

Section five

Accessibility and Sustainability

Sustainability

Strategy & Statement

In accordance with the 'Borough Design Guide, Supplementary Planning Document' (Wokingham Borough Council, June 2012), 'Sustainable Design & Construction SPD' (Wokingham Borough Council, May 2010) and The 'Future Homes Standard 2025', the following measures will be incorporated into the dwelling to ensure it is designed and constructed in a energy-conscious manner, and achieving high levels of sustainability:

1. High Performance Materials & Fabric Efficiency

The proposals include enhanced insulation: all proposed walls ($\leq 0.18 \text{ W/m}^2\text{K}$), roofs ($\leq 0.13 \text{ W/m}^2\text{K}$) and floors ($0.13 \text{ W/m}^2\text{K}$) to be of improved high standard, according to current building regulations, demanding that all new homes built from 2025 to be 'zero-carbon ready'. High performance windows will be introduced for increased thermal and sound performance (double glazing). And minimisation of thermal bridging and improve airtightness. Proposed lower embodied carbon materials (such as timber, recycled materials and sustainable products) will be proposed.

2. Low-Energy Lighting

LED lights will be introduced to reduce carbon dioxide emissions by up to 50kg a year. See page 53.

3. SuDS Drainage System

Sustainable urban drainage will be incorporated to the build up of the private driveway with water run of routed directly into the below ground drainage system (subject to underground routing). See page 54.

4. PV Battery and EV Charging

The electrical energy produced by the PV array is stored in onsite batteries (to the front of the house) (3no. 5.8 kWh SolaX triple powered batteries). One electric car charging points is provided, ensuring a decreased reliance on conventional fossil fuel modes of personal transportation whilst ensuring accessibility is maintained on site.

5. Photovoltaic Panels

A comprehensive photovoltaic panel system of 23.8 kWp (4 x photovoltaic panels of 350W each) provides the primary source of natural energy to the building and acts as a significant cog in the achievement of zero carbon status. The houses - 3Bed 5 Persons, would require app. 8-13 panels that will have enough power for average household electricity usage to an equivalent of 3.5 kW system. For the proposed houses, each house will be supplied with 12 x panel (each app. 1600 x 1000 m).

6. Air Source Heat Pump

Air source heat pumps (8.5 kW Mitsubishi Ecodan R32 or similar) will allow efficient heating for hot water and space; this will represent the main heating source for this development. These will be located to the back or side of the Houses (app. 2m x 1m). This system will be compatible with future decarbonised electricity grid plans.

7. Heating Controls

Zone controls to be provided to heating system. Timing devices to control heating periods together with interlock controls to switch off when no heat is required.

8. Passive Ventilation

Natural cross ventilation and passive stack ventilation is employed via trickle vents and the rooflight vents.

9. Enhanced Water Management

Water Usage to not exceed 110 litres/day per person. See page 54.

10. Carbon Emissions

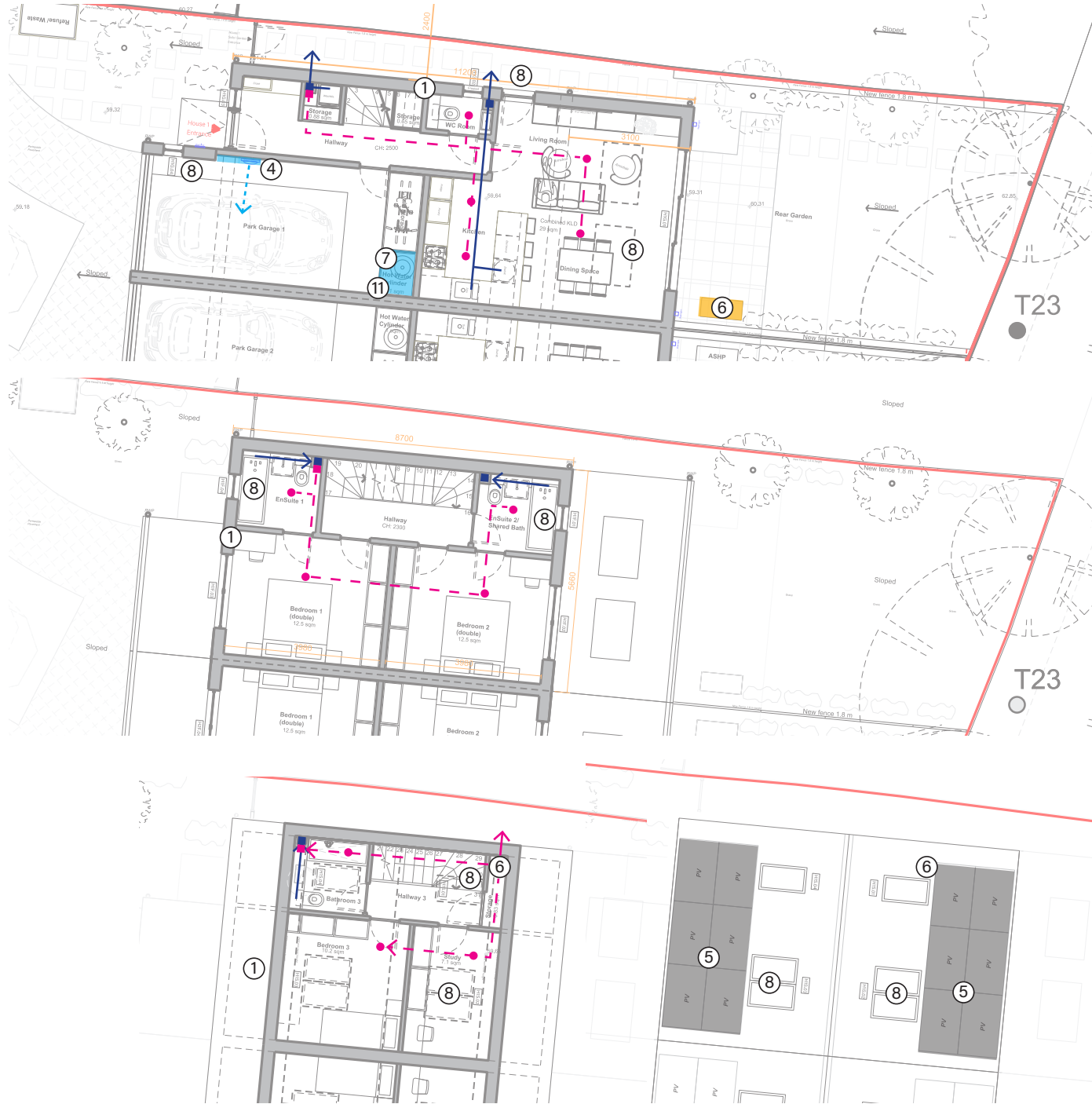
Building a new 3-bedroom house with a 5-person occupancy is estimated to have a carbon footprint of approximately 56 tonnes during construction, according to the Carbon Construction analysis. However, the proposed new homes will be more-energy-efficient than older properties on Mitford Close, leading to lower operational carbon emissions over time.

11. Ventilation & Overheating

The proposed designs will prevent overheating. The houses layout and orientation, means that main windows will have a East-to-West orientation, avoiding direct sunlight. The proposed skylights will have integrated shading devices to avoid direct sunlight. Planting new trees to the front gardens will provide additional shading.

Proposed new Mechanical Extract Ventilation with Heat Recovery, to provide fresh, filtered air and maintain good indoor air quality. (eg: Blauberg Komfort 3-Bed House Horizontal MVHR Heat Recovery Ventilation Kit EC-D5B-180-HK3, or similar).

House 1
Proposed Ground, First and Second Floor Plan.



1



5



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6



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Site Lighting Strategy

Outdoor lighting

The proposed outdoor light scheme strategy will be proposed only where needed, (to reduce light spill into sensitive regions and minimise disturbance on the wildlife/ woodland bordering the site).

The proposed lights are focusing downwards or it is shielded to minimise disruption to wildlife (see image below). Colour temperature is important. (warm white tones between 2200 K and 2700 K are recommended). Operating at 593 nm, this specific wavelength provides the gentle illumination necessary for human visibility while ensuring bats can carry out their natural activities without negative effects associated with harsher lighting.

he new houses will reduce energy consumption with efficient lighting. (All outdoor lightings will be LED lights, using 80% less energy compared with incandescent bulbs and their introduction will reduce carbon dioxide emissions by up to 50kg a year).

Fixture design and materials should minimise glare. (The lighting fixtures selected will minimise glare and blend with the surrounding environment.)

Street light post

The proposed outdoor street lamp will be relocated, by 1 m; this is to allow for the new carparking space.

There is the potential to install bat-freindly lights, subject to agreement with Council.

- ① Proposed relocation of the existing street lamp, by approx. 4.5 m.
- ② Proposed entrance to houses, downwards wall lights.
- ③ Proposed rear garden, downwards wall lights.
- ④ Proposed skylights with integral blinds, to avoid light overspill during evening.



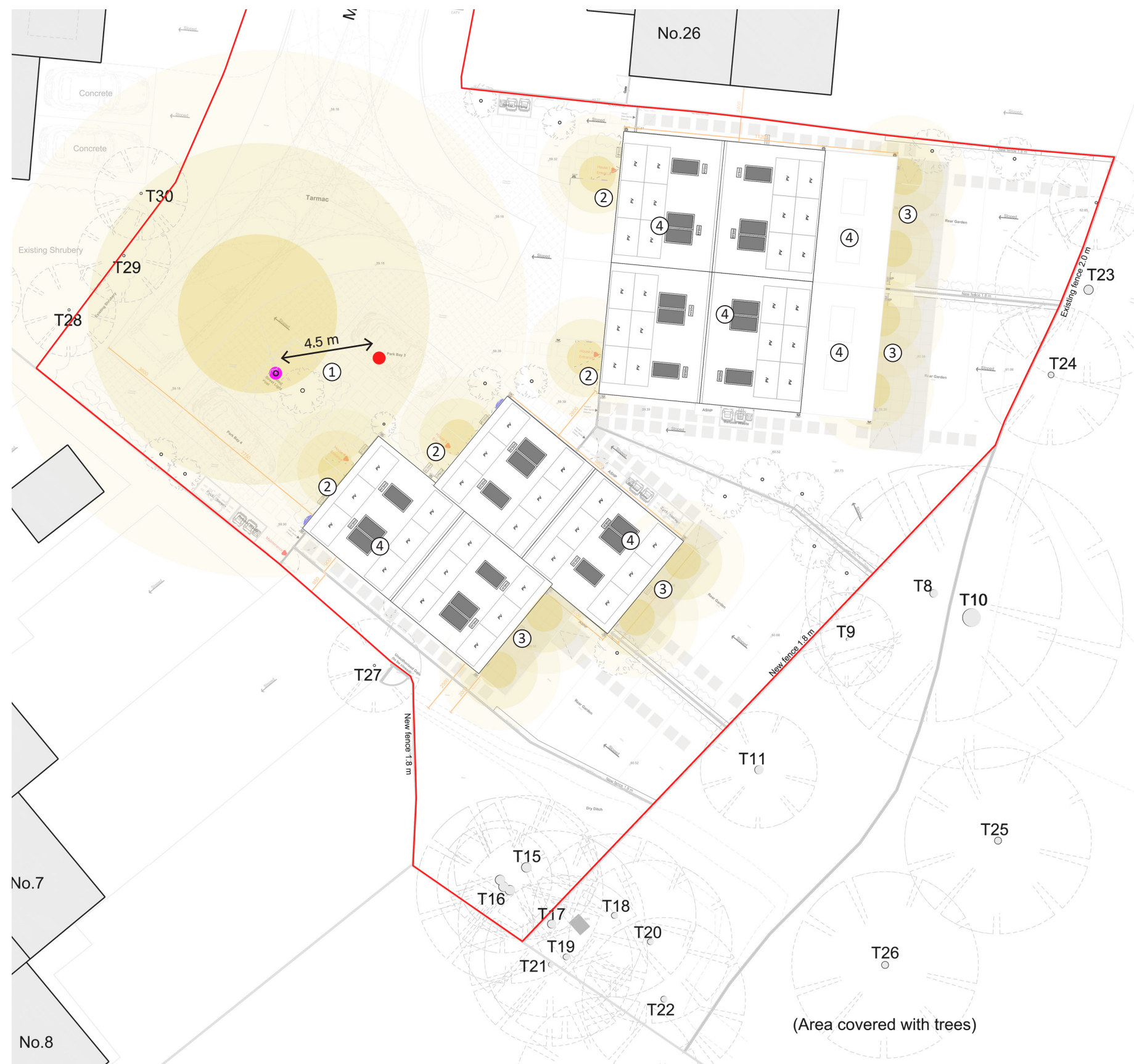
① Existing street lamp



② ③ Proposed downwards lighting



④ Proposed skylights with integral blinds



Site Light Strategy - Proposed Ground Floor Plan

Water Management & SuDS

Proposed House Water Management

- ① The proposed houses will be connected to the local distribution of water supply (as marked in light blue) and sewage (as marked in dark dotted line). See Asset Locator, or in SUDS report pages 70 and 73.
- ②

Please note the full site ownership, includes Mitford Close. (see page 6).

The proposed houses will have enhanced water management features. These include: Water Usage to not exceed 110 litres/ day per person, based on the following maximum capacity/flow rates for:

- WC's - dual flush - 6 litres full flush/ 4 litres part flush;
- Basin mixer taps - 6 litres/ minute
- Sink mixer taps - 8 litres/minute (hot water supplied by under sink heater);
- Power shower - 10 litres/ minute
- Dishwasher - 1.25 litres/ setting;
- Washing Machine - 8.17 litres/kilogram;
- Power shower - 10 litres/ minute

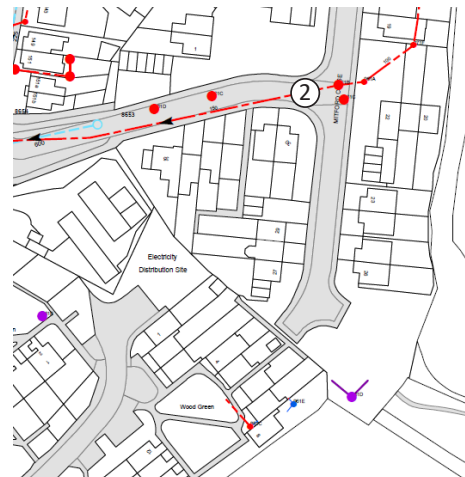
An indirect Unvented Hot Water Cylinder of app. 300l (4-6 people) will be provided, of app. 550 mm diameter. (eg: Ideal Pro 300 L Indirect Unvented Cylinder, or similar).

SuDS Drainage System

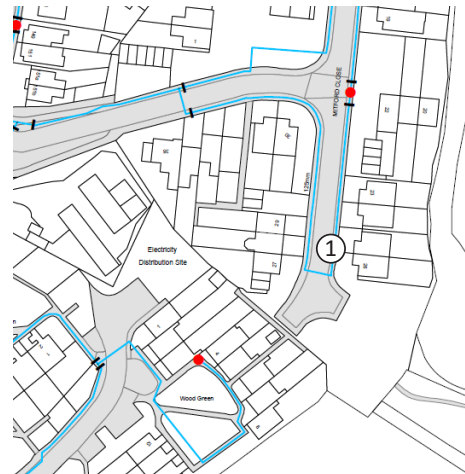
The site is naturally sloped from east to west.

- ③ Sustainable urban drainage will be incorporated to the build up of the private driveway with water run of routed directly into the below ground drainage system (subject to underground routing). See page 54 of SUDs report.
- ④ Surface water from the roof will be discharged into a rainwater harvesting tank and be used for landscape irrigation.

The surface water risk in the area of the drain ranges from Low to High. This risk originates from the surface water that would be generated from the Site. Due to the implementation of SuDS, it will reduce this risk and also water will be stored within the permeable paving for the 1 in 100 + CC event which will reduce the surface water entering the ditch from the present levels.

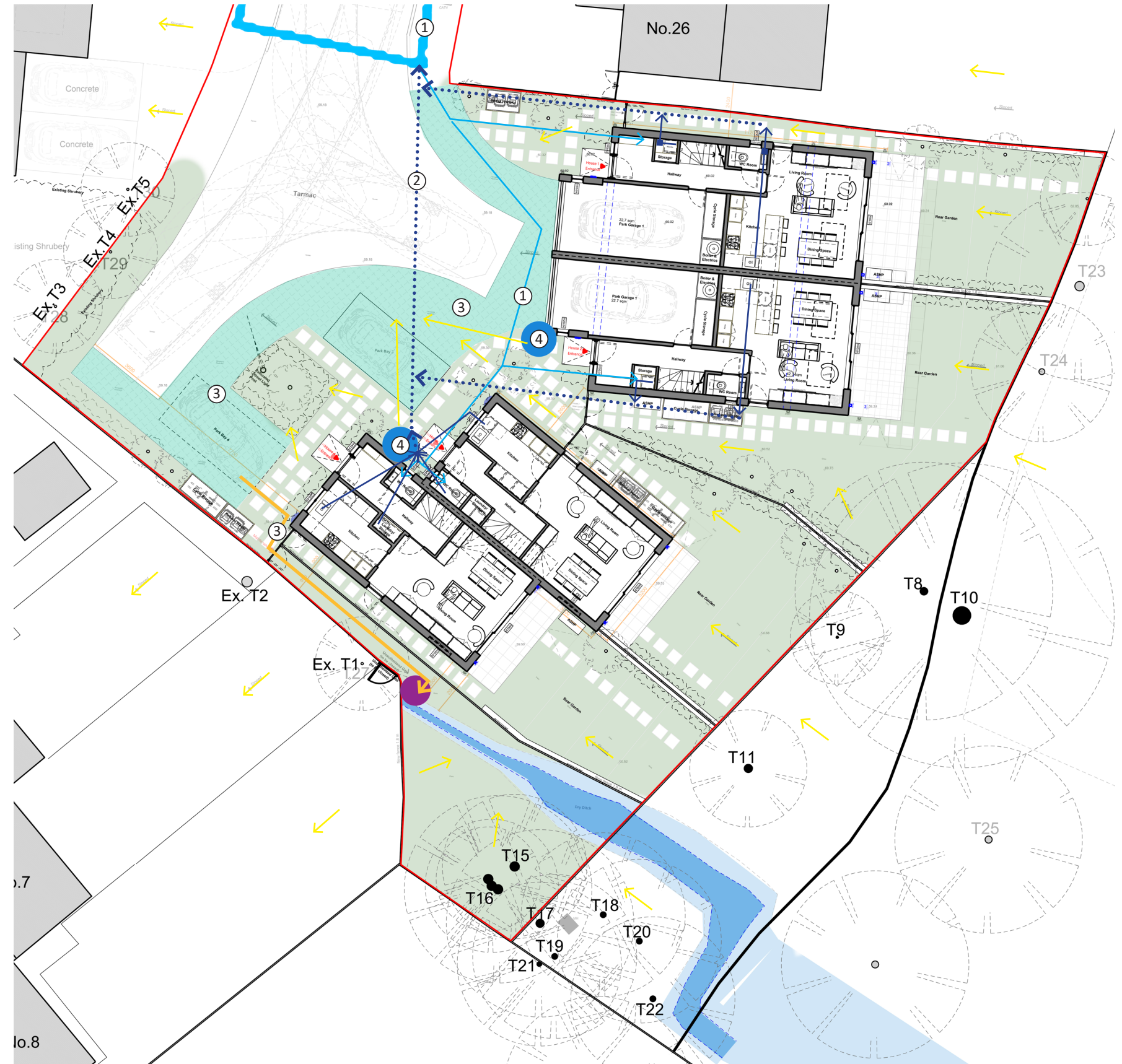


Asset Location Sewer Map (page 70)



Asset Location Water Map (page 73)

- ↘ Slope direction for surface water.
- Lined permeable paving
- Grass
- Dry Ditch- indicative boundary
- ↑ Grey Water from houses
- New sewage pipe
- Fresh Water supply to houses
- Flow control (see SUDs Report)
- ④ ● Rainwater harvesting butt (see SUDs Report)



Water Management Strategy - Proposed Ground Floor Plan

Water Maintenance Statement

Existing Ordinary Watercourse (dry ditch)

The existing site has a dry ditch area and mild banks to the south of the plot. See pages 12, 13 for photographs. The current area is unmaintained, with thick vegetation and unclear ways to identify the existing manholes or existing services.

The applicant and agent have contacted the Council, who confirmed that it is an Ordinary Watercourse (see screenshot). A watercourse includes all rivers, streams, ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers) and passages, through which water flows Land Drainage Act 1991 (as amended) (LDA).

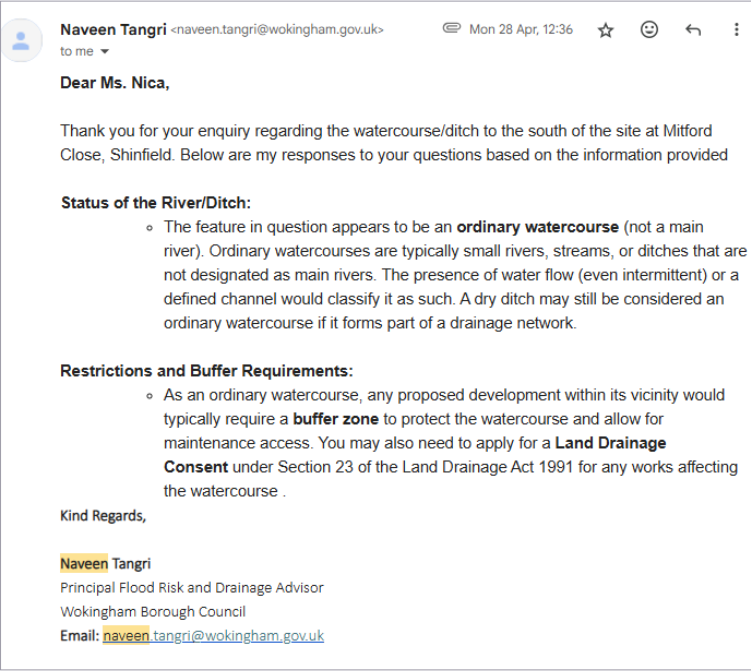
An Ordinary Watercourse is defined by the LDA (s72) as any watercourse other than a Main River. Ordinary Watercourses within a Drainage District are subject to the permissive powers of an Internal Drainage Board ("IDB") under the LDA and Byelaws. Those outside a Drainage District are subject to powers of the local authority. Ownership and responsibility for the maintenance of Ordinary Watercourses lies with the riparian landowner, established at common law. It has also been established that the same rights and responsibilities are applied to piped Ordinary Watercourses unless otherwise evidenced. The riparian landowner is the owner/occupier of land/property adjoining a watercourse unless otherwise evidenced by deed.

Buffer Zone & Maintenance

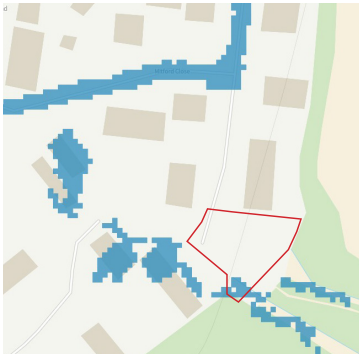
The proposed House 4 has been relocated following the Pre-Application advice and the correspondence with the Principal Flood Risk and Drainage Advisor, allowing 2.2 m offset from the edge of the bank, and between 2 -2.8 m boundary.

In addition, a new 1 m wide corridor has been added between House 4 and No. 7 & 8 Wood Green to allow for future maintenance.

The level of maintenance undertaken on identified Ordinary Watercourses shall be at the discretion of the IDB and will normally be to de-weed the channel and flail the appropriate bank to improve the line of sight for de-weeding machine operations. Circumstances may arise where the IDB consider de-silting is required to maintain flow.



Flood map for planning
Annual likelihood of flooding
1 in 30



Flood map for planning
Annual likelihood of flooding
1 in 100



Flood map for planning
Annual likelihood of flooding
1 in 1000



Hydrology & Drainage - risk of flooding from
surface water & drain

Ordinary Watercourse Strategy - Proposed Ground Floor Plan