Arborfield Trunk Main – Ecological Note

Prepared by	Checked by	Verified by	Approved by
JS – Consultant Ecologist LD – Graduate Ecologist	RW, MCIEEM – Principal Ecologist	JR, MCIEEM – Technical Director	PK – Project Manager

Site Name	Arborfield Trunk Main
Site Location (central grid reference)	Central Grid Reference: Northeast road end SU 78354 68069 Southwest road end SU 76878 66436
Date of Desk Study	21st January 2025,
Date of Field Surveys	7th and 8th January 2025
Proposed Works	It is understood that Thames Water Utilities intend to install into service a new 355mm OD PE100 SDR17 pipe including associated hydrants, valves, chambers and structures to: • Replace 1855m of the existing 9" trunk main along Bearwood Road and Barkham Road; • Replace 230m of the existing 3" distribution main along Langley Common Road; • Provide a new 395m section of trunk main along Langley Common Road. • Create 10 connections from the new pipeline to the existing network • Create eight new fire hydrants. These are collectively hereafter referred to as the 'Proposed Works' AECOM understands that the Proposed Works will be confined to the highway with an open cut method of construction anticipated. The Proposed Works are located along Langly Common Road, Barkham, Wokingham RG40 4TS (centred on OS grid reference SU 76878 66436), following east along Barkham Road, north up Bearwood Road, and ending parallel with Highlands Avenue, Wokingham RG41 4SP (centred on OS grid reference SU 78354 68069). A 30 m buffer surrounding the Site where accessible was also subject to survey, hereafter referred to as the 'Survey Area'. The Proposed Works are split into two sections, referred to in this report as the southwest section and the northeast section. There is a break between these sections of 90m where no Proposed Works are to take place, from SU 77644 66906 to SU 77728 66953 in the centre of the Proposed Works route. This break includes the river Lodden located at SU 77672 66928.

The locations of the works are outlined in Table 1.

Table 1. Proposed Works locations

Location	Coordinates	What3words
Southwest section	Start: SU 76878 66436 Finish: SU 77644 66906	Start: lizards.point.consoles Finish: finishers.outs.woven
Northeast section	Start: SU 77728 66953 Finish: SU 78354 68069	Start: donates.bedding.apart Finish: system.stud.clouds

The locations in Table 1 are hereafter collectively referred to as 'the Site'.

Site Description

The Survey Area is split into two sections (the southwest section and a northeast section) with a 90m break in between. See Appendix A: Site Location
The Site comprises of entirely hardstanding public, within which the proposed open cut method of construction to install into service a new 355mm OD PE100 SDR17 pipe including associated hydrants, valves, chambers and structures will be located.

The Proposed Works will be confined to the highway hardstanding. Surrounding land is mostly within an urban environment with much of the Survey Area comprising of hardstanding road and driveways servicing the many residential buildings situated along the roads. Other areas include grassland for horse grazing, and amenity recreation as well as grassland with tall ruderal vegetation or bracken. Scrub, hedgerows and trees also line the roadside throughout the Survey Area. Two waterbodies are located within the Survey Area. Pond 1 is located within the far west of the Survey Area being a small 240m^2 pond located at SU 76909 66446. The second waterbody is Pond 2, a small 77m^2 garden pond located at SU 78110 67021.

The Site sits in an area of countryside in Barkham, Wokingham, with the wider landscape comprising of agricultural fields and Bearwood lakes, woodland and golf course all north of the Site. However, the Site itself is primarily within an urban area. See Appendix B: Habitat map

Study Area (desk study)

The desk study for the Site included a search for international statutorily designated sites for their nature conservation within 5km of the Site, national statutorily and non-statutory designated sites within 1km of the Site and ancient woodland within 500m (MAGIC, 2024).

Records from Thames Valley Environmental Records Centre (TVERC) have been used for species records and non-statutory designated sites within 1km.

Survey Area (field survey)

A field survey was completed on the 7th and 8th of January 2025 and included the accessible areas of the Site as well as a 30 m buffer where accessible (the "Survey Area".)

A suitably qualified ecologist from AECOM completed an extended UK Habitat classification (UKHab) of the Site, and a 30m buffer surrounding this, to establish the ecological value of the Site. This was extended to include a badger walkover to look for signs of badger including setts, hair and latrines and Daytime Bat Walkover (DBW) and Ground Level Tree Assessment (GLTA) to assess the potential of any trees and structures (where present) to support roosting bats.

	A previous report by Mott MacDonald of a similar Survey Area in 2021 (Document reference: J581-DN-00-004-RP-C-0002-C) has been used for background data.		Habitats were classified using UKhab V2.01[1] and given habitat condition assessments in line with Biodiversity Net Gain guidance[2]. Structures and habitats were assessed for their potential to support bats in accordance with Bat Conservation Trust (BCT) survey guidelines[3]. The Survey Area was searched for badger signs in accordance with standard survey methodology[4,5].
Limitations	Some areas of the Survey Area were inaccessible during the Site visit due to either lack of access, high walls or dense vegetation. These areas were mainly residential gardens within the Survey Area that could not be accessed due to lack of visual access. However, due to the scale of this development, and the lack of habitat removal, this is not considered to be a significant limitation.		

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
Statutory Designated Sites	**There is one internationally designated site within 5 km of the Site.** Thames Basin Heaths Special Protection Area (SPA) is located 3.7km southwest of the Site and encompasses a number of Site of Special Scientific Interest (SSSI) within it consisting of tracts of heathland, scrub and woodland, once almost continuous, but now fragmented into separate blocks by roads, urban development and farmland. Less open habitats of scrub, acidic woodland and conifer plantations dominate, within which are scattered areas of open heath and mire. The SPA is designated for Annex 1 species of; nightjar (*Caprimulgus europaeus*), woodlark (*Lullula arborea*) and Dartford warbler (*Sylvia undata*). **There are no nationally designated sites within 1 km of the Site.**	The distance of the Proposed Works to internationally and nationally designated sites, along with the lack of habitat removal of the works would result in no adverse ecological affects or feed into any impact pathways, and therefore no mitigation is required for internationally and nationally designated sites.	N/A

[1] UKHab Ltd (2023). UK Habitat Classification Version 2.0 (at https://www.ukhab.org)
[2] CIEEM, CIRIA, IEMA (2016) Biodiversity Net Gain: Good Practice Principles for Development, A Practical Guide.
[3] Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6
[4] Badger Trust (2023) Badger Protection: Best Practice Guidance for Developers, Ecologists and Planners (England).
[5] Harris, S. Cresswell, P. and Jefferies D. (1989) Surveying Badgers, Mammal Society.

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
Non-statutory designated sites	**There are 62 non-statutory designated sites (sixty Berkshire Local Wildlife Sites, one Berkshire Local Nature Reserve and one Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT) Reserve) within 5km of the Site.** The closest of these is The Coombes Berkshire Local Wildlife Site which is situated approximately 0.29km north of the Proposed Works. This non-statutory site is noted for its lowland mixed deciduous woodland which supports associated protected and notable species such as bluebell (*Hyacinthoides non-scripta*). Bearwood Estate – Woods and Lakes Local Wildlife Site is the only other non-statutory site within 0.50km of the Proposed Works. This site is 0.30km north of the Proposed Works and is an area with extensive woodland and a large lake. **There are 6 ancient woodlands within a 500m radius from the Site.** These include: Bears Copse, 60m west of the Site Little Coppice, 90m north of the Site Bignell's Copse, 190m north of the Site The Coombes, 280m north of the Site Fox Hill, 330m northeast of the Site	It is recommended that standard best practice construction measures are implemented as part of a Construction Environmental Management Plan (CEMP) to avoid any potential harmful impacts to any adjacent retained habitats. The CEMP should include (but not be limited to): • Measures to reduce vehicle and mechanical plant noise (as required based on existing noise levels); • Minimising of light spill onto adjacent habitat; • Plant and machinery will be turned off when not in use; • Enclosure and sheeting of material stockpiles; • Sheltered location for material storage; • Use of wheel washes to reduce the trafficking of soil onto adjacent highways, with prompt clearance as a remedial action; • Use of a bowser on Site during extended periods of dry weather to damp down dust; • Sheeting of vehicles carrying spoil; • Dust suppression measures; and • Bunding of fuel stores and material stockpiles to prevent pollution.	During works

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
	Kidgem Copse, 390m south of the Site		
Urban u1b6, 800 - Other developed land (Road) u1d - Suburban mosaic of developed and natural surface u1b5, 818 - Buildings (residential)	The majority of the Survey Area comprised both Barkham Road within the southwestern section, and Bearwood Road within the northeastern section (Plate 1). **These roads and their hardstanding are the location of the entirety of the proposed open cut method of construction for the Proposed works** Hardstanding driveways and mown gardens used for the many residential buildings the roads service were the primary habitat type adjacent to the Site (Plate 2). Residential buildings were present along the length of the roads, with higher density along the northeastern section of Bearwood Road. These areas had limited access.	The urban habitats within the Survey Area are of low ecological value and no mitigation is required. **All Proposed works are scheduled to take place within the road hardstanding.**	N/A
Grassland g4, 103 - Modified grassland (Horse grazing) g4, 106 - Modified grassland (Mown) g4, 106, 827 - Modified grassland (Mown, Garden)	There were large grassland fields present within the Survey Area adjacent to the Site, particularly along Barkham Road in the southwest section of the Site that were being used for horse and reindeer grazing (Plate 3). Species included perennial ryegrass (*Lolium perenne*), salad burnet (*Sanguisorba minor*), white clover (*Trifolium repens*), yarrow (*Achillea millefolium*), ribwort plantain (*Plantago lanceolata*), bramble (*Rubus fruticosus* agg.), spear thistle (*Cirsium vulgare*), and common nettle (*Urtica dioica*). Much of the roadside, especially along Barkham Road, had heavily mown grassland verges (Plate 4). Species in these areas included perennial ryegrass, white clover, ribwort plantain, infrequent bramble and common nettle.	All grassland within the Survey Area is not scheduled to be within the Proposed works area and should be retained where possible. Where this isn't possible (for example, if the need arises for access or compound laydown areas), and temporary removal is required, the turf should be stripped, placed next to the Site, and returned upon completion of the Proposed Works. Alternatively, if keeping the turf intact is not possible vegetation should be allowed to revegetate upon completion of the works. Measures outlined above for a CEMP will also be followed. Mown grassland within the Survey Area is of low ecological value and no mitigation is required	Planning before works commence. Implementation of the CEMP during works.

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
g4, 32, 106 - Modified grassland (Scattered trees, Mown) g3c, 81 - Other neutral grassland (Ruderal or ephemeral) g1c - Bracken	Some of the residential buildings within the Survey area had mown grassland gardens instead of hardstanding driveways (Plate 5). There were two areas of mown grassland used for recreation, located at SU 77556 66904 and SU 78111 67059 to the north of Barkham Road . These also supported scattered trees further away from the road, just beyond the Survey Area (Plate 6). Species within these areas consisted of; oak *(Quercus robur*), ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), holly (*Ilex aquifolium*) as well as perennial ryegrass, white clover, yarrow, ribwort plantain, bramble, spear thistle and common nettle. There was one area of grassland towards the centre of the Survey Area at SU 78167 67094 that had not had recent or frequent management and as such, taller swards and ruderal species were present (Plate 7). Species within this area included cocksfoot (*Dactylis glomerata*), common thistle (*Cirsium vulgare*), common dock (*Rumex obtusifolius*), annual meadow grass (*Poa annua*), white clover, bramble, perennial ryegrass, yarrow and common nettle. A strip of bracken (*Pteridium aquilinum*) was present to the east of Bearwood Road at SU 78368 67960, lining a disused track (Plate 8).	.	
Heathland and Scrub h3h, 10 - Mixed scrub (Scattered scrub)	Within the far southwest of the Survey Area was a section of scattered scrub surrounding a derelict building (Building 1) with limited access (Plate 9). Species present within this scrub included bramble, ash, common nettle and dogwood (*Cornus sanguinea*).	Scrub within the Survey Area is not scheduled to be within the Proposed Works area and should be retained where possible. Where this isn't possible (for example, if the need arises for access or compound laydown areas), and temporary removal is required, vegetation should be allowed to revegetate upon completion of the works.	Planning before works commence. Implementation of the CEMP during works.

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
h3d - Bramble scrub h2a - Other native hedgerow h2b - Non-native ornamental hedgerow	A narrow, 370m long stretch of dense bramble scrub was located 5m north of the centre of the Site (Plate 10). There were nine native hedgerows that at points ran parallel to the roads within the Site (Plate 11). Most of these were used as garden or driveway borders and consisted of species such as hawthorn (*Crataegus monogyna*), bramble, blackthorn, common box (*Buxus sempervirens*), ash, oak and dogwood. There were 20 non-native ornamental hedgerows that formed residential garden or driveway borders, with many of them being located along the more urban Bearwood Road (Plate 12). The majority of these hedgerows comprised cherry laurel (*Prunus laurocerasus*) with some containing species such as Lawson cypress (*Chamaecyparis lawsoniana*), rhododendron (*Rhododendron spp*.) (TN4), and other ornamental species. No other ornamental species were invasive non-native species.	Native hedgerows are a priority habitat and are not scheduled to be within the Proposed Works area. If changes to the works areas mean works would impact adjacent hedgerows, additional consultation with an ecologist is required. Pollution impacts on retained habitats will be avoided through use of standard construction measures in the CEMP, outlined above. Rhododendron is listed on Schedule 9 of the Wildlife and Countryside Act 1981[6] and is an invasive non-native species. Proposed Works are not scheduled to take place within areas including rhododendron. If this changes, it is recommended that an invasive species mitigation plan is put in place to allow for removal of invasive species without spreading to other areas. If more signs of invasive non-native species are discovered during the works, an ecologist should be contacted for advice.	
Woodland w1f7 – Other lowland mixed deciduous woodland	There were eight areas of mixed deciduous woodland within the Survey Area (Plate 13). Many of these were blocks of a similar composition containing species such as oak, ash, hawthorn, blackthorn, holly, bramble, common nettle, ground ivy (*Glechoma hederacea*), silver birch (*Betula pendula*), beech (*Fagus sylvatica*), gorse (*Ulex europaeus*) and willow (*Salix spp*.) There were also a total of 50 large individual trees located along the length of the Site (Plate 14). The majority of these trees were large mature oak trees, but other species included Scots pine (*Pinus sylvestris*) particularly in the	Broadleaved woodland is a priority habitat and no woodland or individual trees are scheduled to be lost within the Proposed Works. Many woodlands have a natural hedgerow or fencing buffer already in place between the woodland and the road itself. Pollution impacts on retained habitats will be avoided through use of standard construction measures in the CEMP, outlined above. There must be no lighting of trees or woodlands. Currently no areas of woodland, lines of trees or individual trees are due to be removed during the Proposed Works	Prior to works During work including CEMP

[6] https://www.legislation.gov.uk/ukpga/1981/69/schedule/9 Accessed 22/01/2025

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
w1h, 33 - Other woodland mixed (Line of trees)	northern end of the Site, hornbeam (*Carpinus betulus*) and ash were present. Running parallel to the roads were some instances of lines of trees (Plate 15). The majority of these were lines of Lawson cypress with some comprising native species such as oak, ash, blackthorn and hawthorn.	If changes to the works areas mean works would impact woodland within the Survey Area, additional consultation with an ecologist is required.	
Rivers and Lakes r1g, 40 – Other standing water (Priority habitat) R2a – Rivers (Priority habitat)	Pond 1 (TN1) was a small 240m^2 pond located at SU 76909 66446 8m to the far southwest of the Site (Plate 16). The pond is located within a woodland positioned adjacent to the hardstanding pavement and road. The previous Mott MacDonald report from 2021 recorded this pond as having a Habitat Suitability Index (HSI) of 0.38 - poor quality Pond 2 (TN3) was a small 77m^2 garden pond located at SU 78110 67021 9m south of the Site in the centre of the Survey Area. This pond had no access as it was located within a private garden behind a hedgerow. Although the river Lodden (TN2) located at SU 77672 66928 is outside of the 30m boundary for both the southwest section and the northeast section of works, there remains a low potential for pollution events to impact the river (Plate 17).	Due to the lack of habitat removal, it is unlikely that Pond 1 or Pond 2 would be directly ecologically affected. Pond 1 and Pond 2 are priority habitat and are not scheduled to be within the Proposed Works area. If changes to the works areas mean works would impact Pond 1 or Pond 2, additional consultation with an ecologist is required. Pollution impacts on the ponds and river will be avoided through use of standard construction measures in the CEMP, outlined above. With the lack of habitat removal, the implementation of the CEMP above, and with no works within 40m of the river Loddon, there are set to be no ecological impacts to the river.	N/A
Great crested newts (*Triturus cristatus*) and amphibians	There were two suitable water bodies within the Survey Area being Pond 1, 8m from the Site, and Pond 2 9m from the Site. Pond 2 was inaccessible for a Habitat Suitability Index (HSI) assessment; however, Pond 1 was assessed to have a score HSI score of 0.65 Average. Within 250m of the Proposed Works were an additional two ponds located at SU 78019 67230 and SU 77267 66794. These ponds are likely suitable for great crested newts; however, these ponds have not been surveyed due to having no access as well as having limited connectivity with the Site.	Due to the lack of suitable aquatic or terrestrial habitats being removed or disturbed, with the Proposed Works limited to within the hardstanding highway, great crested newts and other common amphibian species are considered unlikely to be killed or disturbed by the Proposed Works. With more suitable terrestrial habitat of woodland and scrub being situated further south in the opposite direction of the Proposed Works, it is more likely that these areas are used by great crested newts and other amphibians, decreasing the likelihood of these species being present within eh Proposed Works areas.	N/A

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
	The closest record of great crested newt returned by the desk study was located approximately 1.2km away from the Proposed Works in 2020. There were also records of common frog (*Rana temporaria*) 0.68km from the Site, common toad (*Bufo bufo*) 1.1km from the Site and palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*) 1.2km from the Site.	If great crested newts are discovered during works, works must stop immediately, and an ecologist contacted for further advice.	
Reptiles	The non-mown areas of grassland and scrub present within the wider Survey Area had the potential to be suitable for common reptile species such as slow worm (*Anguis fragilis*), common lizard (*Zootoca vivipara*) and grass snake (*Natrix helvetica*). The desk study returned records of adder, common lizard, grass snake and slow worm within 1km of the Proposed Works. The closest of these were grass snake and slow worm both recorded approximately 159m from the Proposed Works in 2015. No habitat suitable for common reptile species are expected to be removed for the Proposed Works.	Clearance of vegetation suitable for common reptile species is not anticipated. If works change and this isn't possible, clearance of non-mown grassland should be completed under a Precautionary Method of Work (PMoW), which would include supervision of works by a suitably qualified ecologist.	Avoidance of vegetation clearance during works planning stage. If this cannot be avoided Precautionary Method of Works should be prepared prior to works commencing and implemented during the works. This will include works being completed at a suitable time of year.
Breeding birds	The desk study returned records for seventy-three protected or notable bird species. This included fifteen records of species protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) such as barn owl (*Tyto alba*), black redstart (*Phoenicurus ochruros*), kingfisher (*Alcedo atthis*) and red kite (*Milvus milvus*). Other species included those protected or listed under Birds of Conservation Concern, Section 41 of the Natural Environment and Rural Communities (NERC) Act and Birds Directive Annex 1. Woodland, trees and scrub were present in close proximity to the Proposed Works that are suitable for nesting birds.	Clearance of vegetation suitable for nesting birds is not anticipated; however, if clearance of suitable vegetation (such as scrub or trees) is required, this should be outside of the breeding bird season (i.e. works should be completed September to February inclusive). If works are completed during the breeding bird season (from March - August inclusive), an ecologist should be contacted for advice as ecological supervision may be required. Where active nets are found a 10 m buffer would be required until the nest is no longer deemed active by a suitably qualified ecologist.	Planning before works commence to avoid clearance of suitable habitat. Mitigation required if clearance occurs during the breeding bird season.

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
	No habitat suitable for breeding birds is expected to be removed for the Proposed Works	Implementation of measures within the CEMP outlined above for designated sites will reduce the risk of noise disturbance to breeding birds. In addition, all vegetation that could be used by nesting birds within 10m of the Proposed Works are also within 10m of either Barkham Road or Bearwood Road, both busy roads used by large vehicles in urban environments. Therefore, the temporary Proposed Works would not likely significantly increase the disturbance levels generally seen in these locations.	
Hazel dormouse (*Muscardinus avellanarius*)	The desk study returned no records of hazel dormouse within 1km of the Proposed Works. The hedgerows, trees and woodland present are considered unlikely to support hazel dormouse (*Muscardinus avellanarius*) as they are isolated within the wider landscape due to the presence of roads, rail lines, residential hardstanding and fences, with no links to other woodlands and a lack of required key vegetation species including honeysuckle (*Lonicera*) and hazel (*Corylus avellana*). Additionally, no habitat suitable for hazel dormouse is expected to be removed for the Proposed Works.	No mitigation is required for hazel dormouse.	N/A
Bats	Both suitable buildings and trees were recorded within 10m of the Proposed Works. Both trees and buildings within the survey area were not fully surveyed for roosting bats but any potential roost features identified from accessible areas are included below. Building 1 was a derelict house located 8m from Site at the southwestern end of the Site at SU 76943 66470. This building had multiple entryways into the building with only boarded up windows and open holes in the brickwork making this building have potential for roosting bats (Plate 18).	Clearance of vegetation or works on buildings suitable for roosting bats is not anticipated to facilitate the Proposed Works. If works to or removal of trees and buildings is required, additional consultation with an ecologist must be completed. Implementation of measures within the CEMP outlined above for designated sites will reduce the risk of noise disturbance to roosting bats. In addition, all buildings and trees with bat roost suitability within 10m of the Proposed Works are also within 10m of either Barkham Road or Bearwood Road, both busy roads used by large vehicles in urban environments. Therefore, the temporary Proposed Works would not likely significantly increase the disturbance levels generally seen in these locations. However, it is recommended that where possible works within 10m of trees with bat roost suitability are conducted during the	Works should be programmed to avoid working at night. If this cannot be avoided, mitigation is required. No tree removal or building work is required. If this changes additional mitigation is required. Recommended that where possible works

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
	Building 2 was a pub that was not in use located 7m from Site towards the centre of the Site at SU 77965 66925, and had similar features of the derelict house of Building 1, with broken boarded windows and missing and gaps in the roofing tiles resulting in a potential for roosting bats (Plate 19). No trees are to be removed within 10m of the proposed Site works; however, trees within 10m of the Site support features suitable for roosting bats. The roads within the Proposed Works in combination with adjacent hedgerows and trees form a linear feature which may be suitable for foraging and commuting bats. The desk study returned records of twelve species of bat within 1km of the Proposed Works; brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrelllus*), Daubenton's bat (*Myotis daubentonii*), Leisler's bat (*Nyctalus leisleri*), *Myotis* bat species (*Myotis* sp.), Nathusius' pipistrelle (*Pipistrellus nathusii*), Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctula*), serotine (*Eptesicus setotinus*), soprano pipistrelle (*Pipistrellus pygmaeus*), barbastelle (*Barbastella barbastellus*) and Whiskered bat (*Myotis mystacinus*). The closest of these records were common pipistrelle, noctule and soprano pipistrelle all recorded approximately 0.01km east from the Proposed Works in 2022.	time of year bats are less likely to be present. Based on the features present, where possible works should be conducted during the period late October to March inclusive. To avoid disturbance of, foraging and commuting bats, all works should be conducted during the day where possible, to avoid the requirement for construction lighting. Where this is not possible, lighting should be designed with ecological input to ensure a sensitive lighting design with regards to bats and must avoid light spill into the adjacent woodlands.	should be conducted during the period late October to March inclusive.
Badgers (*Meles meles*)	The areas of woodland, scrub and grassland adjacent the Site could be used by badgers (*Meles meles*) for foraging. No signs of badgers were recorded during the survey; [redacted]	[redacted]	A pre-construction badger check is recommended no more than 3 months prior to works commencing. During works excavations should be

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
	The closest record of European badger returned by the desk study was located approximately 0.34km away from the Proposed Works in 2023.	Excavations should be backfilled the same day, covered at night or a ramp provided to reduce the risk of mammals becoming trapped in excavations. A nominated member of construction staff should check the excavation the next morning prior to works recommencing.	covered overnight, or a ramp provided and a nominated member of construction staff should check the excavation each morning prior to works recommencing.
Water vole (*Arvicola amphibius*)	No locations within the Survey area are suitable for water vole. The desk study returned no records of water vole within 1km of the Proposed Works.	As the Proposed Works are temporary, they are not likely to affect surrounding waterways ecologically, it is likely that even if water voles are present within the Survey Area they too would be unaffected by the Proposed Works. In addition, the CEMP will include measures to avoid pollution of the watercourse, as outlined above for designated sites. Therefore, no additional mitigation is required.	N/A
Otter (*Lutra lutra*)	The Ludden river situated outside of the Survey Area could potentially be suitable for otter. Although with more favourable terrestrial and aquatic habitat being north of the Survey Area, it is unlikely that otters are present within the Site. The desk study returned one record of otter within 0.41km of the Proposed Works in 2016.	As the Proposed Works are temporary, they are not likely to affect surrounding waterways ecologically, it is likely that even if otters are present within the Survey Area they too would be unaffected by the Proposed Works. In addition, the CEMP will include measures to avoid pollution of the watercourse, as outlined above for designated sites. Therefore, no additional mitigation is required.	N/A
White-clawed crayfish (*Austropotamobius pallipes*)	The Ludden river situated outside of the Survey Area is suitable for white-clawed crayfish. The desk study returned one record of white-clawed crayfish within 0.03km of the Proposed Works in 2020.	Although white-clawed crayfish are potentially present within the Ludden river, the Proposed Works are temporary, and they are not likely to affect surrounding waterways ecologically, it is likely that if white-clawed crayfish are present within the Survey Area they too would be unaffected by the Proposed Works. In addition, the CEMP will include measures to avoid pollution of the watercourse, as outlined above for designated sites. Therefore, no additional mitigation is required.	N/A
Invasive non-native species	One invasive non-native species was recorded during the Site visit on 8th January 2024; rhododendron (*Rhodendron ponticum*).	Rhododendron is listed on Schedule 9 of the Wildlife and Countryside Act 1981[7] and is an invasive non-native species. Proposed Works are not scheduled to take place within areas including rhododendron.	During works.

[7] https://www.legislation.gov.uk/ukpga/1981/69/schedule/9 Accessed 22/01/2025

Ecological Features	Potential Ecological Constraints	Mitigation	Timing
	The desk study returned records of five invasive non-native species within approximately 1km from the Proposed Works. This included two flowering plants, Himalayan balsam (*Impatiens glandulifera*) and rhododendron, one crustacean, signal crayfish (*Pacifastacus leniusculus*) and one mammal, American mink (*Neovision vison*).	If this changes, it is recommended that an invasive species mitigation plan is put in place to allow for removal of invasive species without unintentional spreading or allowing regrowth once works have concluded. If more signs of invasive non-native species are discovered during the works, an ecologist should be contacted for advice. Contractors should remain vigilant for invasive non-native species and if present, an ecologist should be contacted for advice.	
Terrestrial invertebrates	Habitats within the Survey Area and wider habitats were suitable to support terrestrial invertebrate species. The desk study returned records of nine protected or notable terrestrial invertebrate species within approximately 1km from the Proposed Works. This included stag beetle (*Lucanus cervus*) located 0.02km away in 2015, which is protected and listed under Appendix 2 of the Habitat Directive, Schedule 5 of Wildlife & Countryside Act 1981 (as amended), and the Natural Environment and Rural Communities Act 2006 (as amended) (NERC) Three protected species of Lepidoptera were recorded within 1km of the Proposed Works including two protected under the NERC 2006 (as amended) Act, white admiral (*Limenitis camilla*) and cinnabar (*Tyria jacobaeae*), and one protected under Schedule 5 of Wildlife & Countryside Act 1981 (as amended), purple emperor (*Apatura iris*).	Due to the temporary nature of the works as well as the location of the Proposed Works only being within hardstanding, no further surveys or mitigation are deemed necessary as no important invertebrate assemblages are considered likely to be present. No mitigation is required for terrestrial invertebrates.	N/A
Other mammals	Other mammals such as hedgehog (*Erinaceus europaeus*) could be present within the Site and wider area. The closest record of hedgehog returned by the desk study was located approximately 0.17km away from the Proposed Works in 2020.	As per recommendations for badger, excavations should be backfilled the same day, covered at night or a ramp provided to reduce the risk of mammals becoming trapped in excavations. A nominated member of construction staff should check the excavation the next morning prior to works recommencing.	During works

Appendix A: Site Location

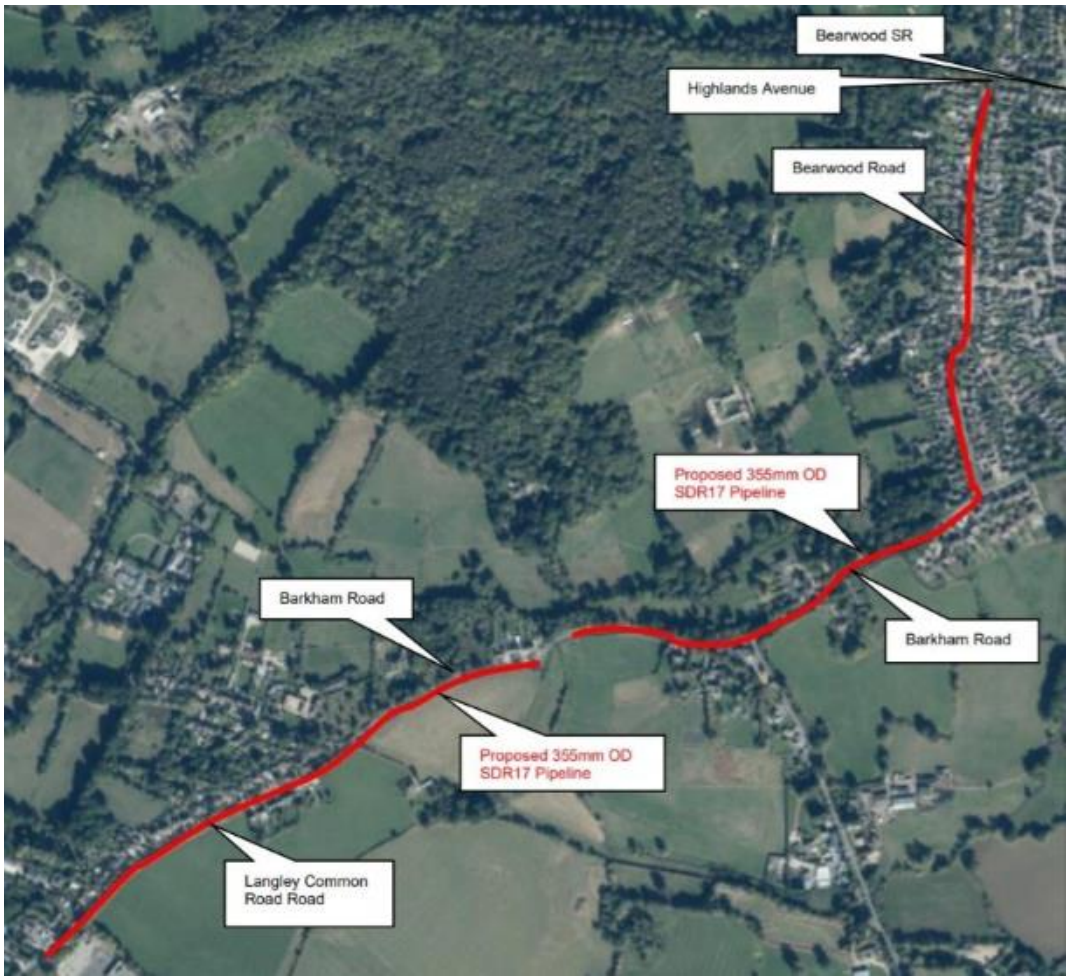
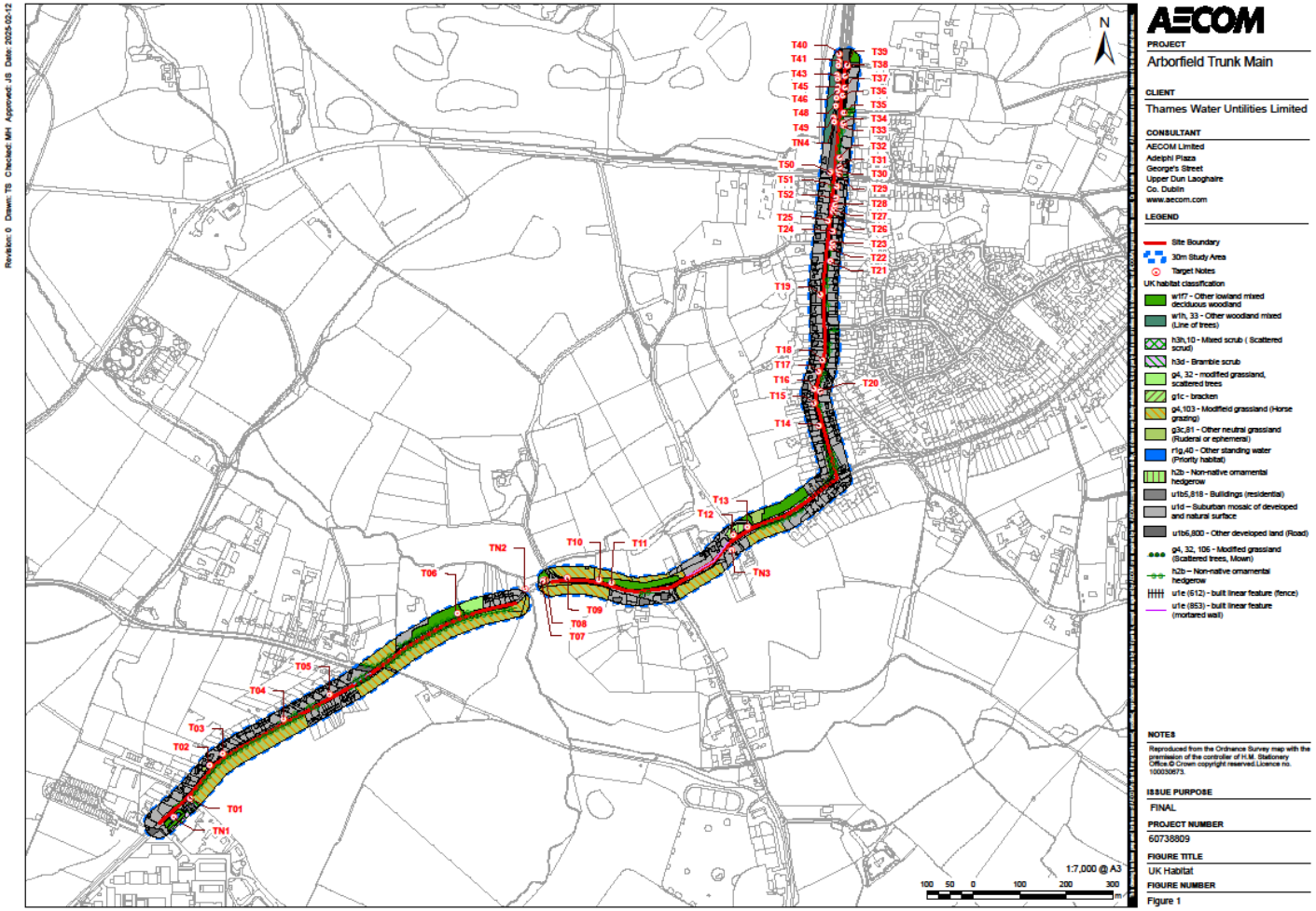
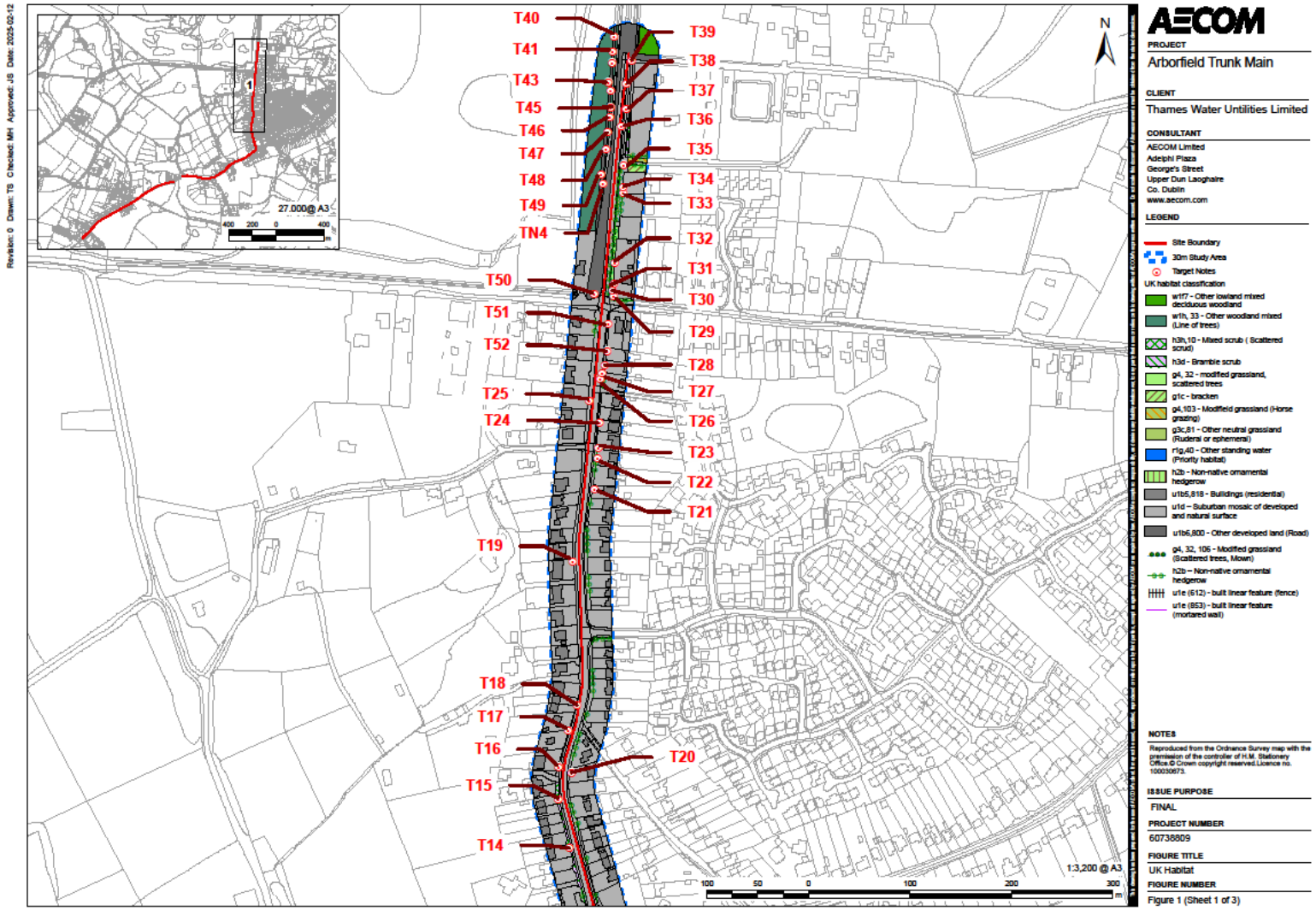


Figure 1. Overview of the Site's Proposed Works.

Appendix B: Habitat map

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T41
T43
T45
T46
T47
T48
T49
TN4
T50
T51
T52
T25
T24
T19
T18
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T32
T31
T30
T29
T28
T27
T26
T23
T22
T21
T20
N
1:3,200 @ A3
AECOM
PROJECT
Arborfield Trunk Main
CLIENT
Thames Water Untilities Limited
CONSULTANT
AECOM Limited
Adelphi Plaza
George's Street
Upper Dun Laoghaire
Co. Dublin
www.aecom.com
LEGEND
Site Boundary
30m Study Area
Target Notes
UK habitat classification
w1f7 - Other lowland mixed deciduous woodland
w1h, 33 - Other woodland mixed (Line of trees)
h3h,10 - Mixed scrub (Scattered scrub)
h3d - Bramble scrub
g4, 32 - modified grassland, scattered trees
g1c - bracken
g4,103 - Modfield grassland (Horse grazing)
g3c,81 - Other neutral grassland (Ruderal or ephemeral)
r1g,40 - Other standing water (Priority habitat)
h2b - Non-native ornamental hedgerow
u1b5,818 - Buildings (residential)
u1d – Suburban mosaic of developed and natural surface
u1b6,800 - Other developed land (Road)
g4, 32, 106 - Modified grassland (Scattered trees, Mown)
h2b – Non-native ornamental hedgerow
u1e (612) - built linear feature (fence)
u1e (853) - built linear feature (mortared wall)
NOTES
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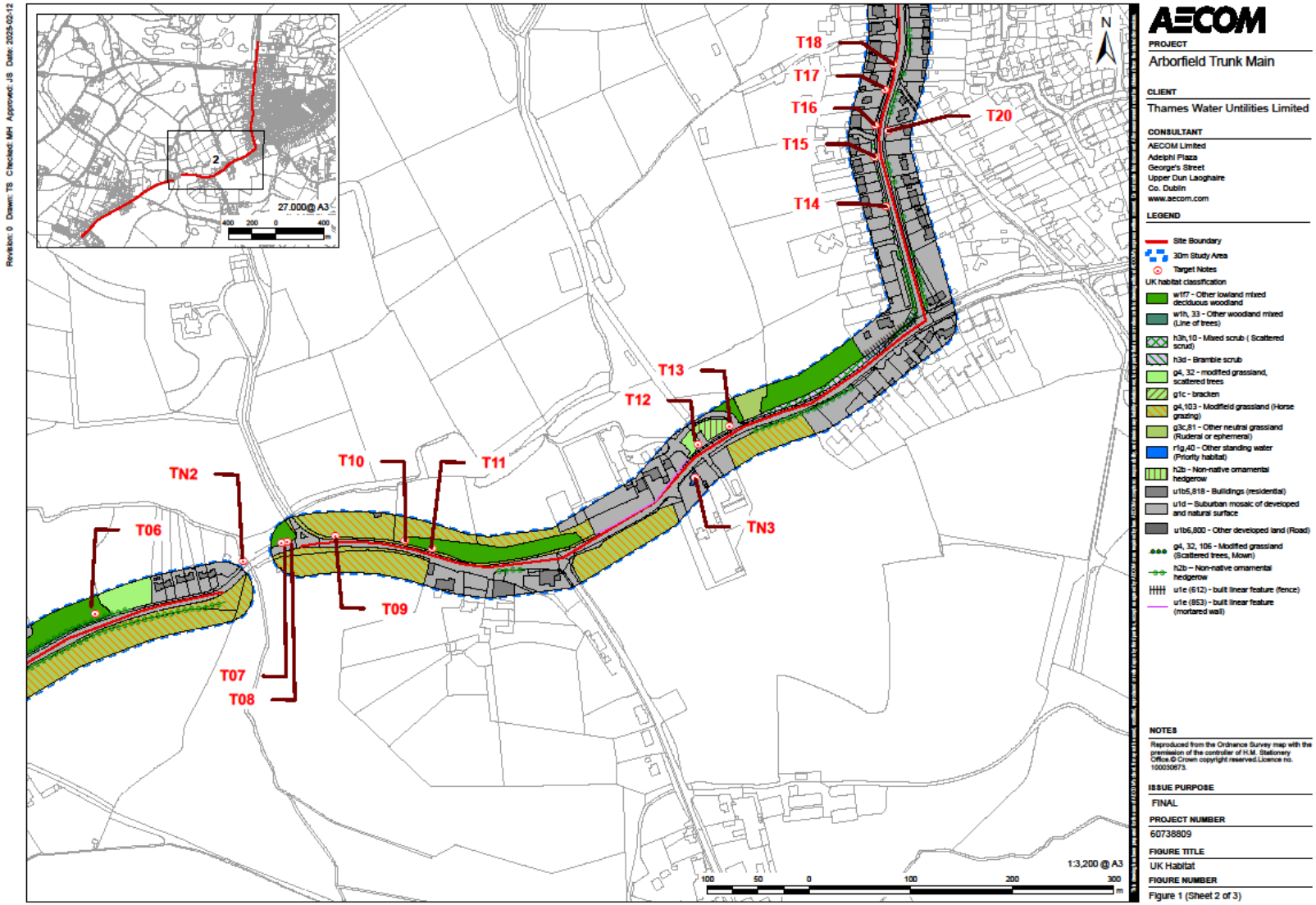
ISSUE PURPOSE
FINAL
PROJECT NUMBER
60736809
FIGURE TITLE
UK Habitat
FIGURE NUMBER
Figure 1 (Sheet 1 of 3)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T12
T10
T11
TN2
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TN3
T09
T07
T08
1:3,200 @ A3
100 50 0 100 200 300 m
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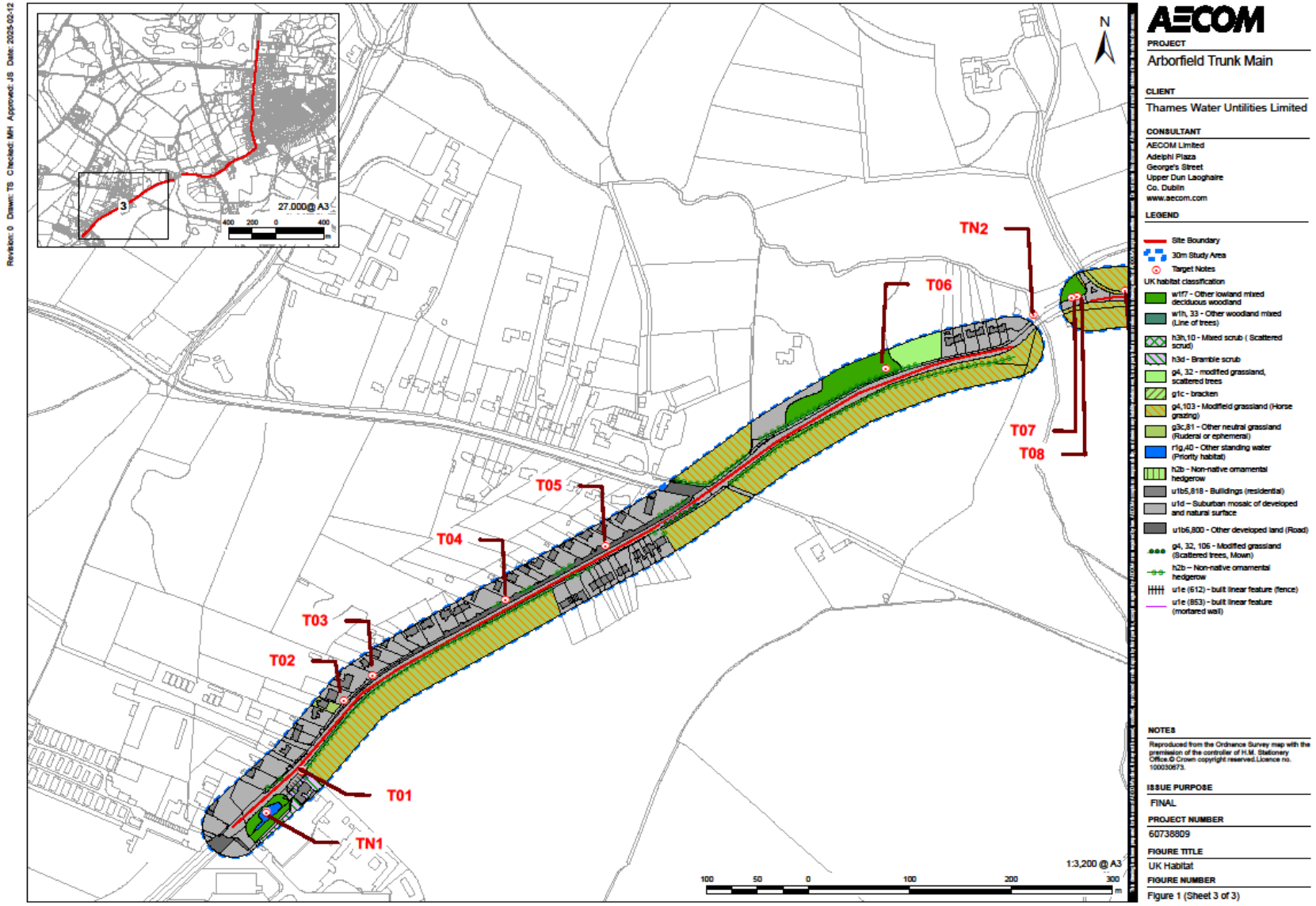
ISSUE PURPOSE
FINAL
PROJECT NUMBER
60738809
FIGURE TITLE
UK Habitat
FIGURE NUMBER
Figure 1 (Sheet 2 of 3)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TN2
T06
T07
T08
T05
T04
T03
T02
T01
TN1
1:3,200 @ A3
100 50 0 100 200 300 m
AECOM
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ISSUE PURPOSE
FINAL
PROJECT NUMBER
60736809
FIGURE TITLE
UK Habitat
FIGURE NUMBER
Figure 1 (Sheet 3 of 3)

Appendix C: Photographs

Plate 1. Roads making up the entire Proposed Works area

Plate 2. Hardstanding driveways for residential buildings

Plate 3. Horse grazing fields in the southwest of the Survey area

Plate 4. Mown grassland road verge

Plate 5. Mown grassland gardens

Plate 6. Grassland with scattered trees outside of Survey Area

Plate 7. Grassland with tall ruderal vegetation

Plate 8. Stretch of bracken in northeast of Survey Area

Plate 9. Scattered scrub surrounding Building 1

Plate 10. Dense bramble scrub

Plate 11. Native hedgerow running parallel to Site Road

Plate 12. Non-native cherry laurel hedgerow

Plate 13. Mixed deciduous woodland block in centre of Survey area

Plate 14. Example of large individual oak tree lining the Site roads

Plate 15. Example of line of trees

Plate 16. Pond 1 within woodland

Plate 17. River 1 outside of Survey Area

Plate 18. Building 1 in the far southwest of the Survey Area

Plate 19. Building 2 in the southern centre of the Survey area