A428 Black Cat to Caxton Gibbet improvements

TR010044

Volume 9

9.24 Borrow Pits Excavation and Restoration Report

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A428 Black Cat to Caxton Gibbet improvements

Development Consent Order 202[ ]

9.24 Borrow Pits Excavation and Restoration Report

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1 Introduction

1.1 Background

Overview

1.1.2 This report presents details of the borrow pits forming part of the A428 Black Cat to Caxton Gibbet improvements (the Scheme).

1.1.3 The planned approach to construction of the Scheme involves the extraction of construction materials from four individual borrow pits, the purpose of which are to provide material at their respective junctions in order to avoid/minimise the need to import materials from beyond the Scheme.

1.1.4 The identified borrow pits comprise the following four sites:

a. **Site 11** – located at Black Cat roundabout on land extending west from Roxton Road, immediately north of Rockham Ditch.

b. **Site 14** – located at Black Cat roundabout on land immediately east of the A1 and north of Black Cat Quarry.

c. **Site 3** – located at Caxton Gibbet roundabout on land immediately west of the A1198 (Ermine Street) and north of the Existing A428 (Cambridge Road).

d. **Site 4** – located at Caxton Gibbet roundabout on land immediately east of the A1198 and north of the Existing A428 (Cambridge Road).

Need for borrow pits and site optioneering

1.1.5 The need for the borrow pits and the optioneering process undertaken to identify, evaluate and select the four preferred sites are described in the Borrow Pits Optioneering Report **[APP-246]** submitted as part of the Development Consent Order (DCO) application.

1.1.6 The design-development process identified a shortfall of material (approximately 500,000m^3 of Class 1/2 material) predominately at the Black Cat and Caxton Gibbet junctions. Accordingly, borrow pits have been sourced close to these locations to avoid the need to import, remote from the Scheme, acceptable engineering fill material. This approach would save approximately 125,000 lorry movements and negates the impacts on the local highway network.

1.1.7 Further information relating to the cut-fill balance of the Scheme is presented in Annex C – Waste Management Plan within the First Iteration Environmental Management Plan (EMP) **[APP-234]**.

Content of the report

1.1.8 For each of the four borrow pits, this report presents information relating to the following aspects:

a. General Description.

b. Key Constraints.

c. Environmental Information.

d. Excavation Methodology.

e. Restoration.

1.2 Environmental information

Environmental Impact Assessment

1.2.2 Within the sub-sections covering Environmental Information, details relating to the environmental baseline conditions, mitigation measures and likely effects of the borrow pits are provided.

1.2.3 The process of Environmental Impact Assessment (EIA) assessed the environmental effects of the Scheme across a total of ten topic areas, defined in accordance with the standards and guidance contained within the Design Manual for Roads and Bridges (DMRB) (Ref 1-1).

1.2.4 The cumulative environmental effects of the Scheme were also assessed to identify how the Scheme's individual effects may combine to result in different or greater effects, and how the Scheme may interact with other development plans and projects in the area.

1.2.5 The description of the Scheme and information relating to its construction presented in Chapter 2, The Scheme of the Environmental Statement **[APP-071]** has formed the basis upon which the EIA has been undertaken, and includes details of how the borrow pits would be formed, worked and restored.

1.2.6 One assumption on which the EIA has been based is that all four of the borrow pits would be restored to a condition to enable agricultural use following completion of construction.

1.2.7 Further details regarding how the borrow pits would be restored are presented in Sections 2 – 5 of this report, and in the Borrow Pits Optioneering Report **[APP-246]**.

Environmental Statement

1.2.8 The outcomes of the EIA are reported within the Environmental Statement **[APP-070 to APP-229]**. This document comprises a number of volumes which detail: the scope of the individual assessments undertaken and the methodologies applied; how consultation has shaped and influenced the assessments; the baseline environmental conditions of the Scheme; the findings and outcomes of the individual assessments; and the measures required to mitigate and monitor the Scheme's environmental effects.

1.2.9 As the borrow pits are an integral component of the planned approach to Scheme construction, the Environmental Statement does not disaggregate and report the environmental conditions and effects of the borrow pits separately as a discreet element of the overall development, nor does it report their interactions with other elements of the Scheme in a cumulative manner.

1.2.10 Notwithstanding this, where it has been necessary to attribute specific conditions, impacts or effects directly to borrow pit activities, the topic assessments reported in the Environmental Statement have made reference to these relationships.

1.2.11 Accordingly, the Environmental Information sub-sections of this technical note have been prepared to provide the following minerals and waste planning authorities with information specifically relating to each borrow pit:

a. Bedford Borough Council (its minerals and waste service is provided jointly with Central Bedfordshire Council and Luton Borough Council) – covering Site 11 and Site 14.

b. Cambridgeshire County Council – covering Site 3 and Site 4.

1.2.12 The information extracted from the Environmental Statement for each borrow pit is presented using the following common headings, these being the environmental matters that are typically relevant to borrow pit developments:

a. Landscape and Visual (including arboricultural interests).

b. Biodiversity.

c. Archaeology.

d. Hydrology.

e. Soils and Agriculture.

f. Amenity (covering air quality, noise and vibration, lighting and recreation).

Environmental Management Plan

1.2.13 The EIA process identified a requirement for appropriate measures to be implemented prior to and during construction to: protect the receiving environment; and to manage, control, reduce and monitor the Scheme's likely environmental effects.

1.2.14 These measures comprise a range of standard, best practice and site-specific working methods, techniques and approaches that will be employed by the Principal Contractor, details of which are presented within the First Iteration EMP **[APP-234]**, which forms part of the DCO application.

1.2.15 The purpose of the First Iteration EMP **[APP-234]** is to:

a. Document all environmental actions and commitments that are required to manage and minimise the environmental effects of the Scheme, as identified in the Environmental Statement **[APP-070 to APP-279]**.

b. Provide the equivalent of a Code of Construction Practice (CoCP), a suggested item for inclusion within the DCO application (see Appendix 1 of the Planning Inspectorate's Advice Note Six: Preparation and submission of application documents (Ref 1-2)).

c. Provide the blueprint for the more detailed iterations of the First Iteration EMP **[APP-234]** (referred to as the Second and Third Iterations) that will follow.

d. Enable the Examining Authority and the Secretary of State for Transport to identify those mitigation measures proposed within the Scheme which are secured within the First Iteration EMP **[APP-234]**.

1.2.16 The First Iteration EMP **[APP-234]** is based on the preliminary design of the Scheme, the content of which is supported by a number of outline management plans for key environmental topics which will, subject to the DCO being made, be developed into final management plans by the Principal Contractor prior to the commencement of construction.

1.2.17 The outline management plans within the First Iteration EMP **[APP-234]** of specific relevance to the formation, operation, and management of the borrow pits are described in **Table 1-1**.

Table 1-1: Outline management plans relevant to the borrow pits

Management plan	Landscape and Visual	Biodiversity	Archaeology	Hydrology	Soils and Agriculture	Amenity	Content summary
Annex A: Air quality management plan						X	This plan details both general and specific (additional) measures that would be implemented by the Principal Contractor to mitigate effects on local air quality including those associated with the formation, operation, and restoration of the borrow pits. Measures would include: • Monitoring. • Covering stockpiled materials on site. • Application of dust suppression techniques. • Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site for high risk sites. • Sheeting of vehicles to prevent the escape of materials. • Use of dust sweepers and wheel washing. • Liaison with local residents at a higher risk of impact.
Annex B: Noise and vibration management plan						X	This plan details the measures that would be implemented by the Principal Contractor to mitigate effects on noise and vibration, including those associated with the formation, operation, and restoration of the borrow pits. Measures would include: • All ancillary plant such as generators, compressors and pumps will be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures will be provided, where appropriate. • Working methods will be developed specific to the area and will consider use of equipment and methods of operations to minimise noise.

Management plan	Landscape and Visual	Biodiversity	Archaeology	Hydrology	Soils and Agriculture	Amenity	Content summary
							• All plant and machinery in intermittent use will be shut down in intervening periods between work or throttled down to a minimum. • Proper use of plant with respect to minimising noise emissions with regular maintenance will be undertaken. All vehicles and mechanical plant used for the purpose of the works will be fitted with exhaust silencers and be maintained in good working order. • Minimising the drop height of materials into hoppers, lorries, or other plant. • Use of less intrusive alarms on vehicles, for example broadband vehicle reversing warnings. • The appropriate selection of plant e.g. rollers. • Consideration of low vibration working methods, including non-vibratory compaction plant where possible. • Haul routes within the site boundary will be kept in good condition. • No start-up or shut down of large vibratory rollers (approximately 13 tonnes) within 50 metres of receptors and medium vibratory rollers (approximately 3.5 tonnes) within 15 metres of receptors. The use of cut-off trenches to disrupt direct vibration movement through the ground.
Annex C: Waste management plan				X	X	X	This plan details the measures that would be implemented by the Principal Contractor to control and manage waste materials, including those arising from the formation, operation and restoration that could present risks to soils, air quality, surface water and groundwater. Measures would include: • The appropriate storage, dispensing, containment and use of fuels, oils and materials that have potential to cause environmental damage to soils, hydrology, and local air quality.

Management plan	Landscape and Visual	Biodiversity	Archaeology	Hydrology	Soils and Agriculture	Amenity	Content summary
							• Preventing the unauthorised or harmful deposit of waste, and its escape. • The application of best practice measures in line with the waste hierarchy, including the reuse of excavated earthworks materials. • Undertaking daily site inspections.
Annex D: Biodiversity management plan		X					This plan details the measures that would be implemented by the Principal Contractor to mitigate effects on biodiversity, including those arising from the formation, operation, and restoration of the borrow pits. Measures would include: • Undertaking pre-construction surveys. • Obtaining licences for protected species, as required, in advance of operations commencing, and undertaking works in accordance with the conditions of those licences. • Delivering toolbox talks on protected species. • Employing an Ecological Clerk of Works to oversee site clearance operations in sensitive habitats, check for animals in excavations left open overnight, and stop work if protected species are encountered during operations. • Undertaking site clearance works outside of the bird nesting season, where possible. • Employment of biosecurity measures to ensure invasive species are not spread.
Annex E: Soil handling and management plan		X	X	X	X		This plan details the general and best practice measures that would be implemented by the Principal Contractor to mitigate effects on soil resources, including those arising from the formation, operation, and restoration of the borrow pits. Measures would include: • Pre-construction surveys and soil testing.

Management plan	Landscape and Visual	Biodiversity	Archaeology	Hydrology	Soils and Agriculture	Amenity	Content summary
							• Removal of invasive weeds in areas identified for stripping. • Undertaking topsoil and subsoil stripping post-testing and post archaeological investigations, in accordance with relevant DEFRA/MAFF guidance and British Standards. • Use of tracked equipment where possible to reduce soil compaction. • Stockpiling soil away from watercourses to reduce pollution risk, and segregation of soils to ensure no mixing or degradation of quality. • Fencing off of stockpiled soils to prevent potential disturbance and contamination. • Implementing measures to assess and control potential risks to humans from potentially contaminated soils. • Undertaking soil restoration operations to replace stripped and stored topsoil and subsoil, as close as possible to their source of origin. • Undertaking post-restoration monitoring to determine whether pre-existing agricultural soil capability has been reinstated.
Annex F: Water management plan		X		X			This plan details the measures that would be implemented by the Principal Contractor to mitigate and manage effects and pollution risk on surface water and groundwater bodies, including those arising from the formation, operation, and restoration of the borrow pits. Measures would include: • Development of a pollution incident plan and construction method statements informed by best practice guidance. • Defining and implementing a programme of water quality, level, and flow monitoring to be undertaken pre-construction, during construction, and for a short period post-construction.

Management plan	Landscape and Visual	Biodiversity	Archaeology	Hydrology	Soils and Agriculture	Amenity	Content summary
							• Preparation of a construction dewatering strategy. • Delivery of toolbox talks on risks to the water environment from construction runoff and chemical spillages. • Timing certain works and operations to be undertaken, where possible, in drier months of the year. • Implementing pre-construction drainage measures. • Implementing measures to intercept and treat suspended fine sediments and reduce the risk of chemical spillages. • Implementing biosecurity measures to ensure no invasive species are introduced. • Implementing measures for corrective action reporting.
Annex G: Energy and resource use management plan							This plan does not contain measures of direct relevance to the formation, operation, or restoration of borrow pits.
Annex H: Materials management plan				X	X		This plan details the measures that would be implemented by the Principal Contractor to manage materials, including those arising from the formation, operation, and restoration of the borrow pits. Measures would include: • Procedures to classify, track, store, reuse and dispose of materials, which includes topsoil and subsoil. • Sampling of groundwater and surface water to evidence that operations are not mobilising contaminants.
Annex I: Contaminated land					X		This plan details the measures that would be implemented by the Principal Contractor to manage arrangements relating to contaminated land, including

Management plan	Landscape and Visual	Biodiversity	Archaeology	Hydrology	Soils and Agriculture	Amenity	Content summary
management plan							those associated with the formation, operation, and restoration of the borrow pits. Measures would include: • Undertaking risk assessments and watching briefs prior to, and during, the works. • Carrying out sampling and testing of suspected contaminated material, including soils, if encountered, and undertaking remediation where required. • Protecting soils resources through best practice measures including: routine testing to confirm suitability for re-use; sheeting of vehicles to reduce the potential for migration of contaminants (e.g. dust); and the use of impermeable sheets to minimise the potential for leachate and run-off from stockpiled soils.
Annex J: Archaeological management plan			X				This plan details the measures that would be implemented by the Principal Contractor to manage archaeological mitigation and record any archaeological resources, including those potentially encountered within the borrow pits. Where required, measures would be applied from the following techniques: • Excavation. • Sampling. • Geoarchaeological assessment. • Preservation of archaeological remains (i.e. fencing). In addition, toolbox talks would be given to site personnel in relation to these measures and what to do in the event unexpected finds are encountered.
Annex K: Construction compound management plan							This plan does not contain measures of direct relevance to the formation, operation, or restoration of borrow pits.

Management plan	Landscape and Visual	Biodiversity	Archaeology	Hydrology	Soils and Agriculture	Amenity	Content summary
Annex L: Landscape and ecology management plan	X	X				X	This plan provides the framework for the delivery of the landscape strategy for the Scheme and includes measures that would be applied by the Principal Contractor during the formation, operation, and restoration of the borrow pits. Measures would include: • The delivery of toolbox talks prior to the start of works, covering the methods and techniques to be applied to minimise light spill on residents, habitats, and species. • Integration with the existing landform by grading out cuttings and embankments to borrow pit slopes to reflect the surrounding topography.

1.2.18 Annexes M, N, O & P of the First Iteration EMP **[APP-234]** are not management plans; rather these relate to documentation and procedures that the Principal Contractor (PC) would be required to develop prior to (and during) construction of the Scheme. These include the development and completion of environmental method statements; emergency reporting procedures; a register of changes associated with the Scheme; and environmental investigation and monitoring reports.

1.2.19 The First Iteration EMP **[APP-234]** will be developed into the Second Iteration EMP by the PC, in consultation with the host authorities once the detailed design of the Scheme has been finalised. The measures defined in the Second Iteration EMP would be applied as stipulated in the relevant parts of the First Iteration EMP **[APP-234]** to provide planning, management and control during the construction phase with the aim of controlling potential impacts upon the natural and historic environment, people and businesses.

1.2.20 The above management plans set out the process for which the borrow pits are restored. The borrow pits will be restored in accordance with the principles set out in Environmental Masterplan **[APP-091]** which is secured through Requirements 6 and 12 of the dDCO **[REP1-003]**.

1.2.21 On completion of construction, the PC will prepare the Third Iteration EMP for the operational and maintenance phase of the Scheme, which will be implemented by the authority responsible for the maintenance of the Scheme once open to traffic.

1.3 The Development Consent Order

1.3.1 The draft Development Consent Order **[REP1-003]** (DCO) sets out the provisions for the construction and operation of the Scheme. Schedule 2 of the DCO sets out the Requirements which are the conditions that govern how the Scheme will be delivered. As outlined in 1.2.20, the restoration of the borrow pits are secured through Requirements 6 and 12 of the DCO, which states that the landscaping scheme and the detailed design of the Scheme must accord with the principles the Environmental Masterplan [APP-091].

1.3.2 The approach to developing the Second Iteration EMP and Third Iteration EMP and how local authorities are involved in this process is detailed in Requirement 5 'Details of Consultation' of the DCO. This sets out that where there is a requirement for details to be submitted for approval following consultation with another party, the application to discharge the requirement must be accompanied by a summary report which encloses the written responses received to the consultation undertaken. Following a submission to discharge the requirement, a copy of the summary report on consultation would be provided to the relevant party.

1.3.3 Implementation of the measures contained within the Second Iteration EMP and Third Iteration EMP will be secured through the following requirements of the DCO:

a. Requirement 3 'Second Iteration EMP'. No part of the development can be commenced until the Second Iteration EMP relating to that part has been submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority and relevant highway authority. The Scheme is then required to be constructed in accordance with the Second Iteration EMP.

b. Requirement 4 'Third Iteration EMP'. Following completion of the development, the Third Iteration EMP must be submitted to and approved in writing by the Secretary of State, following consultation with the relevant planning authority and relevant highway authority. The Scheme is then required to be maintained in accordance with the Third Iteration EMP.

1.3.4 Other relevant requirements include the following:

a. Requirement 6 'Landscaping' sets out that any landscaping scheme for the Scheme must reflect the applicable mitigation measures for landscaping set out in the First Iteration EMP and landscaping principles set out in the Environmental Masterplan **[APP-091]**.

b. Requirement 8 'Contaminated land and groundwater' sets out the measures that need to be taken in the event that contaminated land or groundwater is found including any remedial measures needed.

c. Requirement 9 'Archaeology' sets out that the development must be carried out in accordance with the Archaeological Mitigation Strategy **[APP-238]**.

d. Requirement 10 'Protected Species' sets out the action needed in the event that any protected species not previously identified are found.

e. Requirement 11 ‘Traffic management’ sets out that a traffic management plan must be approved by the Secretary of State, following consultation with the local highway authority, before development can commence.

f. Requirement 12 ‘Detailed design’ sets out that the authorised development must accord with the principles set out in the Environmental Masterplan **[APP-091]**, unless otherwise agreed with the Secretary of State following consultation with the relevant local authority on matters related to their functions, provided any amendments would not give rise to any materially new or materially different environmental effects in comparison with those reported in the environmental statement.

g. Requirement 19 ‘Construction Hours’ sets out when construction work can be undertaken, apart from a number of essential activities that would be undertaken outside of the core hours specified.

1.4 Transport assessment

1.4.1 The Transport Assessment **[APP-241]** sets out that during the construction period, construction traffic trips on the highway network will be minimised. This will be achieved in part through the use of borrow pits adjacent to the Scheme and other measures, such as haul routes.

1.4.2 Furthermore, the Outline Construction Traffic Management Plan **[APP-244]** sets out that the borrow pits will be located close to four of the major Scheme embankments. To facilitate the movement of material between cut and fill zones, haul routes will be established between the borrow pits and adjacent fill areas with further haul routes used along the new alignment. The aim of the haul routes is to minimise transportation of material on the surrounding highway network.

1.4.3 The use of borrow pits in the Scheme therefore has transport benefits as it will lead to a reduction in construction traffic on the local highway network.

1.5 Planning policy assessment

1.5.1 Appendix C ‘Local Policy Accordance Table’ of the Case for the Scheme **[APP-240]** sets out a schedule of local policies contained in Development Plans and emerging Development Plan documents which are considered to have the potential to be both important and relevant to the Scheme. Included within the policy assessment are local policies relating to borrow pits, as follows:

a. Policy MSP9 ‘Borrow Pits’ from the Bedford Borough, Central Bedfordshire and Luton Borough Councils, Minerals and Waste Local Plan: Strategic Sites and Policies (Adopted 30 January 2014) (Ref 1-3).

b. Policy 7 ‘Borrow Pits’ from the Emerging Cambridgeshire and Peterborough Minerals and Waste Local Plan, Proposed Submission (Publication) Draft, November 2019 (Ref 1-4). The Cambridgeshire and Peterborough Minerals and Waste Local Plan was adopted by Cambridgeshire County Council and Peterborough City Council on 28 July 2021.

1.5.2 In relation to Policy MSP9 (Ref 1-3), Appendix C of the Case for the Scheme **[APP-240]** sets out that the two borrow pits proposed within Bedford Borough to the north west of the existing Black Cat roundabout would meet the test set out within the policy for the reasons set out below:

a. The borrow pits are required to supply material for the Scheme, which is a specific major construction project. This is because the Scheme requires a greater level of fill material than the amount of suitable cut material that will be available.

b. The site is well related geographically to the Scheme, being within the Order Limits. Further, the borrow pits have been located to serve a section of the Scheme that will be in particular need for material, being the new bridge over the A421 to the west of the existing Black Cat roundabout, which requires material for the construction of the embankment.

c. The borrow pits will serve the related project only and would not be used to supply mineral to the wider market. The borrow pits would not be retained beyond the life of the project.

d. By helping to supply the balance of material needed for the construction of the Scheme, the borrow pits will minimise the need for material to be brought from off-site locations, thereby removing mineral traffic movements from the public highway and reducing traffic that would need to pass local communities.

e. The borrow pits are proposed to be restored to a condition to enable agricultural use following completion of construction.

f. Following extraction of the required material the borrow pits would be restored through backfilling with material that is unsuitable for engineering purposes. The material used for restoring the borrow pits will be generated from the works across the Scheme. Sub-soil and top-soil would be replaced with the intention of reinstating the borrow pits to a condition to enable agricultural use. It is on this basis that the environmental assessment of the likely effects arising from the borrow pits has been assessed.

1.5.3 In relation to Policy 7 (Ref 1-4), Appendix C of the Case for the Scheme **[APP-240]** sets out that the two borrow pits proposed within Cambridgeshire near to the existing Caxton Gibbet roundabout would meet the test set out within the policy for the reasons set out below:

a. Across the Scheme, it has been identified that a greater level of fill material is required than the amount of suitable cut material that will be available.

b. The borrow pits will serve the related project only and would be well related geographically to the Scheme, being within the Order Limits. Further, the borrow pits have been sited to serve a section of the Scheme that will be in particular need for material, being the raised sections of Caxton Gibbet junction. Being located at the junction where the material would be used, the borrow pits are significantly better located than any potential off site source of material.

c. The borrow pits are proposed to be restored to a condition to enable agricultural use following completion of construction, which is considered the "worst case" for the purposes of the Environmental Statement.

d. The material used for restoring the borrow pits will be generated from the works across the scheme. The need and delivery of the borrow pits is solely for the purposes of the Scheme and would not impact on the wider market.

1.5.4 For the reasons set out above and in the Case for the Scheme **[APP-240]**, the proposed borrow pits are in accordance with relevant local planning policy.

1.6 Acquisition of land

1.6.1 Given the limitations on restoring borrow pits exactly to their previous condition, land that is required for the purposes of the borrow pits will be acquired permanently through the DCO, and not temporarily. However, the Applicant will engage with the affected landowners to understand their future aspirations for the land and if preferred by them, commence negotiations for a lease of the land. The Applicant remains committed to seeking to acquire all land and rights required by agreement where possible.

2 Site 11 - (Black Cat roundabout) – land extending west from Roxton Road, immediately north of Rockham Ditch

2.1 General description

2.1.1 The site (**Figure 2-1**) is situated on the land which extends west from Roxton Road immediately north of Rockham Ditch. The site is approximately 11.7ha (117000m^2) in size, located on Agricultural Land Classification (ALC) Grade 1 land.

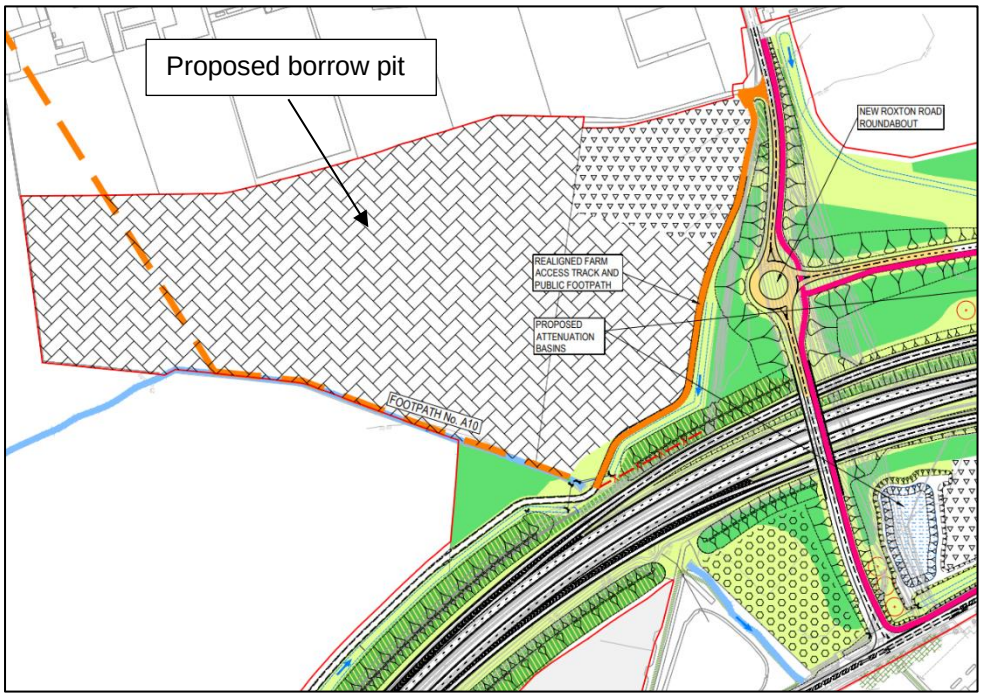


Figure 2-1: Site 11 Location Plan

2.1.2 Trial Pits locations TP398, TP399, TP400, TP401 and TP402 were excavated in the area of the potential borrow pit. Please refer to the Appendices for details on the investigations undertaken.

2.1.3 The geology beneath this site comprises some Alluvium/River Terrace Deposits, which then overlie the Glacial Till (Oadby formation). Deeper boreholes in the area have shown that the Oxford Clay Formation is located below the Glacial Till, which overlies the Kellaways Beds at a depth of around 20-25m.

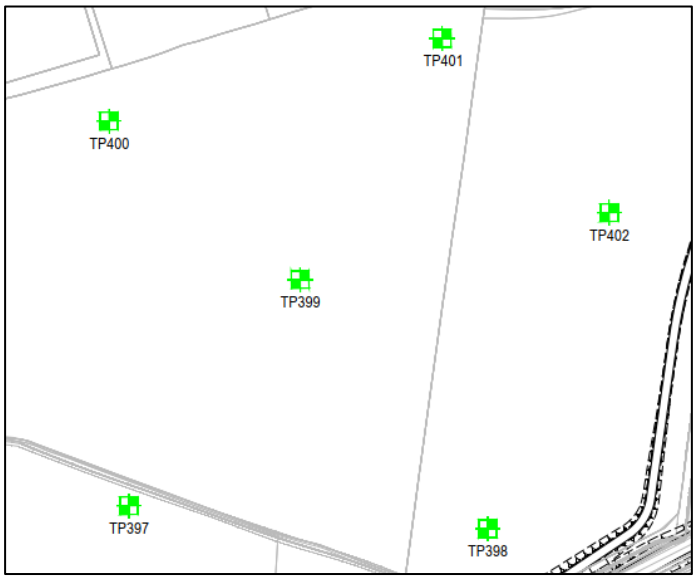


Figure 2-2: Site 11 Ground Investigation Locations

2.1.4 Rockham ditch is adjacent to the south of the site and South Brook (a tributary of the River Great Ouse) is located 300m to the northern boundary of the site.

2.1.5 Some residential properties and businesses are located on the other side of Roxton Road (approximately 220m to the north-east of the site) and also along Spinney Road to the north of the site (the nearest approximately 150m away). Commercial receptors are not normally identified as potentially significant with regard to noise impacts.

2.1.6 A footpath splits the western part of this site and runs along the southern site boundary, adjacent to Rockham Ditch. This footpath will be temporary closed/diverted during the borrow pit works.

2.1.7 The proposed borrow pit location and cross sections can be seen in the following drawings in Appendix B:

a. HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3531 P01

b. HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3532 P01

2.2 Key constraints

2.2.1 The key constraints associated with this borrow pit are the changes in noise levels and visual amenity for residential receptors located on Spinney Road and Roxton Road (which at their nearest are approximately 150m from the site boundary). In addition, a number of properties along Spinney Road have large agricultural greenhouses that may be impacted by the dust generated from the borrow pit. This borrow pit is located in close proximity to Rockham Ditch, a watercourse with low biodiversity value. A temporary diversion/realignment of part of the existing footpath is also required while the borrow pit is in use.

2.2.2 Local environmental constraints within a 300m study area outwards from this site can be seen within Appendix B of the Borrow Pits Optioneering Report.

2.3 Environmental information

Landscape and Visual

Baseline Conditions

2.3.2 The majority of this borrow pit is within Local Landscape Character Area (LLCA) 03 (Wyboston and Chawston).

2.3.3 Fieldwork surveys have recorded that tranquillity surrounding the existing Black Cat roundabout and the A421 (in proximity to this borrow pit) is influenced by a range of negative factors including views and noise of roads caused by the movement of traffic, and industrial and commercial uses (including garages and road haulage businesses).

2.3.4 Groups of trees and hedgerows at G1612, G1627 and G1641 (all of Category B2) are located on the northern boundary of this borrow pit site (refer to Sheet 73 of the Tree Constraints Plan in **Appendix 7.5** of the Environmental Statement **[APP-183 to 187]**).

2.3.5 Two individual trees – T1624 (Category A1) and T1638 (Category C1) – are located on the southern boundary of this borrow pit site (refer to Sheet 8 of the Tree Constraints Plan in **Appendix 7.5** of the Environmental Statement **[APP-183 to 187]**).

Mitigation Measures

2.3.6 Route selection has minimised changes to landform and the introduction of large earthworks. Integration with the existing landform can best be achieved by grading out cuttings and embankments to slopes which reflect the surrounding topography. The borrow pits would be subject to the same design principles.

2.3.7 An area of woodland is proposed directly to the south and east of this borrow pit site to integrate the Scheme with the local landscape by reinforcement of the existing landscape pattern.

2.3.8 Protective fencing would be installed around the individual trees, tree groups and hedgerows identified along the boundaries of the borrow pit. All tree work would follow the principles of British Standard *BS3998:2010* (Ref 1-5) and be carried out by suitably qualified and insured contractors.

Environmental Effects

2.3.9 In the construction period, landscape effects on LLCA 03: Wyboston and Chawston have been assessed as moderate adverse, which is significant. The local landscape character would be altered through the temporary increase in the extent of built development.

2.3.10 The excavation and transportation of material from the borrow pit and the formation of the Black Cat junction embankments and associated infrastructure would be visible for the nearest receptors.

2.3.11 The excavation of the borrow pit would become a focal point in the foreground and middle-distance of views of residential receptors to the north, on the southern edge of Chawston and users of the PRoW to the west. This element of construction would become a dominant feature, in contrast to the existing views of fields with glimpses of the existing road infrastructure in the background.

2.3.12 For example, Sheet 2 of **Figure 7.11** of the Environmental Statement **[APP-112]** shows that residential receptors to the north of this borrow pit would experience large (R9) and very large (R10 and R11) adverse visual effects in the construction period, which are significant. It is noted that there are other Scheme elements in close proximity that would contribute to these visual effects rather than only the visual effects of the borrow pits in isolation.

Biodiversity

Baseline Conditions

2.3.13 According to the terrestrial habitat mapping, hedgerows 1 and 2 (H1 and H2) are located directly to the north of this borrow pit site (refer to **Figure 1** in **Appendix 8.3** of the Environmental Statement **[APP-189]**.

Mitigation Measures

2.3.14 The Scheme has been designed so that impacts upon important habitats (comprising woodland, grassland, hedgerow and pond) have been avoided or reduced, where reasonably practicable, and are mitigated where avoidance was not feasible, through the retention of existing habitat and the creation or replacement of habitat.

2.3.15 At Rockham Ditch, ecological protection measures would provide enhancement with specific interventions to be defined by a Water Framework Directive (WFD) mitigation and enhancement strategy based on further survey and assessment at the detailed design stage.

2.3.16 Directly to the east of this borrow pit site, low maintenance grass seeding including some wildflower species is proposed to reinforce the existing landscape pattern.

Environmental Effects

2.3.17 No significant biodiversity effects are anticipated in the construction period.

Archaeology

Baseline Conditions

2.3.18 An early medieval ditch, two sub-square kilns and a large area of clay extractions found at Field 5 in proximity to the borrow pit provides an indication of historic wider land use, settlement patterns and industries in the area.

2.3.19 The remains are considered to be of medium heritage value. Refer to Sheet 3 of **Figure 6.1** of the Environmental Statement **[APP-099]**.

2.3.20 The scheduled bowl barrow, known as the "Round Hill" (1013521) is located approximately 400m to the south of the borrow pit.

Mitigation Measures

2.3.21 Based on the review of the geophysical surveys and archaeological evaluation trenching, modifications were made to components of the Scheme and the Order Limits to avoid potential impacts on buried archaeology and to preserve features of potential interest, including movement of the position of the borrow pit further east.

2.3.22 Targeted excavation of medieval and post-medieval features will be undertaken in line with the Archaeological Mitigation Strategy **[APP-238]**.

Environmental Effects

2.3.23 The magnitude of impact of the Scheme upon the asset at Field 5 is minor adverse and permanent as limited elements of the asset would be affected by the excavation of a borrow pit. Construction of the Scheme would have a slight adverse effect (not significant) on this asset.

2.3.24 While there will be construction within approximately 400m of the scheduled Round Hill barrow, any effect on its setting will be temporary during the use of the borrow pit. The construction activity will not affect the heritage significance of the asset and it will still be possible to understand it. Construction of the borrow pit would have a neutral effect on this asset.

Hydrology

Baseline Conditions

2.3.25 Rockham Ditch is immediately adjacent to the south of the borrow pit and South Brook (a tributary of the River Great Ouse) is located approximately 300m to the northern boundary. This borrow pit is not within any surface water flood zones.

Mitigation Measures

2.3.26 Within the First Iteration EMP **[APP-234]**, a Water Management Plan will manage water removed from borrow pits.

2.3.27 At Rockham Ditch, water level loggers will be installed and spot flow gauging carried out for a period of 12 months (or as otherwise agreed with the Environment Agency) to ensure there is a good understanding of the flow regime prior to any dewatering works nearby.

2.3.28 A construction dewatering strategy will be prepared by the Principal Contractor which will consider how phasing/sequencing of the excavation of borrow pits and other cuttings will influence the amount of water that may need to be managed at any given time.

2.3.29 Once dewatering starts, the water would be discharged following settlement to remove suspended solids, to the closest watercourse to maintain flows should baseflow be affected by the dewatering works.

2.3.30 Where it is deemed not possible to discharge all of the water removed from excavations and borrow pits to a nearby watercourse, and there are no other alternative options, the Principal Contractor will consider methods to reduce further the ingress of groundwater (and overland flow) into borrow pits or excavations (e.g. working smaller areas at a time or sealing the borrow pit / excavation by a suitable method).

2.3.31 It is proposed that monitoring boreholes are drilled adjacent to the borrow pit.

Environmental Effects

2.3.32 At Rockham Ditch, with the implementation of mitigation measures, it is considered that the construction works would have a temporary and short term slight adverse (not significant) effect (including the water quality, dilution and removal of waste products and conveyance of flow).

2.3.33 It is also not anticipated that there will be any significant effects in relation to groundwater flooding in proximity to this borrow pit.

Soils and Agriculture

Baseline Conditions

2.3.34 This borrow pit is located on Agricultural Land Classification (ALC) Grade 1 land classed as 'River Terrace Deposits – Sand and Gravel' and 'Kellaways Formation and Oxford Clay Formation (undifferentiated) – mudstone, siltstone and sandstone' in terms of soil and geology.

Mitigation Measures

2.3.35 To demonstrate material geochemical/geotechnical acceptability, site-won earthworks materials (including materials from borrow pits) will be subject to a suite of chemical laboratory analysis appropriate to the ground conditions at the site.

2.3.36 Deep excavations for borrow pits will avoid the interception of potentially pressurised groundwater in the Kellaways Formation beneath the Oxford Clay.

2.3.37 Best practice mitigation measures will be implemented by the Principal Contractor to reduce the impacts and effects that construction of the Scheme is likely to have on affected soil resources. These measures are presented within the Soil Handling and Management Plan contained in the First Iteration EMP **[APP-238]** and relate to the testing, stripping, storage, and reuse of high quality agricultural soils.

Environmental Effects

2.3.38 The significance of the effects on groundwater level, flow, quality, and groundwater receptors, such as licensed groundwater sources, as a result of dewatering at borrow pits are considered to be no worse than slight adverse, which is not significant.

Amenity

Baseline Conditions

2.3.39 The nearest human receptors include isolated residential properties on the other side of Roxton Road (approximately 220m to the north-east) and residential properties, businesses, and farm buildings along Spinney Road to the north (the nearest approximately 150m). Commercial receptors are not normally identified as potentially significant with regard to noise impacts.

2.3.40 Footpath A10 dissects the western part of the proposed borrow pit site and runs alongside the southern boundary of the site adjacent to Rockham Ditch.

Mitigation Measures

2.3.41 Mitigation measures for air quality and the fugitive emissions of dust are set out in Annex A: Air quality management plan of the First Iteration EMP. This includes measures such as:

a. Covering stockpiled materials on site.

b. Application of dust suppression techniques.

c. Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site for high risk sites.

d. Sheeting of vehicles to prevent the escape of materials.

e. Use of dust sweepers and wheel washing.

f. Liaison with local residents at a higher risk of impact.

2.3.42 Mitigation measures for noise and vibration are set out in Annex B: Noise and Vibration Management Plan of the First Iteration EMP. These include measures such as:

a. All ancillary plant such as generators, compressors and pumps will be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures will be provided, where appropriate.

b. Working methods will be developed specific to the area and will consider use of equipment and methods of operations to minimise noise.

c. All plant and machinery in intermittent use will be shut down in intervening periods between work or throttled down to a minimum.

d. Proper use of plant with respect to minimising noise emissions with regular maintenance will be undertaken. All vehicles and mechanical plant used for the purpose of the works will be fitted with exhaust silencers and be maintained in good working order.

e. Minimising the drop height of materials into hoppers, lorries, or other plant.

f. Use of less intrusive alarms on vehicles, for example broadband vehicle reversing warnings.

g. The appropriate selection of plant e.g. rollers.

h. Consideration of low vibration working methods, including non-vibratory compaction plant where possible.

i. Haul routes within the site boundary will be kept in good condition.

j. No start-up or shut down of large vibratory rollers (approximately 13 tonnes) within 50 metres of receptors and medium vibratory rollers (approximately 3.5 tonnes) within 15 metres of receptors.

k. The use of cut-off trenches to disrupt direct vibration movement through the ground.

2.3.43 Where construction works areas (e.g. the borrow pit) sever public rights of way (PRoW) the Principal Contractor will consult and agree how to manage these routes with the appropriate local authority.

2.3.44 Post restoration of this borrow pit, Footpath A10 would be stopped up and diverted away from the upgraded A421 onto a dedicated farm access track which runs broadly parallel with the realigned Roxton Road. The access tracks and footpath would join onto Roxton Road with cycle and foot users using the new shared cycle path that runs adjacent to the realigned Roxton Road. Formalisation of the route will improve user experience and the recreational value of the PRoW.

Environmental Effects

2.3.45 The air quality assessment considers the risk of adverse effects during the construction phase. The construction dust risk potential was defined based upon the scale of the works proposed, and the sensitivity of the receiving environment. All sensitive receptors within 200m of construction activity were identified, and the construction dust risk was classified as ‘high’ or ‘low’ based on the distance from construction activities. The scale of the works as a whole for the Scheme was considered to be large with additional measures proposed for locations with receptors within 100m and for borrow pits, given the potential dust generation of these works. Mitigation measures are included within the First Iteration EMP to manage dust emissions such that no significant air quality effects occur at sensitive receptors.

2.3.46 The construction noise assessment reported in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]** was based on reasonable worst-case assumptions, including for works associated with the borrow pits. This included types of construction plant likely to be required for the excavation and backfilling of the borrow pits, such as excavators, tractors, bowsers, water pumps and wagons. These were assumed to operate during the daytime only. The impact of earthworks haul movements to and from the borrow pit along haul roads were also included in the assessment. However, specific mitigation measures, such as localised hoarding, was not included in predicting construction noise impacts.

2.3.47 The assessment reported in the Environmental Statement was based on estimates of monthly average construction noise levels for a selection of 45 potentially sensitive receptors along the Scheme. The closest selected receptor to Site 11 is 10 Roxton Road located approximately 220m north east of the Site (Receptor Reference R08 in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]**). The assessment concluded that significant daytime construction noise effects were likely to occur at residential properties in the vicinity of receptor R08 for a total of four months. However, the sources of these significant effects are not directly related to the excavation or refilling of the borrow pits. The main contributions to this potential significant adverse noise effect were identified as the earthworks fill to Roxton Road and piling activities associated with the construction of the Roxton Road bridge. During the four months in which a significant daytime effect was identified, i.e. when the daytime SOAEL was exceeded, the predicted contribution from the borrow pit activities at Site 11 was approximately 30 dB below the SOAEL.

2.3.48 However, the choice of receptors, and the choice of façade at each receptor reported in the Environmental Statement, was based on proximity to the construction works as a whole not the borrow pits specifically, as these are just one aspect of the large range of construction activities assessed. Therefore, given the interest in the borrow pits expressed by some of the Local Authorities, an additional assessment has been carried out to predict construction noise levels from the excavation and backfilling of the borrow pits at the closest façade of the closest receptor to each of the borrow pits. For Site 11 this is the south façade of the closest residential property on Spinney Road to the north (approximately 150m away). At this location the predicted construction noise level due to the excavation works at Site 11 is 49 dB L_{Aeq}. This is considerably below the SOAEL of 65 dB L_{Aeq} at this receptor. Therefore, the borrow pit works at Site 11 are not considered to be a potential source of significant adverse construction noise effects at the closest receptors.

2.4 Excavation methodology

2.4.1 The proposed excavation of the borrow pit will have an average depth of 3m from existing levels in order to generate the required volume of material. The estimated volumes of materials to be excavated from the site are as follows:

a. Topsoil – 29,500m^3

b. Subsoil – 55,500m^3

c. Earthworks Fill – 160,000m^3

d. Total – 245,000m^3

2.4.2 The method of sourcing material from this borrow pit will generally involve stripping the top-soil with a blade, which would be stockpiled in a temporary landscaped bund in an area that provides screening from local receptors. The sub soil will then be removed, which would also be stockpiled separately in temporary landscaped bunds, which will act as additional screening.

2.4.3 Excavation of material from within the borrow pit to the zone above the existing groundwater level will take place for it to be transported to the construction work areas. The material from the area will be excavated in a rotational method, therefore the site will unlikely be in a fully open state at any one time. At the perimeter of each borrow pit, the edge would be cut to a 1 in 3 slope and a cut off ditch would be excavated to collect any runoff from the slope. Mobile water pumps and pump lines would be located to lift water from the cut off ditches to a treatment pond or lagoon. Further pumps would be used with local sumps to control surface water and groundwater within the pit.

2.5 Restoration

2.5.1 The borrow pit is proposed to be restored to a condition to enable agricultural use, as illustrated on the Environmental Masterplan **[APP-091]** and secured via Requirements 6 and 12 of the DCO. Following extraction of the required materials, restoration of the site would commence and would coincide with the construction phase as a staged process i.e. part of the borrow pit areas would remain in use whist other parts would be backfilled and restored. The borrow pit will be brought back to original ground levels, unless otherwise agreed with the landowner and subject to the limits of the DCO, with excavated material that is unsuitable for engineering use and compacted in layers before reinstatement of the sub-soil and top-soil.

3 Site 14 - (Black Cat roundabout) – land immediately east of the A1 and north of Black Cat Quarry.

3.1 General description

3.1.1 The site (**Figure 3-1**) is situated on the land immediately east of the A1 and north of the Black Cat Quarry. The site is approximately 5.1ha (51000m^2) in size, located on ALC Grade 1 land.

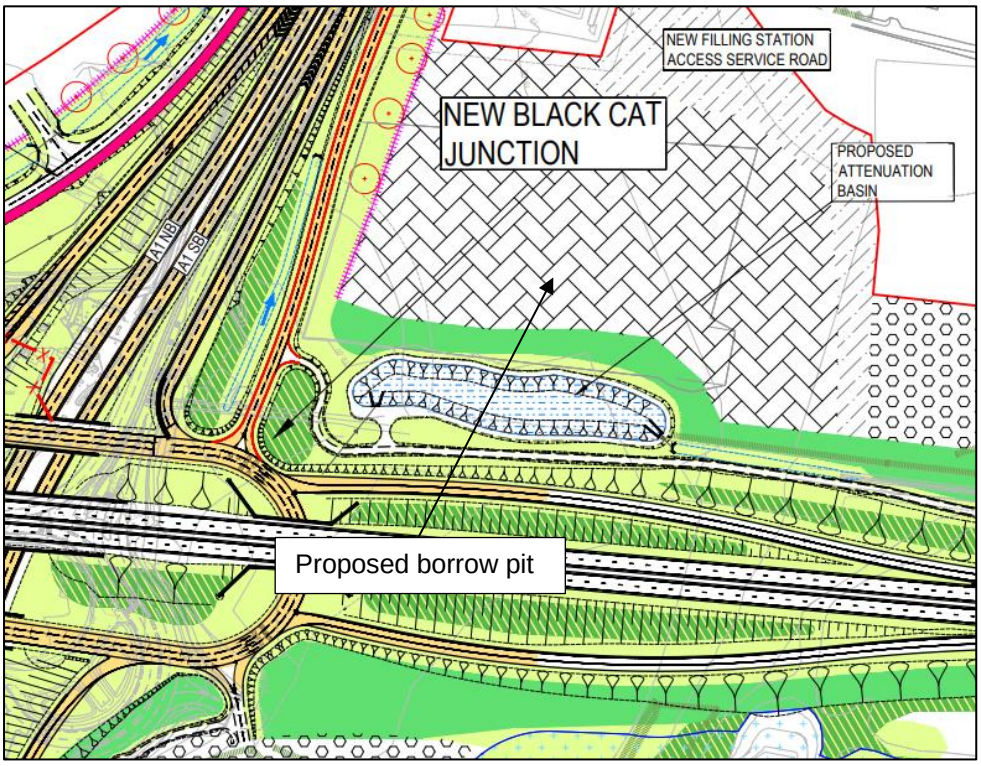


Figure 3-1: Site 14 Location Plan

3.1.2 There were no trial pits excavated during the ground investigation specifically for this area. However, there is information available from trial pits and boreholes around the location, indicating the likely materials. These are TP211, TP334, TP365, BH275C and WS208. Please refer to the Appendices for details on the investigations undertaken.

3.1.3 The geology beneath this site comprises Made Ground over River Terrace Deposits. The Made Ground is assessed as possibly reworked quarry backfill. These overlie the Glacial Till (Oadby formation), with BH275C showing that the Oxford Clay Formation is located below the Glacial Till, which overlies the Kellaways Beds/Cornbrash at a depth of around 21.5m.

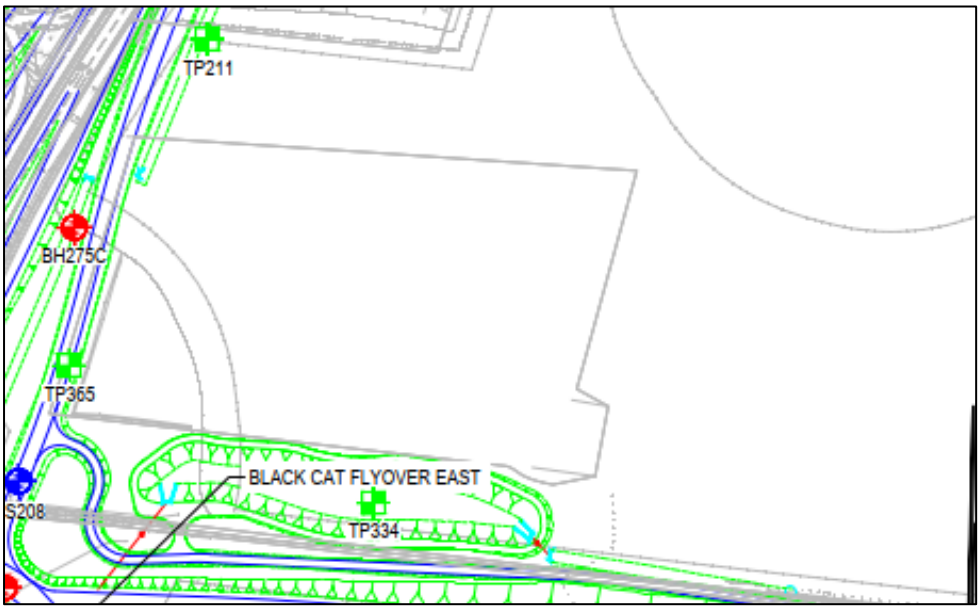


Figure 3-2: Site 14 Ground Investigation Locations

3.1.4 This site is located on agricultural land. South Brook (a tributary of the River Great Ouse) is located approximately 100m north of the site.

3.1.5 Commercial and residential properties are located on the A1 Great North Road, the closest commercial buildings are approximately 50m north of the site and the closest residential to the north of is approximately 140m away. There is an individual residential property slightly closer to Site 14, which is located approximately 100m to the north east of the site. There is a Grade II Listed Building (Brook Cottages) located approximately 150m to the north-west of the site, that is proposed to be demolished as part of the Scheme. There are no other Grade II Listed Buildings in proximity. Commercial receptors are not normally identified as potentially significant with regard to noise impacts.

3.1.6 The proposed borrow pit location and cross sections can be seen in the following drawing in Appendix B:

a. HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3533 P01

3.2 Key constraints

3.2.1 The key constraints associated with this borrow pit are the changes in noise levels and visual amenity for human receptors on the A1 Great North Road, and the individual property located to the north east of the site, which are located approximately 140m and 100m respectively from the site boundary.

3.2.2 Another constraint at the site location is the proximity to flood zones 2 and 3 within the eastern extreme of the site. It is likely that with further design development, that the boundary of the borrow pit could be adjusted to avoid flood zones 2 and 3 so no flooding effects would be likely.

3.2.3 Local environmental constraints within a 300m study area outwards from this site can be seen within Appendix B of the Borrow Pits Optioneering Report.

3.3 Environment

Landscape and visual

Baseline Conditions

3.3.2 This borrow pit is within LLCA 04 (Ouse Valley Lakes).

3.3.3 Fieldwork surveys recorded that tranquillity surrounding the existing Black Cat roundabout and A1 (in proximity to this borrow pit) is influenced by a range of negative factors including views and noise of roads caused by the movement of traffic, and industrial and commercial uses (including garages and road haulage businesses).

3.3.4 Quarrying activity at the Black Cat Quarry (east of the existing Black Cat roundabout) and south of the borrow pit continue these influences as far as the River Great Ouse but will have concluded before construction of the Scheme commences.

3.3.5 There are no trees in the area occupied by this proposed borrow pit requiring protection (refer to sheet 4 of the Tree Constraints Plan in **Appendix 7.5** of the Environmental Statement **[APP-183 to APP-187]**).

Mitigation Measures

3.3.6 Tree and shrub planting within the restored quarry west of the River Great Ouse would help integrate the Scheme with the surrounding landscape. Proposed tree planting directly to the south would provide screening and integrate the Scheme with the local landscape pattern.

Environmental Effects

3.3.7 In the construction period, landscape effects on LLCA 04: Ouse Valley Lakes has been assessed as moderate adverse, which is significant. The local landscape character would be altered through the temporary increase in the extent of built development.

3.3.8 The excavation of this borrow pit, removal and storage of material and associated vehicle movements would be visible in the middle ground of views of residential receptors from the rear of properties in Chawston. This would result in a notable change compared to existing views of the River Great Ouse but in the context of existing views of the Black Cat Quarry.

3.3.9 For example, Sheet 2 of **Figure 7.11** of the Environmental Statement **[APP-112]** shows that residential receptors to the north of this borrow pit would experience large (R18) adverse visual effects and commercial properties (C2) would experience moderate adverse visual effects in the construction period, which are both significant. It is noted that there are other Scheme elements in close proximity that would contribute to these significant visual effects rather than only the visual effects of the borrow pits in isolation.

Biodiversity

Baseline Conditions

3.3.10 Begwary Brook Pit County Wildlife Site (CWS) and Wildlife Trust Nature Reserve are located approximately 0.75km (0.5 miles) to the north-east of this borrow pit site (refer to **Figure 1** in **Appendix 8.2** of the Environmental Statement **[APP-189]**).

3.3.11 Breeding bird territories (for Skylark and Sand Martin) were found at this borrow pit site (refer to **Figure 6** and **Figure 7** in **Appendix 8.10** of the Environmental Statement **[APP-197]**).

Mitigation Measures

3.3.12 Measures necessary to avoid harm to birds and their nests will be implemented under the supervision of the Environmental Clerk of Works (ECoW), with checks regularly carried out prior to and during construction to identify any active nests of Schedule 1 (of the *Wildlife and Countryside Act 1981*) (Ref 1-8) breeding bird species that may be at risk of disturbance.

3.3.13 Native species hedgerow planting directly to the west of this borrow pit site would reinstate field boundaries and restore locally characteristic features, contributing to hedgerow habitat enhancement.

Environmental Effects

3.3.14 No significant biodiversity effects are anticipated in the construction period.

Archaeology

Baseline Conditions

3.3.15 No archaeological sites are located in the area occupied by this borrow pit site. Any archaeology would have been previously quarried away.

Mitigation Measures

3.3.16 No mitigation measures are required.

Environmental Effects

3.3.17 No archaeological features are present, and therefore no effects have been identified at this borrow pit site.

3.3.18 There will be no impacts to heritage assets caused by change to their setting.

Hydrology

Baseline Conditions

3.3.19 South Brook (a tributary of the River Great Ouse) is located approximately 100m north of the borrow pit. The eastern extreme of the site is within the flood zones of the River Great Ouse (Flood Zone 2 and Flood Zone 3).

Mitigation Measures

3.3.20 Within the First Iteration EMP **[APP-234]**, a Water Management Plan will manage water removed from borrow pits.

3.3.21 At South Brook, water level loggers will be installed and spot flow gauging carried out for a period of 12 months (or as otherwise agreed with the Environment Agency) to ensure there is a good understanding of the flow regime prior to any dewatering works nearby.

3.3.22 A construction dewatering strategy will be prepared by the Principal Contractor which will consider how phasing/sequencing of the excavation of borrow pits and other cuttings will influence the amount of water that may need to be managed at any given time.

3.3.23 Once dewatering starts, the water would be discharged following settlement to remove suspended solids, to the closest watercourse (i.e. South Brook) to maintain flows should baseflow be affected by the dewatering works.

3.3.24 Where it is deemed not possible to discharge all of the water removed from excavations and borrow pits to a nearby watercourse, and there are no other alternative options, the Principal Contractor will consider methods to reduce further the ingress of groundwater (and overland flow) into borrow pits or excavations (e.g. working smaller areas at a time or sealing the borrow pit/ excavation by a suitable method).

3.3.25 It is proposed that monitoring boreholes are drilled adjacent to the borrow pit.

Environmental Effects

3.3.26 At South Brook, with the implementation of mitigation measures, it is considered that the construction works would have a temporary and short term slight adverse (not significant) effect (including the water quality, dilution and removal of waste products and conveyance of flow).

3.3.27 At this borrow pit, it is unlikely that the lowering of groundwater would pose any significant risks to the South Brook. It is also not anticipated that there will be any significant effects in relation to groundwater flooding in proximity to this borrow pit.

Soils and agriculture

Baseline Conditions

3.3.28 This borrow pit is located on ALC Grade 1 land classed as ‘River Terrace Deposits – Sand and Gravel’ and ‘Kellaways Formation and Oxford Clay Formation (undifferentiated) – mudstone, siltstone and sandstone’ in terms of soil and geology.

Mitigation Measures

3.3.29 To demonstrate material geochemical/geotechnical acceptability, site-won earthworks materials (including materials from borrow pits) will be subject to a suite of chemical laboratory analysis appropriate to the ground conditions at the site.

3.3.30 Excavations of borrow pits will avoid the interception of potentially pressurised groundwater in the Kellaways Formation beneath the Oxford Clay.

Environmental Effects

3.3.31 The significance of the effects on groundwater level, flow, quality, and groundwater receptors, such as licensed groundwater sources, as a result of dewatering at borrow pits are considered to be no worse than slight adverse, which is not significant.

3.3.32 Best practice mitigation measures will be implemented by the Principal Contractor to reduce the impacts and effects that construction of the Scheme is likely to have on affected soil resources. These measures are presented within the Soil Handling and Management Plan contained in the First Iteration EMP **[APP-238]** and relate to the testing, stripping, storage, and reuse of high quality agricultural soils.

Amenity

Baseline Conditions

3.3.33 The nearest human receptors are residential properties located on the A1 Great North Road to the north, and an individual property to the north east of the site. These are located approximately 140m and 100m respectively from the site boundary.

3.3.34 There are no PRoWs in close proximity to this borrow pit site.

Mitigation Measures

3.3.35 Mitigation measures for air quality and the fugitive emissions of dust are set out in Annex A: Air quality management plan of the First Iteration EMP. This includes measures such as:

a. Covering stockpiled materials on site.

b. Application of dust suppression techniques.

c. Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site for high risk sites.

d. Sheeting of vehicles to prevent the escape of materials.

e. Use of dust sweepers and wheel washing.

f. Liaison with local residents at a higher risk of impact.

3.3.36 Mitigation measures for Noise and Vibration are set out in Annex B: Noise and Vibration Management Plan of the First Iteration EMP. These include measures such as:

a. All ancillary plant such as generators, compressors and pumps will be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures will be provided, where appropriate.

b. Working methods will be developed specific to the area and will consider use of equipment and methods of operations to minimise noise.

c. All plant and machinery in intermittent use will be shut down in intervening periods between work or throttled down to a minimum.

d. Proper use of plant with respect to minimising noise emissions with regular maintenance will be undertaken. All vehicles and mechanical plant used for the purpose of the works will be fitted with exhaust silencers and be maintained in good working order.

e. Minimising the drop height of materials into hoppers, lorries, or other plant.

f. Use of less intrusive alarms on vehicles, for example broadband vehicle reversing warnings.

g. The appropriate selection of plant e.g. rollers.

h. Consideration of low vibration working methods, including non-vibratory compaction plant where possible.

i. Haul routes within the site boundary will be kept in good condition.

j. No start-up or shut down of large vibratory rollers (approximately 13 tonnes) within 50 metres of receptors and medium vibratory rollers (approximately 3.5 tonnes) within 15 metres of receptors.

k. The use of cut-off trenches to disrupt direct vibration movement through the ground.

Environmental Effects

3.3.37 The air quality assessment considers the risk of adverse effects during the construction phase. The construction dust risk potential was defined based upon the scale of the works proposed, and the sensitivity of the receiving environment. All sensitive receptors within 200m of construction activity were identified, and the construction dust risk was classified as ‘high’ or ‘low’ based on the distance from construction activities. The scale of the works as a whole for the Scheme was considered to be large with additional measures proposed for locations with receptors within 100m and for borrow pits, given the potential dust generation of these works. Mitigation measures are included within the First Iteration EMP to manage dust emissions such that no significant air quality effects occur at sensitive receptors.

3.3.38 The construction noise assessment reported in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]** was based on reasonable worst-case assumptions, including for works associated with the borrow pits. This included types of construction plant likely to be required for the excavation and backfilling of the borrow pits, such as excavators, tractors, bowsers, water pumps and wagons. These were assumed to operate during the daytime only. The impact of earthworks haul movements to and from the borrow pit along haul roads were also included in the assessment. However, specific mitigation measures, such as localised hoarding, was not included in predicting construction noise impacts.

3.3.39 The assessment reported in the Environmental Statement was based on estimates of monthly average construction noise levels for a selection of 45 potentially sensitive receptors along the Scheme. The closest selected receptor to Site 14 is 9 Great North Road which is approximately 140m north of Site 14. (Receptor References R15A (west facade) and R15B (south facade) in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]**). The assessment concluded that significant daytime construction noise effects were likely to occur at residential properties in the vicinity of R15B for a total of one month (no daytime significant adverse effects were identified at R15A). However, the sources of the significant effect at R15B are not directly related to the excavation and refilling of the borrow pits. The main contributions to this potential significant adverse noise effect were identified as the earthworks cut for the A1 North and earthworks cut for the A1 southbound offslip. During the one month in which a significant daytime effect was identified i.e. when the daytime SOAEL was exceeded, the predicted contribution from the borrow pit activities at Site 14 was approximately 25 dB below the SOAEL.

3.3.40 However, the choice of receptors, and the choice of façade at each receptor reported in the Environmental Statement, was based on proximity to the construction works as a whole not the borrow pits specifically, as these are just one aspect of the large range of construction activities assessed. Therefore, given the interest in the borrow pits expressed by some of the Local Authorities, an additional assessment has been carried out to predict construction noise levels from the excavation and backfilling of the borrow pits at the closest façade of the closest receptor to each of the borrow pits. For Site 14, this is the west façade of the closest residential property located to the north east of the borrow pit (approximately 100m away). At this location the predicted construction noise level due to the excavation works at Site 14 is 57 dB L_{Aeq}. This is considerably below the SOAEL of 65 dB L_{Aeq} at this receptor. Therefore, the borrow pit works at Site 14 are not considered to be a potential source of significant adverse construction noise effects at the closest receptors.

3.4 Excavation methodology

3.4.1 The proposed excavation of the borrow pit will have an average depth of 7m from existing levels in order to generate the required volume of material. The estimated volumes of materials to be excavated from the site are as follows:

a. Topsoil – 12,500m^3

b. Subsoil – 95,500m^3

c. Earthworks Fill – 120,000m^3

d. Total – 227,500m^3

3.4.2 The excavation methodology of the site is similar to that in Site 11 in its logistics and with the use of bunds and drainage provisions.

3.5 Restoration

3.5.1 Similar to Site 11, the proposed borrow pit land will be backfilled with excavated material which is not suitable for construction/engineering purposes and is proposed to be restored to a condition to enable agricultural use, as stated in the environmental masterplan.

4 Site 3 - (Caxton Gibbet roundabout) – land immediately west of the A1198 (Ermine Street) and north of the Existing A428 (Cambridge Road).

4.1 General Description

4.1.1 The site (**Figure 4-1**) is situated on the land immediately west of the A1198 (Ermine Street) and north of the existing A428 (Cambridge Road). The site is approximately 14.8ha (148000m^2) in size and located on ALC Grade 2 land.

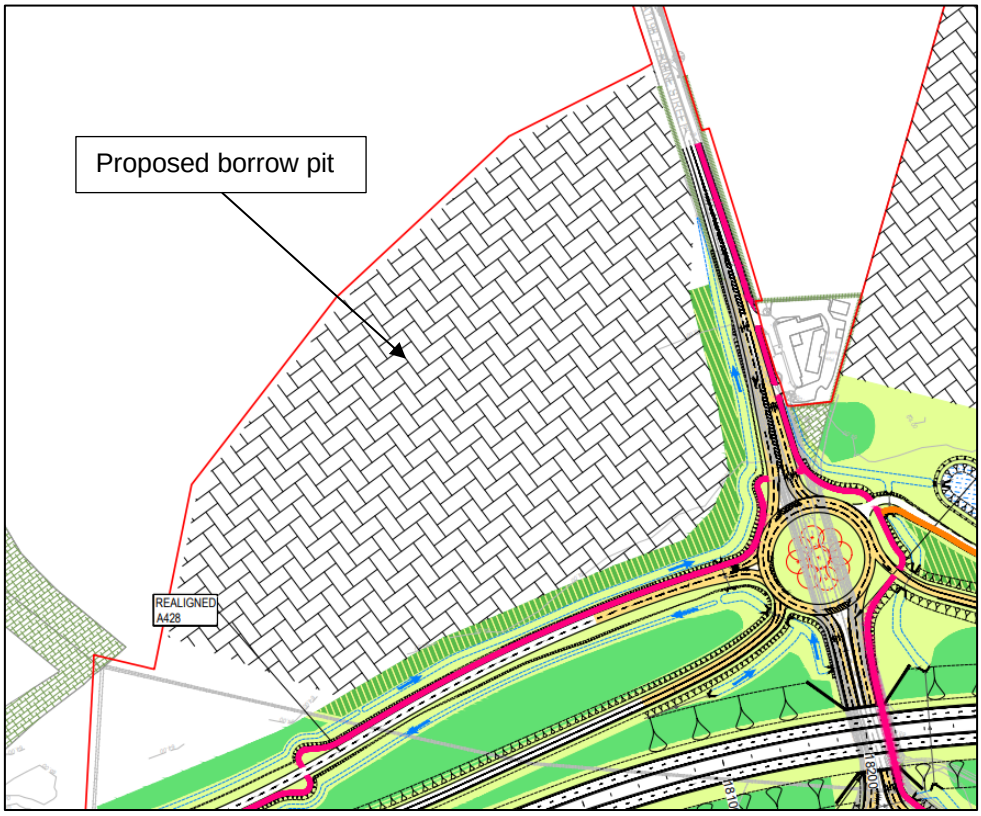


Figure 4-1: Site 3 Location Plan

4.1.2 Four trial pits were excavated in this area – TP319, TP408, TP409 and TP410. Please refer to the Appendices for details on the investigations undertaken.

4.1.3 The geology beneath this site comprises Glacial Till (Oadby formation). Below the Glacial Till, although not proven by any of the boreholes in the area, is the undifferentiated 'West Walton and Ampthill Clay Formation'.

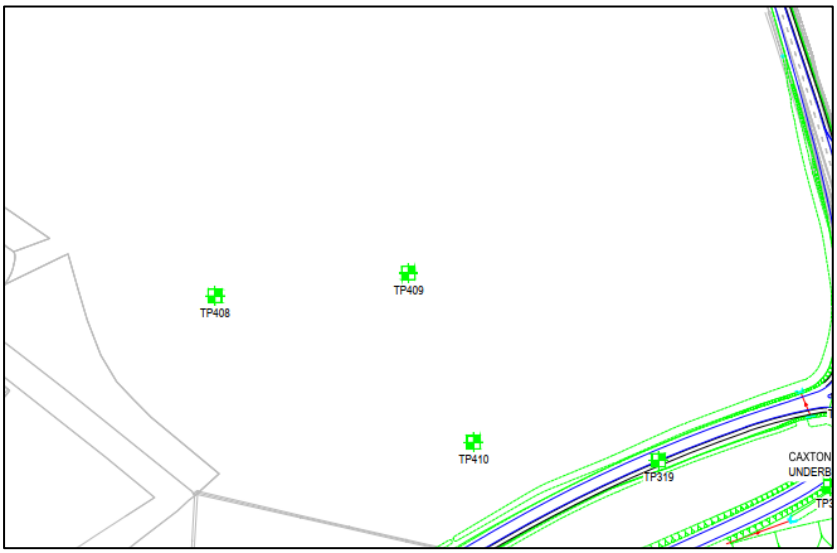


Figure 4-2: Site 3 Ground Investigation Locations

4.1.4 The nearest human receptors include the Iway Inn Hotel on the other side of the A1198 (Ermine Street) within 50m to the east, and farm buildings, including residential property, more than 200m to the west. There are also a number of businesses on the existing Caxton Gibbet roundabout itself, including a convenience shop, a Costcutter supermarket and a Shell Petrol Station, though commercial receptors such as these are not normally identified as potentially significant with regard to noise impacts.

4.1.5 The proposed borrow pit location and cross sections can be seen in the following drawings in Appendix B:

a. HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3534 P01

b. HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3535 P01

4.2 Key constraints

4.2.1 The key constraints associated with this borrow pit are the changes in noise levels and visual amenity for human receptors primarily at Iway Inn Hotel (50m from the borrow pit location) and residential properties at Pembroke Farm (approximately 250m from borrow pit location at their closest point). There are also potential cumulative effects from noise and visual impacts at the Iway Inn Hotel due to the proximity of Site 4.

4.2.2 Local environmental constraints within a 300m study area outwards from this site can be seen within Appendix B of the Borrow Pits Optioneering Report.

4.3 Environment

Landscape and visual

Baseline Conditions

4.3.2 This borrow pit is within LLCA 14 (Western Claylands).

4.3.3 Tree group G557 (Category C1, C2 & C3) which includes Damson (*Prunus domestica*), English Elm (*Ulmus procera*) and Ash (Fraxinus excelsior) is located immediately adjacent to this borrow pit site to the east as shown in Sheet 62 of the Tree Constraints Plan in **Appendix 7.5** of the Environmental Statement **[APP-183 to APP-187]**.

4.3.4 Hedgerow H553 (Category C1, C2 & C3), which includes Damson (*Prunus domestica*) and English Elm (*Ulmus procera*) is located directly to the east of this borrow pit site (refer to Sheet 62 of the Tree Constraints Plan in **Appendix 7.5** of the Environmental Statement **[APP-183 to APP-187]**).

Mitigation Measures

4.3.5 A linear belt of shrubs and trees are proposed at the eastern and southern extents of the borrow pit site to screen views.

4.3.6 Dead elms within G557 and H553 will be felled and disposed of. All tree work would follow the principles of *BS3998:2010* (Ref 1-5) and be carried out by suitably qualified and insured contractors.

Environmental Effects

4.3.7 In the construction period, landscape effects on LLCA 14 (Western Claylands) have been assessed as moderate adverse, which is significant. The local landscape character would be altered through the temporary increase in the extent of built development.

4.3.8 The excavation of borrow pits would extend across the landscape to the north of the Cambridge Road junction towards Papworth Everard resulting in temporary changes to the landform and tranquillity.

4.3.9 Sheet 14 of **Figure 7.11** of the Environmental Statement **[APP-112]** shows that the farm receptor to the west (R107) and the hotel receptor directly to the east (Iway Inn Hotel, C29) would both experience moderate adverse visual effects in the construction period, which are significant. It is noted that there are other Scheme elements in close proximity that would contribute to these significant visual effects rather than only the visual effects of the borrow pits in isolation.

4.3.10 The borrow pit would require the removal of the identified dead elm trees.

Biodiversity

Baseline Conditions

4.3.11 Several breeding bird territories were found in close proximity to this borrow pit site, directly to the south and south-east (refer to the figures in **Appendix 8.10** of the Environmental Statement **[APP-197]**).

Mitigation Measures

4.3.12 Measures necessary to avoid harm to birds and their nests will be implemented under the supervision of the Environmental Clerk of Works (ECoW), with checks regularly carried out prior to and during construction to identify any active nests of Schedule 1 (of the *Wildlife and Countryside Act 1981*) (Ref 1-8) breeding bird species that may be at risk of disturbance.

Environmental Effects

4.3.13 No significant effects are anticipated for local breeding bird populations in proximity to this borrow pit site.

Archaeology

Baseline Conditions

4.3.14 Field 97 contains five areas of archaeological features in proximity to the borrow pit, including a sub-rectangular Middle to Late Iron Age enclosure (Area 1), a possible rectilinear enclosure or field system containing two possible roundhouses (Area 4), and a possible roundhouse drip gully which produced four sherds of Late Iron Age/Roman pottery (Area 5). Refer to Sheet 9 of **Figure 6.1** of the Environmental Statement **[APP-099]**.

Mitigation Measures

4.3.15 The Archaeological sites identified within the borrow pit will be subject to archaeological excavation in advance of the construction of the borrow pit. This will ensure the remains are excavated and recorded.

Environmental Effects

4.3.16 Areas 1, 4 and 5 would be impacted by the excavation of the borrow pit, resulting in a permanent magnitude of impact of moderate adverse. Construction of the Scheme would have a moderate adverse effect (significant) on these areas.

4.3.17 There will be no impacts to heritage assets caused by change to their setting.

Hydrology

Baseline Conditions

4.3.18 The proposed borrow pit is located in close proximity (within 20m) to the headwaters of West Brook, although West Brook itself is located approximately 6km (3.7 miles) downstream. This borrow pit is not within any surface water flood zones.

Mitigation Measures

4.3.19 Within the First Iteration EMP **[APP-234]**, a Water Management Plan will manage water removed from borrow pits.

4.3.20 A construction dewatering strategy will be prepared by the Principal Contractor which will consider how phasing/sequencing of the excavation of borrow pits and other cuttings will influence the amount of water that may need to be managed at any given time.

4.3.21 Where it is deemed not possible to discharge all of the water removed from excavations and borrow pits to a nearby watercourse, and there are no other alternative options, the Principal Contractor will consider methods to reduce further the ingress of groundwater (and overland flow) into borrow pits or excavations (e.g. working smaller areas at a time or sealing the borrow pit/ excavation by a suitable method).

4.3.22 For the borrow pits at Caxton Gibbet junction, excavations are unlikely to require significant dewatering given their shallow depth in relation to the water table/limited groundwater potential of the Till and thus can be managed using standard methods.

Environmental Effects

4.3.23 For the tributaries of West Brook, with the implementation of mitigation measures, it is considered that the construction works would have a temporary and short term slight adverse (not significant) effect (including the water quality, dilution and removal of waste products).

4.3.24 It is also not anticipated that there will be any significant effects in relation to groundwater flooding in proximity to this borrow pit.

Soils and agriculture

Baseline Conditions

4.3.25 This borrow pit is located on ALC Grade 2 land classed as ‘Oadby Member – Diamicton’ and ‘West Walton Formation, Ampthill Clay Formation’ and ‘Kimmeridge Clay Formation (undifferentiated)’ in terms of soils and geology respectively.

Mitigation Measures

4.3.26 To demonstrate material geochemical/geotechnical acceptability, site-won earthworks materials (including materials from borrow pits) will be subject to a suite of chemical laboratory analysis appropriate to the ground conditions at the site.

4.3.27 Best practice mitigation measures will be implemented by the Principal Contractor to reduce the impacts and effects that construction of the Scheme is likely to have on affected soil resources. These measures are presented within the Soil Handling and Management Plan contained in the First Iteration EMP **[APP-238]** and relate to the testing, stripping, storage, and reuse of high quality agricultural soils.

Environmental Effects

4.3.28 The significance of the effects on groundwater level, flow, quality and groundwater receptors, such as licensed groundwater sources, as a result of dewatering at borrow pits are considered to be no worse than slight adverse, which is not significant due to their shallow depth in relation to the water table, the limited groundwater potential of the Till and their proposed management using standards methods.

Amenity

Baseline Conditions

4.3.29 The nearest human receptors include the Iway Inn Hotel on the other side of the A1198 (Ermine Street) within 50m to the east, and farm buildings, including a number of residential properties at Pembroke Farm, approximately 250m to the west. There are also a number of businesses on the existing Caxton Gibbet roundabout itself, including a convenience shop, a Costcutter supermarket and a Shell Petrol Station, though commercial receptors such as these are not normally identified as potentially significant with regard to noise impacts.

4.3.30 There are no PRoWs in close proximity to this borrow pit site.

Mitigation Measures

4.3.31 Mitigation measures for air quality and the fugitive emissions of dust are set out in Annex A: Air quality management plan of the First Iteration EMP. This includes measures such as:

a. Covering stockpiled materials on site.

b. Application of dust suppression techniques.

c. Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site for high risk sites.

d. Sheeting of vehicles to prevent the escape of materials.

e. Use of dust sweepers and wheel washing.

f. Liaison with local residents at a higher risk of impact.

4.3.32 Air quality monitoring will be required at the Iway Inn Hotel due to the proximity of the borrow pits in addition to the construction work at Caxton Gibbet junction.

4.3.33 Mitigation measures for Noise and Vibration are set out in Annex B: Noise and Vibration Management Plan of the First Iteration EMP. These include measures such as:

a. All ancillary plant such as generators, compressors and pumps will be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures will be provided, where appropriate.

b. Working methods will be developed specific to the area and will consider use of equipment and methods of operations to minimise noise.

c. All plant and machinery in intermittent use will be shut down in intervening periods between work or throttled down to a minimum.

d. Proper use of plant with respect to minimising noise emissions with regular maintenance will be undertaken. All vehicles and mechanical plant used for the purpose of the works will be fitted with exhaust silencers and be maintained in good working order.

e. Minimising the drop height of materials into hoppers, lorries, or other plant.

f. Use of less intrusive alarms on vehicles, for example broadband vehicle reversing warnings.

g. The appropriate selection of plant e.g. rollers.

h. Consideration of low vibration working methods, including non-vibratory compaction plant where possible.

i. Haul routes within the site boundary will be kept in good condition.

j. No start-up or shut down of large vibratory rollers (approximately 13 tonnes) within 50 metres of receptors and medium vibratory rollers (approximately 3.5 tonnes) within 15 metres of receptors.

k. The use of cut-off trenches to disrupt direct vibration movement through the ground.

Environmental Effects

4.3.34 The air quality assessment considers the risk of adverse effects during the construction phase. The construction dust risk potential was defined based upon the scale of the works proposed, and the sensitivity of the receiving environment. All sensitive receptors within 200m of construction activity were identified, and the construction dust risk was classified as ‘high’ or ‘low’ based on the distance from construction activities. The scale of the works as a whole for the Scheme was considered to be large with additional measures proposed for locations with receptors within 100m and for borrow pits, given the potential dust generation of these works. Mitigation measures are included within the First Iteration EMP to manage dust emissions such that no significant air quality effects occur at sensitive receptors.

4.3.35 The construction noise assessment reported in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]** was based on reasonable worst-case assumptions, including for works associated with the borrow pits. This included types of construction plant likely to be required for the excavation and backfilling of the borrow pits, such as excavators, tractors, bowsers, water pumps and wagons. These were assumed to operate during the daytime only. The impact of earthworks haul movements to and from the borrow pit along haul roads were also included in the assessment. However, specific mitigation measures, such as localised hoarding, was not included in predicting construction noise impacts.

4.3.36 The assessment reported in the Environmental Statement was based on estimates of monthly average construction noise levels for a selection of 45 potentially sensitive receptors along the Scheme. The closest selected receptor to Site 3 is the Iway Inn which consists of two buildings a minimum of approximately 50m east of Site 3 (receptor Reference R40A (south west façade of western building) and R40B (south façade of eastern building) respectively in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]**). The assessment concluded that significant daytime construction noise effects were likely to occur at R40B for a total of eight months (no significant daytime adverse effects was identified at R40A). However, the sources of these significant effects at R40B are not directly related to the excavation or refilling of the borrow pits. The main contributions to this potential significant adverse noise effect were identified as the earthworks fill for Caxton Gibbet flyover embankment, earthworks fill for Caxton Gibbet junction eastbound onslip, and piling activities associated with Caxton Gibbet bridge construction. During the eight months in which a significant daytime effect was identified i.e. when the daytime SOAEL was exceeded, the predicted contribution from the borrow pit activities at Site 3 was approximately 20 dB below the SOAEL at R40B.

4.3.37 However, the south west façade of the western building at the Iway Inn (receptor R40A) is closer to Site 3 than the eastern building (receptor R40B), and directly faces towards the borrow pit. Therefore, the highest predicted construction noise levels due to Site 3 are at receptor R40A. At this location the predicted construction noise level due to the excavation works at Site 3 is 57 dB L_{Aeq}. This is considerably below the SOAEL of 75 dB L_{Aeq} at this façade of this receptor, and, as stated above, the assessment reported in the Environmental Statement did not identify any potential significant daytime construction noise effects at receptor R40A. Therefore, the borrow pit works at Site 3 are not considered to be a potential source of significant adverse construction noise effects at the closest receptors.

4.4 Excavation methodology

4.4.1 The proposed excavation of the borrow pit will have an average depth of 3m from existing levels in order to generate the required volume of material. The estimated volumes of materials to be excavated from the site are as follows:

a. Topsoil – 36,000m^3
b. Subsoil – 67,000m^3
c. Earthworks Fill – 200,000m^3
d. Total – 303,000m^3

4.4.2 The excavation methodology of the site is similar to that in Site 11 and 14 in its logistics and with the use of bunds and drainage provisions.

4.5 Restoration

4.5.1 Similar to Site 11 and 14, the proposed borrow pit land will be backfilled with excavated material which is not suitable for construction/engineering purposes and restored to a condition proposed to enable agricultural use, as stated in the environmental masterplan.

5 Site 4 - (Caxton Gibbet roundabout) – land immediately east of the A1198 and north of the Existing A428 (Cambridge Road).

5.1 General description

5.1.1 The site (**Figure 5-1**) is situated on the land immediately east of the A1198 and north of the Existing A428 (Cambridge Road). The site is approximately 23.2ha (232000m^2) in size and located on ALC Grade 2 land.

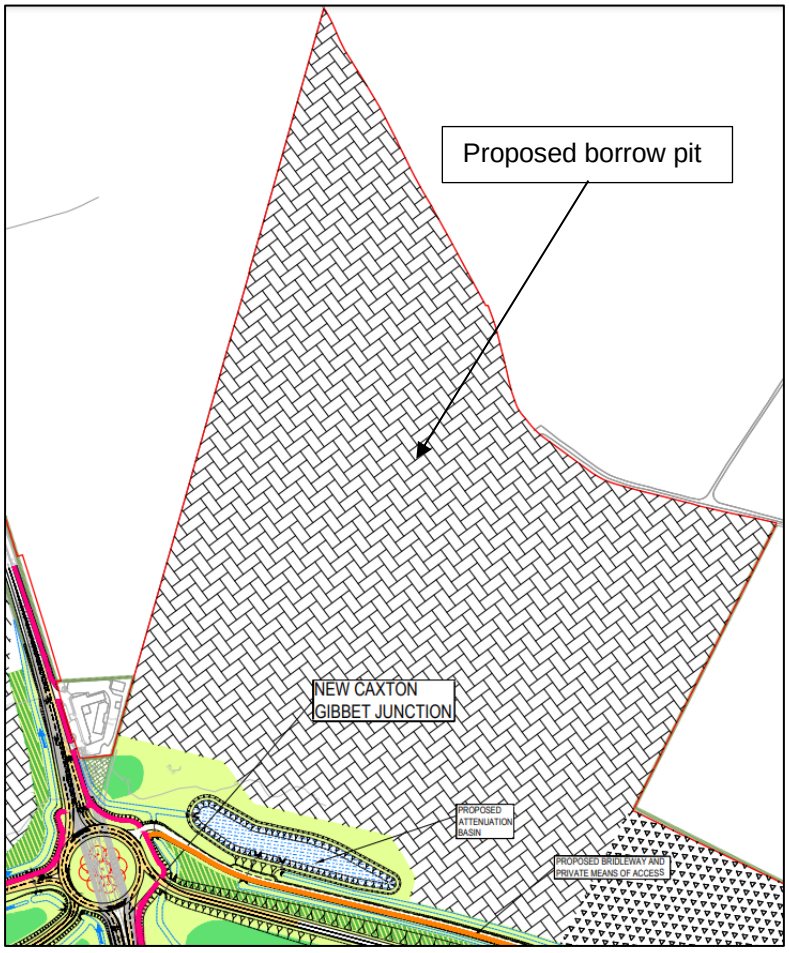


Figure 5-1: Site 4 Location Plan

5.1.2 Ten trial pits were excavated in this area – TP388 to TP392 and TP411 to TP415. Please refer to the Appendices for details on the investigations undertaken.

5.1.3 As with Site 3, the geology beneath this site comprises Glacial Till (Oadby formation). Below the Glacial Till, although not proven by any of the boreholes in the area, is the undifferentiated ‘West Walton and Ampthill Clay Formation’.

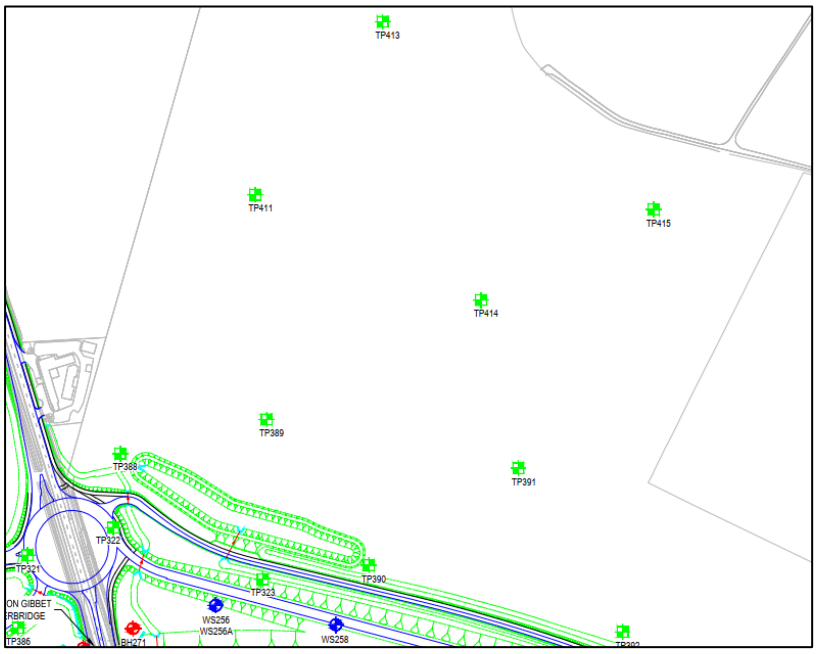


Figure 5-2: Site 4 Ground Investigation Locations

5.1.4 The Iway Inn Hotel is approximately 20m to the west of the borrow pit location and there is an isolated farm building (non-residential) approximately 150m to the east. There are also a number of businesses on the existing Caxton Gibbet roundabout itself, including a McDonald's, a Costa Coffee shop and takeaway food businesses, though commercial receptors such as these are not normally identified as potentially significant with regard to noise impacts.

5.1.5 There is also a dedicated cycleway approximately 100m to the south of the site boundary. The proposed borrow pit location and cross sections can be seen in the following drawings in Appendix B:

a. HE551495-ACM-LSI-ZN5_SW_Z_ZZ-DR-DC-3536 P01

b. HE551495-ACM-LSI-ZN5_SW_Z_ZZ-DR-DC-3537 P01

5.2 Key constraints

5.2.1 The key constraints associated with this borrow pit are the changes in noise levels, potential dust and visual amenity for human receptors primarily at Iway Inn Hotel and the dedicated cycleway to the south of the site, approximately 100m to the south of the site boundary. There are also potential cumulative effects from noise and visual impacts at the Iway Inn Hotel due to the proximity of Site 3.

5.2.2 Local environmental constraints within a 300m study area outwards from this site can be seen within Appendix B of the Borrow Pits Optioneering Report.

5.3 Environment

Landscape and Visual

Baseline Conditions

5.3.2 This borrow pit is within LLCA 14 (Western Claylands).

5.3.3 According to Sheet 62 of the Tree Constraints Plan in **Appendix 7.5** of the Environmental Statement **[APP-183 to APP-187]**, tree group G559 (Category B1, B2 & B3), including Damson (*Prunus domestica*), English Elm (*Ulmus procera*), Ash (*Fraxinus excelsior*) and Common Oak (*Quercus robur*) lies on the south-western boundary of this borrow pit site.

5.3.4 Tree groups G1596 (Category B2), G1779 (Category C2), G1790 (Category C2) and individual trees T1780 to T1789 (of Categories C1 and B1) are all adjacent to the western boundary of this borrow pit site, and tree group G1792 (Category C2) is adjacent to the eastern boundary of this borrow pit site.

Mitigation Measures

5.3.5 All tree work would follow the principles of *BS3998:2010* (Ref 1-5) and be carried out by suitably qualified and insured contractors. Fencing will be provided to protect trees and tree groups where possible in the vicinity of this borrow pit.

5.3.6 To the south of this borrow pit site, a linear belt of shrubs and trees would screen traffic and integrate Caxton Gibbet junction with the local landscape pattern.

Environmental Effects

5.3.7 In the construction period, landscape effects on LLCA 14 (Western Claylands) has been assessed as moderate adverse, which is significant. The local landscape character would be altered through the temporary increase in the extent of built development.

5.3.8 The excavation of borrow pits would extend across the landscape to the north of the Cambridge Road junction towards Papworth Everard resulting in temporary changes to the landform and tranquillity.

5.3.9 The borrow pit would be visible in open views across the flat agricultural fields by residents of Common Farm Cottages.

5.3.10 Sheet 14 of **Figure 7.11** of the Environmental Statement **[APP-112]** shows that Common Farm Cottages (R108) and the hotel receptor directly to the west (Iway Inn Hotel, C29) would both experience significant adverse visual effects (large and moderate respectively) in the construction period. It is noted that there are other Scheme elements in close proximity that would contribute to these significant visual effects rather than only the visual effects of the borrow pits in isolation.

5.3.11 Tree group G559 will be partly removed as a result of the borrow pit.

Biodiversity

Baseline Conditions

5.3.12 Elsworth Wood Site of Special Scientific Interest (SSSI) is located more than 1km (0.6 miles) to the north-east of this borrow pit site (refer to **Figure 1** in **Appendix 8.2** of the Environmental Statement **[APP-189]**).

5.3.13 According to the terrestrial habitats mapping, a species poor hedgerow (H53) is located immediately east of this borrow pit site (refer to **Figure 1** in **Appendix 8.3** of the Environmental Statement **[APP-190]**).

5.3.14 Several breeding bird territories were found in close proximity to this borrow pit site, directly to the south and south-east (refer to the figures in **Appendix 8.10** of the Environmental Statement **[APP-197]**).

5.3.15 A small population of Great Crested Newts (GCN) were surveyed within 200m of the borrow pit site to the east as shown in **Appendix 8.14** of the Environmental Statement **[APP-201]**.

Mitigation Measures

5.3.16 The Scheme has been designed so that impacts upon important habitats (comprising woodland, grassland, hedgerow and ponds) have been avoided or reduced, where reasonably practicable, and are mitigated where avoidance was not feasible, through the retention of existing habitat and the creation or replacement of habitat.

5.3.17 Directly to the south of this borrow pit site, native species hedgerows would be planted to contribute to hedgerow habitat enhancement and reinstate field boundaries.

5.3.18 Measures necessary to avoid harm to birds and their nests will be implemented under the supervision of the Environmental Clerk of Works (ECoW), with checks regularly carried out prior to and during construction to identify any active nests of Schedule 1 (of the *Wildlife and Countryside Act 1981*) (Ref 1-8) breeding bird species that may be at risk of disturbance.

5.3.19 National Highways is seeking to mitigate effects on GCN through a European Protected Species licence applied through Natural England.

Environmental Effects

5.3.20 No biodiversity significant effects are anticipated in the construction period.

Archaeology

Baseline Conditions

5.3.21 Field 99 contains an Iron Age sub-circular enclosure, which was identified through evaluation trenching undertaken within the site. Details of this site are presented and illustrated in the Archaeological Mitigation Strategy **[APP-238]**.

Mitigation Measures

5.3.22 Mitigation of the enclosure would involve the installation of protective fencing around the enclosure prior to construction works commencing at the site, in order to protect the feature from borrow pit activities and operations.

Environmental Effects

5.3.23 Construction of the Scheme would have a neutral effect (not significant) on this asset.

5.3.24 There will be no impacts to heritage assets caused by change to their setting.

Hydrology

Baseline Conditions

5.3.25 The proposed borrow pit is located in close proximity (within 20m) to the headwaters of West Brook, although West Brook itself is located approximately 6km (3.7 miles) downstream. This borrow pit is not within any surface water flood zones.

Mitigation Measures

5.3.26 Within the First Iteration EMP **[APP-234]**, a Water Management Plan will manage water removed from borrow pits.

5.3.27 A construction dewatering strategy will be prepared by the Principal Contractor which will consider how phasing/sequencing of the excavation of borrow pits and other cuttings will influence the amount of water that may need to be managed at any given time.

5.3.28 Where it is deemed not possible to discharge all of the water removed from excavations and borrow pits to a nearby watercourse, and there are no other alternative options, the Principal Contractor will consider methods to reduce further the ingress of groundwater (and overland flow) into borrow pits or excavations (e.g. working smaller areas at a time or sealing the borrow pit/ excavation by a suitable method).

5.3.29 For the borrow pits at Caxton Gibbet junction, excavations are unlikely to require significant dewatering given their shallow depth in relation to the water table/limited groundwater potential of the Till and thus can be managed using standard methods.

Environmental Effects

5.3.30 For the tributaries of West Brook, with the implementation of mitigation measures, it is considered that the construction works would have a temporary and short term slight adverse (not significant) effect (including the water quality, dilution and removal of waste products).

5.3.31 It is also not anticipated that there will be any significant effects in relation to groundwater flooding in proximity to this borrow pit.

Soils and agriculture

Baseline Conditions

5.3.32 This borrow pit is located on ALC Grade 2 land classed as 'Oadby Member – Diamicton' and 'West Walton Formation, Ampthill Clay Formation' and 'Kimmeridge Clay Formation (undifferentiated)' in terms of soils and geology respectively.

Mitigation Measures

5.3.33 To demonstrate material geochemical/geotechnical acceptability, site-won earthworks materials (including materials from borrow pits) will be subject to a suite of chemical laboratory analysis appropriate to the ground conditions at the site.

5.3.34 Best practice mitigation measures will be implemented by the Principal Contractor to reduce the impacts and effects that construction of the Scheme is likely to have on affected soil resources. These measures are presented within the Soil Handling and Management Plan contained in the First Iteration EMP **[APP-238]** and relate to the testing, stripping, storage, and reuse of high quality agricultural soils.

Environmental Effects

5.3.35 The significance of the effects on groundwater level, flow, quality and groundwater receptors, such as licensed groundwater sources, as a result of dewatering at borrow pits are considered to be no worse than slight adverse, which is not significant due to their shallow depth in relation to the water table, the limited groundwater potential of the Till and their proposed management using standards methods.

Amenity

Baseline Conditions

5.3.36 The nearest human receptors include the Iway Inn Hotel approximately 20m to the west, and an isolated farm building (non-residential) approximately 150m to the east. There are also a number of businesses on the existing Caxton Gibbet roundabout itself, including a McDonald's, a Costa Coffee shop and takeaway food businesses, though commercial receptors such as these are not normally identified as potentially significant with regard to noise impacts. Common Farm Cottages are located approximately 400m to the east of this borrow pit.

5.3.37 There is a footpath/cycleway (PRoW 73/17) approximately 100m to the south of this borrow pit. PRoW 73/17 is adjacent to the existing Caxton Gibbet roundabout. It commences from the eastern side of the northern arm of the A1198 and runs alongside, but fully segregated from, the northern verge of the existing A428 dual carriageway.

Mitigation Measures

5.3.38 Mitigation measures for air quality and the fugitive emissions of dust are set out in Annex A: Air quality management plan of the First Iteration EMP. This includes measures such as:

a. Covering stockpiled materials on site.

b. Application of dust suppression techniques.

c. Erect solid screens or barriers around particularly dusty activities or the site boundary that are at least as high as any stockpiles on site for high risk sites.

d. Sheeting of vehicles to prevent the escape of materials.

e. Use of dust sweepers and wheel washing.

f. Liaison with local residents at a higher risk of impact.

5.3.39 Air quality monitoring will be required at the Iway Inn Hotel due to the proximity of the borrow pits in addition to the construction work at Caxton Gibbet junction.

5.3.40 Mitigation measures for Noise and Vibration are set out in Annex B: Noise and Vibration Management Plan of the First Iteration EMP. These include measures such as:

a. All ancillary plant such as generators, compressors and pumps will be positioned so as to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures will be provided, where appropriate.

b. Working methods will be developed specific to the area and will consider use of equipment and methods of operations to minimise noise.

c. All plant and machinery in intermittent use will be shut down in intervening periods between work or throttled down to a minimum.

d. Proper use of plant with respect to minimising noise emissions with regular maintenance will be undertaken. All vehicles and mechanical plant used for the purpose of the works will be fitted with exhaust silencers and be maintained in good working order.

e. Minimising the drop height of materials into hoppers, lorries, or other plant.

f. Use of less intrusive alarms on vehicles, for example broadband vehicle reversing warnings.

g. The appropriate selection of plant e.g. rollers.

h. Consideration of low vibration working methods, including non-vibratory compaction plant where possible.

i. Haul routes within the site boundary will be kept in good condition.

j. No start-up or shut down of large vibratory rollers (approximately 13 tonnes) within 50 metres of receptors and medium vibratory rollers (approximately 3.5 tonnes) within 15 metres of receptors.

k. The use of cut-off trenches to disrupt direct vibration movement through the ground.

Environmental Effects

5.3.41 The air quality assessment considers the risk of adverse effects during the construction phase. The construction dust risk potential was defined based upon the scale of the works proposed, and the sensitivity of the receiving environment. All sensitive receptors within 200m of construction activity were identified, and the construction dust risk was classified as 'high' or 'low' based on the distance from construction activities. The scale of the works as a whole for the Scheme was considered to be large with additional measures proposed for locations with receptors within 100m and for borrow pits, given the potential dust generation of these works. Mitigation measures are included within the First Iteration EMP to manage dust emissions such that no significant air quality effects occur at sensitive receptors.

5.3.42 The construction noise assessment reported in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]** was based on reasonable worst-case assumptions, including for works associated with the borrow pits. This included types of construction plant likely to be required for the excavation and backfilling of the borrow pits, such as excavators, tractors, bowsers, water pumps and wagons. These were assumed to operate during the daytime only. The impact of earthworks haul movements to and from the borrow pit along haul roads were also included in the assessment. However, specific mitigation measures, such as localised hoarding, was not included in predicting construction noise impacts.

5.3.43 The assessment reported in the Environmental Statement was based on estimates of monthly average construction noise levels for a selection of 45 potentially sensitive receptors along the Scheme. The closest selected receptor to Site 4 is the Iway Inn which consists of two buildings a minimum of approximately 20m west of Site 4 (receptor Reference R40A (south west façade of western building) and R40B (south façade of eastern building) respectively in Chapter 11, Noise and Vibration of the Environmental Statement **[APP-080]**). The assessment concluded that significant daytime construction noise effects were likely to occur at R40B for a total of eight months (no significant daytime adverse effects was identified at R40A). However, the sources of these significant effects at R40B are not directly related to the excavation or refilling of the borrow pits. The main contributions to this potential significant adverse noise effect were identified as the earthworks fill for Caxton Gibbet flyover embankment, earthworks fill for Caxton Gibbet junction eastbound onslip, and piling activities associated with Caxton Gibbet bridge construction. During the eight months in which a significant daytime effect was identified i.e. when the daytime SOAEL was exceeded, the predicted contribution from the borrow pit activities at Site 3 was approximately 15 dB below the SOAEL at R40B. Works at

both borrow pits in this location (sites 3 and 4) are ongoing at the same time, however, the combined noise level due to both sites is still low and not a contributor to the significant daytime effect at R40B.

5.3.44 However, the choice of receptors, and the choice of façade at each receptor reported in the Environmental Statement, was based on proximity to the construction works as a whole not the borrow pits specifically, as these are just one aspect of the large range of construction activities assessed. Therefore, given the interest in the borrow pits expressed by some of the Local Authorities, an additional assessment has been carried out to predict construction noise levels from the excavation and backfilling of the borrow pits at the closest façade of the closest receptor to each of the borrow pits. For Site 4, this is the east façade of the eastern building at the Iway Inn (receptor R40B is located on the south façade facing the main area of construction works). At this location on the east façade, the predicted construction noise level due to the excavation works at Site 4 is 55 dB L_{Aeq}. This is considerably below the lowest level at which a potentially significant adverse effect due to construction works could be identified of 65 dB $L_{Aeq,}$ based on the methodology set out in DMRB. Therefore, the borrow pit works at Site 4 are not considered to be a potential source of significant adverse construction noise effects at the closest receptors.

5.4 Excavation methodology

5.4.1 The proposed excavation of the borrow pit will have an average depth of 2m from existing levels in order to generate the required volume of material. The estimated volumes of materials to be excavated from the site are as follows:

a. Topsoil – 78,500m^3
b. Subsoil – 146,000m^3
c. Earthworks Fill – 220,000m^3
d. Total – 444,500m^3

5.4.2 The excavation methodology of the site is similar to the other borrow pits in its logistics and with the use of bunds and drainage provisions.

5.5 Restoration

5.5.1 The restoration of this borrow pit will not be reinstated to the original ground level as agreed through engagement with the landowner. The site is proposed to be restored to a condition to enable agricultural use with 1m of sub-soil and top-soil reinstated (excavated material which is not suitable for construction/engineering purposes will not be placed in this borrow pit). This will result in the finish ground levels being approximately 1m below the original ground levels.

6 References

Ref 1-1 Design Manual for Roads and Bridges. Highways England (2019 – 2021). http://www.standardsforhighways.co.uk/ha/standards/dmrb/index.htm

Ref 1-2 Advice Note Six: Preparation and submission of application documents (version 9). Planning Inspectorate (2020). https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-six-preparation-and-submission-of-application-documents/

Ref 1-3 Minerals and Waste Local Plan: Strategic Sites and Policies. Bedford Borough, Central Bedfordshire and Luton Borough Councils (2014). https://www.centralbedfordshire.gov.uk/migrated_images/minerals-waste_tcm3-2120.pdf

Ref 1-4 Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021) https://www.cambridgeshire.gov.uk/business/planning-and-development/planning-policy/adopted-minerals-and-waste-plan

Ref 1-5 BS3998:2010 Tree work – Recommendations. British Standards Institution (2010).

Ref 1-6 Control of Pollution Act 1974. HMSO (1974). https://www.legislation.gov.uk/ukpga/1974/40

Ref 1-7 Environmental Protection Act 1990. HMSO (1990). https://www.legislation.gov.uk/ukpga/1990/43/contents

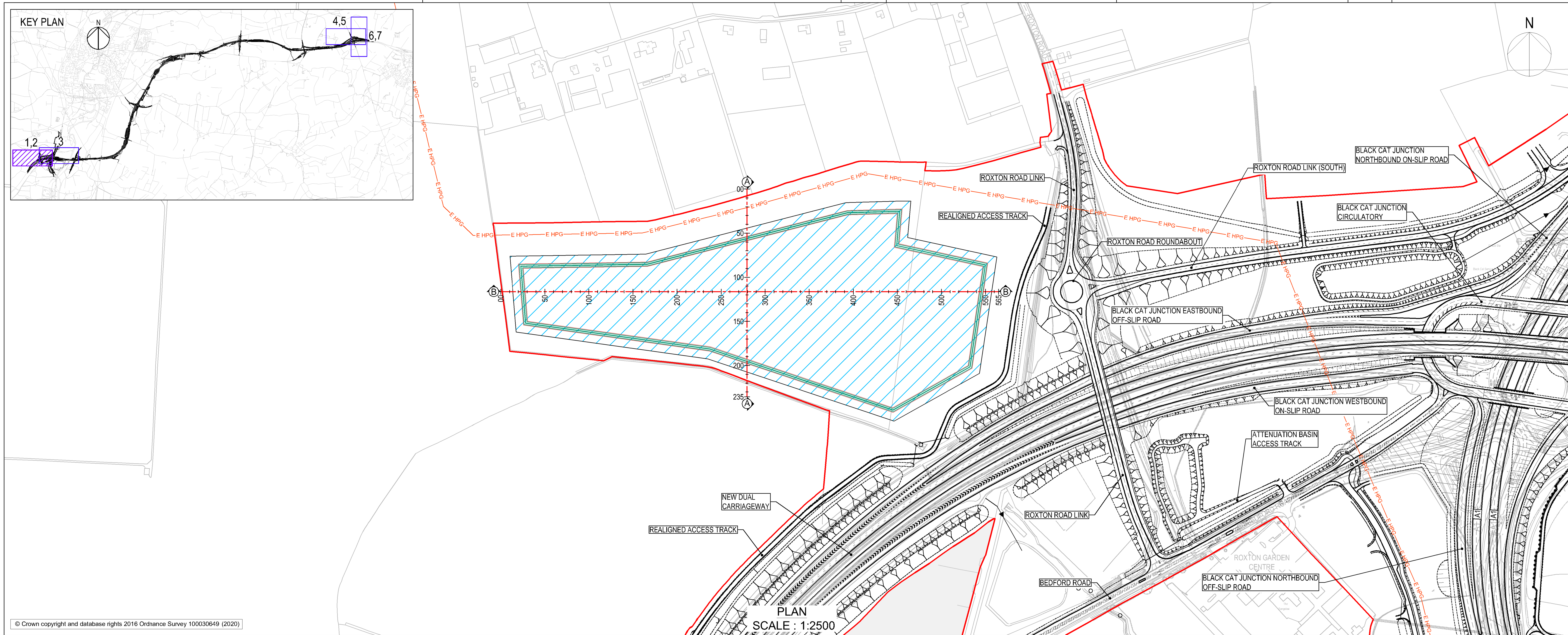
Ref 1-8 Wildlife and Countryside Act 1981. HMSO (1981). https://www.legislation.gov.uk/ukpga/1981/69

Appendices - Borrow Pit Cross Sections

Engineering sections:

- HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3531 P01
- HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3532 P01
- HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3533 P01
- HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3534 P01
- HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3535 P01
- HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3536 P01
- HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-DC-3537 P01

TP398 to TP402, BH275C, WS208, TP211, TP334, TP365, TP319, TP408 to TP410, TP388 to TP392, TP411 to TP415



PLAN
SCALE : 1:2500

NOTES

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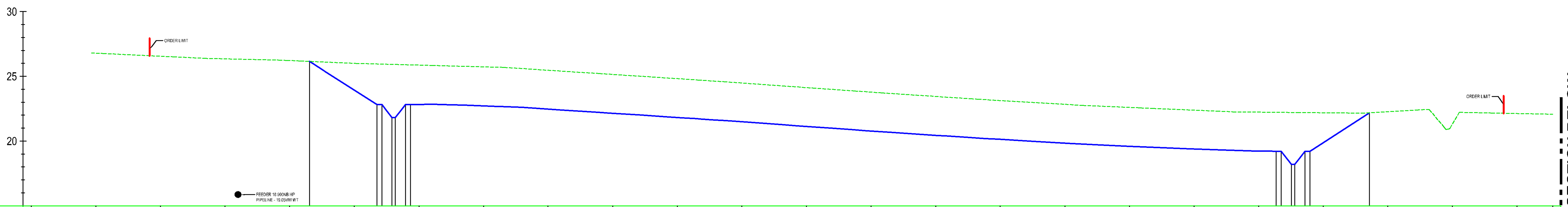
7. THE BORROW PIT WILL BE REINSTATED TO EXISTING GROUND LEVEL.

KEY

- ORDER LIMITS
- LAND NOT INCLUDED WITHIN THE ORDER LIMIT
- ▨ BORROW PIT AREA
- PROPOSED TEMPORARY LEVEL
- TOPOGRAPHICAL SURVEY (EXISTING GROUND)
- DRAINAGE DITCH
- BERM
- E HPG — FEEDER 18 900NB HP PIPELINE - 19.05MM WT
- A 00 A — CHAINAGE AND SECTION VIEW
- BRIDGE
- CULVERT

CONTINUATION - REFER TO SECTION ABOVE



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00.00			
10.00	26.79		
20.00	26.55		
30.00	26.35		
40.00	26.22		
		26.154	0.000
50.00	26.01	23.93	2.07
		22.814	3.142
		21.817	4.107
		22.821	3.066
60.00	25.87	22.83	3.04
70.00	25.73	22.71	3.02
80.00	25.47	22.47	3.00
90.00	25.15	22.15	3.00
100.00	24.82	21.82	3.00
110.00	24.49	21.49	3.00
120.00	24.13	21.13	3.00
130.00	23.78	20.78	3.00
140.00	23.45	20.45	3.00
150.00	23.13	20.13	3.00
160.00	22.84	19.84	3.00
170.00	22.60	19.60	3.00
180.00	22.39	19.39	3.00
190.00	22.23	19.23	3.00
		19.214	3.008
		18.211	3.999
		19.208	2.989
200.00	22.19	19.87	2.32
		22.185	0.002
210.00	22.27		
220.00	21.32		
230.00	22.13		
235.50	22.07		

CONTINUATION - REFER TO SECTION BELOW

SECTION A-A
SCALE : H 1:500 V 1:250

Revision Details	By / Check	Date	Suffix
First Issue	AD / TD	17/06/21	P01

Purpose of issue
FOR INFORMATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
PROPOSED BORROW PIT (CROSS SECTION) SHEET 1

Designed	Drawn	Checked	Approved	Date
	AD	JMW	TD	17/06/21

Internal Project No. 60541541 | Suitability S2
Scale @ A1 AS SHOWN | Zone ZN1

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -LSI -ZN1_SW_Z_ZZ -DR -CH -3531
Location | Type | Role | Number

Rev P01

Plot Date : 17 June 2021 16:23:51
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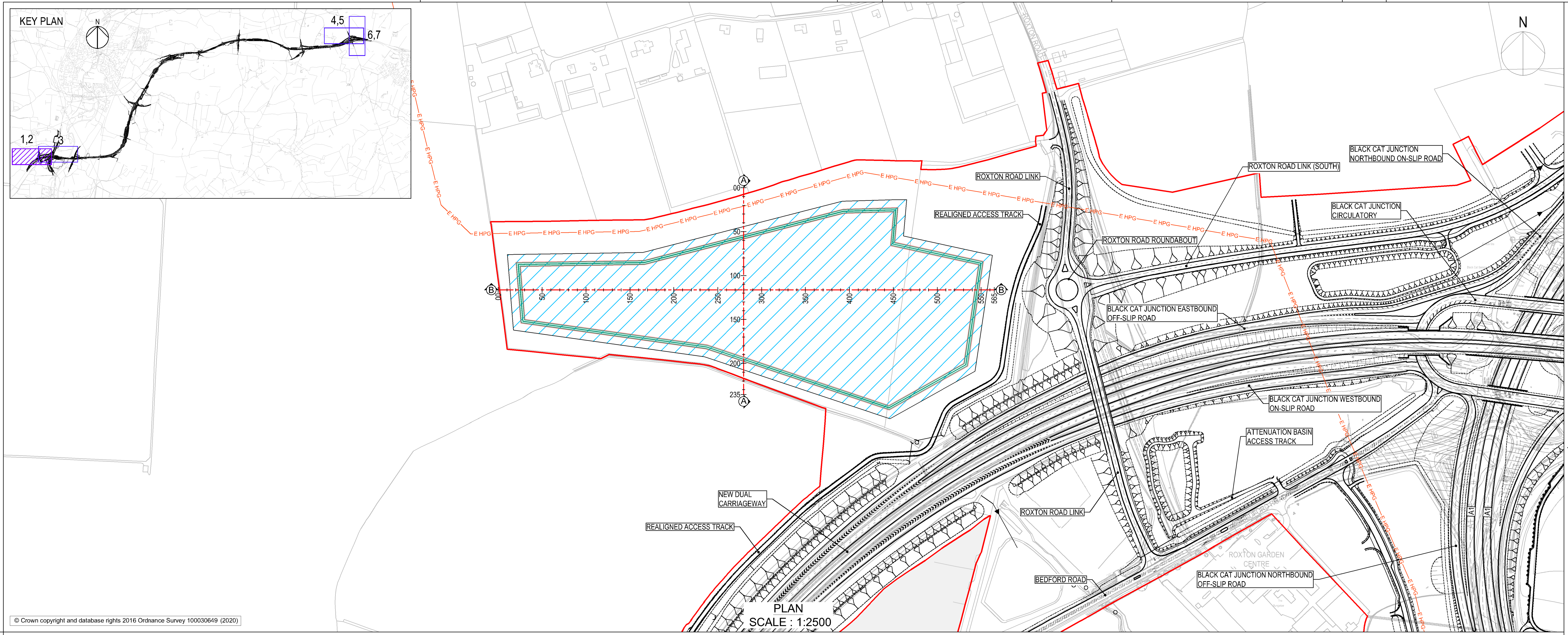

PLAN
SCALE : 1:2500

NOTES

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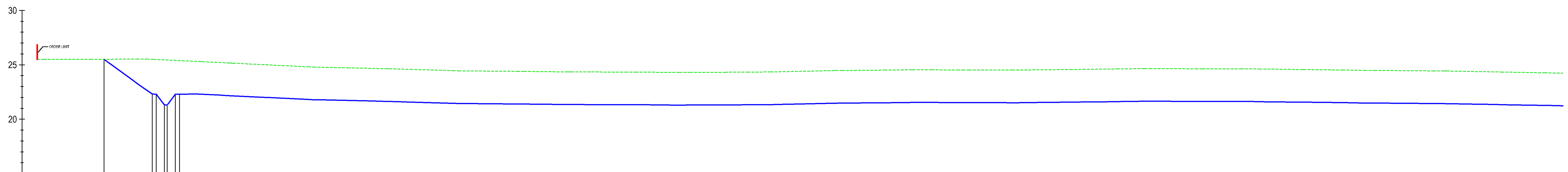
- A 00 A CHAINAGE AND SECTION VIEW
- BRIDGE
- CULVERT



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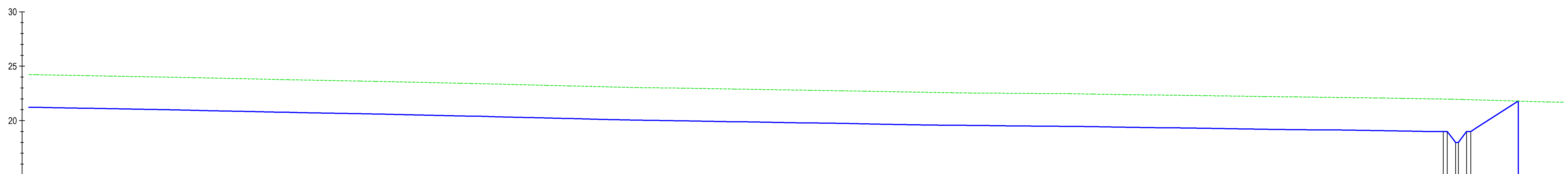
00.00			
10.00	25.50		
		25.508	0.000
20.00	25.53	23.29	2.24
		22.307	3.197
		21.303	4.147
		22.298	3.087
30.00	25.33	22.31	3.02
40.00	25.09	22.09	3.00
50.00	24.85	21.85	3.00
60.00	24.71	21.71	3.00
70.00	24.58	21.58	3.00
80.00	24.44	21.44	3.00
90.00	24.40	21.40	3.00
100.00	24.35	21.35	3.00
110.00	24.33	21.33	3.00
120.00	24.30	21.30	3.00
130.00	24.32	21.32	3.00
140.00	24.38	21.38	3.00
150.00	24.48	21.47	3.00
160.00	24.53	21.53	3.00
170.00	24.53	21.53	3.00
180.00	24.52	21.52	3.00
190.00	24.56	21.56	3.00
200.00	24.62	21.62	3.00
210.00	24.64	21.64	3.00
220.00	24.63	21.63	3.00
230.00	24.59	21.59	3.00
240.00	24.53	21.53	3.00
250.00	24.47	21.47	3.00
260.00	24.44	21.44	3.00
270.00	24.35	21.35	3.00
280.00	24.25	21.25	3.00
282.50	24.23	21.23	3.00

CONTINUATION - REFER TO SECTION BELOW

CONTINUATION - REFER TO SECTION ABOVE



CHAINAGE	EXISTING LEVELS	PROPOSED TEMPORARY LEVELS	LEVEL DIFFERENCE
282.50	24.23	21.23	3.00
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300.00	24.07	21.07	3.00
310.00	23.98	20.98	3.00
320.00	23.87	20.87	3.00
330.00	23.76	20.76	3.00
340.00	23.67	20.67	3.00
350.00	23.57	20.57	3.00
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370.00	23.34	20.34	3.00
380.00	23.22	20.22	3.00
390.00	23.09	20.09	3.00
400.00	23.00	20.00	3.00
410.00	22.92	19.92	3.00
420.00	22.84	19.84	3.00
430.00	22.76	19.76	2.99
440.00	22.67	19.67	3.00
450.00	22.58	19.59	2.99
460.00	22.52	19.54	2.98
470.00	22.49	19.49	3.00
480.00	22.42	19.42	3.00
490.00	22.35	19.35	3.00
500.00	22.29	19.29	3.00
510.00	22.21	19.21	3.00
520.00	22.15	19.15	3.00
530.00	22.08	19.09	2.99
540.00	22.01	19.01	3.00
		18.990	2.992
		17.993	3.967
		18.995	2.926
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		21.795	0.000
560.00	21.74		
564.87	21.69		

CONTINUATION - REFER TO DWG NO:3533

SECTION B-B
SCALE : H 1:500 V 1:250

Revision Details	By / Check	Date	Suffix
First Issue	AD / TD	17/06/21	P01

Purpose of issue
FOR INFORMATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
PROPOSED BORROW PIT (CROSS SECTION) SHEET 2

Designed	Drawn	Checked	Approved	Date
	AD	JMW	TD	17/06/21

Internal Project No.	Suitability
60541541	S2
Scale @ A1	Zone
AS SHOWN	ZN1

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -LSI -
ZN1_SW_Z_ZZ -DR -CH -3532
Location | Type | Role | Number

Rev
P01

Plot Date : 17 June 2021 16:25:37
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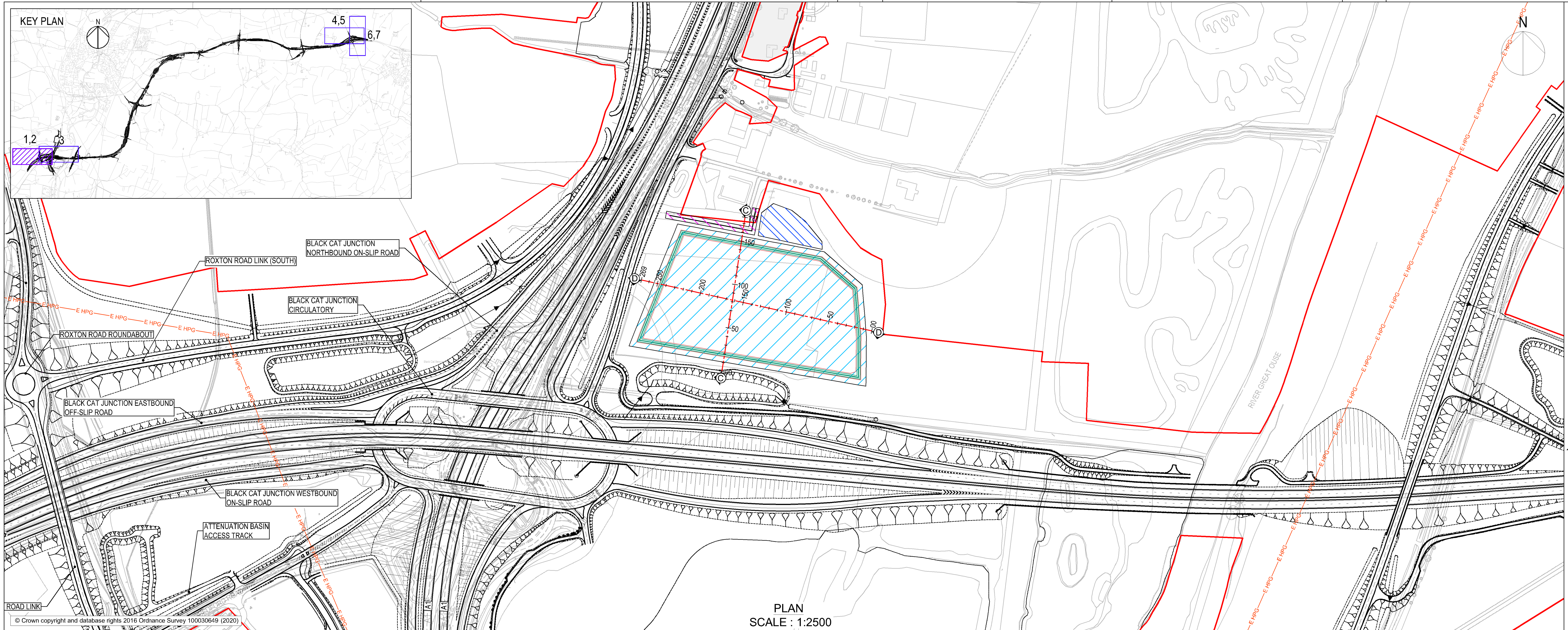

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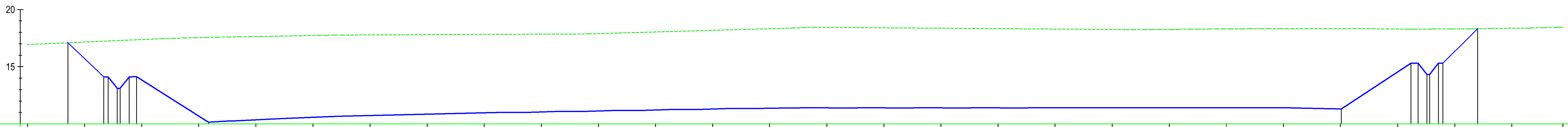

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PROPOSED TEMPORARY LEVELS	17.092 15.71 14.107 13.113 14.120 13.84 10.68 10.150 10.36 10.57 10.73 10.85 10.97 11.05 11.13 11.22 11.31 11.38 11.40 11.41 11.40 11.41 11.42 11.42 11.41 11.41 11.40 11.32 14.55 15.315 14.315 15.315 16.35 18.314
LEVEL DIFFERENCE	0.000 1.45 3.123 4.169 3.211 3.53 6.86 7.407 7.27 7.16 7.05 6.96 6.86 6.80 6.75 6.81 6.87 6.95 7.04 6.99 6.96 6.92 6.87 6.83 6.85 6.90 6.92 7.013 3.74 2.966 3.973 2.980 1.95 0.000
CHAINAGE	00.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 268.96

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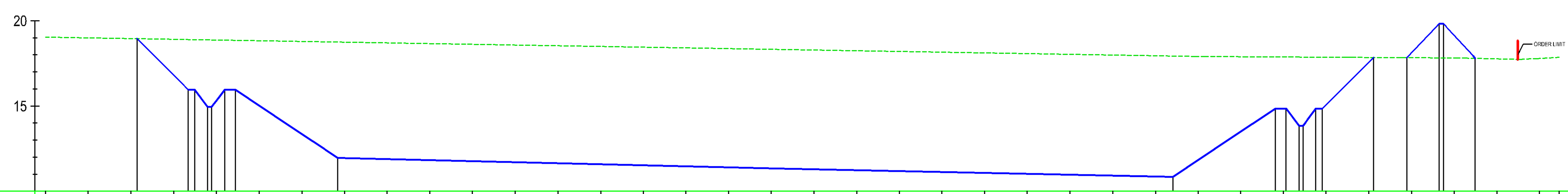
SECTION D-D
SCALE : H 1:500 V 1:250



CONTINUATION - REFER TO SECTION ABOVE

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PROPOSED TEMPORARY LEVELS	18.950 16.81 15.951 14.949 15.949 15.02 13.35 11.94 11.88 11.82 11.76 11.70 11.65 11.59 11.53 11.47 11.41 11.35 11.30 11.24 11.19 11.14 11.08 11.03 10.97 10.92 10.86 10.842 11.82 13.49 14.844 13.845 14.845 17.846 17.844 19.826 17.801
LEVEL DIFFERENCE	0.000 2.11 2.949 3.931 2.904 3.81 5.43 6.804 6.82 6.84 6.86 6.87 6.89 6.91 6.92 6.94 6.96 6.97 6.99 7.00 7.01 7.02 7.03 7.05 7.06 7.07 7.08 7.089 6.08 4.40 3.035 4.026 3.018 0.001 -0.008 -2.000 -1.31 -0.005
CHAINAGE	00.00 05.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00 50.00 55.00 60.00 65.00 70.00 75.00 80.00 85.00 90.00 95.00 100.00 105.00 110.00 115.00 120.00 125.00 130.00 135.00 140.00 145.00 150.00 155.00 160.00 165.00 170.00 175.00 177.29

CONTINUATION - REFER TO DWG NO:3534

SECTION C-C
SCALE : H 1:500 V 1:250

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KEY

🟥	ORDER LIMITS
▨	LAND NOT INCLUDED WITHIN THE ORDER LIMIT
▨	BORROW PIT AREA
—	PROPOSED TEMPORARY LEVEL
- - -	TOPOGRAPHICAL SURVEY (EXISTING GROUND)
—	DRAINAGE DITCH
—	BERM
—E HPG—	FEEDER 18 900NB HP PIPELINE - 19.05MM WT
Ⓐ—00—Ⓐ	CHAINAGE AND SECTION VIEW
=	BRIDGE
)—(	CULVERT

	By / Check	Date	Suffix
First Issue	AD / TD	17/06/21	P01
Revision Details	By / Check	Date	Suffix

Purpose of issue
FOR INFORMATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
PROPOSED BORROW PIT (CROSS SECTION) SHEET 3

Designed	Drawn	Checked	Approved	Date
	AD	JMW	TD	17/06/21

Internal Project No. 60541541	Suitability S2
Scale @ A1 AS SHOWN	Zone ZN1

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -LSI -
ZN1_SW_Z_ZZ -DR -CH -3533
Location | Type | Role | Number

Rev
P01

Plot Date : 17 June 2021 16:27:41
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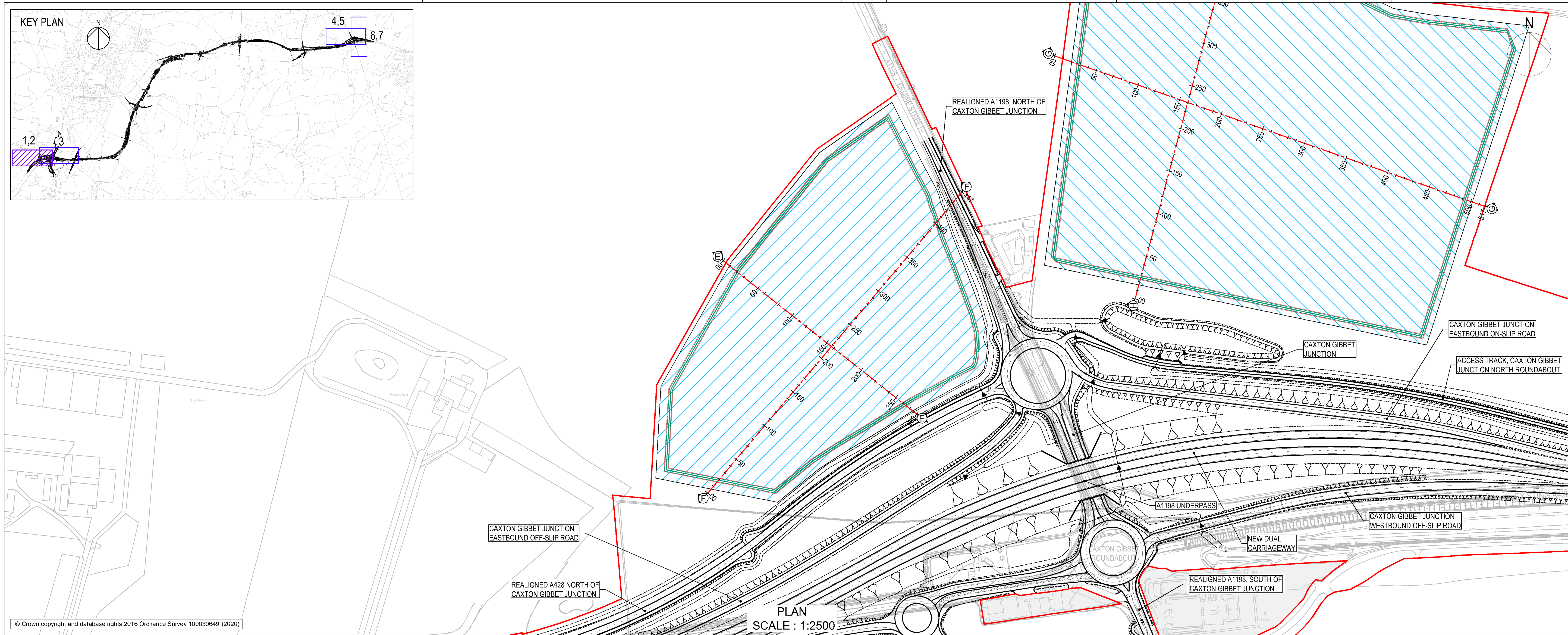

PLAN
SCALE : 1:2500

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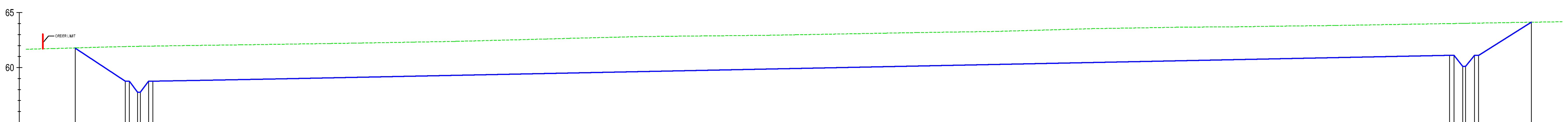
—	BERM
E HPG	FEEDER 18 900NB HP PIPELINE - 19.05MM WT
A 00 A	CHAINAGE AND SECTION VIEW
—	BRIDGE
)-(	CULVERT

CONTINUATION - REFER TO DWG NO:3533



EXISTING LEVELS	61.67	61.81		61.93		62.01	62.08	62.15	62.23	62.31	62.41	62.54	62.67	62.80	62.86	62.91	62.98
PROPOSED TEMPORARY LEVELS		61.757	58.766	57.768	58.770	58.82	58.91	59.01	59.11	59.21	59.31	59.41	59.51	59.61	59.71	59.81	59.91
LEVEL DIFFERENCE		0.036	3.151	3.94	3.188	3.19	3.17	3.14	3.12	3.10	3.10	3.13	3.16	3.18	3.15	3.10	3.07
CHAINAGE	00.00	10.00		20.00		30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00	130.00	140.00

EXISTING LEVELS	63.07	63.16	63.24	63.34	63.48	63.59	63.67	63.71	63.78	63.84	63.93	64.01			64.09		64.17
PROPOSED TEMPORARY LEVELS	60.02	60.12	60.22	60.32	60.42	60.52	60.62	60.72	60.82	60.92	61.02	61.116	60.118	61.120	62.75	64.124	
LEVEL DIFFERENCE	3.06	3.05	3.02	3.02	3.06	3.07	3.05	2.99	2.96	2.92	2.91	2.890	3.908	2.930	1.35	0.004	
CHAINAGE	150.00	160.00	170.00	180.00	190.00	200.00	210.00	220.00	230.00	240.00	250.00	260.00			270.00		280.00

SECTION E-E
SCALE : H 1:500 V 1:250

Revision Details	By / Check	Date	Suffix
First Issue	AD / TD	17/06/21	P01

Purpose of issue
FOR INFORMATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
PROPOSED BORROW PIT (CROSS SECTION) SHEET 4

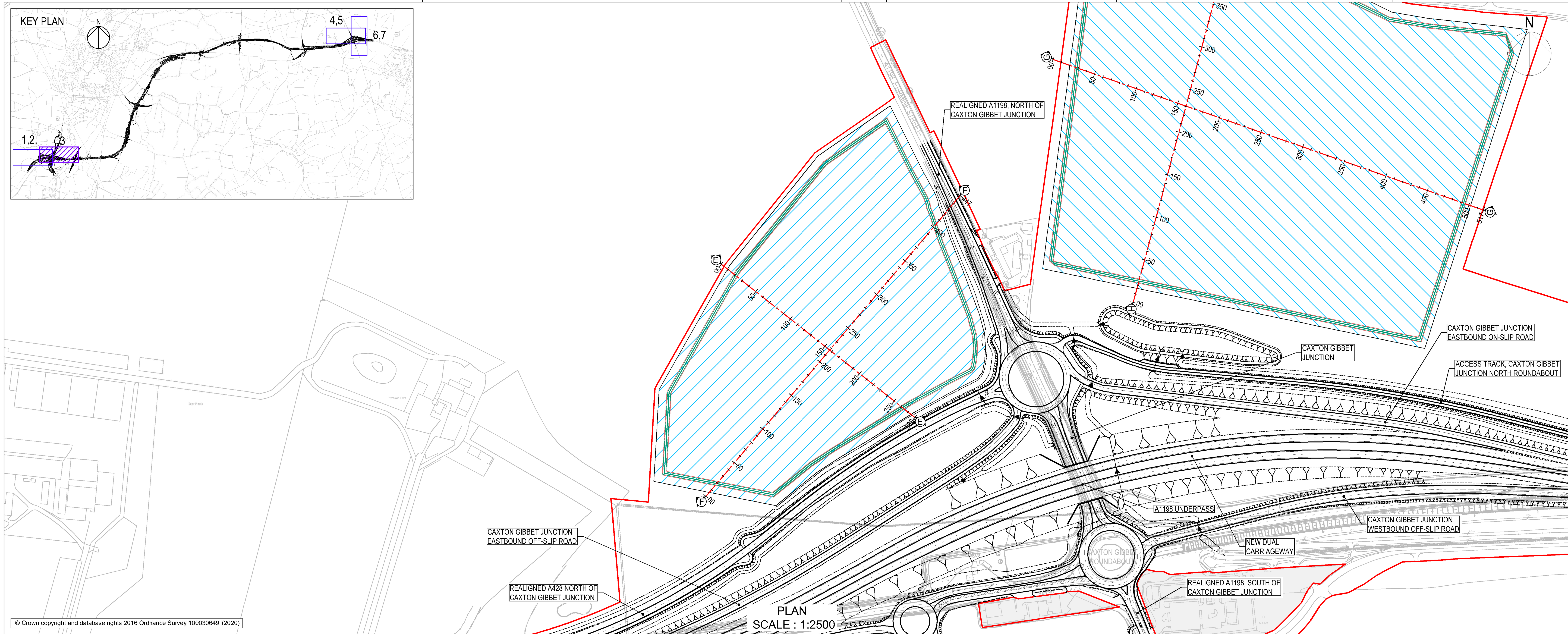
Designed	Drawn	Checked	Approved	Date
	AD	JMW	TD	17/06/21

Internal Project No. 60541541	Suitability S2
Scale @ A1 AS SHOWN	Zone ZN1

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -LSI -
ZN1_SW_Z_ZZ -DR -CH -3534
Location | Type | Role | Number

Rev
P01

Plot Date : 17 June 2021 16:34:28
File Name C:\PWWORKING\AECOM_EU\JOE.MCGILLEY\D0501081\HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-CH-3534

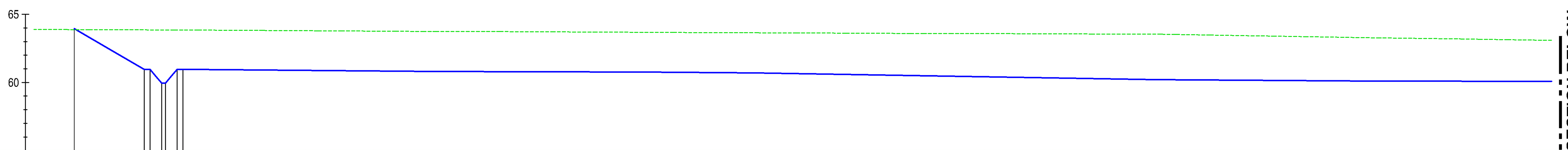


NOTES

1. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
2. ALL DIMENSIONS, CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
3. THE DESIGN SHOWN ON THESE SECTION DRAWINGS IS ILLUSTRATIVE AND WILL BE SUBJECT TO DETAILED DESIGN DEVELOPMENT. ANY CHANGES WILL BE LIMITED TO BEING WITHIN THE ORDER LIMITS AND ANY OTHER CONSTRAINTS INCLUDED IN THE DEVELOPMENT CONSENT ORDER.
4. THESE SECTION DRAWINGS SHOULD BE READ IN CONJUNCTION WITH THE BORROW PIT EXCAVATION AND RESTORATION TECHNICAL NOTE.
5. IN ORDER TO EXTRACT THE REQUIRED MATERIAL FROM THE AREA, THE SITE WILL USE AREAS FOR SOIL STORAGE AND EXCAVATION IN A ROTATIONAL METHOD. THEREFORE THE FULL OPEN BORROW PIT SCENARIO SHOWN IN THE DRAWING SECTIONS IS UNLIKELY TO OCCUR AT ANY ONE TIME.
6. THE TEMPORARY LEVELS SHOWN ARE THE EXPECTED DEPTHS OF THE BORROW PIT DURING CONSTRUCTION AND MAY CHANGE SUBJECT TO DETAILED ANALYSIS AND ANY LIMITS OF DEVIATION WITHIN THE DEVELOPMENT CONSENT ORDER.
7. THE BORROW PIT WILL BE REINSTATED TO EXISTING GROUND LEVEL.

KEY

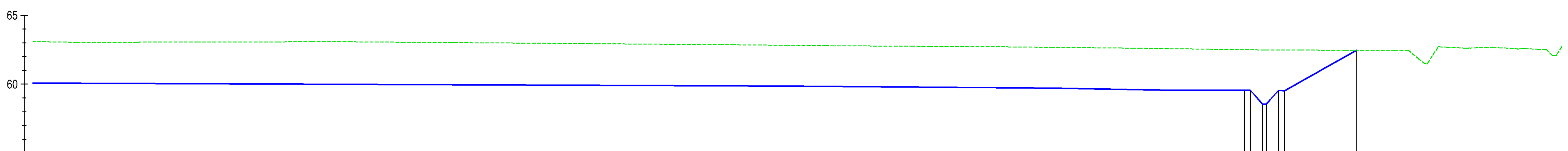
- ORDER LIMITS
- LAND NOT INCLUDED WITHIN THE ORDER LIMIT
- BORROW PIT AREA
- BUND
- E HPG — FEEDER 18 900NB HP PIPELINE - 19.05MM WT
- PROPOSED TEMPORARY LEVEL
- TOPOGRAPHICAL SURVEY (EXISTING GROUND)
- DRAINAGE DITCH
- BERM
- A — 00 — A CHAINAGE AND SECTION VIEW
- BRIDGE
- CULVERT



CHAINAGE	EXISTING LEVELS	PROPOSED TEMPORARY LEVELS	LEVEL DIFFERENCE
00.00	63.89		
		63.949	-0.073
10.00	63.87	62.77	1.10
		60.955	2.902
		59.959	3.893
20.00	63.85		
		60.959	2.888
30.00	63.83	60.93	2.89
40.00	63.80	60.89	2.91
50.00	63.77	60.85	2.92
60.00	63.74	60.81	2.93
70.00	63.73	60.79	2.93
80.00	63.70	60.78	2.93
90.00	63.68	60.76	2.92
100.00	63.66	60.73	2.93
110.00	63.64	60.67	2.96
120.00	63.62	60.59	3.03
130.00	63.59	60.51	3.09
140.00	63.58	60.42	3.16
150.00	63.57	60.34	3.23
160.00	63.55	60.25	3.29
170.00	63.50	60.20	3.31
180.00	63.42	60.16	3.25
190.00	63.34	60.13	3.20
200.00	63.26	60.11	3.15
210.00	63.19	60.09	3.10
220.00	63.11	60.08	3.03
223.50	63.09	60.08	3.01

CONTINUATION - REFER TO SECTION BELOW

CONTINUATION - REFER TO SECTION ABOVE



CHAINAGE	EXISTING LEVELS	PROPOSED TEMPORARY LEVELS	LEVEL DIFFERENCE
223.50	63.09	60.08	3.01
230.00	63.04	60.07	2.97
240.00	63.05	60.05	3.00
250.00	63.06	60.03	3.03
260.00	63.07	60.01	3.06
270.00	63.07	59.99	3.08
280.00	63.03	59.97	3.06
290.00	62.99	59.95	3.05
300.00	62.96	59.93	3.03
310.00	62.92	59.91	3.01
320.00	62.88	59.89	2.99
330.00	62.84	59.87	2.96
340.00	62.79	59.84	2.95
350.00	62.75	59.80	2.95
360.00	62.72	59.77	2.96
370.00	62.68	59.73	2.95
380.00	62.63	59.65	2.98
390.00	62.57	59.56	3.00
400.00	62.50	59.568	2.933
		58.550	3.933
		59.526	2.950
410.00	62.47	60.74	1.73
		62.437	0.025
420.00	62.46		
430.00	62.66		
440.00	62.57		
446.81			

SECTION F-F
SCALE : H 1:500 V 1:250

Revision Details	By / Check	Date	Suffix
First Issue	AD / TD	17/06/21	P01

Purpose of issue
FOR INFORMATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
PROPOSED BORROW PIT (CROSS SECTION) SHEET 5

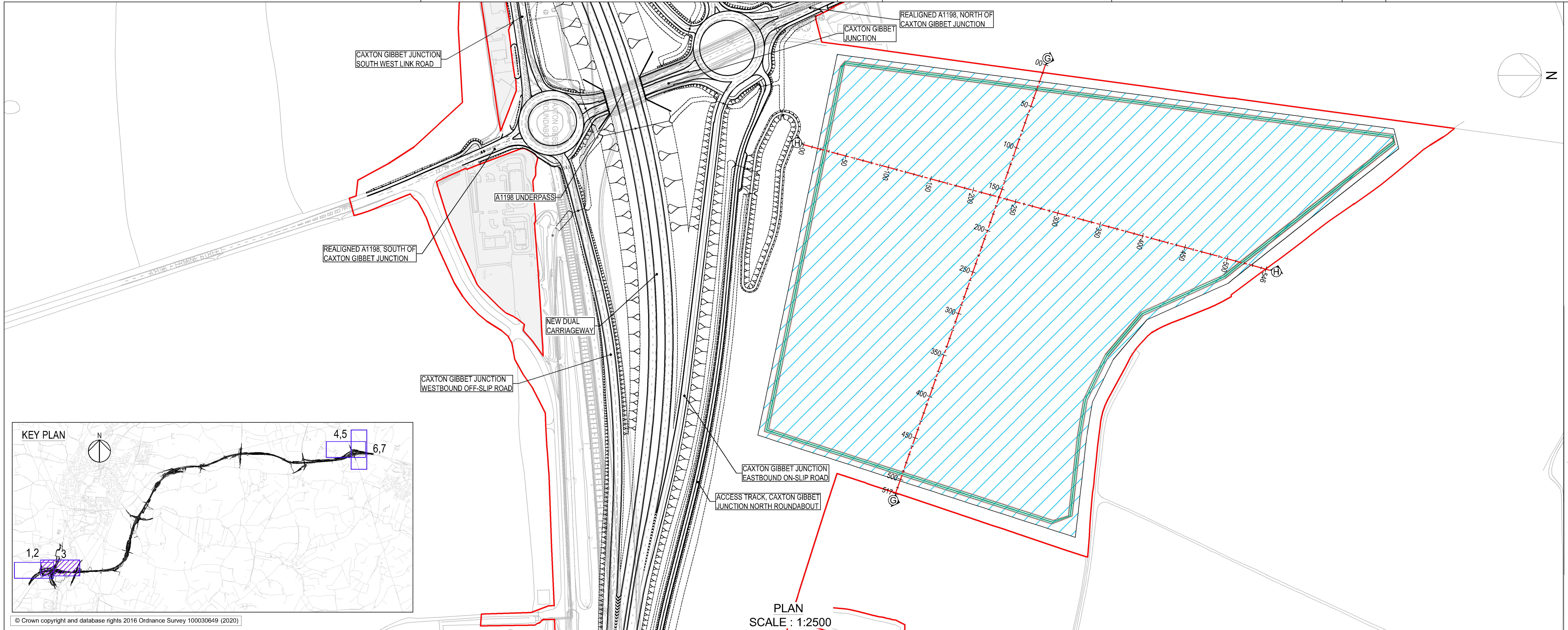
Designed	Drawn	Checked	Approved	Date
	AD	JMW	TD	17/06/21

Internal Project No. 60541541
Suitability S2
Scale @ A1 AS SHOWN
Zone ZN1

Drawing Number
Highways England PIN | Originator | Volume | Location | Type | Role | Number
HE551495 -ACM -LSI -ZN1_SW_Z_ZZ -DR -CH-3535

Rev P01

Plot Date : 17 June 2021 16:33:21
File Name C:\PWWORKING\AECOM_EU\JOE.MCGILLEY\D0501081\HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-CH-3535



PLAN
SCALE : 1:2500

NOTES

1. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
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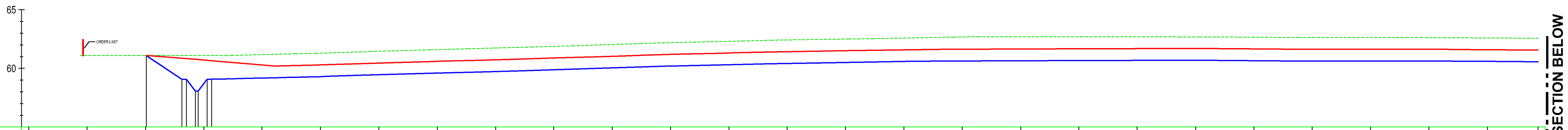
4. THESE SECTION DRAWINGS SHOULD BE READ IN CONJUNCTION WITH THE BORROW PIT EXCAVATION AND RESTORATION TECHNICAL NOTE
5. IN ORDER TO EXTRACT THE REQUIRED MATERIAL FROM THE AREA, THE SITE WILL USE AREAS FOR SOIL STORAGE AND EXCAVATION IN A ROTATIONAL METHOD. THEREFORE THE FULL OPEN BORROW PIT SCENARIO SHOWN IN THE DRAWING SECTIONS IS UNLIKELY TO OCCUR AT ANY ONE TIME.
6. THE TEMPORARY LEVELS ARE THE EXPECTED DEPTH OF THE BORROW PIT DURING CONSTRUCTION WHICH ARE SUBJECT TO CHANGE DURING DETAILED ANALYSIS.
7. THE PROPOSED RESTORED LEVELS OF THE BORROW PITS ARE IN LINE WITH THE EXISTING TOPOGRAPHY OF THE LAND.

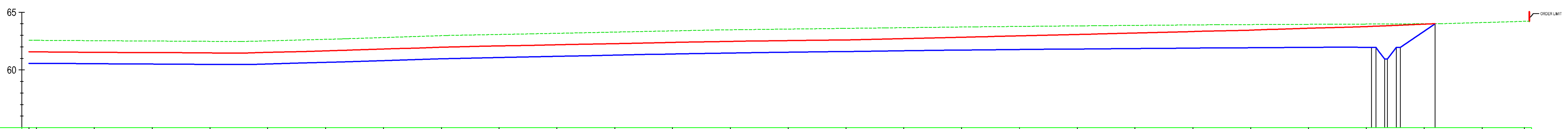
KEY

🟥	ORDER LIMITS
▨	LAND NOT INCLUDED WITHIN THE ORDER LIMIT
▨	BORROW PIT AREA
▨	BUND
E HPG	FEEDER 18 900NB HP PIPELINE - 19.05MM WT
	PROPOSED TEMPORARY LEVEL
	TOPOGRAPHICAL SURVEY (EXISTING GROUND)
	DRAINAGE DITCH
	BERM
A 00 A	CHAINAGE AND SECTION VIEW
	BRIDGE
	CULVERT



CHAINAGE	EXISTING LEVELS	PROPOSED REINSTATEMENT LEVELS	PROPOSED TEMPORARY LEVELS	LEVEL DIFFERENCE
00.00				
10.00	61.09			
20.00	61.09		61.093	0.002
			[illegible]	[illegible]
30.00	61.09	60.71		
40.00	61.17	60.29	59.17	2.00
50.00	61.30	60.30	59.30	2.00
60.00	61.46	60.45	59.45	2.00
70.00	61.60	60.60	59.60	2.00
80.00	61.74	60.74	59.74	2.00
90.00	61.88	60.88	59.88	2.00
100.00	62.04	61.04	60.04	2.00
110.00	62.19	61.19	60.19	2.00
120.00	62.31	61.32	60.32	1.99
130.00	62.43	61.43	60.43	2.00
140.00	62.51	61.51	60.51	2.00
150.00	62.59	61.59	60.59	2.00
160.00	62.68	61.64	60.64	2.04
170.00	62.69	61.66	60.66	2.03
180.00	62.69	61.68	60.68	2.01
190.00	62.69	61.68	60.68	2.01
200.00	62.69	61.69	60.69	2.00
210.00	62.66	61.66	60.66	2.00
220.00	62.63	61.63	60.63	2.00
230.00	62.63	61.63	60.63	2.00
240.00	62.63	61.63	60.63	2.00
250.00	62.60	61.60	60.60	2.00
258.70	62.57	61.57	60.57	2.00

CONTINUATION - REFER TO SECTION BELOW



CHAINAGE	EXISTING LEVELS	PROPOSED REINSTATEMENT LEVELS	PROPOSED TEMPORARY LEVELS	LEVEL DIFFERENCE
258.70	62.57	61.57	60.57	2.00
260.00	62.57	61.57	60.57	2.00
270.00	62.54	61.54	60.54	2.00
280.00	62.51	61.51	60.51	2.00
290.00	62.48	61.48	60.48	2.00
300.00	62.52	61.52	60.52	2.00
310.00	62.65	61.65	60.65	2.00
320.00	62.81	61.81	60.81	2.00
330.00	62.97	61.97	60.97	2.00
340.00	63.07	62.08	61.08	2.00
350.00	63.17	62.18	61.18	2.00
360.00	63.28	62.28	61.28	2.00
370.00	63.38	62.39	61.39	2.00
380.00	63.48	62.47	61.47	2.01
390.00	63.54	62.54	61.54	2.00
400.00	63.60	62.60	61.60	2.00
410.00	63.66	62.71	61.66	2.00
420.00	63.72	62.83	61.72	2.00
430.00	63.77	62.95	61.77	2.00
440.00	63.82	63.07	61.82	2.00
450.00	63.86	63.21	61.86	2.00
460.00	63.90	63.33	61.90	2.00
470.00	63.93	63.45	61.93	2.00
480.00	63.95	63.62	61.95	2.00
490.00	63.98	63.76	[illegible]	[illegible]
			[illegible]	[illegible]
500.00	64.00	63.97	[illegible]	0.64
				0.000
510.00	64.10			
517.33				

CONTINUATION - REFER TO SECTION ABOVE

SECTION G-G
SCALE : H 1:500 V 1:250

Revision Details	By / Check	Date	Suffix
First Issue	AD / TD	17/06/21	P01

Purpose of issue
FOR INFORMATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
PROPOSED BORROW PIT (CROSS SECTION) SHEET 6

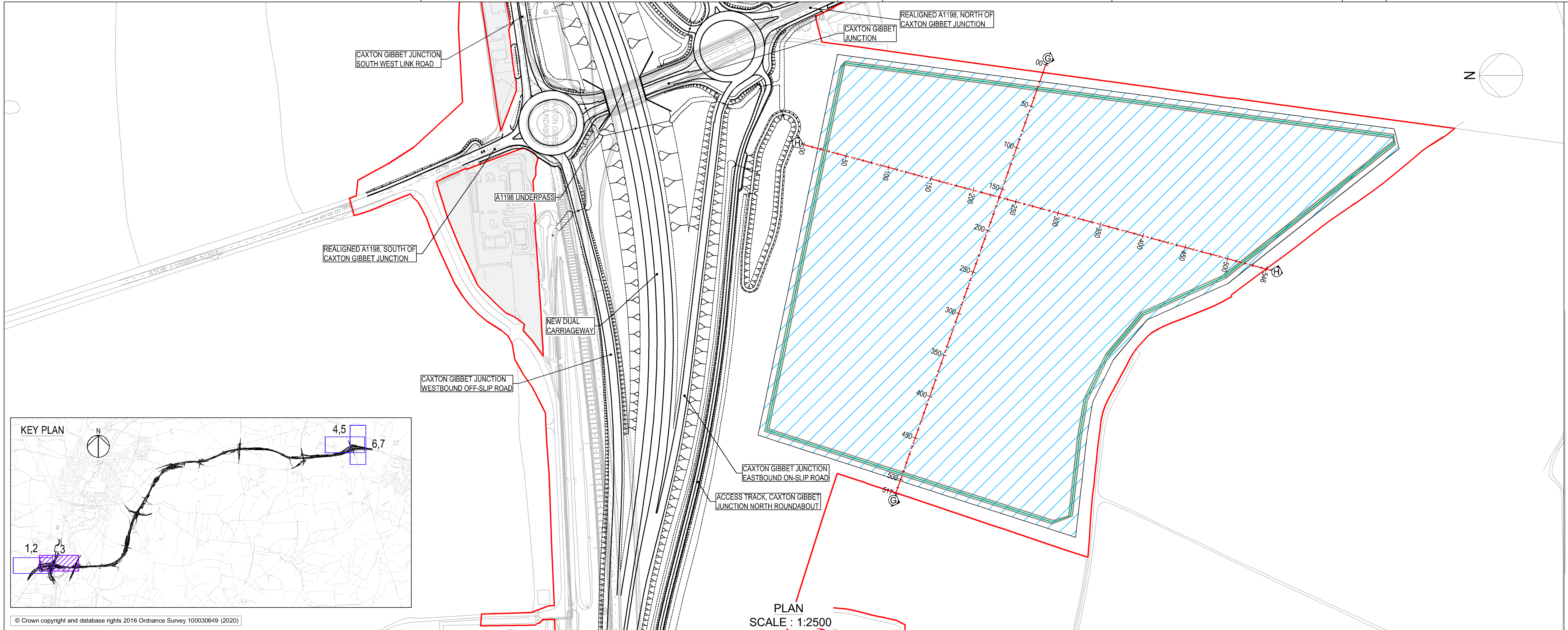
Designed	Drawn	Checked	Approved	Date
	AD	JMW	TD	17/06/21

Internal Project No. 60541541	Suitability S2
Scale @ A1 AS SHOWN	Zone ZN1

Drawing Number
Highways England PIN | Originator | Volume | Location | Type | Role | Number
HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-CH-3536

Rev
P01

Plot Date : 17 June 2021 16:39:53
File Name C:\PWWORKING\AECOM_EU\JOE.MCGILLEY\D0501081\HE551495-ACM-LSI-ZN1_SW_Z_ZZ-DR-CH-3536



PLAN
SCALE : 1:2500

NOTES

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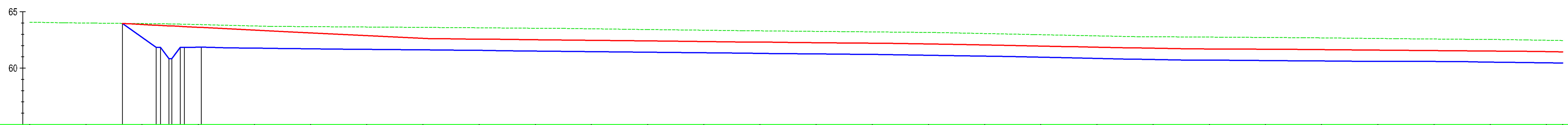
4. THESE SECTION DRAWINGS SHOULD BE READ IN CONJUNCTION WITH THE BORROW PIT EXCAVATION AND RESTORATION TECHNICAL NOTE
5. IN ORDER TO EXTRACT THE REQUIRED MATERIAL FROM THE AREA, THE SITE WILL USE AREAS FOR SOIL STORAGE AND EXCAVATION IN A ROTATIONAL METHOD. THEREFORE THE FULL OPEN BORROW PIT SCENARIO SHOWN IN THE DRAWING SECTIONS IS UNLIKELY TO OCCUR AT ANY ONE TIME.
6. THE TEMPORARY LEVELS ARE THE EXPECTED DEPTH OF THE BORROW PIT DURING CONSTRUCTION WHICH ARE SUBJECT TO CHANGE DURING DETAILED ANALYSIS.
7. THE PROPOSED RESTORED LEVELS OF THE BORROW PITS ARE IN LINE WITH THE EXISTING TOPOGRAPHY OF THE LAND.

KEY

🟥	ORDER LIMITS
▨	LAND NOT INCLUDED WITHIN THE ORDER LIMIT
▨	BORROW PIT AREA
▨	BUND
—E HPG—	FEEDER 18 900NB HP PIPELINE - 19.05MM WT
—	PROPOSED TEMPORARY LEVEL
- - -	TOPOGRAPHICAL SURVEY (EXISTING GROUND)
—	DRAINAGE DITCH
—	BERM
Ⓐ—+ 00—Ⓐ	CHAINAGE AND SECTION VIEW
—	BRIDGE
⟩—⟨	CULVERT

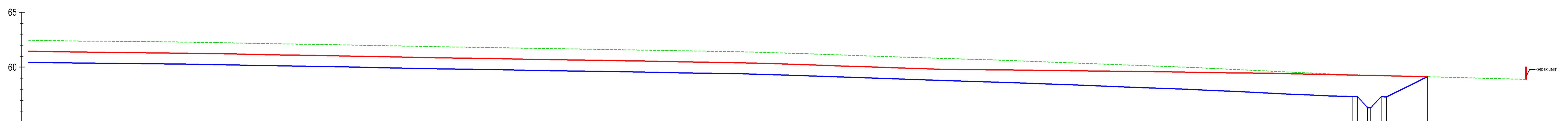


EXISTING LEVELS	64.07	64.00		63.95		63.86	63.74	63.68	63.65	63.61	63.58	63.53	63.49	63.42	63.36
PROPOSED REINSTATEMENT LEVELS				63.87		63.62	63.37	63.12	62.87	62.63	62.57	62.51	62.46	62.42	62.36
PROPOSED TEMPORARY LEVELS			63.963	62.73	61.837 61.837 60.839 60.839 61.837 61.838	61.858 61.85	61.77	61.71	61.66	61.62	61.57	61.52	61.46	61.42	61.36
LEVEL DIFFERENCE			0.003	1.22	2.099 2.095 3.086 3.082 2.068 2.058	2.01 2.000	1.97	1.96	1.98	1.99	2.01	2.02	2.03	2.01	2.00
CHAINAGE	00.00	10.00		20.00		30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00	110.00	120.00

EXISTING LEVELS	63.31	63.26	63.21	63.16	63.07	62.96	62.86	62.78	62.75	62.72	62.68	62.63	62.58	62.55	62.47	62.45
PROPOSED REINSTATEMENT LEVELS	62.31	62.26	62.21	62.15	62.06	61.96	61.86	61.76	61.71	61.67	61.64	61.59	61.55	61.52	61.46	61.44
PROPOSED TEMPORARY LEVELS	61.31	61.26	61.21	61.15	61.06	60.96	60.86	60.76	60.71	60.67	60.64	60.60	60.59	60.53	60.46	60.44
LEVEL DIFFERENCE	2.00	2.00	2.00	2.02	2.01	2.00	2.00	2.01	2.05	2.05	2.04	2.03	1.99	2.01	2.01	2.00
CHAINAGE	130.00	140.00	150.00	160.00	170.00	180.00	190.00	200.00	210.00	220.00	230.00	240.00	250.00	260.00	270.00	272.90

CONTINUATION - REFER TO SECTION BELOW

CONTINUATION - REFER TO SECTION ABOVE



EXISTING LEVELS	62.45	62.39	62.35	62.29	62.21	62.11	62.03	61.93	61.84	61.76	61.68	61.59	61.51	61.42
PROPOSED REINSTATEMENT LEVELS	61.44	61.39	61.34	61.28	61.20	61.11	61.02	60.92	60.84	60.76	60.67	60.59	60.50	60.42
PROPOSED TEMPORARY LEVELS	60.44	60.39	60.34	60.28	60.20	60.11	60.02	59.92	59.84	59.76	59.67	59.59	59.50	59.42
LEVEL DIFFERENCE	2.00	2.00	2.01	2.01	2.01	2.01	2.01	2.01	2.00	2.00	2.01	2.00	2.01	2.00
CHAINAGE	272.90	280.00	290.00	300.00	310.00	320.00	330.00	340.00	350.00	360.00	370.00	380.00	390.00	400.00

EXISTING LEVELS	61.30	61.13	60.95	60.79	60.64	60.45	60.26	60.07	59.86	59.62	59.39		59.24		59.10	58.97	
PROPOSED REINSTATEMENT LEVELS	60.30	60.13	59.96	59.80	59.75	59.69	59.63	59.58	59.50	59.43	59.33		59.23				
PROPOSED TEMPORARY LEVELS	59.30	59.13	58.96	58.79	58.63	58.45	58.26	58.07	57.86	57.62	57.39	57.333 57.328 56.319 56.314 57.303 57.298	57.30	59.128			
LEVEL DIFFERENCE	2.00	2.00	2.00	2.00	2.01	2.00	2.00	2.00	2.00	2.00	2.00	1.974 1.969 2.956 2.955 1.941	1.933	0.002			
CHAINAGE	410.00	420.00	430.00	440.00	450.00	460.00	470.00	480.00	490.00	500.00	510.00		520.00		530.00	540.00	545.70

SECTION H-H
SCALE : H 1:500 V 1:250

First Issue	AD / TD	17/06/21	P01	
Revision Details	By / Check	Date	Suffix	

Purpose of issue
FOR INFORMATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
PROPOSED BORROW PIT (CROSS SECTION) SHEET 7

Designed	Drawn	Checked	Approved	Date
	AD	JMW	TD	17/06/21

Internal Project No. 60541541	Suitability S2
Scale @ A1 AS SHOWN	Zone ZN5

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -LSI -
ZN5_SW_Z_ZZ -DR -CH -3537
Location | Type | Role | Number

Rev
P01

Plot Date : 17 June 2021 16:41:45
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STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP398
	Contract Number: G192219	Date Started: 13/04/2020	Logged By: IL	Checked By:	Status: PRELIM
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 180 Excavator	Date Printed: 17/04/2020
					Scale: 1:50
Weather: Clear	Stability: Unstable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to pit collapse

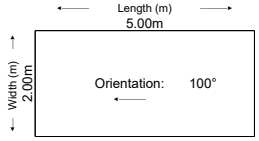
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20 0.20	B2 D1	HV 0.15m, 90/27kPa		0.20		TOPSOIL: Dark brown slightly gravelly clayey SAND with occasional rootlets. Sand is fine to coarse. Gravel is angular to subangular, fine of chert and flint. [Topsoil]		
0.90 0.90	B3 D4	HV 0.90m, 68/40kPa		(1.20)		Firm reddish brown slightly gravelly sandy CLAY with rare rootlets. Sand is fine to coarse. Gravel is subangular, fine of chert and flint. [Glacial Till]		
1.50 1.50	B5 D6	HV 1.50m, 15/6kPa		1.40		Soft to firm light brown mottled light grey slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is subangular, fine of chert. [Glacial Till]		
2.30 2.30	B7 D8	HV 2.30m, 21/12kPa		(1.40)		*Silt becomes soft.*		
				2.80		End of Trial Pit at 2.800m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 2.80m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater encountered at 2.5m
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks
2.50	20	2.30	Medium flow

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP399
	Contract Number: G192219	Date Started: 16/03/2020	Logged By: SI	Checked By: JS	Status: PRELIM
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 24/03/2020
					Scale: 1:50
Weather: Sunny/windy	Stability: Unstable		Services Encountered: None		Hole Termination: Scheduled Depth

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20 (0.30)		TOPSOIL: Dark brown slightly clayey slightly gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of quartzite and flint. [Topsoil]		
0.50	D2	HV 0.50m, 28/6kPa		0.50		Soft to firm brown slightly gravelly sandy CLAY. Sand is fine. Gravel is subrounded to rounded fine to coarse of quartzite, flint and sandstones. [Alluvium]		
0.50 - 1.00	B1			(0.50)				
1.00	D3	HV 1.00m, 40/10kPa		1.00		Soft to firm yellowish brown sandy silty CLAY. Sand is fine. [Alluvium]		
1.00 - 2.00	B2					Soft to firm brown mottled grey sandy silty CLAY. Sand is fine [Alluvium]		
2.00	D4	HV 2.00m, 48/13kPa		(2.00)				
2.00 - 3.00	B3							
3.00	D5			3.00		Dense yellowish brown silty SAND. Sand is fine. [Glacial Till]		
3.00 - 4.00	B4			(1.20)				
4.00	D6			4.20		End of Trial Pit at 4.200m		

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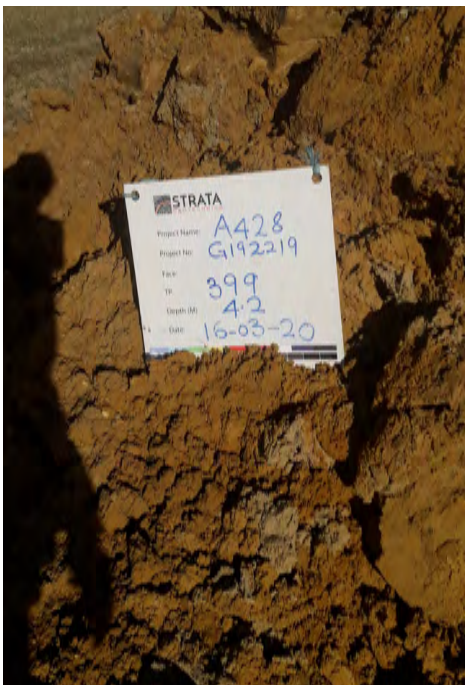
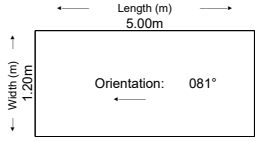
Trial Pit Photographs/Sketches



Dimensions of Trial Pit:

Final Depth: 4.20m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater was encountered at 3.0 during excavation.
Limited hand shear vanes undertaken due to gravelly conditions
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks
3.00	20	3.00	

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP400
	Contract Number: G192219	Date Started: 17/03/2020	Logged By: SI	Checked By: JS	Status: PRELIM
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 24/03/2020
					Scale: 1:50
Weather: Cloudy	Stability: Stable		Services Encountered: None		Hole Termination: Scheduled Depth

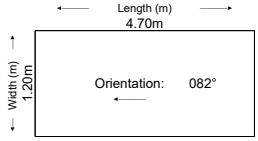
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20		TOPSOIL: Dark brown slightly gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint sandstone and quartzite. [Topsoil]		
0.50	D2							
0.50 - 1.00	B1			(0.80)		Medium dense brown silty gravelly SAND. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of sandstones, quartzite, quartz and flint. [Glacial Till]		
1.00	D3			1.00				
1.00 - 2.00	B2					Soft to firm grey mottled brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel subangular to subrounded fine to coarse of quartzite, flint ,clats of chalk and sandstones [Glacial Till]		
				(1.00)				
2.00	D4	HV 2.00m, 106/24kPa		2.00				
2.00 - 3.00	B3					Firm to stiff dark grey slightly gravelly silty CLAY. Gravel is subrounded to rounded fine coarse of clats of chalk, flint and quartzite. [Glacial Till]		
3.00	D5	HV 3.00m, 66/17kPa		(2.00)				
3.00 - 4.00	B4							
4.00	D6			4.00		End of Trial Pit at 4.000m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 4.00m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater was encountered at 1.8m during excavation.
Limited hand shear vanes undertaken due to gravelly conditions
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks
1.80	20	1.80	Seepage

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP401
	Contract Number: G192219	Date Started: 17/03/2020	Logged By: SI	Checked By: JS	Status: PRELIM — Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 24/03/2020 — Scale: 1:50
Weather: Cloudy/Windy	Stability: Unstable		Services Encountered: None		Hole Termination: Scheduled Depth

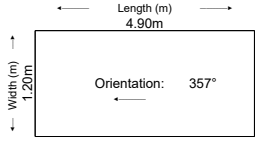
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20 (0.30)		TOPSOIL: Dark brown slightly gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of quartzite, flint and sandstones. [Topsoil]		
0.50	D2			0.50		Brown slightly clayey gravelly SAND. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of quartzite, sandstones, quartz and flint. [Glacial Till]		
0.50 - 1.00	B1							
1.00	D3							
1.00 - 2.00	B2			(1.50)		Medium dense yellowish brown SAND & GRAVEL. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of quartzite. flint and sandstones. [Glacial Till]		
2.00	D4			2.00		Firm to stiff bluish grey slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded to rounded, fine to coarse of quartzite, sandstone, flint and clats of chalk. [Glacial Till]		
2.00 - 3.00	B3							
3.00	D5	HV 3.00m, 110/20kPa		(2.00)				
3.00 - 4.00	B4							
4.00	D6	HV 4.00m, 108/30kPa		4.00		End of Trial Pit at 4.000m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 4.00m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater was at 2.0m encountered during excavation.
Limited hand shear vanes undertaken due to gravelly conditions
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks
2.00	20	2.00	

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP402
	Contract Number: G192219	Date Started: 13/04/2020	Logged By: IL	Checked By:	Status: PRELIM
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: 180 Excavator	Date Printed: 17/04/2020
					Scale: 1:50
Weather: Clear	Stability: Unstable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to pit collapse

Sheet 1 of 1

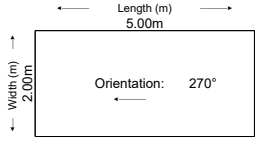
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20 0.20	B2 D1	HV 0.15m, 86/36kPa		0.20		TOPSOIL: Soft dark brown gravelly very sandy CLAY with occasional organic matter. Sand is fine to coarse. Gravel is subangular, fine to coarse of chert and mudstone. [Topsoil]		
0.90 0.90	B4 D3	HV 0.90m, 88/45kPa		(1.40)		Firm dark orangish brown slightly gravelly very sandy SILT. Sand is fine to coarse. Gravel is subangular to rounded, fine of chert and chalk. [River Terrace Deposits]		
2.00 2.00	B6 D5			1.60 (0.70) 2.30		Orangish brown silty gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of chert and chalk. [River Terrace Deposits] End of Trial Pit at 2.300m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 2.30m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater encountered at 2.5m
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks
2.00	20	2.00	Low Flow

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Borehole ID: BH275C
	Contract Number: G192219	Date Started: 10/12/2019	Date Completed: 07/01/2020	Logged: KE	Checked: JS	Status: FINAL
						Sheet 1 of 3
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando 2000/ Dando 2500	Print Date: 28/02/2020	Scale: 1:50

Weather: Overcast and becoming cold. | Rig Crew: David Grey | Termination: Early termination agreed by Investigation Supervisor due to very stiff ground conditions. | SPT Hammer: AR1826/AR267 Energy Ratio: 65%

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
0.20	D1			(0.40)		TOPSOIL: Soft dark brown slightly gravelly sandy CLAY with frequent roots and rootlets (<3mm). Gravel is angular to subrounded, fine to coarse of flint. [Topsoil]		
0.60	D2			0.40 (0.40)		Dark brown and orangish brown clayey gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint [River Terrace Deposits]		
1.20	D3			0.80		Loose dark grey very clayey gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. [River Terrace Deposits]		
1.50 - 1.95	D4	SPT(S) 1.50m, N=9 (1,2/2,2,2,3)						
2.20	D5	SPT(C) 2.50m, N=6 (1,1/0,2,2,2)		(2.50)				
3.20	D6			3.30		Firm to stiff dark grey locally light grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and chalk. [Glacial Till]		
4.20	D7	SPT(C) 3.50m, 50 (25 for 40mm/50 for 100mm)						
4.50 - 4.95	D8	SPT(S) 4.50m, N=43 (5,9/11,12,10,10)						
5.50	D9	SPT(C) 6.00m, 50 (4,7/50 for 120mm)		(3.80)				
7.10	D10			7.10		Stiff to very stiff dark grey slightly sandy silty indistinctly laminated CLAY with frequent shell fragments (<3mm). Sand is fine to coarse. [Oxford Clay]		
9.50 - 9.95	D11	SPT(S) 9.50m, N=47 (3,9/10,10,13,14)						
10.00	D12							

1 2 3 4 5 6 7 8 9 10

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Position undertaken adjacent to BH275 Hand dug inspection pit to 1.2m Ground water strike at 1.7m rising to 1.43m in 20 minutes Backfilled and installed upon completion using slotted and plain 75mm pipe, grout, bentonite and gravel. Response zones from 1m to 4m and 20m to 24m.

Chiselling				Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Borehole ID: BH275C
	Contract Number: G192219	Date Started: 10/12/2019	Date Completed: 07/01/2020	Logged: KE	Checked: JS	Status: FINAL
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando 2000/ Dando 2500	Print Date: 28/02/2020	Scale: 1:50
Weather: Overcast and becoming cold.	Rig Crew: David Grey	Termination: Early termination agreed by Investigation Supervisor due to very stiff ground conditions.		SPT Hammer: AR1826/AR267 Energy Ratio: 65%		

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
						Stiff to very stiff dark grey slightly sandy silty indistinctly laminated CLAY with frequent shell fragments (<3mm). Sand is fine to coarse. [Oxford Clay]		
10.50 - 10.95	UT13	Ublows = 49 Recovery = 89%						
11.00	D14							
12.00 - 12.45	D15	SPT(S) 12.00m, N=44 (5,6/6,10,12,16)						
13.00	D16							
13.50 - 13.95	U17	Ublows = 75 Recovery = 96%						
14.00	D18							
15.00 - 15.45	D19	SPT(S) 15.00m, 50 (4,7/50 for 295mm)		(14.40)				
16.00	D20							
16.50 - 16.95	U21	Ublows = 100 Recovery = 100%						
17.00	D22							
18.00 - 18.38	D23	SPT(S) 18.00m, 50 (2,6/50 for 228mm)						
19.00	D24							
19.50 - 19.95	UF25	Ublows = 100 Recovery = 0%						
20.00	D26							

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Position undertaken adjacent to BH275 Hand dug inspection pit to 1.2m Ground water strike at 1.7m rising to 1.43m in 20 minutes Backfilled and installed upon completion using slotted and plain 75mm pipe, grout, bentonite and gravel. Response zones from 1m to 4m and 20m to 24m.

Chiselling				Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Borehole ID: BH275C
	Contract Number: G192219	Date Started: 10/12/2019	Date Completed: 07/01/2020	Logged: KE	Checked: JS	Status: FINAL
						Sheet 3 of 3
Cable Percussion Borehole Log	Easting:	Northing:	Ground Level:	Plant Used: Dando 2000/ Dando 2500	Print Date: 28/02/2020	Scale: 1:50

Weather: Overcast and becoming cold. | Rig Crew: David Grey | Termination: Early termination agreed by Investigation Supervisor due to very stiff ground conditions. | SPT Hammer: AR1826/AR267 Energy Ratio: 65%

Samples & In Situ Testing			Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/ Installation
20.00 - 20.33	D27	SPT(S) 20.00m, 50 (6,10/50 for 180mm)				Stiff to very stiff dark grey slightly sandy silty indistinctly laminated CLAY with frequent shell fragments (<3mm). Sand is fine to coarse. [Oxford Clay]		
		SPT(C) 21.30m, 50 (25 for 15mm/50 for 10mm)		21.50				
				21.60		Strong medium grained LIMESTONE [Cornbrash]		
						Very stiff dark grey slightly sandy slightly silty indistinctly laminated CLAY with occasional white shell fragments. [Kellaways Clay]		
				(3.30)				
24.00 - 24.45	D28	SPT(S) 24.00m, N=50 (5,8/10,11,13,16)						
24.50 - 24.60	D29							
24.90 - 25.00	D30	SPT(S) 25.00m, 50 (25 for 75mm/50 for 75mm)		24.90 25.03		Very strong thinly bedded medium grained grey LIMESTONE [Cornbrash]		
						End of Borehole at 25.150m		

21 22 23 24 25 26 27 28 29 30

Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Position undertaken adjacent to BH275 Hand dug inspection pit to 1.2m Ground water strike at 1.7m rising to 1.43m in 20 minutes Backfilled and installed upon completion using slotted and plain 75mm pipe, grout, bentonite and gravel. Response zones from 1m to 4m and 20m to 24m.

Chiselling				Installation				Water Strikes					
From (m)	To (m)	Duration	Remarks	Top (m)	Base (m)	Type	Dia (mm)	Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Borehole ID: WS208
	Contract Number: G192219	Date Started: 20/12/2019	Date Completed: 23/12/2019	Logged: NES / Checked: JS	Status: FINAL / Sheet 2 of 2
Dynamic Sample Borehole Log	Easting: 516081.0	Northing: 255499.0	Ground Level: 19.31m (OD)	Plant Used: Dart 351	Print Date: 02/03/2020 / Scale: 1:25
Weather: Cloudy+Fine	Rig Crew: Luke Thomas	Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions		SPT Hammer: Dart351 Energy Ratio: 67%	

Samples & In Situ Testing			Strata Details				Progress		Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Window Run		Water Strike	Backfill/ Installation
5.00 - 5.50	L19	SPT(S) 5.00m, 50 (6,12/50 for 220mm) Recovery = 80%	14.11	5.20		Firm to stiff grey very sandy slightly gravelly very friable CLAY. Sand is fine to medium. Gravel is subangular to subrounded, fine to medium of chalk, flint and occasional medium strong slate. [Oxford Clay]	5.00 - 5.50 (67mm dia) 80% rec			
5.50 - 6.50	L20	Recovery = 60%		(1.30)		Firm grey very sandy silty CLAY. Sand is fine to medium. [Oxford Clay]	5.50 - 6.50 (57mm dia) 60% rec	6		
6.50 - 6.81	D21	SPT(S) 6.50m, 50 (5,11/50 for 158mm) Recovery = 37%	12.81	6.50		Very dense grey slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subangular, fine to medium of flint. [Oxford Clay]	6.50 - 6.90 (57mm dia) 37% rec			
6.50 - 6.90	L22									
6.90 - 7.21	D23	SPT(S) 6.90m, 50 (8,15/50 for 159mm)		(0.80)				7		
			12.01	7.30		End of Borehole at 7.30m		8		
								9		
								10		

Progress by Time					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Depth	Casing	Water	Depth	Diameter	Depth	Diameter	Hand dug inspection pit to 1.2m Groundwater seepage encountered at 1.0m Shear vanes were not possible due to coarse and gravelly ground conditions. DP follow on not requested by Investigation Supervisor. Backfilled with bentonite and arisings upon completion.

Water Strikes

Strike (m)	Casing (m)	Sealed (m)	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP211
	Contract Number: G192219	Date Started: 21/11/2019	Logged By: BW	Checked By: JS	Status: FINAL	Sheet 1 of 1
Trial Pit Log	Easting: 516159.0	Northing: 255682.0	Ground Level: 18.31mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020	Scale: 1:51
Weather: Cloudy	Stability: Unstable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to pit becoming unstable	

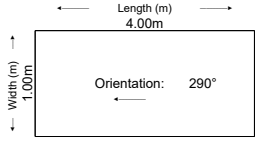
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.10 - 0.30	B2			(0.30)		MADE GROUND: Soft to firm brown sandy gravelly CLAY/SILT with frequent rootlets. Sand is fine. Gravel is subangular to rounded, fine to coarse of flint. (Reworked quarry backfill) [Made Ground]		
0.20	D1		18.01	0.30				
0.20	ES3			(0.50)		MADE GROUND: Yellow and orangish brown very sandy clayey GRAVEL. Gravel is subangular to subrounded, fine to coarse of flint. (Reworked quarry backfill) [Made Ground]		
0.30 - 0.80	B4							
0.70	D6		17.51	0.80				
0.70	ES5					End of Trial Pit at 0.800m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 0.80m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater encountered at 0.8m during excavation, rising to 0.7m after 5mins.
No hand shear vanes done due to granular stratum.
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

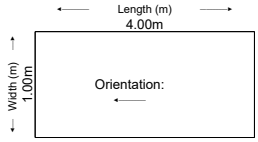
STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP334
	Contract Number: G192219	Date Started: 20/11/2019	Logged By: BW	Checked By: JS	Status: FINAL	Sheet 1 of 1
Trial Pit Log	Easting: 516228.0	Northing: 255490.0	Ground Level: 19.53mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020	Scale: 1:51
Weather: Fine	Stability: Unstable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to pit becoming unstable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			(0.50)		MADE GROUND: Firm brown sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to subrounded fine to coarse of flint. (Reworked quarry backfill) [Made Ground]		
0.50 - 1.00	B2		19.03	0.50				
				(0.60)		MADE GROUND: Yellowish brown slightly clayey sandy GRAVEL. Sand is fine. Gravel is subangular to rounded fine to coarse of flint. (Reworked quarry backfill) [Made Ground]		
1.00	D3		18.43	1.10				
1.50 - 2.00	B4			(1.00)		MADE GROUND: Stiff brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of flint. (Reworked quarry backfill) [Made Ground]		
2.00	D5							
2.10 - 2.20	B6		17.43	2.10				
2.20	D7		17.33	2.20		Orangish brown clayey SAND & GRAVEL. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of flint. [River Terrace Deposits]		
						End of Trial Pit at 2.200m		

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 2.20m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater encountered at 2.1m during excavation, rising to 2.0m after 5mins.
No hand shear vanes done due to granular stratum.
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks
2.10	5	2.00	Fast inflow

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP365
	Contract Number: G192219	Date Started: 21/11/2019	Logged By: BW	Checked By: JS	Status: FINAL	Sheet 1 of 1
Trial Pit Log	Easting: 516102.0	Northing: 255546.9	Ground Level: 19.06mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020	Scale: 1:51
Weather: Cloudy	Stability: Unstable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to pit becoming unstable	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1		18.86	0.20		MADE GROUND: Soft to firm brown slightly sandy gravelly CLAY. Sand is fine. Gravel is subangular to subrounded, fine to coarse of flint with frequent rootlets. (Reworked quarry backfill) [Made Ground]		
0.20 - 0.70	B2			(0.50)				
0.50	D3	HV 0.50m, 23/11kPa	18.36	0.70		MADE GROUND: Soft to firm brown sandy silty friable CLAY. Sand is fine. (Reworked quarry backfill) [Made Ground]		
1.00 - 1.50	B4			(0.60)		MADE GROUND: Orangish brown gravelly SAND. Sand is fine to medium. Gravel is subangular to subrounded, fine to coarse of flint. (Reworked quarry backfill) [Made Ground]		
1.40	D5		17.76	1.30		MADE GROUND: Yellowish brown sandy GRAVEL. Sand is fine to medium. Gravel is subangular to subrounded, fine to coarse of flint. (Reworked quarry backfill) [Made Ground]		
				(0.70)				
			17.06	2.00		End of Trial Pit at 2.000m		

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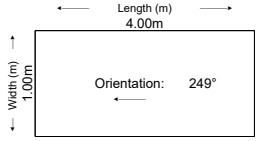
Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 2.00m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater encountered at 1.5m during excavation, rising to 1.4m after 5mins.
Limited shear vanes done due to granular ground conditions.
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks
1.50	5	1.40	Fast inflow

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP319
	Contract Number: G192219	Date Started: 28/01/2020	Logged By: JT	Checked By: JS	Status: PRELIM
					Sheet 1 of 1
Trial Pit Log	Easting: 529384.0	Northing: 260795.0	Ground Level: 64.28mOD	Plant Used: JCB 3CX	Date Printed: 28/02/2020
					Scale: 1:51
Weather: Dry	Stability: Side walls stable.		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20 - 0.30	B1		63.88	(0.40)		TOPSOIL: Firm light brown slightly organic slightly sandy slightly gravelly CLAY with rare rootlets (<2mm). Sand is fine to medium. Gravel is angular to subangular fine to coarse of flint. [Topsoil]		
0.20 - 0.30	D2			0.40				
0.50 - 0.60	B3					Firm to stiff orange brown mottled grey slightly sandy gravelly CLAY with rare relict roots (<3mm). Sand is fine to medium. Gravel is angular to subrounded fine to coarse of flint and chalk. [Glacial Till]		
0.50 - 0.60	D4	HV 0.60m, 87/0kPa		(0.70)				
1.20 - 1.30	B5	HV 1.20m, 98/0kPa	63.18	1.10		Stiff greenish blue mottled orange brown slightly sandy gravelly CLAY with low cobble (<100mm) content of chalk and occasional rootlets (<3mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint and chalk. [Glacial Till]		
1.20 - 1.30	D6					1.20 - 1.20: Pocket (<120mm) of fine to medium orange brown sand encountered.		
				(2.20)		2.20 - 2.20: Contains occasional gypsum crystals (<13mm).		
		HV 2.50m, 133/0kPa				2.30 - 2.30: Clay becomes very stiff dark greenish grey mottled bluish brown and contains rare cobbles (<60mm) of iron oxide and occasional pockets (<60mm) of orange brown clayey sand.		
3.20 - 3.30	B7					3.00 - 3.00: 4no. small rounded limestone boulders (<300mm) encountered.		
3.20 - 3.30	D8		60.98	3.30		End of Trial Pit at 3.300m		

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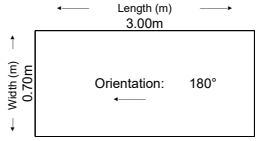
Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.30m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
No shear vane tests undertaken after 3.00m bgl due to friable clay.
Residual strength could not be undertaken or crumbled during testing shown as 0
Trial pit refused at 3.30m bgl on hard ground. Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP408
	Contract Number: G192219	Date Started: 29/01/2020	Logged By: JT	Checked By: JS	Status: PRELIM
Trial Pit Log	Easting: 529060.0	Northing: 260865.0	Ground Level: 62.95mOD	Plant Used: JCB 3CX	Date Printed: 28/02/2020
					Sheet 1 of 1
					Scale: 1:51
Weather: Fine	Stability: Stable		Services Encountered: None	Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20 - 0.30	B2			(0.40)		MADE GROUND: Soft to firm light brown slightly organic slightly sandy gravelly CLAY with occasional roots (2mm to 6mm). Sand is fine to medium. Gravel is subangular to rounded, fine to coarse of flint with occasional brick fragments. [Made Ground]		
0.20 - 0.30	D1		62.55	0.40				
0.50 - 0.60	B4	HV 0.50m, 51/0kPa		(0.30)				
0.50 - 0.60	D3		62.25	0.70		Firm becoming stiff light brown mottled greyish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of chalk and flint. [Glacial Till]		
0.70 - 0.80	B6							
0.70 - 0.80	D5			(1.10)				
						Stiff bluish grey mottled orangish brown slightly sandy gravelly CLAY with low cobble (<100mm) content. Sand is fine to coarse. Gravel is subrounded to angular, fine to coarse of chalk and flint. [Glacial Till]		
1.90 - 2.00	B8		61.15	1.80		*1.60 - 1.90: 1no. boulder (300x200x200mm) of greyish brown subrounded siltstone.*		
1.90 - 2.00	D7	HV 2.00m, 102/0kPa						
						Very stiff bluish grey slightly mottled greenish brown slightly sandy gravelly locally fissured CLAY with low cobble content (<100mm) and occasional iron oxide concretions (5x50mm) and rare rootlets (1x5mm). Sand is fine to coarse. Gravel is subrounded to angular, fine to coarse of chalk and flint. [Glacial Till]		
				(1.80)		*2.30: Rare mudstone lithorelics and gypsum crystals*		
3.50 - 3.60	B10					*3.50 - 3.60: Pocket (200x150x300mm) of orangish brown gravelly SAND.*		
3.50 - 3.60	D9		59.35	3.60		End of Trial Pit at 3.600m		

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Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.60m

Length (m) 3.00m

Width (m) 0.50m

Orientation: 080°

Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Limited hand shear vanes done due to gravel content
Residual strength could not be undertaken or crumbled during testing shown as 0
No groundwater encountered during excavation
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

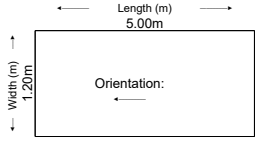
STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP409
	Contract Number: G192219	Date Started: 30/01/2020	Logged By: JT	Checked By:	Status: PRELIM	Sheet 1 of 1
Trial Pit Log	Easting: 529192.0	Northing: 260900.0	Ground Level: 63.07mOD	Plant Used: 180 Excavator	Date Printed: 08/04/2020	Scale: 1:50
Weather: Fine	Stability: Stable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20 - 0.30	B2			(0.35)		MADE GROUND: Reworked topsoils consisting of firm dark brown slightly organic slightly sandy slightly gravelly CLAY with occasional roots (2mm to 6mm). Sand is fine to coarse. Gravel is subangular to subrounded, fine to medium of flint and rare brick fragments. [Made Ground]		
0.20 - 0.30	D1		62.72	0.35				
0.40 - 0.50	B4	HV 0.50m, 76/0kPa						
0.40 - 0.50	D3			(0.55)				
1.00 - 1.10	B6	HV 1.00m, 84/0kPa	62.17	0.90		Firm to stiff light orange brown mottled brownish grey slightly sandy gravelly to very gravelly CLAY with low flint cobble (150 x 200mm) content. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of chalk and flint. [Glacial Till]		
1.00 - 1.10	D5			(0.70)				
			61.47	1.60		Stiff bluish grey mottled dark orangish brown slightly sandy gravelly to very gravelly CLAY with medium flint cobble (250 x 150mm) content. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of chalk and flint. [Glacial Till]		
2.00 - 2.10	B8							
2.00 - 2.10	D7			(1.40)		Stiff to very stiff dark bluish grey mottled dark greenish brown slightly sandy gravelly to very gravelly locally fissured CLAY with medium flint cobble (250 x 150mm) content and relic rootlets. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of chalk and flint. [Glacial Till]		
			60.07	3.00		*1.80: Pocket (20 x 60 x 100mm) of orangish brown clayey gravelly sand.* *1.90: Single reddish brown ironstone cobble (180 x 100 x 50mm)*		
				(0.80)		Very stiff dark bluish grey mottled dark greenish brown slightly sandy gravelly to very gravelly locally randomly orientated fissured CLAY with medium flint cobble (250 x 150mm) content, relic rootlets, gypsum crystals (2 to 6mm) and rare shell fragments (2 to 10mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of chalk, mudstone lithorelicts and flint. [Glacial Till]		
3.70 - 3.80	B10							
3.70 - 3.80	D9		59.27	3.80		End of Trial Pit at 3.800m		

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.80m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Groundwater was not encountered during excavation.
Limited hand shear vanes undertaken due to friable conditions
Residual strength could not be undertaken or crumbled during testing shown as 0
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP410
	Contract Number: G192219	Date Started: 29/01/2020	Logged By: JT	Checked By: JS	Status: PRELIM	Sheet 1 of 1
Trial Pit Log	Easting: 529254.0	Northing: 260789.0	Ground Level: 63.85mOD	Plant Used: JCB 3CX	Date Printed: 28/02/2020	Scale: 1:51
Weather: Fine	Stability: Stable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20 - 0.30	B2			(0.40)		MADE GROUND: Soft dark brown slightly organic sandy slightly gravelly CLAY with occasional root (2mm to 12mm). Sand is fine. Gravel is subangular to rounded, fine to medium of flint and chalk with rare fine gravel of brick fragments. [Made Ground]		
0.20 - 0.30	D1		63.45	0.40				
		HV 0.50m, 50/0kPa						
0.60 - 0.70	B4							
0.60 - 0.70	D3			(0.80)		Firm orange brown mottled light bluish grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to medium of chalk and flint. [Glacial Till]		
			62.65	1.20				
1.40 - 1.50	B6	HV 1.40m, 64/0kPa				Stiff locally firm bluish grey mottled orange brown slightly sandy gravely CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of chalk and flint. [Glacial Till]		
1.40 - 1.50	D5					*1.30 - 1.50: 2no. boulders: sub rounded flint (300x300x200mm) and subangular dark grey ironstone (180x150x50mm)*		
						1.40 - 1.45: Pocket (60x100x200mm) of orange brown clayey gravelly SAND.		
						1.80: Clay becomes very stiff and dark bluish grey		
		HV 2.30m, 98/0kPa		(2.20)		*2.00 - 2.25: 1no. rounded grey limestone boulder (250x200x150mm)*		
						2.10: Occasional iron oxide concretions (40x60x100mm)		
3.30 - 3.40	B8							
3.30 - 3.40	D7		60.45	3.40		End of Trial Pit at 3.400m		

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Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.40m

Length (m) 3.00m

Width (m) 0.60m

Orientation: 000°

Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Residual strength could not be undertaken or crumbled during testing shown as 0
Limited shear vanes undertaken due to gravelly ground conditions
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

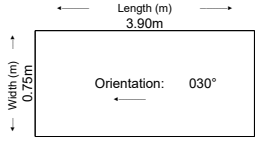
STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP388
	Contract Number: G192219	Date Started: 08/10/2019	Logged By: KE	Checked By: JS	Status: FINAL	Sheet 1 of 1
Trial Pit Log	Easting: 529572.0	Northing: 260955.0	Ground Level: 63.88mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020	Scale: 1:51
Weather: Fine	Stability: Stable		Services Encountered: None		Hole Termination: Scheduled Depth	

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.00 - 0.30	B1					TOPSOIL: Light grey slightly gravelly fine to coarse SAND with occasional rootlets. Gravel is subangular to subrounded, fine to coarse of chert, mudstone and chalk. [Topsoil]		
0.20	D2			(0.40)				
0.50	D4	HV 0.50m, 63/0kPa	63.48	0.40		Firm to stiff orangish brown mottled bluish grey sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of chalk, chert and mudstone. [Glacial Till]		
0.50 - 0.70	B3			(0.45)				
1.00	D6		63.03	0.85		Very stiff bluish grey mottled orangish brown sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of chalk, chert and limestone. [Glacial Till]	1	
1.20 - 1.50	B5							
		HV 1.50m, 118/0kPa						
2.00	D8						2	
2.20 - 2.50	B7			(2.65)				
3.00	D10						3	
3.10 - 3.30	B9							
3.60 - 3.80	B11		60.38	3.50		Very stiff bluish grey sandy slightly gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of chalk, mudstone and chert. [Glacial Till]		
3.80	D12			(0.40)				
			59.98	3.90		End of Trial Pit at 3.900m	4	
							5	

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.90m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Residual strength could not be undertaken or crumbled during testing shown as 0
Limited shear vanes undertaken due to gravelly ground conditions
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP389
	Contract Number: G192219	Date Started: 09/10/2019	Logged By: BW	Checked By: JS	Status: FINAL	Sheet 1 of 1
Trial Pit Log	Easting: 529693.0	Northing: 261002.0	Ground Level: 63.72mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020	Scale: 1:51
Weather: Fine	Stability: Stable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions	

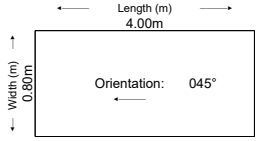
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			(0.30)		TOPSOIL: Soft to firm brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to subrounded, fine to coarse of flint. [Topsoil]		
			63.42	0.30				
0.50	D2	HV 0.50m, 83/26kPa						
0.50 - 1.00	B3			(0.60)		Firm orangish brown mottled brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to subrounded, fine to coarse of chalk and occasional flint. [Glacial Till]		
			62.82	0.90				
1.00	D4					Stiff to very stiff grey mottled brown sandy gravelly CLAY with occasional rootlets and low flint cobble and boulder content. Sand is fine. Gravel is subangular to subrounded, fine to coarse of chalk. [Glacial Till]		
1.50 - 2.00	B5							
2.00	D6			(2.30)				
2.50 - 3.00	B7							
3.00	D8							
3.20 - 3.40	B9		60.52	3.20		Very stiff slightly sandy slightly gravelly CLAY with low chalk cobble content. Sand is fine. Gravel is subangular to rounded, fine to coarse of chalk. [Glacial Till]		
3.40	D10		60.32	3.40		End of Trial Pit at 3.400m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.40m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Limited shear vanes undertaken due to gravelly ground conditions
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP390
	Contract Number: G192219	Date Started: 07/10/2019	Logged By: KE	Checked By: JS	Status: FINAL	Sheet 1 of 1
Trial Pit Log	Easting: 529798.0	Northing: 260890.0	Ground Level: 64.33mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020	Scale: 1:51
Weather: Dry	Stability: Stable		Services Encountered: Land Drain at 0.45m		Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions	

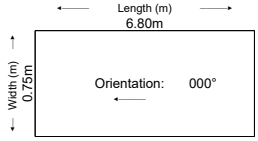
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D2			(0.40)		MADE GROUND: Firm light grey sandy slightly gravelly clayey SILT. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of chalk, mudstone and chert. [Made Ground]		
0.30	B1		63.93	0.40				
0.50	D4	HV 0.50m, 65/0kPa		(0.45)		Firm to stiff orangish brown mottled bluish grey slightly sandy slightly gravelly CLAY with low very strong boulder (<500mm) content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, chalk, chert and limestone. [Glacial Till]		
0.80	B3		63.48	0.85				
1.20	D6							
1.50	B5	HV 1.50m, 120/0kPa		(1.65)		Stiff bluish grey mottled orangish brown sandy slightly gravelly CLAY with occasional brown fine sand lenses. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse, of limestone, mudstone, chalk and chert. [Glacial Till]		
2.20	D8							
2.50	B7		61.83	2.50		End of Trial Pit at 2.500m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 2.50m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Residual strength could not be undertaken or crumbled during testing shown as 0
No groundwater encountered during excavation
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

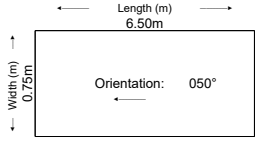
STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP391
	Contract Number: G192219	Date Started: 06/10/2019	Logged By: KE	Checked By: JS	Status: FINAL
					Sheet 1 of 1
Trial Pit Log	Easting: 529914.0	Northing: 260991.0	Ground Level: 64.21mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020
					Scale: 1:51
Weather: Dry	Stability: Stable		Services Encountered: Land Drain at 0.7m		Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D2	HV 0.20m, 63/0kPa		(0.40)		MADE GROUND: Soft to firm light grey sandy slightly gravelly clayey SILT with occasional rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of chalk, chert and mudstone. [Made Ground]		
0.30	B1		63.81	0.40				
0.50	D4			(0.50)		Firm orangish brown mottled bluish grey slightly sandy gravelly CLAY with low strong cobble (<130mm) content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, chalk, chert and flint. [Glacial Till]		
0.80	B3	HV 0.70m, 113/0kPa	63.31	0.90				
1.20	D6			(0.60)				
1.50	B5		62.71	1.50		Firm to stiff bluish grey mottled brown slightly sandy gravelly CLAY with occasional brown fine sand lenses. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of chalk, mudstone, chert and flint. [Glacial Till]		
2.00	D8							
2.30	B7			(1.50)		Brown slightly gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of chalk chert and mudstone. [Glacial Till]		
3.00	D10		61.21	3.00				
3.20	B9		61.01	3.20		Bluish grey mottled light grey slightly gravelly silty SAND. Sand is fine to medium. Gravel is, subangular to subrounded fine to medium of chalk mudstone and chert. [Glacial Till]		
						End of Trial Pit at 3.200m		

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 3.20m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Land drain at 0.7m, trial pit extended.
Residual strength could not be undertaken or crumbled during testing shown as 0
Limited shear vanes undertaken due to gravelly ground conditions
No groundwater encountered during excavation.
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska			Trial Pit ID: TP392
	Contract Number: G192219	Date Started: 07/10/2019	Logged By: KE	Checked By: JS	Status: FINAL	Sheet 1 of 1
Trial Pit Log	Easting: 530023.0	Northing: 260864.0	Ground Level: 64.69mOD	Plant Used: 180 Excavator	Date Printed: 28/02/2020	Scale: 1:51
Weather: Varied	Stability: Stable		Services Encountered: None		Hole Termination: Early termination agreed by Investigation Supervisor due to hard digging conditions	

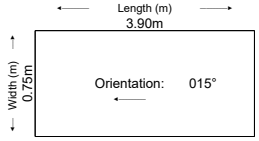
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D2			(0.40)		MADE GROUND: Soft to firm light grey sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of chalk, mudstone and chert [Made Ground]		
0.40	B1		64.29	0.40				
0.50	D4	HV 0.50m, 60/0kPa		(0.40)		Firm orangish brown mottled bluish grey sandy slightly gravelly CLAY with occasional brown fine sand lenses. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of chert, mudstone, chalk and flint. [Glacial Till]		
0.80	B3		63.89	0.80				
1.10	B5	HV 1.00m, 110/0kPa	63.59	(0.30) 1.10		Stiff bluish grey mottled orangish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone, chalk and chert. [Glacial Till]		
						End of Trial Pit at 1.100m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 1.10m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
Residual strength could not be undertaken or crumbled during testing shown as 0
No groundwater encountered during excavation.
Backfilled upon completion using arisings.

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP411
	Contract Number: G192219	Date Started: 13/03/2020	Logged By: SI	Checked By: JS	Status: PRELIM
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 24/03/2020
					Scale: 1:50
Weather: Sunny	Stability: Stable		Services Encountered: None		Hole Termination: Scheduled Depth

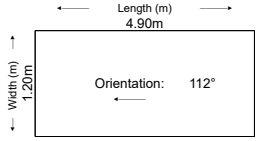
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20 (0.30)		TOPSOIL: Soft to firm dark brown slightly sandy slightly gravelly CLAY with rootlets. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, quartzite and sandstones. [Topsoil]		
0.50	D2	HV 0.50m, 75/12kPa		0.50		Soft to firm brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel subrounded to rounded fine to coarse of quartzite, flint and sandstones. [Glacial Till]		
0.50 - 1.00	B1							
1.00	D3	HV 1.00m, 63/9kPa						
1.00 - 2.00	B2			(1.50)		Firm grey mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel subangular to subrounded fine to coarse of quartzite, flint and clats of chalk. [Glacial Till]		
2.00	D4	HV 2.00m, 74/9kPa		2.00		Firm to stiff dark grey slightly sandy silty CLAY with brown staining. Sand is fine to coarse. [Oxford Clay]		
2.00 - 3.00	B3							
3.00	D5			(2.20)				
3.00 - 4.00	B4							
4.00	D6			4.20		End of Trial Pit at 4.200m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 4.20m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP412
	Contract Number: G192219	Date Started: 13/03/2020	Logged By: SI	Checked By: JS	Status: PRELIM — Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 24/03/2020 — Scale: 1:50
Weather:	Stability: Stable		Services Encountered: None		Hole Termination: Scheduled Depth.

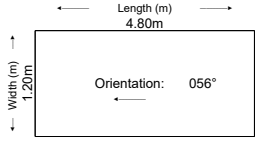
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20 (0.30)		TOPSOIL: Soft dark brown slightly sandy CLAY. Sand is fine to coarse. [Topsoil]		
0.50	D2	HV 0.50m, 70/14kPa		0.50		Soft to firm yellowish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of sandstones, quartz, quartzite and flint. [Glacial Till]		
0.50 - 1.00	B1			(0.50)				
1.00	D3	HV 1.00m, 68/20kPa		1.00		Firm grey and brown sandy gravelly CLAY. Sand is fine to coarse. Gravel subrounded to rounded fine to coarse of quartzite, flint, clats of chalk and sandstones. [Glacial Till]		
1.00 - 2.00	B2			(1.00)		Firm to stiff grey mottled brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to rounded, fine to coarse of flint, clats of chalk and quartzite. [Glacial Till]		
2.00	D4	HV 2.00m, 88/18kPa		2.00		Stiff dark grey slightly sandy slightly gravelly CLAY with low flint and chalk boulder content. Sand is fine to coarse. Gravel is rounded to subrounded, fine to coarse of flint clats of chalk and quartzite. [Glacial Till]		
2.00 - 3.00	B3							
3.00	D5			(2.00)				
3.00 - 4.00	B4							
4.00	D6			4.00		End of Trial Pit at 4.000m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 4.00m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Limited hand shear vanes undertaken due to gravelly conditions
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP413
	Contract Number: G192219	Date Started: 13/03/2020	Logged By: SI	Checked By:	Status: PRELIM
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 19/03/2020
					Scale: 1:50
Weather: Cloudy	Stability: Stable		Services Encountered: None		Hole Termination: Scheduled Depth

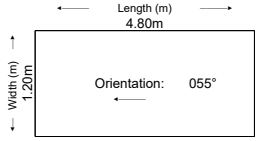
Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20		TOPSOIL: Soft to firm dark brown slightly sandy slightly gravelly CLAY with rootlets. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint, quartzite and sandstones.		
				(0.30)		[Topsoil]		
0.50	D2	HV 0.50m, 96/25kPa		0.50		Soft to firm brown sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of clats of chalk, flint and quartzite.		
0.50 - 1.00	B1			(0.50)		[Glacial Till]		
1.00	D3			1.00		Firm brown and grey sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, quartzite and clats of chalk.		
1.00 - 2.00	B2					[Glacial Till]		
2.00	D4	HV 2.00m, 128/20kPa		(2.00)		Firm to stiff grey mottled brown sandy gravelly CLAY with low flint and chalk boulder content. Sand is fine to coarse. Gravel is subrounded to rounded, fine to coarse of flint and clats of chalk.		
2.00 - 3.00	B3					[Glacial Till]		
3.00	D5			3.00		Stiff dark grey sandy gravelly silty CLAY with low flint and chalk boulder content. Sand is fine to coarse. Gravel is subrounded to rounded, fine to coarse of flint and clats of chalk.		
3.00 - 4.00	B4			(1.00)		[Glacial Till]		
4.00	D6			4.00		End of Trial Pit at 4.000m		

1 2 3 4 5

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 4.00m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Limited shear vanes done due to gravel content.
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

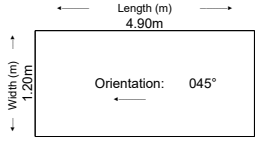
STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP414
	Contract Number: G192219	Date Started: 16/03/2020	Logged By: SI	Checked By: JS	Status: PRELIM
					Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 01/04/2020
					Scale: 1:50
Weather: Sunny/windy	Stability: Stable		Services Encountered: None		Hole Termination: Scheduled Depth

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20 (0.30)		TOPSOIL: Soft to firm dark brown slightly sandy slightly gravelly silty CLAY with rootlets. [Topsoil]		
0.50	D2	HV 0.50m, 68/14kPa		0.50		Soft to firm brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is subrounded to subangular, fine to coarse of quartzite, flint, sandstones and clats of chalk. [Glacial Till]		
0.50 - 1.00	B1							
1.00	D3	HV 1.00m, 103/24kPa				Firm brown and grey sandy gravelly CLAY with low flint and chalk boulder content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint, clats of chalk and quartzite [Glacial Till]	1	
1.00 - 2.00	B2			(1.50)				
2.00	D4	HV 2.00m, 42/12kPa		2.00		Firm to stiff dark grey sandy gravelly CLAY with low flint and chalk boulder content. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of flint, clats of chalk. [Glacial Till]	2	
2.00 - 3.00	B3							
3.00	D5	HV 3.00m, 84/24kPa		(2.00)			3	
3.00 - 4.00	B4							
4.00	D6			4.00		End of Trial Pit at 4.000m	4	
							5	

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 4.00m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks

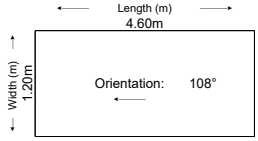
STRATA GEOTECHNICS	Contract Name: A428 Black Cat to Caxton Gibbet Improvements		Client: Highways England / Skanska		Trial Pit ID: TP415
	Contract Number: G192219	Date Started: 12/03/2020	Logged By: SI	Checked By: JS	Status: PRELIM — Sheet 1 of 1
Trial Pit Log	Easting:	Northing:	Ground Level:	Plant Used: Excavator	Date Printed: 24/03/2020 — Scale: 1:50
Weather: Cloudy/windy	Stability: Stable		Services Encountered: None		Hole Termination: Scheduled Depth

Samples & In Situ Testing			Strata Details				Water	Backfill
Depths	Sample ID	Test Result	Reduced Level	Depth (m) (Thickness)	Legend	Strata Description		
0.20	D1			0.20 (0.30)		TOPSOIL: Soft dark brown slightly sandy slightly gravelly CLAY with rootlets. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, sandstones and quartzite [Topsoil]		
0.50	D2	HV 0.50m, 70/20kPa		0.50				
0.50 - 1.00	B1					Soft to firm brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to rounded, fine to coarse of flint, clats of chalk and sandstones. [Glacial Till]		
1.00	D3	HV 1.00m, 92/18kPa					1	
1.00 - 2.00	B2			(1.50)		Soft to firm brown and grey sandy gravelly silty CLAY with low flint and chalk boulder content. Sand is fine to coarse. Gravel is subrounded to rounded, fine to coarse of fragments of chalk, quartzite and flint [Glacial Till]		
2.00	D4	HV 2.00m, 118/14kPa		2.00			2	
2.00 - 3.00	B3			(1.00)		Firm to stiff dark grey slightly gravelly silty CLAY with brown staining. Sand is fine to coarse. Gravel is subrounded to rounded, fine to coarse of flint and clats of chalk. [Glacial Till]		
3.00	D5			3.00			3	
3.00 - 4.00	B4			(1.00)		Stiff dark grey slightly sandy slightly gravelly silty CLAY with low flint boulder content. Sand is fine to coarse. Gravel is rounded to subrounded, fine to coarse of clats of chalk and flint. [Glacial Till]		
4.00	D6			4.00		End of Trial Pit at 4.000m	4	
							5	

Trial Pit Photographs/Sketches

Dimensions of Trial Pit:

Final Depth: 4.00m



Inclination: 90°

Remarks:

Logged from arisings due to exclusion zone restrictions.
No groundwater encountered during excavation.
Limited hand shear vanes undertaken due to gravelly conditions
Backfilled upon completion using arisings

Water Strike

Strike	Time (mins)	Rose to (m)	Remarks