Development Land off Blue Boar Lane, Norwich, NR7 8RJ
Sprowston Town Council
January 2026

BIDWELLS

EMPLOYER'S REQUIREMENTS
SKATEPARK DEVELOPMENT
LAND OFF BLUE BOAR LANE

Table of Contents

1.0 Introduction

This document sets out the requirements for the new skatepark including associated, landscaping, street furniture and new skatepark lighting at Blue Boar Lane, Norwich, NR7 8RJ.

2.0 Project Particulars

2.1 Employer

Sprowston Town Council
Council Office
Recreation Ground Road
Sprowston
NR7 8EW

2.2 Employer's Agent (EA)

Bidwells LLP
King Fisher House
1 Gilders Way
Norwich
NR3 1UB

2.3 Contractor

To Be Confirmed

2.4 Principal Designer

Bidwells LLP
King Fisher House
1 Gilders Way
Norwich
NR3 1UB

2.5 Site Location

Land off Blue Boar Lane
Norwich
NR7 8RJ

2.6 Tendering Instructions

These Employer's Requirements (ERs) comprise an outline briefing document to be issued to as part of an open tender JCT Practice Note 6 Series 2 Main contract tendering. The contractor selection process will be based upon the following stages:

- Following issue of the Employer's Requirements, contractor submissions including the completed Tender Invitation document, pricing document and a fully costed contract sum analysis (with rates) to be submitted electronically by **Thursday 26th February 2026 at 12pm.**

- The project will be centred on good design, with a quality build, based on the Tender Invitation and Employer's Requirements documents. The Contractors proposals should include design drawings and 3D visuals.
- The Contractor's Proposals shall include a construction programme and a Contract Sum Analysis. The Contractor should include a copy of the pricing document, their current insurance certificates and a Form of Tender with their tender return.
- The Contractors tender submission will be marked against section 5 'Supplier Questions' of the 'Invitation to Participate in Tendering for Design & Installation of Skatepark at Development Land off Blue Boar Lane, Norwich, NR7 8RJ' document.
- After the Tender review process and marking, STC will nominate selected Contractors to prepare and present at Sprowston Town Council's office on Friday 6th March 2026.
- After the presentations and design submissions have been reviewed with the Employer, the expectation is that the successful contractor will be appointed.
- This document may be subject to clarification or change during the tender process. For completeness, responses to any queries received will be shared with all contractors.

The contractor shall provide a list of their preferred sub-contractors for the works. If a subcontractor has not been selected at the time of tender, then the contractor must indicate all subcontractors who are being considered for the works.

The Contractor's Tender Submission must include the following outline information / drawings to be finalised in detail post contractor appointment:

- High Level Project programme, critical path identifying lead in periods, construction period and key dates.
- Outline planning timeline and keys dates for submission, consultation and expected decision date.
- Contractor design drawings and 3D visuals.
- Fully costed contract sum analysis.
- Enhancement proposals and designs for consideration.

2.7 Access for Inspection

Access for inspection of the site is by prior appointment arranged through the Employer's Agent, with at least 48 hours' notice.

All inspections must be concluded six business days prior to the date of submission of the Contractor's Proposals.

2.8 Pre-Contract Design

The pre-contract design process is to be progressed on a pro bono basis. Please note that the Employer does not oblige themselves to proceed into Contract with any contractor(s).

Any presentation documents, media etc. left by the contractor(s) with the Employer or their representatives will not be returned.

The Employer shall have a royalty-free irrevocable license to use any information provided by the Contractor(s) to progress the scheme.

2.9 Contract Programme

The expectation is that the works will commence in Summer 2026 subject to planning.

Contractors should submit their proposals for an initial timeline detailing an achievable programme, in line with the tender programme.

3.0 Design & Build Requirements

The appointed contractor shall progress the Employer's Requirements, to the Technical Design stage including preparing all architectural and structural information, specialist subcontractor design and specifications, to allow the Construction Stage to commence. The contractor shall undertake and complete the construction works to hand over the project and conclude the Building Contract, including achieving all necessary planning and Statutory Approvals.

The Contractor when submitting their tender will be deemed to have included for all necessary costs which will be incurred in the planning, complete design, construction, completion and commissioning of the work other than those costs specifically noted as being paid for by the Employer.

The contractor will be responsible for the full design under the JCT D&B Contract 2024 and any accepted risks and unknowns pre contract should be quickly controlled and where possible removed. Where required the design may be challenged and technical detailing will be required to be confirmed through design workshops with the Employer's team to meet the brief, comply with this document,

The contractor shall allow for submitting all Technical Design information (Technical Submissions) to the Employer for review and comment. At least 5 days notice shall be given to the Employer where the contractor requires a decision.

The Contractor shall return a fully priced Employer's Requirements Proposals as set out within Appendix 1 which, once agreed, will form the Contract Sum Analysis (CSA). The priced document should include a line-by-line breakdown of the Contractor's costs with individual rates provided for each item, this should include the electrical services installations.

The Employer Requires the Contractor to provide Contractor's Proposals in response to these Employer's Requirements and appendices.

The Contractor must act as the Principal Contractor under the CDM Regulations (2015) and have due regard to the Pre-Construction Information provided by Bidwells LLP included in Appendix 4. They will also need to fulfil these roles under the Building Safety Act.

The Contractor will be responsible for collating and issuing the Operation and Maintenance manual and Health and Safety File required under the CDM Regulations.

It is anticipated a letter of intent (LOI) may be issued to allow prompt design development and the ordering of long-lead items. The requirements contained within this document will apply to that period of work. Where there may be any unknowns these are to be identified clearly within the Contractor's Proposals.

Should these ER's or the Contractor's Proposals conflict with the agreed contract terms then contract terms will be deemed to take precedent for the purpose of clarity other than in the case of regulation and statute relating to the design.

Should the Contractor's Proposals conflict with the Employer's Requirements, the Employer's Requirements will take precedent.

4.0 Site Details

4.1 Existing Site Description

The development site is 0.25 Hectares of undeveloped land with a close proximity to the Sprowston Garden centre and Sprowston sports and social club. The site is located in the Northeast of Norwich, approximately 3.4miles form the city centre.

The site is located off Blue Boar Lane, opposite Sprowston Garden centre. The site was part of a Persimmons Homes housing development and was allocated to Sprowston Town Council to be developed into a skate park for the community. The Southeast boundary of the site is screened by 'Harrison's Wood' a woodland area. Immediately to the northeast of site is the new housing development. Currently the site has been left undeveloped with the exception of a small carpark and pedestrian pathways

4.2 Existing Mains/Services

The Contractor is entirely responsible for ascertaining the location and layout of any existing services and drainage likely to affect the execution of the Works as no claim for extra costs arising from a lack of knowledge will be allowed.

The Contractor shall notify all service authorities and/or adjacent owners of the proposed works not less than one week before commencing site operations. Before starting work check and mark positions of existing mains/services. Where positions are not shown on drawings obtain relevant details from service authorities or other owners.

The Contractor shall observe service authority's recommendations for work adjacent to existing services.

The Contractor shall adequately protect, and prevent damage to all services. Do not interfere with their operation without consent of the service authorities or owners.

The Contractor shall identify below ground services with signboards, giving type and depth, and overhead services with headroom markers.

If any damage to services results from the execution of the Works, the Contractor shall immediately notify the Employer and appropriate service authority. The Contractor shall make arrangements for the work to be made good without delay, and to the satisfaction of the service authority or owner as appropriate. Any measures taken by the Employer to deal with an emergency will not affect the extent of the Contractor's liability.

The Contractor shall replace all marker tapes or protective covers disturbed during site operations to the service authority's recommendations.

Any work carried out to or which affects new or existing services must be in accordance with the Bye Laws or Regulations of the relevant Statutory Authority.

Mains services supply and connection charges, builders work, attendances and all other Contractor's costs, including overheads and profit recovery are to be included in the tender.

The Contractor shall obtain the provision of all services to and from the Works by such bodies, co -ordinate the same with each other and the remainder of the Works, provide all necessary attendance, setting out and the like, and pay all fees and charges including prescribed fees payable under the Building (Amendment of Prescribed Fees) Regulations ruling at the Base Date, Infrastructure charges connection charges, contribution charges and the like. The Contractor shall provide foul and surface water drainage to the requirement of the Local Authorities, Local Water Authority, Environment Agency and the National Rivers Authority.

The contractor is responsible for the complete ordering, payment and management of the substation installation.

4.3 Existing Trees and Shrubs

The Contractor must ensure that existing trees and shrubs which are to be retained are adequately protected against excavation works, plant and other operations as any such trees damaged or destroyed are to be replaced with trees of the same type and maturity at the Contractors own expense. If any roots exceeding 25mm diameter are unintentionally severed the Contractor shall immediately give notice and seek advice from the Employer's Agent. Measures taken to protect trees are to be to the complete satisfaction of the Employer's Agent. The Contractor will be required to liaise with the Local Authority with regard to any tree preservation orders.

4.4 Proposed Site Layout

The layout of the site is informed by existing site conditions, the existing trees and hedgerows. The location of the site entrance should be proposed by the Contractor as part of their design. It is recommended that the entrance is not positioned on the southeast elevation due to the proximity of the Harrison Wood boundary.

As far as practicable, ensure skate park is visible from Blue Boar Lane, so as to maximise public 'overlooking' and minimise opportunities for anti-social behaviour.

Consideration should be made in relation to leaf and debris from Harrison Woods and a minimum 30m distance from the residential units to the skate park plaza.

5.0 Contract Requirements

5.1 Form of Contract

The Main Contractor shall enter into a JCT Design & Build Contract (2024) with the Employer.

5.2 Design Responsibility

The Contractor is to be responsible for the design of the whole Works including temporary works and any off site works in accordance with these Requirements including preparing all drawings and other documents necessary for the proper and timely completion of the Works, and all drawings and documents necessary to explain their Proposals and paying for all costs so incurred.

The detailed design must achieve the criteria set out in this document. The responsibility of the Contractor for the design of the work is absolute and will not be limited by compliance with any comments issued by the Employer's Agent in the inspection of the design or site inspection.

In addition, the Contractor's design shall comply in all respects with the requirements of the Construction (Design and Management) Regulations 2015 insofar as these extend to Designers and persons directing Designers. Information relating to the Contractor's design shall be utilized in adapting and extending the Health and Safety Plan and File produced under these Regulations and shall be passed to the Principal Designer at the appropriate times and in the appropriate form.

The Contractor shall appoint his own Design Team for the development of the detailed design of the contract. This team shall include if required an Architect, Engineer and other specialists as needed. The Contractor will be required to state which party will be responsible for any such areas of design and to confirm that the design of the whole works, without exclusion will be covered by Professional Indemnity Insurance. The planning stage is to be carried out by the Contractor, and all responsibility and costs associated to obtaining planning permission are to be borne by the contractor. The design liability will be entirely the Contractors responsibility.

Progress meetings chaired by the Employer's Agent will be held at minimum monthly intervals throughout the contract and are to be attended by the Contractor and their Design Team representatives where requested, the Employer, his Agent and Professional Advisers. A Schedule of proposed meeting dates and times will be proposed prior to commencement of works on site.

5.3 Approval of Contractor's Proposals / Technical Submissions

Contractor's Proposals submitted for review should be given a minimum of 2 full working weeks for the Employer's team to comment and approve. The Contractor should factor this into their programmes, so the review process does not delay the project.

5.4 Contract Instructions & Change Orders

All instructions in relation to works are to be confirmed with the Employer's Agent in full accordance with the building contract. The Employer will take no responsibility for abortive works where agreed contract protocol is not followed (see contract documents).

Change orders issued by the Contractor for Employer's instruction should be provided fully costed and with breakdowns and assigned or apportioned to the relevant section of the contract works. Change orders should allow the Employer a minimum of 2 weeks to review and instruct. If

a change order will affect programme this should be clearly identified when sending to the Employer or their representing agent with associated fees for prolongation. If the agreed review period is not adhered to then the contractor will be at fault for any consequential programme delays in accordance with the processes contained within the contract.

5.5 Request for Information (RFI)

A schedule of RFI's should be issued to the Employers Agent at commencement of the work with dates for provision of information. This will then be reviewed at each site meeting.

Any further Contractor RFI's added mid contract should be provided with all the required information for the client to make an informed and the contractor should provide a minimum of 2 weeks for the Employer to provide information and make an informed decision with formal instruction without affecting the programme as detailed above.

5.6 Practical Completion

Prior to the date of planned Practical Completion, the Contractor is to provide written confirmation that the Works are practically complete on the basis that they consider the Works for which they have design responsibility to be practically complete and that they know of no significant reason why the Employer should not accept the Works as practically complete.

Prior to the date of Practical Completion, the Contractor is to give notice of the programmed dates of the whole works or part of the works as required under this Contract. The Contractor will be responsible for ensuring that all necessary access, services, and works are complete and give notice of no less than 2 weeks to the Employer prior to the Works being practically complete.

In additions to the requirements set out above prior to handover the Contractor is required to undertake the following post-handover:

- Completion of any outstanding works, which have been prior agreed with the EA.
- Rectification and making good of any items raised on the snagging list in a timely manner commensurate with the response time to rectification of defects.
- Prepare and agree the Final Account including providing all information as required by the EA to analyse and interrogate the cost included therein.
- Compliance with all statutory consents and provision of all test certification required to safety occupy the space.

The contractor is required to manage the practical completion process openly with the EA allowing input from client representatives.

5.7 O&M File

The Contractor will be expected to provide the completed O&M file two weeks prior to practical completion. The exception to this maybe the testing, commissioning certification and building control approval, which should be provided as an update to the O&M file prior to handover of the building for occupation. The O&M file should be provided with all sections indexed and linked to the contents page. Any link to online files should be divided into their component sections in a neat folder structure. No photocopies or hand sketches are to be included in the O&Ms, in an electronic format and as stated in the PCI with one paper copy to be bound in duplicate and to be left on site.

5.8 Snagging

The contractor should snag and de-snag the project a minimum of one full week prior to inviting the EA to review the site for handover. The EA will have a further week to review snagging for any items that may have been omitted. The contractor should take steps to ensure the site is snag free before offering it up to the Client Team for snagging. It should be noted, if the quantity of snags is excessive and such that the site cannot be used for the purpose intended PC will not be issued.

5.9 Site Set-up

The contractor is required to provide suitable site setup to provide welfare facilities in accordance with Schedule 2 of the CDM Regulations.The contractor should hold sufficient PPE for site visitors. Once the site setup is removed, the contractor should allow to clear the area of the site set up and litter pick around the site before PC.

5.10 Meetings

Formal site meetings should be held on site, the contractor to provide suitable space for all meetings required. Formal site meetings should be held on a 4 weekly basis and brief progress meetings will be required in addition on a weekly basis. An outline agenda, information required and dates/times for the meetings will be communicated during the pre-start meeting.

5.11 Use of Existing Services and Facilities

The contractor will have use of the car parking is permitted limited to 10 spaces; however, a schedule of condition should be taken of the area before use. Any damaged sustained to the car park as a result of the Contractors use will be rectified at the expense of the Contractor. The Site currently has no electrical or water connections, the contractor should make allowance for all temporary services as required.

6.0 Preliminaries and Preambles

6.1 Working Areas

The Contractor's working area and storage areas must be confined to the site unless arrangements are made otherwise. All building operations and storage of materials must be kept within the confines of the site boundary unless arrangements are made otherwise. The parking of the Contractors or his employee's vehicles shall not cause any obstruction on the existing roads around the site.

No materials are to be unloaded or stacked off the site or on the adjoining existing roads.

6.2 Trail Holes or Other Site Investigations

A ground investigation survey of the development adjacent to the site has been obtained. A copy of the report is included in Appendix 7. Although the report does not include our proposed site boundary the contractor is to base their design on the conception the proposed site is of a similar nature and build up to the adjacent land.

The ground investigation report is for guidance only in order to assist in the preparation of tenders and the Employer accepts no responsibility for the accuracy of the information provided. It is the Contractor's responsibility to check the accuracy of the report and make all necessary allowances for the conclusions drawn.

The Contractor is to undertake a new site investigation report to justify their proposals and design.

6.3 Planning

The Contractor is responsible for obtaining all planning permission and consents and all due allowances for this are to be included with in their Tener bid. The Employer will not entertain any additional costs associated to obtaining planning permission not included within their Tender bid.

The Contractor is entirely responsible for ensuring that the development is carried out in accordance with consents granted by, and details submitted to the Local Planning Authority. Any additional fees brought about by the Contractor's Proposals will be borne by the Contractor. Prior to the skate park being handed over the Contractor must obtain written confirmation from the Local Planning Authority that all planning conditions and all reserved matters associated with the Planning Permission have been discharged.

The Contractor shall be responsible for discharging all Conditions contained in consents granted by the Local Planning Authority and obtaining all necessary approvals relating to Section Agreements, including submitting details to and obtaining the approval of the Employer. In addition the Contractor will be required to pay all costs incurred, including the lodging of monies and/or payment of Surety Bonds as required by the relevant Authority.

Should any change to the Employer's Requirements or the Contractor's proposals become necessary for conformity with the terms of any permission, or approval made by decision of a relevant authority, the Contractor shall immediately inform the Employer's Agent in writing of their proposed amendments for complying. Following receipt of the Employer's Agents comments, the Contractor shall entirely at their own cost complete the design and construction of the works in accordance with the amendment.

Compliance with decisions of the planning authority will not constitute a Change in the Employer's Requirements.

The Contractor will be required to arrange for all relevant documentation to be prepared in adequate time for the Employer to enter into any Wayleave Agreements, land lease agreements or the like regarding Statutory Authorities and mains service supply companies. The Contractor shall make due allowance within its programme for the Works to enable the Employer to complete any such agreements.

6.4 Building Control and Building Safety Act

The contractor is to allow for the appointment of an Approved Inspector to undertake the Approved Inspector role.

The contractor is to allow to manage the building control process from instruction to completion ensuring all necessary applications and supporting documents are submitted in the required timescale and the Approved Inspector is consulted and liaised with regarding the design to ensure that the final certificate is provided at handover of the project without conditions.

The Contractor is to assume the role of Building Safety Act Principal Designer and Principal Contractor and shall write to the Employer confirming their appointment if successful.

6.5 RoSPA

The Contractor is to allow for RoSPA applications and inspections to ensure full compliance with certification provided to the employer.

6.6 Information Requests

The Contractor will be responsible for organising a request for information process to include any queries presented by the client team.

6.7 Materials and Workmanship

Materials and workmanship are to be fit for purpose, of the type and quality described herein and of the best quality of their respective kinds. Those for which there is a British Standard are to conform thereto.

Description of materials and workmanship given in any one trade is to apply throughout this Specification unless otherwise described.

The Contractor shall employ only fully qualified, competent, and experienced tradesmen through the Contract period.

All work shall be undertaken in a good and workmanlike manner, to the current relevant legislation and regulations where applicable, and to any recommendations of Trade Organisations with skill and care to produce work fit for its intended purpose and of good quality. Including, but not limited to: -

a) The 18th Edition of the IEE Wiring Regulations with amendments (BS 7671);

b) Health and Safety at Work Act;

c) The Local Authority Building Regulations and subsequent amendments thereto, subject only to the relaxations sanctioned by the Department of the Environment;

d) Specific requirements of the Utility Supply Local Authorities and Local Planning Authorities;

e) The British and European Standards and Codes of Practice;

f) The requirements of the Building Control Officer;

g) The CIBSE Guides including Technical Memorandums;

h) Local Authority Byelaws;

i) The Electricity Supply Act;

j) Construction (Design and Management) Regulations (CDM) 2015;

k) 2010 Equalities Act.

l) A Guide to Good Practice 3rd Edition 1999".

m) HSE Materials Standard ACR (M) 001:2011[Fourth Edition].

All materials, components and systems shall be used strictly in accordance with the manufacturer's recommendations and instructions.

The term "and equal approved" is deemed to be implied where all proprietary products are specifically mentioned by name. The Employer's prior written approval should be obtained before alternatives to materials and components to those specified are used.

The information regarding the site and buildings illustrated in the documents is provided for the Contractor. However, the Contractor should satisfy themselves to verify the accuracy of information given and the Employer will not accept any financial variations as a result of negligence in this respect by the Contractor.

Prior to finalising any colour schedules, all colours and finishes are to be agreed with the Employer.

6.8 Proprietary products

Proprietary products are in all cases to be used and fixed in accordance with any recommendation issued by the supplier and the Contractor is to identify work necessary for complying with any such recommendations that are current at the date of the Contractor's submission.

6.9 Site Inspection

The Contractor must, before tendering, examine the Specification, assess the full extent and nature of the works, visit the site to ascertain the nature of the site, accessibility, and all local conditions and restrictions likely to affect the execution of the works, and assess elements likely to affect labour and the execution of the Contract. No claim for any extra that arose out of the Contractor's omission or neglect in this respect will be admitted.

Access to view the works area is by prior appointment with the Employers Agent.

6.10 Approvals

The whole of the work and materials are to be to the approval of the EA and to the satisfaction of all relevant British Standards, European Standards and other similar technical standards, all Trade Associations and all relevant manufacturer's instruction.

Where the Contractor discovers any discrepancies or ambiguities or should there be any item of work which the Contractor is unclear as to what is required, the Contractor must obtain clarification or instructions from the EA before proceeding.

No qualifications or alterations of any kind are to be made by the Contractor to this schedule of works without the written agreement of the EA.

The Contractor is to provide a cost for each individual item.

6.11 Extras

No extras will be paid for unless ordered as such in writing by the EA.

6.12 Period Of Validity

Tenders must remain open for consideration for a period of 12 weeks from the date fixed for submission of tenders.

6.13 Pre-Construction Health & Safety Information (PCI)

The PCI forms an important part of the employer's requirements and is set out within Appendix 4. The PCI has been provided in accordance with the Construction Design and Management regulations 2015. It is the employer's requirement that the appointed contractor will assume the position as Principal Designer and Principal Contractor under these design regulations from appointment.

The PCI provides details of the existing site and its condition which have been sought out/made available to the client professional team and should be read in conjunction with the design information provided in the ER's. The information provided in the PCI is for guidance only and should not be solely relied upon.

The contractor should develop designs, undertake surveys, checks and investigations as required to ensure their works are compliant and can be managed and maintained safely following completion.

The contractor is to provide copies of the construction phase plan alongside a Principal Designer review process to Bidwells prior to works beginning on site and will be responsible for fulfilling the roles that the duty holders have under the Regulations diligently.

6.14 Keeping the Works Clean

Upon completion of the works to leave all surfaces free from debris and surplus material in good working order and make good all disturbed surfaces to the EA's satisfaction. The surfaces should be cleaned for immediate use.

The contractor is to allow for all provisions necessary to complete the works within this prescribed limit.

The contractor is to inform the Employer's Agent if there is any reason why the programme may not be achievable.

The contractor is to clear away all rubbish arising from the works, excess materials, and plant throughout the contract term and on completion leave the site clean and tidy internally and externally.

The contractor is responsible for covering and protecting all existing surfaces in the surrounding area that do not form part of the works but could be damaged or soiled by the works.

The contractor shall arrange for regular removal of rubbish and redundant materials from the site during the works.

The contractor must provide a waste management plan to the Employer's Agent and dispose of all waste to ensure maximum sustainability.

6.15 Welfare Facilities

The contractor is to provide full welfare facilities and confirm its location. This is to be strictly kept clean and tidy at all times

The contractor is responsible for providing all welfare furniture, fixtures, fittings etc. to ensure that the facilities comply with Schedule 2 of the Construction Design and Management Regulations 2015.

6.16 Deliveries

The contractor is to carefully organise deliveries to avoid disruption. Deliveries to be made HGV/articulated lorries are to be organised outside of busy AM/PM commuting periods as the road can become busy. Deliveries made by small and medium vans are to be carefully managed. The contractor is to ensure that the logistics of deliveries are quickly managed to deliver vehicles parking on the roads in the interim.

6.17 Site Security and Site Hoarding

The contractor is to erect and maintain security to the site and to exclude unauthorised access. The existing site is to be left safe and secure at the end of each working day.

6.18 Parking, Skips and Compounds

Prior to submitting a tender, the contractor is to familiarise themselves with the layout of the site and limitations and restrictions for access and materials. The contractor will be responsible for ensuring that all deliveries and collections of materials and waste can be accommodated for. The contractor is to allow for all special provisions should they be deemed necessary.

The contractor is to always keep road and pathways outside of the site clear especially during deliveries.

Car parking will be available but limited 10 spaces in the existing car park off Blue Boar Lane. The contractor will not be permitted to park vehicles on service roads, paths, or verges of the adjacent site. The exact layout of the compound is to be agreed with the Employer's Agent in advance of the works commencing on site. The skip and compound area are to be kept clean and tidy at all times. The contractor is to provide adequate warning notices and lighting and

ensure that the contractor's compound is secure. All items that are stored on site are at the contractor's own risk.

6.19 Health and Safety

The contractor shall acquaint themselves and comply with all relevant statutory health and safety legislation including Health and Safety at Work Act etc and all revisions thereto and all applicable health and safety guidelines notes standard and products manufacturer's recommendations and guidelines etc. in relation to the storage and use of materials, plants, scaffolding, chemicals etc. all as necessary to safely execute the specified works and implied works not expressly shown in these documents, but which are clearly necessary for the proper and reasonable completion of the works.

The employer will appoint the successful contractor to fulfil the role and duties of Principal Contractor under the Construction Design and Management Regulations 2015.

Prior to commencement on site, the contractor shall provide a job specific construction phase plan complete with site specific risk assessment and method statements for the works. Commencement on site is subject to approval of this construction phase plan, risk assessments and method statements.

Elements of the project may require works and as such the contractor is to provide all necessary insurance, licences and training before this work commencing.

All necessary safety precautions to comply health and safety executive local authority and manufacturers guidance with respect to the following:

- Use of safety helmets and toe protectors.
- Safe transfer of waste to skips.
- Eye and respiratory protection.
- Undertake COSHH assessments where necessary.

The contractor is required to put in place arrangements to control health and safety risks by the legal obligations placed upon them by the Management of Health and Safety at Work Regulations 1999 and in line with their duties under the Health & Safety at Work Act 1974. Whilst not mandated, the use of formal frameworks that use national standards to manage health and safety such as ISO 45001 (occupational health and safety) and BS EN ISO 9001 (quality management) are encouraged, and contractor will be required to set out their arrangements for self-assessment and/or independent audit of H&S performance within their Construction Phase H&S Plan.

The Contractor is responsible for undertaking their role as Principal Designer and Principal Contractor in accordance with The Construction (Design and Management) Regulations 2015 and the Building Safety Act.

The contractor is to note all requirements contained within the Pre-Construction Information pack as requirements to their pricing submission.

Welfare facilities, PPE, risk assessments and method statements are all to be provided for works in advance of start on site. The contractor is responsible for the safety of the site throughout the duration of the contract.

6.20 Asbestos

The contractor should satisfy themselves that they are in acting in accordance with the Regulations at all times throughout the duration of the works.

6.21 Dust

Provide all necessary measures to prevent the passage of dust (including accumulated dust) into adjacent properties as a result of building operations.

Control of noise, pollution and other statutory obligations

Allow for complying with any and all Statutory and Local Authority obligations regarding the control of noise, pollution, etc. which are in force at the time of tender and take all necessary precautions to prevent nuisance from water, smoke, dust, rubbish and other causes at all times for the adjoining owners and others residing in the vicinity of the site.

Provide for taking all reasonable precautions to ensure the efficient protection of all streams and waterways against pollution arising out of or by reason of the execution of the Works.

If pollution occurs the Contractor shall inform the Employer, Employer's Agent and appropriate Authority immediately. If any dust, fumes or other pollution spread beyond the site of the Works, the Contractor shall be responsible for its immediate removal and shall bare all costs arising therefrom.

The Contractor's attention is drawn to the Control of Pollution Act 1974 and that no responsibility will be accepted by the Employer for contravention of the Act by the Contractor, his servants or his sub-contractors nor will any extension of the contract period be granted in respect of any delay due to the enforcement of the Act.

6.22 Completion and Handover

The contractor is to undertake a full professional clean on completion of the works leaving all areas of work in a clean and tidy condition.

Practical completion will not be awarded until the Employer's Agent is in receipt of all guarantees, warranties, building regulations certificates, NICEIC certificates, manufacturer's instructions and product data relating to the works.

7.0 Contractor's Proposals

7.1 Pricing

The contractor's pricing should be provided broken down as required by the client into separate design packages on an elemental bases with individual lines priced for each item of work. All pricing should be quantified or backed with measurements and rates for all elements. Works packages providing only a total sum will not be accepted.

The Contractor shall provide a breakdown of the Preliminaries and General Conditions, including percentages for Overheads and Profits. These should be provided separately for each section of the contract. Statements such as 'included in section 1' will not be accepted.

The Contractor shall include all costs associated with any professional fees, obtaining licences or approvals required to complete the Works in accordance with these Employer's Requirements within their Preliminaries and General Conditions cost breakdown. Any fees that are included in a sub-contract package to complete the design shall be separately identified in the Contractor's cost breakdown.

The Contractor must include both rates and total prices. The Contractor should identify any sub-contractor on costs clearly within the tender if they would like these to be considered for post contract variations.

The Contractor is required to include within their Contract Sum applicable Overheads & Profit which can be applied to any Change formally instructed by the EA.

The transparency of the pricing document is a key requirement from the contractor's return and will be a measurable when scoring the returns for quality and compliance.

To facilitate the Interim Payment Process the Contractor is required to provide sufficient detail within their application for payment at least 1 week prior to the formal 4 week valuation dates throughout the project.

7.2 Provisional Sums

The Contractor should not include provisional sums within their proposals and if required they should be identified in a separate clearly defined list with a clear explanation of the how the allowance has been calculated and why the works could not be priced. If provisional sums are included elsewhere, they will be deemed to be provisional sums between the Contractor and Sub-contractor.

Where provisional sums are included to manage risk then contractors are requested to provide a separate summary sheet within their return providing an optional commercial offer to purchase these risks from the client.

7.3 Pre-Contract Services Agreement Pricing

It is anticipated a Pre-Contract Services Agreement (PCSA) or letter of intent will be put in place prior to entering into contract. The contractor should confirm the works and the associated costs required to be included in the PCSA with the Employer's Agent further appointment of the successful Contractor.

7.4 Variation Pricing

The item totals and rates in the Works Schedules shall apply to authorised variations to the scope of work in accordance with the Conditions of Contract. These totals and rates shall not be adjusted for any change in material prices, wage rates, taxation, or other inflation during the Works.

Post contract pricing should be submitted in a timely manner and in any case within two weeks of any request submitted to the Contractor in writing.

The Contractor should make reasonable endeavours to obtain multiple quotes for any Change Order pricing submitted. Where costs are likely to exceed £10,000 costs must be obtained from a minimum of two suppliers and where costs are likely to exceed £50,000 costs must be obtained from a minimum of three suppliers.

7.5 Qualifications and Clarifications

Any Qualifications and Clarifications should be clearly identified within a separate list. No Qualifications and/or Clarifications included only within the pricing document will be considered unless they are noted in the scope and specification. Otherwise, they will be deemed to be Qualifications and/or Clarifications between the Contractor and Sub- contractor.

7.6 Work Rates

The rates inserted by the Contractor herein shall be deemed to include all costs necessary to carry out the Works in accordance with the information issued to them and available to them for inspection. This shall include all drawing/design work whether specifically included in item descriptions and should include for all works reasonably implied from the drawings and specifications.

All items of work must be priced individually. Terms like “Included Elsewhere”, “Included” etc. must be avoided. Any OH&P and prelim/programme implications should be communicated clearly, and pricing included within rates requested.

7.7 Alternative design solutions or product specification

The Contractor is welcome to offer alternative design solutions or product specification, which may offer value engineering opportunities, whilst retaining the design intent set-out in these Employer’s Requirements.

Value engineering opportunities will only be considered if they constitute a fully priced alternative and are submitted in addition to pricing complying with the requirements specified in the original pricing documents. Value engineering opportunities must contain sufficient supplementary information and data to permit a complete evaluation to be made.

7.8 Construction Programme

The Contractor should submit a detailed programme and clearly set out any alternative proposals alongside their pricing submission. Issues that arise that affect the critical path should be communicated immediately on discovery (within 24hours) with options and associated costs for resolution to remain on the critical path.

7.9 Cashflow Forecast

The Contractor shall submit with their proposals, a detailed cash flow forecast for the proposed contract works. The cash flow forecast should be accurate and linked to the Contract Sum Analysis and relating directly to site-based activities, a standard S Curve graph will not be acceptable. The cashflow forecast should include the following:

- Valuation months and numbers.
- Anticipated monthly valuation amounts.
- Anticipated cumulative valuation.
- Release of retention.

All payments should be net of retention and a final payment shown for release of such monies. All invoices must be issued a minimum of 3 days before the end of the month and the valuation must be issued to Bidwells with the requisite time for EAI assessment and issue of certificates.

7.10 Long Lead Items

Where there are long lead items that require ordering in advance, the contractor should be mindful of this and place orders in due time to ensure timely delivery of the project.

7.11 Value Engineering

Prior to the appointment of the main contractor, there may be a requirement to value engineer the contract sum to an agreeable price that the client can support. The appointed contractor will be expected to work collaboratively with the employer's team to achieve this point of agreeable cost. It will be a requirement that the contractor actively seeks to provide more cost-effective solutions to support the client's needs.

7.12 Contractor's Proposals

Where the contractor is procuring finishes, materials, fixtures, fitting and Equipment, suitable sample boards, mock-ups and samples will be expected to be provided for client team review and approval. As per the design CP's, the contractor should give a minimum of 2 weeks for the client team to review and approve the proposals. If less than 2 weeks is given, any delays to the programme as a result will be the contractor's responsibility.

7.13 Client Direct Contracts & Incumbent Landlord's Contractors / Service Providers

Where packages of work are to be procured as client direct orders with their own supply chain there may be a need for these suppliers to visit site, measure, and survey to ensure their works are coordinated with that constructed. The contractor will be expected to duly accommodate these suppliers needs as a collaborative approach. Some of these packages of works may require site access for initial enabling works or third-party service providers. The contractor should account for this within their programme where informed and accommodate their needs as best as possible.

The contractor is required to make all due allowances for liaising and co-ordinating the proposed Employer's Requirements Works the Landlord's incumbent maintenance contractors & service providers.

APPENDIX 1
PRELIMINARIES

Section 1 - Preliminaries

Issue:

Staus:

Revision:

Issued By: Bidwells

Job Number: JB107044

Date: 22-01-2026

Contents

A10
Project particulars

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 The Project

1. Name: Development Land off Blue Boar Lane
2. Nature: New Build
3. Location: Blue Boar Lane, Norwich, NR7 8RJ
4. Timescale for construction work: 3 months

120 Employer (client)

1. Name: Sprowston Town Council
2. Address: Council Office, Recreation Ground Rd, Norwich NR7 8EW
3. Contact: Guy Ranaweera
4. Telephone: 01603 408063
5. Email: GuyRanaweera@sprowston-tc.gov.uk

130 Principal Contractor (CDM/ Building Regulations)

1. Duties:
2. Name:
3. Address:
4. Contact:
5. Telephone:
6. Email:
7. Competence:
    - 7.1. Standard:
    - 7.2. Evidence of competence:
        - 7.2.1. Submittals:
        - 7.2.2. Timing:

140 Employer's Agent

1. Name: Bidwells LLP
2. Address: Kingfisher House, 1 Gilders Way, Norwich, Norfolk, NR3 1UB
3. Contact: Jason Menezes
4. Telephone: 07787151492
5. Email: JAson.menezes@bidwells.co.uk

150 Principal Designer (CDM/ Building Regulations)

1. Duties: Fulfil all applicable duties that relate to the role of Principal Designer for the purposes of the CDM Regulations and Building Regulations.
2. Name: Bidwells LLP
3. Address: Kingfisher House, 1 Gilders Way, Norwich, Norfolk, NR3 1UB
4. Contact: Christopher Driscoll
5. Telephone: 07976581200
6. Email: christopher.driscoll@bidwells.co.uk

178 Electrical Engineer

1. Name: BWL Consulting (EAST) Limited
2. Address: 300 Peachman Way, Norwich NR7 0LB
3. Contact: Ben Ling
4. Telephone: 07795615289
5. Email: ben.ling@bwlconsulting.net

Ω End of Section

A11
Tender and contract documents REVISED

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Tender Drawings REVISED

1. The tender drawings are: 81304_Blue Boar Lane, Norwich
2. New Item: DETAILED_SOFT_FOR_POS_AREA_L18_REVK-8089415

120 Contract drawings

1. The contract drawings: The same as the tender drawings.
2. Exceptions: TBC

160 Pre-construction information

1. Format: The pre-construction information is described in these Preliminaries in section A34. It refers to information given elsewhere in the Preliminaries, specification, drawings and associated documents.

Ω End of Section

A12
The site/ existing buildings

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 The site

1. Description: The site comprises an undeveloped greenfield area, predominantly covered with natural grassland and wildflower species.

120 Existing buildings on/ adjacent to the site

1. Description: The adjacent buildings comprise of residential houses.

160 Soils and ground water

1. Information: Included in the tender documents.

170 Site investigation

1. Report: Included in the tender documents.

200 Access to the site

1. Description: The site is accessed via Blue boar lane.
2. Limitations: Site is fenced off.
3. Access for inspections: Provide access at reasonable times for both on-site and off-site work.

210 Parking

1. Restrictions on parking of the Contractor's and employees' vehicles: Car parking is available on site.

220 Use of the site

1. General: Do not use the site for any purpose other than carrying out the Works.

240 Health and safety hazards

1. General: The nature and condition of the site/ building cannot be fully and certainly ascertained before it is opened up. However, the following hazards are or may be present:
2. Information: The accuracy and sufficiency of this information is not guaranteed. Ascertain if any additional information is required to ensure the safety of all persons and the works.
3. Site staff: Draw to the attention of all personnel working on the site the nature of any possible contamination and the need to take appropriate precautionary measures.

250 Site visit

1. Assessment: Ascertain the nature of the site, access thereto and all local conditions and restrictions likely to affect the execution of the Works.
2. Arrangements for visit: Access arrangement to be made with ER prior to attending site.

Ω End of Section

A13
Description of the work REVISED

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

120 The works REVISED

1. Description: The construction of a new skate park. The skate park is to be designed and constructed in accordance with the Planning Permission once it has been obtained and all current and relevant codes of practice, legislation, statutory, local authority and RoSPA requirements.

Ω End of Section

A20
JCT Design and Build Contract (DB) REVISED

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

JCT Design and Build Contract

- The Contract: JCT Design and Build Contract (DB), 2024 Edition.
- Requirement: Allow for the obligations, liabilities and services described.

Recitals

First - The Works REVISED

- Comprise: The construction of a new skatepark. The skate park is to be designed and constructed in accordance with the Planning Permission once it has been obtained and all current and relevant codes of practice, legislation, statutory, local authority and RoSPA requirements.

Fifth - Division of the works into sections

- The Fifth Recital will be deleted.

Articles

4 - Employer's Agent

- Employer's Agent: See clause A10/140.

6 - CDM Regulations - Principal Designer and Principal Contractor

- Principal Designer: See clause A10/130.
- Principal Contractor: See clause A10/130.

7 - Building Regulations - Principal Designer and Principal Contractor

- Principal Designer: See clause A10/130.
- Principal Contractor: See clause A10/130.

10 - Legal proceedings

- Amendments: None

Contract Particulars

Fourth recital and clause 4.5 - Construction industry scheme (CIS)

- Employer at the Base Date is a 'contractor' for the purposes of the CIS.

Seventh Recital and Part 2 of Schedule 2 - Supplemental Provisions - Part 2

- Acceleration Quotation: Supplemental Provision 4 Does not apply.
- Health and safety: Supplemental Provision 5 Applies.
- Cost savings and value improvements: Supplemental Provision 6 Applies.
- Performance Indicators and monitoring: Supplemental Provision 7 Does not apply.

Article 5 - Employer's Requirements, Contractor's Proposals, Contract Sum Analysis

- Employer's Requirements: Employers Requirements document and appendices prepared by Bidwells and issued as part of the Tender.
- Contractor's Proposals: TBC
- Contract Sum Analysis: TBC
- Specific Requirements: Contractor submissions including the completed pricing document and a fully costed contract sum analysis (with rates) to be submitted electronically, six weeks from issue of the Employer's Requirements.

  The Contractor's Proposals shall include, finishes schedules, a construction programme and a Contract Sum Analysis. The Contractor should include a copy of the pricing document, their current insurance certificates and a Form of Tender with their tender return.

Article 9 - Arbitration

- Article 9 and clauses 9.4 to 9.9 (Arbitration) Do not apply.

Clause 1.1 - Base Date

- Base Date: March 2026

Clause 1.1 - Date for Completion of the Works

- Date for Completion of the Works (where completion by Sections does not apply): TBC

Clause 1.7.3 - Addresses for service of notices

- Employer
  - Address: Council Office, Recreation Ground Rd, Norwich NR7 8EW
  - Email: Guy.Ranaweera@sprowston-tc.gov.uk
- Contractor
  - Address: TO BE COMPLETED BY CONTRACTOR
  - Email: TO BE COMPLETED BY CONTRACTOR
  - Fax Number: TO BE COMPLETED BY CONTRACTOR

Clause 1.7.4.2 - Service of notices by email

- Clause 1.7.4.2: Applies.
- Employer's email: Guy.Ranaweera@sprowston-tc.gov.uk
- Contractor's email: TO BE COMPLETED BY CONTRACTOR

Clause 2.3 - Date of Possession of the site

- Date of Possession of the site: TBC

Clause 2.4 - Deferment of possession of the site

- Clause 2.4 Does not apply.

Clause 2.17.3 - Limit of Contractor's liability for loss of use, etc.

- Limit of Contractor's liability for loss of use: Unlimited.

Clause 2.29.2 - Liquidated damages

- Damages: At the rate of 1000 per week.

Clause 2.35 - Rectification Period

- Period: 12 months from the date of practical completion of the Works.

Clause 4.2, 4.12 and 4.13 - Fluctuations Provision

- Fluctuations Provision: No Fluctuations Provision applies

Clause 4.6 - Advance payment and Advance Payment Bond

- Advance payment: Clause 4.6 does not apply.

Clause 4.7 - Method of payment - Alternative B

- Payment: Periodically, in accordance with Alternative B.

Clause 4.7.2 - Interim Payments - Interim Valuation Dates

- The first Interim Valuation Date is: 4 calendar weeks from the date of possession of site and thereafter the same date in each month or the nearest Business Day in that month.

Clause 4.17 - Contractor's Retention Bond

- Clause 4.17 does not apply.

Clause 4.18.1 - Retention Percentage

- Retention: 3/1.5 per cent.

Clause 4.21.6 and 4.21.7 - Relevant Matters

- Clause 4.21.6 (the effects of an epidemic on the execution of the Works etc.) Applies.
- Clause 4.21.7 (exercise of a statutory power etc.) Applies.

Clause 5.5 - Daywork

- Percentage Additions to each section of the prime cost or, if they apply in respect of labour, the All-Inclusive Rates, are set out in the following document: Not applicable.

Clause 6.4.1 - Contractor's Public Liability Insurance: Injury to persons or property

- Insurance cover for any one occurrence or series of occurrences arising out of one event: Five Million Pounds.

Clause 6.5.1 - Insurance - liability of Employer

- Minimum amount of indemnity for any one occurrence or series of occurrences arising out of one event: Five Million Pounds.

Clause 6.7 and Schedule 3 - Works Insurance - Insurance Option applicable

- Schedule 3
  - Insurance Option A applies.

- Percentage to cover professional fees: 15 per cent
- Where Insurance Option A applies, annual renewal date (as supplied by the Contractor): TO BE COMPLETED BY CONTRACTOR

Clause 6.10 and Schedule 3 - Terrorism Cover

- Details of the required cover
  - Pool Re Cover is required.

Clause 6.15 - Professional Indemnity Insurance

- Level of cover
  - Amount of indemnity required: Is for any one claim or series of claims arising out of one event
  - and is £ 5,000.000.00.
- Sub-limits within the overall level of cover: is not required.
- Specific exclusions: None.
- Expiry of required period of Professional Indemnity Insurance: 12 years

Clause 6.17 - Joint Fire Code

- The Joint Fire Code: Does not apply

Clause 7.2 - Assignment/ grant by Employer of rights under clause 7.2

- Clause 7.2 Applies.

Clause 7.3.1 - Performance bond or guarantee

- Bond or guarantee from bank or other approved surety: Is not required

Clause 7.3.2 - Guarantee from the Contractor's parent company

- Guarantee: Is not required

Clause 7.4 - Third Party Rights and Collateral Warranties

- Details: As set out in the following documents: The employers requirments.

Clause 8.9.2 - Period of suspension (termination by Contractor)

- Period of suspension: Two months

Clauses 8.11.1.1 to 8.11.1.7 - Period of suspension (termination by either Party)

- Period of suspension: Two months

Clause 9.1 - Notification and negotiation of disputes

- The respective nominees of the Parties are
  - Employer's nominee: Bidwells LLP
  - Contractor's nominee: TO BE COMPLETED BY CONTRACTOR
- Or such replacement as each Party may notify to the other from time to time.

Clause 9.3.1 - Adjudication

- The Adjudicator is:
- Nominating body: Where no Adjudicator is named or where the named Adjudicator is unwilling or unable to act (whenever that is established): The Royal Institution of Chartered Surveyors

Clause 9.5.1 - Arbitration

- Appointor of Arbitrator (and of any replacement): President or a Vice President of the Royal Institution of Chartered Surveyors

Conditions - No Amendments

Section 1: Definitions and Interpretation - No Amendments

Section 2: Carrying out the Works - No Amendments

Section 3: Control of the Works - No Amendments

Section 4: Payment - No Amendments

Section 5: Changes - No Amendments

Section 6: Injury, Damage and Insurance - No Amendments

Section 7: Assignment, Performance Bonds and Guarantees, Third Party Rights and Collateral Warranties - No Amendments

Section 8: Termination - No Amendments

Section 9: Settlement of Disputes - No Amendments

Project Bank Account - No Amendments

Execution

Execution

- The contract: Will be executed As a deed.

Ω End of Section

A30
Tendering/ subletting/ supply

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Main contract tendering

110 Scope

1. General: These conditions are supplementary to those stated in the invitation to tender and on the form of tender.

145 Tendering procedure

1. General: In accordance with the principles of: NBS Guide to Tendering for Construction Projects..
2. Arithmetical errors: Pricing document is dominant.

160 Exclusions

1. Inability to tender: Immediately inform if any parts of the work as defined in the tender documents cannot be tendered.
2. Relevant parts of the work: Define those parts, stating reasons for the inability to tender.

170 Acceptance of tender

1. Acceptance: No guarantee is offered that any tender will be recommended for acceptance or be accepted, or that reasons for non acceptance will be given.
2. Costs: No liability is accepted for any cost incurred in the preparation of any tender.

190 Period of validity

1. Period: After submission or lodgement, keep tender open for consideration (unless previously withdrawn) for not less than three months.
2. Date for possession: See section A20.

Pricing/ submission of documents

210 Preliminaries in the specification

1. The Preliminaries/ General conditions sections (A10-A56 inclusive) have been prepared in accordance with NRM2.

220 Pricing of preliminaries

1. Abbreviations - the following have been used:
   1.1. F = Fixed charge item.
   1.2. TR = Time related charge item.

310 Tender

1. General: Tenders must include for all work shown or described in the tender documents as a whole or clearly apparent as being necessary for the complete and proper execution of the Works.

440 Contract sum analysis

1. Content of the Analysis: A breakdown of the Contract Sum into the following categories.
2. Form: As set out in the Employers Requirements.
3. Fully priced copy: Submit with tender.

480 Programme

1. Programme of work: Prepare a summary showing the sequence and timing of the principal parts of the Works and periods for planning and design. Itemize any work which is excluded.
2. Submit: With tender

500 Tender stage method statements

1. Method statements: Prepare, describing how and when the following is to be carried out:
   1.1. The whole of the works in accordance with the employers requirements.
2. Statements: Submit With the tender.

515 Alternative time tenders

1. General: In addition to and at the same time as tendering based upon the date or period specified in section A20, an alternative tender based upon a different date for completion or period may be submitted.
2. Date for Completion: If any such tender is accepted the Date for Completion inserted in the Contract will be the date stated in the alternative tender or determined from the period stated in the alternative tender.

520 Contractor's proposals

1. Proposals – include the following:
   1.1. Design drawings: A full specification of products, equipment, plant and methods of construction for all works.
   1.2. Technical information: A full specification of products, equipment, plant and methods of construction for all works.
2. Submit: With tender.

540 Quality control resources

1. Statement: Describe the organization and resources to control the quality of the Works, including the work of subcontractors.
2. QA staff: Identify in the statement the number and type of staff responsible for quality control, with details of their qualifications and duties.
3. Submit: With the tender

550 Health and safety information

1. Content: Describe the proposed organization and resources to safeguard the health and safety of operatives, including those of subcontractors, and of any person whom the Works may affect.
2. Include:
   2.1. Policy document: A copy of the Contractor's health and safety policy documents, including risk assessment procedures.
   2.2. Records: Accident and sickness records for the past five years and of any previous Health and Safety Executive enforcement action.
   2.3. Training: Records of training and training policy.
   2.4. Personnel: The proposed number and type of staff responsible for health and safety on this project with details of their qualifications and duties.
3. Submit:

570 Outline construction phase health and safety plan

1. Content: Submit the following documentation:
   1.1. Risk assessment: Method statements on how risk from hazards identified in the pre-construction information and other hazards identified by the contractor will be addressed. Procedures for carrying out risk assessment and for managing and controlling the risk.
   1.2. Management system: Details of the proposed management structure, responsibilities and arrangements for issuing health and safety directions. Include procedures for informing other contractors and employees of health and safety hazards.
   1.3. Selection: Proposed procedure for ensuring competency of other contractors, the self-employed and designers.
   1.4. Communication: Procedures for communications between the project team, other contractors and site operatives. Include arrangements for cooperation and coordination between contractors.
   1.5. Emergency: Procedures including those for fire prevention and escape.
   1.6. Records: Arrangements for ensuring that accidents, illness and dangerous occurrences are recorded.
   1.7. Personnel: Procedures for ensuring that persons on site have received relevant health and safety information and training. Include arrangements for consulting with and taking the views of people on site, for preparing site rules and drawing them to the attention of those affected and ensuring compliance.
   1.8. Monitoring: Monitoring procedures to ensure compliance with site rules, selection and management procedures, health and safety standards and statutory requirements. Review procedures to obtain feedback.
   1.9. Welfare facilities: Include appropriate arrangements.
2. Submittal date: Within one week of request.

590 Site Waste Management Plan

1. Details: As per the Pre-Construction information pack.

599 Freedom of Information Act

1. Records: Retain, make available for inspection and supply on request information reasonably required to allow response to requests made under the provisions of the Freedom of Information Act.
2. Determination: Submit requests received. Do not supply information to anyone other than the project participants without express written permission.
3. Confidentiality: Maintain at all times.

Subletting/ supply

630 Domestic subcontracts

1. Details: Provide details of all subcontractors and the work for which they will be responsible.
2. Submit: Within one week of request

Ω End of Section

A31
Provision, content and use of documents

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Definitions and interpretations

110 Definitions

1. Meaning: Terms, derived terms and synonyms used in the Preliminaries/ general conditions and specification are as stated here or in the appropriate referenced document.

120 Communication

1. Definition: Includes advise, inform, submit, give notice, instruct, agree, confirm, seek, provide or obtain information, consent or instructions, or make arrangements.
2. Format: In writing to the person named in clause A10/140 unless specified otherwise.
3. Response: Do not proceed until response has been received.

130 Products

1. Definition: Materials, both manufactured and naturally occurring, and goods, including components, equipment and accessories, intended for the permanent incorporation in the Works.
2. Includes: Goods, plant, materials, site materials and things for incorporation into the Works.

135 Site equipment

1. Definition: Apparatus, appliances, machinery, vehicles or things of whatsoever nature required in or about the construction for the execution and completion of the Works but not materials or other things intended to form or forming part of the Permanent Works.
2. Includes: Construction appliances, vehicles, consumables, tools, temporary works, scaffolding, cabins and other site facilities.
3. Excludes: Products and equipment or anything intended to form or forming part of the permanent works.

140 Drawings

1. Definitions: To BSRIA BG 6 Design framework for building services.
2. CAD data: In accordance with BS EN ISO 19650.

145 Contractor's choice

1. Meaning: Selection delegated to the Contractor, but liability to remain with the specifier.

150 Contractor's Design

1. Meaning: Design to be carried out or completed by the Contractor and supported by appropriate contractual arrangements, to correspond with specified requirements.

155 Submit proposals

1. Meaning: Submit information in response to specified requirements.

160 Terms used in specification

1. Remove: Disconnect, dismantle as necessary and take out the designated products or work and associated accessories, fixings, supports, linings and bedding materials. Dispose of unwanted materials. Excludes removal and disposal of associated pipework, wiring, ductwork or other services.
2. Remediate: Action or measures taken to lessen, clean up, remove or mitigate the existence of hazardous materials; in accordance with standards, or requirements as may be set out by statutes, rules, regulations or specification.

3. Fix: Receive, unload, handle, store, protect, place and fasten in position; dispose of waste and surplus packaging. To include all labour, materials and site equipment for that purpose.
4. Supply and fix: As above, but including supply of products, components or systems to be fixed, together with everything necessary for their fixing. All products, components or systems are to be supplied and fixed unless stated otherwise.
5. Keep for reuse: Do not damage designated products or work. Clean off bedding and jointing materials. Stack neatly, protect adequately and store until required by the employer/ purchaser, or until required for use in the works as instructed.
6. Keep for recycling: As 'keep for reuse', but relates to a naturally occurring material rather than a manufactured product.
7. Make good: Execute local remedial work to designated work. Make secure, sound and neat. Excludes redecoration and/ or replacement.
8. Replace: Supply and fix new products matching those removed. Execute work to match original new state of that removed.
9. Repair: Execute remedial work to restore something to its original working state. Make secure, sound and neat. Excludes redecoration and/ or replacement.
10. Refix: Fix removed products.
11. Ease: Adjust moving parts of designated products, or work to achieve free movement and good fit in open and closed positions.
12. Match existing: Provide products and work of the same appearance and features as the original, excluding ageing and weathering. Make joints between existing and new work as inconspicuous as possible.
13. System: Equipment, accessories, controls, supports and ancillary items (including installation) necessary for that section of the work to function.
14. Building Manual: A document containing information of use to subsequent building owners, occupiers and users about the requirements and procedures for effective operation, maintenance, decommissioning and demolition of the building.

170 Manufacturer and product reference

1. Definition: When used in this combination:
    1.1. Manufacturer: The person or legal entity under whose name or trademark the particular product, component or system is marketed
    1.2. Product reference: The proprietary brand name and/ or identifier by which the particular product, component or system is described.
2. Currency: References are to the particular product as specified in the manufacturer's technical literature current on the date of the invitation to tender.

200 Substitution of products

1. Products: If an alternative product to that specified is proposed, obtain approval before ordering the product.
2. Reasons: Submit reasons for the proposed substitution.
3. Information to be submitted:
    - Manufacturer and product reference.
    - Cost.
    - Availability.
    - Relevant standards.
    - Performance.
    - Function.
    - Compatibility of accessories.

- Proposed revisions to drawings and specification.
- Compatibility with adjacent work.
- Appearance.
- Copy of warranty or guarantee.

4. Alterations to adjacent work: If needed, advise scope, nature and cost.
5. Manufacturers' guarantees: If substitution is accepted, submit before ordering products.

210 Cross references

1. Accuracy: Check remainder of the annotation or item description against the terminology used in the section or clause referred to.
2. Related terminology: Where a numerical cross reference is not given, the relevant sections and clauses of the specification will apply.
3. Relevant clauses: Clauses in the referred to specification section dealing with general matters, ancillary products and execution also apply.
4. Discrepancy or ambiguity: Before proceeding, obtain clarification or instructions.

220 Referenced documents

1. Conflicts: Specification prevails over referenced documents.

230 Equivalent products

1. Inadvertent omission: Wherever products are specified by proprietary name the phrase 'or equivalent' is to be deemed included.

240 Substitution of standards

1. Specification: To British Standard or European Standard.
2. Substitution: May be proposed complying with a grade or category within a national standard of another Member State of the European Community or an International Standard recognized in the UK.
3. Before ordering: Submit notification of all such substitutions.
4. Documentary evidence: Submit for verification when requested as detailed in clause A31/200. Any submitted foreign language documents must be accompanied by certified translations into English.

250 Currency of documents and information

1. Currency: References to published documents are to the editions, including amendments and revisions, current on the date of the invitation to tender.

260 Sizes

1. General dimensions: Products are specified by their co-ordinating sizes.
2. Timber: Cross section dimensions shown on drawings are:
   Target sizes as defined in BS EN 336 for structural softwood and hardwood sections.
   Finished sizes for non-structural softwood or hardwood sawn and further processed sections.

Documents provided on behalf of employer

410 Additional copies of the drawings/ documents

1. Additional copies: Issued free of charge.

440 Dimensions

1. Scaled dimensions: Do not rely on.

460 The specification

1. Coordination: All sections must be read in conjunction with Main Contract Preliminaries/ General conditions.

Documents provided by contractor/ subcontractors/ suppliers

510 Changes/ amendments to Employer's Requirements

1. Contractor's changes to Employer's Requirements: Support request for substitution or variation with all relevant information.
2. Employer's amendments to Employer's Requirements: If considered to involve a variation, which has not already been acknowledged as a variation, notify without delay (maximum period 7 days), and do not proceed until instructed. Claims for extra cost, if made after the variation has been carried out, may not be allowed.
3. Submit: One copy

600 Contractor's Design information

1. Master programme: Make reasonable allowance for completing design/ production information, submission (including information relevant to the CDM Regulations), comment, inspection, amendment, resubmission and reinspection.
2. Information required: In accordance with section A20.
   2.1. Format: Digital
   2.2. Number of copies: one
3. Submit: Within one week of request.

620 As-built drawings and information

1. General: Provide the following drawings/ information:
   1.1. In accordance with A20.
2. Submit: At least two weeks before date for completion.

640 Maintenance instructions and guarantees

1. Components and equipment: Obtain or retain copies, register with manufacturer and hand over on or before completion of the Works.
2. Information location: In Building Manual.
3. Emergency call out services: Provide telephone numbers for use after completion. Extent of cover: Office hours only.

Document/ data interchange - No Amendments

Ω End of Section

A32
Management of the works

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Generally

110 Supervision

1. General: Accept responsibility for coordination, supervision and administration of the Works, including subcontracts.
2. Coordination: Arrange and monitor a programme with each subcontractor, supplier, local authority and statutory undertaker, and obtain and supply information as necessary for coordination of the work.

115 Considerate Constructors Scheme

1. Registration: Before starting work, register the site and pay the appropriate fee.
2. Contact
   - 2.1. Address: Considerate Constructors Scheme Office, The Maltings, Hoe Lane, Ware, SG12 9LR.
   - 2.2. Tel: 01920 485959.
   - 2.3. Free phone: 0800 7831423.
   - 2.4. Web: www.ccscheme.org.uk.
   - 2.5. E mail: enquiries@ccscheme.org.uk.
3. Standard: Comply with the scheme's Code of Considerate Practice.
   - 3.1. Minimum compliance level: Excellent

118 Vehicle safety requirements

1. Vehicle equipment: Ensure that all vehicles have the following:
   - 1.1. Audible alert to other road users to the planned movement of the vehicle when the vehicle's indicators are in operation.
   - 1.2. Prominent signage at the rear of the vehicle to warn cyclists of the dangers of passing the vehicle on the inside.
   - 1.3. Properly adjusted class VI mirror/s or Fresnel lens to eliminate the near side blind spot.
   - 1.4. Side under run guards.
2. Driver training
   - 2.1. Drivers must be trained on vulnerable road user safety through an approved course and hold a current valid Certificate of Competence.
   - 2.2. Drivers must have a valid driving licence and be legally able to drive the vehicle.
3. Scheme membership: Submit evidence of registration with and accreditation to the Fleet Operator Recognition Scheme (FORS)
4. Level of accreditation: Bronze
5. Submittal date: within seven days of request.

120 Insurance

1. Documentary evidence: Before starting work on site submit details, and/ or policies and receipts for the insurances required by the Conditions of Contract.

130 Insurance claims

1. Notice: If any event occurs which may give rise to any claim or proceeding in respect of loss or damage to the Works or injury or damage to persons or property arising out of the Works, immediately give notice to the employer/ client, the person administering the Contract on their behalf and the Insurers.

2. Failure to notify: Indemnify the employer/ client against any loss, which may be caused by failure to give such notice.

140 Climatic conditions

1. Information: Record accurately and retain:
   1.1. Daily maximum and minimum air temperatures (including overnight).
   1.2. Delays due to adverse weather, including description of the weather, types of work affected and number of hours lost.

150 Ownership

1. Alteration/ clearance work: Materials arising become the property of the Contractor except where otherwise stated. Remove from site as work proceeds.

Programme/ progress

210 Programme

1. Master programme: When requested and before starting work on site, submit in an approved form a master programme for the works, which must include details of:
   1.1. Design, production information and proposals provided by the contractor/ subcontractors/ suppliers, including inspection and checking (see section A31).
   1.2. Planning and mobilization by the contractor.
   1.3. Earliest and latest start and finish dates for each activity and identification of all critical activities.
   1.4. Running in, adjustment, commissioning and testing of all engineering services and installations
   1.5. Work resulting from instructions issued in regard to the expenditure of provisional sums (see section A54)
   1.6. Work by or on behalf of the employer and concurrent with the contract (see section A50). The nature and scope of which, the relationship with preceding and following work and any relevant limitations are suitably defined in the contract documents.
2. Exclusions: Where and to the extent that the programme implications for work which is not so defined are impossible to assess, exclude it and confirm this when submitting the programme.
3. Submit: one copy

240 Notice of commencement of work

1. Part of the work: Commencement of works on site.
2. Notice period (minimum): one week

250 Monitoring

1. Progress
   1.1. Records: Record on a copy of the programme kept on site.
   1.2. Delays: Minimize. Take appropriate action to recover lost time.
   1.3. Corrective action: Where progress falls below target, submit proposals.
   1.4. Submittal date: As soon as possible.
   1.5. Completion forecast: Submit on the last working day of each week.

260 Site meetings

1. General: Site meetings will be held to review progress and other matters arising from administration of the Contract.
2. Frequency: Every month
3. Location: On site.
4. Accommodation: Ensure availability at the time of such meetings.
5. Attendees: Attend meetings and inform subcontractors and suppliers when their presence is required.
6. Chairperson (who will also take and distribute minutes): Employer's representative

290 Notice of completion

1. Requirement: Give notice of the anticipated dates of completion of the whole or parts of the Works.
2. Associated works: Ensure necessary access, services and facilities are complete.
3. Period of notice (minimum): Two weeks

Control of cost

410 Cash flow forecast

1. Submission: Before starting work on site, submit a forecast showing the gross valuation of the Works at the date of each Interim Certificate throughout the Contract period. Base on the programme for the Works.

420 Removal/ replacement of existing work

1. Extent and location: Agree before commencement.
2. Execution: Carry out in ways that minimize the extent of work.

440 Measurement

1. Covered work: Give notice before covering work required to be measured.

450 Daywork vouchers

1. Before commencing work: Give reasonable notice to person countersigning daywork vouchers.
2. Content: Before delivery each voucher must be:
   2.1. Referenced to the instruction under which the work is authorised.
   2.2. Signed by the Contractor's person in charge as evidence that the operatives' names, the time spent by each, the plant and materials shown are correct.

460 Interim payments

1. Application by Contractor: If made under Conditions of Contract clause 4.9 include details of amounts considered due together with all supporting information.

470 Products not incorporated into the Works

1. Ownership: At the time of each valuation, supply details of those products not incorporated into the Works which are subject to any reservation of title inconsistent with passing of property as required by the Conditions of Contract, together with their respective values.
2. Evidence: When requested, provide evidence of freedom of reservation of title.

475 Listed products stored off site

1. Evidence of Title: Submit reasonable proof that the property in 'listed items' is vested in the Contractor.
2. Include for products purchased from a supplier: A copy of the contract of sale and a written statement from the supplier that any conditions of the sale relating to the passing of property have been fulfilled and the products are not subject to any encumbrance or charge.
3. Include for products purchased from a supplier by a subcontractor or manufactured or assembled by any subcontractor: Copies of the subcontract with the subcontractor and a written statement from the subcontractor that any conditions relating to the passing of property have been fulfilled.

480 Labour and equipment returns

1. Records: Provide for verification at the beginning of each week in respect of each of the previous seven days.
2. Records must show
   2.1. The number and description of craftsmen, labourers and other persons directly or indirectly employed on or in connection with the Works or Services, including those employed by subcontractors.
   2.2. The number, type and capacity of all mechanical, electrical and power-operated equipment employed in connection with the Works or Services

Ω End of Section

A33
Quality standards/ control

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Standards of products and executions

110 Incomplete documentation

1. General: Where and to the extent that products or work are not fully documented, they are to be:
   1.1. Standard: Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
   1.2. Suitability: Suitable for the purposes stated or reasonably to be inferred from the project documents.
2. Contract documents: Omissions or errors in description and/ or quantity shall not vitiate the Contract nor release the Contractor from any obligations or liabilities under the Contract.

120 Workmanship skills

1. Operatives: Appropriately skilled and experienced for the type and quality of work.
2. Registration: With Construction Skills Certification Scheme.
3. Verification: When requested, operatives must produce evidence of skills/ qualifications.

130 Quality of products

1. Generally: New. (Proposals for recycled products may be considered.)
2. Supply of each product: From the same source or manufacturer.
3. Whole quantity of each product required to complete the Works: Consistent kind, size, quality and overall appearance.
4. Tolerances: Where critical, measure a sufficient quantity to determine compliance.
5. Deterioration: Prevent. Order in suitable quantities to a programme and use in appropriate sequence.

135 Quality of execution

1. Generally: Fix, apply, install or lay products securely, accurately, plumb, neatly and in alignment.
2. Colour batching: Do not use different colour batches where they can be seen together.
3. Dimensions: Check on-site dimensions.
4. Finished work: Not defective, e.g. not damaged, disfigured, dirty, faulty, or out of tolerance.
5. Location and fixing of products: Adjust joints open to view so they are even and regular.

140 Evidence of Compliance

1. Proprietary products: Retain on site evidence that the proprietary product specified has been supplied.
2. Performance specification: Submit upon request evidence of compliance with performance specifications, including:
   - Test reports indicating properties tested.
   - Pass or fail criteria.
   - Test methods and procedures.
   - Test results.
   - Identity of testing agency.
   - Test dates and times.
   - Identities of witnesses.
   - Analysis of results.

150 Inspections

1. Products and executions: Inspection, or other action, of products or executions must not be taken as approval, unless confirmed in writing and including:
    - Date of inspection.
    - Part of the work inspected.
    - Respects or characteristics which are approved.
    - Extent and purpose of the approval.
    - Any associated conditions.

160 Related work

1. Details: Provide all trades with necessary details of related types of work. Before starting each new type or section of work ensure previous related work is:
    - Appropriately complete.
    - In accordance with the project documents.
    - To a suitable standard.
    - In a suitable condition to receive the new work.
2. Preparatory work: Ensure that all necessary preparatory work has been carried out.

170 Manufacturer's recommendations/ instructions

1. General: Comply with manufacturer's printed recommendations and instructions current on the date of the Invitation to tender.
2. Exceptions: Submit details of changes to recommendations or instructions.
3. Execution: Use ancillary products and accessories supplied or recommended by main product manufacturer.
4. Products: Comply with limitations, recommendations and requirements of relevant valid certificates.

Samples/ approvals

210 Samples

1. Products or executions: Comply with all other specification requirements and in respect of the stated or implied characteristics either:
    - To an express approval.
    - To match a sample expressly approved as a standard for the purpose.

220 Approval of products

1. Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
2. Approval: Relates to a sample of the product and not to the product as used in the Works. Do not confirm orders or use the product until approval of the sample has been obtained.
3. Complying sample: Retain in good, clean condition on site. Remove when no longer required.

230 Approval of execution

1. Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
2. Approval: Relates to the stated characteristics of the sample. (If approval of the finished work as a whole is required this is specified separately). Do not conceal, or proceed with affected work until compliance with requirements is confirmed.

3. Complying sample: Retain in good, clean condition on site. Remove when no longer required.

Accuracy/ setting out generally

320 Setting out

1. General: Submit details of methods and equipment to be used in setting out the Works.
2. Levels and dimensions: Check and record the results on a copy of drawings. Notify discrepancies and obtain instructions before proceeding.
3. Inform: When complete and before commencing construction.

330 Appearance and fit

1. Tolerances and dimensions: If likely to be critical to execution or difficult to achieve, as early as possible either:
    - Submit proposals; or
    - Arrange for inspection of appearance of relevant aspects of partially finished work.
2. General tolerances (maximum): To BS 5606, Tables 1 and 2.

350 Levels of structural floors

1. Maximum tolerances for designed levels to be
    1.1. Floors to be self-finished, and floors to receive sheet or tile finishes directly bedded in adhesive: +/- 10 mm.
    1.2. Floors to receive dry board/ panel construction with little or no tolerance on thickness: +/- 10 mm.
    1.3. Floors to receive mastic asphalt flooring/ underlays directly: +/- 10 mm.
    1.4. Floors to receive mastic asphalt flooring/ underlays laid on mastic asphalt levelling coat(s): +/- 15 mm.
    1.5. Floors to receive fully bonded screeds/ toppings/ beds: +/- 15 mm.
    1.6. Floors to receive unbonded or floating screeds/ beds: +/- 20 mm.

360 Record drawings

1. Site setting out drawing: Record details of all grid lines, setting-out stations, benchmarks and profiles. Retain on site throughout the Contract and hand over on completion.

Services generally

410 Services regulations

1. New or existing services: Comply with the bye-laws or regulations of the relevant statutory authority.

420 Water regulations/ bye-laws notification

1. Requirements: Notify water Statutory Provider of any work carried out to, or which affects, new or existing services. Submit required plans, diagrams and details.
2. Consent: Allow adequate time to receive Statutory Provider's consent before starting work. Inform the Employer immediately if consent is withheld or is granted subject to significant conditions.

430 Water regulations/ bye-laws contractor's certificate

1. On completion of the work: Submit a certificate (copy where also required to the water Statutory Provider), including:
   1.1. Installation: Description of the new installation and/ or the work carried out to an existing installation, including the address.
   1.2. Statement: Confirmation that the installation complies with the relevant water regulations or bye-laws.
   1.3. Inspection: Provide the Contractor's name and address, the name and signature of the individual responsible for checking compliance and the date on which the installation was checked.

435 Electrical installation certificate

1. Submit: When relevant electrical work is completed.
2. Original certificate: To be lodged in the Building Manual.

450 Mechanical and electrical services

1. Final tests and commissioning: Carry out so that services are in full working order at completion of the Works.
2. Building Regulations notice: Copy to be lodged in the Building Manual.

Supervision/ inspection/ defective work

510 Supervision

1. General: The whole of the contract work and any significant parts must be under the close control of competent trade supervisors to ensure maintenance of satisfactory quality, progress and coordination.
2. Evidence: Submit, including details of:
   - the person proposed;
   - their relevant skills training and knowledge;
   - practical experience;
   - qualifications;
   - membership or registration with professional bodies;
   - employment history;
   - work related assessments; and
   - management structure.
3. Submittal date: Within one week of request
4. Replacement: Give maximum possible notice before changing supervisory personnel.

520 Coordination of engineering services

1. Suitability: Site organization staff must include one or more persons with appropriate knowledge and experience of mechanical and electrical engineering services to ensure compatibility between engineering and the Works generally.
2. Evidence: Submit on request, including:
   - details of the person proposed;
   - their relevant skills, training and knowledge;
   - practical experience;
   - qualifications; membership or registration with professional bodies;
   - employment history;

- work-related assessments; and
- management structure.

530 Overtime working

1. Notice: Prior to overtime being worked, submit details of times, types and locations of work to be done.
   1.1. Minimum period of notice: One week
2. Concealed work: If executed during overtime for which notice has not been given, it may be required to be opened up for inspection and reinstated at the Contractor's expense.

540 Defects in existing work

1. Undocumented defects: When discovered, immediately give notice. Do not proceed with affected related work until response has been received.
2. Documented remedial work: Do not execute work which may hinder access to defective products or work, or be rendered abortive by the remedial work.

550 Access for inspection

1. Removal: Before removing scaffolding or other facilities for access, give notice of not less than Three days.

560 Tests and inspections

1. Timing: Agree and record dates and times of tests and inspections to enable all affected parties to be represented.
2. Confirmation: One working day prior to each such test or inspection. If sample or test is not ready, agree a new date and time.
3. Records: Submit a copy of test certificates and retain copies on site.

610 Proposals for rectification of defective products/ executions

1. Proposals: Where any execution or product is, or appears to be, not in accordance with the Contract, immediately submit proposals for opening up, inspection, testing, making good, adjustment of the Contract Sum, or removal and re-execution.
2. Acceptability: Such proposals may be unacceptable and contrary instructions may be issued.

620 Measures to establish acceptability

1. General: Wherever inspection or testing shows that the work, materials or goods are not in accordance with the contract and measures (e.g. testing, opening up, experimental making good) are taken to help in establishing whether or not the work is acceptable, such measures will be at the expense of the Contractor, and will not be considered as grounds for revision of the Completion Date.

630 Quality control

1. Procedures: Establish and maintain to ensure that the Works, including the work of subcontractors, comply with specified requirements.
2. Records: Maintain full records, keep copies on site for inspection, and submit copies on request.
3. Content of records
   3.1. Identification: Describe each element, item, batch or lot including location in the Works.
   3.2. Inspections, tests and approvals: Describe purpose and dates.
   3.3. Nonconforming work: Describe nature and extent of work found.

3.4. Corrective action: Details of work carried out.

Work at or after completion

710 Work before completion

1. General: Make good all damage consequent upon the Works.
2. Temporary markings, coverings and protective wrappings: Remove unless otherwise instructed.
3. Cleaning: Clean the Works thoroughly inside and out, including all accessible ducts and voids. Remove all splashes, deposits, efflorescence, rubbish and surplus materials.
4. Cleaning materials and methods: As recommended by manufacturers of products being cleaned, and must not damage or disfigure other materials or construction.
5. COSHH dated data sheets: Obtain for all materials used for cleaning and ensure they are used only as recommended by their manufacturers.
6. Minor faults: Touch up in newly painted work, carefully matching colour and brushing out edges. Repaint badly marked areas back to suitable breaks or junctions.
7. Moving parts of new work: Adjust, ease and lubricate as necessary to ensure easy and efficient operation, including doors, windows, drawers, ironmongery, appliances, valves and controls.

720 Security at completion

1. General: Leave the Works secure with, where appropriate, all accesses closed and locked.
2. Keys: Account for and adequately label all keys, and hand over together with an itemized schedule, retaining duplicate schedule signed as a receipt.

730 Making good defects

1. Remedial work: Arrange access with Contract Administrator.
2. Rectification: Give reasonable notice for access to the various parts of the Works.
3. Completion: Notify when remedial works have been completed.

Ω End of Section

A34
Security/ safety/ protection

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Security, health and safety

110 Pre-construction information

1. Location: Integral with the project Preliminaries, including but not restricted to the following sections:
   1.1. Description of project: Sections A10 and A11.
   1.2. Client's consideration and management requirements: Sections A12, A13 and A36.
   1.3. Environmental restrictions and on-site risks: Section A12, A35 and A34.
   1.4. Significant design and construction hazards: Section A34.
   1.5. The health and safety file: Section A37.

130 Product hazards

1. Hazardous substances: Site personnel levels must not exceed occupational exposure standards and maximum exposure limits stated in the current version of HSE document EH40: Workplace exposure limits.
2. Common hazards: Not listed. Control by good management and site practice.
3. Significant hazards: Specified construction materials include the following:

140 Construction phase health and safety plan

1. Submission: Present to the employer/ client no later than one week before the commencement of works on site.
2. Confirmation: Do not start construction work until written confirmation is received that the construction phase health and safety plan includes the procedures and arrangements required by the CDM Regulations.
3. Content: Develop the plan from and draw on the outline construction phase health and safety plan, clause A30/570, and the pre-tender health and safety plan/ pre-construction information.

150 Security

1. Protection: Safeguard the site, the Works, products, materials, and any existing buildings affected by the Works from damage and theft.
2. Access: Take all reasonable precautions to prevent unauthorized access to the site, the Works and adjoining property.
3. Special requirements: None.

160 Stability

1. Responsibility: Maintain the stability and structural integrity of the works and adjacent structures during the Contract.
2. Design loads: Obtain details, support as necessary and prevent overloading.

200 Mobile telephones and portable electronic equipment

1. Restrictions on use: No use of mobile phones on site. Mobile phone use allowed in canteen and site office only.

210 Safety provisions for site visits

1. Access: Provide at reasonable times.
2. Inspections: Agree dates and times several days in advance, to enable affected parties to be present.

3. Safety: Submit details in advance of safety provisions and procedures (including those relating to materials, which may be deleterious), which will require their compliance when visiting the site.
4. Protective clothing and/ or equipment: Provide and maintain on site for visitors to the-site.

Protect against the following

310 Explosives

1. Use: Not permitted.

320 Noise consent by local authority

1. Consent: Granted by the local authority under Part III of the Control of Pollution Act relating to the works providing that the following conditions are met:
2. Conditions: In accordance with the local authority's restriction on noisy working.

330 Noise and vibration

1. Standard: In accordance with BS 5228-1.
2. Equipment: Fit compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the compressors, tools or vehicles.
3. Restrictions: Obtain consent before using percussion tools and other noisy appliances. Do not use radios or other audio equipment, or permit employees to use them in ways or at times that may cause nuisance.

340 Pollution

1. Prevention: Protect the site, the works and the general environment (including the atmosphere, land, streams and waterways) against pollution.
2. Contamination: If pollution occurs, report immediately, including to the appropriate authorities, and provide relevant information.

350 Pesticides

1. Use: Not permitted.

360 Nuisance

1. Duty: Prevent nuisance from smoke, dust, rubbish, vermin and other causes.
2. Surface water: Prevent hazardous build-up on site, in excavations and to surrounding areas and roads.

370 Asbestos containing materials

1. Duty: Report immediately any suspected materials discovered during execution of the works. Do not disturb, and agree methods for safe removal or encapsulation.

371 Dangerous or hazardous substances

1. Duty: Report immediately suspected materials discovered during execution of the works. Do not disturb and agree methods for safe removal or remediation.

380 Fire prevention

1. Duty: Prevent personal injury or death, and damage to the Works or other property from fire.
2. Standard: Comply with Fire prevention on construction sites. The joint code of practice on the protection from fire of construction sites and buildings undergoing renovation, published by the Fire Protection Association (the 'Joint Fire Code').

390 Smoking on-site

1. Smoking on-site: Not permitted.

400 Burning on-site

1. Burning on-site: Not permitted.

410 Moisture

1. Wetness or dampness: Prevent, where this may cause damage to the Works.
2. Drying out: Control humidity and the application of heat to prevent:
    - Blistering and failure of adhesion.
    - Damage due to trapped moisture.
    - Excessive movement.

420 Infected timber/ Contaminated materials

1. Removal: Where instructed to remove material affected by fungal/ insect attack from the building, minimize the risk of infecting other parts of the building.
2. Testing: Carry out and keep records of appropriate tests to demonstrate that hazards presented by concentrations of airborne particles, toxins and other microorganisms are within acceptable levels.

430 Waste

1. Waste: Includes rubbish, debris, spoil, containers and packaging, and surplus material requiring disposal.
2. Requirement: Minimize production and prevent accumulation of waste. Keep the site and works clean and tidy. Clean out voids and cavities in the construction before closing.
3. Disposal: Collect and store in suitable containers. Remove from site and dispose of in a safe and competent manner, as approved and directed by the waste regulation authority.
4. Recyclable material: Sort and dispose of at a materials recycling facility approved by the waste regulation authority.
5. Documentation: Retain on-site.

440 Electromagnetic interference

1. Duty: Prevent excessive electromagnetic disturbance to apparatus outside the site.

450 Laser equipment

1. Construction laser equipment: Install, use and store in accordance with BS EN 60825-1 and the manufacturer's instructions.
2. Class 1 or Class 2 laser equipment: Ensure that the laser beam is not set at eye level and is terminated at the end of its useful path.
3. Class 3R and Class 3B laser equipment: Do not use without approval and subject to submission of a method statement on its safe use.

460 Powder actuated fixing systems

1. Use: Not permitted.

470 Invasive species

1. General: Prevent the introduction or spread of species (e.g. plants or animals) that may adversely affect the site and/ or the Works economically, environmentally or ecologically.
2. Duty: Report immediately any suspected invasive species discovered during execution of the Works. Do not disturb and agree methods for safe eradication or removal.

Protect the following

510 Existing services

1. Confirmation: Notify service authorities, statutory undertakers and/ or adjacent owners of proposed works not less than one week before commencing site operations.
2. Identification: Before starting work, check and mark positions of utilities/ services. Where positions are not shown on drawings obtain relevant details from service authorities, statutory undertakers or other owners.
3. Work adjacent to services: Comply with service authority's or statutory undertaker's recommendations. Adequately protect, and prevent damage to services. Do not interfere with their operation without consent of service authorities, statutory undertakers or other owners.
4. Identifying services
   4.1. Below ground: Use signboards, giving type and depth.
   4.2. Overhead: Use headroom markers.
5. Damage to services: N/A
   5.1. Action: Immediately give notice and notify appropriate service authority/ statutory undertaker.
   5.2. Repair: Make arrangements for making good without delay to the satisfaction of service authority, statutory undertaker or other owner as appropriate.
6. Liability: Measures taken to deal with an emergency will not affect the extent of the Contractor's liability.
7. Marker tapes or protective covers: Replace, if disturbed during site operations, to service authority's/ statutory undertakers recommendations.

520 Roads and footpaths

1. Duty: Maintain roads and footpaths within and adjacent to the site and keep clear of mud and debris.
2. Damage caused by site traffic or otherwise consequent upon the Works: Make good to the satisfaction of the Employer, local authority or other owner.

530 Existing topsoil/ subsoil

1. Duty: Prevent over compaction of existing topsoil and subsoil in those areas which may be damaged by construction traffic, parking of vehicles, temporary site accommodation or storage of materials and which will require reinstatement prior to completion of the Works.
2. Protection: Before starting work submit proposals for protective measures.

540 Retained trees/ shrubs/ grassed areas

1. Protection: Preserve and prevent damage, except those not required.
2. Replacement: Mature trees and shrubs if uprooted, destroyed, or damaged beyond reasonable chance of survival in their original shape, as a consequence of the Contractor's negligence, must be replaced with those of a similar type and age at the Contractor's expense.

550 Retained trees

1. Protected area: Unless agreed otherwise, do not dump spoil or rubbish, excavate or disturb topsoil, park vehicles or plant, store materials or place temporary accommodation within the root protection area.
2. Roots: Do not sever if exceeding 25 mm in diameter. If unintentionally severed, give notice and seek advice.
3. Ground levels: Do not change within the root protection area.

555 Wildlife species and habitats

1. General: Safeguard the following: N/A.
2. Protected habitats and species: Upon discovery immediately advise. Do not proceed until instruction is received.
3. Education: Ensure that employees and visitors to the site receive suitable instruction and awareness training.

560 Existing features

1. Protection: Prevent damage to existing buildings, fences, gates, walls, roads, paved areas and other site features, which are to remain in position during execution of the Works.

570 Existing work

1. Protection: Prevent damage to existing work, structures or other property during the course of the work.
2. Removal: Minimum amount necessary.
3. Replacement work: To match existing.

640 Materials for recycling/ reuse

1. Duty: Sort and prevent damage to stated products or materials, clean off bedding and jointing materials and other contaminants.
2. Storage: Stack neatly and protect until required by the Employer or for use in the Works as instructed.

Ω End of Section

A35
Specific limitations on method/ sequence/ timing

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Scope

1. General: The limitations described in this section are supplementary to limitations described or implicit in information given in other sections or on the drawings.

120 Design constraints

1. Details: To be confirmed within the Contractors design proposal.

160 Use or disposal of materials

1. Specific limitations: N/A

170 Working Hours

1. Specific limitations: To be limited to 07:00 - 17:00

Ω End of Section

A36
Facilities/ temporary work/ services

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Generally

110 Spoil heaps, temporary works and services

1. Location: Give notice and details of intended siting.
2. Maintenance: Alter, adapt and move as necessary. Remove when no longer required and make good.

Accommodation

210 Room for meetings

1. Facilities: Provide suitable temporary accommodation for site meetings, adequately heated and lit. The room may be part of the Contractor's own site offices.
2. Furniture and Equipment: Provide table and chairs for 6 people.

260 Sanitary accommodation

1. Requirement: Provide sanitary accommodation for the Employer/ Purchaser, and other members of the consultant team, either separate or shared with the Contractor's supervisory staff. Maintain in clean condition and provide all consumables.

270 Accommodation/ land not included in the site

1. General: The following may be used for the duration of the contract without charge provided that:
    - It is used solely for the purposes of carrying out the Works.
    - The use to which it is put does not involve undue risk of damage.
    - Temporary adaptations are approved by or on behalf of the Employer before being carried out.
    - It is vacated on completion of the Works or determination of the Contract.
    - When vacated, its condition is at least equivalent to its condition at the start of the Contract.

290 Parking

1. Provide and maintain exclusively for use by Employer's representatives: N/A

Temporary works

310 Roads

1. Permanent roads, hard standings and footpaths on the site: The following may be used, subject to clause A34/520:
    1.1. Details: N/A
    1.2. Restrictions on use: N/A
    1.3. Protective or remedial measures: N/A

320 Temporary works

1. Employer's specific requirements: Provide: N/A.

340 Name boards/ advertisements

1. Name boards/ advertisements: Not permitted.

Services and facilities

410 Lighting

1. Finishing work and inspection: Provide temporary lighting, the intensity and direction of which closely resembles that delivered by the permanent installation.

440 Telephones

1. Temporary on site telephone: Provide as soon as practicable after the start on site for joint use by the Contractor and subcontractors and pay all charges.
2. Responses: Make arrangements (e.g. call diverts) to ensure that incoming calls are answered promptly.

570 Personal protective equipment

1. General: Provide the equipment described below for the sole use of other members of the project team, in sizes to be specified.
2. Safety helmets:
   2.1. Standard: To BS EN 397, neither damaged nor time expired.
   2.2. Number required: 6
3. High-visibility waistcoats:
   3.1. Standard: To BS EN ISO 20471.
   3.2. Class: Class 2.
   3.3. Number required: 6
4. Safety boots:
   4.1. Standard: To BS EN ISO 20345, with steel insole and toecap.
   4.2. Number of pairs required: 6
5. Eye protection:
   5.1. Standard: To BS EN ISO 16321-1 and BS EN ISO 16321-3, as appropriate.
   5.2. Number required: 6
6. Ear protection:
   6.1. Standard: Muffs to BS EN 352-1, plugs to BS EN 352-2.
   6.2. Number required: 6
7. Hand protection:
   7.1. Standard: To BS EN 388, BS EN 407, BS EN ISO 21420 or BS EN 511 as appropriate.
   7.2. Number required: 6

Ω End of Section

A37
Operation/ maintenance of the finished works

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Generally

110 The Building Manual

1. Purpose: The Building Manual is to be a comprehensive information source and guide for owners and users of the completed Works. It should provide an overview of the main design principles and describe key components and systems to enable proper understanding, efficient and safe operation and maintenance.
2. Scope
   2.1. Part 1: General: content as clause 120.
   2.2. Part 2: Fabric: content as clause 130.
   2.3. Part 3: Services: content as clause 140.
   2.4. Part 4: The Health and Safety File: content as clause 150.
   2.5. Part 5: Building User Guide: content as clause 151.
3. Responsibility for production: The Contractor
4. Date required: one week before practical completion.
5. Information provided by others: None.
6. Compilation: Prepare all information for Contractor designed or performance specified work including as-built drawings. Obtain or prepare all other information to be included in the Building Manual.
7. Reviewing the Building Manual: Prepare and circulate a complete draft. Amend in the light of any comments and recirculate. Do not proceed with production of the final copies until authorized.
8. Final copies of the Building Manual
   8.1. Number of copies: 2
   8.2. Format: Digital and hardcopy
   8.3. Latest date for submission: One week before the Date for Completion stated in the Contract.
9. As-built drawings and schedules
   9.1. Number of copies: 1
   9.2. Format: Digital

115 The Health and Safety File

1. Responsibility: The Contractor
2. Content: Testing certification, Product and data sheets, As built Drawings, maintenance files, list of sub constrictors used, Material gaurentss and warranties
3. Format: Digital and hard copy
4. Delivery to: the Employers Agent By (date): one week before practical completion.

120 Content of the Building Manual part 1: General

1. Content: Obtain and provide the following, including all relevant details not included in other parts of the Building Manual.
2. Index: List the constituent parts of the Building Manual, together with their location in the document.
3. The Works:
   - Description of the buildings and facilities.
   - Ownership and tenancy, where relevant.

- Health and safety information – other than that specifically required by the Construction (Design and Management) Regulations.

4. The Contract:
    - Names, addresses and contact details of all significant consultants, contractors, subcontractors, suppliers and manufacturers.
    - Overall design criteria.
    - Environmental performance requirements.
    - Relevant authorities, consents and approvals.
    - Third-party certification, such as those made by 'competent' persons in accordance with the Building Regulations.
5. Operational requirements and constraints of a general nature:
    - Maintenance contracts and contractors.
    - Fire safety strategy for the buildings and the site. Include drawings showing emergency escape and fire appliance routes, fire-resisting doors, location of emergency alarm and firefighting systems, services, shut off valves switches, etc.
    - Emergency procedures and contact details in case of emergency.

130 Content of the Building Manual part 2: Building fabric

1. Content: Obtain and provide the following, including all relevant details not included in other parts of the Building Manual:
2. Detailed design criteria: Including:
    - Floor and roof loadings.
    - Durability of individual components and elements.
    - Loading restrictions.
    - Insulation values.
    - Fire ratings.
    - Other relevant performance requirements.
3. Construction of the building:
    - A detailed description of methods and materials used.
    - As-built drawings recording the construction, together with an index.
    - Information and guidance concerning repair, renovation or demolition/ deconstruction.
4. Periodic building maintenance guide chart: Provide for all significant items of work.
5. Inspection reports:
6. Manufacturer's instructions index: Include relevant COSHH data sheets and recommendations for cleaning, repair and maintenance of components.
7. Fixtures, fittings and components schedule and index:
8. Guarantees, warranties and maintenance agreements: Obtain from manufacturers, suppliers and subcontractors.
9. Test certificates and reports required in the specification: Obtain, including:
    - Air permeability.
    - Resistance to passage of sound.
    - Continuity of insulation.
    - Electricity and gas safety.

140 Content of the Building Manual part 3: Building services

1. Content: Obtain and provide the following, including all relevant details not included in other parts of the Building Manual:
2. Detailed design criteria and description of the systems, including:

- Services capacity, loadings and restrictions.
- Services instructions.
- Services log sheets.
- Manufacturers' instruction manuals and leaflets index.
- Fixtures, fittings and component schedule index.

3. Detailed description of methods and materials used:
4. As-built/ record drawings: For each system recording the construction, together with an index, including:
    - Diagrammatic drawings indicating principal items of plant, equipment and fittings.
    - Record drawings showing overall installation.
    - Schedules of plant, equipment, valves, etc. describing location, design performance and unique identification cross-referenced to the record drawings.
    - Identification of services – a legend for colour-coded services.
5. Product details: Including for each item of plant and equipment:
    - Name, address and contact details of the manufacturer.
    - Catalogue number or reference.
    - Manufacturer's technical literature, including detailed operating and maintenance instructions.
    - Information and guidance concerning dismantling, repair, renovation or decommissioning.
6. Operation: A description of the operation of each system, including:
    - Starting up, operation and shutting down.
    - Control sequences.
    - Procedures for seasonal changeover.
    - Procedures for diagnostics, troubleshooting and fault-finding.
7. Guarantees, warranties and maintenance agreements: Obtain from manufacturers, suppliers and subcontractors.
8. Commissioning records and test certificates: List for each item of plant, equipment, valves, etc. used in the installations, including:
    - Electrical circuit tests.
    - Corrosion tests.
    - Type tests.
    - Work tests.
    - Start and commissioning tests.
9. Equipment settings: Schedules of fixed and variable equipment settings established during commissioning.
10. Preventative maintenance: Recommendations for frequency and procedures to be adopted to ensure efficient operation of the systems
11. Lubrication: Schedules of all lubricated items
12. Consumables: A list of all consumable items and their source.
13. Spares: A list of recommended spares to be kept in stock, being those items subject to wear and tear or deterioration and which may involve an extended delivery time when replacements are required.
14. Emergency procedures: For all systems, significant items of plant and equipment.

150 Content of the Building Manual part 4: the Health and Safety File

1. Content: Obtain and provide the following, including all relevant details not included in other parts of the Building Manual:
    - Residual hazards and how they have been dealt with.

- Hazardous materials used.
- Information regarding the removal or dismantling of installed plant and equipment.
- Health and safety information about equipment provided for cleaning or maintaining the structure.
- The nature, location and markings of significant services.
- Information and as-built drawings of the structure, its plant and equipment.

151 Content of the Building Manual part 5: the building user guide

1. Content: Obtain and provide the following:
    - Building services information.
    - Emergency information.
    - Energy and environmental strategy.
    - Water use.
    - Transport facilities.
    - Materials and waste policy.
    - Refit/ rearrangement considerations.
    - Reporting provision.
    - Training.
    - Links and references.

160 Presentation of Building Manual

1. Format: Electronic & Hard copy.
2. Hard copy documents: 2
    2.1. Presentation: A4-size, plastics-covered, loose-leaf, four-ring binders with hard covers, each indexed, divided and appropriately cover-titled.
    2.2. Selected drawings needed to illustrate or locate items mentioned in the Manual: Where larger than A4, to be folded and accommodated in the binders so that they may be unfolded without being detached from the rings.
    2.3. Number required: 2
3. As-built drawings: The main sets may form annexes to the Building Manual.

210 Information for commissioning of services

1. General: Submit relevant drawings and preliminary performance data to enable users to become familiar with the installation.
2. Time of submission: At commencement of commissioning.

220 Training

1. Objective: Before completion, explain and demonstrate to designated maintenance staff the purpose, function and operation of the installations, including items and procedures listed in the Building Manual.

230 Spare parts

1. General: Prepare a priced schedule of recommended spare parts that should be obtained and kept in stock for maintenance of the services installations.
2. Content: Include in the priced schedule for:
    - Manufacturers' current prices, including packaging and delivery to site.
    - Checking receipts, marking and numbering in accordance with the schedule of spare parts.

- Referencing to the plant and equipment list in part 3 of the Building Manual.
- Painting, greasing, etc. and packing to prevent deterioration during storage.

3. Latest date for submission: Two weeks before completion

250 Tools

1. General: Provide tools and portable indicating instruments for the operation and maintenance of all services plant and equipment (except any installed under Named Sub-Contracts) together with suitable means of identifying, storing and securing.
2. Quantity: Two complete sets.
3. Consumables: Supply a complete list of all consumables necessary for the operation.
4. Time of submission: At completion.

Ω End of Section

A40
Contractor's general cost items: management and staff

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Management and staff

1. Cost-significant items: To be confirmed by the Contractor.

Ω End of Section

A41
Contractor's general cost items: site accommodation

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Site accommodation

1. Details: Site accommodation required or made/ not made available by the Employer: See section A36.
2. Cost significant items: To be confirmed by the Contractor.

Ω End of Section

A42
Contractor's general cost items: services and facilities

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Power

1. Cost significant items: Contractor to provide temporary power for the works.

120 Lighting

1. Cost significant items: Contractor to provide temporary lighting for the works.

140 Water

1. Cost significant items: Contractor to provide temporary water supply for the works.

160 Safety, health and welfare

1. See clause A34/210.
2. Cost significant items: As required to carry out the works

170 Storage of materials

1. Cost significant items: /in a safe and secure location.

Ω End of Section

A43
Contractor's general cost items: mechanical plant

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Cranes

1. Cost significant items:

120 Hoists

1. Cost significant items:

140 Transport

1. Cost significant items:

150 Earthmoving plant

1. Cost significant items:

160 Concrete plant

1. Cost significant items:

170 Piling plant

1. Cost significant items:

180 Paving and surfacing plant

1. Cost significant items:

200 Additional mechanical plant

1. Cost significant items: TO BE COMPLETED BY CONTRACTOR

Ω End of Section

A44
Contractor's general cost items: temporary works

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Temporary roads

1. Cost significant items:

120 Temporary walkways

1. Cost significant items:

130 Access scaffolding

1. Cost significant items:

140 Support scaffolding and propping

1. Cost significant items:

150 Hoardings, fans, fencing, etc.

1. Cost significant items:

160 Hardstanding

1. Cost significant items:

170 Traffic regulations

1. Cost significant items:

200 Additional temporary works

1. Cost significant items: TO BE COMPLETED BY CONTRACTOR

Ω End of Section

A55
Dayworks

Summary

Revision history

Date	No.	Title	Status	Revision	Note
20/01/2026		Section 1 - Preliminaries			
22/01/2026		Section 1 - Preliminaries			

Clauses

110 Labour

1. Provisional sum: Include prime cost of labour incurred before the Final Completion Date: …….
   1.1. Percentage adjustment: Add to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
2. Provisional sum: Include prime cost of labour incurred after the Final Completion Date: …….
   2.1. Percentage adjustment: Add to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.

120 Products

1. Provisional sum: Include prime cost incurred at any time during the Contract …….
   1.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.

130 Equipment

1. Provisional sum: Include prime cost of plant (equipment) incurred before the Final Completion Date: …….
   1.1. Percentage adjustment to cover incidental costs, overheads and profit: TO BE COMPLETED BY CONTRACTOR%.
2. Provisional sum: Include prime cost of plant (equipment) incurred after the Final Completion Date: …….
   2.1. Percentage adjustment to cover incidental costs, overheads and profit TO BE COMPLETED BY CONTRACTOR%.
3. Plant (equipment) costs: Rates set out in the Schedule of Basic Plant Charges published by the RICS current at the Date of Tender.

Ω End of Section

APPENDIX 2

BASE BUILD SPECIFICATION

Land off Blue Boar Lane, Norwich NR7 8RJ
Sprowston Town Council
January 2026

BIDWELLS

SPROWSTON TOWN COUNCIL

BASE BUILD SPECIFICATION

Table of Contents

1.0 Introduction

This base specification has been prepared for Sprowston Town Council for the construction of a new skatepark. The skatepark is to be designed and constructed in accordance with the Draft Specification (v.3.1) and, the employers requirements and must be built in accordance with all current and relevant codes of practice, legislation, statutory, local authority and RoSPA post inspection.

In order to satisfy such criteria, Sprowston Town Council reserves the right to modify detailed provision under the scope of design development.

The specification may vary slightly during pre and on site construction with the agreement of the employer. The below may vary depending on final agreement and will be documented within the as built O&M manual after completion.

2.0 Project

Sprowston Town Council has acquired a parcel of greenfield land as part of the adjacent housing development. This land has outline planning permission for the construction of a skate park for the local community.

To progress the project, the Town Council has formed a working group comprising council representatives and local skatepark users to define the requirements for the new facility.

As part of the project, the appointed contractor will be responsible for designing a skatepark that meets these agreed requirements. In addition, the contractor will prepare and submit the full planning application and undertake all tasks necessary to secure planning permission for the new skate park and construct the skatepark.

The council has set out their requirements in appendix 1 of this document.

2.1 Specified Items

Where reference is made in this specification to specific products or manufacturers, alternatives of similar quality and performance may be substituted subject to prior written approval of the Employers Representative.

2.2 Standards

All elements of the works, materials and workmanship will be designed and constructed in accordance with all relevant 'Standards' current at the time of commencement of the works, not confined to those scheduled below:

a) The 18th Edition of the IEE Wiring Regulations with amendments (BS 7671);

b) Health and Safety at Work Act;

c) The Local Authority Building Regulations and subsequent amendments thereto, subject only to the relaxations sanctioned by the Department of the Environment;

d) Specific requirements of the Utility Supply Local Authorities and Local Planning Authorities;

e) The British and European Standards and Codes of Practice;

f) The requirements of the Building Control Officer;

g) The CIBSE Guides including Technical Memorandums;

h) Local Authority Byelaws;

i) The Electricity Supply Act;

j) Construction (Design and Management) Regulations (CDM) 2015;

k) 2010 Equalities Act.

l) A Guide to Good Practice 3rd Edition 1999".

m) HSE Materials Standard ACR (M) 001:2011[Fourth Edition].

n) BSI 2019 BSEN14974:2019 Skateparks

o) BSI 2007 BSEN12193:2007

2.3 Drawings

List of drawings:

- 81304_Blue Boar Lane, Norwich
- DETAILED_SOFT_FOR_POS_AREA_L18_REVK-8089415

2.4 Maintenance Requirements

A schedule of Subcontractor Quotes shall be provided to the Employer / Tenant for all installed equipment and any other element of the contract requiring maintenance within the Defects Liability Period from Substantial Completion.

3.0 External Works

3.1 Geotechnical Report

A Borehole/Trial Pit Site Investigation including appropriate geotechnical and contamination testing shall be undertaken by the Contractor and the recommendations/results used in the subsequent design.

3.2 Site Clearance

The site to be covered by the new skatepark and paving will be cleared of all undergrowth, hard standings and the like and the site reduced in level to the required formation levels.

Site clearance, where necessary, will be carried out including removing to Contractor's waste off site. The formation level will be graded, trimmed and compacted prior to laying the hardcore bed.

3.3 Ground Improvement

Any necessary ground improvement works shall be carried out in full accordance with the requirements of the Structural Engineer and to the approval of Building Control and the EA prior to commencement.

Foundations

The Contractor shall carry out the detailed design to support the new skate park structures depending on ground condition.

3.4 Concrete

The skate park shall be constructed entirely from low-maintenance reinforced concrete to ensure durability and minimal upkeep. All riding surfaces must be power-floated to achieve a super-smooth finish suitable for skateboarding, BMX, and similar activities. Exposed edges that are subject to impact or grinding should be fitted with galvanized or stainless-steel metal caps, amiss securely anchored to prevent movement and protect against chipping.

The concrete shall achieve a minimum compressive strength of C35/45 (35 MPa at 28 days) and increased as necessary depending on element, be designed for external exposure conditions, incorporating freeze-thaw resistance where applicable. The water/cement ratio should not exceed 0.50 to ensure strength and durability, and air entrainment should be included as required.

The surface finish must be power-floated to produce a smooth, even riding surface free from ridges or imperfections, with a tolerance of ±3 mm over a 3 m straightedge. Expansion joints should be avoided within riding areas; where structurally necessary, saw-cut joints must be sealed flush to prevent interference with wheels

Concrete shall be cured for a minimum of seven days using approved curing compounds or wet hessian and polythene sheeting, and no trafficking should occur until the concrete reaches at least 75% of its design strength. Surfaces must remain free from coatings, sealants, or paints that could alter friction characteristics. The design life of the skate park should be a minimum of 25 years, requiring only routine cleaning for maintenance.

3.5 Reinforcement

Reinforcement shall consist of steel mesh and/or rebar in accordance with the structural engineer's design, with a minimum cover of 40 mm for external exposure. Additives such as plasticizers or superplasticizers may be used to improve workability, and fibres can be considered for additional crack control.

3.6 Footpaths

Footpaths will be excavated to formation level, trimmed and compacted and provided with a minimum 100 mm thick stone hardcore base blinded with fine stone sand as:

Macadam surfacing to ancillary paths and margins to and around the skate park.

3.7 Landscaping

The soft landscape scheme is to be constructed during the earliest planting season.

The scheme prepared will include design, ground cultivation, compost, planting, forest bark and twelve months maintenance. The Contractor will be responsible for maintaining the soft landscape areas for a minimum period of 12 months or two planting seasons (whichever is the longest) after the planting has been completed to the satisfaction of the Employer.

3.8 Drainage

The soakaway and associated drainage system shall be designed and installed to manage surface water runoff effectively and in compliance with current Building Regulations/Environment Agency and Sustainable Drainage Systems (SuDS) principles. The system must ensure that water is discharged into the ground or ditch without causing flooding, erosion, or structural damage. The soakaway/attenuation tank shall be sized based on site-specific infiltration tests and rainfall data, with sufficient capacity to accommodate a 1-in-100-year storm event as a minimum.

The soakaway shall be constructed using proprietary modular soakaway crates wrapped in a geotextile membrane to prevent soil ingress and maintain permeability. The depth and footprint of the soakaway must be designed to achieve adequate infiltration rates, with a minimum clearance of 5 meters from any foundations and boundaries. All pipework leading to the soakaway shall be laid to a uniform gradient, ensuring free-flowing discharge, and shall be constructed from durable, corrosion-resistant materials such as uPVC or HDPE.

Surface water shall be collected via appropriately sized gullies and channels, fitted with debris traps to prevent blockages. The system must incorporate inspection chambers at key points for maintenance access. All works shall be carried out to ensure long-term performance, with consideration for future maintenance and compliance with local authority requirements. The installation shall be tested upon completion to confirm infiltration performance and hydraulic capacity.

3.9 Signage

Contractor to install metal informative sign with details to be agreed with Sprowston Town Council.

4.0 External Services

The Contractor shall organise for the Main Billing Meters for Electric be ordered and installed all to suit the peak loads and for a supply agreement to be put in place in the name of the Employer for a one year period. The Employers utility shippers shall be identified during the contract. The Contractor shall be responsible for all services supply and usage costs up to the date of agreed Substantial Completion where the services meters will be read. All services supply and usage costs after the Substantial Completion shall be the responsibility of the Employer.

4.1 General

The electrical services work will be designed and installed in compliance and the recommendations of the 18th Edition of the IEE Wiring Regulations plus amendments, current relevant British Standards and Codes of Practice, Building Control Officers' requirements, the Electricity Supply Regulations and Health and Safety at Work Act.

4.2 Electrical supply

The Employer will arrange, organise and pay for the new UKPN power supply to site. The final location of the Kiosk will be made available during the Tender process. The Contractor will be responsible for installation of a suitable distribution board and all wiring from the Kiosk to the lighting throughout.

4.3 LV Panel & Distribution Boards

The Contractor shall supply LV switch panels as detailed. MCCB devices shall be used within LV panels and MCB's with RCBO's within distribution boards.

The main switch panel shall conform to BS EN 60439 Form 4 Type 6.

All Switch panels shall be tested and ASTA certified to withstand a short circuit fault level.

Switch panels shall offer a degree of protection against the ingress of dust and liquid to at least IP42 classification.

Switch panels shall have long life enclosures fabricated from corrosion resistant zinc coated sheet steel with durable electrostatically deposited epoxy powder paint finish.

The main switch panel shall be sized to allow for the maximum power demand of the site and shall be modular such that it is fully extendable to allow for additional MCCB's to be fitted for future fit out requirements.

All auxiliary cables shall be provided with wire numbers at each end to facilitate ease of identification.

The Contractor shall include for providing MCB/RCBO distribution boards within a new metal Kiosk approved by UKPN, in order to serve the lighting circuits for the skatepark and future upgrades. Position to be agreed with Employer.

All distribution boards shall comply with the following:

a) Distribution boards for final sub-circuits shall comply with BS 5486, part 12 and shall be of the miniature circuit breaker type using suitably selected BS EN 60898 circuit breakers.

b) All distribution boards shall have hinged lockable front covers to prevent unauthorized access.

c) Provide 2 No. Spare keys for every lock provided on the distribution board.

f) Distribution board circuit reference charts shall be typed and contained within a plastic protective wallet. This wallet shall be secured affixed to the inside of a hinged lockable cupboard of the distribution board.

g) 25% spare capacity shall be provided in all distribution board. The 25% spare capacity shall be fitted with one spare MCB of each size used. The remainder of the spare ways shall be fitted with blanks.

h) Where cable containment systems connect to distribution boards, the maximum capacity shall be maintained whether needed for the works envisaged under this contract or not. It shall therefore be possible to add cables at a later date to utilise the 25% spare ways without altering access into the distribution boards.

4.4 Lighting Installations

The Contractor shall ensure that all lighting is designed and installed in compliance with the following criteria.

The maintained luminance for each area shall be: -

Area	Lux Level
Skate Park	100 – 200 Lux

Illuminance levels shall be treated as being at floor level unless otherwise stated. The contractor to eliminate dark spots and harsh shadows.

4.5 Witnessing, Testing and Commissioning

The complete electrical installations will be tested and commissioned to give correct working. A Completion Certificate in conformance with NICEIC, record drawings, protective device charts and details of installed plant and equipment will be incorporated into an Operating and Maintenance Manual.

4.6 Health and Safety Files/Operating and Maintenance Manuals

The Health and Safety Files/Operating and Maintenance Manuals are to be in the format as detailed within the Employers Requirements.

A draft copy is to be made available two working weeks prior to Practical/Substantial Completion and two hard copies at Practical/Substantial Completion. An electronic version of the file is also to be provided to follow the same format as the hard copies following Practical/Substantial Completion.

APPENDIX 1
SKATEPARK SPECIFICATION

Sprowston Town Council

Draft Specification (v3.1) for Sprowston Skate Park

Budget

Sprowston Town Council has allocated this project a design and build budget of £250,000.

A further budget of £50,000 is available for suppliers to propose suitable additional enhancements.

The total budget is £300,000.

Specification:

A. Planned and delivered by a specialist skate park design and construction company with a good record of successful skate park delivery

B. Constructed from low maintenance concrete (no wood and metal ramps etc) with power-floated super-smooth concrete surfaces. Concrete to be metal capped as necessary

C. Accommodate all ability levels of skateboarder and other main types of skate park users (i.e.: younger children on scooters, mixed abilities on BMXs, mixed abilities on roller skates, wheelchair users).

D. For 'street' skateboarders and roller skaters: a large, level (no gradient), super-smooth plaza area which:

1. is suitable for the full range of experience levels; novice to advanced
2. is suitable for the full range of age ranges; young children to older adults
3. contains a mix of low obstacles and equipment mimicking real-world street furniture and architecture
4. includes furniture and architecture such as (but not limited to): concrete blocks, platforms, ledges, steps, banks, rails etc)
5. includes a street course with banked sides (emulating elements of a bowl)
6. includes sound-dampening of any rails or other metal features (e.g. filled tubes)
7. incorporates low maintenance planting where possible (e.g. wildflower beds)

E. Include a smooth surfaced, circular or connected set of 'activity' paths for skateboarding, roller skating and/or scooting, to serve and enhance the skate park site:

1. The new 'activity' paths must be separate from the existing on-site footpaths, but connected to them in appropriate places. This is to make the site fully permeable and accessible to people travelling to the skate park via the local network of footpaths. Separate 'activity' paths should reduce conflict and

collision between people wishing to use footpaths to travel across the site and people wishing to use footpaths to skate or ride on as part of the skate park

2. Activity paths could include features such as bumps, berms, concrete block seating (doubling as skateboard equipment). Activity paths could be coloured differently to clearly differentiate them from 'pedestrian' footpaths

F. Design must take into account drainage (and water table, as relevant)

G. Design must minimise impact of debris and litter from adjacent trees and facilitate ease of clearing and cleaning

H. Flood lights. A new mains electricity supply will be laid to site. This can be used to power flood lighting and other site lighting as may be appropriate.

1. Flood lights must be user activated and timer-controlled to facilitate use of the site in darker winter months. Must include a cut-off time of 9.00pm (to be adjustable at a later date, if required)
2. Design of lighting should prioritise minimisation of light pollution to nearby homes

I. Noise and nuisance mitigation

1. Utilise high bunds or mounds, acoustic fencing, planting or other effective methods to minimise noise disturbance to nearby homes
2. Where metal tube rails are installed; to fill these with concrete or a suitable alternative to ensure minimisation of noise
3. To ensure site overall is as quiet as possible
4. Utilise planting / other hard landscaping to prevent overlooking (visual screening) into neighbouring properties from bunds or equipment on the skate park
5. Position skate park on site as far away from nearest houses as practicable (minimum 30 metres to boundary of nearest dwelling – preferably further)
6. Include provision of adequate general waste and recycling bins

J. As far as practicable, ensure skate park is visible from Blue Boar Lane, so as to maximise public 'overlooking' and minimise opportunities for anti-social behaviour (ref: Safeguarding, and designing-out crime in public open spaces)

K. Planning Application – If required, the successful contractor is to manage the planning application process (or, at the least to fully support the Town Council in submitting an application), including but not limited to completion of necessary paperwork, provision of visualisations, design and access statement, responses to consultees and public commentary during the planning consultation period

L. The supplier will be responsible for project managing all aspects of the design and build process. This includes compliance with the CDM regulations, health and safety regulations and any and all other applicable regulations or legal requirements

APPENDIX 2
PHOTOGRAPHIC SCHEDULE

81304 - Blue Boar Lane, Norwich - P001

81304 - Blue Boar Lane, Norwich - P002

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1431 14-01-2026 13:07:27
E: 626129.232m N 52°39'16.1604"
N: 311546.190m E 1°20'30.7472"
Z: 32.606m H: 77.213m

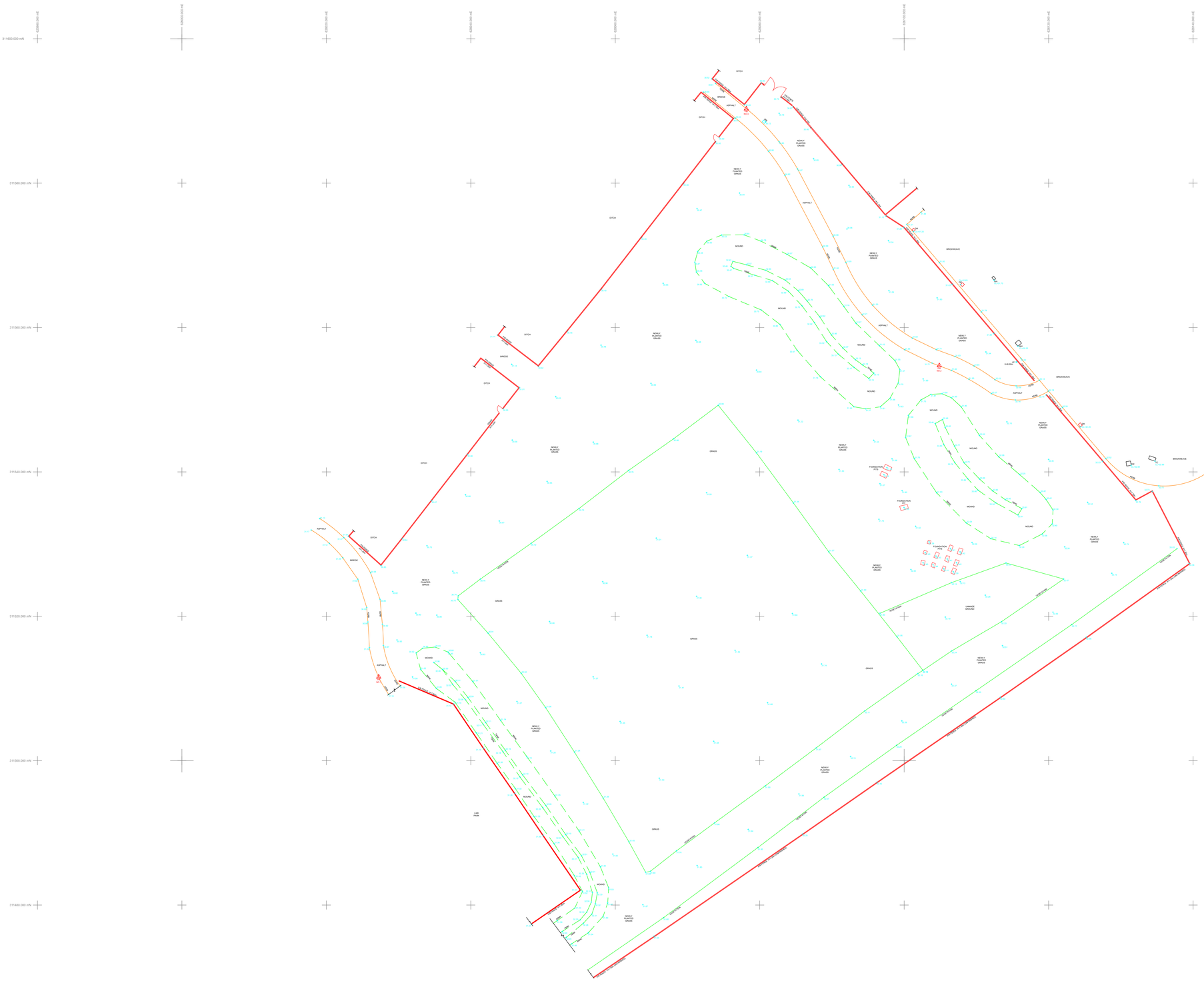
81304 - Blue Boar Lane, Norwich - P089

1432 14-01-26 13:09:14
E: 626114.904m N 52°39'16.6283"
N: 311560.010m E 1°20'30.0201"
Z: 32.025m H: 76.632m

81304 - Blue Boar Lane, Norwich - P090

BIDWELLS

APPENDIX 3
DRAWINGS



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Whilst every effort has been made to correctly identify species of trees on site, we advise that an arborologist be consulted before any final decisions are made.

Drainage information has been visually inspected and measured from the surface, therefore should be treated as approximate only.

Please note: all dimensions to be checked on site by contractors prior to commencement of works.

THE SURVEY ASSOCIATION

Legends:

N

PERMANENT MARKER CO-ORDINATES

MARKER	EASTING	NORTHING	LEVEL	TYPE
1	626027.245	311511.594	31.045	Survey Nail
2	626104.860	311554.718	31.736	Survey Nail
3	626078.144	311590.298	30.679	Survey Nail

Site Survey Information:-

Fieldwork dates:-	14/01/2026
Instrumentation:-	GeoMax Zenith 15 GNSS rover
Surveyors:-	AE
Checked:-	AE/IT

Survey Method:-

Source of control data:	GeoNet RTK network
Local control extended by:	N/A
Detail surveyed by:	AE

Co-ordinate System:-

Projection:	No projection, k=1.000000 (Ground distances)
Horizontal and vertical datum:	Local - Coordinates and orientation coincident with OSGB36(15) at station point PM-NO.1.

Level Data

Spot Levels	+ 99.75
Eaves / Ridges	+ 99.75 (E) / (R)

Trees

Trees Are Drawn To Scale On The Survey, Descriptions Should Only Be Used As A Guide

Beech	6h
Type	Height
UK	Unknown Tree Type

Fence Types

B/W	Barbed Wire
C/B	Close Boarded
C/I	Corrugated Iron
C/L	Chain Link
C/P	Chestnut Paling
I/R	Iron Railing
Pan	Panel Fence
P/R	Post & Rail
P/W	Post & Wire
S/P	Steel Palisade
W/M	Welded Wire Mesh

Abbreviations

ACU	Air Conditioner Unit
BA	Barrier
BB	Belisha Beacon
BBNK	Bottom of Bank
BO	Bollard
BS	Bus Stop
BU	Bush
CATV	Cable TV Cover
CH	Ceiling Height
CHC	Ceiling Height Change
CIH	Clear Internal Height
CL	Cover Level
CON	Concrete
CPS	Concrete Paving Slabs
CSU	Ceiling Slopes Up
DH	Door Height
DP	Down Pipe
DR	Drain
EH	Eaves Height
ER	Earth Rod
FBO	Folding Bollard
FD	Floor Duct
FFL	Finished Floor Level
FL	Floor Level
FH	Fire Hydrant
GG	Gully Grate
H	Height
IC	Inspection Chamber
LP	Lamp Post
MH	Manhole
OH	Opening Height
PB	Post Box
PM	Parking Meter
PO	Post
RA	Rail
RE	Rodding Eye
RFV	Raised Floor Void
RS	Road Sign
RWP	Rainwater Pipe
S	Sill
SC	Stop Cock
SCH	Suspended Ceiling Height
SI	Sign Post
STN	Station
SV	Stop Valve
SVP	Soil Vent Pipe
SW	Storm Water
TAC	Tank Access Cover
TBNK	Top of Bank
TC	Telecom Cover
TB	Telephone Box
TL	Traffic Light
TP	Telegraph Pole
TPA	Tactile Paving
UC	Unknown Cover
UNS	Underside
UNSBM	Underside Of Beam
UTL	Unable To Lift
VP	Vent Pipe
WA	Water Valve
WOH	Window Over Height

REV.	DATE	BY	DESCRIPTION

CADS
C A Design Services Limited
The Design Centre, Hewett Road, Gapton Hall,
Great Yarmouth, Norfolk NR31 0NN
Tel: 01493 440444 www.cadesignservices.co.uk
Registered in England No. 1595687

CLIENT
BIDWELLS

SITE ADDRESS
BLUE BOAR LANE
SPROWSTON
NORWICH
NR7 8RJ

TITLE
EXISTING SITE PLAN

DRAWN BY	DATE	SCALE	SHEET SIZE
AE	JAN 2026	1/200	A0
CHECKED BY	DATE	APPROVED BY	DATE
AE/IT	JAN 2026	CADS	JAN 2026

DRAWING No.	REVISION
81304_SPSURVEY	0

SPECIFICATION NOTES - REFER ALSO TO THE MEASURED WORKS SCHEDULE:-

A) Setting out

1. Planting shall be set out exactly as shown on the drawing, and measured from existing fixed points. Curved beds shall be set out using radii scribed on the ground using two pointed stakes and a line between, or with site marker paint. The junction between convex and concave curves shall be cut to form a smooth and even flowing line. Check that all setting out conforms to the plan before cultivation and planting works are carried out. Failure to do so may result in rejection of the work by the landscape architect and may require amendment at the contractor's expense.

2. All planting beds shall be a minimum of 1 metre wide, except where there is insufficient space, due to the constraints of walls and path edgings and their foundations. With narrow beds between walls/ fences and path edgings, ensure that the bed has space free from concrete footings before planting. If the bed is sealed with concrete, then the landscape contractor shall contact the site manager or landscape architect to determine if footings are excessive and can be reduced or else, the bed can be paved. The width of all beds will be checked by the inspecting landscape architect and where the width is not as drawn, the contractor shall re- cultivate them to the specified width at his own expense.

B) Ground preparation

1. Pre-planting herbicide application:- Apply by suitable spraying apparatus, an approved translocated systemic herbicide to the manufacturer's instructions and to 1997 Control of Pesticides Regulations and 2003 COSHH regulations on all beds, except those which are both weed free and are to receive agrotextile sheet mulch. Spray immediately if any weeds are present. If none are showing, but there may be a delay before planting, or the area is to be seeded, spray after one month following cultivation, to allow dormant seed to germinate. All spraying shall be carried out by skilled and qualified operatives, using protective clothing, in suitable weather (no wind) and any damage caused by spray drift, from incorrect usage or spillage, shall be rectified at the contractor's own cost. Repeat as necessary to ensure complete kill and rake off all dead material from site.

2. Carry out the following works to the existing topsoil on site to ensure it Conforms to BS 3882:2015, being free from rocks larger than 50m diameter, concrete, all roots, wire, brick, and have less than 20% clay. Allow for pre-application of herbicide as above. Fertilise with 100g per meter square of Hortibase CRF (16-8-12) slow release fertilizer, in accordance with the manufacturer's instructions. For beds less than 5 meters in width, fork over thoroughly or machine rotovate soil to a depth of 300mm, ensuring that the subgrade and topsoil are completely broken up and free draining, relieving any compaction. For beds greater than 5 metres in width, break up the subgrade and topsoil using a tractor mounted subsoiler or ripper at 500mm centres to a depth of 500mm,except where there are services, or within 10 meters of tree stems or 3 meters of existing hedges. Do not rip areas where roots greater than 10mm diameter are encountered.

3. Determine before submitting a tender, the extent of support from the site manager with ground preparation: ensure soil of all planting beds is graded to a level 65mm below adjacent grass or paved surfaces, (90mm below where agro- textile/ sett mulch is not specified), within 400-600mm of edges to ensure bark or wood chip mulches are retained. Where grass is proposed, then the soil level shall be flush (maximum 10mm below - but never proud) of adjacent paved surfaces, to receive rain water run off. The landscape contractor is responsible for ensuring that the final product conforms to the specification even where the developer and/or main contractor have failed to supply and spread topsoil to the recessed level. The landscape contractor shall allow for adjustment of levels, as specified above, including for re-grading subsoil and topsoil. Where beds are sloping, ensure that topsoil is graded to the specified levels below pavement & grass surfaces within 400mm of the edges of the bed. This is to allow for sheet mulch and bark or wood chip mulch so that mulch does not spill out on to pavements and also to allow surface water to drain from paths on to planted areas.

4. For sloping areas to be turfed adjacent to paved areas, topsoil levels shall be graded flush with the finished pavement level (or up to 10mm below) to allow surface water to drain from pavements to soft areas. Soil of grass areas should therefore never be proud of paved areas. Soil levels more than 10 mm below pavement edges will cause mower damage on cutting.

5.Imported topsoil (where specified and sanctioned by the employer) for making up ground, shall conform to BS 3882: 2015, and be free from rocks (over 50mm diameter), concrete, roots, wire and brick, and have less than greater than 20% clay. Such soil shall be cultivated as set out above, Representative samples shall first be approved by the landscape architect before being supplied to site, No imported soil shall be supplied to site without a written instruction.

C) Planting

1. All planting must be carried out in accordance to the specification and schedule of quantities accompanying these drawings. Refer to the specification for the preparation of existing topsoil and required depths for planting, turfing, and standard trees, and also for maintenance requirements.

2. No substitutions will be accepted without the prior agreement of the inspecting landscape architect. The contractor shall replace at once at his own cost any stock size, species or variety of plant which has not been specified on the planting plan and schedule, unless prior agreement to a substitution by the landscape architect has been received. All plants shall be true to size specified in the schedule of plants and associated notes, (3L pots are 15cm diameter and 15cm deep). All shrubs, (other than ground cover), shall be 400-600mm height and spread, or otherwise specified for the pot size by the HTA National Plant Specification and be bushy, healthy, disease free stock, not pot bound, leggy or spindly. There should be a minimum of 5 breaks per shrub. This specification is the minimum standard required and any stock falling below this standard, in the sole opinion of the inspecting landscape architect,shall be lifted and replaced at the contractor's expense.

3. All shrubs, herbaceous plants, whips and transplants shall be watered in on planting with 20 litres per square metre. Trees shall be watered in with 25 litres per tree position. Water thereafter during the contract period at weekly intervals with 30 litres of water.

4. Proposed large feathered or standard trees to be true to the species, variety and size as specified on the planting plan, to include 1.6m chestnut stake 600mm above ground and 1000mm below ground) and 1No. sackcloth tie with spacing device positioned 25mm maximum from the top of the post.

5. Turf to be of cultivated grade such as Rowlawn "Medallion", or other of similar quality and source, approved by the landscape architect. The contractor shall replace at once any turf rejected by the landscape architect at his own cost.

6.Self clinging climbing shrubs or wall shrubs, with "S" drawn after the climber name, shall be trained to the wall/fence with heavy duty, plastic coated garden wire. Training wires shall be attached vertically to the wall/fence by means of 125mm long stainless steel eye screw fittings, Position 1No. at 250mm from ground, and 1No. 250mm from top of the wall/fence, and string the wire tightly between the fixings. Train the climber to the wire with plastic coated garden wire tags.

7. Twining varieties of climber, with "T" drawn after the climber's name (in specially prepared pits or general shrub beds) shall be trained to walls/ fences by mounting ready-made trellis panels 1.8 x 1.8m generally (but 1.8 x 0.6m for corners or where space is restricted), trellis for adapting any panels for locations where walls or fences are lower than 1.8m, Fix trellis panels to the walls/ fences using non rusting screws 125mm long (to be approved), incorporating 50mm cube wood spacing blocks to ensure that the panel is mounted sufficiently far from the wall/ fence to allow twining of stems, Ensure that all timber is pressure impregnated with a non phyto-toxic preservative and then painted with a dark brown non phyto-toxic preservative wood stain such as Sadolin "Classic" walnut or similar and approved, Ensure that the trellis is not in contact with the ground, Train the climbing shrub to the trellis with plastic coated garden wire tags.

8. Climbers specified outside proposed shrub beds shall have specially prepared climber pits. Climber pits shall be 400mm x 400mm and 600mm deep (minimum size), and be backfilled with topsoil (from site - unless otherwise agreed). Ensure the base of the pit is thoroughly broken up and free draining before back filling with topsoil.Ensure no damage to foundations and services, and make good all structures and surfaces disturbed. Fertilise with 50g of Hortibase CRF (16-8-12) slow release fertilizer. Water with 15 litres of water per climber pit.

D) Mulch

1. When specified by the additional specification notes on this plan, supply and spread suitable biodegradeable sheet mulch over planting beds, previously, cultivated, graded and fertilized topsoil before planting, and peg down at a minimum of 500mm centres, (300mm at edges) and beds less than 1m wide. Pegging this densely is essential to prevent flaps of material becoming exposed, Refer to the specification for biodegradable sheet mulch on plan.

2. Following planting supply and spread evenly Melcourt Industries "Edwards of Brandon" to a depth of 50mm, (75mm if no sheet mulch specified), over all planted areas. Finished mulch levels shall be no higher than 15mm below pavement or grass levels to avoid any spillage onto pavements or lawns. N.B. no substitution of mulch type will be acceptable. It is essential to have a no-fines, large particled, brown wood chip to reduce weed growth, reduce wind blow and prevent rapid break down.

E) BS codes

1. All workmanship and materials shall conform to the following codes:-
A) General landscape operations (excluding hard surfaces) - BS 4428:1989.
B) Trees in relation to construction- BS 5837: 2012 and BS 4549:1999. BS 3998:2010 (recommendations for tree works) unless otherwise specified.
Arboricultural Association - Standard Conditions of Contract and Specifications of Tree Works 1996.
C) Nursery stock in accordance with latest horticultural trade association nursery stock specification entitled "National Plant Specification 2001".
Plants shall conform to:
-BS 8545 : 2014 Trees from Nursery to Independence in the Landscape
-BS 3936-1 : 1992 Nursery Stock - Specification for trees and shrubs.
-BS 3936-2 : 1990 Nursery Stock- Specification for roses + AMD 6628.
-BS 3936- 4 : 2007 Nursery stock- Specification for forest trees.
-BS 3936-9 : 1998 Nursery stock- Specification forbulbs, corms and tubers.
-BS 3936-10 : 1990 Nursery stock- Specification for ground cover shrubs.
-CPSE-Committee for Plant Establishment, Handling and re-establishing landscape plants 1996, Part 3, paragraphs 6.2 to 6.6.
D) Glossary for Landscape Works BS 4428 :1989
E) Turf - BS 3969:1998 -recommendations for turf for general purposes.
F) Seeding - EEC Regulations 1974. Use blue labelled certified varieties to EC purity and germination regulations. When requested, submit an official seed Testing Station Certificate of germination, purity and composition.
G) Topsoil - BS 3882: 2015
H) Pesticides: Control of Pesticides Regulations 1997;The Health and Safety at Work Act 1974; the COSHH Regulation 2003, the product COSHH sheet Water Supply (Water Quality.) Regulations amended 2000; Control of Pollution Act 1974; Hedgerow ACT 1997; Wildlife and Countryside Act 1981; Countryside and Rights of way Act 2000.

GENERAL NOTES FOR THE DEVELOPER.

A) Tree protection
1. Any existing trees to be retained, are the responsibility of the main contractor on site who shall take all necessary protective measures set out in BS 5837-2012 to ensure no damage to stems or roots, to prevent compaction from vehicles or storage of materials, contamination of soil from spillages, scorching from fires and instability or stress from changes of soil level. The landscape contractor is however responsible for ensuring that neither plant, materials or labour are cause of any damage to existing trees, and like the employer, the landscape contractor shall replace at once any tree damaged on site, supplying and planting a tree of the same species and size, at his own cost. Protection barriers will comprise a scaffold framework in accordance with Figure 2 of BS 5837:2012 (The BS).
The framework will consist of vertical and horizontal scaffolds with vertical tubes spaced at no more than 3m
intervals and driven into the ground. Weld mesh (Heras or similar) panels will be securely fixed on to this
framework with wire or scaffold clamps. Tubes will be driven into the ground to a minimum depth of 600mm.
Supporting struts will be fixed to the inside of the barrier to ensure maximum rigidity.

B) Ground work

1. Soil levels: soil levels for shrub beds and grass areas should have any compacted subgrade thoroughly broken up by machine before instructing the ground worker to spread topsoil or the landscape contractor to commence work or the beds will become waterlogged in wet weather and the plants and turf will die.

2. Top soil spread from on site should be to the following minimum depths:- Shrub beds: 350mm, Grass areas 150mm, allow for excavation of 415mm of the subgrade for shrub beds to leave beds 65mm below finished pavement or grass areas in order to receive sheet and bark mulch. (90mm below where sheet mulch is not to be used), Tree pits will be dug by the landscape contractor. Top soil shall be spread for grass areas flush with any areas of paving and after settlement, the soil level should be no greater than 10mm below paved areas to allow for turf. For areas to be grass seeded, the soil level shall be flush with any finished paved surfaces after settlement (or to a maximum of 5mm below) to allow for rain water to drain onto soft surfaces. Settlement shall be no greater than the tolerances given or problems will be encountered with mowing (the blades in danger of touching concrete edgings) or where soil is proud of pavements, then drainage problems will be encountered.

3. Existing topsoil and imported soil shall conform to BS 3882:2015, and be free from compaction, rocks/bricks greater than 50mm diameter, concrete, wire, roots, debris, oil, cement and builders rubble. Soil shall have a day content of less than 20%.

C) Hardworks

1. Hard works, unless otherwise agreed, shall be carried out by the developer or main contractor, and all materials and workmanship shall be in accordance with the construction details and the layout plan.

2. All paths and edgings shall be set out properly to lines and radii, with all curves scribed on the ground using pointed pegs and string or site marker paint, achieving flowing natural arcs. Setting out shall be agreed with the landscape contractor and subsequently the landscape architect.

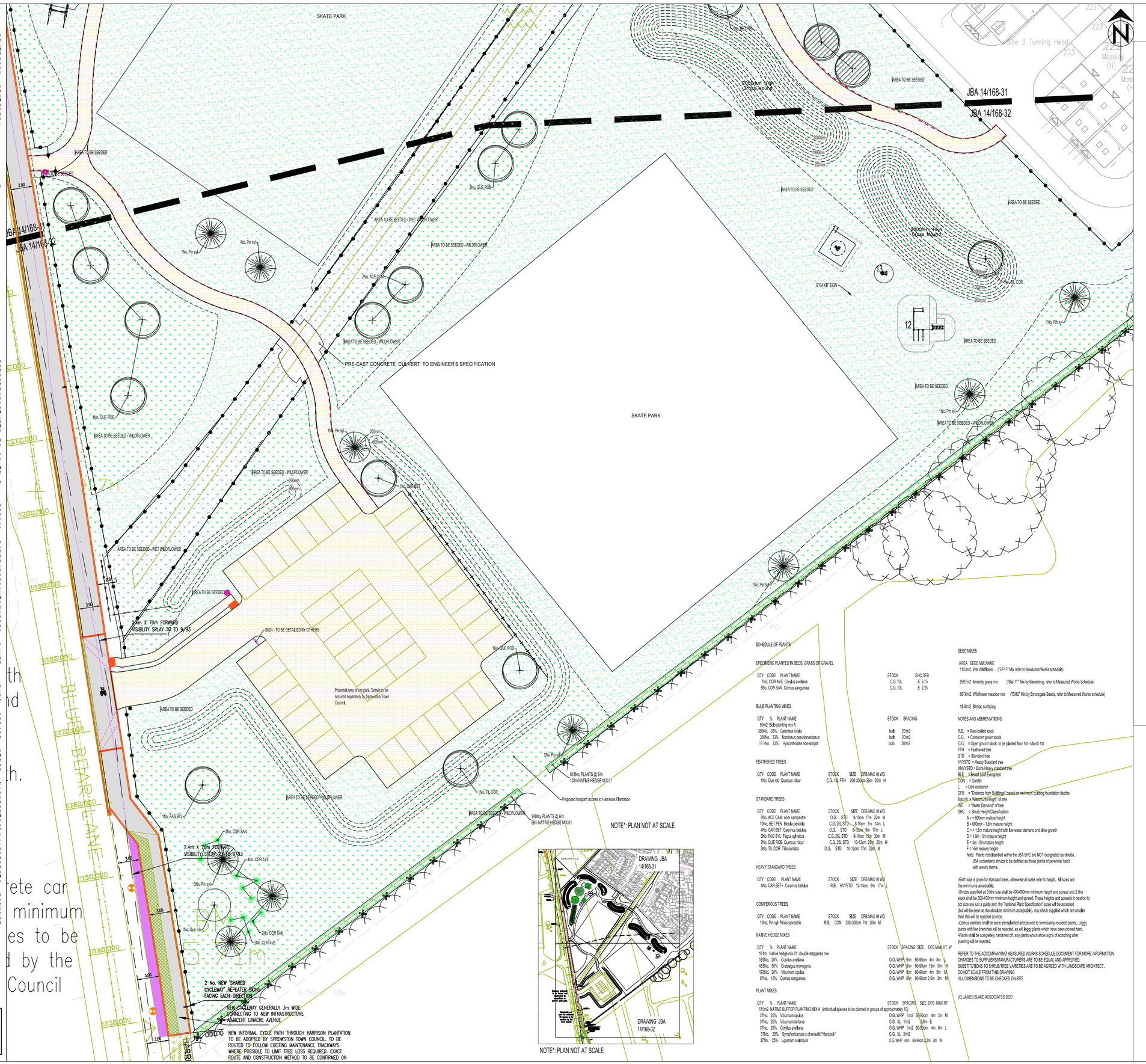
3. Hard surfaces shall be constructed after suitable base courses have been laid, taking full account of local site conditions, soft spots and substrate. The indicative depths of base courses are minimum depths assuming suitable substrate conditions.

4.. All metalwork shall be finished hot dipped galvanized in accordance with BS EN ISO1460. The galvanizer shall be responsible for the thorough removal of all galvanizing smuts (fettling) to the complete satisfaction of the Landscape Architect. The decorating contractor shall prepare the galvanized surface by washing with detergent and water and scrubbing with a scouring pad until all dirt, grease, white rust & sulphates have been removed & then allowed to dry thoroughly. Supply and paint 'Isolit 6630' from Sika Ltd (tel. 01707 374444) applied with a turfhead brush strictly in accordance with the manufacturers instructions, COSHH regulations and the product COSHH sheet, Apply 2No. coats of paint with a dry film thickness of 100 microns per coat, Apply paint only when galvanized surface is thoroughly dry at temperatures above five degrees celsius and in any event above the current dew point temperature, Paint work will be subject to inspection by experts and if found wanting, shall be stripped off, re-prepared and applied entirely at the decorating contractors own cost.

5. All wood work to use ACQ water based wood preservative applied by vacuum pressure by Permawood or other similar and approved company. The timber shall then be stained with 3No. coats of Sadolin "Classic," colour 'Walnut' strictly in accordance with the manufacturers instructions, COSHH Regulations 2003 and product COSHH sheet.

GENERAL NOTES

-ALL DIMENSIONS IN MILLIMETRES
-DO NOT SCALE OFF THIS DRAWING
-ALL DIMENSIONS TO BE CHECKED ON SITE



PROPOSED STANDARD TREE, INCLUDING DOUBLE STAKE AND TIE. SEE SPECIFICATION NOTES A1, B2-3, B5, C1-4, D1-2 AND E1.

PROPOSED HEAVY STANDARD TREE, INCLUDING DOUBLE STAKE AND TIE. SEE SPECIFICATION NOTES A1, B2-3, B5, C1-4, D1-2 AND E1.

PROPOSED CONIFER OR BROAD LEAF EVERGREEN TREE, INCLUDING STAKE AND TIE. SEE SPECIFICATION NOTES A1, B2-3, B5, C1-6, D1-2 AND E1.

NATIVE WHIP AND SHRUB PLANTING IN MIXES, INCLUDING BIODEGRADABLE SHEET AND BARK MULCH (ACCORDING TO SPECIFICATION. SEE SPECIFICATION NOTES A1-2, B1-3, C1-3, D1-2 AND E1.

CULTIVATED TURF UNLESS OTHERWISE STATED ON PLAN. SEE SPECIFICATION NOTES B4, C5 AND E1.

WET WILDFLOWER SEEDED AREA. REFER TO PLANT SCHEDULE FOR SPECIFICATION OF MIX.

WILDFLOWER SEEDED AREA. REFER TO PLANT SCHEDULE FOR SPECIFICATION OF MIX.

BULB PLANTING IN MIXES, SPRING FLOWERING VARIETIES, REFER TO SCHEDULE FOR FURTHER INFORMATION.

SPECIMEN SHRUBS IN SHRUB BEDS OR PIT PLANTED IN GRASS/GRAVEL AREAS. SPECIMEN SHRUBS IN GRASS ARE MEASURED SEPARATELY IN SCHEDULE OF QUANTITIES. SEE SPECIFICATION NOTES A1, B1-3, C1-3, D1-2 AND E1.

EXISTING TREE TO BE RETAINED, SEE GENERAL NOTE A1 AND E1. IF PREPARED, SEE ALSO JAMES BLAKE ASSOCIATES PLAN AND SCHEDULE FOR ANY SURGERY WORKS.

EXISTING VEGETATION GROUP OR HEDGE TO BE RETAINED, SEE GENERAL NOTE A1 AND E1. IF PREPARED, SEE ALSO JAMES BLAKE ASSOCIATES PLAN AND SCHEDULE FOR ANY SURGERY WORKS.

BOSTON TIMBER LITTER BIN BOS 490 TB, AVAILABLE FROM FURNITUBES INTERNATIONAL LTD TEL: 020 8378 3200 OR SIMILAR AND APPROVED BY THE LOCAL PLANNING AUTHORITY

TARMACADAM FOOTPATHS WITHIN THE PUBLIC OPEN SPACE TO INCLUDE FLAT TOP PCC EDGE (a) TO STRAIGHT SECTIONS AND CONCRETE BLOCK EDGING (b) LAID STRING COURSE TO CURVED SECTIONS. BLOCKS TO BE. ALL EDGING FLUSH WITH PAVING AND 15mm ABOVE ADJACENT GRASS AND BARK LEVELS.

POST AND DOUBLE RAIL FENCE

POST AND WIRE FENCING. AS BUILT

1.8m CHAINLINK FENCE. AS BUILT

K-NINE POST MOUNTED DOG WASTE BIN AVAILABLE FROM BROXAP TEL: 01782 564411 OR SIMILAR AND APPROVED.

ASF910RP RECYCLED PLASTIC SEAT 450 x 400 x 2000mm AVAILABLE FROM AFS LTD TEL: 01484 401414 OR SIMILAR AND APPROVED.

PLAY EQUIPMENT SAFETY MAT FROM PROLUDIC

1. BORNEO CLIMBER- J4811. AVAILABLE FROM PROLUDIC

2. MONKEY BARS -JPS21-5-M. AVAILABLE FROM PROLUDIC

3 . VERTICAL POLES - J4905 . AVAILABLE FROM PROLUDIC

4. CARGO NET -J4913. AVAILABLE FROM PROLUDIC

5. ORIGIN LOG STEPPERS - J4904. AVAILABLE FROM PROLUDIC

6. GYRO SWING-R24-ITY-724. AVAILABLE FROM PROLUDIC

7. METAL POD SWING -J441. AVAILABLE FROM PROLUDIC

9. METAL CABLEWAY -JS20. AVAILABLE FROM PROLUDIC

10. LOW PLATFORM ROUNDABOUT -J2409. AVAILABLE FROM PROLUDIC, INSTALLED ON RUBBER MULCH OR WETPOUR (DRAINAGE IS RECOMMENDED TO AVOID FLOODING)

11. URBANIX FITNESS -R37-IJBX-289C. AVAILABLE FROM PROLUDIC

12. STREET WORKOUT-JS212. AVAILABLE FROM PROLUDIC

13. EXERCISE BIKE - R37-IJBX-2468. AVAILABLE FROM PROLUDIC

14. CLIMBING POLE- J3503. AVAILABLE FROM PROLUDIC

15. METAL SWINGS -J472. AVAILABLE FROM PROLUDIC

SCHEDULE OF PLANTS

SPECIMENS PLANTED IN BEDS, GRASS OR GRAVEL

QTY	CODE	PLANT NAME	STOCK	SHC	DFB
7No.	COR AVE	Corylus avellana	C.G. 10L	E	3.75
9No.	COR SAN	Cornus sanguinea	C.G. 10L	E	2.25

BULB PLANTING MIXES

QTY	%	PLANT NAME	STOCK	SPACING
5m2		Bulb planting mix A	bulb	20/m2
388No.	33%	Galanthus nivalis	bulb	20/m2
388No.	33%	Narcissus pseudonarcissus	bulb	20/m2
388No.	33%	Hyacinthoides non-scripta		

FEATHERED TREES

QTY	CODE	PLANT NAME	STOCK	SIZE	DFB	MAX HT	W	D
1No.	Que rob	Quercus robur	C.G. 15L	FTH	200-250cm	25m	20m	H

STANDARD TREES

QTY	CODE	PLANT NAME	STOCK	SIZE	DFB	MAX HT	W	D
5No.	ACE CAM	Acer campestre	C.G.L.	STD	8-10cm	17m	22m	M
10No.	BET PEN	Betula pendula	C.G. 25L	STD	8-10cm	7m	14m	L
4No.	CAR BET	Carpinus betulus	C.G.	STD	8-10cm	9m	17m	L
3No.	FAG SYL	Fagus sylvatica	C.G. 25L	STD	8-10cm	15m	22m	M
7No.	QUE ROB	Quercus robur	C.G. 25L	STD	10-12cm	22m	22m	H
3No.	TIL COR	Tilia cordata	C.G.	STD	10-12cm	17m	22m	M

HEAVY STANDARD TREES

QTY	CODE	PLANT NAME	STOCK	SIZE	DFB	MAX HT	W	D
4No.	CAR BET+	Carpinus betulus	R.B.	HV/STD	12-14cm	9m	17m	L

CONIFEROUS TREES

QTY	CODE	PLANT NAME	STOCK	SIZE	DFB	MAX HT	W	D
13No.	Pin syl	Pinus sylvestris	R.B.	CON	250-300cm	7m	20m	M

NATIVE HEDGE MIXES

QTY	%	PLANT NAME	STOCK	SPACING	SIZE	DFB	MAX HT	W
181m		Native hedge mix 01: double staggered row						
193No.	20%	Corylus avellana	O.G. WHP	6/m	60-90cm	4m	8m	L
483No.	50%	Crataegus monogyna	O.G. WHP	6/m	60-90cm	13m	10m	H
193No.	20%	Viburnum opulus	O.G. WHP	6/m	60-90cm	4m	5m	M
97No.	10%	Cornus sanguinea	O.G. WHP	6/m	60-90cm	2.5m	3m	M

PLANT MIXES

QTY	%	PLANT NAME	STOCK	SPACING	SIZE	DFB	MAX HT
515m2		NATIVE BUFFER PLANTING MIX A (individual species to be planted in groups of approximately 10)					
37No.	25%	Viburnum opulus	O.G. WHP	1/m2	60-90cm	4m	5m M
37No.	25%	Viburnum lantana	C.G. 3L	1/m2	1.0m	E	
37No.	25%	Corylus avellana	O.G. WHP	1/m2	60-90cm	4m	8m L
37No.	25%	Symphoricarpos x chenaultii "Hancock"	C.G. 3L	3/m2			
37No.	25%	Ligustrum ovalifolium	O.G. WHP	6/m	60-90cm	2.5m	3m M

SEED MIXES

AREA	SEED MIX NAME
1153m2	Wet Wildflower ("EP1" Mix refer to Measured Works schedule)
9597m2	Amenity grass mix ("Bar 11" Mix by Barenbrug, refer to Measured Works Schedule)
6678m2	Wildflower meadow mix ("EM2" Mix by Emorsgate Seeds, refer to Measured Works schedule)
1646m2	Bitmac surfacing

NOTES AND ABBREVIATIONS

R.B. = Root-balled stock
C.G. = Container grown stock
O.G. = Open ground stock, to be planted Nov 1st - March 1st
FTH = Feathered tree
STD = Standard tree
H/V/STD = Heavy Standard tree
XH/F/STD = Extra Heavy standard tree
B.E. = Broad Leaf Evergreen
CON = Conifer
L = Litre container
DFB = "Distance from Building2" based on minimum building foundation depths
Max Ht. = "Maximum Height" of tree
WD = "Water Demand" of tree
SHC = Shrub Height Classification
A = < 600mm mature height
B = 600mm - 1.8m mature height
C = > 1.8m mature height with low water demand and slow growth
D = 1.8m - 3m mature height
E = 3m - 5m mature height
F = >5m mature height
Note: Plants not classified within the JBA SHC are NOT designated as shrubs, JBA understand shrubs to be defined as those plants of perennial habit with woody stems.

-Girth size is given for standard trees, otherwise all sizes refer to height. All sizes are the minimum acceptable.
-Shrubs specified as 3 litre size shall be 400-600mm minimum height and spread and 2 litre stock shall be 300-400mm minimum height and spread. These heights and spreads in relation to pot size are just a guide and the "National Plant Specification" sizes will be accepted (but will be seen as the absolute minimum acceptable). Any shrub supplied which are smaller than this will be rejected at once.
-Cornus varieties shall be twice transplanted and pruned to form bushy rounded plants, Leggy plants with few branches will be rejected, as will leggy plants which have been pruned hard.
-Plants shall be completely hardened off, any plants which show signs of scorching after planting will be rejected,

REFER TO THE ACCOMPANYING MEASURED WORKS SCHEDULE DOCUMENT FOR MORE INFORMATION
CHANGES TO SUPPLIERS/MANUFACTURERS ARE TO BE EQUAL AND APPROVED
SUBSTITUTIONS TO SHRUB/TREE VARIETIES ARE TO BE AGREED WITH LANDSCAPE ARCHITECT.
DO NOT SCALE FROM THIS DRAWING
ALL DIMENSIONS TO BE CHECKED ON SITE

REV.	DATE	INITIALS	DETAILS
K	10.11.2022	CLR	AMENDED LAYOUT AS PER CLIENT REQUEST RECEIVED 04.10.22
J	13.07.2022	CLR	REINSTATED METAL SWINGS J472 AS PER EMAIL RECEIVED 13.06.22
I	20.04.2022	PLB	DRAWING AMENDED ACCORDING TO CLIENT MARK-UP RECEIVED 30.03.2022
H	25.02.2022	CLR	ADDED PLAY EQUIPMENT.
G	05.10.2020	KK	DRAWING AMENDED ACCORDING TO CLIENT MARK-UP RECEIVED 30.09.2020
F	20.12.2019	KK	DRAWING AMENDED ACCORDING TO CLIENT MARK-UP RECEIVED 10.12.2019
E	19.07.2019	LB	DRAWING AMENDED ACCORDING TO CLIENT MARK-UP RECEIVED 10.07.2019
D	13.06.2019	LB	DRAWING AMENDED ACCORDING TO CLIENT MARK-UP RECEIVED 04.06.2019
C	01.03.2019	LB	DRAWING AMENDED ACCORDING TO CLIENT COMMENTS RECEIVED 15.01.2019
B	08.12.2017	JMM	DRAWING AMENDED ACCORDING TO CLIENT COMMENTS RECEIVED 28.11.2017
A	02.10.2017	JP	DRAWING AMENDED ACCORDING TO JBA INTERNAL COMMENTS

CLIENT	HOPKINS HOMES, TAYLOR WIMPEY EAST ANGLIA & PERSIMMON HOMES ANGLIA
DWG. TITLE	DETAILED HARD AND SOFT LANDSCAPE PROPOSALS FOR SPORT AREA POS L18
SITE	BLUE BOAR LANE, SPROXTON	CONSORTIUM ONLY| SPORT AREA L18
PURPOSE OF ISSUE	PLANNING

DRG BY	CHECKED	AUTH'D	SCALE	DATE	DWG NO.	REV.
AS	JBA	JBA	1:250@A1	SEPTEMBER 2017	JBA 14/168-52	K

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LANDSCAPE ARCHITECTURE o ARBORICULTURE o ECOLOGY

APPENDIX 4
PRE-CONSTRUCTION INFORMATION

Blue Boar Lane – Skatepark
Sprowston Town Council
January 2026

BIDWELLS

PRE-CONSTRUCTION INFORMATION (DESIGN & MANAGEMENT REGULATIONS) 2015

Table of Contents

1.0 Description of Project

REF	TOPIC	PROJECT SPECIFICATION INFORMATION	OTHER COMMENTS/LOCATION
1.01	Project description and programme details	Design and build of new skate park for local community.	
	Key dates		
	Minimum time between appointment of Principal Contractor/Instruction to commence work on site	4 weeks subject to planning	
	Construction start	April 2026	
	Construction finish	September 2026	
1.02	Details of Client, Designers, Principal Designer and other consultants	See Project Directory at Appendix 1	
1.03	Is the structure to be used as a workplace when complete? Designers to apply the relevant requirements of the Workplace (Health, Safety and Welfare) Regulations 1992	The new building will not be used as a workplace.	
1.04	Extent and location of existing records and plans inc. Building Files prepared under CDM 1997.	Geo-technical survey	Site investigation report provided.
		Topographical survey	Topographical survey drawing provided.
		Asbestos Surveys	N/A
		Building Record drawings	N/A
		Service Records	N/A

2.0 Clients Considerations & Management Regulations

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
2.01	Arrangements for planning for and managing the construction work, including any health and safety goals for the project	The Client will satisfy the Regulations by appointing a Principal Contractor and Principal Designer. Aims are to execute the work without affecting the health of site users or Construction Team. Formal risk assessments and method statement required to maintain safe system of work.	Principle Contractor and Principal Designer to be appointed Tender has been awarded.
	Communication and liaison between Client and others	General correspondence and meetings to ensure all parties are aware of the works in hand and their responsibilities.	Weekley site meeting and monthly project updates.
	Security of the site	Principal Contractor to take responsibility for enclosing the full extent of the site and maintaining security. All unauthorised persons to be excluded.	Site set up and security to be confirmed by the contractor once Tender has been awarded.
	Welfare provision	Commensurate with scale of operation. Provide facilities for all construction personnel in accordance with the regulations.	Design package
2.02	Requirements relating to the H&S of the Client's employees or customers or those involved in the project		
	Site hoarding requirements	Contractor to erect site horded around the whole of the site to prevent unauthorised access.	
	Site transport arrangements or vehicle movement restrictions	Standard highway laws/regulations apply.	
	Client permit-to-work systems	Review specification to omit or reduce use of hot working. If hot working remains ensure hot work permit system instigated. Provide specific Risk Assessment/Method Statement for working in confined spaces.	Design package
	Fire precautions	The Principal Contractor will put into place a fire plan and emergency procedure for evacuation in the event of a fire. To be set out in CSH&SP. Other areas of work to be co-ordinated with existing Tenants. Local work within existing facility in use to be reviewed.	Design package
	Emergency procedures and means of escape.	To be confirmed by the Contractor once Tender has been awarded.	Design package
	Excluded areas or other authorisation requirements for those involved in the project	N/A	
	Any areas the Client has designated as confined spaces	N/A subject to design information submitted and Tender stage.	

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
	Smoking and parking restrictions	No smoking on site and designated parking available.	

3.0 Environmental Restrictions & Existing on Site Risks

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
3.01	Safety hazards, including:		
	Boundaries and access, including temporary access – for example narrow streets, lack of parking, turning or storage space	There is a ditch adjacent to the site. Contractor to take into account when planning vehicle routes	.
	Any restrictions on deliveries or waste collection or storage	Limited access to site for large commercial vehicles. Contractor to allow for one way vehicle routes when planning site set up.	
	Adjacent land uses – for example schools, railway lines/busy roads	Adjacent land comprises of residential properties and undeveloped land	
	Existing storage of hazardous materials	N/A	
	Location of existing services particularly those that are concealed e.g. water, electricity, gas etc	N/A	
	Ground conditions, underground structures or water courses where this might affect the safe use of plant, for example cranes, or the safety of groundworks.	Refer to Site Investigation Report Provided.	
	Information about existing structures – stability, structural form, fragile or hazardous materials, anchorage points for fall arrest systems (particularly where demolition is involved)	N/A	
	Previous structural modifications including weakening or strengthening of the structure (particularly where demolition is involved)	N/A	

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
	Any difficulties relating to plant and equipment in the premises, such as overhead gantries whose height restricts access	N/A	
	Health and safety information contained in earlier design, construction or 'as-built' drawings, such as details of pre-stressed and post-tensioned structures	N/A	
3.02	Health hazards including:		
	Asbestos, including results of surveys (particularly where demolition is involved)	N/A	
	Existing storage of hazardous materials	N/A	
	Contaminated land, including results of surveys	Please refer to site investigation report.	
	Existing structures containing hazardous materials	N/A	
	Health risks rising from client's activities	N/A	

4.0 Significant Design & Construction Hazards

REF	TOPIC	PROJECT SPECIFICATION INFORMATION	OTHER COMMENTS/LOCATION
4.01	Significant design assumptions and suggested work methods, sequences or other control measures	See Appendix 3	This document
4.02	Arrangements for coordination of ongoing design work and handling design changes	General liaison and distribution of meeting minutes and instructions.	
4.03	Information on significant risks identified during design	See Appendix 3	This document
4.04	Materials requiring particular precautions	Concrete	Refer to method statements and risk assessment provided by contractor.
4.05	Residual hazards upon completion	See Appendix 3	This document

5.0 The Health & Safety File

REF	TOPIC	PROJECT SPECIFIC INFORMATION	OTHER COMMENTS/LOCATION
5.01	Description of its format and any conditions relating to its content	Provide information for Health & Safety File/O+M Manuals users. Content as agreed with Client	To be provided at the end of the project.

APPENDIX 1
PROJECT DIRECTORY

Project Directory

Building Consultancy

Project	Land off Blue Boar Lane, Norwich, NR7 8RJ
Issue number	01
Date of Issue	21/01/2026

	Name and Address	Contact Details
Client	Guy Ranaweera Town Clerk Sprowston Town Council Recreation Ground Road Norwich NR7 8EW	T 10603408063 M E Guyranaweera@sprowston-tc.gov.uk
Employers Agent	Jason Menezes Kingfisher House 1 Gilders Way Norwich NR3 1UB	T 01603 229322 M 07787151492 E Jason.menenzes@bidwells.co.uk
Principal Designer	Bidwells LLP Kingfisher House 1 Gilders Way Norwich NR3 1UB	T 01603 763939
Principal Contractor	TBC	
Building Control	TBC	

APPENDIX 2
HSE F10 NOTIFICATION INFORMATION

APPENDIX 3
EXISTING BUILDING & SITE INFORMATION

Existing Building & Site Information

BIDWELLS

INFORMATION	SOURCE	COMMENTS
Existing Drawings	CAD's – Topographical Survey	
Health & Safety File (Existing buildings)	N/A	
Proposed Layout and Design Drawings	N/A	
Structural Engineer Drawings	N/A	
Mechanical and Electrical Drawings	N/A	
Utilities Location Drawings	N/A	
Asbestos Survey Report/Asbestos Register	N/A	
Hazardous Substances Reports (see previous section)	N/A	
Condition/Dilapidation Report	N/A	
Planning Consent	Broadland District Council	
Building Regulations Approval	N/A	
Fire Risk Assessment	N/A	
Design Risk Assessments – Architect:	N/A	
Design Risk Assessments - Structural:	N/A	
Design Risk Assessments - Mechanical & Electrical:	N/A	
Design Risk Assessments - Temporary Works:	N/A	
Clients Health & Safety Procedures	N/A	
Developers Tenants Handbook.	N/A	

APPENDIX 4
POTENTIAL HAZARDS

Existing Building & Site Potential Hazards

BIDWELLS

POTENTIAL HAZARD	YES	NO	LOCATION	COMMENT
Fragile roof lights, asbestos cement sheeting to roofs, etc.		/		
Pitched roofs where access is difficult.		/		
Rotten and defective internal timberwork.		/		
Refuse and debris from former occupiers		/		
Asbestos – see Section 8		/		
Restricted access and vehicle movements.		/		
Limited area for site set up externally.		/		
Limited area for materials storage.		/		Ensure materials are not excessively stock piled on site and barriers to be erected around stockpiled materials.
Pedestrian access ways to front of building		/		
Residential accommodation adjacent to site/in the vicinity.	/			Residential accommodation in proximity of the property. Ensure disruption and noise levels are kept within the legal limits. Working hours are strictly between 8am-6pm Mon – Fri.
Water courses, etc.	/		North West of site boundary	All harmful chemicals, fuels, and hazardous substances must be stored in secure, bunded containers at a safe distance from the adjacent watercourse, with spill kits kept on hand for immediate use. If any leak, spill, or discharge into the watercourse is identified, the contractor must immediately stop the source of the leak (if safe to do so), deploy spill-containment measures such as booms or absorbent materials, and report the incident without delay to the Environment Agency using their emergency hotline (0800 80 70 60). The contractor must then notify the local authority and the client, and ensure that the incident and all corrective actions taken are recorded in the site log.
Overhead power lines		/		
Contaminated land		/		

POTENTIAL HAZARD	YES	NO	LOCATION	COMMENT
Hazardous substances		/		
Pigeons, rodents or other infestations		/		
Shared access routes		/		Ensure not work materials, tools and works are obstructing entrances and fire exits. Ensure materials are not taken into the property via communal entrances.
Restricted delivery areas/routes		/		There is limited space on site for deliveries. Contractor is to ensure that no vehicles violate any parking restrictions and that no roads are blocked.
Public transport		/		
Train/railway lines/land		/		
Yellow lines/red routes adjacent to premises	/			Parking restrictions sounding the site. The contractor is to ensure that parking restrictions are not violated.
Large areas of glazing		/		
Unguarded roof edges		/		
Eyebolts, running lines, etc, without current testing and inspection certificates		/		
Building in constant operation i.e. Not closed for the construction works		/		
Public access		/		
Redundant tanks, petrol or other hazardous substance containers		/		
Overhead trees		/		
Syringes or other evidence of drugs		/		
Horse hair plaster or other potential sources of anthrax spores		/		
Other – please list:		/		

The principal contractor is to specifically investigate the above and is required to submit derails of how health and safety matters will be addressed in the Construction Phase Health and Safety Plan

APPENDIX 5
DESIGNER'S ASSUMPTIONS & IDENTIFICATION OF SIGNIFICANT HAZARDS

The CDM Regulations 2015

BIDWELLS

Designers Guidance & Checklist – Bidwells Guide No 2 (& Appendix 5 to Bidwells Pre-Construction Information)

DESIGNERS ACTIONS & CHECKLIST				
REF	ITEM	COMMENT & RESIDUAL ACTION	COMPLETED	
			YES	NO
1	**Client awareness** - do not commence work in relation to a project unless satisfied that the client is aware of duties.	Formally write to and provide copy of HSE guidance	✓	
2	**Elimination of risk** - take account of the general principals of prevention and PCI when preparing or modifying a design to eliminate foreseeable risks	See guidance below and review during the design process	✓	
3	**Risk reduction and control** - if not possible to eliminate take steps to reduce and control risks through the subsequent design process;	Has the design been reviewed at appropriate stages with the intent to remove/reduce hazards.	✓	
4	**Residual risk** - provide information about those risks to the PD and ensure information is included in the health and safety file; and	Ensure that the PD is aware of remaining risk areas and why they are not eliminated. Provide details on how to manage safely as part of the H&S File	✓	
5	**Provide information** - with the design about aspects of the design of the structure or its construction or maintenance to adequately assist others to comply.	Has the necessary information been provided for the H&S File	✓	

Completed by: Bidwells LLP

Dated: January 2026

Designers Assumptions & Identificaion of Significant Hazards

Designers are required to show/record that they have carried out their duties under the CDM Regulations including compliance with Regulation 9. Designers are required to:

- When preparing of modifying designs:
  - Take account for any pre-construction information provided by the client (and principal designer, if one is involved)
  - Eliminate foreseeable health and safety risks to anyone affected by the project (if possible)
  - Take steps to reduce or control any risks that cannot be eliminated
  - Apply the HSE guidance and the 'Principals of Presentation'
- Provide design information to:
  - The principal designer (if involved), for inclusion in the pre-construction information and the health and safety file
  - The client and principal contractor (or contractor for single contractor projects) to help them comply with their duties, such as ensuring a construction phase plan is prepared
- Communicate, cooperate and coordinate with
  - Any other designers (including the principal designer) so that all designs are compatible and ensure health and safety, both during the project and beyond
  - All contractors (including the principal contractor), to take account of their knowledge and experience of building designs
- Ensure that designs for workplaces meet the requirements of the Workplace Regulations

The following HSE 'CDM red, amber and green lists' should be applied to the design process

Red Lists: Hazardous procedures, products and processes that should be eliminated from the project where possible				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Lack of adequate pre-construction information, eg asbestos surveys, geology, obstructions, services, ground contamination etc.	Pre-construction information pack available and issued prior to works commencing on site.	✓	
	Hand scabbling of concrete ('stop ends', etc);	Safety Gloves to made available to all on site	✓	
	Demolition by hand-held breakers of the top sections of concrete piles (pile cropping techniques are available);	N/A		
	The specification of fragile rooflights and roofing assemblies;	N/A		
	Processes giving rise to large quantities of dust (dry cutting, blasting etc.);	N/A		
	On-site spraying of harmful substances;	Suitable respiratory protective equipment to be made available for all site operatives carrying out the works and those in close proximity. Refer to HSE for guidance.	✓	
	The specification of structural steelwork which is not purposely designed to accommodate safety nets;			
	Designing roof mounted services requiring access (for maintenance, etc), without provision for safe access (eg. barriers).	N/A		
	Glazing that cannot be accessed Safely, All glazing should be anticipated as requiring cleaning and replacement, so a safe system of access is essential.	N/A		
	Entrances, floors, ramps, stairs and escalators etc not specifically designed to avoid slips and trips during use and maintenance, including effect of rain water and spillages.	N/A		
	Design of environments involving adverse lighting, noise, vibration, temperature, wetness, humidity and draughts or chemical and/or biological conditions during use and maintenance operations.	N/A		
	Designs of structures that do not allow for fire containment during construction	N/A		
	Woking inside excavation	Where possible, excavations should be dug using mechanical plant to minimise the need for operatives to enter the excavation. If entry into the excavation is required, a permit-to-work system must be in place, supported by a suitable emergency rescue plan and continuous competent supervision at all times.		✓

Amber Lists: Products, processes and procedures to be eliminated or reduced as far as possible and only specified/allowed if unavoidable. Including amber items would always lead to the provision of information to the Principal Contractor.				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Internal manholes / inspection chambers in circulation areas;	N/A		
	External manholes in heavy used vehicle access zones;	N/A		
	The specification of “lip” details (i.e. trip hazards) at the tops of pre-cast concrete staircases;	N/A		
	The specification of shallow steps (i.e. risers) in external paved areas;	N/A		
	The specification of heavy building blocks i.e. those weighing > 20kgs;	N/A		
	The chasing out of concrete / brick / blockwork walls or floors for the installation of services;	N/A		
	The specification of heavy lintels (the use of slim metal or hollow concrete lintels being alternatives);	N/A		
	Large and heavy glass panels;	N/A		
	The specification of solvent-based paints and thinners, or isocyanates, particularly for use in confined areas;	N/A		
	Specification of curtain wall or panel systems without provision for the tying (or raking) of scaffolds;	N/A		
	Specification of blockwork walls >3.5 metres high using retarded mortar mixes.	N/A		
	Site traffic routes that do not allow for ‘one way’ systems and/or vehicular traffic segregated from site personnel	N/A		
	Heavy construction components which cannot be handled using mechanical lifting devices (because of access restrictions / floor loadings etc)	N/A		
	Site layout that does not allow for adequate room for delivery and/or storage of materials, including specific components.	Ensure that all materials are stored either in a site compound or in a area away from walkways which does not pose a trip hazard.	✓	
	Pouring concrete	When carrying out concrete pouring operations, all work must be planned and supervised to ensure safe handling of wet concrete and associated equipment. Operatives must wear appropriate PPE, including waterproof gloves, eye protection, and suitable footwear, to prevent skin burns and chemical irritation. Access routes and pour	✓	

		areas must be kept clear of obstructions, and controls must be in place to prevent concrete splashes. Mechanical aids should be used where possible to minimise manual handling, and proper communication must be maintained between the pouring team and plant operators. A safe system of work must be followed at all times, with emergency procedures briefed to all personnel prior to the pour.		

Amber Lists: Products, processes and procedures to be eliminated or reduced as far as possible and only specified/allowed if unavoidable. Including amber items would always lead to the provision of information to the Principal Contractor.				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Heavy construction components which cannot be handled using mechanical lifting devices (because of access restrictions / floor loadings etc)	N/A		
	On-site welding, in particular for new structures.	N/A		
	Need to use large piling rigs and cranes near ‘live’ railways and overhead electric power lines or where proximity to obstructions prevents guarding of rigs			

Green Lists: Products, processes and procedures to be positively encouraged.				
Ref	**Item**	**Comment & Residual Action**	**Eliminated**	
			Yes	**No**
	Adequate access for construction vehicles to minimise reversing requirements (one- way systems and turning radii);	Limited access. Where vehicular access is required ensure that adequate signage and a banksman are present when a vehicle is reversing.	✓	
	Provision of adequate access and headroom for maintenance in plant rooms, and adequate provision for replacing heavy components;	N/A		
	Thoughtful location of mechanical / electrical equipment, light fittings, security devices etc. to facilitate access and away from crowded areas;	N/A		
	The specification of concrete products with pre-cast fixings to avoid drilling;	N/A		
	Specify half board sizes for plasterboard sheets to make handling easier;	N/A		
	Early installation of permanent means of access, and prefabricated staircases with hand rails;	N/A		
	The provision of edge protection at permanent works where there is a foreseeable risk of falls after handover;	N/A		
	Practical and safe methods of window cleaning (eg. from the inside);	High level windows can be cleaned from a tower scaffold.	✓	
	Appointment of a Temporary Work Coordinator (BS 5975);	N/A		
	Off-site timber treatment if PPA- and CCA-based preservatives are used (Boron or copper salts can be used for cut ends on site).	N/A		
	Off-site fabrication and prefabricated elements to minimize on site hazards.	All Steel work is being prefabricated off site.		
	Encourage the use of engineering controls to minimize the use of Personal Protective Equipment	N/A		

BIDWELLS

APPENDIX 5
OUTLINE PLANNING

The Horizon Centre, Broadland Business Park, Peachman Way,
Norwich, NR7 0WF
Tel 01508 533633 / 01603 430509 Text phone 01508 533622
Freephone 0800 3896109
Email planning@southnorfolkandbroadland.gov.uk
Website www.southnorfolkandbroadland.gov.uk

Broadland District Council
Community at heart

Agent

Persimmon Homes
Persimmon Homes (ANGLIA)
Bankside 100 Peachman Way
Broadland Business Park
Norwich
NR7 0WF

Applicant

Ms Debi Sherman
Bankside 100 Peachman Way
Broadland Business Park
Norwich
Norfolk
NR7 0WF

DECISION NOTICE

Town and Country Planning Act 1990

Reference : 2023/1943

Application Type : Approval of details reserved by condition

Applicant : Ms Debi Sherman

Location : Land At Blue Boar Lane Blue Boar Lane Sprowston Norfolk

Proposal : Details of condition 21 of 20140652 (21) Landscape proposals

Date of Decision : 6 August 2025

The details submitted in pursuance of the conditions referred to above have been **approved**

1. Condition 21 (Landscaping excluding that agreed under 20221648) - The following plans satisfy the submission requirements of this condition:

   - JBA 14/168-49 Rev A
   - JBA 14/168-01 Rev B
   - JBA 14/168-04
   - JBA 14/168-32 Rev M
   - Q7191 Rev D
   - JBA 14/168-40 Rev C
   - JBA 14/168-35 Rev A
   - JBA 14/168-37 Rev B
   - JBA 14/168-09
   - JBA 14/168-06 Rev J
   - Q4338 Rev H
   - JBA 14/168-54 Rev A
   - JBA 14/168-03 Rev A
   - JBA 14/168-51 Rev A
   - JBA 14/168-44 Rev A
   - JBA 14/168-45 Rev A
   - JBA 14/168-42 Rev A
   - JBA 14/168-39 Rev C

- JBA 14/168-34 Rev A
- JBA 14/168-31 Rev L
- JBA 14/168-05
- JBA 14/168-53 Rev A
- JBA 14/168-02 Rev B
- JBA 14/168-50 Rev A
- JBA 14/168-08 Rev D
- JBA 14/168-36 Rev B
- JBA 14/168-47 Rev A
- JBA 14/168-10 Rev C
- JBA 14/168-38 Rev A
- JBA 14/168-33 Rev A
- SPR CIV 003 Rev A
- SCHEDULE FOR MANAGEMENT & MAINTENANCE OF LANDSCAPING
- 16072/1021 B Implementation Phasing Plan (confirming who is responsible for each area of open space within the development site)
- email from Persimmon Homes dated 12th June 2025 confirming suitable grass (not wildflower) for the junior pitch.

Informatives

1. The Local Planning Authority confirm it has taken a positive and proactive approach to reach this decision in accordance with the requirements of the National Planning Policy Framework

Assistant Director - Planning

How did we do? Let us know your feedback on the service you received.
https://www.smartsurvey.co.uk/s/CSANew2021/

Information relating to appeals against the decision of the Local Planning Authority.
If you are aggrieved by this decision to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under section 78 of the Town and Country Planning Act 1990 or Section 20 of the Planning (Listed Buildings and Conservation Areas) Act 1990.

Time periods to submit appeal
If the application relates to minor commercial development (as defined in Article 2 of the Town and Country Planning (Development Management Procedure) (England) Order 2015) this should be submitted with **12 weeks** of the date of this notice

If the decision relates to the same or substantially the same land and development as is already the subject of an enforcement notice, any appeal must be submitted within **28 days** of the date of this notice

If an enforcement notice is served relating to the same or substantially the same land and development as in your application and if you want to appeal against the decision on your application, then you must do so within: **28 days** of the date of service of the enforcement notice, or within 6 months of the date of this notice, whichever period expires earlier.

In all other cases the appeal should be submitted within **six months** of the date of this notice.

If you intend to submit an appeal that you would like examined by inquiry then you must notify the Local Planning Authority and Planning Inspectorate (inquiryappeals@planninginspectorate.gov.uk) at least 10 days before submitting the appeal. Further details are on GOV.UK

The Secretary of State can allow a longer period for giving notice of appeal, but he will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal. The Secretary of State need not consider an appeal if it seems to the Secretary of State that permission for the proposed development could not have been given by the Council or could not have been given without the conditions imposed having regard to the statutory requirements, to the provisions of the development order and to any directions given under a development order and to any directions given under a development order.

In practice, the Secretary of State does not refuse to consider appeals solely because the local planning authority based their decision on a direction given by him.

Appeals can be made online at http://www.gov.uk/planning-inspectorate If you are unable to access the online appeal form, please contact the Planning Inspectorate to obtain a paper copy of the appeal form at Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN or tel no. 0303 444 5000

Purchase Notices
If permission to develop land or carry out works is refused or granted subject to conditions, whether by the Council or by the Secretary of State for the Environment, the owners of the land may claim that the land has become incapable of reasonably beneficial use by the carrying out of any development which has been or would be permitted.

In these circumstances, the owner may serve on the Council a purchase notice requiring the Council to purchase his interest in the land in accordance with the provisions of either Part VI of the Town and Country Planning Act 1990.

APPENDIX 6
SI REPORTS

Document: Site Investigation Report

Project: Blue Boar Lane, Sprowston

Reference No.: GN20251-2_SI

Date: October 2016

Prepared for: Persimmon Homes Limited

harrisongeotechnical
ENGINEERING

A division of Harrison Group Environmental Ltd.

HARRISON GROUP ENVIRONMENTAL LIMITED

Document: Site Investigation Report

Project: Blue Boar Lane, Sprowston

Reference No.: GN20251-2_SI

Date: October 2016

Prepared For: Persimmon Homes Limited

REPORT STATUS:

Revision	Comments	Prepared By	Approved By	Issued By	Audited By
0		INIT RCR SIGN COMMENTS DATE 03/10/16	INIT EO SIGN COMMENTS DATE 25/10/16	INIT RCR SIGN COMMENTS DATE 31/10/16	INIT EO SIGN COMMENTS DATE 25/10/16
		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE
		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE
		INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE	INIT SIGN COMMENTS DATE

CONTENTS

FOREWORD

General Conditions Relating To Site Investigation

This investigation has been devised to generally comply with the relevant principles and requirements of B.S.10175:2011+A1:2013 'Investigation of potentially contaminated sites - Code of practice', science report SC050021/SR3 'Updated Technical Background to the CLEA Model' (Environment Agency, 2008), and Contaminated Land Report 11 'Model procedures for the management of contaminated land' (Department for Environment, Food and Rural Affairs and the Environment Agency, 2004). The recommendations made and opinions expressed in this report are based on the information obtained from the sources described using a methodology intended to provide reasonable consistency and robustness.

The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between exploratory positions, these are only for guidance and no liability can be accepted for their accuracy.

Boring and sampling procedures are undertaken in accordance with B.S.5930:2015 'Code of Practice for Ground Investigations'. Likewise in-situ and laboratory testing complies with B.S.1377:1990 'Methods of Tests for Soils for Civil Engineering Purposes' and B.S.22475:2011, unless stated otherwise in the text. Chemical Testing has been undertaken by a UKAS accredited laboratory.

The groundwater conditions entered on the boring records are those observed at the time of investigation. The normal rate of boring usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions.

Some items of the investigation have been provided by third parties and whilst Harrison Group have no reason to doubt the accuracy, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report.

This report is produced for the benefit of the client alone. No responsibility can be accepted for any consequences of this information being passed to a third party who may act upon its contents/recommendations.

EXECUTIVE SUMMARY

Location	The site is spilt across two fields (denoted P3 and P4), south of Laundry Lane, just off Blue Boar Lane, Sprowston, North of Norwich.
Previous & Current Site Use	The site is currently and has previously been used for agricultural purposes. Although P3 was briefly used for polo in the early 20th century with a small pavilion noted on the site (later demolished). A small pit was present bordering the west of P3 which was possibly backfilled in the late 1930s (we recommend additional investigation of this potential hazard).
Proposed Site Use	The site is to be developed involving the construction of a new residential development and associated infrastructure.
Geology	Superficial – Sheringham Cliffs Formation –sands and gravels with lenses of silt and Clay over the Happisburgh Glacigenic Formation – clay. Bedrock – Crag Group – sands and gravels.
Background Information	Landfill – None locally but one within 1km of the site boundary (not of concern to the site) A smaller likely backfilled pit may exist to the west of P3. Flood – Not considered to be at risk of flooding from rivers or the sea. Radon – No radon protective measures required.
Ground Conditions	The ground conditions encountered at P3 were found to comprise topsoil and made ground to a maximum recorded depth of 0.40m overlying generally medium dense to very dense natural sands of the Sheringham Cliffs Formation. Across the west of P4 these sands thinned considerably with these underlain by low heave potential clays of the Happisburgh Glacigenic Formation which were present from as little as 0.5 but generally around 0.6-0.9m depth deepening further across the east of the P4 site. Groundwater was only encountered within WS123, 124, 125 and 126 (field P3 only) at depths of 2.3m, 2.6m, 2.6m and 1.70m respectively (28.03maOD- 30.20maOD) which likely represents a perched groundwater body resting on cohesive soils beyond the investigation depth (below 5.45m in this area). However, the main body of groundwater (principal aquifer) is expected at a depth between 21 and 26m. The site lies within the total catchment a groundwater source protection zone.
Foundations, Floor Slabs	Shallow strip/pad foundations will likely be suitable for conventionally loaded two and three storey residential structures with the allowable bearing capacities and recommended depths provided in sections 5.1.2 and 5.2.2 for the respective site areas and soils types. More careful consideration of foundation depth will be required across the west of P4 where low heave clays are present and deepening may also be required on a plot-by plot basis to ensure depths are suitable in relation to the NHBC guidance and to ensure that building footprints rest on a consistent soil type. Whilst ground bearing slabs will be suitable upon compacted natural granular soils it would be recommended that the use of suspended floor slabs be used where resting above the cohesive soils within southwest of P4.
Concrete Design	A design sulphate class of DS-1 and an ACEC class of AC-1 is considered suitable.
Contamination	Minimal amounts of made ground were encountered on site and the chemical analyses carried out would indicate the there is no significant risk to the identified sensitive receptors. Groundwater is not considered to be at risk from on-site contamination. However, a small likely backfilled pit borders the west of P3 and we would recommend that a day of trial pitting and possibly supplementary chemical testing is undertaken to assess whether this features presents a contamination, ground gas or geotechnical hazard. Waste disposal of excavated soils should be carried out in accordance with current legislation and the responsibility for suitable disposal rests with the waste producer. The results from this investigation should be provided to groundwork contractors to aid in classification, although most material would appear to be suitable for disposal as inert waste. Further assessment of the likely backfilled pit should be undertaken to assess the nature of the fill material and the waste disposal implications or any deleterious fill.

SITE INVESTIGATION REPORT-

BLUE BOAR LANE, SPROWSTON

1 TERMS OF REFERENCE & INTRODUCTION

The work covered by this report was undertaken on behalf of Persimmon Homes Ltd. The investigation is in accordance with Harrison Group Environmental Limited's quotation (GN20251_Q_JA) dated 23rd June 2016 with an emailed instruction to proceed from Mark Wilkinson of Hopkins Homes Ltd dated 1st August 2016.

The purpose of the work was to undertake a site investigation, focusing on geotechnical and contamination issues relating to land off Blue Boar Lane, Sprowston. The site was split across two fields, P3 was north of Salhouse Road, and P4 was located northeast of Blue Boar Lane. The site locations are shown on drawing GN20251-DR001b.

The report was undertaken in order to assess environmental and geotechnical issues on the site prior to development involving the construction of a new residential development and associated infrastructure. This was carried out using available published documentation in association with a site walkover and in-situ investigation. The centre of P3 can be identified by National Grid Reference 626743, 311517 and by examination of online resources, the elevation of the site is estimated at between 31-36m above Ordnance Datum (maOD) with P4 identified by National Grid Reference 626219, 311636 and elevation estimated approximated between 31-35maOD.

2 BACKGROUND INFORMATION

The environmental setting background information (geology, hydrology, hydrogeology, database information) and site history information have been researched as part of this report. A summary of which is given in the following sections.

2.1 Environmental Setting

Table 2.1, below, gives background information from mapping, online and literature sources.

	Data Source	Data Summary
Topography	Online resource, Google Earth, accessed October 2016.	The site is positioned east of Sprowston just off Blue Boar Lane. Satellite imagery suggests the elevation range of the field north of Salhouse Road (P3) was approximately 31-36maOD and 31-35maOD for the field (P4) northeast of Blue Boar Lane.
Geology	Online resource, British Geological Survey, Geology of Britain, accessed October 2016. Online resource, British Geological Survey website previous borehole records, BGS ID: 516746 and 516736, 516829, 516830, and 516735 all accessed October 2016.	The site was shown to be underlain by superficial Sands and Gravels of the Sheringham Cliffs Formation, with Diamicton of the Happisburgh Glacigenic Formation to the north, southeast and northwest and may encroach onto the site. The superficial deposits were shown to overly bedrock of the Crag Group composed of Sands and Gravels. Boreholes drilled in close proximity to the north of P3 and northeast of P4 of the two fields and within the same formation encountered gravel, sands and clay of the Happisburgh Formation over sands and gravels with shells of the Crag Formation over soft chalk and flints. Immediately to the south of P3 mainly medium to coarse sands and gravels were encountered with one showing drift deposits over crag over chalk with a few boreholes further to the south encountering Clay around 3-4mbgl.
Hydrogeology	Hydrogeological Map Sheet 4: Northern East Anglia (1:125,000) 1976. Online resource, British Geological Survey website previous borehole records, BGS ID: 516736, 516746, 516735 accessed October 2016.	Study of the hydrogeological maps and the nearby borehole records indicate that the water table is at approximately 10maOD. A borehole drilled to the southeast of the site encountered standing water at approximately 14m and 18mbgl.

	Data Source	Data Summary
Hydrology	Landmark Envirocheck Report Reference 723143.	The site lies above groundwater within source protection zone III (SPZ) and is within a principal aquifer (highly permeable).
Pollution and Landfill	Online resource, Environment Agency Website, accessed October 2016.	A Household, commercial & Industrial Waste Landfill was noted to the east of P3 and P4 approximately 0.49km and 1.29km from the centre of the sites respectively.
UXO	MACC, Unexploded Ordinance Desk Study, Development Plot East of Blue Boar Lane Sprowston Norfolk, 4351, dated 16th May 2016.	MACC UXO report indicates the site is within agricultural land in which has had limited degree of post war development. P3 and P4 were considered to be of low risk. To the south of P4 and west of P3 a medium risk was noted.
Previous reports	MLM, Blue Boar Lane, Sprowston, Phase 2 Area, Preliminary Contamination Assessment Report dated February 2011. MLM, Blue Boar Lane, Sprowston, Phase II Geoenvironmental Assessment Report, dated February 2011.	A previous desk study report for the site indicates the site consists of agricultural fields and has not been developed in the past with the exception of a small pavilion in P3, which was associated with a Polo ground in 1919. A small pond was noted to the east of P3 and was no longer seen on mapping after 1986. It was identified within their preliminary conceptual site model that potential contaminants for the sites are considered to be very low to moderate.
Environmental Sensitivity	Landmark Envirocheck Report Reference 723143.	The site is within a Nitrate Vulnerable Zone (NVZ).

Table 2.1: Background Information.

2.2 Site History

The history of the two site areas P3 and P4 has been researched from historical mapping sources provided in the previous reports made available to us.

P3

Since as early as 1885 the sites appear to be part of agricultural field albeit with an interim use as a polo ground shown on the 1919 mapping (along with a small pavilion noted within the the east of the site). A small pit was noted on the western site boundary up until 1938 after which time it was noted as scrub land presumably having been backfilled. The previous MLM reporting indicated that no further investigation was warranted in these areas although made ground may be present which presents a contamination and ground gas hazard.

P4

All historic mapping suggests no previous site use other than as arable fields.

Surrounding land use also appears to have been used for agricultural use as well as plantations.

2.3 Site Walkover

A site walkover was undertaken on prior to fieldwork. A description of the reconnaissance is presented in table 2.3.

Current Use	At the time of the walkover the site was open land, assumed to be for agriculture.  **Figure 2.3a:** Showing field P3.  **Figure 2.3b:** Showing one section of field P4.
Former Use	It is assumed that the site area have been used as agricultural land in the past.
Access	Access to the site was gained via Laundry Lane accessed off Blue Boar Lane.
Topography	The site appeared to be relatively flat.
Vegetation	Field P3 at the time of the walk over had a crop of rape seed. P4 was split over two fields adjacent one another divided by a small hedge and had a crop of mustard seed. Trees bordered the southern boundary of P4 and the western, southern and northern boundary of P4.
Site surface	The site surface was unmade earth/topsoil with high vegetation in places.
Structures	There were no structures present on site.
Above/below ground tanks	None were present on site.
Services	At the time of the investigation service plans were provided. None were present within P4. Through the northern part of P3 a sewer was seen to cross from northwest to northeast.
Surrounding area	The surrounding area comprised arable agricultural fields, residential properties and commercial premises.
Surface Water	There were no surface water features on site.

Table 2.3: Details of the site walkover.

2.4 Summary of Background Information

The geology underlying the site is shown to comprise Sands and Gravels of the Sheringham Cliffs Formation. Cohesive soils, Diamicton of the Happisburgh Glacigenic Formation, lie within close proximity and may encroach onto either site area although to a very limited extent. The superficial deposits are expected to overly bedrock of the Crag group consisting of sands and gravels. Groundwater is not anticipated to be found within the depths of normal excavation and at least 14mbgl.

Reference to the historical mapping would suggest that the site has had very little activity over the past century, with use for agriculture. No significant changes were noted, with the exception of small likely backfilled pit last shown on mapping in the late 1930s. Backfilled pits create a potential ground gas, contamination and geotechnical hazard.

3 INITIAL HAZARD IDENTIFICATION AND ASSESSMENT

Contamination hazard identification has been undertaken and this has been developed to include the source-pathway-receptor principles. Geotechnical hazards are also identified and commented upon.

3.1 Initial Geotechnical Hazard Identification

Table 3.1 below contains an initial assessment of the likely geotechnical hazards that could be present at the site.

Hazard	Requires further consideration?	Comment
Sulphate bearing soils	**Yes**	Considered to be a low risk from encountering soils high in sulphate, but chemical testing is recommended.
Uncontrolled backfill	**Yes**	From background research there appears to have been a relatively small pit bordering the west of P3 which could have potentially been backfilled.
Low permeability soil	**Yes**	Although permeable soils were likely to underlie the majority of the site, it was anticipated the geology of the site may include cohesive soils (clay) which will have a lower permeability.
Shrink/ swell potential	**Yes**	The site may include cohesive (potentially shrinkable) soils within the superficial deposits.
Slope stability	No	Insufficient slope to suffer instability on site.
Underground obstructions and structures	No	Examination of available historic map data does not suggest the likely presence of relic structures/footings within P4. Within P3, it was noted a pavilion was present in 1919 and no longer seen in 1929. Its small scale nature and age suggests that that significant below ground structures that would impact development would be unlikely.
High groundwater level/flooding	No	Unlikely to be a problem. Groundwater anticipated to be found at approximately 10maOD (between 21-26mbgl across the two sites).
Potential variable deposits	**Yes**	Although the geological maps at the site showed the site to be underlain by sand deposits, local borehole records outline variability in the superficial deposits.

Table 3.1: Initial geotechnical hazard identification.

This table has been based on local knowledge, geology and topography; however it should be revised at any time if additional relevant data was identified.

3.2 Initial Environmental Hazard Identification

In this part of the report, environmental hazard identification is undertaken. Sources are specified based on the information provided and information previously presented in the phase 1 assessment carried out by MLM in February 2011, as well as our experience and identified receptors, in association with a list of potential contaminants. MLM had noted the site was open, undeveloped arable farmland with no structures on site and surrounding land use predominantly agricultural. A site walkover was also carried out by MLM in January 2010 as well as Harrison Group Environmental which was carried out in 2016, in which no evidence of contamination was noted. The potential sources of contamination identified are listed below.

1. Infilled pond to the northwest of the site of P3 approx. 608m and approx. 168m from P4 (measured from the centre of the sites). With a potential infilled pit along the western border of P3.
2. Made Ground from the construction and demolition of the pavilion in P3.
3. Car dealership to the south of P3 approximately 34m to the southeast (measured from the southernmost boundary).

The overall contamination risk to the site was classed as very low to moderate with no significant contamination hazards present. No further investigation was not considered necessary by MLM. The risk from carbon dioxide and methane was considered to be low if suspended floor slabs were used at this site with a ventilated underfloor void of at least 150mm height. Overall, MLM have considered no further assessment with regard to gas and contamination issues. It should be noted however, that the pit adjacent to site P3 was not investigated further by MLM and it is not known as to nature of this feature (backfilled or otherwise) we would recommend further investigation of this feature prior to development.

4 INTRUSIVE INVESTIGATION

4.1 Introduction

The intrusive investigation was designed to provide a good coverage of the ground conditions across the site with positions chosen by the client. This was undertaken by dynamic continuous sampler boreholes.

4.2 Fieldwork, Monitoring and In-situ Testing Program

Details of the site investigation methods employed have been presented on the appended data sheet and a brief summary of the fieldwork has been presented below with the exploratory locations indicated on appended drawing GN20251-DR008 (P3) and DR009 (P4).

4.2.2 Dynamic Sampling (Windowless Sampler) Boreholes

Twenty nine dynamic sampler boreholes (WS123 to WS152) were drilled between 18/08/2016 and 24/08/2016 using a dual-purpose tracked rig between depths of 1.19mbgl and 6.45mbgl. Experienced field technicians undertook the drilling and collected samples within plastic liners, which were later examined, described and sub-sampled for subsequent laboratory testing. Upon completion, all of the boreholes were backfilled with spoil/ballast.

A detailed description of all the strata encountered, in-situ testing undertaken, position and types of samples taken along, with any groundwater observations made at the time of drilling are included on the borehole records presented in the Appendix.

4.3 Fieldwork Observations

4.3.1 Ground Conditions for P3

Made Ground

Soil containing anthropogenic material (made ground) was encountered in one exploratory location (WS124) to a maximum depth of 0.40m. The made ground generally consisted of brown slightly gravelly very sandy silt. Anthropogenic material consisted of rare clinker.

Topsoil

Topsoil was recorded in all other positions across the site at depths between 0.2m and 0.4mbgl. Topsoil generally comprised brown slightly gravelly very sandy silt or brown gravelly very silty sand.

At most locations topsoil was underlain by granular soils of the Sheringham Cliffs Formation (as mentioned below) although at a number of positions (WS123, 124, 128 and WS131) a slightly to very sandy, slightly gravelly silt was encountered to a maximum depth of 0.60m. At WS125 a silty slightly gravelly sandy clay was encountered to 0.8m depth.

Sheringham Cliffs Formation

The underlying natural soils were very variable and consisted of differing granular horizons of the Sheringham Cliffs Formation. The granular soils were generally fine to medium and fine to coarse sands

containing varying amounts of silt, clay and gravels. The Sheringham Cliffs Formation was encountered at every fieldwork position across the P3.

4.3.2 Ground Conditions for P4

Made Ground

Soil containing anthropogenic material (made ground) was encountered in seven locations to a maximum depth of 0.60m. The made ground generally consisted of light brown slightly gravelly sandy silt or brown silty to very silty, slightly gravelly to gravelly sand with a few locations being slightly clayey. Anthropogenic material consisted of tile fragments, brick and glass.

Topsoil

Topsoil was recorded at all other positions across the site at depths between 0.3m and 0.6mbgl. Topsoil generally comprised brown silty to very silty, slightly gravelly to very gravelly sand, occasionally slightly clayey, or light brown very sandy silt.

Sheringham Cliffs Formation

The underlying natural soils were very variable and consisted of both granular and cohesive horizons of the Sheringham Cliffs Formation. The granular soils were very varied and were seen to be fine to medium and fine to coarse sands with varying amounts of silt, clay and gravels. The Sheringham Cliffs Formation was encountered at every borehole location although extended no deeper than 1.0m across the west of the site. These soils deepened significantly across the west of the site being recorded to depth greater than 2.3m at WS139. A number of boreholes in the east of the site terminated early within the Sheringham Cliffs Formation soils due to it high density (specifically WS134 and 137-140).

Cohesive lenses were present within the granular units in a limited number of positions. These were seen to a maximum depth of 0.90m generally consisted of slightly gravelly to gravelly very sandy Silt / very sandy Silt.

Happisburgh Glacigenic Formation

Below the more granular horizons of the Sheringham Cliffs Formation, extensive cohesive deposits of the Happisburgh Glacigenic Formation were encountered in the majority of the fieldwork locations. The cohesive deposits were encountered beneath the Sheringham Cliffs Formation soils and where recorded identified to the termination of the boreholes at a maximum depth if 6.45m. This generally consisted of firm to stiff orangish brown mottled grey and orange silty clay with varying amounts of sand and gravel.

4.3.3 Groundwater

Groundwater was encountered in three of the exploratory holes WS123, 124, 125 and 126 during fieldwork between depths of 2.3m, 2.6m, 2.6m and 1.70m respectively (28.03maOD- 30.20maOD) likely representing perched water resting upon the deeper cohesive Happisburgh Glacigenic Formation soils.

4.4 In-Situ Testing

In-situ testing was undertaken for geotechnical purposes and is summarised below in Table 4.4a and 4.4b with subsequent sections providing details regarding the tests results.

Test Type and Reference (BS 1377: 1990 unless stated)	Stratum	Number of Results	Results (Range)	Comments / Limitations
Standard penetration test (BS EN ISO 22476-3:2005)	Sheringham Cliffs Formation	23	N_{60} = 4 - 107	Field test results (raw N values) presented on the appended borehole records have been adjusted to standard "N_{60}" values which take into consideration the potential energy loss to and by the drive rods, by using the following equation provided in BS EN ISO 22476-3:2005+A1:2011. $N_{60} = \frac{E_r}{60} N\boldsymbol{\lambda}$ Where: N = N values from field tests. Er = Energy ratio of the hammer $\boldsymbol{\lambda}$ = Correction value for the rod length below the anvil (where in granular soils). Further description of the results is presented in section 4.4.1 below

Table 4.4a: Summary of In-situ Geotechnical Testing for **P3.**

Test Type and Reference (BS 1377: 1990 unless stated)	Stratum	Number of Results	Results (Range)	Comments / Limitations
Standard penetration test (BS EN ISO 22476-3:2005)	Sheringham Cliffs Formation	9	N_{60} = 13 - 38	Field test results (raw N values) presented on the appended borehole records have been adjusted to standard "N_{60}" values which take into consideration the potential energy loss to and by the drive rods, by using the following equation provided in BS EN ISO 22476-3:2005+A1:2011. $N_{60} = \frac{E_r}{60} N\boldsymbol{\lambda}$ Where: N = N values from field tests. Er = Energy ratio of the hammer $\boldsymbol{\lambda}$ = Correction value for the rod length below the anvil (where in granular soils). Further description of the results is presented in section 4.4.1 below.
	Happisburgh Glacigenic Formation	63	N_{60} = 4 - 20	

Table 4.4b: Summary of In-situ Geotechnical Testing for **P4.**

4.4.1 Standard Penetration Testing

Figure 4.4.1 and 4.4.2 below provides the relationship between depth and N_{60} for P3 and P4 respectively.

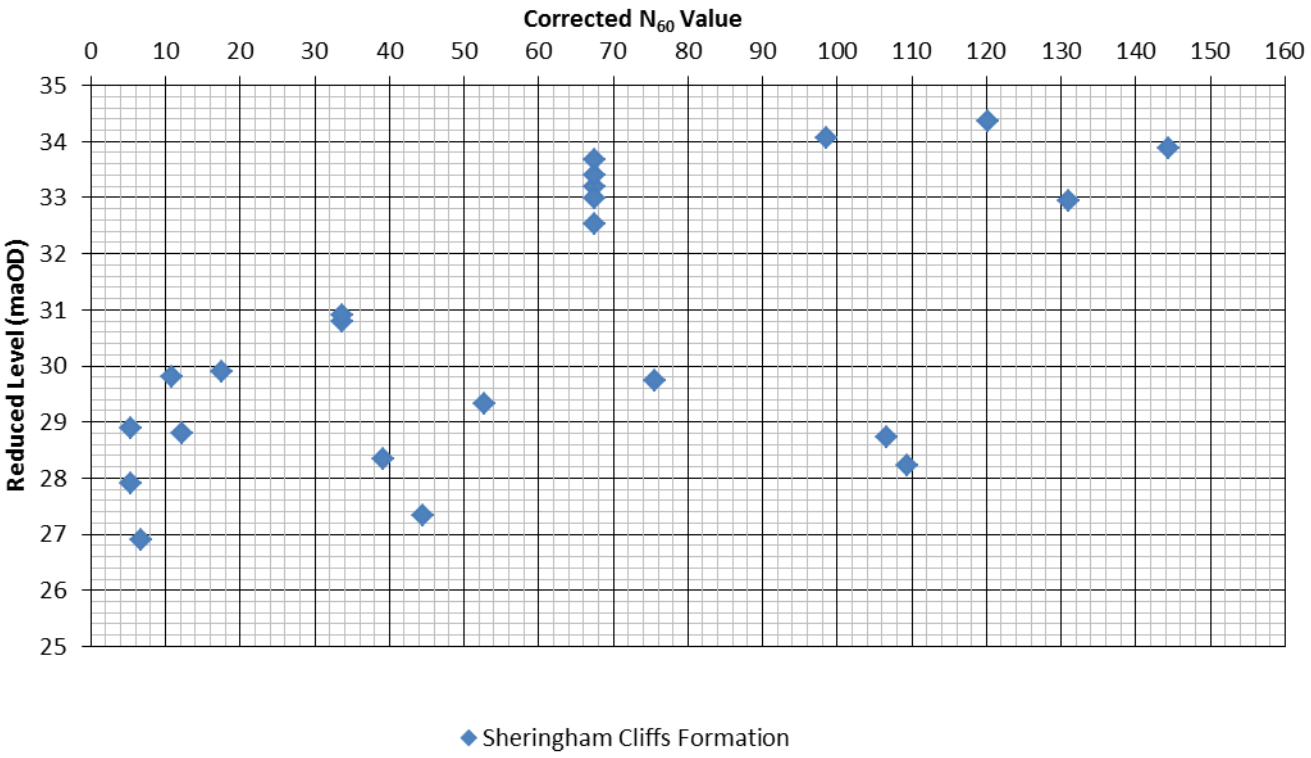

Figure 4.4.1: Corrected N_{60} Values vs. Depth for **P3.**

Figure 4.4.1 above shows the SPT N_{60} values for P3 and shows that the majority of the SPT N_{60} values within the Sheringham Cliffs Formation show a spread between 33 and 144, which can be interpreted as dense to very dense sandy gravels and gravelly sand. A few values were seen between 5 and 17, and can be interpreted as loose to medium dense, with three values in WS126 showing low values at tests carried out at 3.45m, 4.45m and 5.45m indicating loose soils. These lower values were undertaken in more silty sands and therefore are considered likely to be showing conservative density values.

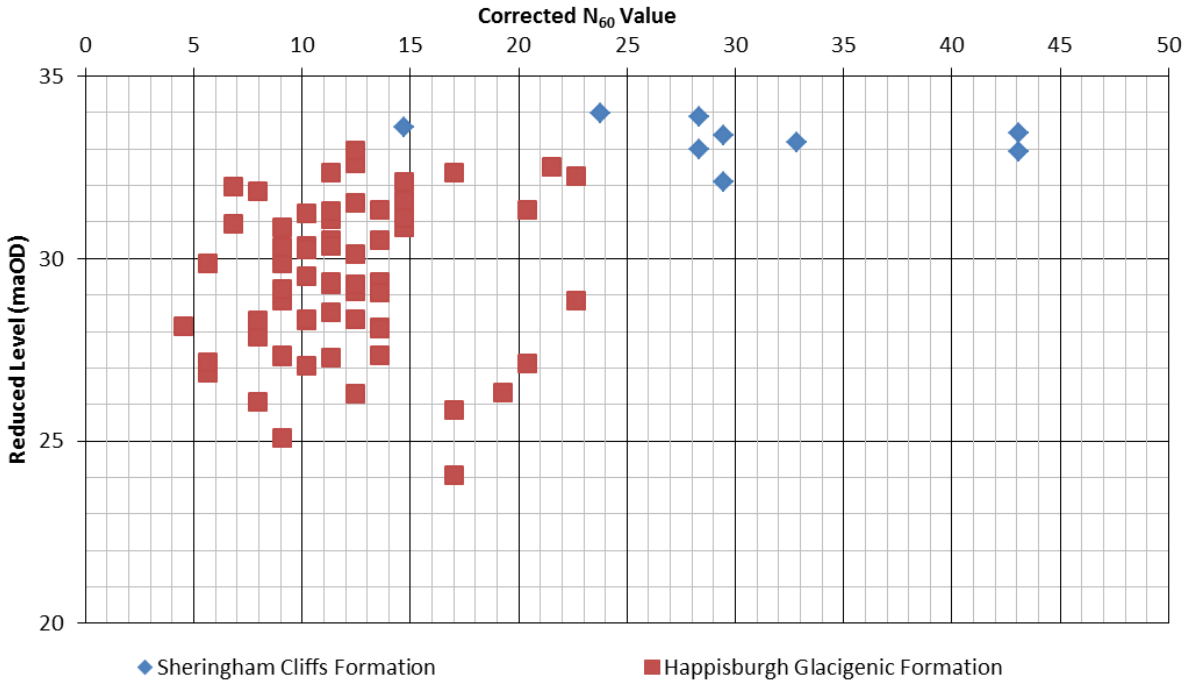

Figure 4.4.2: Corrected N_{60} Values vs. Depth for **P4.**

Figure 4.4.2 shows SPT N_{60} values for P4 and shows the majority of the SPT N_{60} values within the Sheringham Cliffs Formation show a spread between 23 and 32, which can be interpreted as medium dense to dense. One value was in WS134 was at 43, indicating very dense granular soils. One value was at 14, indicating medium dense soils.

Although generally used in granular soils, the results from the SPT testing in conjunction with visual descriptions can be used as a guide to estimate the strength of cohesive material. The majority of the SPT N_{60} values within the cohesive material of the Happisburgh Glacigenic Formation were between 4 and 14, indicating firm cohesive soils, with eight values between 17 and 22 indicating stiff soils. It should be noted that the values within this cohesive material are usually conservative of the in-situ strength and therefore are not considered to be an unduly soft soils within this profile.

Adjustment can also be made to N-values to consider the effect of the overburden pressure in granular material, as described in BS EN ISO 22476-3:2005+A1:2011. This correction has not been applied to the data for this project.

4.5 Geotechnical Laboratory Testing

The following laboratory tests have been scheduled by Harrison Geotechnical Engineering and carried out on samples obtained from the exploratory holes. Unless otherwise stated the tests were performed to B.S.1377, "Methods of Test for Soils for Civil Engineering Purposes". The results of this work are presented in the Appendix and are summarised in table 4.5.1 and 4.5.2 below for both P3 and P4 respectively.

Test Type and Reference (BS 1377: 1990 unless stated)	Strata	Depth (m)	Number of Results	Results (Range)	Comments / Limitations
Moisture content (Part 2)	Sheringham Cliffs Formation - CLAY	0.70	1	13%	
Atterberg Limits (Part 2)	Sheringham Cliffs Formation - CLAY	0.70	1	PL – 12% LL –20% PI – 9% Modified PI – 8%	British Standard classification – Low and plasticity (CL). NHBC Standards Chapter 4.2 'Building Near Tress' – low volume change potential.
Particle size distribution - wet sieving (Part 2, clause 9.2) & sedimentation by pipette (Part 2, clause 9.4)	Sheringham Cliffs Formation - SAND	0.50 - 2.50	4	Gravel 7.7 – 56.1% Sand 39.0 – 82.54% Silt/ Clay 4.9 – 9.9%	The majority of the laboratory testing of this material compares with the field descriptions.

Table 4.5.1: Summary of Geotechnical Laboratory Testing for **P3.**

Test Type and Reference (BS 1377: 1990 unless stated)	Strata	Depth (m)	Number of Results	Results (Range)	Comments / Limitations
Moisture content (Part 2)	Sheringham Cliffs Formation - SAND	0.70	1	2.1	
	Happisburgh Glacigenic Formation – CLAY	0.80 – 3.60	14	10 - 17%	
Atterberg Limits (Part 2)	Sheringham Cliffs Formation - SAND	0.70	1	Non-plastic	
	Happisburgh Glacigenic Formation – CLAY	0.80 – 3.30	11	PL – 11 - 14% LL –23 - 36% PI –10 - 22% Modified PI –8 - 16%	British Standard classification – Low (CL). NHBC Standards Chapter 4.2 'Building Near Tress' – low volume change potential.
Particle size distribution - wet sieving (Part 2, clause 9.2) & sedimentation by pipette (Part 2, clause 9.4)	Sheringham Cliffs Formation - SAND	0.55 – 2.00	2	Gravel 33.7 – 65.0% Sand 32.9 – 63.8% Silt/ Clay 1.5 – 1.8%	The majority laboratory testing of this material compares with the field descriptions.
	Happisburgh Glacigenic Formation – CLAY	1.20- 2.00	2	Gravel 0.0% Sand 59.6% Silt 29.8- 25.9 Clay 1.8 - 10.6%	
Single stage 38mm UU triaxial compression test (Part 7, clause 8)	Happisburgh Glacigenic Formation - CLAY	1.6 – 3.4	2	66 - 75 kPa	Representative of firm to stiff (medium to high strength) cohesive soils.

Table 4.5.2: Summary of Geotechnical Laboratory Testing for **P4.**

4.6 Chemical Laboratory Testing

Four samples of the near surface made ground and/or topsoil (depth ranging 0.1m to 0.4m) were submitted to a UKAS/MCERTS accredited laboratory for a general suite of analytes as detailed in table 4.6 below. A further, four samples (depth of 0.1m and 1.5m) were sent for Greenfield Suites in order to determine the soluble sulphate content and pH of the soil.

Test Type	Number of tests
Soil	
Soil Suite HSS 5a: As, Cd, Cr (Total and VI), Cu, Ni, Zn, Pb, Hg, Se, B, pH, TOC, TPH 8 Band, PAH USEPA16, asbestos screen (with ID where found)	4
HSSG Greenfield Suite - Determination of soluble sulphate content and pH of soil	4

Table 4.6: Summary of Chemical Laboratory Testing.

4.7 Geochemical Laboratory Testing

4.7.1 Aggressive Chemical Environment

In accordance with BRE Special Digest 1 'Concrete in Aggressive Ground' (BRE, 2005) four no. samples of soil from a range of depths were scheduled for analysis by a UKAS/MCERTS accredited laboratory for water-soluble sulphate and pH ("Greenfield suite") to determine parameters for concrete specification. The range of samples scheduled was designed to represent topsoil and underlying superficial deposits.

The results from the chemical laboratory analysis for concrete specification are summarised below in table 4.7.1.

Soil Type	Sample Depth (mbgl)	pH Value	Soluble Sulphate (mg/l)
Topsoil	0.10	7.1	3.4
Sheringham Cliffs Formation - Sand	0.7, 0.9	8.0, 9.4	8.8, 50
Happisburgh Glacigenic Formation - Clay	1.50	6.4	23

Table 4.7.1: Soil Chemical Results (concrete specification)

4.8 Comparison with Background Research

The soils encountered during the investigation were those that were expected from the background research. The granular soils were very variable and consisted of differing granular horizons of the Sheringham Cliffs Formation.

The background research suggested groundwater was between approximately 21m and 26m depth (the principal aquifer). However, perched groundwater was encountered to the north of P3 in four of the exploratory holes WS123, 124, 125 and 126 during fieldwork between depths of 2.3m, 2.6m, 2.6m and 1.70m respectively (28.03maOD- 30.20maOD). This may be a significant water body resting above cohesive soils below the base of our investigation in this area.

The historic mapping provided to us show a likely backfilled pit (likely extent shown on the attached fieldwork location plan) bordering P3 which not identified as a hazard by the MLM report and we were not instructed to investigate this feature. Whilst this features unlikely impact the development area we would recommend supplementary investigation of this feature to assess where its fill creates a contamination or ground gas hazard.

5 GEOTECHNICAL ASSESSMENT

Due to the differing geology geotechnical assessment has been provided for field P3 and P4 separately.

5.1 Field P3

5.1.1 General (P3)

It is understood that the entire field is planned to be developed for a new housing development with both soft landscaping and hard standing areas. The ground conditions were found to comprise topsoil and made ground to a maximum recorded depth of 0.40m overlying variably natural sands and shallow silt and clay lenses of the Sheringham Cliffs Formation.

It should be noted that the current work has only investigated the site at the discrete locations requested although the development site was given coverage. Ground conditions may vary between areas of investigation.

5.1.2 Foundation Recommendations (P3)

Ten boreholes were conducted across P3, north of Salhouse Road. Given the results of the investigation, shallow strip/pad foundations should be taken though the surface layer of topsoil/made ground and extended into the natural granular deposits at a depth of around 0.75m. The soils at this depth generally comprised granular sands with varying amounts of silt, clay and gravel. These granular soils may be associated with allowable bearing capacities in the order of 175kN/m^2 for foundations up to 1.0m wide.

It should be noted that foundation bases should be checked to ensure that the limited shallow deposits of clay have been penetrated and the bases rest on granular soils.

Through interpretation of the results, no voids or unduly loose soils likely to be associated with the presence of dissolution features were encountered at the site, and along with the results of the rest of the intrusive investigation they suggest that it is likely that a traditional shallow foundation solution will be appropriate.

Should unsuitable material at founding depths be encountered and deepening the foundations not be a viable option, ground improvement techniques may be utilised prior to construction. This may include vibro or dynamic compaction, which are techniques to improve the density of loose granular soils.

5.1.3 Floor Slabs (P3)

Suitably reinforced ground bearing floor slabs are likely to represent a suitable option for the proposed development following the removal of the topsoil/ shallow cohesive soils and replacement with a suitably compacted engineered fill.

It is recommended that the natural formation is subject to suitable compaction prior to placement of engineered fill in order to increase the density of any loose deposits present and help limit potential differential settlements. The use of dynamic compaction using an impact roller should be appropriate, but the advice of specialist contractors should be sought as to the suitability of specific methods.

5.2 Field P4

5.2.1 General (P4)

It is understood that the entire site is planned to be developed for a new housing development with both soft landscaping and hard standing areas.

The ground conditions beneath P4 were found to comprise topsoil and made ground to a maximum recorded depth of 0.60m overlying a mostly thin layer variably natural sands and occasional shallow silt lenses of the Sheringham Cliffs Formation. These granular soils extended to less than 1.0m across the western half of the site (although included WS135) with this generally very dense, dense and medium dense granular material deepening to the northeast of the site to in excess of 1.5m.

5.2.2 Foundation Recommendations (P4)

North Eastern Area

In this north eastern site area (east of WS135, where deeper granular soils are encountered) a strip/pad foundation can be taken though the surface layer of topsoil/made ground and extend into the natural granular deposits at a depth of around 0.75m. These granular soils may be associated with allowable bearing capacities in the order of 175kN/m^2 for foundations up to 1.0m wide. Settlements of less than 25mm would again be expected at such a loading intensity.

Should unsuitable material at founding depths be encountered and deepening the foundations not be a viable option, ground improvement techniques may be utilised prior to construction. This may include vibro or dynamic compaction, which are techniques to improve the density of any loose granular soils.

South Western Area

In the south west of the site (west of WS138) where the granular soils are present only within the very near surface, foundations should extend to consistently rest upon the underlying low heave potential firm to stiff cohesive Happisburgh Glacigenic Formation soils at a minimum foundation depth of 1.0m (allowing for restricted new planting).

Where plots overly differing materials, it would be prudent to deepen the foundations so they are bearing onto the same soil type to avoid differential settlement. Reinforcement of the foundations should also be considered.

An allowable bearing capacity for the Happisburgh Glaicigenic Formation (cohesive soils) of around 125kN/m^2 should be assumed (at a minimum depth of 1.0m for a 1.0m wide strip footing). Settlements of less than 25mm would again be expected at such a loading intensity.

Given the absence of proposed development plans, foundation depths stated have been based on development outside the zone of influence of any vegetation and foundation depths have been based on a minimum foundation depth for restricted planting. Foundations should be positioned at least 25m away from the influence of vegetation to maintain a foundation depth of 1.0mbgl, based on a high water demand tree at a mature height of 20m and should be deepened where necessary, according to the NHBC Standards.

Should unsuitable material at founding depths be encountered and deepening the foundations not be a viable option, ground improvement techniques may be utilised prior to construction. This may include vibro or dynamic compaction, which are techniques to improve the density of loose granular soils.

Groundwater is unlikely to be encountered in shallow excavations. However, surface water/rainfall may pond in excavations across the southeast of the site where more cohesive units are encountered and will be moisture dependent both on drying and wetting and excavations should not be left open for any longer than required for construction and wet weather working should be avoided where possible.

Where plots overly variable pockets of sand and clay, it is prudent to deepen the foundations so they are bearing into the same soil type to avoid differential settlement. Reinforcement of the foundations should also be considered.

5.2.3 Floor Slabs (P4)

Suitably reinforced ground bearing floor slabs are likely to represent a suitable option for the proposed development following the removal of the topsoil/ made ground and replacement with a suitably compacted engineered fill. Where granular, the engineered fill is likely to be founded on the underlying medium dense granular deposits. It is recommended that the natural formation is subject to suitable compaction prior to placement of engineered fill in order to increase the density of any loose deposits present and help limit potential differential settlements. The use of dynamic compaction using an impact roller should be appropriate, but the advice of specialist contractors should be sought as to the suitability of specific methods.

Where foundations are to sit within cohesive clay deposits, suspended floor slabs are recommended.

5.3 Stability of Excavations

The short term stability of excavations within the granular sands and gravels is thought to be generally poor. Within the more cohesive deposits where encountered stability is thought to be generally good. However due to the nature of the material, wetting could potentially cause softening making excavations

less stable; therefore it would be wise to blind pit bases with concrete cover any excavations and shelter them from wet weather. Instability of excavations is likely where they are taken through the loose natural shallow and denser deeper granular soils.

Attention is drawn to the provisions of the Health and Safety at Work regulations, which state that the sides of any excavations greater than 1.20m depth into which personnel are required to enter, shall be fully supported or battered back to a safe angle.

5.4 Foundation Concrete (Aggressive Chemical Environment)

The results of chemical tests carried out on samples of natural materials at this site indicate that an upgraded design sulphate class will not be required for new below ground concrete structures where in contact with either the topsoil, or the granular soils of the Sheringham Cliffs Formation and the cohesive clays of the Happisburgh Glacigenic Formation. Based on assessment in accordance with figure C5 of with BRE Special Digest 1 'Concrete in Aggressive Ground' (BRE, 2005), a "mobile water" scenario and soils which may be oxidised following exposure/disturbance, the design sulphate class of DS-1 and ACEC class of AC-1 is considered suitable for concrete foundations.

The BRE digest described should be consulted prior to scheduling the permanent works as the specification must be applicable to the application.

5.5 Geotechnical Hazard Evaluation

Five geotechnical hazards have been carried forward in the assessment, and are detailed in table 5.9.1 below. Based on the findings of the intrusive investigation, laboratory testing and monitoring each risk has been evaluated to assess whether a positive risk remains. Where a positive risk is still identified the recommended action(s) have been provided.

Hazard	Requires further consideration ?	Comment
Sulphate bearing soils	No	Use a concrete design class DS-1 and an ACEC class of AC-1 for buried concrete in contact with topsoil, Sheringham Cliffs Formation and Happisburgh Glacigenic Formation.
Uncontrolled backfill	**Yes**	No significant uncontrolled fill and limited made ground has been recorded. However, it would be considered prudent to undertake an additional day of trial pitting across a small area to the west of P3 where a historic pit was recorded. Its location would suggest that this would not be a significant geotechnical hazard but may present a local ground gas and contamination hazard.
Low permeability soils	**Yes**	Use of conventional soakaways will likely be feasible across P3. Previous BRE365 soakaway results on this site provided two rates of $2.06x10^{-5}$m/s and $1.94x10^{-6}$m/s (at between 0.7 and 3.0m depth). Within P4 conventional soakaways may be restricted to the north east of the site where similar rates may be obtainable. The Happisburgh Glacigenic Formation soils will likely be relatively impermeable and not suitable in which to place conventional drainage systems. Further location specific soakage testing is advised.
Shrink/ swell potential	**Yes**	Consideration of the low heave potential of the Happisburgh Glacigenic Formation soils present across the west of P4 should be considered for appropriate foundation depth in relation to the NHBC guidance.
Potential Variable deposits	**Yes**	Care should be undertaken across P4 to ensure that foundations rest in a consistent material and deepening where necessary to achieve this. Across P3 compaction of any loose near surface granular soils is recommended prior to the placement of suitably reinforced ground bearing slabs.

Table 5.9.1: Geotechnical Hazard Evaluation.

6 CONTAMINATION ASSESSMENT

6.1 General

The risks posed to the potential sensitive receptors associated with the site are assessed at this stage. Specific assessment of the short-term exposure to ground workers was not part of the scope of this investigation. Therefore, with regard to these, chemical test data should be made available for contractors own risk assessment.

The risks associated with long-term human exposure to soil can be addressed by comparing the laboratory test results with soil generic assessment criteria (GAC) derived using the CLEA model. This specifically applies to dermal exposure and inhalation of contaminated dust, but can be used as a preliminary indication to consider the effects on controlled water, drinking water supply pipes, natural flora and fauna and building structures from soil contamination on the site. Screening values have been published for standard land uses, including Residential with home grown produce and the CLEA software initially allows for GAC to be amended for site specific exposure scenarios.

6.2 Soil Assessment

Four samples of the near surface made ground and/or topsoil were submitted to a UKAS/MCERTS accredited laboratory for a general suite of analytes.

For an initial screening of soil chemical test results with regard to long-term human health risks, the results have been compared to GAC. Land Quality Management Limited and the Chartered Institute for Environmental Health published ‘Suitable 4 Use Levels’ (S4UL) as GAC for a range of substances, for a range of generic land uses. DEFRA published category four screening levels (C4SL) for six contaminants in March 2014 to assist practitioners in assessing land contamination under part IIA of the environmental protection act 1990. These have also been identified as suitable for use within the planning system, although it should be noted that they assume a higher level of acceptable risk than S4UL and earlier published GAC. Release of a more comprehensive set of C4SL comparison values was anticipated later in 2015, but is yet to be received.

The proposed end use is for a new housing development with associated gardens and car parking. A ‘residential with home grown produce’ generic land use is considered to be the most applicable.

For each land use category, a single value is provided for metals, with three values specified for organic contaminants based on the proportion of soil organic matter (%SOM) or the total organic carbon (%TOC) content of the soil. Unless otherwise stated, the GAC (S4UL and C4SL) for the most conservative SOM (1%) has been used for the assessment.

Records of the soil chemical testing have been appended to this report, and are summarised in table 6.2 below.

Determinant	Maximum recorded concentration (mg/kg)	Residential With Home grown Produce (mg/kg)	Exceeded?
Asbestos	-	-	Not identified
Arsenic	7	37	No
Boron	5	290	No
Cadmium	<0.2	11	No
Chromium (III)	15	910	No
Chromium (VI)	<4.0	6	No
Copper	20	2400	No
Lead	51	200	No
Mercury	0.8	1.2	No
Nickel	9.2	180	No
Selenium	<1.0	250	No
Zinc	33	3700	No
TPH C5-C6	<1.0	42	No
TPH C6-C7	<1.0	42	No
TPH C7-C8	<1.0	70	No
TPH C8-C10	<1.0	100	No
TPH C10-C12	<1.0	27	No
TPH C12-C16	<1.0	74	No
TPH C16-C21	<1.0	130	No
TPH C21-C35	<1.0	260	No
Naphthalene	<0.05	2.3	No
Acenaphthylene	<0.10	170	No
Acenaphthene	<0.10	210	No
Fluorene	<0.10	170	No
Phenanthrene	<0.10	95	No
Anthracene	<0.10	2400	No
Fluoranthene	<0.10	280	No
Pyrene	<0.10	620	No
Benzo[a]anthracene	<0.10	7.2	No
Chrysene	<0.05	15	No
Benzo[b]fluoranthene	<0.10	2.6	No
Benzo[k]fluoranthene	<0.10	77	No
Benzo(a)pyrene	<0.10	2.2	No
Indeno(1,2,3-c,d)pyrene	<0.10	0.24	No
Dibenzo(a,h)anthracene	<0.10	27	No
Benzo[g,h,i]perylene	<0.05	320	No

Table 6.2: Contamination Test Result Summary.

The contaminants listed above which do not exceed the screening criteria are not considered to pose a risk to the sensitive receptors identified and therefore are not considered further. Implications of the exceeding contaminants are considered below. The results of the asbestos analysis indicate that there were no asbestos fibres detected in the samples tested.

The levels of contaminants detected in the soils are not considered to represent a risk to the sensitive receptors identified for the proposed development and further investigation or remedial action is not considered to be warranted for the wider site.

However, as a small likely backfilled pit is noted bordering the west of P3 further specific investigation of this feature is advised to consider whether this present a contamination, ground gas and geotechnical hazard.

In addition, should indications of contamination be discovered during development, this should be further assessed and appropriate action taken if necessary.

6.3 Groundwater Assessment

Groundwater was only encountered within WS123, 124, 125 and 126 (field P3 only) at depths of 2.3m, 2.6m, 2.6m and 1.70m respectively (28.03maOD- 30.20maOD) which likely represents a perched groundwater body resting on cohesive soils beyond the investigation depth (below 5.45m in this area).

However, the main body of groundwater (principal aquifer) is expected at a depth between 21 and 26m. The site lies within the total catchment of a groundwater source protection zone.

Based on the minimal extent of made ground found to be present and the low levels of soil contamination encountered, it is very unlikely that any leachable contamination from the site will migrate to the aquifers. As such, the risk for groundwater contamination from the site is assessed to be very low, and need not be considered further, unless additional contamination is identified during the development.

6.4 Waste Disposal

All waste related activities must be undertaken in accordance with the Waste Management and Landfill Regulations. Any proposed reuse of materials must be in accordance with the Waste (England and Wales) Regulations 2011 (as amended). Under the Landfill (England and Wales) Regulations 2002 (as amended), prior to disposal all waste must be classified as;

- Inert;
- Non-hazardous or;
- Hazardous.

The Environment Agency's Hazardous Waste Technical Guidance (WM3) document outlines the methodology for classifying wastes. Once classified, the waste can be removed to the appropriately licensed facilities with some waste requiring pre-treatments prior to disposal. The results contained in this report should be submitted to allow suitable classification for waste disposal purposes by the contractor.

Specific Waste Acceptance Criteria (WAC) testing was not undertaken within this stage of investigation. However, waste classification is the responsibility of the Contractor and should be determined in conjunction with the receiving landfill and in accordance with Environment Agency technical guidance.

Further assessment of the likely backfilled pit should be undertaken to assess the nature of the fill material and the waste disposal implications or any deleterious fill.

7 CONCLUSIONS & RECOMMENDATIONS

This investigation was undertaken in order to establish the ground conditions prior to the design and construction of a new housing development at land east of Blue Boar Lane, Sprowston.

From the initial desk study information carried out by MLM the overall contamination risk to the site was classed as very low to moderate. Geotechnical hazards were identified, uncontrolled backfill (specifically the potential small backfilled pit adjacent to P3, low permeability and shrink/swell potential of the clays beneath the west of P4), and potential for variable natural soils where the clays interact between the east and west of site P4.

From the intrusive investigation undertaken, the ground conditions encountered at P3 were found to comprise topsoil and made ground to a maximum recorded depth of 0.40m overlying generally medium dense to very dense natural sands of the Sheringham Cliffs Formation. Across P4 these sands thinned considerably with these underlain by low heave potential clays of the Happisburgh Glacigenic Formation.

Shallow strip/pad foundations will likely be suitable for conventionally loaded two and three storey residential structures with the allowable bearing capacities and depths provided in sections 5.1.2 and 5.2.2. More careful consideration of foundation depth will be required across the west of P4 where low heave clays are present and deepening may also be required on a plot-by plot basis to ensure building footprints rest on a consistent soil type. Whilst ground bearing slabs will be suitable upon compacted natural granular soils it would be recommended that the use of suspended floor slabs be used where resting above the cohesive soils within southwest of P4.

A design sulphate class of DS-1 and an ACEC class of AC-1 is suitable for buried concrete in contact with the soils beneath the site.

Groundwater should not be encountered in shallow excavations, although surface water/rainfall may pond in excavations where more cohesive material is encountered across the south west of P4. Instability is likely to occur when excavating through both the shallow and deep granular layers. The strength of the deeper cohesive soils will be moisture dependent both on drying and wetting and excavations should not be left open for any longer than required for construction and wet weather working should be avoided where possible.

Chemical testing results showed there to be no significant risk to the identified sensitive receptors from soil contamination when compared to S4ULs for residential with home grown produce and indicate that concentrations are not elevated. The lack of contamination would suggest that groundwater is not at risk.

However, it would be considered prudent to conduct a supplementary investigation to consider the risk from a small likely backfilled pit which borders the west of field P3.

Waste disposal of excavated soils should be carried out in accordance with current legislation and guidance and the responsibility for suitable disposal rests with the waste producer.

Risks to site workers during development should be addressed through ground worker risk assessment utilising the results from this investigation. It is recommended that site workers remain vigilant during construction and if contamination is identified, advice should be sought from suitably qualified personnel.

The basic requirement for development standards in the UK is that land should be ‘suitable for use’ or ‘fit for purpose’. It is important to consider the limited nature of the sampling for this investigation, and the possibility of higher concentrations of contaminants and differing ground conditions existing between sample positions. However, providing the recommendations are adhered to, we believe that the site can be suitable for the intended use.

We recommend that this report is submitted to Regulators as part of the planning process.

Harrison Group Environmental Limited would be pleased to offer further assistance with the recommended works if requested, and if the client or regulators have any comments or questions we would be glad to discuss them.

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Environment Agency Technical Guidance WM3: 2015 ‘Waste Classification - Guidance on the classification and assessment of waste (1st edition 2015)

Land Quality Management Ltd, (2014). The LQM/CIEH Suitable 4 Use Levels (S4ULs) for Human Health Risk Assessment.

National House Building Council (NHBC) Standards, Part 4.2.

The Waste (England and Wales) Regulations 2011 – as amended.

The Landfill (England and Wales) Regulations 2002 – as amended.

LIST OF APPENDICES

DATASHEET: SITE INVESTIGATION METHODS

This datasheet provides basic details of the methods employed during the undertaking of site investigations. Detailed method statements may be provided if requested or further information may be obtained from the relevant British Standards or other quoted publications. Investigations are generally carried out in accordance with BS 5930:2015, "Code of practice for site investigations", BS 10175:2011+A1:2013, "Investigation of potentially contaminated sites – Code of Practice, and BS EN ISO 1997-2:2007, "Eurocode 7 – Geotechnical design – Part 2: Ground investigation and testing".

Prior to any excavation being undertaken, service plans are obtained and/or a service tracing team may be employed to locate and mark up service locations. A surface sweep using a cable avoidance tool (CAT) is undertaken, in order to avoid services and service inspection pits are generally hand excavated prior to commencing work with any mechanical plant.

DYNAMIC CONTINUOUS SAMPLING (WINDOW SAMPLER) BOREHOLES

The window sampler system comprises a series of varying diameter (100mm down to 36mm) steel tubes of either 1m length, and in the case of window (rather than windowless) having a slot or window cut along the side. The tubes are driven into the ground using a light percussive hammer attached to solid rods, and withdrawn by use of a jack. The hammer may be machine mounted (wheeled or tracked) or for restricted access work, hand held. The soil sample is forced up into the tube during the driving, samples being obtained directly through the slot or window, or in the case of windowless, in plastic liners in the steel tube. The sampler generally achieves depths of around 5m in favourable soils. Use of a super heavy tracked rig allows samples to be retrieved in liners to depths of up to 10m in suitable ground conditions.

Sampling can be carried out from the boreholes in accordance with BS EN ISO 22475-1:2006 and SPT testing can be undertaken in accordance with BS EN ISO 22476-3:2005+A1:2011. In addition small diameter standpipes/monitoring wells can be installed to facilitate the sampling and monitoring of gas and groundwater.

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Dynamic Continuous Sampling Borehole Record

WS123

Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626744.39	N: 311675.38
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 30.33	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly gravelly very sandy SILT. Gravel is fine to coarse subangular to subrounded flint and rare clinker. Rootlets present). [TOPSOIL]								
Light brown slightly sandy SILT with occasional gravel of fine to medium subangular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.40	29.93	D1	0.40			
Reddish brown slightly clayey silty fine to medium SAND with occasional gravel of fine to coarse subangular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.60	29.73	D2	0.70			
Dense yellowish slightly silty fine to medium SAND. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 1.00m to 1.20m: Becoming gravelly.* *From 1.20m: Becoming silty gravelly with occasional clayey pockets.* *At 1.30m: Clayey pockets present.*		0.80	29.53	D3	0.90			
				SPT(C)	1.00	N=39 (6,6/9,9,10,11)	- (2.30)	
				B1	1.20 - 2.00			
From 2.00m: Becoming medium dense. Sand becoming fine to coarse.				SPT(C)	2.00	N=29 (6,5/4,7,8,10)	- (2.30)	
Dense orange slightly silty very sandy GRAVEL of fine to medium angular to subrounded flint and quartz with occasional coarse gravel present. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		2.50	27.83	B2	2.50 - 3.00			
				SPT(C)	3.00	N=33 (3,5/6,8,9,10)	- (2.30)	
Borehole completed at 3.45m.		3.45	26.88					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
100	0.00	1.00	1.00	100
85	1.00	2.00	1.00	100
75	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
18-08-2016	2.30					

Remarks:

1. Backfill: GL to 3.45m arisings.

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Dynamic Continuous Sampling Borehole Record

WS124

Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626672.65	N: 311645.04
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 30.73	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Brown slightly gravelly very sandy SILT. Gravel is fine to medium subangular to subrounded flint, brick and coal. Rootlets present). [MADE GROUND]				ES1	0.10			
Light brown slightly sandy SILT with occasional gravel of fine to medium subangular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.40	30.33	ES2	0.50			
Reddish brown slightly clayey silty fine to medium SAND with occasional gravel of fine to coarse subangular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.60	30.13	D1	0.80			
Very dense yellowish slightly silty fine to medium SAND. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 1.00m to 1.70m: Sand is fine to coarse.* *From 1.50m to 1.60m: Pocket of gravel present.* *From 2.00m to 2.40m: Becoming brown slightly silty very gravelly fine to coarse sand. Gravel is fine to coarse subangular to subrounded flint and quartz.*		0.90	29.83	SPT(C) B1	1.00 1.00 - 2.00	N=56 (4,9/13,10,17,16)	- (2.60)	
				SPT(C) B2	2.00 2.00 - 2.40	N=79 (8,16/20,18,21,20)	- (2.60)	
				SPT(C)	2.50	81 (12,20/22,28,31,0 for 0mm)	- (2.60)	▼
Borehole completed at 2.88m.		2.88	27.85					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
100	0.00	1.00	1.00	100
100	1.00	2.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
18-08-2016	2.60					

Remarks:

1. Backfill: GL to 2.875m arisings.

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Dynamic Continuous Sampling Borehole Record

WS125

Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626715.93	N: 311554.06
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 31.80	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown very sandy SILT with occasional gravel of fine to medium subangular to subrounded flint. Roots and rootlets present). [TOPSOIL]								
		0.40	31.40					
Orangish brown mottled light greyish brown silty slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				PP01	0.60	351 kPa		
		0.70	31.10	D1	0.70			
Brown mottled dark grey slightly gravelly silty very sandy CLAY. Gravel is fine to coarse angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.80	31.00					
Medium dense orangish brown mottled light grey slightly clayey silty fine to medium SAND. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				SPT(C)	1.00	N=25 (7,6/7,6,6,6)	- (2.60)	
From 1.00m to 1.40m: Becoming brown with frequent organic matter.				D2	1.30			
From 1.40m to 2.00m: Becoming orange mottled light brown dark orange slightly clayey very silty fine to medium sand with occasional light grey sandy pockets.				B1	1.40 - 2.50			
From 2.00m: Becoming loose.				SPT(C)	2.00	N=8 (2,2/1,2,2,3)	- (2.60)	
				SPT(C)	3.00	N=9 (1,2/2,2,3,2)	- (2.60)	
Borehole completed at 3.45m.		3.45	28.35					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
100	0.00	1.00	1.00	100
100	1.00	2.00	1.00	100
85	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
18-08-2016	2.60					

Remarks:

1. Backfill: GL to 3.45m arisings.

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Dynamic Continuous Sampling Borehole Record

WS126

Sheet 1 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626666.48	N: 311548.84
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 31.90	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly gravelly very sandy SILT. Gravel is fine to medium subangular to subrounded flint with occasional clinker. Roots and rootlets present). [TOPSOIL]				ES1	0.20			
Medium dense orangish brown mottled light grey slightly clayey silty fine to medium SAND. Gravel is fine to coarse subangular to subrounded flint and quartz. Frequent pockets of light grey fine to medium sand. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.40	31.50					
				D1	0.80			
From 1.00m to 1.60m: Becoming orange occasionally mottled grey very clayey fine to coarse SAND.				SPT(C)	1.00	N=25 (6,6/6,6,6,7)	- (1.70)	
				D2	1.30			
From 1.60m to 2.00m: Becoming orange mottled light brown dark orange slightly clayey very silty fine to medium sand with occasional light grey sandy pockets.				D3	1.80			▼
From 2.00m to 2.20m: Becoming brown and very clayey.				SPT(C)	2.00	N=13 (2,2/3,3,3,4)	- (1.70)	
At 2.20m: Becoming brown very silty fine to medium SAND.				B1	2.20 - 3.00			
From 3.00m: Becoming very loose to loose.				SPT(C) B2	3.00 3.00 - 4.00	N=4 (0,1/1,1,1,1)	- (1.70)	
From 4.00m to 5.00m: Becoming slightly clayey.				SPT(C) B3	4.00 4.00 - 5.00	N=4 (0,0/1,1,1,1)	- (1.70)	
				SPT(C)	5.00	N=5 (0,1/1,1,1,2)	- (1.70)	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
100	0.00	1.00	1.00	100
100	1.00	2.00	1.00	100
85	2.00	3.00	1.00	100
75	3.00	4.00	1.00	100
67	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
18-08-2016	1.70					

Remarks:

1. Hole terminated early due to wet sand collapse.
2. Backfill: GL to 5.45m arisings.

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Dynamic Continuous Sampling Borehole Record

WS126

Sheet 2 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626666.48	N: 311548.84
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 31.90	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
From 5.00m: Becoming loose.								
Borehole terminated at 5.45m: Wet sand collapse		5.45	26.45					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
100	0.00	1.00	1.00	100
100	1.00	2.00	1.00	100
85	2.00	3.00	1.00	100
75	3.00	4.00	1.00	100
67	4.00	5.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
18-08-2016	1.70					

Remarks:

1. Hole terminated early due to wet sand collapse.
2. Backfill: GL to 5.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626690.34	N: 311453.97
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.20	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown gravelly very silty fine SAND. Gravel is fine to coarse angular to subrounded flint with rare fine concrete. Rootlets present). [TOPSOIL]				ES1	0.20			
Very dense reddish orange silty gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint and quartz with occasional cobbles. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.40	33.80	ES2 B1	0.40 - 0.50 0.50 - 1.00			
				SPT(C)	1.00	50 (14,29/43,7 for 12mm)	- (Dry)	
At 1.20m: Becoming orange very sandy gravel of fine to coarse subangular to subrounded flint and quartz with occasional cobbles.				B2	1.00 - 1.20			
Borehole terminated at 1.24m: Dense strata		1.24	32.96					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.237m arisings.

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Dynamic Continuous Sampling Borehole Record

WS128

Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626753.37	N: 311467.48
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.94	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly gravelly very sandy SILT. Gravel is fine to coarse subangular to subrounded flint with rare clinker. Rootlets present). [TOPSOIL]		0.20	33.74	ES1	0.10			
				ES2	0.30			
Brown gravelly very sandy SILT. Gravel is fine to coarse subangular to subrounded flint and quartz with occasional cobbles. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.50	33.44	B1	0.50 - 1.40			
Very dense reddish orange silty very gravelly fine to coarse SAND / very sandy GRAVEL. Gravel is fine to coarse subangular to subrounded flint and quartz with occasional cobbles. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 1.00m: Becoming gravelly.*				SPT(C)	1.00	N=97 (14,15/16,20,26,35)	- (Dry)	
				SPT(C)	1.40	50 (16,29/50 for 60mm)	- (Dry)	
Borehole terminated at 1.61m: Dense strata		1.61	32.33					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.61m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626726.10	N: 311425.37
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.89	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown gravelly very silty fine SAND. Gravel is fine to coarse angular to subrounded flint with rare fine concrete. Rootlets present). [MADE GROUND]				B1	0.00 - 1.00			
Orange brown very silty very gravelly SAND. Gravel is fine to coarse angular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.30	34.59					
Orange brown mottled orange and light grey slightly silty slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. Occasional brown very silty very clayey sand present. Rare cobble of flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		1.00	33.89	SPT(C)	1.00	N=107 (10,17/20,22,31,34)	- (Dry)	
				B2	1.10 - 2.00			
				SPT(C)	1.50	50 (19,31/50 for 20mm)	- (Dry)	
From 2.50m to 2.70m: Becoming very gravelly.								
From 2.70m to 3.0m: Becoming orange slightly silty fine to coarse sand.				D1	2.70 - 3.00			
Borehole completed at 3.00m.		3.00	31.89					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.00m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626803.77	N: 311447.65
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.98	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly gravelly very sandy SILT. Gravel is fine to coarse subangular to subrounded flint with rare clinker. Rootlets present). [TOPSOIL]		0.30	33.68	B1	0.00 - 1.00			
Brown very silty very gravelly fine to coarse SAND with occasional clayey pockets present. Gravel is fine to coarse subangular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				SPT(C)	1.00	50 (21,46/50 for 40mm)	- (Dry)	
Borehole terminated at 1.19m: Dense strata		1.19	32.79					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.19m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626704.34	N: 311369.16
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 35.37	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly gravelly very silty SAND. Gravel is fine to coarse angular to subrounded flint and quartz). [TOPSOIL]				ES1	0.20			
Light brown slightly gravelly very sandy SILT. Gravel is fine to coarse subangular to rounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.30	35.07	ES2	0.40			
Very dense orangish brown mottled orange slightly silty gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint and quartz. Occasional clayey pockets. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.60 0.70	34.77 34.67	B1	0.70 - 1.20			
Very dense dark orange brown slightly silty very sandy GRAVEL. Gravel is fine to coarse angular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				SPT(C)	1.00	89 (17,26/39,50 for 35mm)	- (Dry)	
Borehole terminated at 1.26m: Dense strata		1.26	34.11					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.26m arisings.

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Dynamic Continuous Sampling Borehole Record

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626775.73	N: 311378.70
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Dando Terrier	SPT Hammer Serial No: DT/15172 (ER: 81%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 35.07	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly gravelly very silty SAND. Gravel is fine to coarse angular to subrounded flint and quartz). [TOPSOIL]				B1	0.00 - 1.00			
Brown very silty very gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint and quartz. Occasional clayey pockets present. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.30	34.77					
Reddish brown silty very clayey very gravelly SAND. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		1.00	34.07	SPT(C)	1.00	N=73 (9,13/13,15,19,26)	- (Dry)	
				SPT(C)	1.40	50 (36,0 for 0mm/50 for 20mm)	- (Dry)	
				D1	1.50			
Borehole terminated at 2.00m: Dense strata		2.00	33.07					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
85	0.00	1.00	0.50	50

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 2.00m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626254.98	N: 311726.85
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 17/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.09	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Light brown slightly gravelly sandy SILT. Gravel is fine to coarse subangular to subrounded flint with rare tile fragments. Occasional specks of organic matter). [MADE GROUND]				ES1	0.10 - 0.30			
		0.30	32.79					
Light brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint with occasional cobbles. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				ES2	0.40			
				D1	0.70 - 0.90			
				SPT(C)	1.00	N=26 (6,8/7,6,7,6)	- (Dry)	
		1.10	31.99					
Medium dense dark orangish brown slightly gravelly clayey fine to coarse SAND. Gravel is fine to coarse subangular to rounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				D2	1.20			
		1.50	31.59					
Firm sandy very gravelly CLAY. Gravel is fine to coarse subangular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				D3	1.80			
		2.00	31.09	SPT(C)	2.00	N=10 (2,2/1,3,3,3)	- (Dry)	
Stiff light orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded flint. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				PP01	2.30	114 kPa		
				D4	2.50			
At 2.70m: Layers of light yellowish orange sand present.				PP02	2.80	262 kPa		
				SPT(C)	3.00	N=8 (1,2/2,1,3,2)	- (Dry)	
		3.45	29.64					
Borehole completed at 3.45m.								

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m gravel.

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Dynamic Continuous Sampling Borehole Record

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626291.16	N: 311707.12
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.94	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and subangular and subrounded quartz. Frequent roots and rootlets present). [TOPSOIL]				ES1	0.10 - 0.20			
Dense orange gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 0.90m: Becoming fine to coarse sand.*		0.50	33.44	ES2	0.60 - 0.70			
				D1	0.90 - 1.00			
				SPT(C)	1.00	38 (5,10/12,12,14,0 for 0mm)	- (Dry)	
Borehole terminated at 1.38m: Dense strata		1.38	32.56					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.38m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626232.44	N: 311672.47
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 17/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.51	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Light brown slightly gravelly sandy SILT. Gravel is fine to coarse subangular to subrounded flint with rare tile fragments. Occasional specks of organic matter). [MADE GROUND]				ES1	0.20			
Light brown very silty fine SAND with rare fine to medium subrounded flint gravel. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.50	33.01	ES2	0.50 - 0.60			
Dark orangish brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.75	32.76	D1	0.80 - 0.90			
Firm to stiff orangish brown mottled grey slightly sandy slightly gravelly CLAY / clayey SILT. Gravel is fine to coarse subangular to subrounded flint. Becoming sandy with depth. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]		1.00	32.51	SPT(C)	1.00	N=19 (1,3/5,5,4,5)	- (Dry)	
				D2	1.50			
				PP01	1.50	327 kPa		
				PP02	1.80	245 kPa		
				SPT(C)	2.00	N=11 (1,2/2,2,3,4)	- (Dry)	
				D3	2.00			
				D4	2.50			
				PP03	2.70	245 kPa		
				SPT(C)	3.00	N=10 (2,2/2,2,3,3)	- (Dry)	
Borehole completed at 3.45m.		3.45	30.06					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m gravel.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626304.76	N: 311664.11
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Depth (m)	Ground Level (maOD) 34.36	Type	Depth	Results / Remarks	Casing (Water)
TOPSOIL (Brown gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz with possible clinker. Frequent roots and rootlets present). [TOPSOIL]			ES1	0.10 - 0.20		
	0.40	33.96	ES2	0.40 - 0.55		
Yellowish brown gravelly very sandy SILT. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]	0.55	33.81	B1	0.55 - 1.00		
Medium dense orange slightly silty gravelly fine to coarse SAND. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]			SPT(C)	1.00	N=26 (8,9/8,8,5,5)	- (Dry)
From 0.80m to 1.00m: Becoming very sandy gravel.						
	1.30	33.06				
Medium dense reddish orange very clayey very silty fine to medium SAND with occasional gravel of fine to medium subangular to subrounded quartz and angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]	1.60	32.76	PP01	1.60	229 kPa	
			D1	1.70 - 1.90		
Firm to stiff orangish brown mottled grey silty very sandy CLAY. Pockets of grey fine to medium sand. Frequent black specks of organic matter. Rare red silt. Becoming firm with depth. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]			PP02	1.90	82 kPa	
			SPT(C)	2.00	N=10 (2,2/2,2,3,3)	- (Dry)
			D2	2.10 - 2.40		
			PP03	2.40	49 kPa	
			SPT(C)	2.50	N=7 (1,1/2,1,2,2)	- (Dry)
			D3	2.90 - 3.10		
From 3.10m: Becoming slightly sandy silty clay.			U1	3.10 - 3.40		
			PP04	3.40	98 kPa	
			SPT(C)	3.50	N=8 (1,1/2,2,2,2)	- (Dry)
			SPT(C)	4.50	N=8 (1,2/1,2,3,2)	- (Dry)
			D4	4.60 - 4.80		

Installation & Backfill

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	1.50	2.50	1.00	100
67	2.50	3.50	1.00	100
57	3.50	4.50	1.00	100
47	4.50	6.00	1.00	67

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole collapsed from 2.00m to 1.50m during L2 sampling.
2. Backfill: GL to 6.00m arisings.

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Sheet 2 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626304.76	N: 311664.11
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.36	Sample / In-Situ Test Information			Casing (Water)	Installation & Backfill
				Type	Depth	Results / Remarks		
				SPT(C) D5	5.50 5.50 - 5.90	N=20 (2,4,4,5,5,6)	- (Dry)	
At 5.90m: Pocket of whitish brown fine to medium sand present.								
Borehole completed at 6.00m.		6.00	28.36					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	1.50	2.50	1.00	100
67	2.50	3.50	1.00	100
57	3.50	4.50	1.00	100
47	4.50	6.00	1.00	67

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole collapsed from 2.00m to 1.50m during L2 sampling.
2. Backfill: GL to 6.00m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626264.14	N: 311642.82
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.43	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Brown gravelly very silty fine SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz and brick. Frequent roots and rootlets present). [MADE GROUND]				ES1	0.20 - 0.30			
Orangish brown gravelly very sandy SILT. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 0.80m to 0.90m: Becoming creamy in colour.*		0.50	33.93	ES2	0.50 - 0.60			
				D1	0.70 - 0.80			
Dense orange slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded quartz and angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.90	33.53	D2	0.90 - 1.00			
				SPT(C)	1.00	N=38 (8,12/10,10,9,9)	- (Dry)	
Borehole terminated at 1.45m: Dense strata		1.45	32.98					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.45m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626230.81	N: 311632.90
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.17	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and subangular and subrounded quartz. Frequent roots and rootlets present). [TOPSOIL]				ES1	0.10 - 0.20			
Medium dense orangish brown gravelly very silty fine SAND. Gravel is fine to coarse subangular to subrounded quartz and angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 0.80m: Becoming orange slightly silty fine to coarse sand.*		0.50	33.67	ES2	0.50 - 0.60			
				D1	0.85 - 0.95			
				SPT(C)	1.00	29 (12,15/15,14,0 for 0mm)	- (Dry)	
Borehole terminated at 1.30m: Dense strata		1.30	32.87					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.30m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626294.35	N: 311602.82
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.99	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown very silty very gravelly fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and subangular and subrounded quartz with occasional rare brick. Frequent roots and rootlets present). [TOPSOIL]				ES1	0.20 - 0.30			
		0.40	34.59					
Medium dense orangish brown silty very gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 0.55m to 0.85m: Becoming orangish brown mottled orange silty fine to medium sand.* *From 1.10m to 1.30m: Becoming brown slightly clayey slightly silty very sandy fine to medium gravel, with occasional coarse gravel. Gravel is fine to coarse angular to subrounded flint and subrounded to subangular quartz.* *From 1.30m to 1.40m: Pocket of orangish brown mottled cream slightly silty very clayey sand.* *From 1.50m to 2.00m: Orangish brown slightly silty very gravelly fine to coarse sand.*				ES2	0.50 - 0.60			
				D1	0.60 - 0.70			
				SPT(C)	1.00	N=21 (2,5/5,5,5,6)	- (Dry)	
				D2	1.10 - 1.30			
				B1	1.50 - 2.00			
				SPT(C)	2.00	25 (16,12/12,13,0 for 0mm)	- (Dry)	
Borehole terminated at 2.30m: Dense strata		2.30	32.69					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 2.30m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626244.35	N: 311583.70
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 18/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.89	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and quartz. Roots and rootlets present). [TOPSOIL]				ES1	0.20 - 0.30			
Yellowish orange gravelly very sandy SILT. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.40	34.49	ES2	0.50 - 0.70			
Medium dense orangish brown very silty very gravelly fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and fine to medium subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.85	34.04	D1	0.85 - 1.00			
				SPT(C)	1.00	25 (13,14/13,12,0 for 0mm)	- (Dry)	
Borehole terminated at 1.30m: Dense strata		1.30	33.59					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Hole terminated early due to dense strata.
2. Backfill: GL to 1.30m arisings.

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Dynamic Continuous Sampling Borehole Record

WS141

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626214.24	N: 311602.57
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 34.60	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Brown slightly gravelly very silty fine SAND. Gravel is fine to medium angular to subrounded flint, quartz and brick. Frequent roots and rootlets present). [MADE GROUND]				ES1	0.40 - 0.50			
Medium dense orange slightly gravelly very silty fine SAND. Gravel is fine to medium angular to subrounded flint and subangular to subrounded quartz. Occasional pockets of fine to medium sand. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 0.95m: Becoming orange slightly clayey fine to medium sand.*		0.60	34.00	D1	0.70 - 0.80			
				SPT(C)	1.00	N=13 (6,4/3,3,3,4)	- (Dry)	
Firm to stiff thinly laminated orangish brown silty sandy CLAY with occasional gravel of fine angular to subrounded flint. Occasional pockets of orange fine to medium sand. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]		1.20	33.40	B1	1.20 - 2.00			
				PP01	1.50	237 kPa		
From 2.00m to 3.00m: Becoming firm.				SPT(C)	2.00	N=11 (1,2/2,3,3,3)	- (Dry)	
				PP02	2.00	147 kPa		
				D2	2.50			
				PP03	2.60	106 kPa		
				PP04	2.90	98 kPa		
				SPT(C)	3.00	N=13 (2,2/2,3,4,4)	- (Dry)	
				D3	3.00			
Borehole completed at 3.45m.		3.45	31.15					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m arisings.

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Dynamic Continuous Sampling Borehole Record

WS142

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626203.43	N: 311645.56
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.34	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Brown slightly gravelly silty fine to medium SAND. Gravel is fine to medium angular to subrounded flint and subangular to subrounded quartz with rare brick, glass and tile. Rootlets present). [MADE GROUND]				ES1	0.30			
Orange slightly gravelly very silty fine SAND. Gravel is fine to medium angular to subrounded flint and subangular to subrounded quartz. Occasional pockets of fine to medium sand. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.50	32.84	ES2	0.60 - 0.70			
Orange mottled light brown very clayey very silty fine to medium SAND with rare gravel of fine subangular to subrounded flint and quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.80 0.90	32.54 32.44	PP01 SPT(C)	0.95 1.00	270 kPa N=15 (3,6/5,3,3,4)	- (Dry)	
Firm to stiff orangish brown mottled orange and light grey silty very sandy CLAY with occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. Pockets of light grey fine to medium sand. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				PP02 D1	1.55 1.60	188 kPa		
From 1.10m to 1.20m: Pocket of very clayey very gravelly fine to coarse sand present.				PP03 SPT(C)	1.90 2.00	163 kPa N=12 (1,2/3,2,3,4)	- (Dry)	
From 1.50m: Frequent black specks present.								
From 2.00m: Becoming orangish mottled brown and very sandy.				D2 PP04	2.50 2.60	 147 kPa		
				SPT(C)	3.00	N=9 (1,2/1,3,3,2)	- (Dry)	
				B1	3.30 - 4.00			
				PP05	3.60	90 kPa		
From 4.00m: Becoming orange with orange fine to medium sand pockets present.				SPT(C) PP06	4.00 4.00	N=12 (1,2/2,3,3,4) 98 kPa	- (Dry)	
				PP07	4.60	229 kPa		
				SPT(C)	5.00	N=11 (1,2/3,2,3,3)	- (Dry)	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 2 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626203.43	N: 311645.56
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.34	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Firm to stiff orangish brown mottled orange and light grey silty very sandy CLAY with occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. Pockets of light grey fine to medium sand. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				PP08	5.50	147 kPa		
				SPT(C)	6.00	N=12 (2,3/2,3,3,4)	- (Dry)	
Borehole completed at 6.45m.		6.45	26.89					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626183.76	N: 311621.80
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 24/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.25	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Light brown very sandy SILT with occasional gravel of fine to medium angular to subrounded flint. Roots and rootlets present). [TOPSOIL]				ES1	0.10 - 0.20			
Orange slightly gravelly very silty fine SAND. Gravel is fine to medium angular to subrounded flint and subangular to subrounded quartz. Occasional pockets of fine to medium sand. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.30	32.95	D1	0.50 - 0.60			
Firm orangish brown mottled orange and light grey silty very sandy CLAY with occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. Pockets of light grey fine to medium sand. Frequent black specks of presumed degrading organic matter. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION] *From 1.00m: Becoming firm grey slightly gravelly silty and very sandy with occasional gravel of fine angular to subrounded flint. Occasional organic matter present.*		0.80	32.45	D2 SPT(C) PP01 SPT(C) B1 PP02 SPT(C)	0.90 1.00 1.60 2.00 2.00 - 3.00 2.50 3.00	 N=20 (4,4/4,5,6,5) 172 kPa N=9 (1,2/2,2,2,3) 106 kPa N=9 (1,1/2,2,3,2)	 - (Dry) - (Dry) - (Dry)	
Borehole completed at 3.45m.		3.45	29.80					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626158.93	N: 311639.15
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 31.86	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and quartz. With frequent rootlets). [TOPSOIL]				ES1	0.10 - 0.20			
Yellowish brown occasionally mottled orange very sandy SILT with occasional gravel of fine to coarse angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.60	31.26	ES2	0.60 - 0.70			
Firm to stiff orangish brown mottled orange silty very sandy CLAY with occasional gravel of fine to coarse angular to subrounded flint. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]		0.80	31.06	SPT(C)	1.00	N=13 (1,2/3,3,3,4)	- (Dry)	
From 0.90m: Becoming firm to stiff orangish brown mottled light yellowish brown slightly sandy silty clay.				D1	1.10 - 1.20			
				D2	1.50 - 1.60			
				PP01	1.50	188 kPa		
From 1.80m: Becoming soft to firm.				PP02	1.90	74 kPa		
From 2.00m: Becoming very sandy with sandy pockets.				SPT(C)	2.00	N=5 (1,0/1,1,1,2)	- (Dry)	
				D3	2.40 - 2.50			
				D4	2.90 - 3.00			
				SPT(C)	3.00	N=8 (1,1/2,2,1,3)	- (Dry)	
				D5	3.40 - 3.50			
				D6	3.90 - 4.00			
From 4.00m: Frequent organic matter present and no mottling.				SPT(C)	4.00	N=7 (2,1/2,1,2,2)	- (Dry)	
				D7	4.50 - 4.60			
				PP03	4.50	57 kPa		
				D8	4.90 - 5.00			
				SPT(C)	5.00	N=5 (1,1/1,1,2,1)	- (Dry)	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	0.80	80
77	2.00	3.00	0.80	80
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 2 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626158.93	N: 311639.15
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 31.86	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Firm to stiff orangish brown mottled orange silty very sandy CLAY with occasional gravel of fine to coarse angular to subrounded flint. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				B1	5.30 - 6.00			
				PP04	5.60	74 kPa		
				SPT(C)	6.00	N=15 (2,3/3,4,4,4)	- (Dry)	
Borehole completed at 6.45m.		6.45	25.41					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	0.80	80
77	2.00	3.00	0.80	80
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626125.37	N: 311645.98
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 25/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 30.15	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Light brown very sandy SILT with occasional gravel of fine to coarse angular to subrounded flint. Roots and rootlets present). [TOPSOIL]				ES1	0.10 - 0.20			
Orange slightly gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint. Slightly clayey pockets. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.40	29.75	ES2	0.40 - 0.50			
Firm to stiff orange slightly mottled light brown silty very sandy CLAY with occasional gravel of fine to coarse angular to subrounded flint. Frequent pockets of orange fine to medium sand. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]		0.60	29.55	PP01	0.80	279 kPa		
				D1	0.90			
				SPT(C)	1.00	N=8 (1,2/1,2,3,2)	- (Dry)	
				B1	1.20 - 2.00			
				PP02	1.50	116 kPa		
From 2.00m: Light brown pockets of sand. Occasional organic matter present.				SPT(C)	2.00	N=4 (1,0/1,1,1,1)	- (Dry)	
				D2	2.10 - 2.20			
				PP03	2.50	41 kPa		
				D3	2.70 - 2.80			
				SPT(C)	3.00	N=5 (1,1/1,1,1,2)	- (Dry)	
Borehole completed at 3.45m.		3.45	26.70					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	0.80	80
67	2.00	3.00	0.90	90

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626141.18	N: 311594.07
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 32.30	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown gravelly very silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and quartz. Frequent rootlets present). [TOPSOIL]				ES1	0.20 - 0.30			
		0.40	31.90	ES2	0.40 - 0.50			
Yellowish brown occasional mottled orange very silty fine to medium SAND with occasional gravel of fine to coarse angular to subrounded flint and quartz. Occasional pockets of reddish orange fine to medium sand. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				D1	0.80			
		1.00	31.30	SPT(C)	1.00	N=10 (1,1/2,2,3,3)	- (Dry)	
Firm to stiff orange mottled light brown silty sandy CLAY with occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				D2	1.50			
				PP01	1.50	155 kPa		
				U1	1.60 - 1.90			
From 1.90m: Becoming very sandy and firm with sandy pockets present. *From 2.00m: Organic material present.*				SPT(C)	2.00	N=8 (1,0/2,2,2,2)	- (Dry)	
				B1	2.10 - 3.00			
				PP02	2.60	106 kPa		
From 3.00m: Becoming orange with fine to medium orange sand pockets.				SPT(C)	3.00	N=10 (1,2/2,2,3,3)	- (Dry)	
				D3	3.40 - 3.50			
				PP03	3.60	41 kPa		
				D4	3.90 - 4.00			
				SPT(C)	4.00	N=9 (2,1/2,2,3,2)	- (Dry)	
				D5	4.50			
				PP04	4.50	65 kPa		
				D6	4.90 - 5.00			
				SPT(C)	5.00	N=8 (2,1/2,2,2,2)	- (Dry)	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	0.60	60

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626141.18	N: 311594.07
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 32.30	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Firm to stiff orange mottled light brown silty sandy CLAY with occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				PP05	5.50			
				SPT(C)	6.00	N=11 (2,1/3,2,3,3)	- (Dry)	
Borehole completed at 6.45m.		6.45	25.85					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	0.60	60

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626176.88	N: 311574.17
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 22/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.96	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly clayey silty fine to medium SAND with occasional gravel of fine to coarse angular to subrounded flint and subangular to subrounded quartz. Roots and rootlets present). [TOPSOIL]				ES1	0.20 - 0.30			
Orangish brown slightly gravelly silty fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. Pockets of orange fine to coarse sand present. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.50	33.46	ES2	0.60 - 0.70			
				D1	0.90 - 1.00			
Firm orange mottled yellowish orange silty sandy CLAY with occasional gravel of fine to coarse angular to subrounded flint. Frequent pockets of yellowish orange fine to medium sand. Frequent black specks of presumed degrading organic matter. Becoming softer and very sandy with depth. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]		1.00	32.96	SPT(C)	1.00	N=11 (1,3/2,3,3,3)	- (Dry)	
				D2	1.20 - 1.30			
				PP01	1.40	172 kPa		
				SPT(C)	2.00	N=6 (1,2/1,2,1,2)	- (Dry)	
				PP02	2.00	57 kPa		
				D3	2.40 - 2.50			
				U1	2.50 - 2.80			
				PP03	2.50	57 kPa		
				PP04	2.90	74 kPa		
				SPT(C)	3.00	N=6 (1,0/1,2,1,2)	- (Dry)	
Borehole completed at 3.45m.		3.45	30.51					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 1 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626145.03	N: 311549.80
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 22/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Depth (m)	Ground Level (maOD) 33.11	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Brown slightly clayey slightly gravelly silty fine to medium SAND. Gravel is fine to medium angular to subrounded flint and subangular to subrounded quartz with rare fine brick. Rootlets present).			ES1	0.20			
[MADE GROUND]	0.40	32.71	ES2	0.40 - 0.50			
Yellowish brown slightly gravelly very sandy SILT. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz.	0.50	32.61					
[ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]	0.60	32.51	D1	0.80 - 0.90			
			PP01	0.85	270 kPa		
Orange slightly silty slightly gravelly fine to coarse SAND. Gravel is angular to subrounded flint and subangular to subrounded quartz.			SPT(C)	1.00	N=13 (2,2/3,3,3,4)	- (Dry)	
[ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]			ES3	1.00 - 1.10			
			B1	1.20 - 2.00			
Firm orangish brown mottled orange and light grey silty very sandy CLAY with occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. Pockets of light grey fine to medium sand. Frequent black specks of presumed degrading organic matter.			PP02	1.50	245 kPa		
[ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]							
From 1.70m: Becoming firm with frequent sand pockets present.			PP03	1.95	74 kPa		
From 2.00m: Becoming firm to stiff orangish brown slightly gravelly silty very sandy clay. Gravel is fine angular to subrounded flint.			SPT(C)	2.00	N=13 (2,2/4,3,3,3)	- (Dry)	
			PP04	2.25	237 kPa		
			D2	2.50 - 2.60			
			PP05	2.90	106 kPa		
From 2.90m: Frequent organic matter and rare red silt.			SPT(C)	3.00	N=11 (1,1/2,3,3,3)	- (Dry)	
From 3.00m: Becoming orange.							
			PP06	3.55	131 kPa		
			D3	3.60 - 3.70			
From 4.00m: Becoming very sandy.			SPT(C)	4.00	N=11 (1,1/2,3,3,3)	- (Dry)	
			PP07	4.50	74 kPa		
			PP08	4.90	147 kPa		
			SPT(C)	5.00	N=12 (2,1/3,2,3,4)	- (Dry)	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 2 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626145.03	N: 311549.80
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 22/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 33.11	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Firm orangish brown mottled orange and light grey silty very sandy CLAY with occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. Pockets of light grey fine to medium sand. Frequent black specks of presumed degrading organic matter. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				PP09	5.50	204 kPa		
				SPT(C)	6.00	N=18 (2,3/4,4,4,6)	- (Dry)	
Borehole completed at 6.45m.		6.45	26.66					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626107.46	N: 311564.07
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 22/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 31.52	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Brown slightly gravelly very silty fine SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. Roots and rootlets present). [TOPSOIL]				ES1	0.10			
		0.30	31.22					
Orange slightly gravelly very silty fine SAND. Gravel is fine to medium angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]				D1	0.50 - 0.60			
		0.70	30.82					
Firm to stiff thinly laminated orangish brown slightly gravelly silty very sandy CLAY. Gravel is fine angular to subrounded flint. Occasional pockets of orange fine to medium sand. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				D2	0.90			
				PP01	0.90	343 kPa		
				SPT(C)	1.00	N=12 (2,2/3,3,2,4)	- (Dry)	
				HV01	1.10	66 kPa		
				HV02	1.90	52 kPa		
				SPT(C)	2.00	N=9 (1,2/2,2,2,3)	- (Dry)	
				SPT(C)	3.00	N=10 (1,2/2,2,3,3)	- (Dry)	
Borehole completed at 3.45m.		3.45	28.07					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626099.44	N: 311612.48
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Depth (m)	Ground Level (maOD) 30.07	Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Brown slightly gravelly very silty fine SAND. Gravel is fine to medium angular to subrounded flint, quartz and brick. Frequent roots and rootlets present). [MADE GROUND]			ES1	0.20 - 0.30			
Orange slightly gravelly very silty fine SAND. Gravel is fine to medium angular to subrounded flint and subangular to subrounded quartz. Occasional fine to medium sand pockets present. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]	0.60	29.47					
From 0.80m: Becoming clayey.	0.90	29.17	D1	0.90			
			PP01	0.90	237 kPa		
			SPT(C)	1.00	N=12 (2,2/3,2,3,4)	- (Dry)	
Firm orangish brown mottled orange and light grey silty very sandy CLAY. Light grey fine to medium sandy pockets present. Frequent black specks of presumed degrading organic matter. Occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]			D2	1.50 - 1.60			
			PP02	1.50	262 kPa		
From 2.00m: Becoming orange.			SPT(C)	2.00	N=12 (3,2/3,3,3,3)	- (Dry)	
			PP03	2.00	270 kPa		
			D3	2.10 - 2.20			
			PP04	2.50	74 kPa		
			D4	2.60 - 2.70			
From 3.00m: Organic matter present.			SPT(C)	3.00	N=9 (1,1/2,2,2,3)	- (Dry)	
			PP05	3.50	33 kPa		
			D5	3.60 - 3.70			
			PP06	3.60			
			SPT(C)	4.00	N=7 (1,2/1,2,2,2)	- (Dry)	
			D6	4.60			
			PP07	4.60	49 kPa		
			SPT(C)	5.00	N=8 (1,1/1,2,3,2)	- (Dry)	

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

WS150

Sheet 2 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626099.44	N: 311612.48
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 23/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 30.07	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Firm orangish brown mottled orange and light grey silty very sandy CLAY. Light grey fine to medium sandy pockets present. Frequent black specks of presumed degrading organic matter. Occasional gravel of fine to medium angular to subrounded flint and subangular to subrounded quartz. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				D7	5.50 - 5.80			
				SPT(C)	6.00	N=15 (2,2/3,3,4,5)	- (Dry)	
Borehole completed at 6.45m.		6.45	23.62					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	1.00	100
57	4.00	5.00	1.00	100
47	5.00	6.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

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Sheet 1 of 1

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626071.17	N: 311576.07
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 22/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 30.29	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
TOPSOIL (Light brown very sandy SILT with occasional gravel of fine to medium angular to subrounded flint. Roots and rootlets present). [TOPSOIL]				ES1	0.00 - 0.10			
Yellowish brown very sandy SILT with occasional gravel of fine to medium angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.30	29.99	ES2	0.30 - 0.40			
Orangish brown mottled brown yellowish brown slightly silty gravelly fine to medium SAND. Gravel is fine to coarse angular to subrounded flint and subangular to subrounded quartz. Pockets of clayey sand. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION] *From 0.70m: Becoming reddish brown very gravelly and clayey.*		0.45	29.84	D1	0.60			
Firm to stiff orangish brown mottled greyish brown silty very sandy CLAY with occasional gravel of fine to medium subangular to subrounded flint. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION] *From 1.00m: Becoming whitish brown with no sandy pockets. Occasional fine to medium subangular to subrounded quartz and occasional black organic specks present.*		0.90	29.39	D2 PP01 SPT(C) B1 HV01 U1 HV02 SPT(C) D3 PP02 D4 PP03 SPT(C)	0.90 0.95 1.00 1.00 - 1.60 1.10 1.60 - 1.90 1.90 2.00 2.50 - 2.70 2.50 2.80 - 3.00 2.90 3.00	230 kPa N=11 (1,2/3,2,3,3) 66 kPa 52 kPa N=7 (1,1/2,2,1,2) 74 kPa 139 kPa N=10 (2,2/2,2,3,3)	- (Dry) - (Dry)	
Borehole completed at 3.45m.		3.45	26.84					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
77	1.00	2.00	1.00	100
67	2.00	3.00	1.00	100

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 6.45m arisings.

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Dynamic Continuous Sampling Borehole Record

WS152

Sheet 1 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626112.60	N: 311524.64
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 22/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 32.34	Sample / In-Situ Test Information: Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
MADE GROUND (Brown slightly clayey very silty fine to medium SAND with occasional gravel of fine to coarse angular to subrounded flint. Frequent roots and rootlets present). [MADE GROUND]				ES1	0.10 - 0.20			
Yellowish orange very silty fine to medium SAND with occasional gravel and rare cobbles of fine to coarse angular to subrounded flint. [ALBION GLACIGENIC GROUP - SHERINGHAM CLIFFS FORMATION]		0.40 0.50	31.94 31.84	ES2	0.40 - 0.50			
Firm to stiff orangish brown mottled light yellowish brown slightly sandy silty CLAY with rare gravel of fine subangular to subrounded flint. Frequent pockets of yellowish brown fine to medium sand. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				PP01	0.60	351 kPa		
From 1.00m: Occasional organic matter present and frequent fine to coarse angular to subrounded flint. Becoming very sandy with frequent sand pockets present.				D1	0.80			
				SPT(C)	1.00	N=18 (2,2/3,4,5,6)	- (Dry)	
				B1	1.00 - 2.00			
				PP02	1.00	262 kPa		
From 1.60m: Becoming less mottled and more organic matter present.				PP03	1.60	204 kPa		
				PP04	1.90	82 kPa		
				SPT(C)	2.00	N=10 (1,2/2,2,3,3)	- (Dry)	
From 3.00m to 4.00m: No mottling present.				SPT(C)	3.00	N=10 (2,1/2,2,3,3)	- (Dry)	
				D2	3.50			
				PP05	3.60	90 kPa		
				D3	3.90 - 4.00			
From 4.00m to 5.00m: Rare gravel present.				SPT(C)	4.00	N=9 (1,2/1,2,3,3)	- (Dry)	
				D4	4.50			
				PP06	4.60	114 kPa		
				D5	4.90 - 5.00			
				SPT(C)	5.00	N=8 (1,2/1,2,3,2)	- (Dry)	
				PP07	5.00	123 kPa		

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	0.80	80
57	4.00	5.00	0.60	60
47	5.00	6.00	0.60	60

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m arisings.

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Dynamic Continuous Sampling Borehole Record

WS152

Sheet 2 of 2

Project ID: **GN20251**	Client: Persimmon Homes (Anglia) Limited	E: 626112.60	N: 311524.64
Location: Blue Boar Lane, Sprowston	Consultant:	Date: 22/08/2016	
	Plant used: Competitor Archway Dart	SPT Hammer Serial No: 20AJ11B (ER: 68%)	

Geological Description	Legend	Depth (m)	Ground Level (maOD) 32.34	Sample / In-Situ Test Information Type	Depth	Results / Remarks	Casing (Water)	Installation & Backfill
Firm to stiff orangish brown mottled light yellowish brown slightly sandy silty CLAY with rare gravel of fine subangular to subrounded flint. Frequent pockets of yellowish brown fine to medium sand. [ALBION GLACIGENIC GROUP - HAPPISBURGH GLACIGENIC FORMATION]				B2	5.40 - 6.00			
				SPT(C)	6.00	N=17 (1,2/4,4,3,6)	- (Dry)	
Borehole completed at 6.45m.		6.45	25.89					

Window or Windowless Sampling Run Details

Diameter (mm)	Top Depth (m)	Base Depth (m)	Sample Length (m)	Recovery (%)
87	0.00	1.00	1.00	100
87	1.00	2.00	1.00	100
77	2.00	3.00	1.00	100
67	3.00	4.00	0.80	80
57	4.00	5.00	0.60	60
47	5.00	6.00	0.60	60

Water Strike

Date	Strike Depth (m)	Depth Sealed (m)	Casing Depth (m)	Time Elapsed (mins)	Standing Level (m)	Remarks
						No groundwater encountered

Remarks:

1. Backfill: GL to 3.45m arisings.

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Website: www.harrisongroupuk.com

Drilled by: AW / KP | Logged by: RCr | Checked by: EO

SPT Calibration Report

EQUIPE GROUP
www.equipegroup.com

Hammer Energy Measurement Report

Type of Hammer	DANDO TERRIER
Client	BOREHOLE SURVEYS LTD
Test No	EQU1588
Test Depth (m)	8.50
Date of Test	20 June 2016
Valid until	20 June 2017
Hammer ID	DT/15172

Mass of the hammer	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of the instrumented rod		0.558 m
Area	A =	11.61 cm^2
Modulus	E_a =	206843 MPa

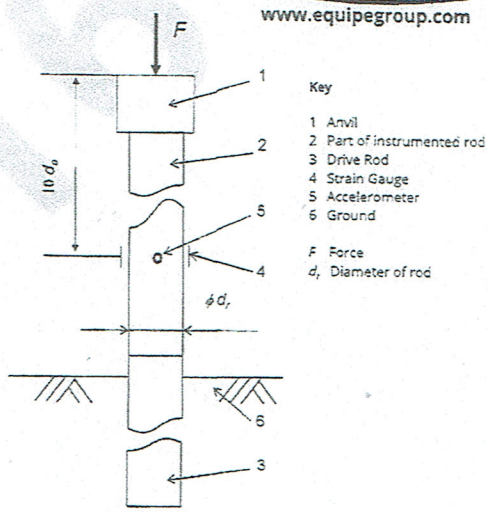
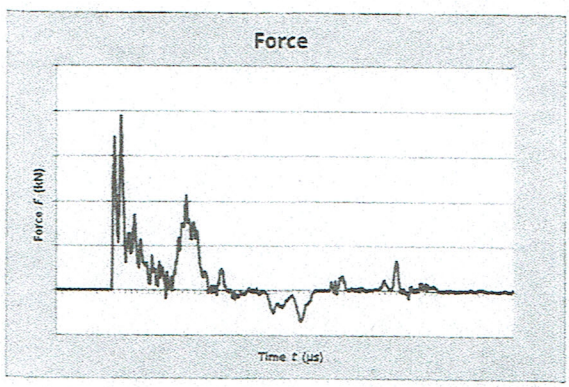
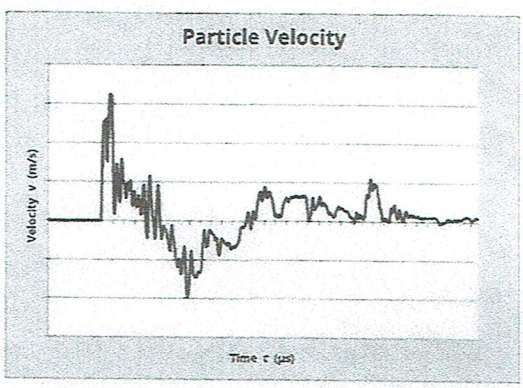
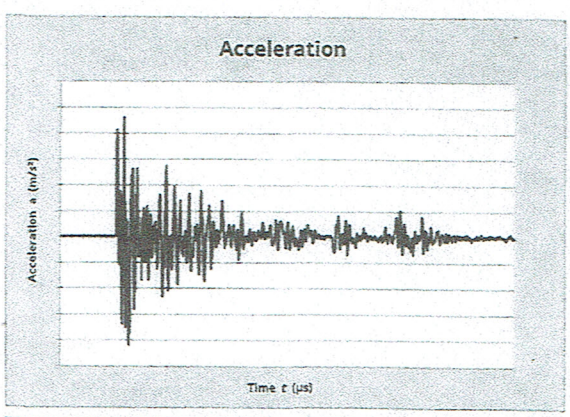
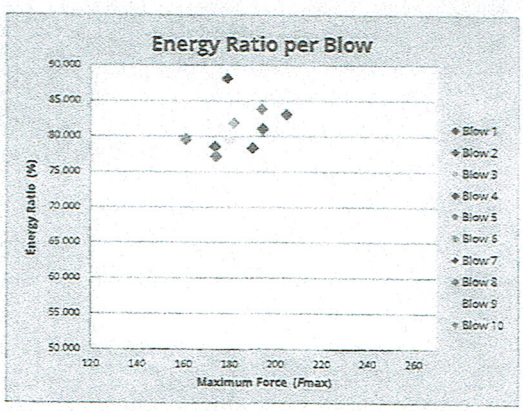


Fig. B.1 and B.2 BS EN ISO 22476-3 : 2005 + A1 : 2011









Observations:
1.

E_{meas} =	0.384 kN-m	
E_{theor} =	0.473 kN-m	
Energy Ratio (E_r) = E_{meas} / E_{theor}		81.08%

Equipe SPT Analyzer Operators: AF

Prepared by:	Checked by:	Date	30/06/2016

 Equipe Group, The Paddocks, Home Farm Offices, The Upton Estate, Banbury, Oxfordshire, OX15 6HU
Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Equipe Group
The Paddocks
Home Farm Offices
Banbury
Oxfordshire
OX15 6HU

SPT Hammer Ref:	20AJ11B
Test Date:	18/11/2015
Report Date:	18/11/2015
File Name:	20AJ11B.spt
Test Operator:	AF

Instrumented Rod Data

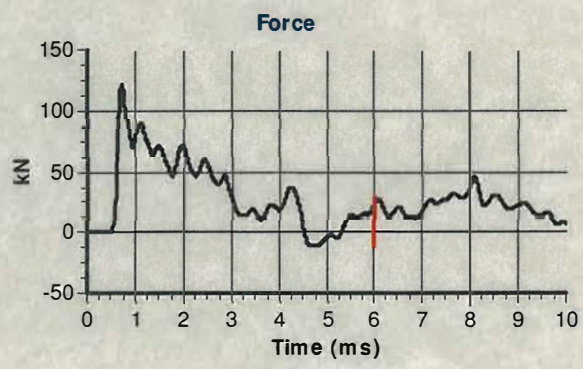
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	9607
Accelerometer No.2:	6458

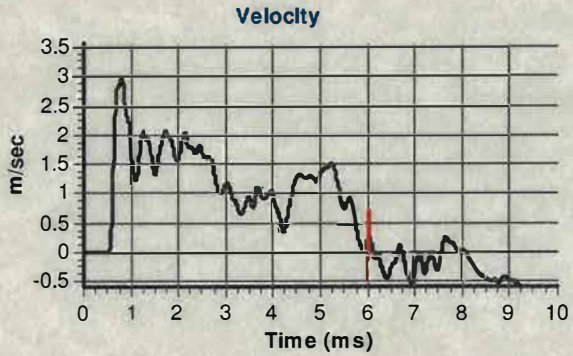
SPT Hammer Information

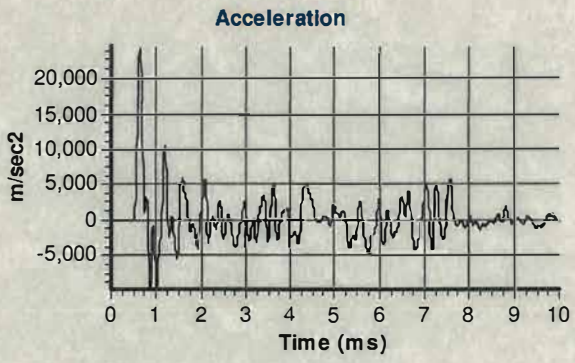
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

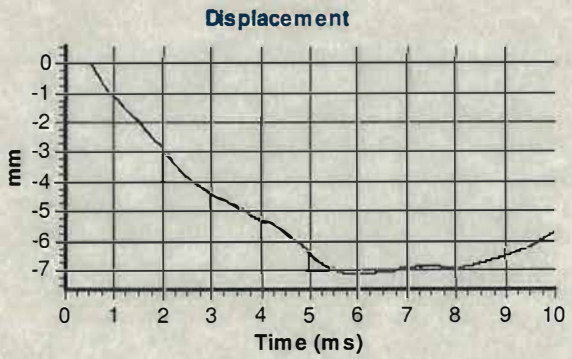
Comments / Location

NORWICH









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	321

Energy Ratio E_r (%): **68**

Signed: Julian Lovell

Title: Managing Director

The recommended calibration interval is 12 months

4031

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SERVICES

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Client: **Harrison Group Environmental**
Kimberley Street
Norwich
Norfolk
NR2 2RJ

For the attention of: Rachael Crowe

Date of Issue: 27/09/2016

TEST REPORT TRANSMITTAL

Report Form FMR3000 Rev.C Revision Date 26/11/08

Project	**Blue Boar Lane, Sprowston - P3**	**Samples received**	**09/09/2016**
Report No	**GN20251**	**Instruction received**	**09/09/2016**
Your Ref	**GN20251**	**Testing commenced**	**13/09/2016**

SUMMARY OF RESULTS ATTACHED

Test Method and Description	Quantity	UKAS Accredited
BS1377: Part 2: 1990:3.2 Moisture Content	1	Yes
BS1377: Part 2: 1990:4.4/5.0 Liquid & Plastic Limits - Single Point Method	1	Yes
BS1377: Part 2: 1990:9.3 Particle Size Distribution - Wet Sieve Method	4	Yes

Remarks:

Issued by: M Willson

Approved Signatories:

M Willson (Laboratory Manager), G Bream (Senior Laboratory Technician)

Unless we are notified to the contrary, samples will be disposed after a period of one month from this date

Only those results indicated in this report are UKAS accredited and any opinion or interpretations expressed are outside the scope of UKAS accreditation

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SERVICES

PROJECT NAME: Blue Boar Lane, Sprowston - P3
PROJECT NUMBER: GN20251
CLIENT: Persimmon Homes
DATE OF ISSUE: 27/09/2016

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT (ONE POINT CONE PENETROMETER METHOD), PLASTIC LIMIT AND PLASTICITY INDEX TO BS1377 : PART 2 : 1990

BH/TP No	Depth (m)	Sample No.	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	NHBC Modified Plasticity Index	Passing 0.425mm (%)	Soil Class	Sample Description
WS125	0.70	D1	13	20	12	9	8	90	CL	Dark brown mottled light grey slightly gravelly sandy silty CLAY. Gravel is of flint

BS1377 : Part 2 : Clause 3.2 : 1990 Determination of Moisture Content
BS1377 : Part 2 : Clause 4.4 : 1990 Determination of Liquid Limit (Single Point Cone Penetrometer Method)
BS1377 : Part 2 : Clause 5 : 1990 Determination of Plastic Limit and Plasticity Index
NHBC Standards Chapter 4.2 : Determination of the modified plasticity index

REMARKS (Including any abnormalities or departures from procedure)
Determination of modified plasticity index is not covered by UKAS accreditation

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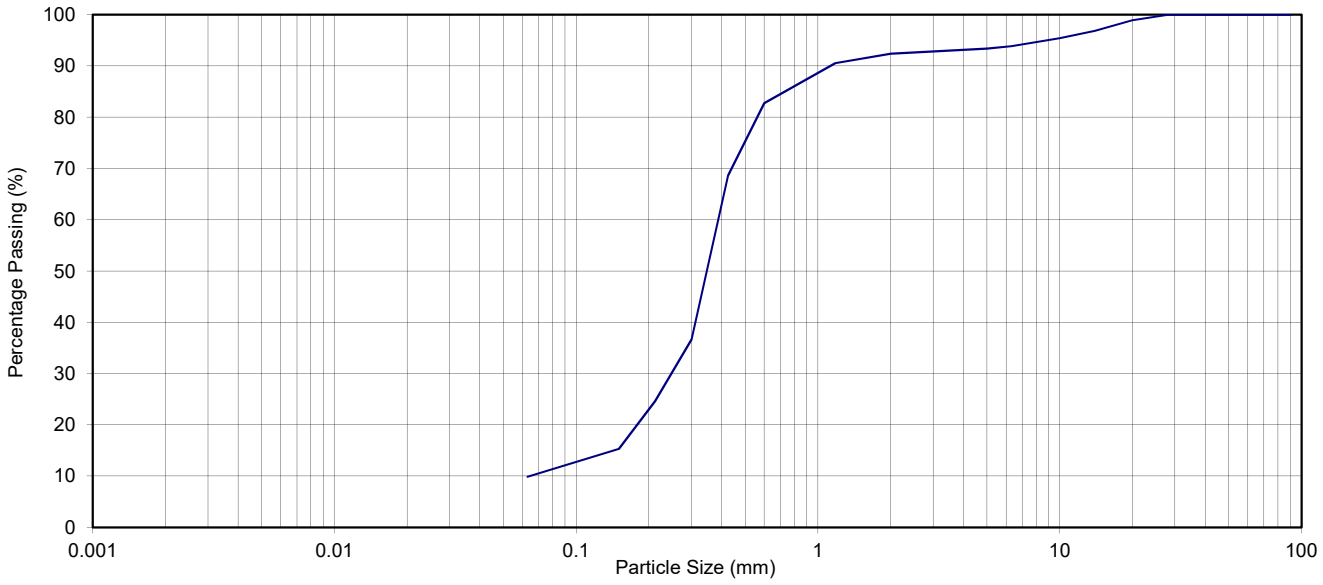
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P3**	**BH/TP No.:**	**WS123**
PROJECT NUMBER:	**GN20251**	**Depth (m):**	**1.20**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**B1**
DATE OF ISSUE:	**27/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	100
28.0	100
20.0	99
14.0	97
10.0	95
6.30	94
5.00	93
3.35	93
2.00	92
1.18	91
0.600	83
0.425	69
0.300	37
0.212	25
0.150	15
0.063	10

Sample Description
Orange brown silty gravelly SAND. Gravel is of flint

Sample Proportions %	
Cobbles	0.0
Gravel	7.7
Sand	82.5
Silt / Clay	9.9

Remarks

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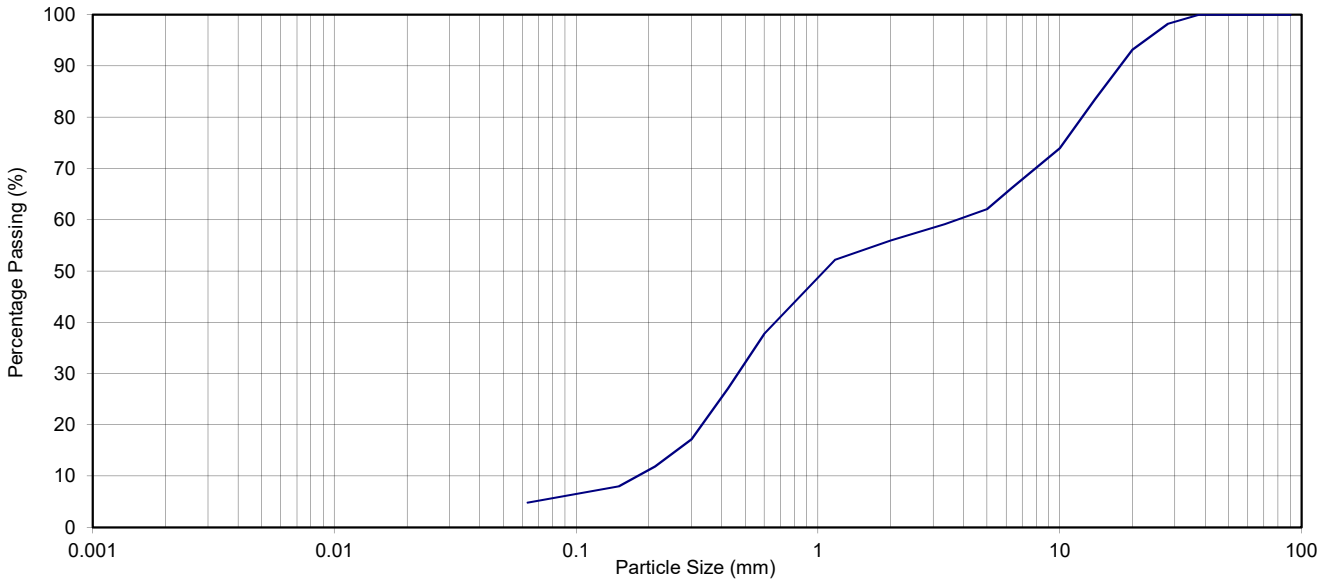
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P3**	**BH/TP No.:**	**WS123**
PROJECT NUMBER:	**GN20251**	**Depth (m):**	**2.50**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**B2**
DATE OF ISSUE:	**27/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	100
28.0	98
20.0	93
14.0	84
10.0	74
6.30	66
5.00	62
3.35	59
2.00	56
1.18	52
0.600	38
0.425	27
0.300	17
0.212	12
0.150	8
0.063	5

Sample Description
Brown slightly silty SAND / GRAVEL. Gravel is of flint

Sample Proportions %	
Cobbles	0.0
Gravel	44.0
Sand	51.1
Silt / Clay	4.9

Remarks

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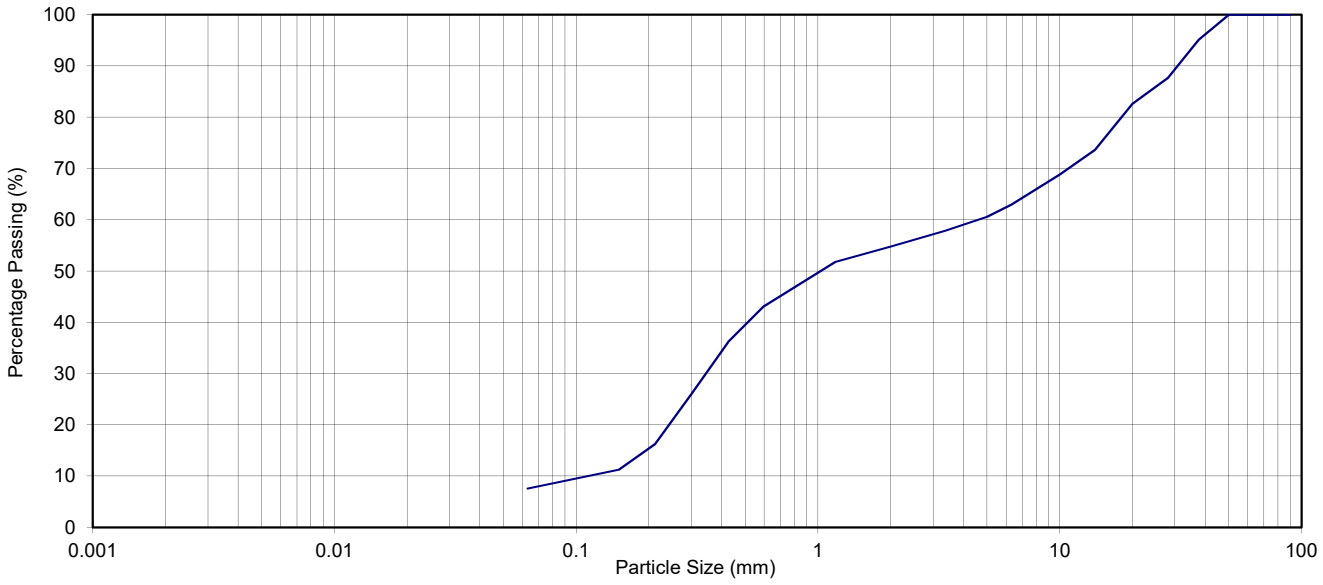
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P3**	**BH/TP No.:**	**WS128**
PROJECT NUMBER:	**GN20251**	**Depth (m):**	**0.50**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**B1**
DATE OF ISSUE:	**27/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	95
28.0	88
20.0	83
14.0	74
10.0	69
6.30	63
5.00	61
3.35	58
2.00	55
1.18	52
0.600	43
0.425	36
0.300	26
0.212	16
0.150	11
0.063	8

Sample Description
Orange brown silty SAND / GRAVEL. Gravel is of flint and quartzite

Sample Proportions %	
Cobbles	0.0
Gravel	45.2
Sand	47.2
Silt / Clay	7.6

Remarks

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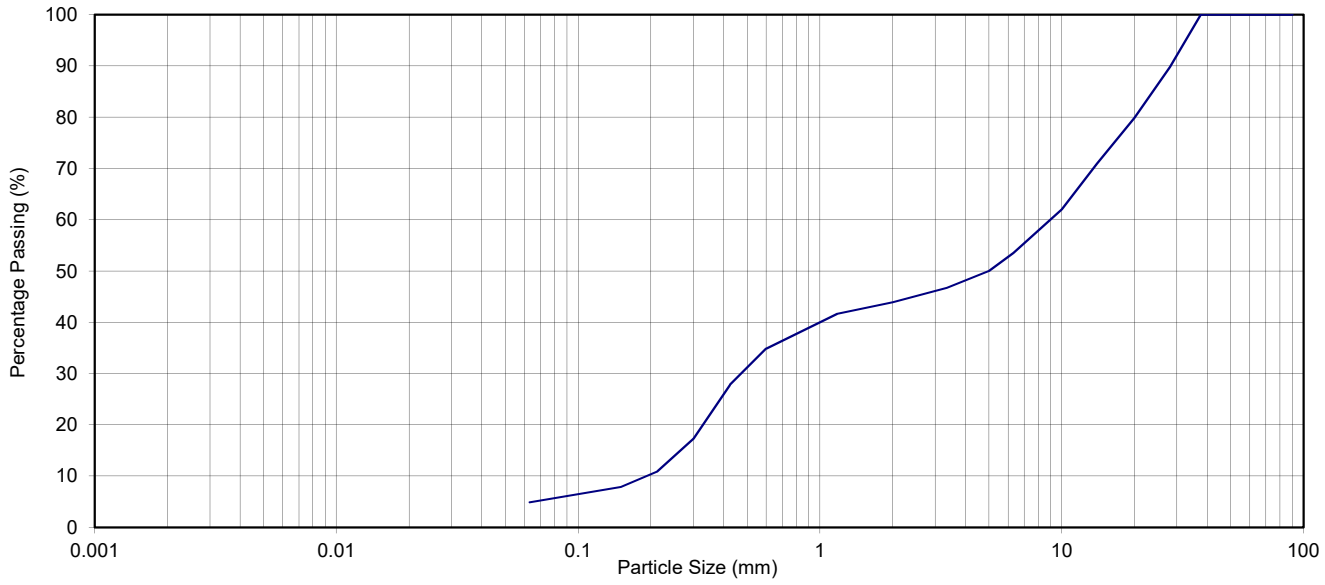
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P3**	**BH/TP No.:**	**WS131**
PROJECT NUMBER:	**GN20251**	**Depth (m):**	**0.70**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**B1**
DATE OF ISSUE:	**27/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	100
28.0	90
20.0	80
14.0	71
10.0	62
6.30	54
5.00	50
3.35	47
2.00	44
1.18	42
0.600	35
0.425	28
0.300	17
0.212	11
0.150	8
0.063	5

Sample Description
Dark orange brown slightly silty very sandy GRAVEL. Gravel is of flint and quartzite

Sample Proportions %	
Cobbles	0.0
Gravel	56.1
Sand	39.0
Silt / Clay	4.9

Remarks

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SERVICES

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Norwich NR6 5DS
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Fax +44 (0) 1603 416443

Client: **Harrison Group Environmental**
Kimberley Street
Norwich
Norfolk
NR2 2RJ

For the attention of: Rachael Crowe

Date of Issue: 28/09/2016

TEST REPORT TRANSMITTAL

Report Form FMR3000 Rev.C Revision Date 26/11/08

Project	**Blue Boar Lane, Sprowston - P4**	**Samples received**	**09/09/2016**
Report No	**GN20251 - PH**	**Instruction received**	**09/09/2016**
Your Ref	**GN20251 - PH**	**Testing commenced**	**13/09/2016**

SUMMARY OF RESULTS ATTACHED

Test Method and Description	Quantity	UKAS Accredited
BS1377: Part 2: 1990:3.2 Moisture Content	15	Yes
BS1377: Part 2: 1990:4.4/5.0 Liquid & Plastic Limits - Single Point Method	12	Yes
BS1377: Part 2: 1990:9.3 Particle Size Distribution - Wet Sieve Method	4	Yes
BS1377: Part 7: 1990:8.0 Unconsolidated Undrained Shear Strength - Single Stage	2	Yes

Remarks:

Issued by: M Willson

Approved Signatories:

M Willson (Laboratory Manager), G Bream (Senior Laboratory Technician)

Unless we are notified to the contrary, samples will be disposed after a period of one month from this date

Only those results indicated in this report are UKAS accredited and any opinion or interpretations expressed are outside the scope of UKAS accreditation

harrisontesting
SERVICES

PROJECT NAME: Blue Boar Lane, Sprowston - P4
PROJECT NUMBER: GN20251 - PH
CLIENT: Persimmon Homes
DATE OF ISSUE: 28/09/2016

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT (ONE POINT CONE PENETROMETER METHOD), PLASTIC LIMIT AND PLASTICITY INDEX TO BS1377 : PART 2 : 1990

BH/TP No	Depth (m)	Sample No.	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	NHBC Modified Plasticity Index	Passing 0.425mm (%)	Soil Class	Sample Description
WS133	1.80	D3	10	36	14	22	8	38	CI	Brown clayey sandy GRAVEL. Gravel is of flint
WS135	1.50	D2	14	27	12	15	14	93	CL	Orange brown slightly gravelly slightly sandy silty CLAY. Gravel is of flint
WS136	1.70	D1	17	23	12	11	11	96	CL	Orange brown and light grey slightly gravelly slightly sandy silty CLAY. Gravel is of flint
WS137	0.70	D1	2.1	Non-plastic	Non-plastic	Non-plastic	Non-plastic	38	Non-plastic	Light brown silty gravelly SAND. Gravel is of flint
WS141	1.20	B1	15	28	12	16	16	100	CL	Orange brown slightly sandy silty CLAY
WS141	2.50	D2	17							Orange brown slightly sandy silty CLAY
WS142	3.30	B1	14	26	11	15	15	100	CL	Orange brown slightly sandy silty CLAY
WS144	1.10	D1	12	26	12	14	13	95	CL	Dark orange brown slightly gravelly slightly sandy silty CLAY. Gravel is of flint
WS148	0.80	D1	13	26	11	15	14	95	CL	Orange brown and light grey slightly gravelly slightly sandy silty CLAY. Gravel is of flint

BS1377 : Part 2 : Clause 3.2 : 1990 Determination of Moisture Content
BS1377 : Part 2 : Clause 4.4 : 1990 Determination of Liquid Limit (Single Point Cone Penetrometer Method)
BS1377 : Part 2 : Clause 5 : 1990 Determination of Plastic Limit and Plasticity Index
NHBC Standards Chapter 4.2 : Determination of the modified plasticity index

REMARKS (Including any abnormalities or departures from procedure)
Determination of modified plasticity index is not covered by UKAS accreditation

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SERVICES

PROJECT NAME: Blue Boar Lane, Sprowston - P4
PROJECT NUMBER: GN20251 - PH
CLIENT: Persimmon Homes
DATE OF ISSUE: 28/09/2016

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT (ONE POINT CONE PENETROMETER METHOD), PLASTIC LIMIT AND PLASTICITY INDEX TO BS1377 : PART 2 : 1990

BH/TP No	Depth (m)	Sample No.	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index	NHBC Modified Plasticity Index	Passing 0.425mm (%)	Soil Class	Sample Description
WS148	2.50	D2	16	27	12	15	15	100	CL	Brown and orange brown slightly sandy silty CLAY
WS148	3.60	D3	15							Orange brown slightly sandy silty CLAY
WS151	1.00	B1	17	28	13	15	15	100	CL	Brown slightly sandy silty CLAY
WS151	2.50	D3	14							Orange brown slightly sandy silty CLAY
WS151	2.80	D4	16	23	13	10	10	100	CL	Orange brown slightly sandy silty CLAY
WS152	0.80	D1	14	28	13	15	15	100	CL	Orange brown and occasional light grey slightly sandy silty CLAY

BS1377 : Part 2 : Clause 3.2 : 1990 Determination of Moisture Content
BS1377 : Part 2 : Clause 4.4 : 1990 Determination of Liquid Limit (Single Point Cone Penetrometer Method)
BS1377 : Part 2 : Clause 5 : 1990 Determination of Plastic Limit and Plasticity Index
NHBC Standards Chapter 4.2 : Determination of the modified plasticity index

REMARKS (Including any abnormalities or departures from procedure)
Determination of modified plasticity index is not covered by UKAS accreditation

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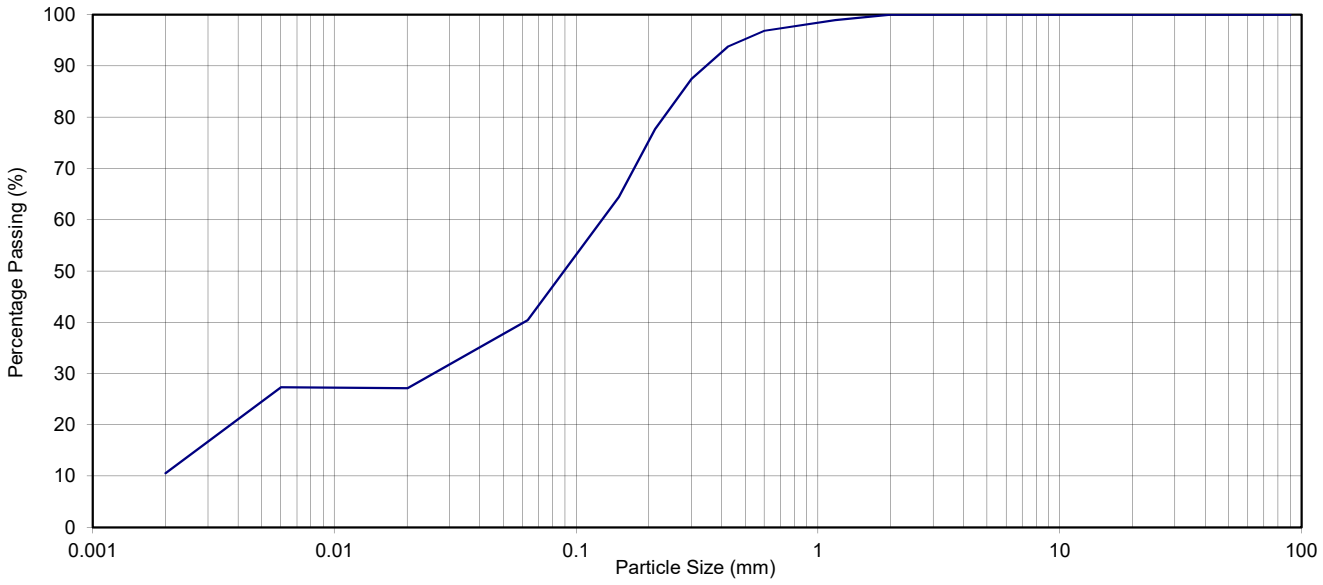
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P4**	**BH/TP No.:**	**WS135**
PROJECT NUMBER:	**GN20251 - PH**	**Depth (m):**	**1.50**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**D2**
DATE OF ISSUE:	**28/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING & BS1377 : PART 2 : 1990 : CLAUSE 9.4 - SEDIMENTATION BY PIPETTE



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	100
28.0	100
20.0	100
14.0	100
10.0	100
6.30	100
5.00	100
3.35	100
2.00	100
1.18	99
0.600	97
0.425	94
0.300	88
0.212	78
0.150	64
0.063	40
0.020	27
0.006	27
0.002	11

Sample Description
Orange brown sandy clayey SILT

Sample Proportions %	
Cobbles	0.0
Gravel	0.0
Sand	59.6
Silt	29.8
Clay	10.6

Remarks

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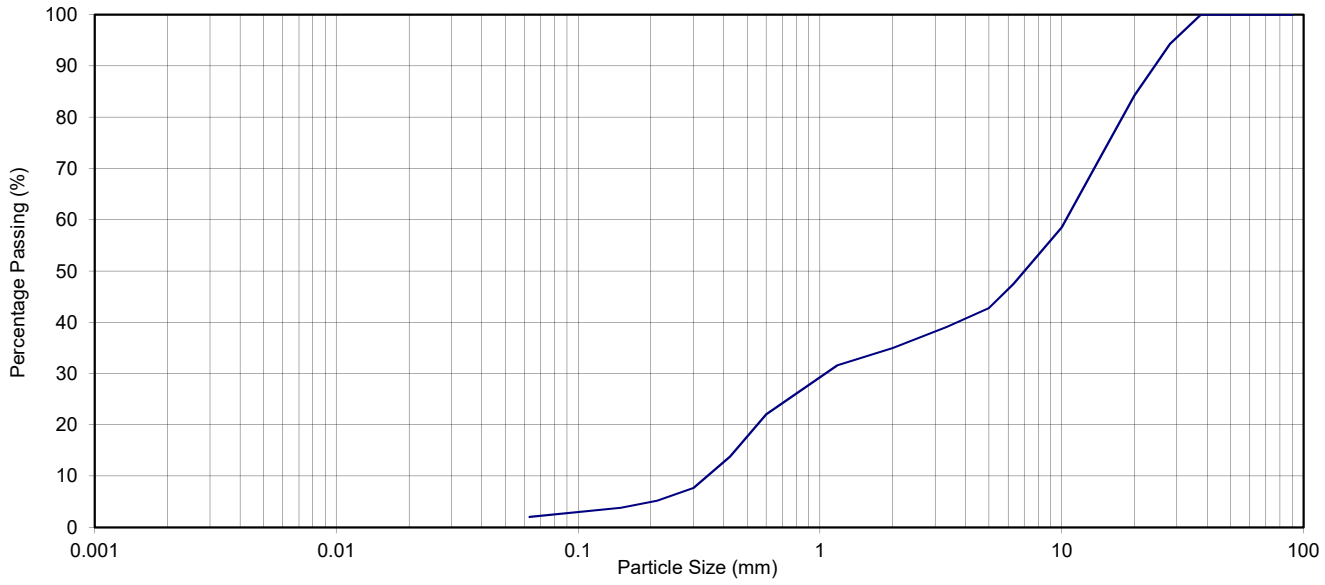
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P4**	**BH/TP No.:**	**WS136**
PROJECT NUMBER:	**GN20251 - PH**	**Depth (m):**	**0.55**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**B1**
DATE OF ISSUE:	**28/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	100
28.0	94
20.0	84
14.0	71
10.0	59
6.30	47
5.00	43
3.35	39
2.00	35
1.18	32
0.600	22
0.425	14
0.300	8
0.212	5
0.150	4
0.063	2
0.020	1
0.006	1
0.002	1

Sample Description
Orange brown slightly silty very sandy GRAVEL. Gravel is of flint

Sample Proportions %	
Cobbles	0.0
Gravel	65.0
Sand	32.9
Silt / Clay	1.5

Remarks

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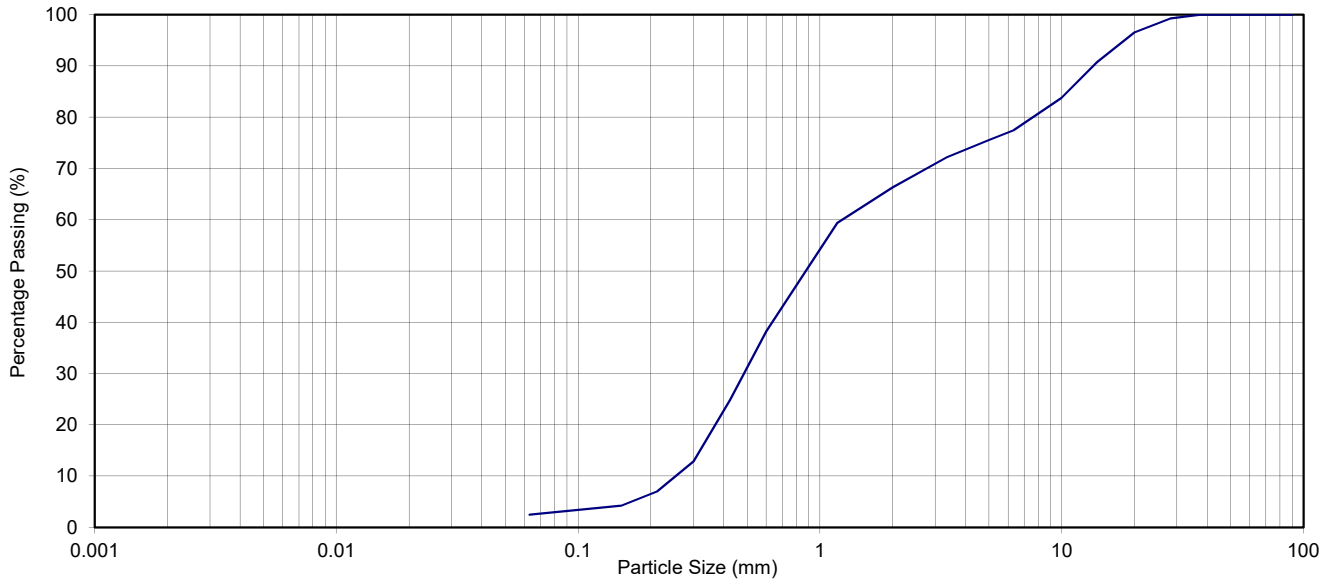
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P4**	**BH/TP No.:**	**WS139**
PROJECT NUMBER:	**GN20251 - PH**	**Depth (m):**	**1.50**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**B1**
DATE OF ISSUE:	**28/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	100
28.0	99
20.0	97
14.0	91
10.0	84
6.30	77
5.00	76
3.35	72
2.00	66
1.18	59
0.600	38
0.425	25
0.300	13
0.212	7
0.150	4
0.063	3
0.020	2
0.006	2
0.002	1

Sample Description
Orange brown slightly silty very gravelly SAND. Gravel is of flint

Sample Proportions %	
Cobbles	0.0
Gravel	33.7
Sand	63.8
Silt / Clay	1.8

Remarks

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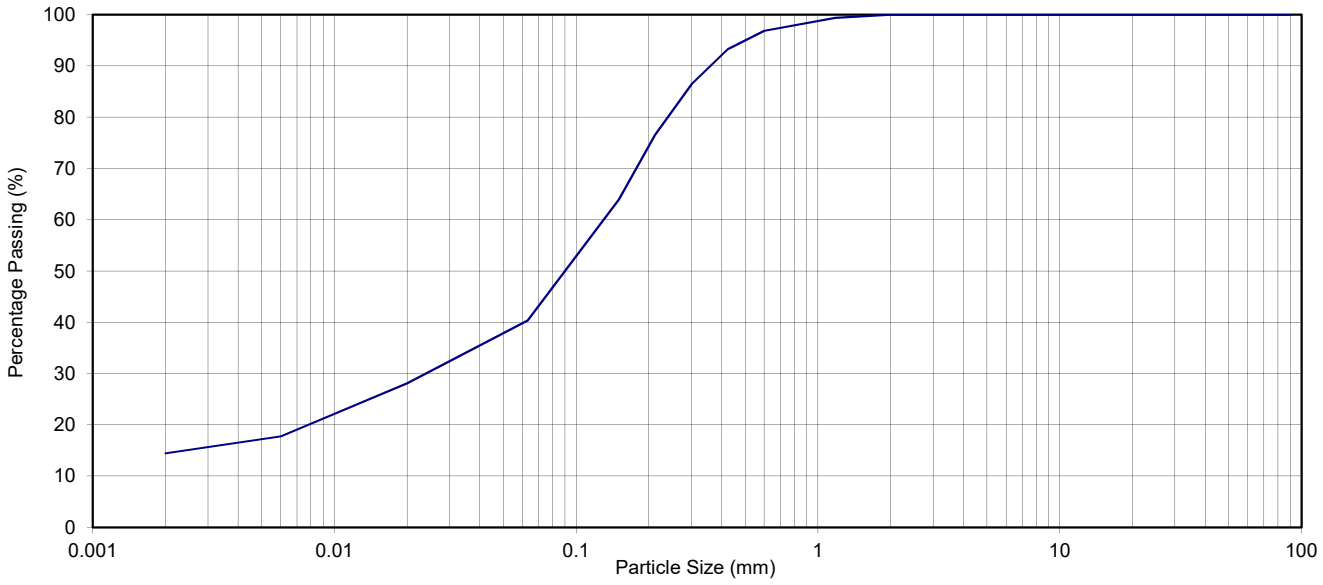
SERVICES

PROJECT NAME:	**Blue Boar Lane, Sprowston - P4**	**BH/TP No.:**	**WS141**
PROJECT NUMBER:	**GN20251 - PH**	**Depth (m):**	**1.20**
CLIENT:	**Persimmon Homes**	**Sample No.:**	**B1**
DATE OF ISSUE:	**28/09/2016**		

DETERMINATION OF PARTICLE SIZE DISTRIBUTION TO BS1377 : PART 2 : 1990 : CLAUSE 9.2 - WET SIEVING & BS1377 : PART 2 : 1990 : CLAUSE 9.4 - SEDIMENTATION BY PIPETTE



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

Particle Size (mm)	Percentage Passing
75.0	100
63.0	100
50.0	100
37.5	100
28.0	100
20.0	100
14.0	100
10.0	100
6.30	100
5.00	100
3.35	100
2.00	100
1.18	99
0.600	97
0.425	93
0.300	86
0.212	77
0.150	64
0.063	40
0.020	28
0.006	18
0.002	14

Sample Description
Orange brown sandy silty CLAY

Sample Proportions %	
Cobbles	0.0
Gravel	0.0
Sand	59.6
Silt	25.9
Clay	14.4

Remarks

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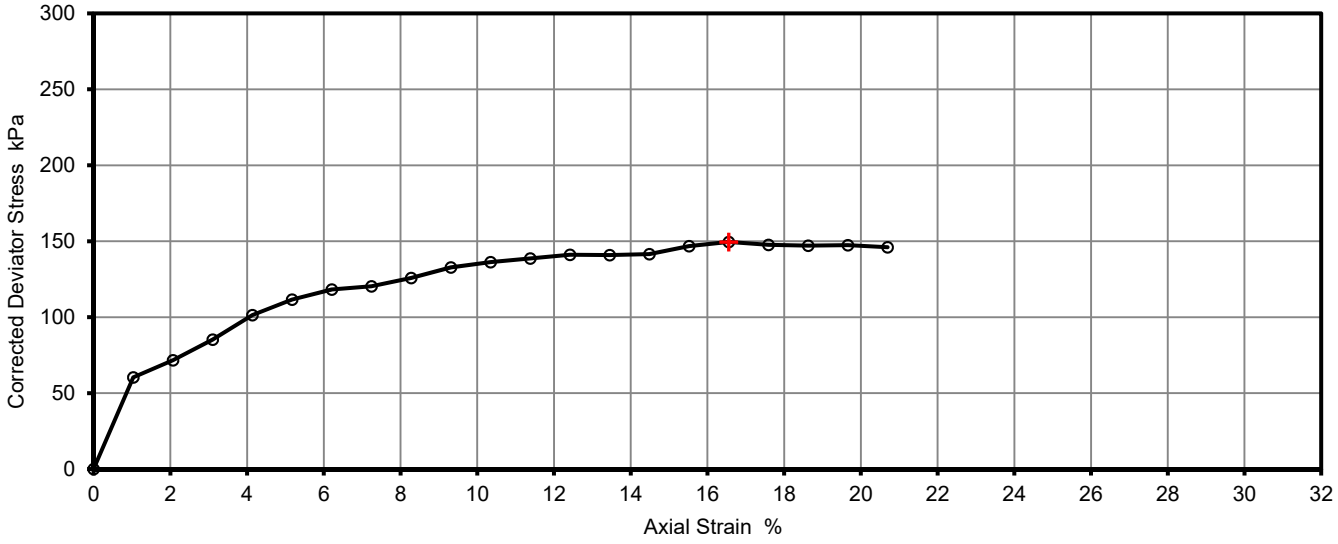
DETERMINATION OF UNDRAINED SHEAR STRENGTH - DEFINITIVE

BS1377 : Part 7 : 1990, Clause 8, Single Specimen

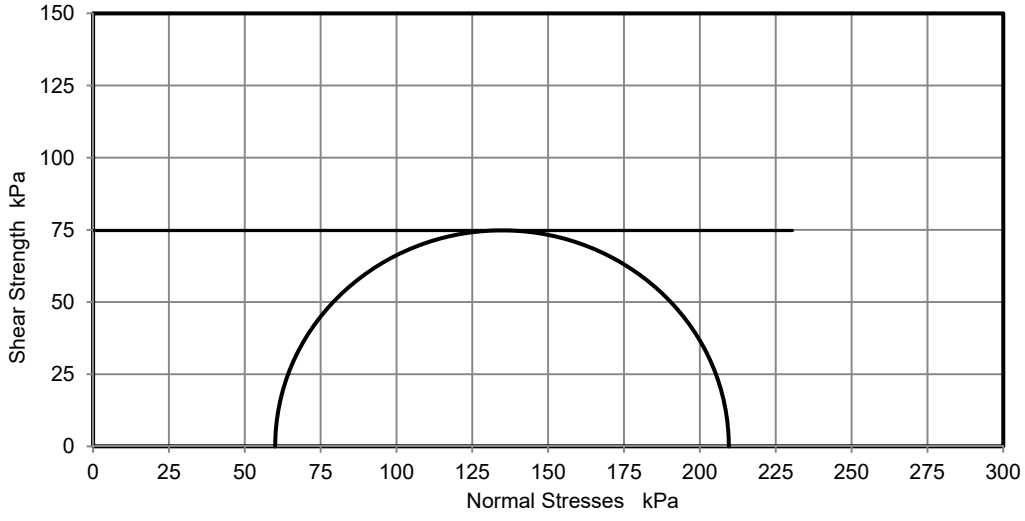
Project Name:	Blue Boar Lane, Sprowston - P4	Project Number:	**GN20251 - PH**
Client Name:	Persimmon Homes	Sample Location:	WS136
Sample Description:	High strength light brown slightly sandy silty CLAY	Sample Depth (m)	3.10
		Sample Reference	U1

Test Number		1	
Length		72.5	mm
Diameter		36.8	mm
Bulk Density		2.18	Mg/m^3
Moisture Content		15.6	%
Dry Density		1.89	Mg/m^3
Rate of Strain		2.1	%/min
Cell Pressure		60	kPa
At failure	Axial Strain	16.6	%
	Deviator Stress, $(\sigma_1 - \sigma_3)_f$	150	kPa
	Undrained Shear Strength, c_u	75	kPa $= \frac{1}{2}(\sigma_1 - \sigma_3)_f$
	Mode of Failure	Compound	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks	Approved	Date	Sheet No.:
	MW	28/09/2016	8 of 9

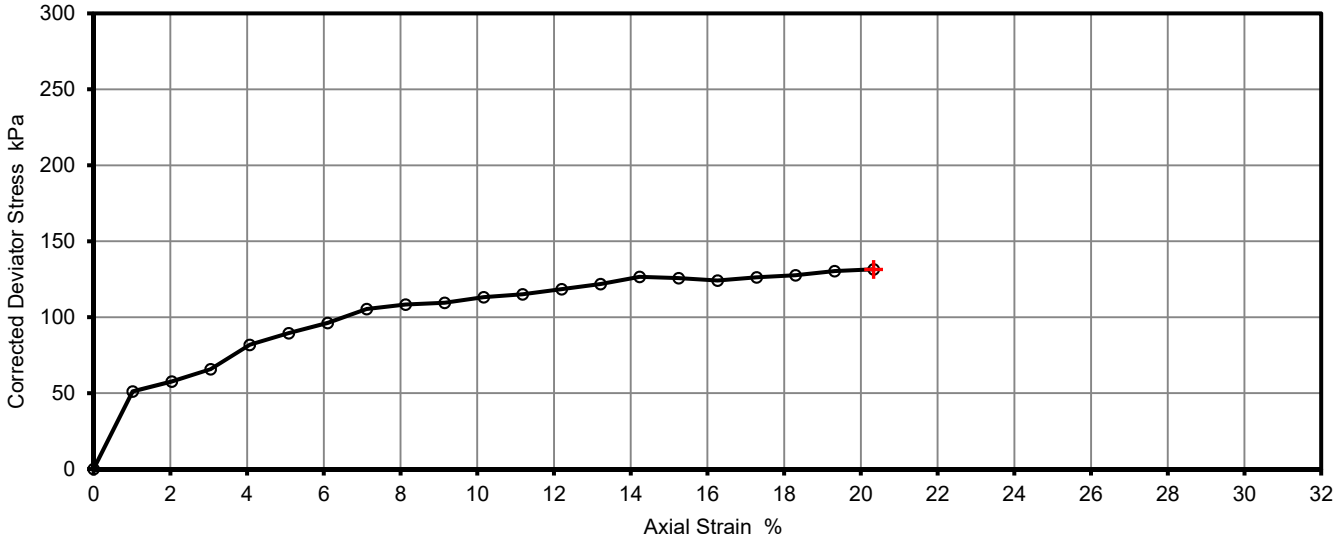
DETERMINATION OF UNDRAINED SHEAR STRENGTH - DEFINITIVE

BS1377 : Part 7 : 1990, Clause 8, Single Specimen

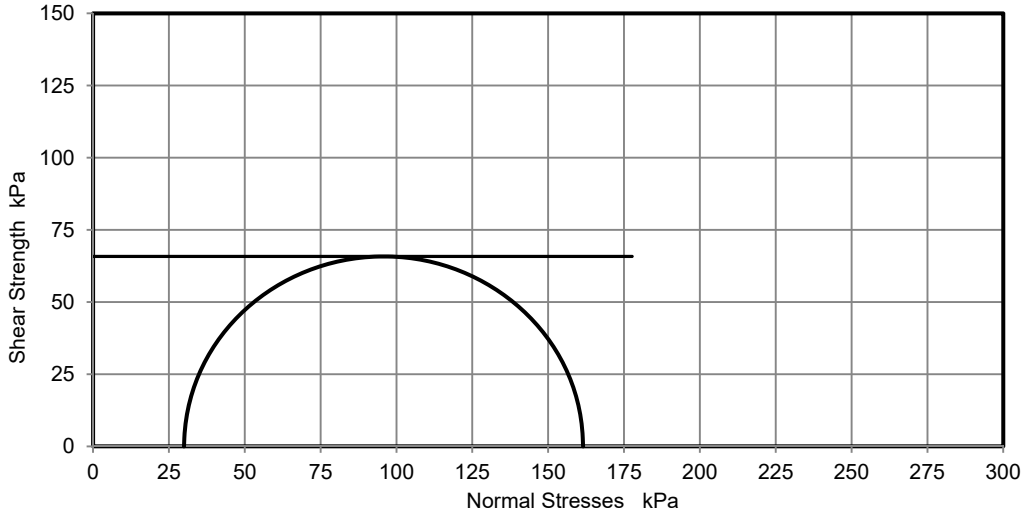
Project Name:	Blue Boar Lane, Sprowston - P4	Project Number:	**GN20251 - PH**
Client Name:	Persimmon Homes	Sample Location:	WS146
Sample Description:	Medium strength light brown slightly sandy silty CLAY	Sample Depth (m)	1.60
		Sample Reference	U1

Test Number		1	
Length		73.8	mm
Diameter		37.1	mm
Bulk Density		2.13	Mg/m^3
Moisture Content		16.0	%
Dry Density		1.83	Mg/m^3
Rate of Strain		2.0	%/min
Cell Pressure		30	kPa
At failure	Axial Strain	20.3	%
	Deviator Stress, $(\sigma_1 - \sigma_3)_f$	132	kPa
	Undrained Shear Strength, c_u	66	kPa $= \frac{1}{2}(\sigma_1 - \sigma_3)_f$
	Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks	Approved	Date	Sheet No.:
	MW	28/09/2016	9 of 9

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PROJECT NAME:	**Blue Boar Lane, Sprowston - P4**
PROJECT NUMBER:	**GN20251 - PH**
CLIENT:	**Persimmon Homes**
DATE OF ISSUE:	**28/09/2016**

SUMMARY OF RESTRICTED TESTS

BH No.:	Sample Depth (m)	Sample No.	Test Scheduled	Reason why sample could not be tested
WS147	2.50	U1	Unconsolidated Undrained Shear Strength - Single Stage	Unable to prepare intact test specimen of suitable height
WS151	1.60	U1	Unconsolidated Undrained Shear Strength - Single Stage	Unable to prepare intact test specimen of suitable height

REMARKS (Including any abnormalities or departures from procedure)

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Analytical Report Number : 16-27716

Replaces Analytical Report Number : 16-27716, issue no. 1

Project / Site name:	Blue Boar Lane	**Samples received on:**	15/09/2016
Your job number:	GN20251	**Samples instructed on:**	15/09/2016
Your order number:		**Analysis completed by:**	25/10/2016
Report Issue Number:	2	**Report issued on:**	01/11/2016
Samples Analysed:	9 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 16-27716

Project / Site name: Blue Boar Lane

Lab Sample Number				629653	629654	629655	629656	629657
Sample Reference				WS124	WS137	WS144	WS133	WS126
Sample Number				ES1	ES1	D2	D1	D1
Depth (m)				0.10	0.20	1.50	0.90	0.80
Date Sampled				13/09/2016	13/09/2016	23/08/2016	17/08/2016	18/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.4	3.2	12	2.2	7.2
Total mass of sample received	kg	0.001	NONE	1.1	1.4	1.1	0.98	1.7
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	8.6	6.4	9.4	8.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.023	0.050	0.0088
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.3	1.2	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.6	7.0	-	-	-
Boron (total)	mg/kg	1	MCERTS	5.0	4.6	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	10	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	20	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	51	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.8	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.2	7.2	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	33	29	-	-	-
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-

Analytical Report Number: 16-27716

Project / Site name: Blue Boar Lane

Lab Sample Number				629658	629659	629660	629661	
Sample Reference				WS163	WS156	WS172	WS166	
Sample Number				D1	ES1	D1	D2	
Depth (m)				0.80	0.10	1.50	1.20	
Date Sampled				17/08/2016	18/08/2016	25/08/2016	24/08/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	3.7	7.0	9.8	10	
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.3	1.1	
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.2	5.2	8.2	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0093	0.010	0.035	0.036	
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	-	-	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	-	-	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Boron (total)	mg/kg	1	MCERTS	-	-	-	-	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	-	-	-	-	
TPH (C6 - C7)	mg/kg	1	NONE	-	-	-	-	
TPH (C7 - C8)	mg/kg	1	NONE	-	-	-	-	
TPH (C8 - C10)	mg/kg	1	NONE	-	-	-	-	
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-	-	-	
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-	-	-	
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-	-	-	
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-	-	-	

Analytical Report Number : 16-27716

Project / Site name: Blue Boar Lane

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
629653	WS124	ES1	0.10	Brown sandy loam with gravel.
629654	WS137	ES1	0.20	Brown sandy loam with gravel.
629655	WS144	D2	1.50	Light brown clay.
629656	WS133	D1	0.90	Light brown sand with gravel.
629657	WS126	D1	0.80	Light brown sand with gravel.
629658	WS163	D1	0.80	Light brown sand with gravel.
629659	WS156	ES1	0.10	Brown sandy loam with gravel.
629660	WS172	D1	1.50	Light brown clay and sand.
629661	WS166	D2	1.20	Light brown clay and sand.

Analytical Report Number : 16-27716

Project / Site name: Blue Boar Lane

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
TPH 8 Band (Soil)	Determination of extractable petroleum hydrocarbons in soil.	In-house method	L064/076PL	D	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
WS133	1	S	16-27716	629656	c	pH in soil (automated)	L099-PL	c
WS163	1	S	16-27716	629658	c	pH in soil (automated)	L099-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 16-26400

Replaces Analytical Report Number : 16-26400, issue no. 1

Project / Site name:	Blue Boar Lane, Sprowston	**Samples received on:**	30/08/2016
Your job number:	GN20251	**Samples instructed on:**	30/08/2016
Your order number:		**Analysis completed by:**	25/10/2016
Report Issue Number:	2	**Report issued on:**	31/10/2016
Samples Analysed:	13 soil samples		

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 16-26400

Project / Site name: Blue Boar Lane, Sprowston

Lab Sample Number				621917	621918	621919	621920	621921
Sample Reference				WS154	WS155	WS159	WS161	WS165
Sample Number				ES1	ES1	ES1	ES1	ES1
Depth (m)				0.20	0.20	0.30	0.30	0.10
Date Sampled				26/08/2016	26/08/2016	26/08/2016	26/08/2016	26/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.0	3.3	6.7	9.6	7.9
Total mass of sample received	kg	0.001	NONE	1.3	1.4	1.3	1.3	1.4
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.3	8.2	8.1	7.4	6.9
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.5	1.1	1.0	1.6	1.5
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.3	9.3	8.4	7.4	6.0
Boron (total)	mg/kg	1	MCERTS	4.4	2.3	3.7	3.3	2.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	8.0	11	7.8	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	18	17	24	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	54	46	46	58	44
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.5	0.6	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.7	5.7	8.6	6.7	7.2
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.1	< 1.0	1.2
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	37	30	30	45	36
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Lab Sample Number				621922	621923	621924	621925	621926
Sample Reference				WS171	BH101	BH101	WS167	WS175
Sample Number				ES1	ES6	ES10	ES1	ES1
Depth (m)				0.60	2.00	5.50	0.35	0.10
Date Sampled				26/08/2016	26/08/2016	26/08/2016	26/08/2016	26/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	4.7	11	14	7.9	7.2
Total mass of sample received	kg	0.001	NONE	1.3	1.5	1.5	1.3	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	5.1	6.2	7.2	6.9
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.4	0.1	< 0.1	1.7	1.2
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	8.7	3.3	10	4.7
Boron (total)	mg/kg	1	MCERTS	5.2	4.3	4.9	3.8	2.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.9	13	17	9.0	7.0
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	16	17	13	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	11	10	39	40
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	< 0.3	0.8	0.8	0.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.8	17	27	6.1	5.3
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.6	1.1
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	42	45	28	24
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Project / Site name: Blue Boar Lane, Sprowston

Lab Sample Number				621927	621928	621929		
Sample Reference				WS150	WS141	WS149		
Sample Number				ES1	ES1	ES1		
Depth (m)				0.20	0.40	0.10		
Date Sampled				26/08/2016	26/08/2016	26/08/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	37	< 0.1		
Moisture Content	%	N/A	NONE	5.8	5.3	7.4		
Total mass of sample received	kg	0.001	NONE	1.2	1.3	1.1		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.4	7.1		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.0034		
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.4	1.2	-		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	-		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	-		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.6	3.1	-		
Boron (total)	mg/kg	1	MCERTS	2.3	1.8	-		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	-		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.7	6.7	-		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.7	13	-		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	31	-		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	5.8	5.0	-		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	24	26	-		
Petroleum Hydrocarbons								
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	-		
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	-		
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	-		
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	< 1.0	-		
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-		
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-		
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-		
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-		

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Project / Site name: Blue Boar Lane, Sprowston

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
621917	WS154	ES1	0.20	Brown loam and sand with gravel and vegetation.
621918	WS155	ES1	0.20	Brown sandy loam with gravel and vegetation.
621919	WS159	ES1	0.30	Brown sandy loam with gravel and vegetation.
621920	WS161	ES1	0.30	Brown sandy loam with gravel and vegetation.
621921	WS165	ES1	0.10	Brown sandy loam with gravel and vegetation.
621922	WS171	ES1	0.60	Brown sandy loam with gravel and vegetation.
621923	BH101	ES6	2.00	Brown clay and sand.
621924	BH101	ES10	5.50	Brown clay and sand.
621925	WS167	ES1	0.35	Brown loam and sand with gravel and vegetation.
621926	WS175	ES1	0.10	Brown sandy loam with gravel.
621927	WS150	ES1	0.20	Brown sandy loam with gravel and vegetation.
621928	WS141	ES1	0.40	Brown loam and sand with gravel and stones.
621929	WS149	ES1	0.10	Brown loam and sand with gravel and vegetation.

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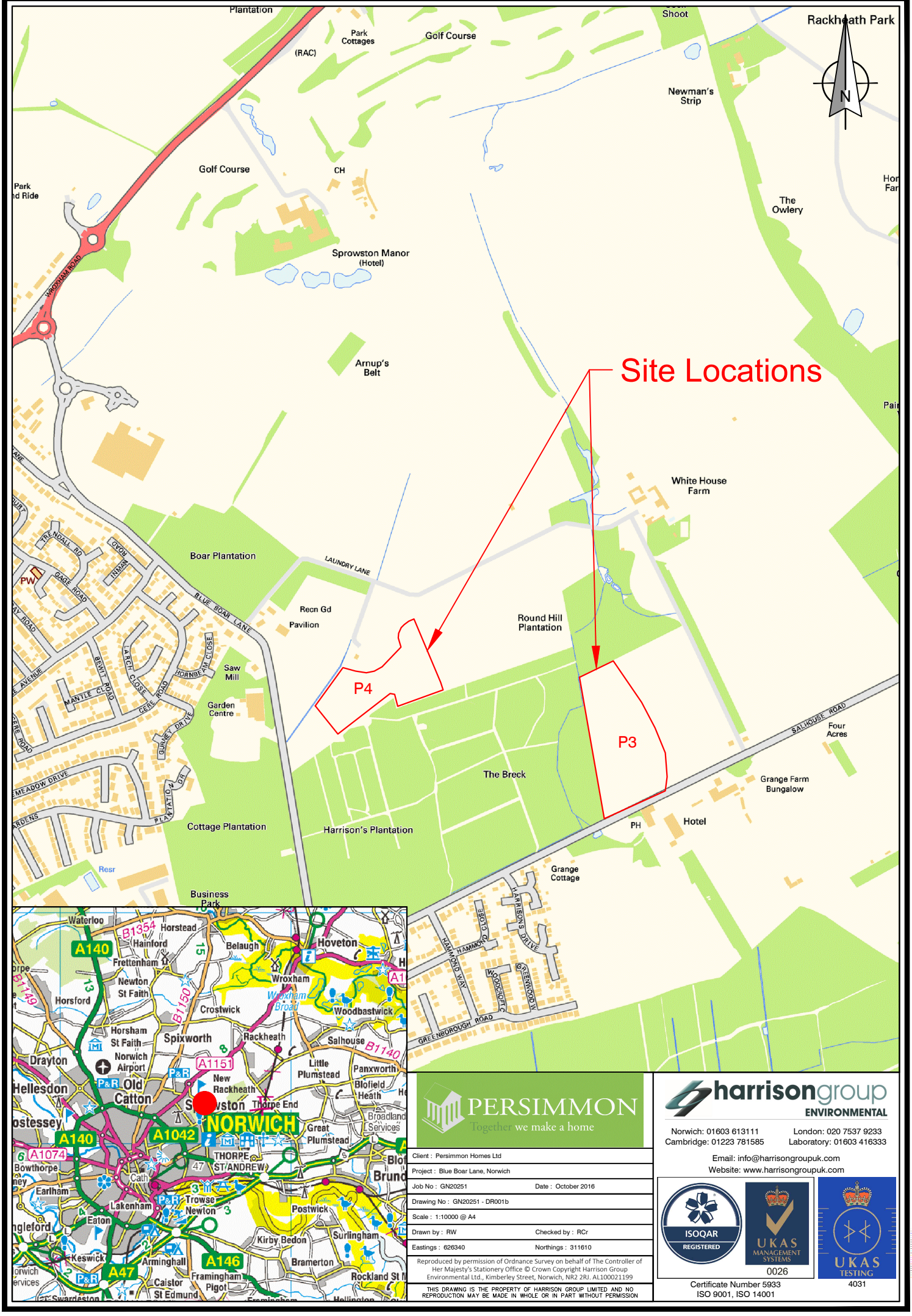
Project / Site name: Blue Boar Lane, Sprowston

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
TPH 8 Band (Soil)	Determination of extractable petroleum hydrocarbons in soil.	In-house method	L064/076PL	D	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

FM-Hn-D-104 Rev B N:\NorwichProjects\Jobs 20000s\20200\GN20251 Blue Boar Lane, Sprowston\Drawings\CAD Files\GN20251 - DR001.dwg



PERSIMMON
Together we make a home

Client : Persimmon Homes Ltd	
Project : Blue Boar Lane, Norwich	
Job No : GN20251	Date : October 2016
Drawing No : GN20251 - DR001b	
Scale : 1:10000 @ A4	
Drawn by : RW	Checked by : RCr
Eastings : 626340	Northings : 311610

harrisongroup
ENVIRONMENTAL

Norwich: 01603 613111
Cambridge: 01223 781585
London: 020 7537 9233
Laboratory: 01603 416333

Email: info@harrisongroupuk.com
Website: www.harrisongroupuk.com

ISOQAR REGISTERED 0026
UKAS MANAGEMENT SYSTEMS
UKAS TESTING 4031

Certificate Number 5933
ISO 9001, ISO 14001

Woodland

30.33
WS123
0.40 29.93
0.60 29.73
0.80 29.53
2.50 27.83
3.45 26.88

30.73
WS124
0.40 30.33
0.60 30.13
0.90 29.83
2.88 27.85

Access route made by the removal of trees

Cropped Agricultural Field

N

31.90
WS126
0.40 31.50
5.45 26.45

31.80
WS125
0.40 31.40
0.70 31.10
0.80 31.00
3.45 28.35

Historic Pond

Agricultural Field

Woodland

Historic Pit

34.20
WS127
0.40 33.80
1.24 32.96

33.94
WS128
0.20 33.74
0.50 33.44
1.61 32.33

33.98
WS130
0.30 33.68
1.19 32.79

34.89
WS129
0.30 34.59
1.00 33.89
3.00 31.89

Salhouse Road

35.07
WS132
0.30 34.77
1.00 34.07
2.00 33.07

35.37
WS131
0.30 35.07
0.70 34.77
0.80 34.67
1.26 34.11

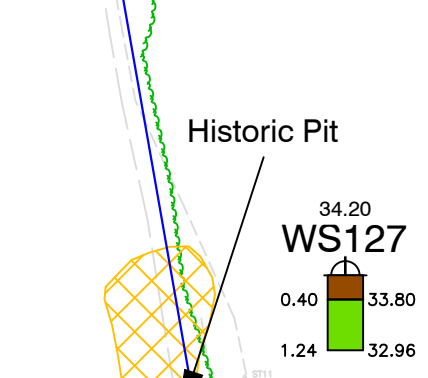
PERSIMMON
Together we make a home

Client : Persimmon Homes Limited	
Project : Blue Boar Lane, Norwich	
Job No : GN20251	Date : October 2016
Drawing Title : P3 - Fieldwork Location Plan	
Drawing No : GN20251-2 - DR008	
Scale : 1:1000 @ A3	
Drawn by : RW	Checked by : RCr
Eastings : 626726	Northings : 311502

Revision history

Rev	Date	Revision Data

Key :



Site Boundary

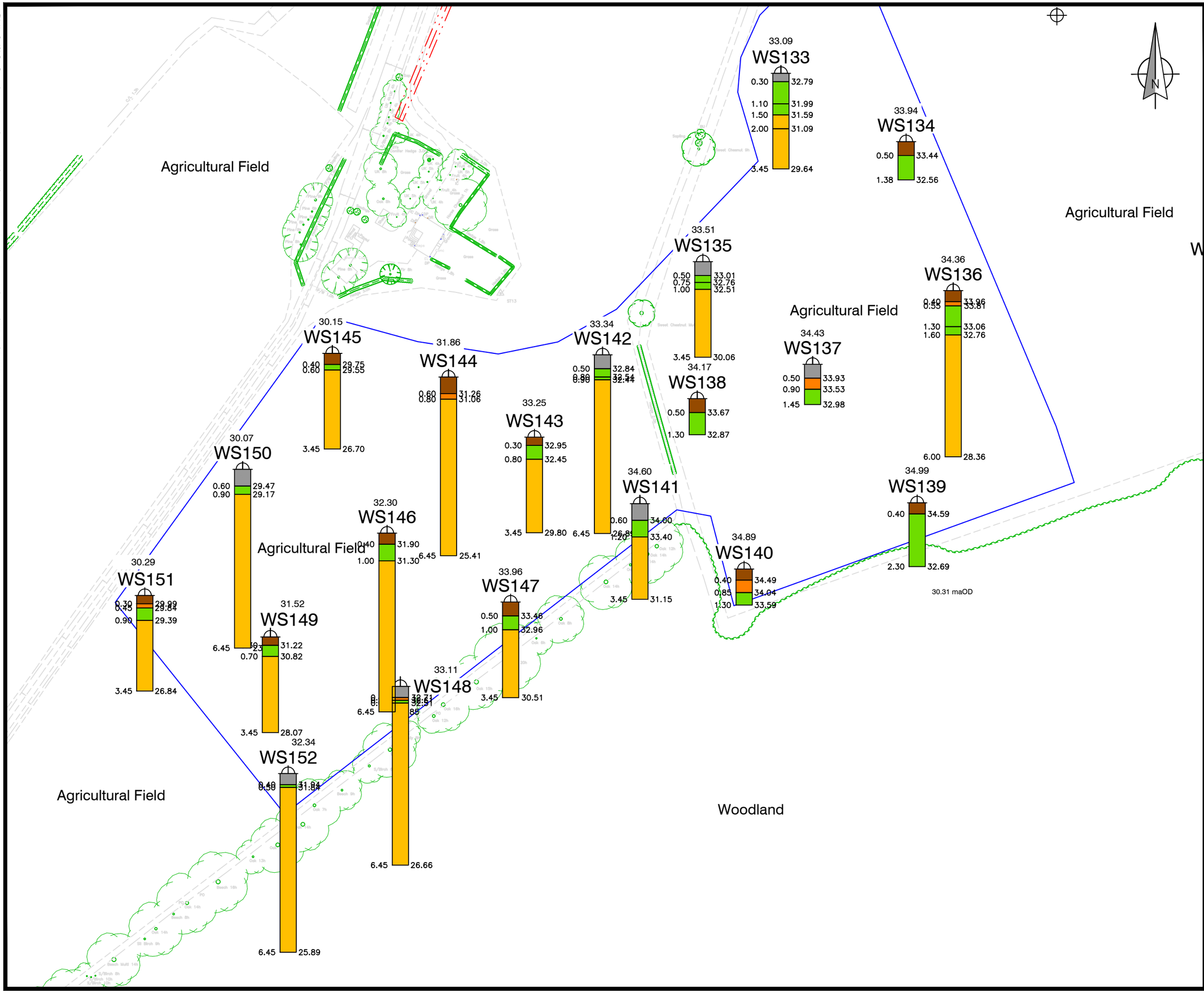
WS123 Dynamic Continuous Sampling Borehole

Notes :

harrisongroup ENVIRONMENTAL
Norwich: 01603 613111 London: 020 7537 9233
Cambridge: 01223 781585 Laboratory: 01603 416333
Email: info@harrisongroupuk.com
Website: www.harrisongroupuk.com

ISOQAR REGISTERED 0026 UKAS MANAGEMENT SYSTEMS UKAS TESTING 4031

Certificate Number 5933
ISO 9001, ISO 14001


Agricultural Field
Agricultural Field
Agricultural Field
Agricultural Field
Agricultural Field
Woodland
33.09
WS133
0.30 32.79
1.10 31.99
1.50 31.59
2.00 31.09
3.45 29.64
33.94
WS134
0.50 33.44
1.38 32.56
33.51
WS135
0.50 33.01
0.75 32.76
1.00 32.51
3.45 30.06
34.36
WS136
0.40 33.96
0.55 33.81
1.30 33.06
1.60 32.76
6.00 28.36
34.43
WS137
0.50 33.93
0.90 33.53
1.45 32.98
34.17
WS138
0.50 33.67
1.30 32.87
34.99
WS139
0.40 34.59
2.30 32.69
34.89
WS140
0.40 34.49
0.85 34.04
1.30 33.59
34.60
WS141
0.60 34.00
1.20 33.40
3.45 31.15
33.34
WS142
0.50 32.84
0.90 32.44
3.45 29.80
6.45 26.66
33.25
WS143
0.30 32.95
0.80 32.45
3.45 29.80
31.86
WS144
0.60 31.26
0.80 31.06
6.45 25.41
30.15
WS145
0.40 29.75
0.60 29.55
3.45 26.70
30.07
WS150
0.60 29.47
0.90 29.17
6.45 26.70
30.29
WS151
0.70 29.99
0.45 29.84
0.90 29.39
3.45 26.84
31.52
WS149
0.70 31.22
0.70 30.82
3.45 28.07
32.34
WS152
0.40 31.94
0.50 31.84
6.45 25.89
32.30
WS146
0.40 31.90
1.00 31.30
6.45 26.66
33.11
WS148
6.45
33.96
WS147
0.50 33.46
1.00 32.96
3.45 30.51
30.31 maOD
N
Key :
Site Boundary
WS133 Dynamic Continuous Sampling Borehole
Ground Level (maOD)
26.26
Depth (mbgl)
Made Ground
0.50 25.76
Topsoil
Depth (maOD)
1.00 25.26
Sheringham Cliffs Formation - Sand
1.50 24.76
Sheringham Cliffs Formation - Clay
2.00 24.26
Happisburgh Glacigenic Formation - Clay
2.50 23.76
Notes :
PERSIMMON
Together we make a home
Client : Persimmon Homes Limited
Project : Blue Boar Lane, Norwich
Job No : GN20251
Date : October 2016
Drawing Title : P4 - Fieldwork Location Plan
Drawing No : GN20251-2 - DR009
Scale : 1:1000 @ A3
Drawn by : RW
Checked by : RCr
Eastings : 626210
Northings : 311622
Revision history
Rev Date Revision Data
harrisongroup ENVIRONMENTAL
Norwich: 01603 613111
Cambridge: 01223 781585
London: 020 7537 9233
Laboratory: 01603 416333
Email: info@harrisongroupuk.com
Website: www.harrisongroupuk.com
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UKAS TESTING
4031
Certificate Number 5933
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FM-Hn-D-101 Rev B N:\Norwich\Projects\Jobs 20000s\20200\GN20251 Blue Boar Lane, Sprowston\Drawings\CAD Files\GN20251 - DR002.dwg

APPENDIX 7
CONTRACT SUM ANALYSIS

Contract Sum Analysis

1.0	**PRELIMINARIES**	**Sub total**	**£**
1.1	Site fencing/horading and security		£
1.2	Site welfare and accomondation		£
1.3	Power and water		£
1.4	Plant		£
1.5	Site management		£
1.6	Overhead and profits		£
2.0	**PLANNING/STATUTORY**	**Sub total**	**£**
2.1	Application fee		£
2.2	Preperation and submission of planning application including consultant reports		£
2.3	Post submission consultation		£
2.4	Building control fee's		£
	BASE BUILD SPECIFICATION		
3.0	**Substructure**	**Sub total**	**£**
3.1	Site clearance		£
3.2	Excavation		£
3.3	Foundations		£
3.4	Concrete plaza		£
3.5	Skate park structures		
4.0	**External Areas**	**Sub total**	**£**
4.1	Steps, ramps, rails		£
4.2	Footpaths		£
4.3	Soft landscaping		£
4.4	Drainage		£
4.5	External furniture		£
4.6	Security & perimeter fencing		£
5.0	**Extras**	**Sub total**	**£**
5.1	Enchancment package		£

Contract Sum Analysis

6.0	**Electrical**	**Sub total**	**£**
6.1	General		£
6.2	Distribution board		£
6.3	Lighting		£
6.4	Metering		£
6.5	Testing and commissioning services		£
6.6	12 months maintenance on services		£
7.0	**Handover**	**Sub total**	**£**
7.1	Health & safety files/ operating & maintenance manuals		£
		Total	**£**

APPENDIX 8
FORM OF TENDER

Appendix 8 - FORM OF TENDER

Sprowston Town Council
c/o Bidwells LLP
King Fisher House
1 Gilders Way
Norwich
NR3 1UB

Design & Build of New Skatepark
Land off Blue Boar Lane, Norwich, NR7 8RJ

I/We having read the conditions of contract and specification delivered to me/us, do hereby offer to execute and complete in accordance with the conditions of the contract the whole of the works described in the sum of:

£……..(plus VAT) (in words)……..(plus VAT)

I/We confirm that we will complete the works within …..... weeks of possession.

I/We confirm that if this tender is accepted we could commence on site within……..weeks of acceptance.

The employer is not bound to accept the lowest or any offer.

Signed …… Date ……

Position …… Tel Number ……

Company ……

Address ……

……

……

BIDWELLS