

# Technical design note

Project name	Himley Village, Bicester - Reserved Matters Application		
Design note title	Phase 1 - Site Access Drainage Strategy		
Document reference	27141-HYD-XX-XX-TN-C-0001		
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## Introduction

The following technical note is intended to support a Reserved Matters application by Cala Homes, for the site access at their proposed development of the site known as Himley Village, to the north west of Bicester Town.

The site has previously been awarded outline planning permission (ref 14/02121/OUT for up to 1,700 residential dwellings, a retirement village, commercial and social facilities, energy centre, school and associated infrastructure.

A subsequent Non Material Amendment has been submitted & approved under reference 22/03492/NMA to allow for a reduced scope of development to be submitted as phase 1, which has resulted in the extent of development under this Reserved Matters application being limited to those highway access works shown within the boundary of Hydrock drawings 27141-HYD-XX-XX-DR-D-0001 Spine Rd Jct and 27171-HYD-XX-XX-DR-D-0002 Secondary Rd Jct.

The below drainage strategy should be read in conjunction with Alan Baxter report dated December 2014 and approved as part of the outline as that sets out the philosophy of the surface water drainage strategy for the whole development.

## Existing Drainage Regime

The current highway fronting the site, known as Middleton Stoney Road, drains into the existing ditch that runs along approximately 850m of its length, the majority of this ditch falls from the west to the east and utilises a pipe/culvert to pass under the B4030 Middleton Stoney Road at the junction with Howes Lane in the south east of the wider site.

The ditch has multiple connections to the wider site field drainage ditches which come from the north.

The infiltration undertaken during the 2014 application do not imply that infiltration is present in any great extent across this site (supported further by the extensive local ditch network), albeit deeper strata does function as a local aquifer.

There is no foul drainage in or near to the current application boundary.

## Proposed Development Description

The current application boundary encompasses the two junctions required to service this site as a future development, the eastern junction (Spine Road Junction) includes the bellmouth carriageway, footway, new bus stop layby along with any land within the visibility splays required to facilitate the works, and the western access (Secondary Road Junction) includes the carriageway and any visibility splay required to facilitate the works. No buildings or landscaping are proposed within this application.

## Proposed Surface Water Drainage

In accordance with the approved outline strategy, the surface water resulting from the development will be managed with the use of local SuDS and discharged from site via the existing onsite ditch network into the downstream receiving land drainage network.

Given the extent of this application, being purely a small area of highway - Circa 0.1 Ha out of a wider 90Ha site across the two junctions, it is proposed to provide a simple gully and piped connection for each of the bellmouths to discharge to the existing ditches to allow for natural cleansing of any sediment along the length of the ditch.

Each gully will be located appropriately to minimise the catchment area draining to it before connecting to the ditch.

The supplementary technical note reference 27141-HYD-XX-XX-TN-C-0002 P01 Site Wide Strategy should be read in furtherance to this strategy.

## Management & Maintenance

The extent of development within this application will be offered to Oxfordshire County Council highways for adoption and in perpetuity will therefore be subject to their maintenance regime which should, as a minimum, ensure the long term functioning of the system. In the first instance we would recommend following the CIRIA SuDS Manual operation & maintenance schedules per the below:

All drainage features require regular monitoring and maintenance to ensure they continue to operate correctly and efficiently. Drainage features can be maintained by a range of people, including, but not limited to, property owners, highway authority or management companies, in this instance the drainage will be maintained purely by OCC highways Dept due to the works included within the application. Maintenance operations are categorised under three levels: Regular Maintenance, Occasional Maintenance and Remedial Maintenance.

**Regular Maintenance:** Consists of basic tasks to be carried out on a frequent and predictable schedule. Inspections and monitoring of the feature should be undertaken during these visits. During the first year of operation these visits should be undertaken monthly and after all major storm events to ensure each drainage feature is operating to its design standard.

**Occasional Maintenance:** Consists of tasks which are required to be undertaken on a less frequent and predictable basis, such as sediment removal of the ditches.

**Remedial Maintenance:** These are intermittent tasks required to rectify faults which occur within the drainage feature. These are undertaken as required, but anticipated to be infrequent as long as the best practice guidance during design, construction and maintenance are followed.

Table 1 (below summarises the recommended maintenance activities required for main drainage components included in the proposed drainage scheme.

Table 1 - Drainage components operation and maintenance activities (extract from CIRIA C753 SuDS manual)

Operation and maintenance activity	Drainage component
	Ditch
Regular maintenance	
Inspection	X
Litter and debris removal	X
Grass cutting	X
Weed and invasive plant control	O
Shrub management (including pruning)	O
Bank vegetation management	O
Aquatic vegetation management	O
Occasional maintenance	
Sediment management	X
Vegetation replacement	O
Vacuum sweeping and brushing	NA
Remedial maintenance	
Structure rehabilitation / repair	O

Key

X - Will be required

O- May be required

### Headwalls for Gully outlets

The headwalls are to be maintained by OCC Highways

Access

Access to the headwalls will be provided from above the ditch.

Regular Maintenance

Visual inspection - The headwalls/outlets should be inspected for deficiencies, such as: blockages, condition of the structure and signs of damage to any visible apparatus.

Removal of litter and debris - Litter and debris could block the drainage network. All litter and debris should be collected and removed from site regularly.

Occasional Maintenance

Sediment removal - The sediment which builds up beneath the headwall/outlets will require removal as and when necessary to ensure efficient operation of the system. This sediment should be disposed of in a suitable manner, in accordance with best practice.

Remedial Maintenance

Remedial maintenance may be required to be undertaken by a suitably qualified contractor.

Structural Rehabilitation or Repair - In the event there is a structural failure of the system, e.g. deformed or damaged sections will require rectifying to ensure the system continues to operate as designed.

## Water Quality

### First Flush

The CIRIA C753 SuDS manual sets out standards of good practice in order to protect the water quality of receiving water courses and ground water. The SuDS manual states that where possible "no runoff should be discharged from the site to receiving surface waters or sewers for the majority of small (eg <5mm rainfall events) rainfall events". This is to capture the "first flush" which contains the most concentrated level of pollutants as a result of pollutant build up on surfaces during dry periods.

### Trapped Road Gullies

All adoptable highway road gullies are to be trapped. These will intercept sediment and potential pollutants in the surface water runoff.

### Swales

The roadside ditch/swale will intercept sediment and potential pollutants in the surface water runoff.

### Water Quality Analysis

General access roads are deemed to have a low-level pollution hazard as stated within chapter 26 of the SuDS manual. As this access road forms only the initial application and does not function until later stages of development (i.e. it will not drain any traffic until further water management & quality control systems are implemented) we consider this an appropriate designation. A simple index approach is therefore recommended to determine what measures are required to deal with any pollution that may arise. Table 2 and 3 are extracts from chapter 26 of the SuDS manual, identifying the level of pollution hazard and pollution mitigation index respectively. The total pollution hazard indices must be less than or equal to the total SuDS mitigation indices.

Table 2 - Pollution hazard indices for different land use classifications (extract from CIRIA C753 SuDS manual)

Land Use	Pollution Hazard Level	Total Suspended Solids	Metals	Hydro-carbons
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4

Table 3 - Indicative SuDS mitigation indices for discharges to surface waters (extract from CIRIA C753 SuDS manual)

Land Use	Mitigation Indices		
Type of SuDS component	TSS	Metals	Hydrocarbons
Swale	0.5	0.6	0.6
<b>Mitigation Total</b>	0.5	0.5	0.6
<b>Total SuDS mitigation index = mitigation index1 + 0.5 (mitigation index2)</b>			

Table 3 confirms the total mitigation index of the discharge swale is greater or equal to pollution hazard index in table 2. The inclusion of a detention basin is therefore satisfactory for dealing with any potential pollution arising from the development. No other mitigation measures are required.

## Summary & Conclusion

As a drainage strategy to serve two highway access, we consider that the use of a simple gulley/pipe network upstream of the existing ditch/swale network is appropriate in terms of conveyance and treatment.

As the development progresses with further phases this will be interlinked with attenuation and treatment systems which are further outlined within report 27141-HYD-XX-XX-TN-C-0002