

# **DRAINAGE STRATEGY REPORT**

## **Proposed Residential Development on Lambert Bank**

### **Prepared in support of a planning application**

#### **1. Introduction**

This Drainage Strategy has been prepared in support of a planning application for the proposed development of four residential dwellings at Lambert Bank.

The purpose of this report is to demonstrate that the development can be adequately drained without increasing flood risk elsewhere or creating an unacceptable risk of pollution.

The proposed drainage strategy is based upon:

- separate foul and surface water drainage systems;
- treatment of domestic foul sewage within a package sewage treatment plant;
- discharge of treated effluent to Lambert Drain, subject to the necessary consents and regulatory requirements; and
- disposal of uncontaminated roof water to individual soakaways located within the rear gardens of the proposed dwellings.

This is a planning-stage strategy rather than a final detailed drainage design. Final pipe sizes, gradients, treatment plant specification, infiltration rates and soakaway dimensions will be confirmed following site investigation, infiltration testing and detailed drainage calculations.

#### **2. Site and Proposed Development**

The proposed development comprises four residential dwellings.

The approximate building footprints are:

##### **Dwelling Approximate roof footprint**

Plot 1     107 m<sup>2</sup>

Plot 2     110 m<sup>2</sup>

Plot 3     116 m<sup>2</sup>

Plot 4     124 m<sup>2</sup>

For the purposes of this preliminary strategy, the roof catchment area has been taken as equivalent to the stated building footprint. The final contributing roof area will be confirmed from the construction drawings and will include any projecting roof areas, canopies or other positively drained impermeable surfaces.

Lambert Drain is located adjacent to the front of the site. It is proposed that the treated effluent from the package sewage treatment plant will discharge to this drain, subject to confirmation of its status, ownership, condition, connectivity and the necessary discharge and outfall consents.

### **3. Existing Ground Conditions**

Investigation have confirmed that the soil encountered on the site is silty. Previous infiltration testing undertaken on comparable silty ground in the locality has shown water soaking away in approximately 35-40 minutes.

This information provides reasonable preliminary evidence that infiltration drainage will be feasible and is the norm in this area. Site-specific testing will therefore be undertaken before the final drainage design is completed.

The soakaways will be designed to discharge into the permeable silty strata and will not rely upon infiltration into the underlying Oxford Clay.

The water level in Lambert Drain is approximately 3-4m below ground levels indicating that ground water levels are similar.

### **4. Drainage Design Principles**

The proposed development will incorporate separate foul and surface water systems.

The surface water strategy follows the sustainable drainage hierarchy by disposing of clean roof water close to its source through infiltration to soakaways in the back garden.

The foul drainage strategy will use an appropriately sized package treatment plant, including for the existing house. Current Environment Agency requirements provide that a discharge of treated domestic sewage to surface water made through a suitable sewage treatment plant is acceptable.

## **PART A — FOUL WATER DRAINAGE**

### **5. Proposed Foul Drainage System**

Domestic foul water from the four dwellings will drain through a gravity foul drainage network to a package sewage treatment plant located within the development site.

The treatment plant will be:

- designed and manufactured for domestic sewage treatment;
- compliant with the relevant British Standard applicable at the time of installation;
- sized in accordance with the manufacturer's requirements and the latest British *Water Flows and Loads* guidance;
- accessible for inspection, maintenance and desludging;
- provided with appropriate ventilation and electrical supplies;
- installed in accordance with the manufacturer's instructions; and
- commissioned before occupation of the dwellings.

The final plant specification will be based upon the calculated design population rather than solely upon the number of dwellings.

The Environment Agency requires a treatment plant to have sufficient capacity for the maximum sewage load it will receive and to be installed and operated in accordance with the manufacturer's specification.

### **6. Discharge to Lambert Drain**

Following treatment, the final effluent is proposed to discharge through a dedicated outfall to Lambert Drain at the front of the site.

The outfall will be designed to:

- provide a secure and maintainable connection;
- avoid erosion or destabilisation of the bank;
- avoid obstruction to the flow of the drain;
- prevent backflow into the treatment plant;
- remain accessible for inspection;
- avoid an unacceptable effect on water quality or aquatic ecology; and

- comply with any requirements imposed by the Environment Agency, Lead Local Flood Authority, Internal Drainage Board, local authority or riparian owner.

The relevant authority's approval will be obtained for the construction of the outfall and any works affecting the bed or bank of the drain.

Approval to construct an outfall and compliance with the Environment Agency's environmental permitting requirements are separate matters. Obtaining one consent will not remove the need to obtain any other applicable consent.

In the event of an outfall not being acceptable then a drainage field will be constructed at the rear of the houses.

## **7. Environment Agency Requirements**

A new discharge of treated domestic sewage to surface water may operate under the Environment Agency's general binding rules where all applicable requirements are satisfied.

Among other matters:

- only domestic sewage may be treated;
- the discharge must not cause pollution;
- the daily discharge to surface water must not exceed 5 m<sup>3</sup> unless an environmental permit is obtained;
- the plant must be properly sized, installed, operated and maintained;
- the possibility of connection to a public foul sewer must first be investigated;
- restrictions apply near certain environmentally protected sites; and
- the same outlet must not be used for separate discharges where the combined volume would exceed the applicable threshold.

## **8. Foul Drainage Alternatives**

The principal foul drainage options have been considered as follows.

### **8.1 Public foul sewer**

Connection to a public foul sewer would normally represent the preferred method of foul drainage where a suitable sewer is reasonably available, however there is not one close to the site.

### **8.2 Drainage field**

Discharge of treated effluent to ground through a drainage field would require sufficient suitable land to accommodate the drainage field and its statutory separation distances.

The available garden and amenity areas are constrained at the front. The construction of a drainage field serving four dwellings would need to be located at the rear of the houses.

Discharge of treated effluent to Lambert Drain is therefore considered a more practical solution, provided the applicable regulatory requirements can be met.

### **8.3 Sealed cesspool**

A sealed cesspool would require frequent emptying and would create recurring tanker movements, operating costs and risks associated with storage failure or delayed emptying. It is not proposed.

## **9. Foul Drainage Maintenance**

The treatment plant will serve each individual property.

A maintenance arrangement will be established before occupation and will identify responsibility for:

- routine servicing;
- mechanical and electrical repairs;
- alarms and telemetry, where fitted;
- desludging;
- inspection of the final effluent and outfall;
- electricity consumption;
- emergency response;
- maintaining access for service vehicles; and
- compliance with the general binding rules or environmental permit.

The Environment Agency normally requires treatment plants to be maintained in accordance with the manufacturer's requirements and desludged at least annually, or more frequently where specified by the manufacturer.

## **PART B — SURFACE WATER DRAINAGE**

### **10. Proposed Surface Water Strategy**

Uncontaminated rainwater from the roofs of the proposed dwellings will discharge to individual soakaways located within the respective rear gardens.

Each dwelling will have a separate roof-water system comprising:

- gutters and rainwater pipes;
- trapped or accessible rainwater connections where appropriate;
- a silt-trap or catchpit upstream of the soakaway;
- below-ground drainage pipes;
- an accessible inspection point; and
- a geocellular, granular or other appropriately designed infiltration structure.

Surface water from roofs will not be connected to the package treatment plant or foul drainage system.

Driveways and parking areas will be constructed using permeable finishes draining through a suitable permeable sub-base. The final treatment and disposal of runoff from trafficked surfaces will be confirmed during detailed design and will include suitable water-quality measures.

The government's national SuDS standards apply a hierarchy to the selection of runoff destinations and require surface water systems to address hydraulic performance, water quality, amenity, biodiversity and long-term maintenance.

### **11. Evidence Supporting Infiltration**

The following information supports the principle of using soakaways:

1. The soils encountered on the site are reported to be silty.
2. Previous testing in comparable silty soil has shown water soaking away in approximately 40 minutes.
3. The roof-water systems will serve relatively small, clean residential roof catchments.

The soakaways are therefore considered a reasonable and deliverable planning-stage method of surface water disposal, subject to satisfactory site-specific testing.