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**Technical Note**

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|--------------|-----------------------|----------|---------------|
| Project:     | North Street, Reading | SMA Ref: | 5946          |
| Subject:     | Drainage Statement    |          |               |
| Prepared by: | Stewart Andrews       | Date:    | November 2018 |
| Checked by:  | Tim Wood              | Date:    | November 2018 |

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## **1.0 INTRODUCTION**

- 1.1. A planning application to redevelop land adjacent to the junction of North Street with Weldale Street for residential use has been submitted to Reading Borough Council. The application seeks consent for the construction of 47 apartments in a mix of one, two and three-bedroom units, landscaping, cycle and car parking with associated works.
- 1.2. A site location plan is provided at Figure 1 and a plan illustrating the proposed development is included as Annex 1.
- 1.3. The site is currently disused vacant land on the north-west corner of Weldale Street and North Street. The site is generally flat, set down slightly from Weldale Street and extends to approximately 0.26 hectares. There is an area of hardstanding in the centre of the site where a building formerly stood, and a car park at the eastern end accessed via a gated entrance onto North Street.
- 1.4. The proposed development will result in a small reduction in impermeable area when compared to the previous use of the site.
- 1.5. The site is a brownfield, previously-developed site, which is currently vacant and disused.

## **2.0 EXISTING HYDROLOGY AND GEOLOGY**

- 2.1. There are no rivers, ponds, swales or ditches within the site area or its immediate vicinity. The River Kennet flows approximately 610 metres to the south west of the site and the River Thames flows approximately 600 metres to the north of the site.
- 2.2. A small watercourse is located approximately 260 metres north of the site and passes under the Reading West Branch Railway line via a culvert.
- 2.3. A review of Environment Agency flood mapping and information contained in the Strategic Flood Risk Assessment for the area (SFRA) indicates that the site is not at risk of fluvial flooding.
- 2.4. From the "*Historic Flood Events*" (Figure 9 of the SFRA) it appears that the site has not experienced flooding from sewers surcharging.
- 2.5. Groundwater flooding is caused by increased groundwater levels generated by prolonged periods of rainfall.

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- 2.6. From the “*Historic flood events*” map it appears that the site is not at risk of groundwater flooding.
- 2.7. Pluvial Flooding is caused by intense rainfall in areas where natural and artificial channels that run at full capacity are unable to cope with excess water. Flooding can also occur when rainfall cannot soak into the ground quickly enough.
- 2.8. According to the “*Historic flood events*” map the site is not at risk of pluvial flood incidents, although North Street, to the east of the site, is at low risk for surface water flooding.
- 2.9. There are no reservoirs or canals within the site area or its immediate vicinity. from the EA’s ‘*Risk of Flooding from Reservoirs*’ map it appears that the site is located outside of the area that is at risk at flooding from artificial sources.
- 2.10. Information from the British Geological Survey indicates that the site consists of a shallow layer of made ground over superficial deposits of Alluvium and Clay, Silt, Sand and Gravel. The bedrock geology consists of Seaford Chalk and Newhaven Chalk Formations.
- 2.11. Investigations undertaken as part of neighbouring development proposals indicate that the water table is roughly 4.5 metres below ground levels at the site and that the site will have a low to medium permeability.

### **3.0 EXISTING DRAINAGE INFRASTRUCTURE**

- 3.1. An existing 225mm diameter surface water sewer is located in Weldale Street to the south of the site. The sewer discharges into an existing 525mm diameter surface water sewer located in Caversham Road, to the east of the site.
- 3.2. A second 225mm diameter surface water sewer is located in North Street. The head off the sewer is located adjacent to the existing site access. The sewer discharges to the watercourse located to the north of the site.

### **4.0 CLIMATE CHANGE**

- 4.1. In 2016 the Environment Agency updated its national guidance on climate change allowances for flood risk assessments. In the Thames Region this means adding up to an additional 70% onto the modelled flow rates.
- 4.2. Given that the proposal is located in Flood Zone 1 and that proposed ground levels are sufficiently above the 1 in 100 year flood extent future fluvial flooding should have no impact on the proposed development site.

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## **5.0 DRAINAGE STRATEGY**

### Surface Water

- 5.1. Having regard to the existing surface water regime and pathways on site, future management proposals will be based upon a restricted discharge to the existing sewers in either Weldale Street or North Street. As discussed above the proposed development will result in a small reduction in impermeable area when compared to the previous use of the site, however attenuation measures will be incorporated as part of the drainage strategy to reduce the rate of surface water discharge from the site.

### Sustainable Drainage Systems (SuDS)

- 5.2. There is scope to incorporate the use of Sustainable Drainage Systems (SuDS) at the site. These will address the necessary attenuation, the effective treatment of surface water run-off and ensure that surface water management is optimised.
- 5.3. Together, these SuDS features would form a 'treatment train' that remove harmful pollutants from surface water run-off before discharge back into the local watercourse network. SuDS features are often used to enhance the look local landscape and be part of the proposed green infrastructure. Typically the type of measures that are likely to be implemented are outlined below.

### Porous Paving

- 5.4. Porous paving, in specific areas such as car parking and footways, will permit rainwater to infiltrate through the surface layer and into the underlying sub-structure. As run-off percolates through the sub-layers, pollutants and contaminants are filtered out by the surfacing layer and biological process in the sub-base.

### Bio-Retention Areas

- 5.5. Bio-Retention areas are shallow, landscaped depressions that reduce run-off rates and volumes and treat pollution through the use of engineered soils and vegetation. Run-off collected in these areas would filter through the vegetation and underlying soils. It is proposed that bio-retention areas could be provided as part of the landscaped amenity areas and within the proposed drying area.
- 5.6. An initial assessment based on a site area of 0.26 hectares and an existing impervious area of 0.104 hectares provides the following runoff calculation results:

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| Return Period<br>(1:x years) | Rainfall Intensity<br>(mm/hr) | Brownfield Runoff<br>(l/s) | Greenfield Runoff<br>(l/s) | Total Site Runoff<br>(l/s) |
|------------------------------|-------------------------------|----------------------------|----------------------------|----------------------------|
| 1                            | 7.2                           | 2.1                        | 0.1                        | 2.2                        |
| 30                           | 17.7                          | 5.1                        | 0.1                        | 5.2                        |
| 100                          | 22.9                          | 6.6                        | 0.2                        | 6.8                        |

Table 1: Existing Runoff Rates

- 5.7. Based upon a revised impervious area 0.091 hectares for the proposed development and the provision of 44m<sup>3</sup> of attenuation storage on site a runoff of 3.4l/s has been calculated for the 1:100 year event. This represents a 50% reduction in the rate of discharge from the current use of the site.
- 5.8. It therefore proposed that 14m<sup>3</sup> of attenuation storage will be provided in the proposed permeable paving located in the car parking areas and a further 30m<sup>3</sup> provided within the site.

### Foul Drainage

- 5.9. It is proposed that the foul water generated by the proposal would discharge into the existing Thames Water sewer in Weldale Street.

### Off-Site Impacts and Mitigation Measures

- 5.10. The proposed drainage strategy will incorporate a reduction in surface water discharge from the site and it is therefore considered that the drainage strategy would not have a negative effect on flows in the local sewer system.

## 6.0 CONCLUSIONS

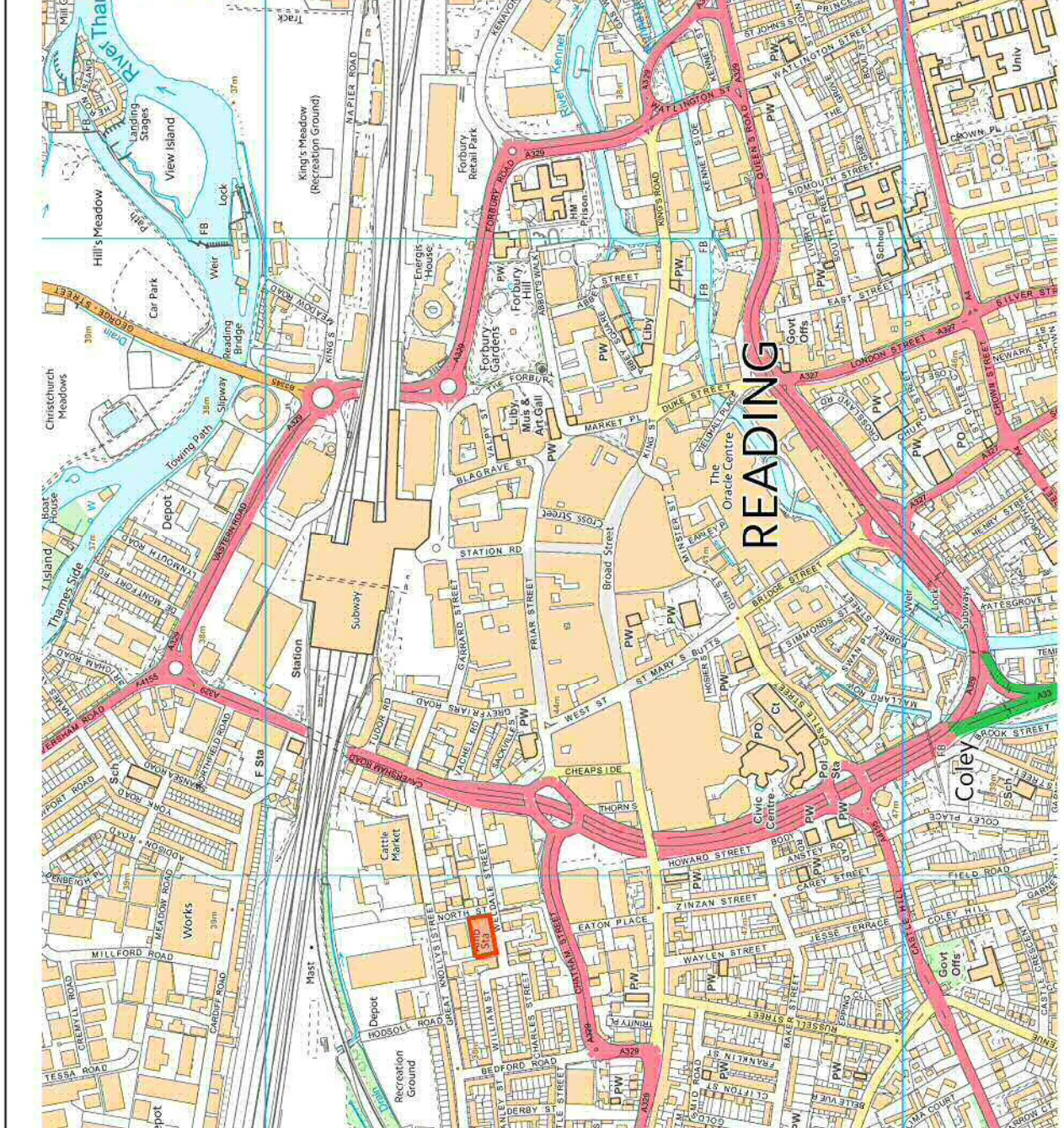
- 6.1. The proposed development is located in an area with a low probability of flooding (less than 1 in 1000 probability in any given year).
- 6.2. There are no records indicating any historical flood events on the proposed development site or immediate vicinity.
- 6.3. Given the site location, a safe access route to/from the site will be available under the 1 in 100 year flood event.
- 6.4. The surface water drainage proposal considers discharging into the existing public network located in Weldale Street and Caversham Road. The discharge would be at a reduced rate from that is generated by the previous use of the site.
- 6.5. Flood management measures (SuDS) will be incorporated in to the design of the development and will comply with current design standards.

**FIGURES**



**SITE LOCATION**

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|-------------|------------|-------|-----|---------|-------|----------------|
| DATE        | JAN '18    | DRAWN | COR | CHECKED | SWA   | ISSUE CHECKBOX |
| DRAWING No. | FIGURE 1.1 | REV.  |     |         | SCALE | 1:10,000 @ A4  |

**LAND AT NORTH STREET READING**

**SITE LOCATION PLAN**

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**LOCHALORT READING INVESTMENTS**

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## **ANNEX 1**



Reading Ambulance  
Service

NORTH STREET

Private Landscaped Amenity

Burford  
Court

Focal Landscaped  
Amenity Area

Position of Pre-App  
perspective view

WELDALE STREET

land off weldale street, reading

LOCHAILORT

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