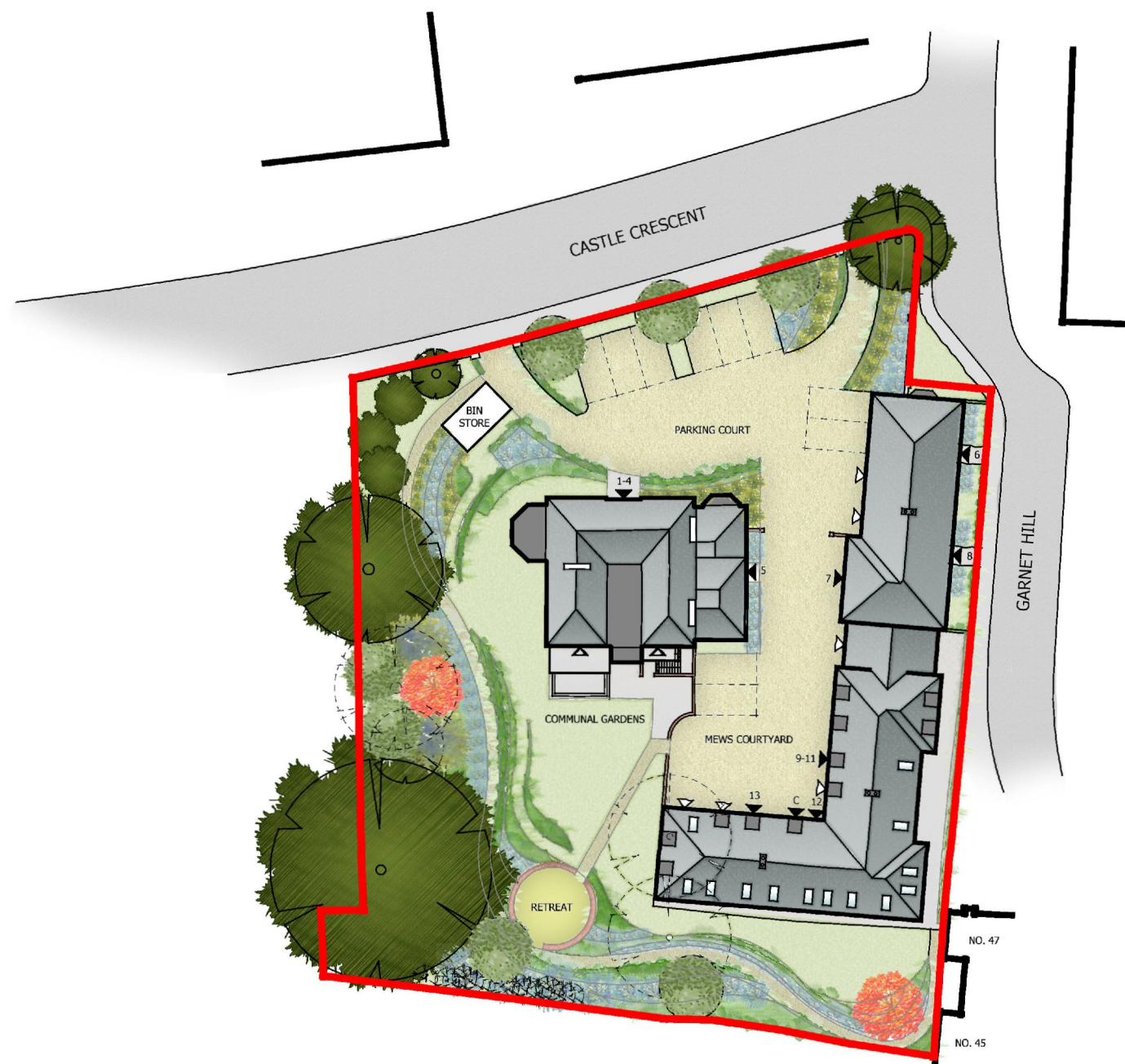
Date	Scale	Drawn by	Check by
AUG_2014	1:1250@A3	SP	ST
Project No	Drawing No	Revision	
23264	SL-01	-	

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KEY:

-  EXISTING TREE
-  PROPOSED TREE - REFER TO LANDSCAPE PROPOSAL DRAWING
-  EXISTING TREE TO BE REMOVED
-  SITE BOUNDARY

Project
**1-3 CASTLE CRESCENT
READING**
Drawing Title
COLOURED SITE LAYOUT

Date	Scale	Drawn by	Check by
JUNE 2015	1:500@A3	JT	SP
Project No	Drawing No	Revision	
23264	CSL-01	-	

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Appendix 2 – Micro Drainage

Micro Drainage Outputs

Abley Letchford Partnership Ltd		Page 1
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT GREENFIELD RUN OFF	
Date Sept 2015 File	Designed by SL Checked by LPA	
XP Solutions Source Control 2015.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.150
Area (ha)	0.287	Urban	0.000
SAAR (mm)	700	Region Number	Region 6

Results l/s

QBAR Rural	0.1
QBAR Urban	0.1
Q2 years	0.1
Q1 year	0.1
Q30 years	0.3
Q100 years	0.4

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Abley Letchford Partnership Ltd		Page 1
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions	Network 2015.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes SFA7

FSR Rainfall Model - England and Wales

Return Period (years)	5	Add Flow / Climate Change (%)	0
M5-60 (mm)	18.800	Minimum Backdrop Height (m)	0.000
Ratio R	0.400	Maximum Backdrop Height (m)	0.000
Maximum Rainfall (mm/hr)	50	Min Design Depth for Optimisation (m)	1.200
Maximum Time of Concentration (mins)	30	Min Vel for Auto Design only (m/s)	1.00
Foul Sewage (l/s/ha)	0.000	Min Slope for Optimisation (1:X)	500
Volumetric Runoff Coeff.	0.750		

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Auto Design
S1.000	10.000	0.067	150.0	0.167	5.00	0.0	0.600	0	225	
S1.001	10.000	0.067	150.0	0.000	0.00	0.0	0.600	0	225	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.16	58.150	0.167	0.0	0.0	0.0	1.07	42.4	22.6
S1.001	50.00	5.31	58.083	0.167	0.0	0.0	0.0	1.07	42.4	22.6

Abley Letchford Partnership Ltd		Page 2
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions	Network 2015.1	

Summary Wizard of 360 minute 1 year Summer I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

			Water	Surcharged	Flooded			Pipe	
PN	US/MH Name	Storm Rank	Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status
S1.000	S1	6	58.203	-0.172	0.000	0.13		4.5	OK
S1.001	S2	6	58.137	-0.172	0.000	0.13		4.5	OK

Abley Letchford Partnership Ltd		Page 3
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions Network 2015.1		

Summary Wizard of 360 minute 2 year Summer I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

PN	US/MH Name	Storm Rank	Water	Surcharged	Flooded	Flow / Cap.	Overflow	Pipe	Status
			Level (m)	Depth (m)	Volume (m ³)		(l/s)	Flow (l/s)	
S1.000	S1	5	58.209	-0.166	0.000	0.16		5.5	OK
S1.001	S2	5	58.142	-0.166	0.000	0.16		5.5	OK

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Abley Letchford Partnership Ltd		Page 4
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
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XP Solutions	Network 2015.1	

Summary Wizard of 360 minute 30 year Summer I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

			Water	Surcharged	Flooded			Pipe	
PN	US/MH Name	Storm Rank	Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status
S1.000	S1	2	58.231	-0.144	0.000	0.28		10.0	OK
S1.001	S2	2	58.165	-0.144	0.000	0.28		10.0	OK

Abley Letchford Partnership Ltd		Page 5
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions	Network 2015.1	

Summary Wizard of 360 minute 100 year Summer I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

			Water	Surcharged	Flooded			Pipe	
PN	US/MH Name	Storm Rank	Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status
S1.000	S1	1	58.244	-0.131	0.000	0.37		13.0	OK
S1.001	S2	1	58.179	-0.130	0.000	0.37		13.0	OK

Abley Letchford Partnership Ltd		Page 6
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions Network 2015.1		

Summary Wizard of 360 minute 1 year Winter I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

PN	US/MH Name	Storm Rank	Water	Surcharged	Flooded	Flow / Cap.	Overflow	Pipe	Status
			Level (m)	Depth (m)	Volume (m³)		(l/s)	Flow (l/s)	
S1.000	S1	8	58.196	-0.179	0.000	0.09	3.3	OK	
S1.001	S2	8	58.130	-0.179	0.000	0.09	3.3	OK	

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Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions	Network 2015.1	

Summary Wizard of 360 minute 2 year Winter I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

			Water	Surcharged	Flooded		Pipe	
PN	US/MH Name	Storm Rank	Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s) Status
S1.000	S1	7	58.201	-0.174	0.000	0.12	4.1	OK
S1.001	S2	7	58.134	-0.174	0.000	0.12	4.1	OK

Abley Letchford Partnership Ltd		Page 8
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions	Network 2015.1	

Summary Wizard of 360 minute 30 year Winter I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

			Water	Surcharged	Flooded			Pipe	
PN	US/MH Name	Storm Rank	Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status
S1.000	S1	4	58.220	-0.155	0.000	0.21		7.4	OK
S1.001	S2	4	58.153	-0.155	0.000	0.21		7.4	OK

Abley Letchford Partnership Ltd		Page 9
Search House Charnham Lane Hungerford RG17 0EY	1-3 CASTLE CRESCENT BROWNFIELD EXISTING SURFACE WATER	
Date Sept 2015 File EXISTING.mdx	Designed by SL Checked by LPA	
XP Solutions	Network 2015.1	

Summary Wizard of 360 minute 100 year Winter I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Storage Structures 0
 Number of Online Controls 0 Number of Time/Area Diagrams 0
 Number of Offline Controls 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.400
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.800 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 360
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 0

			Water	Surcharged	Flooded		Pipe	
PN	US/MH Name	Storm Rank	Level (m)	Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	Status
S1.000	S1	3	58.230	-0.145	0.000	0.27	9.7	OK
S1.001	S2	3	58.163	-0.145	0.000	0.27	9.7	OK

Quick Storage Estimate

Micro Drainage

Variables

FSR Rainfall

Return Period (years) 100

Region England and Wales

Map

M5-60 (mm) 18.800

Ratio R 0.400

Cv (Summer) 0.750

Cv (Winter) 0.840

Impermeable Area (ha) 0.160

Maximum Allowable Discharge (l/s) 5.0

Infiltration Coefficient (m/hr) 0.00000

Safety Factor 2.0

Climate Change (%) 30

Analyse OK Cancel Help

Enter Climate Change between -100 and 600

Quick Storage Estimate

Micro Drainage

Results

Global Variables require approximate storage of between 48 m³ and 74 m³.

These values are estimates only and should not be used for design purposes.

Variables

Results

Design

Overview 2D

Overview 3D

Vt

Analyse OK Cancel Help

Enter Climate Change between -100 and 600



Appendix 3 – Correspondence

Thames Water Asset Plans

Thames Water Response

Asset Location Search



Ben Austin
Abley Letchford Partnership Ltd
Search House
Charnham Lane
HUNGERFORD
RG17 0EY

Search address supplied 1 - 3
Castle Crescent
Reading
RG1 6AQ

Your reference N/A

Our reference ALS/ALS Standard/2015_3122001

Search date 17 August 2015

You are now able to order your Asset Location Search requests online by visiting
www.thameswater-propertysearches.co.uk



NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
9853	n/a	n/a
08NE	n/a	n/a
08ML	n/a	n/a
08NL	n/a	n/a
0802	51.95	50.03
07ME	n/a	n/a
0757	n/a	n/a
0756	n/a	n/a
0850	52.03	50.83
0865	n/a	n/a
0864	n/a	n/a
0866	n/a	n/a
0801	51.23	48.75
0863	n/a	n/a
0755	n/a	n/a
08MJ	n/a	n/a
0862	n/a	n/a
9701	56.94	52.48
9750	56.94	52.72
0751	52.41	50.22
0702	52.4	49.63
0752	50.69	49.62
0703	50.71	48.11
07MF	n/a	n/a
8752	n/a	n/a
8755	n/a	n/a
9856	n/a	n/a
9850	n/a	n/a
9801	59.47	55.35
98NJ	n/a	n/a
9854	n/a	n/a
9855	n/a	n/a
98NK	n/a	n/a
87KK	n/a	n/a
87MM	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

	Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Trunk Surface Water
	Trunk Foul
	Storm Relief
	Trunk Combined
	Vent Pipe
	Bio-solids (Sludge)
	Proposed Thames Surface Water Sewer
	Proposed Thames Water Foul Sewer
	Gallery
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Sludge Rising Main
	Proposed Thames Water Rising Main
	Vacuum

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Control Valve
	Drop Pipe
	Ancillary
	Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Outfall
	Undefined End
	Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer
	Surface Water Sewer
	Combined Sewer
	Gully
	Culverted Watercourse
	Proposed
	Abandoned Sewer

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

RECEIVED
09/09/15
BA 352

Mr B Austin

Developer Services, Sewer Adoptions

Abley Letchford Partnership Ltd
Search House
Charnham Lane
Hungerford
Berkshire RG17 0EY

Your ref na
Our ref 50074973 / 1013170969
Name Siva Sivarajan
Phone 0845 850 2777
E-Mail developer.services@thameswater.co.uk

07 September 2015

Re: Flat 1, 3 Castle Crescent Reading Berkshire RG1 6AQ

Dear Mr Austin,

I write in relation to the above site and further to your Pre-Development Enquiry application regarding the proposed development as detailed in your application.

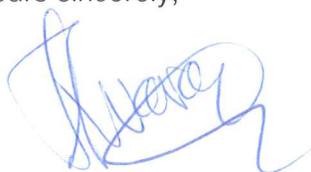
Having reviewed your application, I can advise that the foul flows from your proposed development will not have a detrimental effect on our existing foul sewage network, based on the information submitted with your application.

Under these conditions Thames Water have no concerns regarding the foul flows to the existing foul network. It is expected that you will be restricting Surface Water flows and will be proposing suitable on site storage and associated flow attenuation to the satisfaction of the Local Authority. At no account should the surface water flows be discharged to the TW foul sewer network.

Please note that the views expressed by Thames Water in this letter are in response to this pre development enquiry at this time and do not represent our final views on any future planning applications made in relation to this site.

We reserve the right to change our position in relation to any such planning applications.

Yours sincerely,



Siva Sivarajan
Senior Engineer
TW Developer Services

Thames Water Utilities Ltd,
Clearwater Court, Vastern
Road, Reading RG1 8BD

T 0118 3 738744
I www.thames-water.com

Registered in England and Wales
No. 2366661, Registered office
Clearwater Court, Vastern Road
Reading, Berks. RG1 8DB

Shaun Letchford

Subject: FW: IRef:1013170969 Courtesy DS4001456 - A092 Castle Crescent, Reading

From: Siva Sivarajan [<mailto:Siva.Sivarajan@thameswater.co.uk>]

Sent: 10 September 2015 09:16

To: Ben Austin <baustin@alpce.co.uk>

Subject: RE: IRef:1013170969 Courtesy DS4001456 - A092 Castle Crescent, Reading

Ben,

The second paragraph of my letter states that 'foul flows are acceptable based on the info submitted with your application'. Therefore it answers your query re; the foul flows, as your application states the proposed foul flow. For the surface water my letter states that 'you should be looking to restrict surface water flows and attenuate and adhere to the local authority stipulations'. I presumed that the local authority stipulation is 5 l/s; if not you should adhere to their stipulations for that area. Hence my wording covers that scenario.

Regds,

Siva Sivarajan
Senior Adoptions Engineer (TW)

Thames Water Utilities Ltd
Clearwater Court
Vastern Road
Reading, RG1 8DB

From: Ben Austin [<mailto:baustin@alpce.co.uk>]

Sent: 09 September 2015 15:26

To: Siva Sivarajan

Subject: RE: IRef:1013170969 Courtesy DS4001456 - A092 Castle Crescent, Reading

Siva,

Many thanks for your assistance with our pre-development enquiry for Castle Crescent, Reading it is very much appreciated. To keep you informed we received your confirmation letter this morning.

I was just hoping to confirm some of the wording and that the foul and surface water discharge flows considered for the development match up to those within our online original enquiry, i.e. 0.6 for foul and 5 for storm? Any clarification on this would be very much appreciated.

Kind regards,

Ben Austin
Engineer

Tel: 01488 684390

Abley Letchford Partnership Ltd
Consulting Engineers