North East Cambridge Area Action Plan

Draft Surface Water Drainage Core Principles: Key Parameters (2021)

1. Introduction

This paper outlines the key parameters to be applied to Sustainable Drainage Systems (SuDS) and integrated water management which will be expected by the Greater Cambridge Shared Planning Service (GCSP) in the consideration of planning applications submitted within the North East Cambridge Area Action Plan (NEC AAP) area boundary both ahead of and after the adoption of the AAP. It builds upon existing policy and guidance (see below) and looks at the next steps that will need to be taken to progress a comprehensive site wide approach to drainage.

2. Existing Policies and Evidence

South Cambridgeshire Local Plan (2018) Policy CC/7: Water Quality, Policy CC/8: Sustainable Drainage Systems and Policy CC/9 Managing Flood Risk

Cambridge Local Plan (2018) Policy 31: Integrated water management and the water cycle and Policy 32: Flood Risk

Cambridgeshire Flood and Water Supplementary Planning Document (2016)

Cambridge Northern Fringe East Surface water drainage space allocation for master planning (2019)

Cambridge Northern Fringe East Area Flood Risk Assessment (2019)

Greater Cambridge Sustainable Design and Construction SPD (2020)

Greater Cambridge Integrated Water Management Study – Level 1 Strategic Flood Risk Assessment (2021)

Greater Cambridge Integrated Water Management Study – Outline Water Cycle Strategy (2021)

Phase 1 Geo-Environmental Desk Study – North East Cambridge Area (2021)

3. Importance of Water Efficiency

The Greater Cambridge Outline Water Cycle Study (2021) has shown that existing abstraction from the chalk aquifer is having a detrimental impact on chalk stream baseflows and is causing environmental damage, particularly during dry years. Therefore, there is no environmental capacity for further abstraction from the chalk aquifer to supply additional development such as North East Cambridge and future demand and supply will need to be balanced in other ways.

The Outline Water Cycle Study has shown that 80 litres/person/day is achievable by making full use of water efficient fixture and fittings, and also water re-use measures on site including rainwater harvesting, and grey water recycling. It also shows that the cost effectiveness improves with the scale of the project, and that a site-wide system is preferable to smaller installations. Rainwater harvesting can be used as a contribution to strategic attenuation and to intercept storage if there is adequate demand. This does not include water butts as a method of harvesting as it is non quantifiable and based on householder behaviour.

This item will need to be considered on an area wide basis as it is likely that ponds within the open spaces would need to contribute to a wider water reuse system.

4. Importance of considering area wide site constraints and topography

Limitations on infiltration drainage

Maintaining and enhancing water quality of both watercourses and groundwater within North East Cambridge is crucial to water supply as well as for amenity, biodiversity, and recreational purposes. The previous and current uses of the site indicate that ground contamination is likely to be an issue as shown in the Phase 1 Geo-Environmental Desk Study (2021). Although this is not a flood risk issue, it will have an impact on the type of surface water management regime that should be utilised by any development proposal. It is crucial developers undertake detailed historical information searches and site investigations for contamination to determine the degree of contamination.

There are also likely to be high groundwater levels as described in the Area Flood Risk Assessment (2019) and shown in the susceptibility to groundwater flooding maps (Appendix D10) in the Greater Cambridge SFRA (2021). There must be at least 1 metre between the base of the infiltration device and the unsaturated ground beneath. Therefore, groundwater monitoring must be undertaken in advance of any proposal to use infiltration SuDS.

Both of these factors may limit the scope for infiltration SuDS, however these should not be ruled out until further assessments have been made and the use of equivalent lined SuDS features will be possible even where infiltration is not possible.

Minimising pumping

NEC has limited gradient as identified in the NEC Area FRA and the Surface Water Attenuation Report (2019). There is a risk of unnecessary surface water pumping stations, greater land take from designing for pump failure and/or landlocked parcels that cannot access a suitable gravity outfall point if parcels are only considered on an individual basis. To avoid this outcome indicative locations for shallow surface features that can convey flow to identified discharge points will need to be considered early in the process on an area wide basis.

The Councils will require outfalls to be gravity designed unless certain site conditions apply as contained within the Sustainable Design and Construction SPD (2020) and Anglian Water Design and Construction Guidance (DCG 2020). A pumped solution will only be considered acceptable if it can be clearly demonstrated that all other options are unfeasible.

5. Preferred Approach for SuDS

Development proposals will be required to demonstrate that the peak rate of run-off over the lifetime of the development achieves greenfield run-off rates. If this cannot be technically achieved, then the limiting discharge should be 2 litres per second per hectare for all events up to and including the 100-year return period event, including an allowance for climate change.

Plot level SuDS

The density of the proposed development in the AAP is high and so space-efficient SuDS which intercept rainwater close to where the rain falls will be the most appropriate approach. SuDS should be assessed in the following order of priority and provided at plot level where appropriate:

1. Maximise the use of green/brown roofs.
2. Maximise water re-use through rainwater harvesting.
3. Maximise the use of permeable paving.
4. Use rain gardens and bio-retention tree pits wherever possible.

The interception storage requirement for each plot is 5mm per square metre of impermeable surface. This would need to be provided close to where the rain falls at plot level in features such as green/brown roofs, raingardens, permeable paving, and other vegetated features.

Strategic attenuation storage and conveyance

Within informal open space, the following types of SuDS, which provide some shallow attenuation storage and conveyance, will be appropriate:

1. Swales
2. Ponds

It is important that the conveyance routes and surface water outfall points are considered early in the process on an area wide basis so that all sites can drain sustainably.

The overall aim is to limit the size of large ponds and underground attenuation tanks.

Multiple Benefits of SuDS

The approach to SuDS should seek to improve water quality before it goes into the First Public Drain and eventually the River Cam. Additionally, it should provide other forms of benefit to the development including biodiversity, climate change and amenity requirements.

6. The use of SuDS in Open Space Calculations

Between 10-15% of each development parcel should be allocated towards SuDS attenuation and conveyance.

Land used for SuDS will not be included in formal open space calculations. This is to ensure the functionality of the SuDS system does not reduce the amount of useable formal open space provided on-site.

There is a requirement for 36 hectares of informal open space to be provided in the AAP area in different formats (for further information refer to the Open Space and Recreation Topic Paper (2021)). SuDS should form an integral part of informal open spaces to deliver additional biodiversity and amenity benefits and must be designed in such a way that their provision is balanced with the wider amenity and biodiversity requirements.

It is therefore important to prioritise SuDS using the preferred approach to minimise the overall land take however for this to be most effective an NEC area wide approach will be required.

7. Next Steps

The following stages are required to be undertaken by developers in consultation with the Councils to ensure the above requirements can be met:

NEC area wide drainage constraints plan.

The objectives are to:

- List existing surface water drainage infrastructure and identify existing outfall points in the locality.
- Highlight existing or proposed services and infrastructure which could restrict surface water conveyance routes.

NEC area wide drainage strategy

The objectives are to:

- Develop an illustrative surface water drainage strategy for the area as a whole to maximise benefits.
- Consider area wide water reuse opportunities.
- Identify opportunities to introduce Sustainable Drainage Systems (SuDS) measures to provide amenity and biodiversity benefits beyond flood risk requirements.
- Develop initial drainage design criteria (for both surface water and foul systems) to provide a framework for future detailed planning applications.
- As the site is in multiple ownership the major landowners should be encouraged to work together to produce a drainage masterplan for the NEC area.
- Consideration of the appropriate way to address the multiple ownership for management and maintenance of SuDS infrastructure within NEC to help inform a coordinated approach and future NEC wide project governance structures.

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