

Appendix 2A: Arboricultural Survey Report and Tree Constraints Plans

Humber Zero

Environmental Statement Appendix 2A Tree Survey
Report

VPI Immingham LLP and Phillips 66 Ltd

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Quality information

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2A.1.Introduction

2A.1.1 Background

2A.1.1.1 AECOM has been instructed by VPI Immingham LLP and Phillips 66 Limited (the Applicants) to carry out a tree survey to British Standard (BS) 5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837) (British Standards Institution, 2012); to include trees with the potential to be affected by the construction, operation and maintenance of two proposed Post-Combustion Carbon Capture (PCC) developments and associated facilities (hereafter referred to as ‘the Proposed Developments’) located at the VPI Immingham Combined Heat and Power (CHP) Plant and Phillips 66 Humber Refinery. The Proposed Developments’ planning application boundaries are hereafter referred to as ‘the Sites’, or ‘the VPI Site’ and ‘the Phillips 66 Site’ respectively.

2A.1.1.2 This report identifies preliminary information in relation to the nature and level of constraints posed by existing trees on the Sites and is intended to inform the development of any design proposals and working methodologies to ensure that the potential impacts on significant trees are fully considered.

2A.1.2 Trees and the Planning Process

2A.1.2.1 The National Planning Policy Framework (NPPF) seeks to ensure that new development is sustainable and underlines the importance of Green Infrastructure, of which trees form an integral part. This encompasses a recognition of the importance of trees in relation to the management of air, soil and water quality along with other associated ecosystem services and climate change adaption. The NPPF also seeks to achieve the protection and enhancement of landscapes and a net gain in biodiversity. Finally, it specifically identifies veteran and ancient trees and woodland as a highly valuable and irreplaceable habitat.

2A.1.2.2 Local Planning Authorities (LPA) in the UK have a statutory duty to consider both the protection and planting of trees when considering planning applications. The potential impact of development on all trees (including those not protected by a Tree Preservation Order or other statutory designation) is therefore a material consideration.

2A.1.2.3 BS5837 provides a framework which sets out how trees should be considered in this context and also explicitly applies to development where planning consent is not required.

2A.1.2.4 BS5837 recommends that a tree survey is undertaken to identify the quality and benefits of trees and the spatial constraints associated with them. This is then used to produce a Tree Constraints Plan showing the above and below ground constraints associated with trees. This drawing is used to inform the design process and to allow the retention of good quality trees where appropriate.

2A.1.2.5 An Arboricultural Impact Assessment may then be developed to identify the likely direct and indirect impacts of the Proposed Developments, and a Tree Protection Plan may be prepared to identify trees to be removed or retained and to illustrate how retained trees are to be protected. An Arboricultural Method Statement is often required as a condition of planning consent to detail how sensitive operations are to be achieved in proximity to retained trees. These elements are the minimum normally required for a planning application and are intended to ensure both a sustainable and harmonious relationship between trees and new development.

Local Policy Context

2A.1.2.6 LPAs have a statutory obligation to consider trees when granting planning permission. The Sites are located within the boundary of North Lincolnshire Council. The North Lincolnshire Core Strategy¹ (North Lincolnshire Council, 2011), which forms part of a suite of Development Plan Documents within the North Lincolnshire Local Development Framework, was adopted in June 2011 and will be used to make planning decisions in the area up to 2026.

Core Strategy 2011, Policy CS16: North Lincolnshire’s Landscape, Greenspace and Waterscape states that:

¹ <https://www.northlincs.gov.uk/planning-and-environment/planning-policy-local-development-framework/#1591178700859-b856fc83-069c>

2A.1.2.7 “The council will protect, enhance and support a diverse and multi-functional network of landscape, greenspace and waterscape through:

1. *Identifying in supporting documents within or evidencing the Local Development Framework, a network of strategically and locally important landscape, greenspace and waterscape areas. Development on or adjacent to these areas will not be permitted where it would result in unacceptable conflict with the function(s) or characteristic of that area.*
2. *Requiring development proposals to improve the quality and quantity of accessible landscape, greenspace and waterscape, where appropriate.*
3. *Requiring development proposals to address local deficiencies in accessible landscape, waterscape and greenspace where appropriate.*
4. *Requiring the protection of trees, hedgerows and historic landscape to be specified where appropriate.”*

2A.1.2.8 Paragraph 11.37 of the Core Strategy states:

2A.1.2.9 *“Smaller scale greenspace features which include individual trees and hedgerows are also important to quality of life and the environment. The council will be proactive in protecting such features through Tree Preservation Orders or other applications of its powers. Development proposals should also bring forward landscaping schemes that protect existing landscape features and deliver environmental improvements appropriate to the location of the scheme and the function and scale of development.”*

2A.1.2.10 North Lincolnshire Council is currently in the process of producing a draft Local Plan² (North Lincolnshire Council, 2022) which sets out the Council’s vision and strategy for the Borough up to 2038. Although not yet adopted it includes their likely approach to trees in relation to development and is likely to be considered during the planning process.

Policy DQE12: Protection of Trees, Woodland and Hedgerows states that:

1. *“Proposals for all new development will, wherever possible, ensure the retention of trees, woodland and hedgerows. Particular regard will be given to protecting their amenity value within and adjacent to settlements.*
2. *Development resulting in the loss or deterioration of irreplaceable habitats such as ancient woodlands, aged or veteran trees, and historic hedgerows should be refused unless there are wholly exceptional reasons* and a suitable compensation strategy exists.*
3. *Where trees which contribute to local amenity or local landscape character are at risk the Council will be proactive in protecting such features through the use of Tree Preservation Orders or other applications of its powers.*
4. *Landscaping and tree and hedgerow planting schemes will be required to accompany applications for new development, having regard to the Biodiversity Opportunity Mapping and contributing towards Nature Recovery Networks. Developers will be encouraged to maximise on-site tree canopy cover in line with local and/or national canopy cover targets**.*
5. *Reference should also be made to the requirements of Policy DQE2: Landscape enhancement, Policy DQE3: Biodiversity and Geodiversity, and Policy DQE11: Green Infrastructure Network in this Plan.*

* For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and Hybrid Bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

** Especially by planting trees that have the potential to ‘grow large’.”

Within **Policy DQE3: Biodiversity and Geodiversity**, trees are included where it states;

2A.1.2.11 *“All development schemes shall, as appropriate to their nature and scale: retain and enhance existing landscape and natural features (e.g. trees, hedges, riverbanks, watercourses, water bodies and important habitats); or ensure an alternative corridor can be provided to ensure equivalent ecological connectivity is maintained.*

² <https://localplan.northlincs.gov.uk/stages/5>

2A.1.2.12 *Development resulting in the loss or deterioration of irreplaceable habitats, such as ancient woodland and aged or veteran trees, will be refused unless there are wholly exceptional reasons** and a suitable compensation strategy exists.*

2A.1.2.13 *** for example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and Hybrid Bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.”*

2A.1.3 Methodology

2A.1.3.1 The tree survey has been based on the Ordnance Survey (OS) Mastermap using publicly available photography and GPS to plot tree features on each of the Sites. Following the on-site survey National Tree Map (NTM) dataset (provided by Bluesky International Ltd) was used to help position tree features more accurately.

2A.1.3.2 NTM is a digital map layer and database that depicts and records the location and extent of trees. NTM data is generated from a combination of high-resolution aerial photography, Digital Surface Models (DSM) and Digital Terrain Models (DTM). It provides approximate tree canopies and heights for individual tree features.

2A.1.3.3 Although the NTM dataset has been used it is not as accurate as a topographical survey (as required by BS5837) and as such all positions for tree features must be considered to be indicative only and the relative distances of features must be measured out on each of the Sites as required.

2A.1.3.4 The survey was otherwise conducted in accordance with the requirements of BS5837.

2A.1.3.5 The initial fieldwork was undertaken on 29th September 2022, during which dimensional data and observational information were collected. A diameter tape measure was used to measure stem diameters where feasible.

2A.1.3.6 Access was only available for two areas: the field to the west of Rosper Road to the south of the VPI Immingham CHP Plant; and the car park to the east of Eastfield Road at the boundary of the Phillips 66 Site. Access was not sought to the areas of the Phillips 66 Site within the operational areas of the Humber Refinery, or to the areas of the VPI Site within the operational CHP Plant, as no trees are present in these areas. No access was available to the railway embankments within the Phillips 66 Site, so these trees were viewed from the nearest accessible location.

2A.1.3.7 The fieldwork informing this report has comprised a preliminary, non-intrusive, visual survey undertaken from ground level with the specific intention of evaluating the quality and benefits of trees on the two Sites.

2A.1.3.8 Where further inspection is deemed appropriate to ascertain the condition of the tree or other arboreal features, this has been identified within the preliminary management recommendations. Average dimensions or dimensional ranges have occasionally been used, where appropriate, to best describe features.

2A.1.3.9 The Root Protection Area (RPA) is the notional extent of what is considered to be the key rooting area for tree health and function. This is generally depicted as a circle but can be amended to a polygon with an equivalent area in accordance with Section 4.6.2 of BS5837 where the RPA is likely to have developed asymmetrically. The RPA of all surveyed trees is depicted as a circle and no RPAs have been amended.

2A.1.3.10 Tree Constraints Plans showing the position of trees and the spatial constraints associated with them is included as Annex A of this report, which corresponds with the Tree Survey Schedule presented in Annex B.

2A.1.3.11 The tree categorisation process recommended by BS5837:2012 is summarised in the table below and corresponds with the tree canopy outline shown on the Tree Constraints Plans (Annex A) and the information in the Tree Survey Schedule (Annex B).

Table 2A.1: BS5837:2012 Tree Categorisation process

Category	Definition
A	High quality, minimum of 40+ years remaining contribution
B	Moderate quality, minimum of 20+ years remaining contribution
C	Low quality, minimum of 10+ years remaining contribution
U	Unsuitable for retention, <10 years remaining contribution
1	Arboricultural value
2	Landscape value
3	Conservation or cultural value

2A.2 General Arboricultural Principles

2A.2.1 General Principles

2A.2.1.1 Trees are dynamic living organisms which provide essential benefits to society and the wider environment. Any proposed development with the potential to impact on trees must take into consideration the value of trees on a site; the impact of any proposed activity along with any potential future conflicts on a site. Suitable measures to safeguard retained trees or mitigate the loss of trees (to be removed) will need to be fully considered and may be subject to a condition of planning consent.

2A.2.1.2 Tree branches and roots frequently grow across site boundaries and off-site trees can pose a significant constraint, and should be carefully considered when assessing the developable space within a site.

2A.2.2 Below Ground Constraints

2A.2.2.1 Below ground tree roots and the soil environment in which they grow need to be protected if the tree is to be retained. Trees grow in association with fungi and other soil organisms which are of key importance to tree health. Roots are essential for anchorage, the uptake of water and nutrients, and the storage of energy (carbohydrates) for the future growth and function of the tree.

2A.2.2.2 Roots can be damaged by physical severance or wounding (e.g. following excavation of the soil) which can lead to the development of decay and a decline in vitality and/or instability. Raising the soil level can bury tree roots at a depth where suitable conditions for growth are less available. Toxic materials discharged into the soil (such as cement-based aggregates, fuel and chemicals) can lead to root death and dysfunction. Soils can be compacted to levels inhospitable to tree growth with even a single pass of machinery, regular pedestrian traffic or the storage of plant and materials. Relieving compaction can be problematic and may require costly remedial works. Changes in drainage/water levels can also have significant long-term impacts for tree health.

2A.2.2.3 The effects of these incursions may take many years to manifest, with a resulting decline in amenity value and potentially the death or failure of the tree. It should be noted that older trees are particularly sensitive to damage and changes in conditions.

2A.2.2.4 The Root Protection Area (RPA) is a notional area considered to be the minimum zone that must be protected to avoid any adverse impacts on retained trees. This area is deemed to be particularly important for tree stability, growth, function and health. However, roots may extend far greater distances, with the distribution of the root system relating directly to the availability of suitable conditions for growth (namely oxygen, water and nutrients). It is generally accepted that tree roots are predominantly located in the upper 1000mm of soil; however, roots may develop at deeper levels where conditions allow.

2A.2.2.5 RPAs are calculated as per BS5837: 2012 Annex C, D and Section 4.6 in the BS 5837 2012 document.

2A.2.2.6 The RPA of the existing tree stock is an important material consideration when considering site constraints and planning development activities. The RPA of significant trees on the Site is shown on the Tree Constraints Plans (Annex A).

2A.2.2.7 The default position must be that all development, including any associated services will occur outside the RPAs of retained trees. Where this is unavoidable, it may be appropriate to use special measures to install structures, services or surfacing within RPAs which allow the protection of roots and soil structure which are essential for tree growth and keep any incursion to a minimum.

2A.2.2.8 Further steps to improve or increase the useable rooting area available to the tree may also be required.

2A.2.3 Soils

2A.2.3.1 On shrinkable clay soil, tree growth can lead to the differential movement of structures as moisture is removed from the soil during the growing season. Soils must be carefully assessed, and any foundations must be installed following the recommendations of National House Building Council (NHBC) Standards Chapter 4.2: Building Near Trees (2021) to avoid potential future damage. Where trees which predate existing structures are to be removed, this can result in heave as the soils are re-wet. The advice of a suitably qualified engineer must be obtained to inform any potential issue of heave. Specific advice in relation to this issue is beyond the scope of this report.

2A.2.3.2 Following a review of Cranfield University's Soilscales³ mapping on 26th October 2022, the site soil was identified as slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.

2A.2.4 Above Ground Constraints

2A.2.4.1 Tree stems and branches can restrict available space on a site. Damage or wounding (including excessive pruning) can significantly reduce the amenity contribution of the tree and may lead to the development of dysfunction and decay, with significant long term implications for tree health. The future impact of existing trees should be carefully considered, including individual species characteristics (such as potential future size, fruit fall, shade etc.) and how the tree will interact with any proposed development and future land use. Annual tree growth can lead to direct damage if stems/branches (or roots) come into physical contact with structures and this must also be taken into consideration.

2A.2.5 Trees and Risk in the Context of Development

2A.2.5.1 Tree owners/ managers have a legal duty to prevent foreseeable harm. It is generally accepted that this duty can be fulfilled by undertaking proactive inspections of significant trees to identify obvious defects and by taking appropriate remedial action or gaining further advice as appropriate.

2A.2.5.2 AECOM can provide surveys and advice in relation to tree risk management if required. Further guidance is available from the National Tree Safety Group⁴.

2A.2.5.3 The tree survey carried out as the basis of this report is primarily for planning purposes, focusing on the quality and benefits of the trees and is not specifically designed to assess the safety of trees on the Site. However, when obvious issues have been identified recommendations have been included in the Tree Survey Schedule.

2A.2.5.4 The Construction (Design and Management) Regulations (2015) states that developers and contractors have responsibilities for health and safety as a result of their actions. Should trees be left in an unstable or hazardous condition the Health and Safety Executive (HSE) could seek to prosecute those responsible along with the potential for further Civil claims for damages.

2A.2.6 Trees and Wildlife

2A.2.6.1 Full consideration must be given to the presence of species protected under the Wildlife and Countryside Act (1981 - as amended), the Countryside Rights of Way Act (2000) and the Conservation of Habitats and Species Regulations (2017), in particular the presence of bats and nesting birds. It is recommended that wherever possible, significant tree/hedge works take place outside of the typical bird nesting season of March to September. The advice of a suitably qualified Ecologist is recommended in relation to any potential impacts on protected species.

2A.2.7 Tree Works

2A.2.7.1 Any tree surgery recommendations contained within this report are to be undertaken in accordance with BS3998: 2010 Tree work – Recommendations (BS3998) by suitably qualified and insured contractors. Significant pruning works are best undertaken when trees are dormant or outside periods of high functional activity to reduce the overall impact on energy available to the tree for growth and processes. In general, the optimum period for works is between November to February and July to August (subject to the presence of protected species) when the tree is less active and better placed to respond to wounding and a reduction in leaf area.

³ <http://www.landis.org.uk/soilscales/#>

⁴ National Tree Safety Group (NTSG),2011. Common sense risk management of trees. Forestry Commission.

2A.3 Field Work Observations

2A.3.1 The Sites

- 2A.3.1.1 The boundary for the Proposed Developments is shown on the Tree Constraints Plans included within Annex A (refs: 60668866-ACM-XX-XX-AB-TCP-01 to 02 (Philips 66) and 60668866-ACM-XX-XX-AB-TCP-03 (VPI)) of this report.
- 2A.3.1.2 The two survey areas are defined as the car park to the east of Eastfield Road, outside of the Philips 66 Humber Refinery perimeter fence, and the field off Rosper Road to the south of the VPI Immingham CHP Plant.

2A.3.2 The Trees

- 2A.3.2.1 There are a total of 17 tree features recorded on the survey, including seven individual trees, nine tree groups, and one hedgerow. The recorded trees are predominantly semi to early mature and in a good to fair condition. Species present include ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), goat willow (*Salix caprea*), grey alder (*Alnus incana*), hawthorn (*Crataegus monogyna*), Norway maple (*Acer platanoides*), silver birch (*Betula pendula*), sycamore (*Acer pseudoplatanus*), whitebeam (*Sorbus aria*) and wild cherry (*Prunus avium*).
- 2A.3.2.2 The most significant trees included within the survey are T4, T6, T7 and G10, G11, G12 and G17 which are all identified as moderate quality (Category B).
- 2A.3.2.3 The trees within the survey to the east of Eastfield Road are mainly of low quality (Category C) with only T4 and T6 classed as moderate quality (Category B) individuals.
- 2A.3.2.4 Groups G10, G11, G12 and G17 flank the railway line and are considered collectively to be of moderate quality (Category B) although it should be noted that a number of ash within G12 were noted to have signs of ash dieback (*Hymenoscyphus fraxineus*) which is known to cause rapid death and decline for the majority of affected trees.
- 2A.3.2.5 Two groups of ash were identified beneath the existing pipe bridge crossing the railway line. These are identified as G8 and G16 and categorised as low quality (Category C) due to their limited long-term value.
- 2A.3.2.6 Some of the trees included within the survey are likely within the ownership of third-parties. Prior to any works the ownership of affected trees must be established and the consent of the tree owner obtained in writing.
- 2A.3.2.7 Site photography is included within Annex C.

2A.3.3 Statutory and Non-Statutory Designations

Statutory Designations

- 2A.3.3.1 AECOM viewed North Lincolnshire Council's online mapping⁵ on 26th October 2022 which confirmed that there are no Conservation Areas or trees subject to a Tree Preservation Order within the Sites.
- 2A.3.3.2 AECOM checked Magic Map⁶ on 26th October 2022 and it was confirmed that there are no statutory designations relating to trees within the Sites. The Humber Estuary (to the east of the Sites) is classified as a Site of Special Scientific Interest, a Special Area of Conservation, a Special Protection Area and a Ramsar site. However, these statutory designations do not correlate with any of the trees recorded in the survey.
- 2A.3.3.3 The Hedgerow Regulations (1997) protect agricultural or countryside hedgerows which meet the requirements of an 'important hedgerow'. These include a minimum length of 20 m (or meets another hedge at each end) and a minimum age of at least 30 years. A wide range of other ecological and archaeological/ heritage features can constitute an important hedgerow and further advice from a qualified ecologist is recommended in advance of any planned works which could impact established

⁵ <http://map.northlincs.gov.uk/mycouncil.aspx?tab=maps>

⁶ <https://magic.defra.gov.uk/MagicMap.aspx>

hedgerows on or bordering agricultural or countryside land. Prior to the removal or destruction of a protected hedgerow an application must be made to the Local Planning Authority.

2A.3.3.4 A felling licence may be required by the Forestry Commission to fell more than 5 m³ in any calendar quarter (subject to relevant exceptions including trees in gardens, designated public open spaces or churchyards).

2A.3.3.5 Full planning consent is an exemption from the need to apply for consent for works to trees protected by a Tree Preservation Order, the need to give notice of the intention to undertake works within a Conservation Area and the need to apply for a Felling Licence with the Forestry Commission (to fell more than 5 m³ per calendar quarter). Prior to any tree works the status of trees to be removed or pruned must be verified with the LPA and the Forestry Commission as appropriate.

Non-Statutory Designations

2A.3.3.6 Following a review of Magic Map an area of Deciduous Woodland included within the Priority Habitat Inventory was identified located directly adjacent to the railway to the north of the Phillips 66 Site (Image 1 below). Although a non-statutory designation it has the potential to be a material consideration in the planning process. Although this designation does not correlate with any surveyed trees, constraints from the edge trees are likely to extend into the Phillips 66 Site and must be considered.



Image 2A.1 Extract from Magic Map indicating the locations of Priority Habitat Inventory Deciduous Woodland in Proximity to the Sites

AECOM checked the Woodland Trust Ancient Tree Inventory⁷ (ATI) on 26th October 2022 and it was confirmed that there are no recorded Ancient, Veteran or Notable trees within or immediately adjacent to the Sites.

2A.4 Tree Related Constraints and Opportunities

2A.4.1.1 The Tree Constraints Plans (Annex A) show the area of constraints associated with the trees on the two Sites. As identified within the drawing key, the green shaded area shows the extent of tree canopies, the canopy outline colour indicates the quality category of the tree and the dashed black line is indicative of the RPA, which is the nominal area of tree roots which are generally considered essential to tree health and function. Roots are likely to extend outside of this point but beyond the RPA extent tree roots are not considered a significant constraint.

2A.4.1.2 The default position is generally that all new features and associated works be located outside of areas where trees are to be retained.

⁷ <https://ati.woodlandtrust.org.uk/tree-search/?v=1936142&ml=map&z=16&nwLat=54.03156937512583&nwLng=-2.80551208168049&seLat=54.02679258789523&seLng=-2.7784110417940155>

2A.4.2 Tree Categorisations as per BS5837:2012

- 2A.4.2.1 The trees on the Sites have been assigned to a quality category as per BS5837:2012, which relates to their arboricultural, landscape and cultural/ conservation value.
- 2A.4.2.2 Category C trees are shown by a grey canopy outline on the Tree Constraints Plans (Annex A). This means they are of relatively low quality and would not normally be considered a significant constraint to future development. However, these trees may still provide some useful value and should be considered for retention where they do not pose a significant constraint to the Proposed Developments.
- 2A.4.2.3 Category B trees (blue canopy outline) are described as being of moderate quality and it is generally desirable to retain trees of this standard and incorporate them within the Proposed Developments wherever feasible.
- 2A.4.2.4 Category A trees (green canopy outline) are classified as being of high quality and trees of this nature should be retained and incorporated into the design of the Proposed Developments due to the high level of benefits they provide.
- 2A.4.2.5 Category U trees (red canopy outline) are trees with less than ten years of reasonable useful life expectancy or those in such poor condition that they should be removed, regardless of any development activity. Trees of this nature represent no constraint to development.
- 2A.4.2.6 Table 2 below summarises the number of trees in each category recorded within or adjacent to the Sites.

Table 2A2 Summary of trees in each quality category.

Quality Category	A	B	C	U
Number of individual trees	-	3	4	-
Number of tree groups	-	4	5	-
Number of hedgerows	-	-	1	-

2A.4.3 Considerations

- 2A.4.3.1 In planning terms, lower quality trees can often be straightforwardly removed to facilitate development where their loss can be mitigated with replacement tree planting or where no replacement planting is necessary. This is likely to apply to Category C and Category U trees and hedgerows where there are no other constraints in place (e.g. ecological or heritage).
- 2A.4.3.2 The default position must be that higher quality trees (Category B) be retained and protected, however, in some cases it may also be feasible to remove trees of this quality where there is no reasonable alternative and where the benefit of the development outweighs the impact of the loss of the tree(s). Should this be required, pre-application discussions with the LPA are recommended.
- 2A.4.3.3 If any of the trees are owned by third parties, prior consent must be in place before any tree works outside those permitted under established rights in common law are carried out.
- 2A.4.3.4 While it is often feasible to install new hard surfacing on existing soft ground within a tree RPA this generally requires the use of raised surfaces supported by carefully located piles or the use of proprietary load bearing surfaces (such as CellWeb, ArborRaft or equivalent) installed on top of the existing unsurfaced ground level using 'no dig' techniques. Any unavoidable footings within RPAs should be the smallest dimensions feasible (such as screw piles) and be sited to avoid significant tree roots (which may require preliminary trial excavations). New areas of hard surfacing or building footprints should not generally occupy more than 20% of the RPA of a retained tree, as set out in Section 7.4.2.3 of BS5837.
- 2A.4.3.5 New services or the diversion or removal of existing services must be carefully considered. In general all new services should be routed outside of the RPA of retained trees. Where this is unavoidable

alternative methodologies such as the use of directional drilling or equivalent trenchless techniques can facilitate service installation beneath tree root systems (likely to be at least 1 m+ dependent on ground conditions and tree species affected).

2A.4.3.6 Shallow service runs may be installed using hand excavation where all significant tree roots can be retained and services be threaded beneath. Existing services can be winched out from a manhole/ chamber located outside of an RPA and redundant pipework can be decommissioned using pipe bursting techniques to avoid excavation which could damage roots.

2A.4.3.7 These operations typically require a detailed arboricultural method statement to set out in detail how they can be successfully achieved.

2A.4.4 The Future Impact of Trees

2A.4.4.1 The future impact of trees on the Sites must be considered in relation to any development proposals. Trees and groups to be retained must be afforded suitable space to ensure they remain viable in the long term. Trees which are currently not fully grown will increase in size and this must be considered in conjunction with the Proposed Developments and future uses of the Sites.

2A.4.4.2 Sycamores, maples and lime trees are often associated with aphids which secrete a sticky liquid called 'honeydew'. This can be a nuisance for parked cars and potentially areas of hard surfacing and structures as the deposits can lead to the development of sooty moulds and staining. This can be easily cleaned with warm soapy water or equivalent and is likely to be less visible on darker surfaces, alternatively it is possible that the trees could be regularly pruned back to manage overhanging canopies. This potential future maintenance requirement should be considered in relation to the future uses of the Sites beneath the canopy of these trees where they are to be retained.

2A.4.4.3 Deciduous trees will drop leaves each autumn and this is likely to result in a maintenance requirement to manage leaves on hard surfaced footways. Leaf fall can be easily cleared as required from hard surfacing. Non-slip surfacing can reduce the frequency that this is required.

2A.4.5 Tree Protection

2A.4.5.1 Trees to be retained in proximity to areas of development activity, including areas for new surfacing, services, work site compounds and storage will need to be protected to ensure they are not damaged. This is generally achieved with the use of robust, immovable temporary tree protection fencing, to prevent access within the RPA or canopy spread of trees. Where access is unavoidable, alternative protection arrangements such as ground protection (sufficient to protect the structure of the soil from compaction), and /or access facilitation pruning (to ensure a reasonable clearance for operations is provided) may be required. The advice of an arboriculturist should be sought to inform this assessment.

2A.4.6 Tree Planting

2A.4.6.1 Where trees are to be removed to enable a development, mitigation planting is likely to be required to ensure a continuity of tree cover for the Sites and to address any negative impact on local amenity and landscape character. Consideration should be given to the reasonable provision of space for new tree planting to off-set any necessary tree loss.

2A.4.6.2 Soil structure in areas for new planting will need to be maintained and may require protection during operation of the Proposed Developments to ensure reasonable conditions for future tree growth are available.

2A.4.6.3 New planting should consider the existing species mix present on the Sites in relation to both arboricultural and ecological considerations. New planting also offers an opportunity to increase the species and age class diversity for a given area which can boost the resilience of the local tree stock in relation to pests, disease and climate change as well as providing a greater range of amenity and other benefits.

2A.4.6.4 Any new trees should be planted in accordance with the guidance set out in BS8545:2014 Trees: from nursery to independence in the landscape - Recommendations (BS8545) and with the minimum distances from new structures, services and surfacing set out in Table A.1 of BS5837. AECOM's arboriculturists can provide further advice in relation to this issue if required.

2A.5 Summary and Conclusion

- 2A.5.1.1 The survey area contains 17 tree features which are typically in good to fair condition and contribute to the character of the two Sites.
- 2A.5.1.2 The trees on the Sites, and especially the groups flanking the railway line form a spatial constraint to any potential development works.
- 2A.5.1.3 Where it is not possible to completely avoid the area of constraint associated with significant trees it may be possible to utilise special measures to facilitate the works.
- 2A.5.1.4 A key consideration for any development activity will be the protection of the surrounding trees including the structure of the soil in which they grow, including from indirect damage via the storage or discharge of materials and the movement and use of plant and machinery. The default position is that all RPA and canopies of retained trees be fenced off as exclusion zones with no access. Where this is not feasible limited access may be acceptable using fit for purpose ground protection or other protective measures in accordance with BS5837.
- 2A.5.1.5 Outside of the canopy and RPA, development works are not likely to be significantly constrained by trees, however it is important not to significantly impact on ground water levels in proximity to trees and where this could be a potential impact specific arboricultural advice must be obtained.
- 2A.5.1.6 Lower quality trees (Category C and U) are not likely to be significant constraint to development where they can be satisfactorily replaced with new tree planting (or where their loss will not have a significant impact - e.g. due to the retention of adjacent trees) and therefore some sections of lower quality tree cover may be feasible to remove from a planning perspective.
- 2A.5.1.7 All moderate value trees should be afforded full protection where possible. If the potential removal of higher value trees (Category B) is unavoidable this should be discussed in advance with local planning authority (North Lincolnshire Council). However, the default position must be that trees of this quality are to be retained and protected where possible.
- 2A.5.1.8 Some of the trees within the Sites' boundaries are likely within the ownership of third-parties including Network Rail. Prior to any works the ownership of works to such trees must be established and the consent of the tree owner obtained in writing.
- 2A.5.1.9 As the design progresses, it is recommended that the advice of an arboriculturist is sought to inform this process, particularly in relation to new features in close proximity to trees.
- 2A.5.1.10 Proposed Development layouts should be overlaid onto the Tree Constraints Plans to allow an assessment of the impact of the Proposed Developments, including the identification of any trees which are to be removed. It is currently anticipated that:
- 2A.5.1.11 the Proposed Phillips 66 Development will require the removal of part of G14 (Category C) and part of H15 (Category C), with all other trees to be retained; and
- 2A.5.1.12 the Proposed VPI Development will require the removal of part of G9 (Category C) and part of G13 (Category C) (and no other trees are present within the VPI Site).
- 2A.5.1.13 An Arboricultural Impact Assessment may be required when the detailed designs have been completed to confirm the identification and assessment of the direct and indirect effects of the Proposed Developments along with appropriate mitigation measures where necessary.

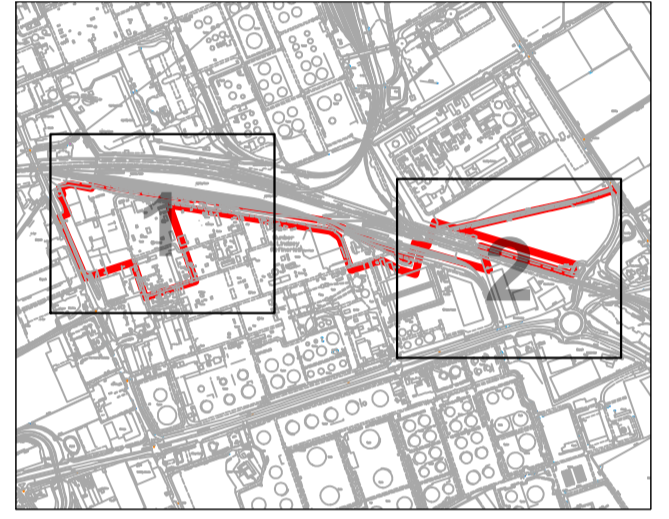
2A.6 References

- 2A.6.1.1 British Standards Institution (2010) BS3998:2010. Tree work – Recommendations.
- 2A.6.1.2 British Standards Institution (2012), BS5837:2012. Trees in relation to design, demolition and construction – Recommendations.
- 2A.6.1.3 British Standards Institution (2014) BS8545: 2014 Trees: from the nursery to independence in the landscape – Recommendations.
- 2A.6.1.4 Ministry of Housing, Communities and Local Government (2021). National Planning Policy Framework.
- 2A.6.1.5 National House Building Council (2021) National House Building Council Standards, Chapter 4.2: Building Near Trees
- 2A.6.1.6 National Joint Utilities Group (NJUG) (2007) Volume 4, Issue 2, NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.
- 2A.6.1.7 National Tree Safety Group (2011) Common sense risk management of trees. Forestry Commission.
- 2A.6.1.8 North Lincolnshire Council (2011) North Lincolnshire Core Strategy.
- 2A.6.1.9 North Lincolnshire Council (2022) North Lincolnshire Local Plan, Submission November 2022

Annex 2A.A Tree Constraints Plans

1. TREE CATEGORIES AS DEFINED BY BS 5837:2012
2. TREE LOCATIONS ARE BASED ON A COMBINATION OF THE ORDNANCE SURVEY MAPPING, AERIAL IMAGERY, GPS CO-ORDINATES FROM ON SITE WALKOVER AND NTM DATA
3. * INDICATES A TREE / GROUP WHOSE POSITION IS APPROXIMATE AS BASED UPON AERIAL PHOTOGRAPHY AND ON SITE OBSERVATIONS.
4. PLANS SHOULD BE READ IN CONJUNCTION WITH THE AECOM ARBORICULTURAL REPORT.
5. THE ORIGINAL OF THIS DRAWING WAS PRODUCED IN COLOUR - A MONOCHROME COPY SHOULD NOT BE RELIED UPON
6. DRAWING REFERENCES:
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 Phillips_66_Carbon_Capture_Development_Boundary_230223.dwg

KEY PLAN



KEY

- PHILLIPS 66 CARBON CAPTURE DEVELOPMENT BOUNDARY
- A CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (HIGH QUALITY & VALUE)
- B CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (MODERATE QUALITY & VALUE)
- C CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (LOW QUALITY & VALUE)
- U CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (UNSUITABLE FOR RETENTION)
- NATIONAL TREE MAP DATA (PROVIDED BY BLUESKY INTERNATIONAL LTD)
- ROOT PROTECTION AREAS (RPA) (AS DEFINED BY BS 5837:2012)
- APPROXIMATE SHADING ARC (AS DEFINED BY BS 5837:2012)

ISSUE/REVISION

NO	DATE	DESCRIPTION
P02	27/02/23	UPDATED RED LINE BOUNDARY
P01	09/02/23	FIRST ISSUE
VR		DATE DESCRIPTION

DRAWING STATUS

ISSUE

PROJECT NUMBER

60668866

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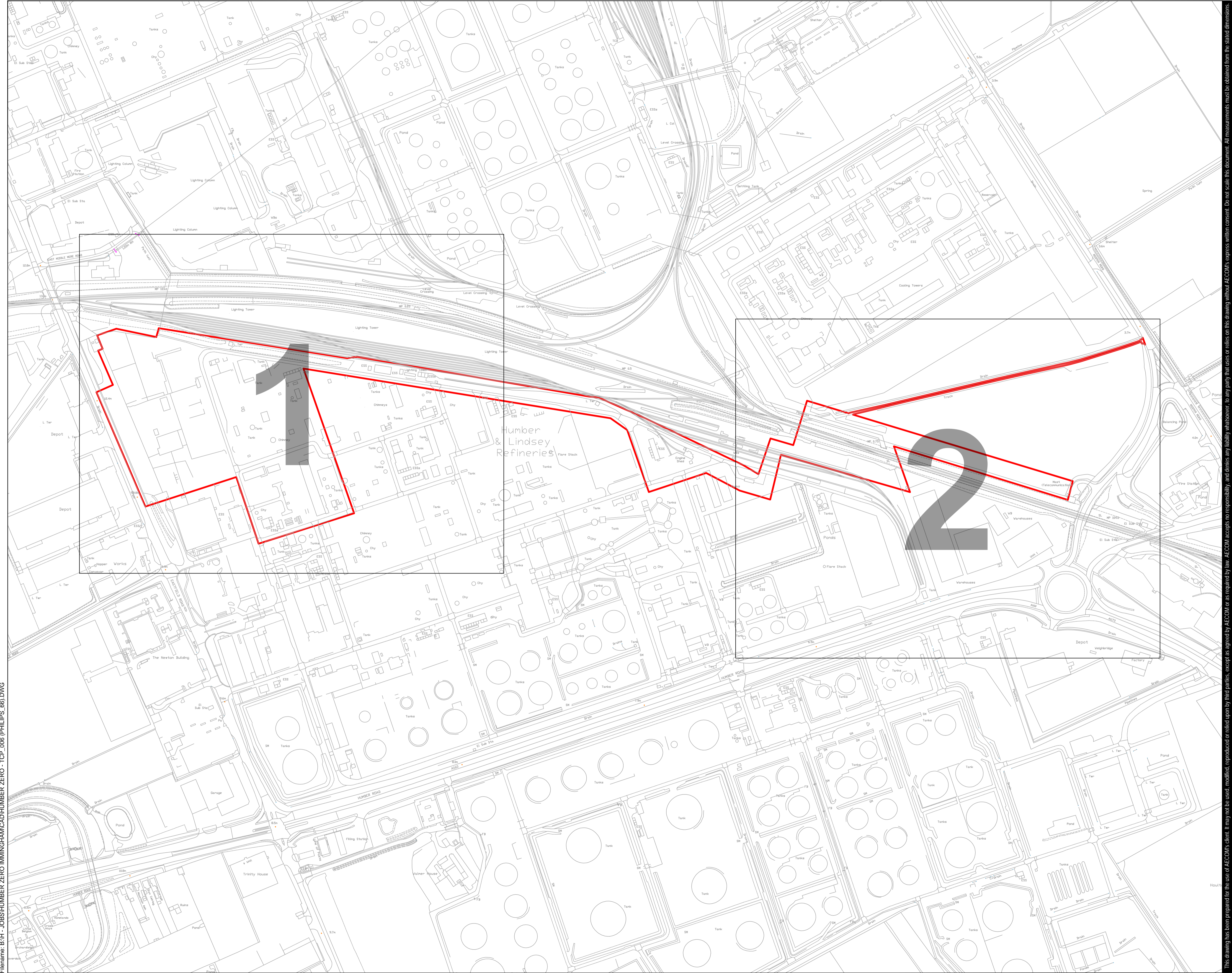
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 (SHEET 0)

SHEET NUMBER

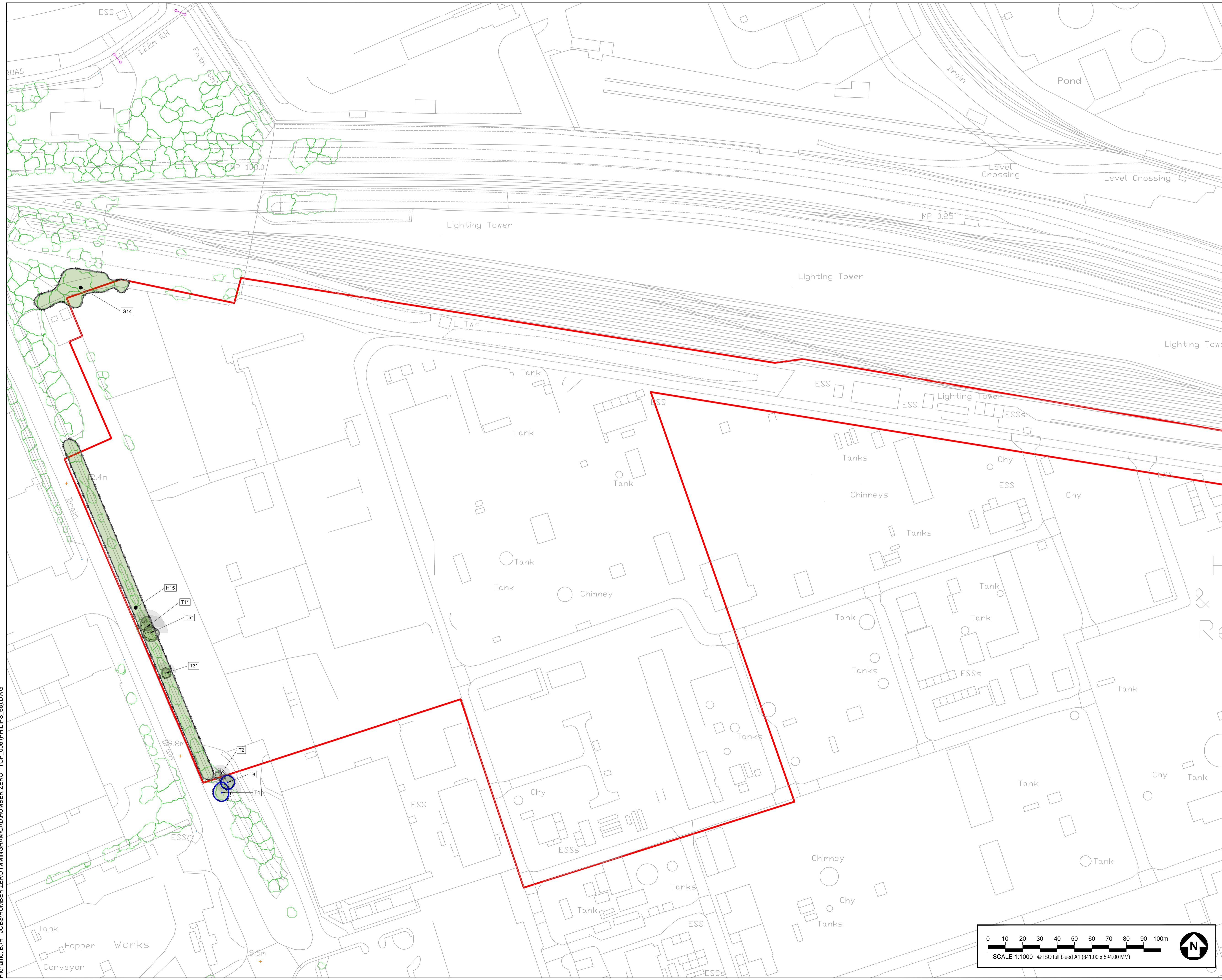
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P02

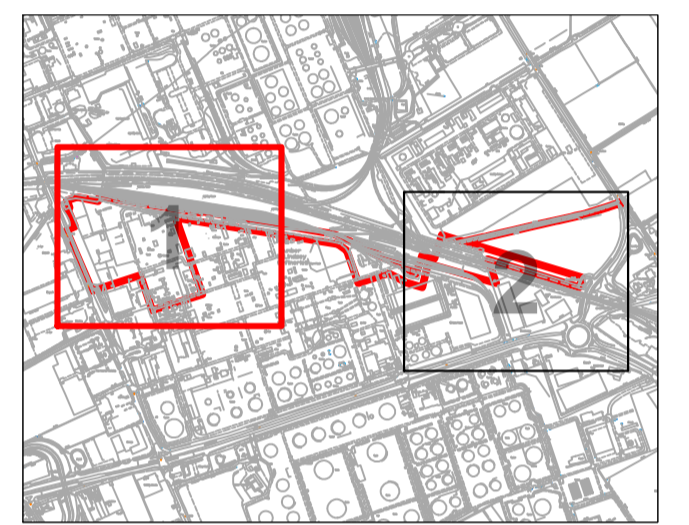


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 Phillips_66_Carbon_Capture_Development_Boundary_230223.dwg

KEY PLAN



KEY

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ISSUE/REVISION

NO	DATE	DESCRIPTION
P02	27/02/23	UPDATED RED LINE BOUNDARY
P01	09/02/23	FIRST ISSUE
VR		

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ISSUE

PROJECT NUMBER

60668866

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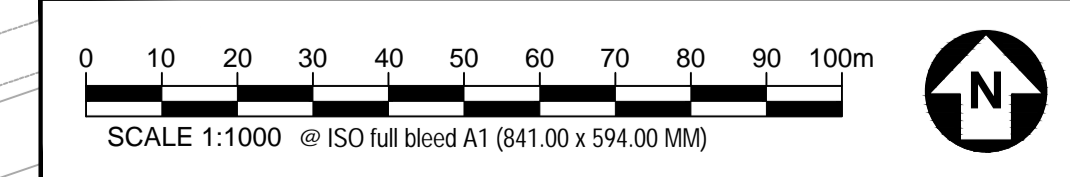
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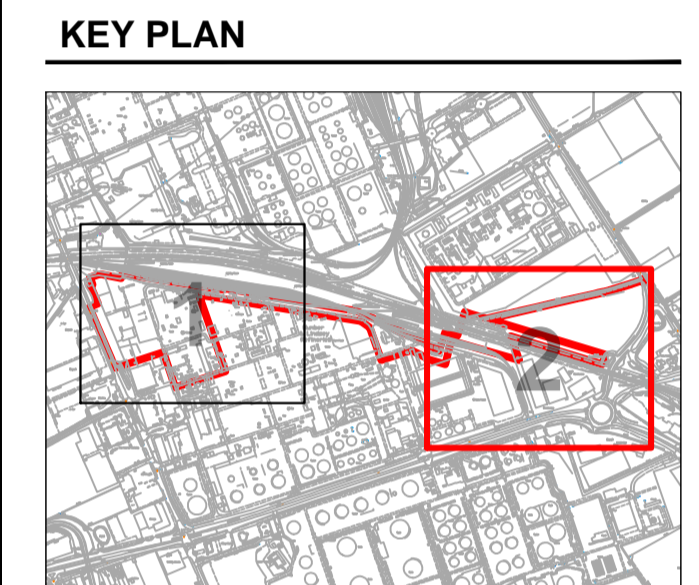
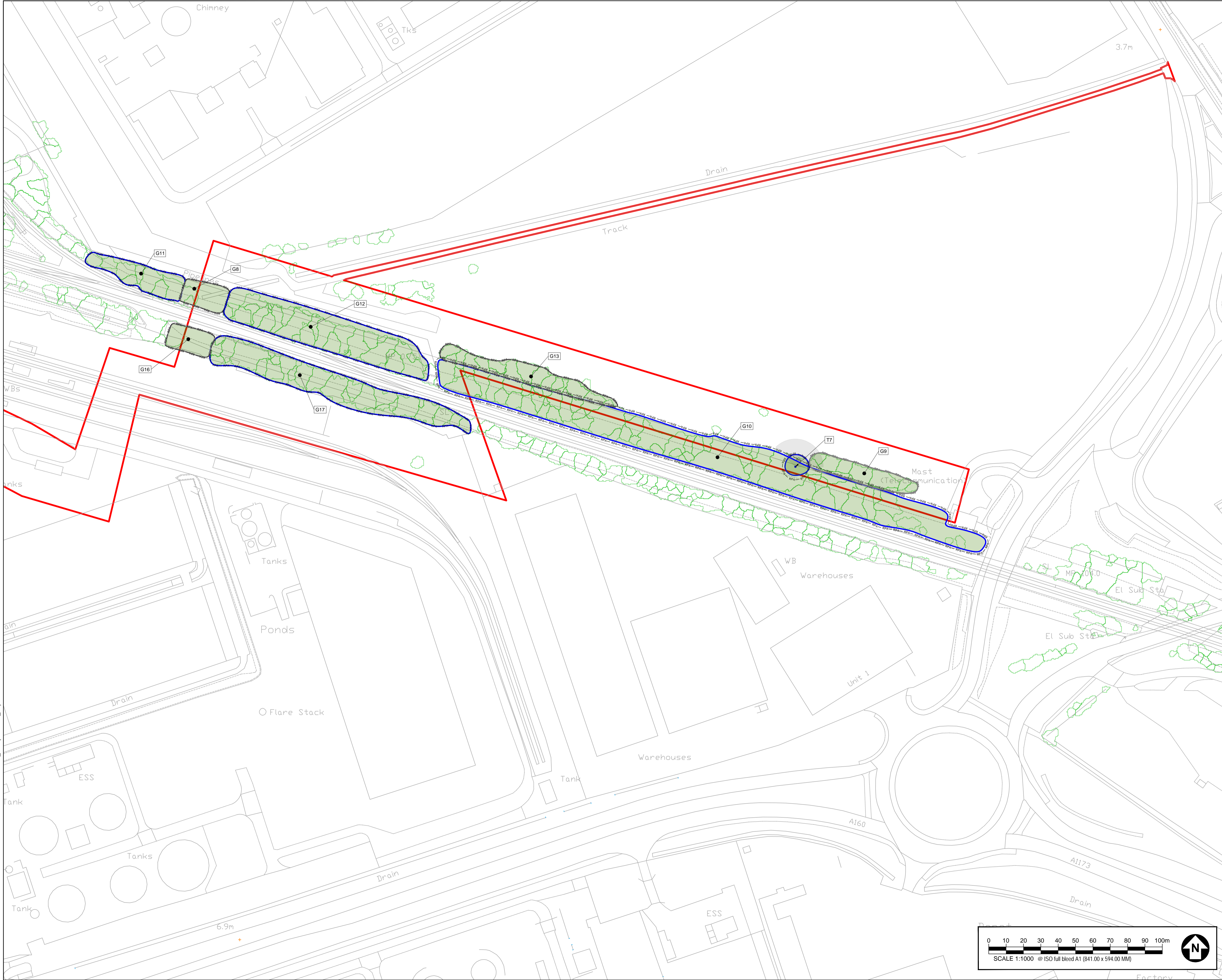
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KEY

- PHILLIPS 66 CARBON CAPTURE DEVELOPMENT BOUNDARY
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- APPROXIMATE SHADING ARC (AS DEFINED BY BS 5837:2012)

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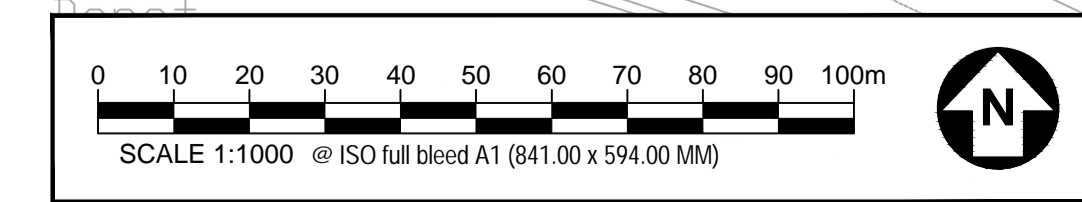
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P01	09/02/23	FIRST ISSUE
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ISSUE

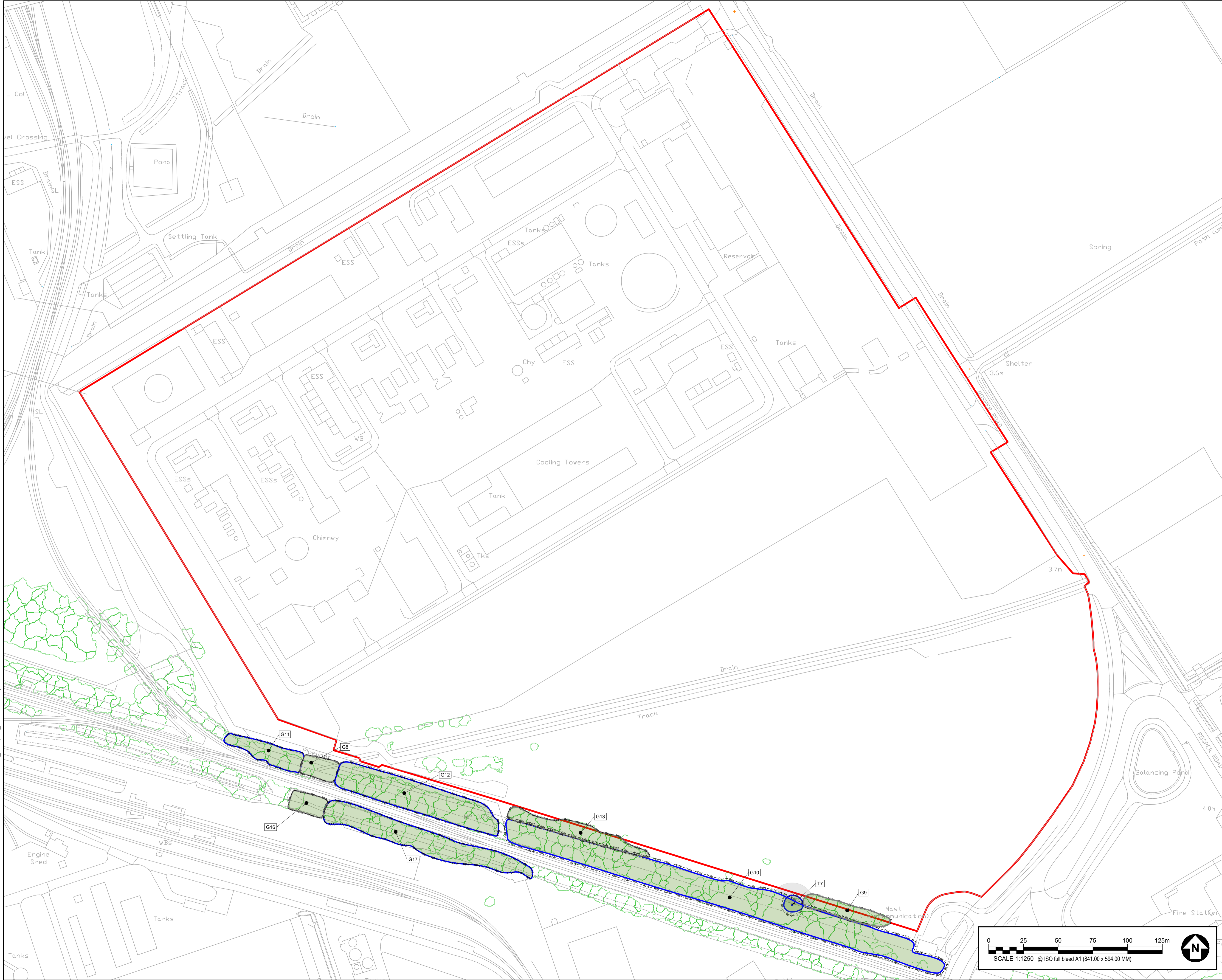
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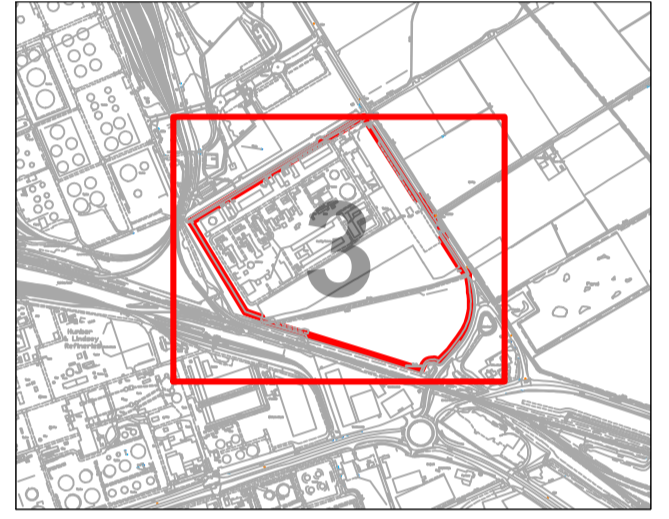


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 OS MasterMap_Topography_Layer_768023_988725_OS_Mastermap.dwg
 VPI_Immingham_Carbon_Capture_Development_Boundary_230207.dwg

KEY PLAN



KEY

- VPI IMMINGHAM CARBON CAPTURE DEVELOPMENT BOUNDARY
- A CATEGORY TREE, GROUP, HEDGE, OR WOODLAND (HIGH QUALITY & VALUE)
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ISSUE/REVISION

NO	DATE	DESCRIPTION
P01	09/02/23	FIRST ISSUE
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DRAWING STATUS

ISSUE

PROJECT NUMBER

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SHEET TITLE

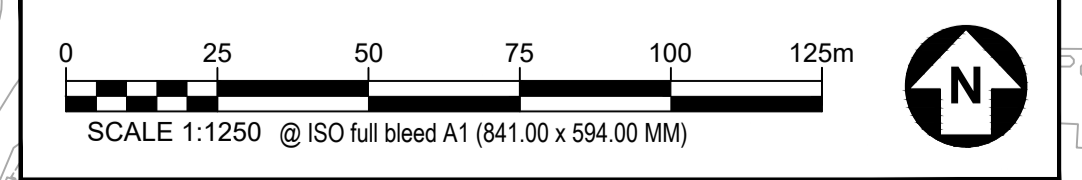
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SHEET NUMBER

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Annex 2A.B Tree Survey Schedule

Ref. No	Species Common Name (<i>Scientific name</i>)	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (m)				First Significant Branch & direction (m)	Canopy Clearance height (m)	Physiological Condition	Life Stage	Structural Condition	Observations	Preliminary Management Recommendations	Estimated Remaining Contribution (yrs)	Category	RPA Radius (m)	RPA Area (m ²)
				N	S	E	W											
T1	Ash (<i>Fraxinus excelsior</i>)	10	280#	6	2	3	4	4.0/All	4	Fair	EM	Good - Fair	Growing within ditch. Deadwood and signs of ash dieback.		10+	C1,2	3.4	35
T2	Birch (<i>Betula sp.</i>)	6	220	2	2	1	4	4.0/W	3	Fair	EM	Good	Minor deadwood throughout and one dead branch to east.		10+	C1,2	2.6	22
T3	Wild Cherry (<i>Prunus avium</i>)	6	220#	3	3	3	2	3.0/All	1	Good	SM	Good	In hedge. Slightly biased crown to east.		10+	C1,2	2.6	22
T4	Sycamore (<i>Acer pseudoplatanus</i>)	11	420	6	5	4	5	2.0/All	2	Good	EM	Good	Attractive individual tree located within grassed area in prominent position along Eastfield Road		20+	B	5	80
T5	Ash (<i>Fraxinus excelsior</i>)	10	320#	3	5	5	4	4.0/All	4	Fair	EM	Good - Fair	Growing within ditch. Deadwood and signs of ash dieback		10+	C1,2	3.8	46
T6	Whitebeam (<i>Sorbus aria</i>)	5	330	4	4	4	4	2.0/All	1	Good	EM	Good	Minor deadwood. Even crown. Old pruning wounds on stem.		20+	B1,2	4	49
T7	Ash (<i>Fraxinus excelsior</i>)	16	480, 400	7	5	8	6	4.0/E	1	Good	M	Good	Forked at 0.5 m with one dominant leader. Some deadwood and stubs. Good canopy vitality.		20+	B1,2	7.5	177
G8	Ash (<i>Fraxinus excelsior</i>), Elder (<i>Sambucus nigra</i>)	10	<250#	See Plan				n/a	n/a	Good	SM	Good	Approximately 4 semi-mature ash growing beneath the pipe bridge, easily replaced but canopies currently beneath height of bridge. Limited opportunity to develop fully.		10+	C1,2	3 max	(Area: 174.42 m ²)
G9	Goat Willow (<i>Salix caprea</i>), Hawthorn (<i>Crataegus monogyna</i>), Ash (<i>Fraxinus excelsior</i>), Elder (<i>Sambucus nigra</i>)	3	<330	See Plan				n/a	n/a	Good	Y-EM	Good	Growing in front of the railway line fence. Mostly goat willow with occasional others. Mostly less than 200 mm stem diameter. Understory of bramble and rose.		10+	C1,2	4 max	(Area: 668 m ²)
G10	Hawthorn (<i>Crataegus monogyna</i>), Ash (<i>Fraxinus excelsior</i>), Elder (<i>Sambucus nigra</i>), Sycamore (<i>Acer pseudoplatanus</i>)	12	<450#	See Plan				n/a	n/a	Good	Y-EM	Good	Beginning with younger and shrubby plants around infrastructure becoming more established dominated by hawthorn with many bare understory areas with rabbit holes into railway embankment. Some ash which are more established closer to railway. Maximum stem diameter of hawthorn 320 mm.		20+	B1,2	5.4 max	(Area: 6336.22 m ²)
G11	Ash (<i>Fraxinus excelsior</i>), Hawthorn (<i>Crataegus monogyna</i>), Elder (<i>Sambucus nigra</i>)	16	<300#	See Plan				n/a	n/a	Good - Fair	SM-EM	Good - Fair	Continuation of main group along railway. Mostly multi-stemmed ash with elder closer to pipes. Changing North into dense hawthorn with no ash. Only surveyed from eastern side of pipes.		20+	B1,2	3.6 max	(Area: 692.02 m ²)
G12	Ash (<i>Fraxinus excelsior</i>), Hawthorn (<i>Crataegus monogyna</i>), Elder (<i>Sambucus nigra</i>)	16	<480#	See Plan				n/a	n/a	Good - Fair	SM-EM	Good - Fair	Dense group of ash along railway embankment with hawthorn and elder up to 5 m in height forming dense understory. Many of the ash are multi-stemmed with closest trees directly beyond post and rail fence. Signs of ash dieback within 3 or 4 trees in group.		20+	B1,2	5.8 max	(Area: 2630.56m ²)
G13	Ash (<i>Fraxinus excelsior</i>), Hawthorn (<i>Crataegus monogyna</i>), Goat Willow (<i>Salix caprea</i>)	4	<120#	See Plan				n/a	n/a	Good - Poor	Y	Good - Poor	Scattered across an area of dense bramble with some rose. Mostly in good condition but some ash with ash dieback with sections of deadwood and epicormic shoots.		10+	C1,2	1.4 max	(Area: 1047.17 m ²)
G14	Grey Alder (<i>Alnus incana</i>), Ash (<i>Fraxinus excelsior</i>), Goat Willow (<i>Salix caprea</i>),	6	<150#	See Plan				n/a	n/a	Good - Fair	Y-SM	Good - Fair	A collection of trees located beyond a compound area. Only surveyed from within car park.		10+	C1,2	1.8 max	(Area: 705.52 m ²)

	Norway Maple (<i>Acer platanoides</i>)														
H15	Hawthorn (<i>Crataegus monogyna</i>), Elder (<i>Sambucus nigra</i>), Blackthorn (<i>Prunus spinosa</i>)	3	<100#	See Plan	n/a	n/a	Good - Fair	EM	Good - Fair	Dense hedgerow along the side boundary. Some dieback to elder but otherwise of good vitality.		10+	C1,2	1.2 max	(Area: 1756.85 m ²)
G16	Ash (<i>Fraxinus excelsior</i>), Elder (<i>Sambucus nigra</i>)	10	<250#	See Plan	n/a	n/a	Good	SM	Good	Approximately 4 semi-mature ash growing beneath the pipe bridge, easily replaced but canopies currently beneath height of bridge. Limited opportunity to develop fully. Viewed only from field to east of railway.		10+	C1,2	3 max	(Area: 174.42 m ²)
G17	Ash (<i>Fraxinus excelsior</i>), Hawthorn (<i>Crataegus monogyna</i>), Elder (<i>Sambucus nigra</i>)	16	<480#	See Plan	n/a	n/a	Good - Fair	SM-EM	Good - Fair	Dense group of ash along southwest side of railway embankment with hawthorn and elder up to 5 m in height forming dense understory. Many of the ash are multi-stemmed. Viewed from field to east of railway.		20+	B1,2	5.8 max	(Area: 2630.56 m ²)

Key to Abbreviations

Ref No	Specific identification number given to each tree or group. T=Tree/H=Hedge/G=Group.
Species	Common name followed by botanical name shown in <i>italics</i>
RPA	Root Protection Area (As defined by BS5837)
Stem diameter	Diameter of main stem, measured in millimetres at 1.5 m above ground level. (MS = Multi-stem tree measured in accordance with BS5837 Annexe C) Av / Average: indicates an average representative measured dimension for the group or feature
Spread	The width and breadth of the crown. Estimated on the four compass points in metres.
Crown clearance	The estimated height (in metres) above ground level of the lowest significant branch attachments.
#	Estimated dimensions
*	Indicates estimated position of tree (not indicated on topographical survey).
Category	Categorisation of the quality and benefits of trees on Site as per Table 1 and 2 of BS5837:2012. 1=Arboricultural quality/value 2=Landscape quality/value 3=Cultural quality/value (including conservation) A=High quality/value 40yrs+ (light green). B=Moderate quality/value 20yrs+ (mid blue) C=Low quality/value min 10yrs/stem diameter less than 150mm (grey). U=Unsuitable for retention (dark red).
Life stage	Young (Y): Newly planted tree 0-10 years. Semi-Mature (SM): Tree in the first third of its normal life expectancy for the species (significant potential for future growth in size). Early Mature (EM): Tree in the second third of its normal life expectancy for the species (some potential for future growth in size) Mature (M): Tree in the final third of its normal life expectancy for the species (having typically reached its approximate ultimate size). Over Mature (OM): Tree beyond the normal life expectancy for the species. Veteran (V): Tree which is of interest biologically, aesthetically or culturally because of its condition, size or age.
Structural condition	Good: No significant structural defects Fair: Structural defects which can be resolved via remedial works. Poor: Structural defects which cannot be resolved via remedial works. Dead: Dead.
Physiological condition	Good: Normal vitality including leaf size, bud growth, density of crown and wound wood development. Fair: Lower than normal vitality, reduced bud development, reduced crown density, reduced response to wounds. Poor: Low vitality, low development and distribution of buds, discoloured leaves, low crown density, little extension growth for the species. Dead: Dead Fair/Good = Indicates an intermediate condition Fair – Good = Indicates a range of conditions (e.g. within a group)
Preliminary management recommendations	Works identified during the tree survey as part of sound arboricultural management, based on the current context of the Site (where relevant reference has been made to tree management based on the potential future context of the site).

Annex 2A.C Site Photography



2A.6.1.10

Photo 1 Two ash, T1 (Right) and T5 (Left) with H15 towards car park.



2A.6.1.11

Photo 2 Looking south along H15 located between the car park and Eastfield Road.



2A.6.1.12

Photo 3 Group 14 located behind the existing pipes adjacent to the railway.



Photo 4 G8 growing under the existing pipe bridge with G12 to the left and G11 to the right.



2A.6.1.13

Photo 5 T7 a mature ash located within G9.

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