Appeal by Boningale Developments Ltd

Hearing Statement

Land at Tilstock Road, Tilstock

LPA Ref: 24/04176/FUL

PINS Ref: APP/L3245/W/25/3362414

Against the non-determination by Shropshire Council of "Residential development of 70 dwellings including access, open space, landscaping and associated works"

Cubo, 38 Carver Street, Sheffield S1 4FS

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0. Introduction

0.1. This Hearing Statement is submitted by Marrons on behalf of Boningale Developments Ltd ('the Appellant') and it relates to an appeal against Shropshire Council's ('the Council') non-determination of full planning application 24/04176/FUL, for which the description of development is as follows:

> *"Residential development of 70 dwellings including access, open space, landscaping and associated works."*

0.2. Following correspondence with the Planning Inspectorate, it has been determined that this Appeal will proceed under the Informal Hearing procedure. The Appellant has therefore been afforded the opportunity to update their submission in light of the revised procedure.

0.3. This Hearing Statement should be read alongside the submitted draft Statement of Common Ground ('SoCG') **[CD4.1]** and the Statement of Case('SoC') **[CD3.1]**.

0.4. The Appellant has sought to engage proactively and positively with the Council throughout the application and appeal. Nonetheless, with the Appeal having been made against non-determination of the planning application, the putative reasons for refusal of the application are not known at the time of drafting this Statement. Insofar as information which has been exchanged prior to the drafting of this Statement, the Appellant is relying on the email correspondence with the Case Officer and any consultee responses which have been received.

0.5. Should further information come to light, including putative reasons for refusal not considered within the scope of this Statement, the Appellant reserves the right to adduce further evidence to address such information.

0.6. The Appellant reserves the right to make an application for Costs at a later date.

0.7. The background to this Appeal, including details of the Appeal Site and the history of the Site and application's consideration has been set out in the Statement of Case **[CD3.1]** and shall not be repeated here.

0.8. This Hearing Statement brings together the Appellant's full appeal case, including a summary of the evidence of technical specialists, which is provided in individual topic specific papers. In addition to summarising those technical matters, this Hearing Statement also addresses the following key matters:

- Principle of development
- Benefits of the development

1. Executive Summary

Appeal Site and Surroundings

1.1. The boundary of the appeal Site is shown on Location Plan **[CD6.21]**.

1.2. The Site occupies a 4.05 hectare site at Tilstock Road, Tilstock. Lying to the north of the settlement, the Site is comprised of greenfield land, presently in use for equestrian grazing.

1.3. The Site is bound by agricultural land to the north and east, with the village built form to the south. To the west lies Tilstock Road, separating the Site and agricultural land, along with some ribbon development to the west.

1.4. The Site is bordered to the west and the south by mature hedgerows and trees. The northern boundary is bordered by a smaller hedgerow, separating the site from the field adjacent to the northern boundary. The eastern boundary is made up of fencing. Vehicular access into the site will come from off Tilstock Road, entering the site from the western boundary. Pedestrian access will be provided by a public footpath, entering the Site from the south eastern corner, offering connections to Tilstock village centre, utilising and enhancing existing Public Rights of Way that run adjacent to Tilstock Primary School.

1.5. The settlement of Tilstock is characterised as an '(Other) Rural Settlement' (Community Cluster) in the adopted Development Plan and benefits from numerous local facilities including a primary school. More details will be provided in this regard further in this Statement. Further settlements of Whitchurch and Shrewsbury are also readily accessible by public transport.

Principle of Development

1.6. It is common ground between the parties that the tilted balance as defined at Paragraph 11(d) of the NPPF (2024) is engaged. This means that planning permission should be granted unless:

I. the application of policies in this Framework that protect areas or assets of particular importance[7] provides a strong reason for refusing the development proposed; or

II. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework

taken as a whole, having particular regard to key policies for directing development to sustainable locations, making effective use of land, securing well-designed places and providing affordable homes, individually or in combination .

1.7. With regards to the factors at point i above, no such assets are of relevance to the Appeal Site and it is common ground that this is not a reason to withhold planning permission in this case.

1.8. With regards to the factors at point ii, it has been demonstrated within the application, Statement of Case, and this Hearing Statement (including accompanying technical evidence) that there are no adverse impacts which would significantly and demonstrably outweigh the benefits.

1.9. It should be common ground that the relevant test for this Appeal to succeed is simply, in relation to each material consideration individually and collectively, whether there is sufficient adverse impact caused by the development that the benefits of the development, set out below, are outweighed.

1.10. In making this assessment, the decision maker should have particular regard to the key policies for directing development to sustainable location, making effective use of land, securing well-designed places, and providing affordable homes, individually or in combination.

Highways

1.11. As set out in the Hearing Statement prepared by DLP Planning Ltd's Transport and Infrastructure Team, a review of the proposals against national policy contained within the NPPF, and the limits set out within in regard to reasons why a scheme could be refused on highways ground being highway safety or severe impact on the network have been considered.

1.12. In terms of highway safety, the Transport and Infrastructure Team have drawn upon the work undertaken in the Transport Statement and also provided up to date evidence to demonstrate how there are no preexisting safety concerns that could be attributed to the highway network in the vicinity of the site, that could be exacerbated by the scheme. In addition to this, the independent Road Safety Audit found no insurmountable safety concerns and any issues have subsequently been addressed as part of the design stage. The Transport and Infrastructure Team deem that the proposed measures to upgrade the PROW and provide infrastructure improvements

along Tilstock Road and Tilstock Lane are of a sufficient level and that these could be secured through a S106 Agreement

1.13. In relation to the issue of the additional traffic generated by the development, The Transport and Infrastructure Team have concluded that the level of traffic generated by the site (less than one vehicle every two minutes) would not materially impact how the surrounding road network would operate. We therefore maintain the position as set out in the Transport Statement, that the proposed development would not give rise to a severe impact on the surrounding highway network or fundamentally affect how it currently operates.

1.14. Based upon our review of the works undertaken to date in preparation of the planning application, and the additional evidence we have provided as part of this highways Hearing Statement, we find that there are no highways-related reasons to refuse this scheme, subject to the agreement of suitably worded planning conditions.

Flood risk and drainage

1.15. Enzygo have prepared a detailed Flood Risk and Drainage Hearing Statement. This confirms that FRA demonstrates that the proposed development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of national and local policy and guidance. The incorporated design measures as part of the development have provided the opportunity to introduce a measurable betterment to offsite flood risk.

1.16. SuDS drainage strategy is proposed to manage the potential impact of the development on surface water runoff rates post-development. This will be achieved through discharge to the public surface water sewer system within the public highway, at an agreed restricted discharge rate with Severn Trent Water and appropriately sized attenuation (i.e. detention basin/lined permeable paving).

1.17. The surface water drainage strategy during the construction phase would need to be integrated into a Construction Environment Management Plan (CEMP). The quality of surface water runoff from the proposed development during the operational phase will be improved through the adoption of a SuDS drainage strategy. A maintenance and management plan (carried out by a private maintenance company, with elements adopted naturally by Severn Trent Water) will ensure the effectiveness of the drainage strategy for the lifetime of the development. Details can be managed through a condition.

1.18. Current consultee comments, as noted by the Local Planning Authority can be adequately dealt with by condition, as is indeed drafted by the LLFA.

1.19. As confirmed with the Enzygo Statement, it is their professional assessment that the proposed site in discussion at this appeal, with regard to Flood Risk and Drainage, complies with National and Local Policies and should not be precluded on these grounds

Heritage

1.20. Matters relating to heritage have been assessed through the completion of a Heritage Statement covering archaeology and built heritage (Pegasus Group, October 2024).

1.21. With regards to built heritage, less than substantial harm at the lower end of the spectrum is anticipated for the Grade II Listed Christ Church through changes to its setting. In accordance with paragraph 215 of the NPPF, such harm is not prohibited, but rather should be weighed against the public benefits of the proposed scheme.

1.22. A low level of harm has also been identified to the non-designated Ivy House Farm. Under paragraph 216 of the NPPF, such harm is not prohibited, but rather should be considered as part of a balanced judgement, taking into account the scale of any harm or loss and the significance of the heritage asset.

1.23. With regards to archaeological remains, no remains of higher than regional significance are anticipated, and the potential for such remains is considered to be low. A response from the Archaeological Advisor to the LPA dated 14th of November 2024 confirmed that the Heritage Statement provided sufficient information for the determination of the application, in line with the requirements of Local Plan Policy MD13 and the NPPF. This confirmed that archaeological mitigation works could be secured through a condition attached to any permission granted, worded as follows:

a) No development approved by this permission shall commence until a written scheme of investigation for a programme of archaeological work has been submitted to and approved by the local Planning Authority in writing. The submitted details shall include post-fieldwork reporting and appropriate publication.
b) The approved programme of archaeological work set out in the written scheme of investigation shall be implemented in full and a report provided to the local planning authority prior to first use or occupancy of the development. The report shall include post fieldwork assessments and analyses that have been completed in accordance with the approved written scheme of investigation. This shall include evidence that the publication and dissemination of the results and archive deposition has been secured.

1.24. This is considered to be reasonable.

1.25. As such, there are considered to be no reasons relating to heritage for the withholding of planning permission.

Ecology

1.26. PJA have provided a detailed Ecology Hearing Statement. Within this Statement, initial Skylark surveys, a BNG Metric assessment and consideration of the recreational pressures on Brown Moss and Cole Mere are considered.

1.27. The Appellant is will to enter into a legal agreement to address any recreational pressures identified.

1.28. Initial Skylark surveys have concluded that grass within the field was observed to be a touch long in places and the field a little small in area to provide optimal suitability for skylark. The close proximity of hedgerows to the fields interior, facilitating predator pressure, makes the site of sub- optimal suitability for skylark.

1.29. No Skylark were recorded on site, however, they were observed and recorded calling in the fields to the east of the site.

1.30. In regard to BNG, post development a net increase in habitat units of 22.88% will be seen, with a net increase of 14.44% in hedgerow units.

1.31. It is concluded that there are no ecological reasons upon which development in this location should be precluded.

Trees

1.32. A position statement produced by FPCR is appended to this Hearing Statement (Appendix 2). It considers the impact of the proposed development, including changes to the layout on the northern boundary to trees within and adjacent to the site. The Statement concludes that the proposals are sustainable from an Arboricultural perspective and are not in conflict with NPPF, local development framework policies on sustainable development and design and protection of the natural environment (CS6, MD2 and MD12).

Landscape

1.33. The Landscape team at Pegasus have prepared a detailed Landscape Hearing Statement.

1.34. It is assessed that the Proposed Development would not result in any material changes to landscape elements on or adjacent to the Site, noting that all trees would be retained, a small section of low quality hedgerow removed to accommodate the access and associated visibility splays. The Proposed Development includes notable green infrastructure benefits in terms of native woodland planting, wildflower meadow and swales, attenuation pond, public open space provision, and play areas.

1.35. The Site is well contained by existing hedgerows and trees to the north and west, and a new woodland belt to the east. The key characteristics of the wider countryside context would not be altered, and there would be no change to any of the published key characteristics of the 'Settled Pastoral Farmlands' Landscape Character Type in which the Site is located.

1.36. The opportunity to perceive indirect effects upon landscape character from lighting or increased traffic movements would be Negligible in the context of the existing settlement and Tilstock Road.

1.37. Views towards the Site from much of the village of Tilstock are restricted by the built form immediately adjacent to the Site, ribbon development along Tilstock Lane and trees along the southern boundary of the Site. There would be some localised adverse effects upon users of a single public footpath to the east of the Site and to fleeting views from a short section of Tilstock Road. These visual effects would be reduced following the growth of mitigation planting.

1.38. The review of the Pegasus LVIA (**CD10.1**) by ESP Ltd on behalf of the Council (**CD 16.1),** considered that further information was required. With reference to best practice guidance, and additional contextual analysis, we disagree that any further formal assessment was required in order for the Council to make a decision on the likely landscape and visual effects resulting from the Proposed Development.

1.39. For the reasons identified above, it is assessed that the Proposed Development would comply with the relevant national and local landscape policies. By virtue of the baseline context and design approach there would be very localised effects upon both landscape character and visual amenity. This evidence informs our conclusion that the Proposed Development could be satisfactorily accommodated within the landscape.

Design

1.40. A detailed Urban Design Hearing Statement has been prepared by Pegasus. As is detailed in their Hearing Statement, the scheme is a well-designed and contextual proposal.

1.41. What is proposed is not just a variety of housing but significant landscaping, open space and tree planting. The scheme proposes the optimum amount of development within a strong landscape setting that provides a positive, attractive edge to the village having regard to the surrounding context.

1.42. The scheme will undoubtedly be a change to the existing context. However, Pegasus consider this a positive one, providing a well-designed residential scheme which retains the characteristics of Tilstock and built development at the edge of the village. By design, the scheme retains the characteristic built and landscape qualities of the village with an attractive residential building that responds to the architectural qualities of the area, the landscape and topography of the site and relates well to its neighbours.

1.43. Through an appraisal of the scheme in its context Pegasus conclude that:

- The requirements of relevant national and local urban design policies and guidance have been met. This is a well designed and attractive scheme;
- The approach to the layout would create an attractive framework for the development areas; the accessible area of open space that informs the sense of place; and
- The density of development is appropriate having regard to the accessibility of the appeal site, surrounding built and landscape context and the features, constraints and opportunities afforded the site. The proposed development is of an appropriate layout and built form determined by good design principles.

1.44. And for the reasons identified above, the scheme would positively relate to the character and appearance of Tilstock.

Conclusion

1.45. As In the view of the Appellant, following consideration of the proposals and their related impacts and benefits, there are no adverse impacts sufficient to outweigh the benefits and accordingly planning permission should be granted.

2. Principle of Development

Introduction

2.1. In setting out this section of the Hearing Statement, in the absence of putative reasons for refusal being provided at the time of drafting, the Appellant has had regard to the email correspondence with the Case Officer which allude to potential reasons for refusal.

2.2. The first of these is an email from the Case Officer dated 9th January 2025 **[CD14.19]**, wherein it is stated:

I am also aware that you have been following the application online and preparing amendments/new information to submit in response to consultee comments. However I do have concerns with this site in regard to its overall sustainability, scale and location.

Whilst Tilstock is an identified settlement for new housing growth under the current adopted Local Plan, the settlement is defined by a development boundary. This application site is outside of the development boundary and therefore contrary to adopted policy. I am aware that the application is being made on the challenge of our 5YHLS. I am sure you will know that the draft LP going through examination has been paused due to significant concerns raised by the examining Inspectors – we are still waiting to understand their concerns in full and work out how we respond to this. The new NPPF has introduced a higher housing supply for Shropshire, which will have an impact on our housing land supply.

That being said, even if we are not able to demonstrate a 5YHLS (which is not our confirmed position at present), the tilted balance still requires development to achieve sustainability goals, whereby the planning balance whilst in presumption in favour of approval, does not avoid the need for new housing to be suitably located in a settlement that is able to accommodate the additional growth and all of the associated pressures – Tilstock is no such settlement.

The development of this site would result in visual harm through encroachment into the countryside, environmental harm through reliance on private car, social harm through pressures on local services and facilities. There are little material benefits over and above policy requirements to outweigh this harm.

I am still waiting for the Highways Authority to provide their comments, but we have received a large number of objection comments all of which highlight the unsatisfactory access arrangement and cite highway safety concerns.

2.3. Then at 11th February 2025, the Case Officer emailed as follows **[CD14.27]:**

I have passed over your submissions to be uploaded to the file and requested comments from the ecology and highways teams.

Following this latest round of consultation, I will not be accepting any further submissions on the application. I have not asked for any previously and have previously advised that I have significant concerns with the site in terms of its sustainability and compliance with national and local policies in this regard (scale of development, impact on services/facilities, landscape/visual harm). Any further submissions will further and unnecessarily delay a decision being made on the proposals.

You will be aware that our housing land supply position is being considered by members at Cabinet tomorrow, following which and if agreed, I will be moving forward to making my recommendation, subject to receiving any outstanding consultee comments – ecology and highways. Based on already expressed concerns, it is unlikely that my recommendation will be one of approval as whilst the tilted balance is engaged, the development of this site will result in significant harm such that outweighs the presumption in favour.

2.4. Furthermore, in an email dated 24th February 2025 **[CD14.33]**, the Case Officer explains:

As previously advised I will not be accepting further submissions of additional information, as I am not satisfied that the additional or amended information will address all reasons for refusal – i.e. would not result in a different outcome to one of refusal. Whilst the NPPF requires us, the LPA, to work proactively, this is very much focussed on engagement through pre-application, it does not oblige us to engage in discussions during a live planning application, in all circumstances. The site has been through pre-application previously, however this was for a different scheme and we previously advised that the site was unsuitable for a number of reasons. You have not sought pre-application advice on the originally submitted scheme. Furthermore, you have sought to seek a number of amendments and submissions of additional information such that the scheme currently being determined is not the scheme as originally applied for. This is far from what the NPPF and PPG advocate in terms of collaborative engagement and is not conducive to supporting negotiation or working positively.

The previous pre-application response, whilst for a different scheme, nonetheless considers the sustainability of the 'site' in the round and the particular impacts of the enquiry development would have in terms of social disbenefits and resultant harm. The current application has failed to address these concerns, such that our opinion has changed on this matter.

The recent Cabinet approved our position of being able to demonstrate a 4.73 years supply of housing, which as already agreed engages the tilted balance and the presumption in favour of sustainable development. This is not an 'open door' to new housing wherever and by whatever scale. I still have a planning judgement to make, based on still in-date planning policies, the NPPF, the advice of my technical consultees and having considered the public representations. Additionally, whilst under the required 5 years supply, 4.73 years transpires to an under-delivery of only some 567 dwellings, this is not a particularly significant under-delivery that the presumption is weighted as strongly towards approval as you would imply (I know you disagree with this, as set out in your submission documents, but this is nonetheless the adopted position of the LPA). Therefore, where significant harm is encountered (either singularly or cumulatively and unable to be mitigated), it is probable that this be sufficient enough to outweigh the benefits and the balance weighted towards refusal – indeed the NPPF has been recently updated to strengthen this approach (para 11 d) ii)).

Your comment re the Policy comments, no one is disputing whether Tilstock is a sustainable settlement or not – it is an identified settlement for growth in the current adopted LP. Its sustainability is already established. However, this site lies outside of the settlement boundary and is therefore considered as lying in open countryside, which by definition under the LP is an unsustainable location for new open market housing development by not supporting the character and landscape setting, or failing to recognise the countryside as a living-working environment. This position has not changed under the tilted balance. Equally, it should be noted that these Policy comments were provided prior to the updated NPPF in Dec 24' and prior to us unable to demonstrate a 5 years supply. Therefore these comments are now out of date.

I will move forward to making my recommendation once all consultee comments have been received and you can view the reasons for refusal and subsequent justification for such reasons in due course.

2.5. In addition to those emails exchanges during the course of the application, in discussion regarding the appeal procedure, the Case Officer's email to the Inspectorate, dated 11th April 2025, (**CD14.47**) outlines the following of relevance to the matter of the principle of development:

On the appellant's second point, the LPA disagrees with the statement that discussions during the determination stage indicate disagreement on a number of technical areas. While there are areas of disagreement, as outlined to the appellant during the determination stage, this is primarily in relation to the scale of development and its impact on the sustainability of the proposed development

in relation to the existing settlement being able to accommodate the quantum of development. The settlement is a modest rural settlement (with limited services and facilities) that has received incremental and proportionate growth that respects the existing built pattern, whereas the development of 70 dwellings would significantly and adversely impact upon the setting and character of the settlement spatially and is considered disproportionate.

Furthermore, whilst the NPPFs tilted balance is engaged, this only renders those most relevant policies out-of-date (i.e. housing supply and growth policies). Those policies which seek to protect the character and setting of the countryside and its rural settlements still apply, as does the requirement to respect currently adopted development boundaries. Whilst the LPA have publicised their intention to withdraw the draft Local Plan, the Council has agreed its position to attach weight to the evidence base underpinning the now-withdrawn Draft Local Plan – this remains a material consideration in the determination of this proposal, which supports the judgment made above in regard to proportionality. This reasoning for refusal does not warrant testing via an advocate and would be much more suited to questioning and clarifications made by the Inspector themselves.

2.6. The final evidence which the Appellant is able to rely on in order to establish the Council's position is the response of the Planning Policy team to the application consultation, dated 27th November 2024. The full text is provided at **CD16.1** but the conclusion reads as follows:

Paragraph 47 of the National Planning Policy Framework (NPPF) states that 'Planning law requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise.' The Core Strategy and SAMDev (alongside any adopted formal Neighbourhood Plans) currently make up the adopted local plan in Shropshire. The draft Shropshire Local Plan does need to be taken into consideration, albeit the policies only have 'limited weight' as discussed above.

Tilstock is part of a community cluster and is considered an appropriate location to achieve sustainable development. The site subject to this application is outside the currently adopted development boundary for Tilstock and as such for policy purposes, located within the 'countryside'. Adopted local plan policies (including Core Strategy Policy CS5 and SAMDev Plan policy MD7a) and the NPPF set out criteria which limit new residential development in the countryside. The scheme is considered contrary to the adopted development plan policy and no material considerations have been identified which may weigh sufficiently in favour of the proposal to justify departure to the adopted development plan.

There remains a need to consider the details of proposals from a development management perspective and have regard to the wider policies and technical advice from relevant service areas.

2.7. However, while the emails from the Case Officer and the Planning Policy response are useful to a degree, it should be noted that during the lifetime of this application, two key events have occurred which alter the policy backdrop to the application. This was firstly the publication of the Council's Five-Year Housing Land Supply Statement **[CD2.4]** wherein it was announced that the Council could no longer demonstrate a five-year supply (going from 5.91 years at the time the application was submitted to 4.73 upon publication on 13th February 2025). The second key event was the publication of the Inspector's letter ID48 to the Council regarding their Local Plan review **[CD14.42]** dated 17th February 2025, which resulted in their statement of intention to withdraw the draft Plan from examination, as published on 13th March 2025 **[CD14.46]**. It should therefore be noted that the first two emails from the Case Officer as referenced above were written prior to these key events, likewise the Planning Policy Comments were written prior to those events.

2.8. Therefore, taking into consideration the above correspondence, the points raised by the Council which relate to the principle of development are as follows:

- Whether Tilstock as a settlement is a sustainable location for growth
- Whether Tilstock can accommodate growth of this scale
- Whether the fact that the Site lies outside the settlement boundary in the adopted Local Plan gives rise to adverse impacts, including rendering the Site unsustainable (as asserted in the email of 24th Feb)

2.9. It is the points above upon which the Appellant will now base their case regarding the principle of development. Whilst the above points do not identify the policies within the Development Plan that the Council consider the appeal proposal to conflict with, we have had regard to the consultee response from the Planning Policy team.

2.10. We have therefore, in addition to the discussion set out within the Statement of Case, considered the appeal proposal against these policies below.

Development Plan

2.11. Section 38(6) of the Planning and Compulsory Purchase Act 2004 provides that determination must be made in accordance with the development plan unless material considerations indicate otherwise. Section 39 of the Act requires decision makers to exercise their functions with the objective of contributing to the achievement of sustainable development.

2.12. The adopted development plan for Shropshire Council comprises of:

- Core Strategy Development Plan Document 2006-2026 (adopted 24th February 2011) **[CD2.2]**

- SAMDev Plan 2006-2026 (adopted 17th December 2015) **[CD2.3]**

2.13. In addition, at the time of submission, the 'emerging Local Plan Review 2026-2038' formed a material consideration. However, since the submission of the application circumstances have moved on and the emerging Local Plan Review is set to be imminently withdrawn from Examination. The Council have confirmed in a letter to Inspectors' (GC57) **[CD14.46]** that it is their intention to withdraw the Plan following Full Council approval which is expected on 17th July 2025. The weight to be afforded to the policies contained within the withdrawn Local Plan are considered below.

2.14. Taken as a whole, the adopted Development Plan is considered to be time-expired and in the absence of a five-year housing land supply, the policies most important for determining this Appeal are deemed out-of-date.

2.15. It should also be noted that a key aim of the Framework is to support the Government's objective of significantly boosting the supply of housing and as such, in the context of a time expired Development Plan and in the absence of a five-year housing land supply, policies which seeks to limit development opportunities are considered to conflict with the aims of the Framework and as such are afforded significantly reduced weight as set out in the Spondon decision (**CD16.23**). The weight given to the Development Plan in the consideration of this Appeal is therefore diminished considerably as those policies are not delivering housing consistent with the central objectives and requirements of national policy.

2.16. Core Strategy Policy CS1: Strategic Approach outlines Shropshire's strategic strategy for development from 2006 to 2026. It proposes to build around 27,500 new dwellings, including 9,000 affordable flats, as well as 290 hectares of employment land and related infrastructure. The rural areas of Shropshire will become more sustainable through a "rural rebalance" approach, accommodating 35% of Shropshire's residential development over the plan period. Development in rural areas will be located predominantly in community hubs and community clusters. Policy Core Strategy Policy CS4 states that in rural areas, communities will become more sustained by;

> "*Focusing private and public investment in the rural area into Community Hubs and Community Clusters, and not allowing development outside these settlements unless it meets policy CS5*."

2.17. Supporting text associated with Policy CS4 recognises the importance of ensuring and enhancing rural vitality and states at paragraph 4.65;

> *"Rather than abandoning settlements that have lost services as perpetually 'unsustainable', this approach seeks to improve the sustainability of rural settlements and their hinterlands, even those that start from a low base. Shropshire Council will work with communities, including delivery stakeholders and landowners that wish to achieve this vision".*

2.18. The support for ensuring ongoing vitality and viability is engrained in the NPPF at paragraphs 82-84.

2.19. The Tolleshunt d'Arcy decision (**CD16.24**) at paragraph 11 builds on this and recognises that that where there are groups of smaller settlements, development in one village may support services in a village nearby. As defined through the introduction of community clusters and hubs, this is a position taken by SCC and one which is relevant to this appeal, with Tilstock, as the hub within the sector. acting as settlement that not only supports its residents, but also those in surrounding more rural villages.

2.20. Core Strategy Policy CS5 goes on to state that new development in the countryside will be strictly controlled. It goes on to state that development in rural areas will be supported where it meets one of the criteria listed within the policy. Criterion 2 states that the below form of development will be supported;

> *"dwellings to house agricultural, forestry or other essential countryside workers and other affordable housing / accommodation to meet a local need in accordance with national planning policies and Policies CS11 and CS12; - With regard to the above two types of development, applicants will be required to demonstrate the need and benefit for the development proposed. Development will be expected to take place primarily in recognisable named settlements or be linked to other existing development and business activity where this is appropriate".*

2.21. In accordance with the findings of the Local Housing Need Assessment (Appendix 1) prepared by Marrons' Socio-Economic team, there is an identified outstanding local need for 183 to 295 dwellings in the Tilstock cluster, and 402-624 dwellings in the combined Tilstock & Prees clusters. Accordingly, and notwithstanding the assessment of weight to be afforded to policies CS4 and CS5 set out in the appellants Statement of Case, it is considered that the appeal proposal accords with the provisions of Core Strategy Policies CS4 and CS5.

2.22. In the SAMDev, Policy MD1: Scale and Distribution of Development seeks to ensure sufficient land availability to meet Core Strategy development targets, including housing and employment land. Sustainable development is supported in designated areas including the identified Community Hubs and Community Cluster settlements. In addition, Schedule MD1.1 attached to this policy identifies Tilstock as a community cluster settlement.

2.23. This policy was reiterated in the earliest indication of Council feeling for the application, when the Policy Team stated, on 27th November 2024 **[CD16.1]**, that *"Tilstock is part of a community cluster and is considered an appropriate location to achieve sustainable development."*

2.24. While the Case Officer, in their earlier email of 9th January **[CD14.19]** states that *"Tilstock is an identified settlement for new housing growth under the current adopted Local Plan"* he then goes onto say, somewhat contradictorily, that Tilstock is not a settlement that is able to accommodate additional growth *"and all of the associated pressures"*.

2.25. Nonetheless, their stance appears to shift again in later comments, noting on 24th February **[CD14.33]**, that *"no one is disputing whether Tilstock is a sustainable settlement or not – it is an identified settlement for growth in the current adopted LP. Its sustainability is already established."*

2.26. Turning to adopted policy, under the provisions of SAMDev Policy MD1, community cluster settlements are considered sustainable and suitable locations for growth. Tilstock is part of the Tilstock, Ash Magna/Ash Parva, Prees Heath, Ightfield and Calverhall Community Cluster as noted under Policy MD1.

2.27. It is therefore established that Tilstock is a sustainable location for growth and the appeal proposal, again notwithstanding the weight to be afforded to SAMDev Policy MD1 as set out in the Statement of Case, does not conflict with Policy MD1.

2.28. In terms of sustainability of the Site itself, it is well connected to the amenities within Tilstock, with the entire village being walkable from the Site.

2.29. The amenities within walking distance are:

Table 1: Walking Distances to Services and Facilities.

Amenity	Distance from centre of Site along walking route
Tilstock Bradbury Village Hall and Play Park	400m
Tilstock C of E Primary School	280m
Tilstock Christ Church	400m
Tilstock Bowling and Tennis Club	330m
The Horseshoes PH	610m
Nearest Bus Stops (Tilstock Lane)	445m

2.30. The Site also boasts excellent cycle links. With reference to acceptable cycling distances, Paragraph 2.2.2 of the 'Department for Transports' 'LTN 1/20' document states that:

2.31. "Two out of every three personal trips are less than five miles in length – an achievable distance to cycle for most people"

2.32. Within this distance is the entirety of the villages of Whitchurch, Prees Heath and Prees Higher Heath, which includes a wide range of employment, leisure, and convenience locations. This also includes the two railway stations of Whitchurch and Prees. Further detail on cycle infrastructure and routes can be found within the Transport Statement **[CD7.1]**.

2.33. In terms of public transport, the Site is within easy walking distance of bus stops on Tilstock Lane, providing ready access to the 511 and 512 bus services. This service travels between Whitchurch and Shrewsbury, which includes stops in many other settlements including Prees Heath, Higher Heath. Prees and Wem.

2.34. This bus route includes Sir John Talbot's School and Sixth Form on the outskirts of Whitchurch, the nearest secondary school, which has a specific bus stop served by the 511 at school start/finish times. The journey time is approximately 15 minutes.

2.35. Notwithstanding these excellent connections, a holistic assessment of sustainability in 2025 should recognise changing practices and preferences by which residents live day to day. This includes, in a post-Covid setting, the prevalence of Working From Home as a common mode of working.

2.36. In a 2023 Opinions and Lifestyle Survey carried out by the Office for National Statistics, the Characteristics of Homeworkers in Great Britain were analysed. Their findings included the headlines that 16% of adults solely work from home, and 28% work both from home and out of the home (known as hybrid working). This is a total

of 34% of workers being either fully homeworkers, or hybrid, indicating that lockdown-era modes of working are here to stay, and the ability to travel to work is less of an important factor than prior to 2020.

2.37. Aside from work, many other aspects of day-to-day life are lived in a more varied manner than traditionally associated with an assessment of sustainability. A key example of this is the widespread use of online shopping, for both the main household groceries, and smaller ad-hoc purchases including clothing and household items. All major supermarkets offer delivery, which is a popular and convenient means of shopping.

2.38. The Council has expressed concern that the settlement of Tilstock, whilst considered sustainable, could not accommodate the level of growth which is proposed, i.e. 70 dwellings.

2.39. However, what has not been made clear, is the full extent and nature of the Council's particular concern regarding the scale of growth.

2.40. On 11th February the Case Officer cites concern with *"impact on services/facilities"* **[CD14.27]**, and on 24th February notes that comments were made under a previous pre-app on the Site which noted *"social disbenefits and resultant harm"* which the current proposals fail to address. On 11th April **[CD14.47]**, the Officer noted their concerns regarding "*the scale of development and its impact on the sustainability of the proposed development in relation to the existing settlement being able to accommodate the quantum of development".*

2.41. Taking the above into consideration, it appears that the concern of the Council centres largely on the impact that the 70 dwellings would have on the facilities and services within Tilstock and generally with regards to an increase in number of dwellings. It may be that the Council clarifies matters in their forthcoming Hearing Statement, but at the time of drafting, this is the logical conclusion to be drawn from the correspondence.

2.42. However, increase in number of dwellings is not in-and-of-itself harmful, nor does it automatically result in harm or unacceptable pressure to the availability of services.

2.43. In order to assess the impact on local services which could result from the development, a review of consultation responses is a helpful starting point. The table below summarises the consultations sent by the Council to parties which are relevant to the provision of services or at least likely to have a view on the matter.

Table 2: Consultee Comments

Organisation	Response
Trinity Area Residents Association	None
SC Highways DC	None
SC Parks And Recreation	None
West Mercia Constabulary	None
SC Learning & Skills	Due to the scale of development and the number of pupils it will generate it is recommended that contributions for both primary and secondary education provision are secured via a CiL agreement. Based on child yeild: 6 new EARLY YEARS places (DFE Yield 0.07) 23 new PRIMARY places (DFE Yield 0.27) 9 new SECONDARY places (DFE Yield 0.14) 4 new POST 16 places (DFE Yield 0.05) and 1 child who will require an EHCP (Educational Health Care Plan) (DFE Yield 0.01)
Tilstock school (consulted as a neighbour of the Site)	None
Whitchurch Rural Parish Council	A development of 70 homes on one site is inappropriate in the context and setting of a rural village. It would increase the size of the village by unacceptable levels. Tilstock is largely a residential area and employment opportunities within Tilstock itself are limited. Employment would therefore need to be sought outside the settlement. This increases the need to travel and would, therefore, fail to reduce carbon emissions. The addition of 70 new homes in a residential settlement is contrary to its function and inappropriate, therefore, the proposals are contrary to strategic objective 3: Rebalance rural communities through the delivery of local housing and employment opportunities *appropriate to the role, size and function of each settlement*, or group of settlements, *ensuring that development delivers community benefit*.

	A development of 70 houses would place undue pressures on existing infrastructure: The School has no places available, there is not a GP surgery in the village, patients would therefore be expected to join practices in Whitchurch which are already struggling to absorb numbers from new developments in Whitchurch. Tilstock does not have any shops so residents must travel to small local shops in Prees Heath or into Whitchurch via car or the somewhat limited bus service. The Parish Council would like raise the long standing recognised sewerage/drainage infrastructure issues in Tilstock. Any new development will inevitably put the existing system under increased pressure and developers will need to clearly and positively demonstrate that capacity is adequate and sufficient to cater for 70 additional homes as specified. The Parish Council is aware that a recent attempt by the Village Hall to install electric car charging points failed due to lack of electrical capacity.

2.44. As such, the Council have failed to provide evidence that any of the local services or facilities, beyond mitigation that is standard for this form of development, will be overwhelmed or do not have sufficient capacity to accommodate the scale of development proposed. Furthermore, the Appellant is willing to enter into a Section 106 Agreement with the Council and furthermore, a CIL Charging Schedule is in place in Shropshire.

2.45. It is noted that within the SAMDev Tilstock was allocated a growth requirement of 50 dwellings over the plan period. As is detailed above the housing requirement that the SAMDev sought to facilitate was some 1,375 dwellings per annum. The latest local housing need for Shropshire is 1,994. This is a 45% increase in the minimum requirement. It invariably follows, that each of the identified sustainable settlements in Shropshire will have to take their fair share of growth. If the same 45% uplift were to be applied to the 50 dwellings allocated in the SAMDev, a total of 73 dwellings would be an appropriate share for Tilstock to accommodate.

2.46. Within the response from Shropshire Policy Team (**CD16.1**) reference is made to the delivery of dwellings across the Community Cluster, with the March 2024 Housing Land Supply Statement demonstrating delivery of 108 dwellings across the cluster,

against a requirement of 100. Reference here is made to SamDev Policy MD3 which states that the settlement housing guideline is a significant policy consideration. It is acknowledged that development of the Appeal site would bring about delivery of dwellings in excess of that planned for in the adopted Development Plan. However, the development plan is time-expired, owing to a lack of a five year housing land supply, the most important policies for determining applications such as this are out-of-date and notwithstanding that the Core Strategy and SAMDev Plan only runs until 2026, less than a year from the point of writing this statement.

2.47. It is relevant to note also, the this significant increase in the overall housing need for Shropshire as a result of revisions to the standard method has wider implications. It is therefore sensible to consider, the weight and approach taken within the recently 'withdrawn' Local Plan at this point, with specific reference to the spatial distribution of land for housing.

2.48. Firstly, it should be noted that the withdrawn Local Plan also planned to meet a lower number that than of the latest local housing need for Shropshire.

2.49. Local Plan Review Policy SP10, as it was drafted stated that new market housing will be strictly controlled outside the development boundaries of the Strategic Centre of Shrewsbury, the Principle Centres, the Key Centres, the new Regulation 19: Pre-Submission Draft of the Shropshire Local Plan Page 40 Strategic Settlements and the Community Hubs. Within Community Clusters only new market housing which meets Community Cluster Policy SP9 criteria will be acceptable.

2.50. Aligned with the Basildon decision (**CD16.25**) and Hertsmere decisions (**CD16.26** and **CD16.27**) neither the Local Plan as a whole, nor specific policies within the withdrawn Local Plan carry any weight, but the evidence underpinning said policies can be considered a material consideration.

2.51. Whilst Local Plan Review Policy SP9 seeks to very strictly control development in Community Clusters to that within the defined settlement boundaries, it is relevant to note that the revised standard method requires a more significant level of annual housing delivery and whilst ensuring that growth is directed towards the most sustainable locations is rightly the focus, in order to accommodate this more significant minimum housing requirement, each of the settlements identified as being a sustainable location for growth, including Tilstock, will need to play a role in delivering housing growth and an appropriate uplift in growth will be necessary.

2.52. It is a matter of fact and it is common ground that the appeal site is located outside of, although contiguous with, the currently defined built up area boundary for Tilstock. Cognisant of this, this statement provides comment below on the compliancy of the proposal with these policies, the harm that arises from any conflict, as well as the

appropriate weight that should be afforded to the policies (and any acknowledged breach) for determining the appeal.

2.53. The settlement boundaries have been drawn up to accommodate a housing requirement that is significantly lower than current housing need, as is detailed above. The boundaries will need to flex to accommodate local housing need. They should not be seen as inviolable in this context.

2.54. Furthermore, SCC cannot demonstrate the minimum housing land supply, as required by Framework paragraph 74, and therefore development plan policies that seek to restrict housing delivery should not be applied with full rigour and should be considered out-of-date. Policy intervention is required and additional land outside of settlement boundaries should be released.

2.55. Indeed this is the very approach that has been taken by the Council and continues to be taken with the settlement boundaries shown on the proposals map do not reflect the extent of the built-up area across a number of Shropshire settlements. Significant areas of greenfield land, outside of the settlement, have been released for housing development, in order to help meet local needs. Across the last five years numerous applications have been granted planning permission in Shropshire outside defined settlement boundaries.

2.56. Within the supporting text contained in the SAMDev, it is also pertinent to note that at paragraph 3.22 the Council recognize that in the absence of a sufficient housing land supply, it is appropriate for development to take place beyond, defined settlement boundaries;

> *"Should there not be a five year supply of housing land in Shropshire as a whole, then paragraph 49 of the National Planning Policy Framework (NPPF) effectively allows sustainable housing developments to take place beyond settlement development boundaries."*

2.57. More significantly, the Council's claimed housing land supply statement comprises over 2,000 dwellings worth of land that is expected to come forward on land outside of the defined settlement boundaries.

2.58. Indeed, with specific reference to the February 2025 Housing Land Supply Statement, we draw the Inspectors attention to sites contained within Appendix F and Appendix G.

2.59. Of the claimed supply of 9,902, a minimum of 2,204 dwellings are located outside of the defined settlement boundaries. This is almost a quarter of the Council's claimed supply.

2.60. The built-up area boundary cannot be considered to be up to date in this context and the application of policies by the Council in an inconsistent manner further undermines the position taken by the Council in regard to this appeal. Simply put, the Council can't have it both ways.

Other Matters

2.61. In reference to matters beyond the principle of development, we summarise below technical consultee comments for ease.

2.62. We rely on the submissions of the Appellants technical teams in regard to highways, landscape, urban design, ecology, flood risk and drainage and landscape. An arboricultural position statement can be found at Appendix 2 of the Statement.

Table 3: Technical Consultee Comments

Organisation	Response
SC Ecologist	BNG metric and conditions assessment requested. Skylark survey requested. Confirmation of financial contribution to Brown Moss and Cole Mere to offset recreational pressures.
SC Regulatory Services	Gas Monitoring has not yet been fully completed.
SUDS	Condition proposed
SC Trees	Recommended layout changes in respect of plots 67,68 and 69 so as to reduce risk of residents seeking to prune tree beyond the northern edge of the site boundary.
SC Archaeology	Condition proposed
Landscape	Requested consideration of construction implication and a review of the sensitivity of 'Settlement and Places of Interest'.

2.63. Taking each of these in turn, a detailed ecology Hearing Statement has been prepared and submitted by PJA that provides the information requested by the SC Ecologist. It should be noted that this information had been prepared ahead of the Appeal being submitted, but the Council confirmed that they would not accept any additional information.

2.64. The Appellant is willing to make any and all necessary financial contributions to offset the recreational pressures on the Brown Moss and Cole Mere. This can be secured through a Section 106 Agreement.

2.65. Gas monitoring has been completed. The full details and outcome of this monitoring can be found at Appendix 3. This monitoring does not indicate and issue that would preclude development from coming forward.

2.66. Comments in regard to the consultee response from the SUDS team are provided in the detailed Hearing Statement prepared by Enzygo.

2.67. As is demonstrated on the amended layout (**CD6.23**) and reflected in the Agricultural Position Statement, an adjustment was made during the course of the application and plots 67,98 and 69 where moved further south as requested by the Tree Officer.

2.68. Pegasus have prepared a detailed Landscape Hearing Statement in response to the Landscape comments received from ESP on behalf of the Council.

3. Benefits of the Development

Introduction

3.1. Framework paragraph 11(d) provides that, in the circumstances of this appeal, planning permission should be granted unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits.

3.2. The appeal proposal will secure a range of benefits that will be demonstrated in full in evidence. These include, inter alia:

- 70 dwellings in a sustainable location, to meet pressing need;
- 15% affordable housing comprising 10.5 dwellings total, being 10 dwellings provided onsite and an additional financial contribution equivalent to 0.5 dwellings to address an identified affordable housing need;
- New areas of publicly accessible open space and green infrastructure, including two children's play areas, one to be equipped;
- Economic benefits through construction spend and jobs created over the build-out period;
- Additional Council Tax and New Homes Bonus revenue.

3.3. The development of the site will entail a substantial investment in the region, reflecting the developments' construction value and related expenditures throughout the construction phase. The construction sector, especially residential building, plays a crucial role in contributing to both the local and national economy by generating employment opportunities.

3.4. This Economic Benefits Statement provides an estimation of key economic benefits arising from the proposal as per the below;

- An estimated construction spend of £12.37 million, contributing to GDP.
- The creation of/support for approximately 102 direct Full Time Equivalent (FTE) construction jobs and 138 FTE indirect jobs, elsewhere in the economy.
    - An estimated resident's gross expenditure of circa £2.5 million annually, a proportion of which will be spent locally.

3.5. The advantages presented by this specific proposal are both concrete and significant, and the economic benefits derived from the appeal proposal hold considerable importance and should be afforded moderate weight in the planning balance.

3.6. In terms of promoting healthy communities, the Framework (paragraph 98) recognises that access to a network of high-quality open spaces and opportunities for physical activity is important. The appeal application was accompanied by a masterplan. This illustrates how the will be brought forward to be developed to deliver green infrastructure and public open space. It shows a Local Equipped Area of Play (LEAP) and an extensive area of open space. It is clear that the proposals will deliver large new areas of public open space within the development, available for use by residents of the proposed development and the wider community.

3.7. The delivery of additional public open space, particularly at the level proposed, is a benefit that weighs in favour of the proposed development and should be afforded moderate weight in the planning balance.

3.8. The appeal application was accompanied by a Biodiversity Net Gain Assessment. This demonstrates that the proposed development provides a framework for biodiversity enhancements and that the scheme can deliver a biodiversity net gain of 22% for habitats and 14% for hedgerows.

3.9. The proposed development supports the objectives of the Framework paragraphs 174 and 180(d), which seek to support opportunities to improve biodiversity as part of developments, especially where this can secure measurable net gains for biodiversity or enhance public access to nature.

3.10. These benefits outweigh the very minimal harm that may arise from the proposals.

4. Planning Balance

4.1. It is a matter of fact and common ground that the Council cannot demonstrate a sufficient supply of deliverable housing.

4.2. Their February 2025 position statement confirms a supply of 4.73 years and acknowledgement that the tilted balance is engaged.

4.3. The Case Officer has acknowledged this position, but has sought to argue that the shortfall is minimal. Irrespective of the level of shortfall, the tilted balance is engaged, but not withstanding this, the evidence of Mr Pycroft indicates that the shortfall of housing is far more significant than that presented by the Council.

4.4. Mr Pycroft's detailed assessment concludes that there is a shortfall of 3,251 dwellings, and against the local housing need figure derived from the standard method, the Council can only demonstrate a 3.72. Year supply. This is a very significant shortfall in the provision of housing and alongside the withdrawal of the Local Plan, indicates that policy intervention is required so as to deliver the housing that the people of Shropshire require and deserve. The Council's failure to get a Local Plan in place has resulted in a vacuum, whereby it is necessary to seek to deliver housing, such as that in Tilstock, outside of the Local Plan process.

4.5. In this context, the provision of market dwellings should be afforded very significant weight.

4.6. It is common ground and a matter of fact, as confirmed in the evidence base underpinning the recently withdrawn Local Plan Review that recent data signposts a significant housing affordability issue in Shropshire along with significant unmet affordable housing need. The fact that the appeal proposal makes provision for an above policy compliant of affordable housing and the delivery of 10 affordable dwellings is an important benefit in this context.

4.7. It is considered that very significant weight should be given to the provision of affordable housing in determining the appeal proposal.

4.8. For ease, the table below sets out our consideration of the harms and benefits associated with the scheme;

Table 4: Assessment of Harm and Benefit

Harms		Benefits	
Development in the countryside	Limited	Delivery of market housing	Very significant weight
Character and Appearance Harm	Limited	Delivery of affordable housing	Very significant weight
		Socio-economic benefits	Moderate weight
		Biodiversity Net Gain	Moderate weight

4.9. On the basis of the evidence adduced by the technical consultant team and have reviewed in detail the statutory consultee comments, we consider that there is not harm associated with any other matters.

4.10. We therefore conclude that the Appeal Scheme represents appropriate development such that the presumption in favour of sustainable development applies that would justify the grant of planning permission.

Appendix 1 – Local Housing Need Assessment

Marrons

Part of Shakespeare Martineau

BONINGALE DEVELOPMENTS LIMITED

Tilstock Local Housing Need Assessment

April 2025

60 Gracechurch Street, London, EC3V 0HR
www.marrons.co.uk

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1.0 INTRODUCTION AND PLANNNG POLICY CONTEXT

Introduction

1.1 This Local Housing Need Assessment (LHNA) has been prepared by Marrons socio-economics team on behalf of Boningale Developments Limited, in support of their proposed development in the village of Tilstock, Shropshire Council.

1.2 The LHNA's purpose is to inform what the local housing need is for the local area and considers this in the context of the policies of the National Planning Policy Framework (NPPF, December 2024) and Shropshire Council's (SC's) adopted Development Plan and New Local Plan (proposed for withdrawal in July 2025).

1.3 We present analysis of demographics, affordability, and housing supply data to reach a conclusion on what the housing need for the area.

Planning Policy Context

1.4 The social objective of the NPPF is *"to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations"* [1] (our emphasis) and deliver *"mixed and balanced communities."*

1.5 It is therefore crucial for the area surrounding Tilstock to have enough housing planned to support this objective and those of SC's Development Plan.

Shropshire Council Development Plan

1.6 The adopted Development Plan for Shropshire currently comprises of the Core Strategy (adopted 2011); the Site Allocations and Management of Development (SAMDev) Plan (adopted 2015), together with the adopted formal Neighbourhood Plans.

1.7 A new Local Plan for Shropshire was submitted to the Secretary of State for examination on 03 September 2021. However, despite hearings taking place throughout 2023 and 2024 the Council wrote to the Planning Inspectorate on 13 March 2025 outlining their intention to recommend the plan for withdrawal at their full Council meeting of 17 July 2025.

1.8 This proposed withdrawal has followed the Planning Inspectorate concluding that significant modifications of the Plan were required and that this could not be completed within a reasonable period.

[1] Paragraph 8 b), page 5, NPPF, December 2024

Site Allocations and Management of Development (SAMDev) Plan (2015)

1.9 The most recent adopted development plan document is the SAMDev, adopted in December 2015.

1.10 Policy MD1: Scale and Distribution of Development of the SAMDev and its accompanying Settlement Policy Framework (Schedule MD1.1) set out the overarching approach to housing development in Shropshire for the 2006-2026 period.[2]

1.11 This framework includes several 'Community Cluster Settlements', one of which is listed as the Tilstock, Ash Magna/Ash Parva, Prees Heath, Ightfield and Calverhall Cluster.[3]

1.12 Policy S18 of the SAMDev covers the Whitchurch area of Shropshire, and within this Policy S18.2(ii) refers to the Tilstock, Ash Magna/Ash Parva, Prees Heath, Ightfield and Calverhall Cluster.

1.13 Policy S18.2(ii) states how there will be provision of 100 dwellings, 2011-2026, in this cluster made up of 50 dwellings in Tilstock, 15 dwellings in Ash Magna/Parva, 25 dwellings in Ightfield and Calverhall, and 10 dwellings in Prees Heath.[4]

1.14 A second cluster is made up of Prees and Prees Higher Heath as set out in Policy S18.2(i) and a further 100 dwellings were proposed for this area. [5]

Regulation 19: Pre-Submission Draft of the Shropshire Local Plan 2016 to 2038

1.15 Although the emerging Plan is now scheduled to be withdrawn, it should be noted how the Planning Inspectorate concluded the housing requirement to be 32,300 dwellings, 2016-2038. This was confirmed in document ID47 sent to the Council on 10th December 2024.

1.16 The submission version of the Plan (December 2020) maintained the same community cluster in which Tilstock was located in the SAMDev, but reclassified Prees and Prees Higher Heath as a community 'hub' with *"around 170 dwellings"* stated as a residential guideline. [6]

[2] Page 15, Shropshire Council Site Allocations and Management of Development (SAMDev) Plan Adopted Plan 17th December 2015
[3] Page 18, Shropshire Council Site Allocations and Management of Development (SAMDev) Plan Adopted Plan 17th December 2015
[4] Policy S18.2(ii), page 231, Shropshire Council Site Allocations and Management of Development (SAMDev) Plan Adopted Plan 17th December 2015
[5] Policy S18.2(i), page 231, Shropshire Council Site Allocations and Management of Development (SAMDev) Plan Adopted Plan 17th December 2015
[6] Policy S18.2, page 299, Regulation 19: Pre-Submission Draft of the Shropshire Local Plan, December 2020

Neighbourhood Plans

1.17 None of the settlements listed above in the community clusters we have identified have made or emerging neighbourhood plans.

Study Area

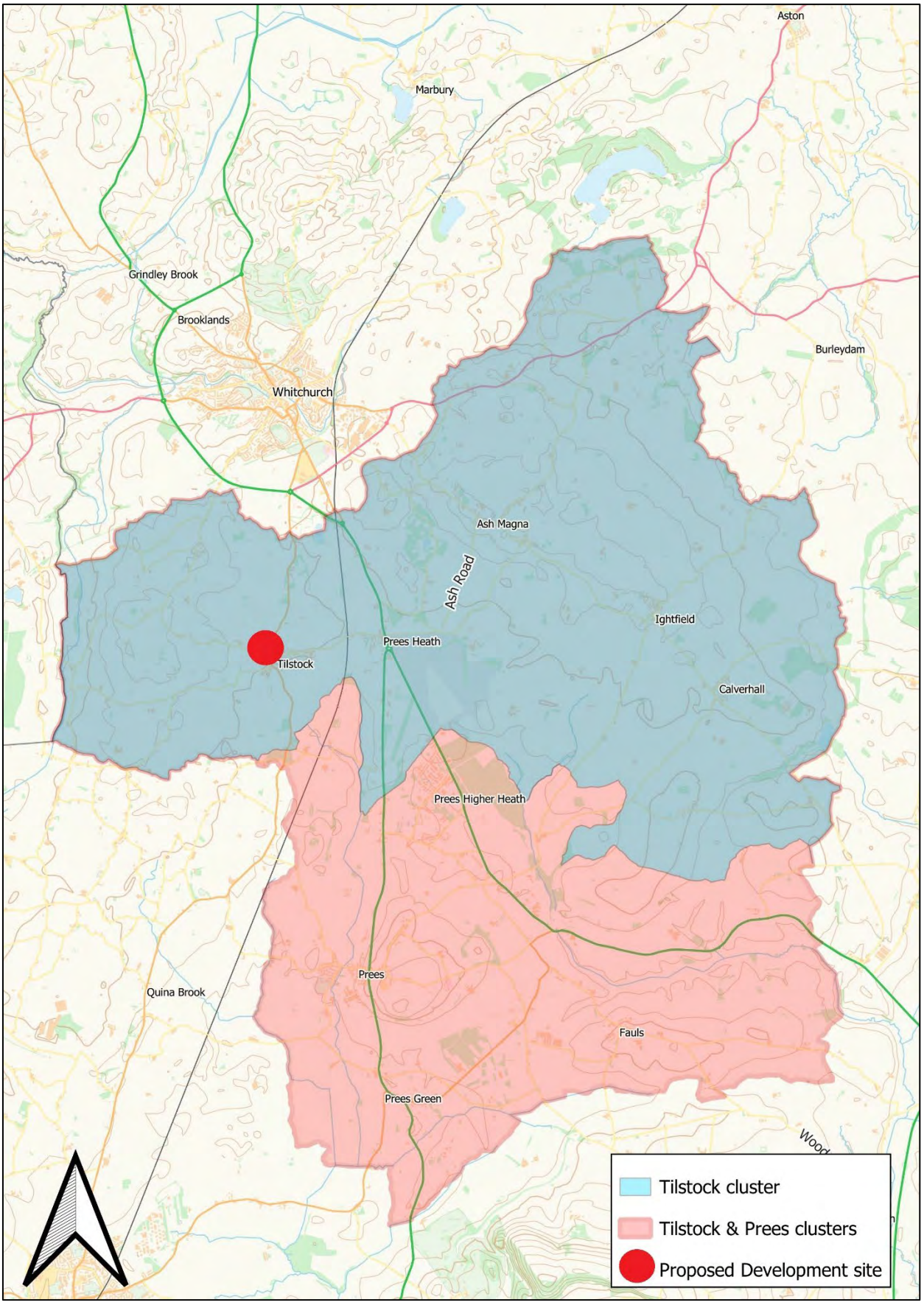
1.18 In the context of the above we have determined local housing need based on two areas as follows:

- Tilstock, Ash Magna/Ash Parva, Prees Heath, Ightfield and Calverhall Community Cluster.
- Tilstock, Ash Magna/Ash Parva, Prees Heath, Ightfield and Calverhall Community Cluster and Prees and Prees Higher Heath Community Cluster.

1.19 This is considered to represent a robust area to determine need, following the S18 Whitchurch Place Plan area set out in the SAMDev which remained consistent with the proposals maps submitted with the Regulation 19 Submission Local Plan 2016-2038.

1.20 The study areas are illustrated in Figure 1.1 and for ease we will now refer to the two areas as the Tilstock Cluster and the Tilstock & Prees Cluster.

Figure 1.1: Tilstock Cluster and Tilstock & Prees Cluster



Source: Ordnance Survey

2. DEMOGRAPHIC PROFILE OF THE STUDY AREA

2.1 This section of our analysis draws on the most recent demographic information available from the Office for National Statistics (ONS) to build a demographic profile of the two study areas illustrated in Figure 1.1. We will refer to these as the Tilstock Cluster and Tilstock & Prees Cluster.

2.2 This process will assist in determining the scale of housing need which exists to ensure the aims and objectives of the Development Plan, and the objectives of the National Planning Policy Framework (NPPF) to create mixed and balanced communities and locate housing where it will enhance of maintain the vitality of rural communities, are achieved.

Population change 2011-2021

2.3 Table 2.1 sets out the population change experienced in the two cluster areas between the 2011 and 2021 Census by broad age groups. We have compared this with the wider local authority area and region.

Table 2.1: Population change 2011-2021

	Tilstock	Tilstock & Prees	Shropshire Council	West Midlands
0-18	-13%	-14%	-5%	4%
19-29	4%	15%	-2%	-2%
30-44	-10%	-13%	-6%	3%
45-64	0%	4%	7%	8%
65+	27%	29%	30%	18%
All ages	**2%**	**4%**	**6%**	**6%**

Source: ONS, nomisweb.co.uk

2.4 Table 2.1 shows how the two clusters have experienced nearly three times the *decline* in their child age population (0-18 years) than Shropshire has. In contrast the region has experienced an *increase*.

2.5 Furthermore, the two clusters have experienced a *higher* decline in the 30-44 age group (those most likely to be first time buyers and/or younger families) compared with Shropshire. Again, there has been a small *increase* across the region.

2.6 The declines in the two clusters and (to a lesser extent) across Shropshire indicates a lack of housing delivery over the 2011-2021 period for the 30-44 demographic in particular.

2.7 This trend needs to be arrested to ensure local amenities and services such as Tilstock Primary school remain viable, and to ensure the 2024 NPPF objectives of creating mixed and balanced communities, and providing for local housing need, are achieved.

Household change by Household Reference Person's (HRP) age, 2011-2021

2.8 Notwithstanding the population change data which records all persons irrespective of where they reside, the change in the age of households by the HRP is another important measure.

2.9 The HRP is the household member who owns the accommodation; is legally responsible for the rent; or occupies the accommodation as reward of their employment, or through some relationship to its owner who is not a member of the household.

2.10 Table 2.2 summarises the change in households by the age of the HRP, between the 2011 and 2021 Census.

Table 2.2: Change in households by age of HRP, 2011-2021

	Tilstock	Tilstock & Prees	Shropshire Council	West Midlands
Under 24	3	14	-617	-20,159
25-34	17	42	861	9,521
35-49	-56	-117	-6,808	-52,739
50-64	15	76	5,616	100,392
65+	66	165	10,854	97,569
Total	45 (+6%)	180 (+9%)	9,906 (+8%)	134,584 (+6%)

Source: ONS, nomisweb.co.uk

2.11 Table 2.2 reflects the population data in Table 2.1, insofar as there has been a decline in households aged 35-49. However, again this decline is more pronounced in the Tilstock cluster (-26%) and Tilstock & Prees cluster (-22%) than across Shropshire (-19%) and the West Midlands (-8%).

2.12 In contrast however the Tilstock & Prees area has experienced the lowest change in the under 24 age group and a small increase in those aged 25-34, however the same area has experienced the *largest* increase by far in those aged 65+.

2.13 In the context of this change between 2011 and 2021, it is useful to consider the proportion of households in each age group recorded by the 2021 Census. Table 2.3 sets out this data.

Table 2.3: Proportion of households by age of HRP in 2021 Census

	Tilstock	Tilstock & Prees	Shropshire Council	West Midlands
Under 24	1%	1%	2%	3%
25-34	8%	8%	10%	13%
35-49	19%	19%	20%	26%
50-64	35%	33%	31%	29%
65+	37%	39%	37%	30%

Source: ONS, nomisweb.co.uk

2.14 Despite Table 2.2 showing an increase in HRPs under 24 and 25-34 in Tilstock and Tilstock & Prees, the proportion of HRPs in both age groups (both 9%) remains low compared with the wider local authority (12%) and region (16%).

Concealed Households

2.15 As the affordability of housing has deteriorated nationally and locally there has been an increase in the number of single adults and couples living with other adults as part of the same household. An example is where a younger couple may be living with one of the couple's parents and are therefore a 'concealed' household.

2.16 This is often indicative of a housing need not being met in an area, and we have set out the data available from the 2021 Census for households where there are three or more adults (with or without children) living in the same household.

Table 2.4: Proportion of all households with 3+ adults in 2021

Area	%
Tilstock	22.5%
Tilstock & Prees	19.4%
Shropshire Council	16.2%
West Midlands	18.8%

Source: ONS 2021 Census

2.17 As Table 2.4 illustrates, there is a higher proportion of households with 3 or more adults in the smaller Tilstock cluster (22.5%) and the Tilstock & Prees cluster (19.4%) than across Shropshire (16.2%) and the West Midlands (18.8%).

2.18 Some of these households will have dependent children and will therefore be concealed families in need of their own home. This indicates a higher-than-average proportion of concealed households in the local area to the development site, which in turn indicates a lack of suitable housing delivery.

Occupancy Rating (Bedrooms)

2.19 The occupancy rating of properties can help us to understand the extent of which homes are overcrowded or where they are under-occupied (i.e. empty bedrooms).

2.20 Table 2.5 considers the occupancy rating of households by number of bedrooms in the four areas studied as recorded by the 2021 Census.

Table 2.5: Proportion of households in each occupancy (bedrooms) category, 2021

	Occupancy rating of bedrooms: +2 or more	Occupancy rating of bedrooms: +1	Occupancy rating of bedrooms: 0	Occupancy rating of bedrooms: -1	Occupancy rating of bedrooms: -2 or less
Tilstock	58.6%	27.1%	11.9%	2.1%	0.2%
Tilstock & Prees	58.0%	27.7%	12.3%	1.9%	0.1%
Shropshire Council	46.1%	33.8%	18.3%	1.5%	0.3%
West Midlands	37.0%	33.3%	25.4%	3.5%	0.8%

Source: nomisweb.co.uk (Table TS052, 2021 Census)
Note: Figures may not sum due to rounding

2.21 The data in Table 2.5 reveals a much higher proportion of homes in both the Tilstock (85.8%) and Tilstock & Prees (85.7%) clusters are under-occupied compared with Shropshire (79.9%) and the West Midlands (70.3%).

2.22 In both clusters, nearly 60% of all houses are under-occupied by 2 or more bedrooms. This category falls to only 46.1% across Shropshire and 37.0% across the West Midlands.

2.23 This data, particularly the 2+ bedrooms proportion, indicates a significant number of family sized homes which are under-occupied by older people whose children have left home.

2.24 This is reflected by the higher comparable growth in the 65+ population summarised in Tables 2.1 and 2.2, and the higher-than-average number of households with 3 or more adults in both clusters compared with Shropshire and the West Midlands set out in Table 2.4.

2.25 This larger stock could be better utilised by families with children, but the likelihood of it coming back onto the market quickly is reduced in more affluent areas such as Tilstock if residents are not under any financial pressure to sell or downsize. Furthermore, this could also be indicative of a lack of suitable options for the older generation to ‘right-size’.

2.26 Table 2.6 illustrates the change in under-occupied homes between 2011 and 2021.

Table 2.6: Change in under-occupied properties (bedrooms) 2011-2021

	Occupancy rating of bedrooms: +2 or more	Occupancy rating of bedrooms: +1
Tilstock	13.7%	-3.3%
Tilstock & Prees	18.3%	-0.8%
Shropshire Council	14.8%	3.7%
West Midlands	9.0%	2.3%

Source: nomisweb.co.uk (Tables QS412EW, 2011 Census and TS052, 2021 Census)
Note: Figures may not sum due to rounding

2.27 Table 2.6 illustrates how all areas have experienced an increase in under-occupied homes between 2011 and 2021.

2.28 The two cluster areas and Shropshire have experienced an increase in larger under-occupied properties, 2011-2021, which exceeds the average across the region.

2.29 The increase in the larger Tilstock & Prees area is particularly high, showing an 18.3% increase in larger under-occupied homes.

2.30 Taken together, Tables 2.5 and 2.6 illustrate how the existing housing stock in the two clusters is under-occupied at a greater rate than across Shropshire and West Midlands, and the number of homes under-occupied continues to increase.

2.31 Unless residents choose to downsize from these larger family sized homes to smaller properties there will be limited larger family sized housing returning to the market across the cluster areas. New properties of this size will need to be built to help reverse the unbalancing of the population which has been experienced between 2011 and 2021.

Number of Bedrooms

2.32 The number of bedrooms in households is a useful indicator of where need may lie, and we have set out the number of bedrooms by households in Table 2.7 below.

Table 2.7: Proportion of households by bedroom size, 2021

	1-bed	2-bed	3-bed	4+ bed
Tilstock	3%	16%	42%	38%
Tilstock & Prees	4%	17%	44%	36%
Shropshire Council	7%	24%	42%	26%
West Midlands	10%	25%	46%	20%

Source: nomisweb.co.uk (Table TS050, 2021 Census)

2.33 The relevance of this data needs to be considered in the context of the occupancy analysis set out above. The two cluster areas have a higher proportion of larger 4+ bed properties than Shropshire and the West Midlands.

2.34 Taken together, 3-bed and 4+ bed combined account for 80% of the housing stock in the two clusters, compared with only 68% across Shropshire and 66% across the West Midlands.

2.35 Notwithstanding this high proportion of 3+ bed homes, as we have shown earlier in this section there has been a decline in the first-time buyer and dependent children age groups in the clusters which indicates a particular lack of *available* family housing of this size.

2.36 One of the main reasons for this will be the high level of under-occupancy of this size of property in the two clusters. So, despite there being a high proportional level of stock, a limited amount is coming back onto the market and there is high demand.

2.37 Table 2.8 illustrates how the number of bedrooms has changed between 2011 and 2021.

Table 2.8: Change in households by bedroom size, 2011-2021

	1-bed	2-bed	3-bed	4+ bed		All households
Tilstock	19%	-1%	1%	13%		5%
Tilstock & Prees	40%	1%	4%	19%		9%
Shropshire Council	3%	4%	5%	19%		8%
West Midlands	6%	4%	3%	18%		6%

Source: nomisweb.co.uk (Table QS411EW, 2011 Census, and Table TS050, 2021 Census)

2.38 Table 2.8 shows how there has been lower growth in the Tilstock cluster (5%) than the Tilstock & Prees cluster (9%) and Shropshire (8%) between the two Censuses.

2.39 Furthermore, the Tilstock cluster has only experienced 14% growth in 3+ bed properties (only 1% in 3-bed) which compares with 23% in the Tilstock & Prees cluster and 24% across Shropshire. Across the West Midlands there has been 21% growth.

2.40 The smaller Tilstock cluster has therefore experienced much lower growth in family sized housing between 2011 and 2021 than on average.

Retirees

2.41 The economic activity status is a further indicator which helps to illustrate the character of an area. Table 2.8 summarises the proportion of the population aged 16 and over who are retired.

Table 2.8: Retirees in 2021

	All residents aged 16+	Retired population	% of 16+ population retired
Tilstock	1,799	520	29%
Tilstock & Prees	4,427	1,350	30%
Shropshire Council	272,245	77,553	28%
West Midlands	4,801,331	1,061,221	22%

Source: nomisweb.co.uk (Tables QS601EW, 2011 Census and TS066, 2021 Census)
Note: Figures may not sum due to rounding

2.42 Table 2.8 illustrates how the two clusters and Shropshire have a significantly higher proportion of retirees than the regional average.

2.43 The change in retirees between the 2011 and 2021 Censuses is also of use in understanding how the local area has developed. This data is summarised in Table 2.9.

Table 2.9: Change in retired residents 2011-2021

	2011 Census	2021 Census	% change 2011-2021
Tilstock	231	520	125%
Tilstock & Prees	639	1,350	111%
Shropshire Council	37,833	77,553	105%
West Midlands	586,305	1,061,221	81%

Source: nomisweb.co.uk (Tables QS601EW, 2011 Census and TS066, 2021 Census)
Note: Figures may not sum due to rounding

2.44 Table 2.9 illustrates how there have been significant increases in retirees across Shropshire when compared to the West Midlands average. However, the increase in the two clusters, particularly the smaller Tilstock cluster, has exceeded the Shropshire average.

2.45 This higher growth in retirees is another reason why the two clusters have such a high proportion of under-occupied properties, as many of these retirees who had children will now be living in larger family homes and those children will have left home.

Demographic summary

2.46 In summary the key points from this section are as follows:

- Tilstock and Tilstock & Prees have experienced significant declines in the child age population and first-time buyer population which contrasts with lower declines or increases across Shropshire and the West Midlands.
- This is emphasised by sharper declines in HRP in Tilstock & Tilstock & Prees compared with Shropshire and the West Midlands.
- The proportion of HRPs aged under 49 is also noticeably lower in Tilstock and Tilstock & Prees than across Shropshire and the West Midlands.
- Tilstock & Tilstock & Prees both have higher proportions of households with 3 or more adults than Shropshire or the West Midlands, indicating higher levels of concealed households.
- Furthermore, a much higher proportion of homes in both the Tilstock (85.8%) and Tilstock & Prees (85.7%) clusters are under-occupied compared with Shropshire (79.9%) and the West Midlands (70.3%). These larger households are unlikely to come back onto the market in affluent rural areas.
- The increase in larger unoccupied homes where 2 or more bedrooms are unoccupied has increased at a far greater rate locally and across Shropshire when compared to the West Midlands.
- Despite there being a high proportional level of 3+ bedroom stock, a limited amount is coming back onto the market as the underoccupancy data illustrates, fueling demand.
- The change in households 2011-2021 in Tilstock itself has been lower than the other three comparator areas for all bedroom sizes.
- There has been a significantly higher increase in retirees in Tilstock and Tilstock & Prees than across Shropshire and the West Midlands between 2011 and 2021. This highlights how many of the under-occupied properties will be inhabited with older residents.

2.47 These demographic factors combine to indicate that housing need in Tilstock and Tilstock & Prees for the under 49 population in particular is much more acute than across Shropshire and West Midlands.

2.48 Without providing adequate housing, the trends experienced over the 2011-2021 period will continue, creating an increasing lack of balance in the communities and therefore failing to align with the NPPF objective of creating mixed and balanced communities.

3. HOUSING AFFORDABILITY

3.1 The affordability of housing is a key consideration and one which represents the main adjustment in the calculation of minimum housing need for local authorities, using the 'standard method' set out in the National Planning Policy Framework (NPPF, 2024) and Planning Practice Guidance (PPG).

3.2 Affordability remained the main component in changes to the standard method proposed by the new government in their consultation on proposed changes to the planning system published on 30 July 2024. This stated how the revised method would use a *"stronger affordability multiplier"*[7].

3.3 This 'stronger' multiplier was borne out by the proposal set out in the consultation as follows, *"we propose increasing the significance of affordability by revising the affordability adjustment. This would mean that the baseline stock figure is adjusted upwards in areas where house prices are more than four times higher than earnings: for every 1% above that 4:1 ratio, the multiplier increases to 0.6% (the current method multiplier is 0.25%)."*[8]

3.4 The reason for this proposed change was explained in the consultation as follows, *"High and rapidly increasing house prices indicate an imbalance between the supply of and demand for new homes, making homes less affordable. The worsening affordability of homes is the best evidence that supply is failing to keep up with demand."* [9]

3.5 However following consultation of these proposed changes, the standard method published and adopted as part of the December 2024 National Planning Policy Framework (NPPF) was amended to include an even greater adjustment for affordability constraints.

3.6 The multiplier increased from the proposed 0.60% to 0.95% under the December 2024 NPPF, emphasising the importance placed on addressing existing affordability constraints.

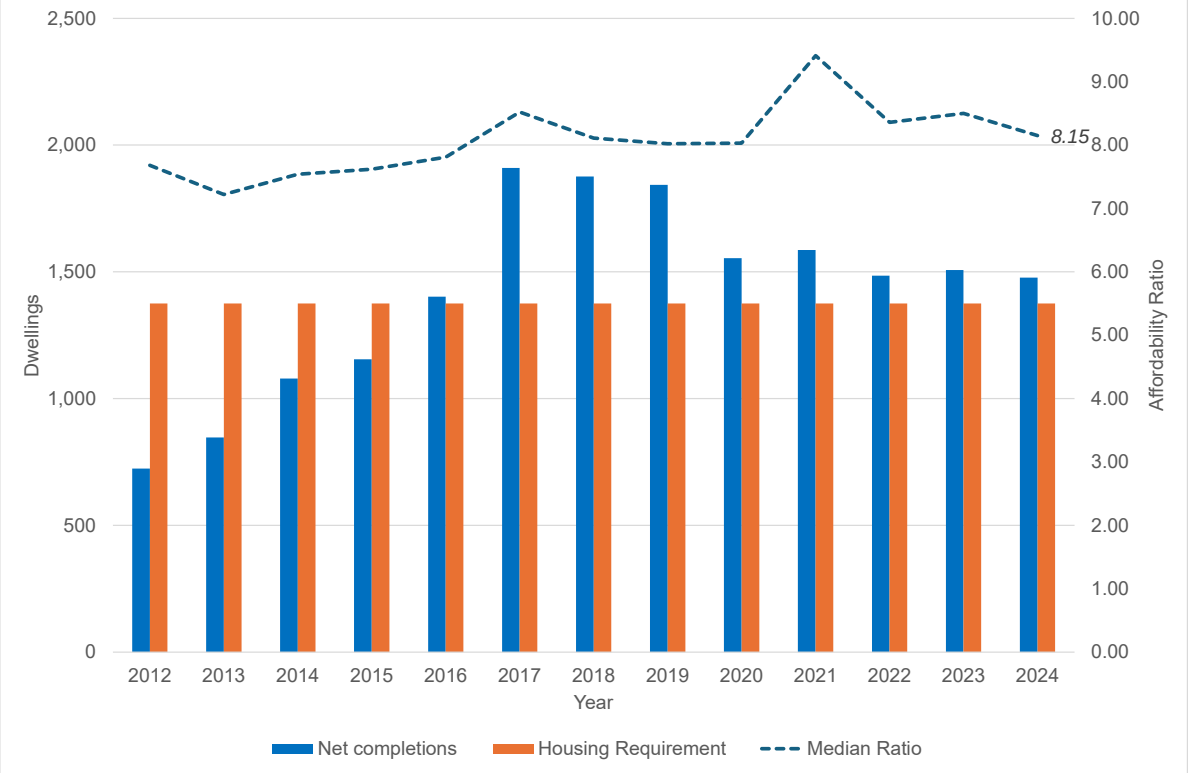
3.7 In this section we consider affordability in the context of the Tilstock and Tilstock & Prees clusters we have focussed on in this report.

[7] Paragraph 7b, Proposed reforms to the National Planning Policy Framework and other changes to the planning system, 30 July 2024
[8] Paragraph 14, Proposed reforms to the National Planning Policy Framework and other changes to the planning system, 30 July 2024
[9] Paragraph 12, Proposed reforms to the National Planning Policy Framework and other changes to the planning system, 30 July 2024

Shropshire Council

3.8 Figure 3.1 illustrates the change in the median and lower quartile affordability ratios across Shropshire since 2011. We have also included net housing completions and housing need to consider the relationship between housing supply and affordability.

Figure 3.1: Key housing indicators in Shropshire Council, 2011/12 to 2023/24



Source: Shropshire Council and ONS

3.9 As Figure 3.1 illustrates, Shropshire has failed to deliver its cumulative housing requirement between 2011/12 and 2023/24. The shortfall has been minor at 570 dwellings.

3.10 However, this should be considered in the context of the 2024 NPPF's standard method assessment of minimum housing need which means minimum housing need is now 2,005 dwellings per annum for Shropshire.

3.11 Despite several recent years exceeding the adopted 2015 housing requirement (1,375 dpa), the median affordability ratio remains higher in 2024 than it did in 2011 at 8.15.

3.12 This means someone earning a median salary would need 8.15 times that salary to afford a median priced home in Shropshire. This means owning a house is out of reach for many.

3.13 The median ratio of 8.15 in Shropshire is also higher than the West Midlands average (6.87) and the England average (7.71).

Sub-District Analysis of Housing Affordability

3.14 The ratio of median house prices to net annual household income (equivalised) before housing costs is available at sub-district level for 2020 (published on 14 June 2024).

3.15 It is important to note that this is a different calculation to the district-wide figures above which are based on *individual* rather than gross *household* income.

3.16 The smallest area of geography this data is available at is Middle Super Output Area (MSOA). Notwithstanding this there are 39 MSOAs within Shropshire Council and this provides us with robust evidence of affordability in sub-markets of the district.

3.17 The larger MSOAs means that a larger area than our wider study area illustrated in Figure 1.1 has to be used, as the Woore, Prees & Tilstock MSOA covers a larger area. However, this includes all of our study area listed in Figure 1.1 which represents the majority of the MSOA.

3.18 Table 3.1 displays the 39 MSOAs along with their median affordability ratios, ranked by their median ratio as of 2020. The MSOA covering our study area is highlighted in yellow.

Table 3.1 Ratio of median house price (year ending Mar 2020) to gross annual household income (financial year ending 2020) by Middle layer Super Output Area (MSOA) in Shropshire

MSOA Name	Ratio	MSOA Name	Ratio
Clun & Bucknell	7.37	Shrewsbury Town	5.22
Alveley, Claverley & Worfield	7.16	Cosford & Albrighton	5.21
Cressage, Dorrington & Pulverbatch	6.86	Shrewsbury Sutton & Coleham	5.18
Craven Arms & Broadstone	6.81	Shawbury & Weston	5.16
Bishop's Castle, Brockton & Chirbury	6.67	Hanwood, Pontesbury & Minsterley	5.09
Baschurch, Cockshutt & Harmer Hill	6.49	Shrewsbury London Road	5.08
Woore, Prees & Tilstock	6.35	Bridgnorth West	5.01
Church Stretton	6.29	Bayston Hill & Atcham	4.87
Hinstock & Hodnet	6.2	Shrewsbury Monkmoor	4.63
Bomere Heath & Montford Bridge	6.14	Whitchurch	4.6
Cleobury Mortimer, Burford & Ashford Carbonell	5.85	Ellesmere	4.59
Much Wenlock & Broseley	5.72	Wem	4.59
Shrewsbury Copthorne & Bowbrook	5.54	Shrewsbury Harlescott Grange	4.58
Shifnal	5.53	Market Drayton	4.27
Bridgnorth East	5.51	Gobowen, St Martin's & Weston Rhyn	4.15
Ruyton-XI-Towns, West Felton & Whittington	5.4	Shrewsbury Harlescott & Sundorne	4.11
Shrewsbury Meole & Kingsland	5.39	Oswestry West	3.92
Highley & Ditton Priors	5.29	Shrewsbury Greenfields	3.85
Ludlow Town	5.25	Oswestry East	3.76
Trefonen & Pant	5.22		

Source: Housing affordability ratios for Middle layer Super Output Areas, England and Wales, year ending March 2020

3.19 As Table 3.1 illustrates, the median ratio was 6.35 when the last MSOA level affordability ratios were collected for the year ending 2020. Table 3.1 also illustrates how the study area we have used was less affordable than most Shropshire Council's 39 MSOAs.

3.20 Given the intervening period since the 2020 ratios, it is reasonable to expect that these have increased. Notwithstanding this a median ratio of 6.35 means housing ownership would have been beyond the majority in 2020.

Sub-District Analysis of House Prices

3.21 The lack of affordability in Shropshire is further emphasised by more recent house price data published as part of the ONS' 'House Price Statistics for Small Areas' (HPSSA) series, the most recent of which published median house prices lower quartile house prices for the year ending December 2022.

3.22 HPSSA dataset 48 provides lower quartile house prices by Lower Super Output Area (LSOA) in England and Wales. This is a more local area of geography than

the MSOA data used for the affordability ratios and whereas there are 39 MSOAs across Shropshire there are 193 LSOAs.

3.23 The LSOA in which Tilstock is located (Shropshire 002D) has experienced a 94% increase in its lower quartile house price over the decade from December 2012 to December 2022.

3.24 The lower quartile house price has increased from £155,000 to £300,000 over this period.

3.25 This means that of the 193 LSOAs in Shropshire, the LSOA covering Tilstock and Prees Heath has experienced the 18th highest increase in lower quartile house price (i.e. within the highest 10% of increases across Shropshire).

3.26 In terms of median house prices, HPSSA dataset 46 is available. This shows how the median house price increased by 64% in the LSOA in which the proposal site is located which is within the top 50% of increases.

3.27 The average median price is now £350,000, an increase of £135,000 from the figure of £215,000 a decade ago. This is also higher than the average across Shropshire of £299,000.

Summary

3.28 In summary the key points to note from this section are as follows:

- The median affordability ratio is 8.15 as of 2024, exceeding both the regional and national averages.
- Locally, the median affordability ratio for the MSOA in which the development site is located is 6.35, within the 10% least affordable MSOAs (of 39 MSOAs in total) in Shropshire.
- The lower quartile house price in the LSOA in which the proposal site is located is now £300,000, and the LSOA has experienced the 18th highest increase (94%) in Shropshire (of 193 LSOAs) over the last decade.
- The median house price increase has not been as pronounced but has still been 64% and higher than average.

3.29 This analysis shows how Shropshire Council and the local area to the proposal site have acute affordability issues when considered locally, regionally, and nationally, indicating a need for new housing to drive down prices and make housing more affordable for all, particularly in the case of housing for those on lower incomes (i.e., younger age groups).

3.30 The requirement to provide for these age groups is highlighted by the demographic analysis set out in section 2 of this report, including the higher than average increases in households where 3 or more adults live (indicating adult children living at home) in the local areas of study, and the higher-than-average child age and first-time buyer age population decline between the 2011 and 2021 Censuses.

4. HOUSING NEED AND DELIVERY IN THE STUDY AREA

Introduction

4.1 This section of our report considers the amount of housing which has been delivered in Tilstock and Tilstock & Prees. In this context we then consider what the indicative housing need is based on the methodology set out in Appendix A of the 'Housing Needs Assessments at Neighbourhood Plan' document drafted by AECOM for Locality and referred to in paragraph ID: 41- 105-20190509 of the 'Neighbourhood Planning' section of Planning Practice Guidance (PPG).

Methodology for assessing housing need

4.2 For our assessment of overall need we follow the methodology referred to above from the PPG.

4.3 The **first step** in determining the need is to work down from the housing target or requirement for the local planning authority, however the guidance states *"If the Local Plan was adopted before January 2019, the housing target is likely to have been determined under previous planning policy and guidance. If this is the case, speak to your local authority about whether they intend to produce an up-to-date figure or whether the Local Plan requirement remains valid."*[10]

4.4 Because the most recently adopted housing requirement was the figure included in the Site Allocations and Management Development (SAMDev) Plan in December 2015, over 9 years ago, we consider that this figure could be used from 2006/07 to 2019/20. However, due to a lack of available information on completions for the first five years we have assessed need from 2011/12 onwards as we explain later in this section.

4.5 For future need we have used the December 2024 NPPF standard method minimum which is 2,005 dpa as of April 2025.

4.6 The **second step** is to determine the population in the Neighbourhood Plan area, and what proportion this is of the local authority area's population. As we have identified earlier in this report there are no Neighbourhood Plans covering the area where the development site is located.

[10] Page 58, Housing Needs Assessments at Neighbourhood Plan Level, Locality

4.7 We have therefore used the Tilstock, Ash Magna/Ash Parva, Prees Heath, Ightfield and Calverhall Community Cluster (referred to as Tilstock throughout this report) and the Tilstock cluster plus the Prees and Prees Higher Heath Community Cluster (referred to as Tilstock & Prees).

4.8 The 2022 mid-year population estimates published by the ONS are the most recent source available for this purpose. Table 4.1 sets out the population for the Tilstock area, the wider Tilstock & Prees area, and Shropshire Council.

Table 4.1: 2022 mid-year population estimates

Area	Population	% of District
Shropshire Council	327,479	100%
Tilstock & Prees	5,287	2%
Tilstock	2,077	1%

Source: ONS 2022 mid-year population estimates

4.9 As Table 4.1 illustrates, the Tilstock area accounted for 1% of Shropshire Council's 2022 population, and the Tilstock & Prees area accounted for 2%.

4.10 The next step is to consider whether the need would reflect the overall **development strategy** for the local planning authority, taking into account the intended distribution of development including targets for specific areas.

4.11 Although out of date, Table MD1.1 of the SAMDev allocated 10,000 dwellings to the 'Rural Areas' of Shropshire between 2006 and 2026. This excluded the 'County Town and Sub-regional Centre' of Shrewsbury, and 17 'Market Towns and Key Centres.'

4.12 This distribution of development meant that 36.4% of the 27,500-housing requirement in the SAMDev was allocated to Rural Areas, 2006-2026.

4.13 The population of the Rural Areas combined was 125,559 people as of mid-2022, meaning Tilstock's population (2,077 people) and Tilstock & Prees population (5,287 people) were 2% and 4% of the Rural Areas population respectively.

4.14 In the context of the above and the AECOM guidance, it is therefore considered that 36% of the housing need figure could be applied to the rural areas, and that 2% and 4% of this overall need for rural areas could be applied to Tilstock and Tilstock & Prees respectively.

4.15 **Step 3** of the guidance then states *"any dwellings that have already been completed over the neighbourhood plan period to the present date (or to the last date for which data is available) should be deducted from the total to provide a housing need figure for the remainder of the Plan period that reflects past under- or over-delivery"* [11] (our emphasis).

4.16 We have not been able to obtain net housing completions for the 2006/07 – 2010/11 period for the two sub district areas and have not therefore assessed need for this period.

4.17 However, the most recent five-year housing land supply statement (published 13th February 2025) provides completions data for the 2011/12 to 2023/24 period, and we have set this out in Table 4.2.

Table 4.2: Net Completions 2011/12 to 2023/24 in the study areas

Area	Completions 2011/12 to 2023/24
Tilstock cluster	166
Prees and Prees Higher Heath cluster	84
Tilstock & Prees	**250**

Source: Pages 52-53, Shropshire Council Five Yeah Housing Land Supply Statement, 13th February 2025

4.18 As Table 4.2 illustrates, there have been 250 net completions across the two clusters (166 in Tilstock and 84 in Tilstock & Prees) since 2011 according to the Council's most recent five-year housing land supply statement.

4.19 Using this information, we are able to assess housing need to date, but also for the future.

Determining existing housing need

4.20 We have determined need based on the Council's own series of five-year housing land supply statements which incorporated the following housing requirements:

- 1,390 dpa 2011/12 to 2020/21.
- 1,530 dpa 2021/22 to 2023/24.
- 2,005 dpa 2024/25 to 2037/38.

[11] Page 59, Housing Needs Assessments at Neighbourhood Plan Level, Locality

4.21 Table 4.3 summarises what this would mean for need based on the population % and distribution strategy approaches set out in the guidance referred to by PPG.

Table 4.3: Housing need based on the adopted Local Plan housing requirement, 2011/12 to 2023/24 and the distribution of development strategy % of the adopted Local Plan

Area	Need based on Local Plan strategy	Need based on population %		Completions to date (2011/12-2023/24)	Outstanding housing need
Tilstock	150	185		166	*-16* to 19
Tilstock & Prees	300	370		250	50 to 120

4.22 Table 4.4 illustrates how based on the outdated housing requirement of the adopted Local Plan there has been a slight over-delivery (16 dwellings) for the Tilstock cluster, but there remains a need for an additional 50 dwellings based on the distribution strategy of 10,000 dwellings to rural areas in the 2015 SAMDev Plan.

4.23 However, we consider this should be approached with caution due to the age of the Plan and this distribution strategy (i.e., over 9 years since adoption).

4.24 We consider the population % approach to be more robust as it is based on the most recent 2022 mid-year population estimate for Shropshire and the two study areas.

Future housing need

4.25 As we have already identified, Shropshire Council intend to withdraw their draft Local Plan in July 2025. In this context the most recent February 2025 five-year housing land supply statement uses the December 2024 NPPF's new standard method for the calculation of minimum housing need.

4.26 The new standard method was 1,994 dpa prior to new affordability ratios being published on 24th March 2025. The new affordability ratios have led to a slight increase to minimum housing need for Shropshire, and it is now 2,005 dpa.

4.27 We have therefore calculated future need from 2024/25 to 2037/38 based on this being the period for the most recent draft Local Plan. Need for this period is therefore summarised in Table 4.4.

Table 4.4: Housing need based on standard method minimum need, 2024/25 to 2037/38 and the distribution of development strategy % of the adopted Local Plan

Area	Need based on Local Plan strategy	Need based on population %
Tilstock	204	281
Tilstock & Prees	409	561

4.28 The outstanding need/surplus from the 2011/12-2023/24 period set out in the final column of Table 4.3 would need to be added to the figures for the 2024/25 to 2037/38 period in Table 4.4. Table 4.5 provides this calculation.

Table 4.5: Housing need based on standard method minimum need, 2024/25 to 2037/38 and the distribution of development strategy % of the adopted Local Plan plus outstanding need/surplus 2011/12-2023/24

Area	Need based on Local Plan strategy	Need based on population %
Tilstock	204 – 16 = 188	281 + 19 = 300
Tilstock & Prees	409 + 50 = 459	561 + 120 = 681

4.29 The AECOM guidance then moves on in Step 3 to state *"Outstanding housing commitments (planning permissions that have been granted but where construction is still underway or has not begun) can be considered here as well. However, they should not be discounted from the housing need figure until they are completed*[12] (our emphasis).

4.30 Although the guidance states that outstanding commitments which haven't been completed should not be deducted from the housing need figure, it is useful to understand how they would affect the need.

4.31 The commitments for each area is set out below in Table 4.6, taken from the Council's February 2025 five-year housing land supply statement.

Table 4.6: Housing Commitments with Planning Permission in Tilstock and Tilstock & Prees on March 31st 2024

Area	Sites with Planning Permission or Prior Approval
Tilstock	5
Tilstock & Prees	57

Source: Table 12, Shropshire Council Five Yeah Housing Land Supply Statement, 13th February 2025

[12] Page 59, Housing Needs Assessments at Neighbourhood Plan Level, Locality

4.32 As Table 4.6 illustrates, there are a total of 5 commitments with planning permission in Tilstock, and 57 in Tilstock & Prees.

4.33 Table 4.7 therefore summarises how this affects the need for housing between 2024/25 and 2037/38.

Table 4.7: Housing need, 2024/25 – 2037/38, minus commitments

Area	Need based on Local Plan strategy	Need based on population %	Minus all commitments with planning permission	Outstanding Housing Need 2024/25 – 2037/38	
				Local Plan Strategy	Population %
Tilstock	188	300	5	183	295
Tilstock & Prees	459	681	57	402	624

4.34 Table 4.7 therefore shows how there remains an outstanding need of between 183 and 295 homes for the Tilstock area, and between 402 and 624 homes for Tilstock & Prees area, 2024/25 – 2037/38 even if we assumed that all commitments with planning permission are built out.

4.35 However, this is for illustrative purposes only as the AECOM guidance is clear that commitments with planning permission can be 'considered', but ultimately should not be discounted from the calculation of need until completion.

Need and Delivery in Tilstock Village

4.36 In the context of the proposed development being located in Tilstock village, we have taken the analysis one step further to establish need in the village in isolation. It should be noted that the smallest level of geography available (output area) dissects the village and includes the small hamlet of Alkington and a small area near to Ash Magna. Population in these areas is likely to be minimal due to their rural nature and is not considered to unduly affect the analysis for the village.

4.37 The population as of 2022 in Tilstock village was 843, which is 41% of the Tilstock cluster (2,077 people) as set out above.

4.38 If we were to apply 41% to the cluster need for 2011/12 to 2023/24 (185 dwellings) the village need would be 76 dwellings. Since 2011 we have recorded 45 completions in the village, leaving outstanding need of 31 in the village to 2023/24.

4.39 Added to this would be 41% of the *future* need for the Tilstock cluster (281 dwellings 2024/25 to 2037/38) which would be 115 dwellings.

4.40 In total, based on the outstanding need to date (31 dwellings) and the newly arising need (115 dwellings) there is a need for 146 dwellings in the village based on the population approach.

4.41 Based on the Local Plan Strategy approach, Tilstock village was proposed to take 50% (100 dwellings) of the total development for the cluster. This would have equated to 75 dwellings to 2023/24 and then 102 to 2037/38 based on our calculations for the wider Tilstock cluster.

4.42 Once completions to 2023/24 are taken account of (45) this would leave an outstanding need of 132 dwellings overall.

4.43 Within the village itself we therefore conclude the need to be between 132 and 146 dwellings to 2037/38. If the demolition of 17 dwellings at the village's nursing home are accounted for the need increases to between 149 and 163 dwellings.

Summary

4.44 In summary, this section of the report has determined there to be an outstanding housing need in the Tilstock cluster and Tilstock & Prees clusters combined from the period of 2011/12 to 2023/24.

4.45 This outstanding need and the calculation of need for the most recent emerging Plan period (to 2037/38) shows a need for between 188 and 300 dwellings in Tilstock and between 459 and 681 dwellings across the Tilstock & Prees area.

4.46 The AECOM local needs assessment guidance included in the national Planning Practice Guidance is clear that outstanding housing commitments (planning permissions that have been granted but where construction is still underway or has not begun) should not be discounted from the housing need figure until they are completed.

4.47 Notwithstanding this guidance, even if we were to deduct all the commitments with planning permission listed in the Council's most recent five-year housing land supply report, there would remain an outstanding need for housing over the most recent emerging Local Plan period of 2024/25 – 2037/38 of 183 to 295 dwellings in Tilstock and 402 – 624 dwellings across the combined Tilstock & Prees area.

4.48 If we were to distil this analysis down to the village of Tilstock alone the need is between 132 and 146 dwellings to 2037/38 (149 to 163 if the nursing home demolition of 17 units is accounted for).

5. SUMMARY AND CONCLUSIONS

5.1 The purpose of this technical report has been to assess what the housing need is in Tilstock and its surrounding area, within Shropshire Council.

5.2 As Figure 1.1 illustrates we have assessed need in the Tilstock, Ash Magna/Ash Parva, Prees Heath, Ightfield and Calverhall Cluster (referred to as the Tilstock cluster in this report) and the combined area of the Tilstock cluster with the separate Prees and Prees Higher Heath cluster (this combined area is referred to as Tilstock & Prees throughout the report).

5.3 We have chosen to include the combined area given the settlement of Tilstock being located very close to the Prees and Prees Higher Heath cluster, and because they represent most of the rural area outside of Whitchurch in area S18 of the Adopted SAMDev Policies Map.

5.4 Furthermore these cluster areas were proposed to remain consistent in the draft new Local Plan which is due to be withdrawn in July 2025.

5.5 As part of our analysis we have considered housing need and delivery over the course of the adopted SAMDev Plan period (2006-2026), alongside what the need is based on the National Planning Policy Framework's (NPPF, December 2024) standard method for calculating local housing need.

5.6 We have also considered the 2021 Census and how the demographics of the two areas have changed since the 2011 Census, and whether the trends experienced are likely to support NPPF objectives for rural areas. This includes ensuring that development encourages the creation of mixed, balanced, and inclusive communities.

5.7 The conclusion is that there is an outstanding need for housing in both areas as this report details, which can be summarised as follows.

Demographics

5.8 Tilstock and Tilstock & Prees have experienced significant declines in the child age population and first-time buyer population which contrasts with lower declines or increases across Shropshire and the West Midlands. This is emphasised by sharper declines in HRP in Tilstock & Tilstock & Prees compared with Shropshire and the West Midlands.

5.9 The proportion of HRPs aged under 49 is also noticeably lower in Tilstock and Tilstock & Prees than across Shropshire and the West Midlands.

5.10 Tilstock & Tilstock & Prees both have higher proportions of households with 3 or more adults than Shropshire or the West Midlands, indicating higher levels of concealed households.

5.11 Furthermore, a much higher proportion of homes in both the Tilstock (85.8%) and Tilstock & Prees (85.7%) clusters are under-occupied compared with Shropshire (79.9%) and the West Midlands (70.3%). These larger households are unlikely to come back onto the market in affluent rural areas. The increase in larger unoccupied homes where 2 or more bedrooms are unoccupied has increased at a far greater rate locally and across Shropshire when compared to the West Midlands.

5.12 Despite there being a high proportional level of 3+ bedroom stock, a limited amount is coming back onto the market as the underoccupancy data illustrates, fueling demand.

5.13 The change in the number of households 2011-2021 in Tilstock itself has been lower than the other three comparator areas for all bedroom sizes indicating limited growth.

5.14 There has also been a significantly higher increase in retirees in Tilstock and Tilstock & Prees than across Shropshire and the West Midlands between 2011 and 2021. This highlights how many of the under-occupied properties will be inhabited with older residents.

5.15 These demographic factors combine to indicate that housing need in Tilstock and Tilstock & Prees for the under 49 population in particular is much more acute than across Shropshire and West Midlands.

5.16 Without providing adequate housing, the trends experienced over the 2011-2021 period will continue and worsen, creating an increasing lack of balance in the communities and therefore failing to align with the NPPF objective of creating mixed and balanced communities.

Affordability

5.17 The median affordability ratio in Shropshire is 8.15 as of 2024, exceeding both the regional and national averages and highlighting how affordability constraints are more pronounced than average levels.

5.18 Locally, the median affordability ratio for the MSOA in which the development site is located is 6.35, within the 10% least affordable MSOAs (of 39 MSOAs in total) in Shropshire.

5.19 The lower quartile house price in the LSOA in which the proposal site is located is now £300,000, and the LSOA has experienced the 18th highest increase (94%) in Shropshire (of 193 LSOAs) over the last decade.

5.20 The median house price increase has not been as pronounced but has still been 64% and higher than average.

5.21 Notwithstanding the fact that Shropshire has a more acute affordability problem than the regional and national averages, the area local to the proposal site has more acute affordability issues than the Shropshire average. New housing is needed locally to try and reverse this trend and ensure that there is more opportunity for people to live in the area and maintain its amenities.

Housing delivery and need in Tilstock village, the Tilstock cluster, and the Tilstock & Prees clusters combined

5.22 Based on the guidance for determining local housing need referred to in Planning Practice Guidance (PPG), this report has established there to be an outstanding housing need in the Tilstock cluster when considered in isolation, and the wider study area of Tilstock & Prees as set out in Table 5.1.

Table 5.1: Housing need based on the Adopted Local Plan requirement, 2011/12-2023/24, and the 2024 NPPF's standard method minimum need for Shropshire over the emerging Local Plan period (2024/25-2037/38)

Area	Need based on Local Plan strategy	Need based on population %
Tilstock village	132	146
Tilstock cluster	188	300
Tilstock & Prees clusters combined	459	681

5.23 The guidance states that *"Outstanding housing commitments (planning permissions that have been granted but where construction is still underway or has not begun) should not be discounted from the housing need figure until they are completed"* and Table 5.1 therefore does not consider commitments.

5.24 However, even if we were to assume the delivery of all commitments listed in the most recent 2023/24 Five Year Housing Land Supply Statement published by Shropshire Council, an outstanding need would remain for 183 to 295 dwellings in the Tilstock cluster, and 402-624 dwellings in the combined Tilstock & Prees clusters.

Conclusion

5.25 This report has shown a clear and urgent need for additional housing in the Tilstock cluster and the Tilstock & Prees clusters combined to address worsening demographic and affordability trends in the local area and deliver housing need calculated using the methodology recommended by Planning Practice Guidance.

5.26 At the more local level in Tilstock village itself there also remains an outstanding housing need.

5.27 Failure to address demographic trends and worsening affordability indicators will mean the NPPF objective to *"be responsive to local circumstances and support housing developments that reflect local needs"* will not be achieved. Furthermore, without new housing it will be difficult to achieve the objective to *"enhance or maintain the vitality of rural communities"*.

Appendix 2 – Arboriculture Position Statement

Appeal Reference: APP/L3245/W/25/3362414
Local Authority Planning Application Reference: 24/04176/FUL

FPCR | environment & design




Position Statement for Arboriculture

Appellant

Boningale Developments Limited

Respondent

Shropshire Council

Site

Land to the East of Tilstock Road, Tilstock, Whitchurch, Shropshire

Date

May 2025

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Rev	Issue Status	Prepared/Date	Approved/Date
-	Draft	HR / 13.05.25	HCK / 13.05.25
-	Final	HR / 19.05.25	HCK / 19.05.25

1.0 BACKGROUND AND PURPOSE

1.1 This Position Statement for Arboriculture has been prepared by FPCR Environment and Design Limited (FPCR) on behalf of Boningale Developments ('the Appellant') to set out the position regarding Arboricultural matters relating to an appeal for non-determination of planning permission by Shropshire Council ('the Council').

Arboricultural Baseline

1.2 FPCR prepared an Arboricultural Assessment dated October 2024 (CD 9.4) as part of the planning application. The Assessment was carried out in accordance with British Standard 5837 (2012) '*Trees in Relation to Design, Demolition and Construction – Recommendations*' (hereafter referred to as BS5837). It fully describes the existing tree cover associated with the appeal site and discusses the impacts of the proposed development.

1.3 A total of four individual trees, three groups of trees and a single hedgerow were surveyed as part of the Arboricultural Assessment. Trees were surveyed as individual trees, groups and hedgerows as per an acceptable survey methodology set out within the submitted Arboricultural Assessment.

1.4 Trees ranged in quality from high (category A) to low (category C), including two trees of moderate quality (category B). There were no specimens regarded as unsuitable for retention (category U) recorded.

1.5 T1 was a large mature specimen of English oak *Quercus robur* that reach a height of 20m from ground level and held a crown spread of 11m measured radially from the stem. T1 was in a fair physical condition and graded Category A, a specimen of high arboricultural value and quality, due to its considerable future life expectancy by virtue of species and positive visual impact within the wider landscape by virtue of size.

1.6 Trees T2 and T3, also English oak were located on the northern boundary of the site. These two mature oak trees were graded Category B having been downgraded from the higher Category A due to presenting slightly lower quality overall.

1.7 T4 was a specimen of field maple *Acer campestre* whose existence had developed from the hedgerow (H2) along the northern boundary of the site. This tree was in a fair condition but graded as Category C for its limited overall impact on the wider landscape.

1.8 G1 was positioned just to the north of the site boundary, adjacent to Tilstock Road. This group had developed around a pond and mainly consisted of alder *Alnus glutinosa* specimens.

1.9 G2 formed a portion of the southern boundary of the site and consisted of tall specimens of sycamore *Acer pseudoplatanus* that reached 15m in height. This group was graded as Category B, of moderate landscape and arboricultural value for the screening benefit it provided to the residential houses to the south.

1.10 G3 formed the remainder of the southern boundary and consisted of outgrown hedgerow specimens of hawthorn *Crataegus monogyna*, hazel *Corylus avellana* and holly *Ilex aquifolium.* Although this group formed a dense buffer to the site, it could only be considered as Category C material of limited overall arboricultural and landscape value.

1.11 Two hedgerows (H1 and H2) were recorded around the field boundary, both of which were typical maintained field boundary hedgerows comprising of native species including hawthorn and blackthorn predominately. Both hedgerows were considered as retention Category C for their limited arboricultural merit.

1.12 None of the assessed trees were considered as ancient or veteran trees in accordance with accepted methodologies.

2.0 SUBMITTED DOCUMENTS

2.1 The submitted documents relating to the above application in respect of arboriculture are as follows.

2.2 An Arboricultural Assessment dated October 2024 including a Tree Survey Plan, Tree Retention Plan and Arboricultural Impact Assessment (AIA) was submitted as part of the planning application (CD9.4) and was deemed fit for the purpose of setting out the Arboricultural baseline and identification of any impacts to existing trees. The Retention Plan shows the development proposals superimposed with the Tree Survey to illustrate impacts arising from the proposed development on existing trees and hedgerows and to highlight the opportunities for new landscaping and tree planting.

2.3 The plans contained within the above assessment are as follows:

- Tree Survey Plan (12304-T-01)
- Tree Retention Plan (12304-T-02A)

3.0 ARBORICULTURAL IMPACTS

3.1 The proposals have been carefully considered and designed through a 'constraint led' process to take account of existing trees thereby ensuring there are minimal impacts to existing trees and hedgerows, both directly and indirectly as a result of developing the site for residential use.

3.2 The only impact upon the existing trees and hedgerows arising from the proposals is as a result of creating an access into the site.

3.3 No other trees or hedgerows would be affected.

3.4 Thus, the only existing tree cover needing to be removed, as per the Site Layout (CD6.23) would be a section of H1 to facilitate access into the site from Tilstock Road.

3.5 H1 was a typical managed boundary hedgerow consisting of blackthorn *Prunus spinosa*, hawthorn, sycamore and English elm *Ulmus procera.*

3.6 The loss of this section of hedgerow would be replanted as part of a landscaping scheme around the entrance.

3.7 The Site Layout has incorporated new green space along the entire length of Tilstock Road, forming a landscaped area between the road and the housing area which will provide ample space for new hedgerow and tree planting and would more than mitigate for the loss of part of H1 to access. The loss of visual amenity from the removal of H1 will be regained long term along with additional tree planting, all of which will be set to increase the amount of tree cover to that which currently exists along Tilstock Road.

4.0 LPA PLANNING CONSULTATION RESPONSE

4.1 On the 22nd November 2024 comments were received from the resident Arboricultural Officer Martin Sutton at Shropshire Council in relation to the site layout (CD 16.1). These are set out below for ease.

1. Layout:

The Site Layout Plan (P24-1425_DE_002_C_02) is considered generally acceptable from an arboricultural perspective. There is, however, one point at the north-east corner of the site where a conflict is perceived between the housing layout as proposed and existing boundary trees to be retained. The rear gardens of plots 67, 68 and 69 are seen to be overhung to a considerable degree (about half of each garden) by the canopies of two mature oak trees located within the hedgerow boundary to the site. These trees are identified in the Arboricultural Assessment (fpcr, October 2024) as T2 and T3. These trees are currently recorded as being 16m in height and having radial crown spreads of 8m (T2) and 9m (T3). Although classed as 'mature', both these trees have the potential to increase significantly in size, by up to some 10m in height and some 4-5m in radial branch spread.

The trees are located to the north of the dwellings, so shading of the properties is not considered to present undue problem. However, the degree of canopy overhang is considered to be excessive, and likely to restrict reasonable use and enjoyment of the gardens. In addition, the proximity of these large trees is likely to have an overbearing presence as a 'green wall' from the main rooms windows facing them and, being mature trees which naturally carry a certain amount of dead wood, cause concerns for future occupants as to tree safety. These issues are likely to lead to pressure for heavy pruning or possibly even removal of the trees.

This could not be considered a successful juxtaposition between trees and new housing and thus does not constitute a sustainable development. It is contrary to the NPPF and local development framework policies on sustainable development and design and protection of the natural environment (CS6, MD2 and MD12).

It is therefore recommended that the layout of the development be reviewed and amended with respect to plots 67, 68 and 69, so as to create a more successful and sustainable juxtaposition between trees T2 and T3 and the dwellings and their gardens on these plots.

5.0 APPELLANTS RESPONSE

5.1 There was generally a positive response from the resident Arboricultural Officer whereby he states that the Site Layout (CD6.23) is '*considered generally acceptable from an arboricultural perspective*'.

5.2 The main concerns from the Officer focus on the two mature oak trees (T2 and T3) located along the northern boundary and for '*perceived conflict*' between the trees and plots 67, 68 and 69.

5.3 Regarding the first point relating to future growth and size increase, although trees T2 and T3 could potentially increase in dimensions, the final height and spread would be unpredictable due to the uncertainties in both future climatic and growing conditions both of which would affect the rate and size that a tree could achieve.

5.4 Despite the unpredictability and uncertainty surrounding the future size of any given tree, it would be reasonable and appropriate to undertake sensitive crown pruning to ensure that any given tree is managed suitably for the situation it is located in. It would be considered reasonable and appropriate to undertake crown pruning work to T2 and T3 as required and for the work to be approved by the LPA prior to implementation through a planning condition.

5.5 Regarding the second point relating to the degree of canopy currently overhanging the proposed gardens of plots 67, 68 and 69, while it is acknowledged there is overhang onto the gardens, it would not be considered excessive or unreasonable. It would also not be considered unreasonable and inappropriate to undertake sensitively applied pruning work to the trees as per the above paragraph, in the future to ensure that the canopies are suitably managed. This may involve some minor crown reduction work, using suitable growth points to maintain natural character, periodically applied in accordance with industry standards, meaning such work would not result in adverse harm to the trees and visual amenity would be maintained. The oak species is tolerant of pruning and therefore would not be subjected to any long-term detriment.

5.6 Regarding the third points relating to the trees '*restricting reasonable use and enjoyment of the gardens…..proximity of these large trees being likely to have an overbearing presence as a 'green wall' from the main rooms windows facing them and, being mature trees which naturally carry a certain amount of dead wood, cause concerns for future occupants as to tree safety….leading to pressure to prune or remove*', it is only a perceived view that future occupants will not welcome the presence of a mature tree at the end of their garden. Canopies of trees can provide notable cooling by their presence thus in periods of hot, dry weather such as that experienced in the summer of 2022, shade from trees was welcomed. The cooling effect is considerable. In an age where we are at increased risk from skin cancers, shade from trees is also a benefit. The rear gardens of these plots offer part shade and part openness meaning future occupants have the benefit of both.

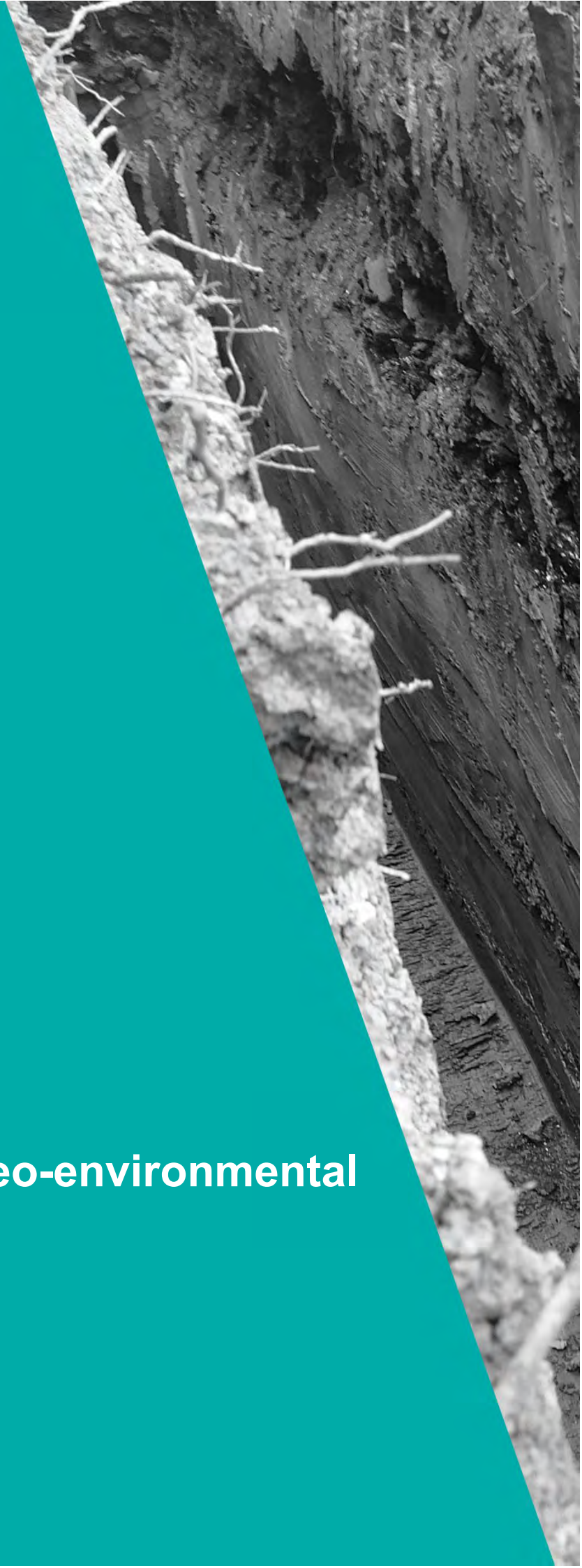
5.7 Regarding the Officers comment about the presence of deadwood creating another perceived reason for future occupants to be concerned for safety, the removal of deadwood from trees is a common management activity and would not be unreasonable to manage by removing any large pieces and managing appropriately.

5.8 As such, the transition of site from open countryside to a residential setting would mean a degree of management would be inevitable both in the form of minor crown lifting, appropriate crown reduction and removal of dead wood to integrate trees with residential use. It would be recommended any works are carried out prior to occupation of the dwellings. The aim of the work and being sensitively applied would create a harmonious relationship between the retained trees and the gardens whilst maintaining character and visual amenity.

5.9 In summary, the retention T2 and T3 is important, and the proposals have been designed with a constraint led process to ensure their successful integration long-term. The crown management as set out above would not be detrimental to the trees and through this management a sustainable long-term relationship could be achieved between T2 and T3 and the proposed dwellings. As such it is considered that the proposals are sustainable from an Arboricultural perspective and are not in conflict with NPPF, local development framework policies on sustainable development and design and protection of the natural environment (CS6, MD2 and MD12).

Appendix 3 – Gas Monitoring

Eastwood
CONSULTING ENGINEERS



Phase 2
Geotechnical and Geo-environmental Site Investigation

Tilstock Road, Tilstock

Boningale Homes Limited

17 March 2025

Eastwood
CONSULTING ENGINEERS

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PHASE 2
GEOTECHNICAL AND GEO-ENVIRONMENTAL SITE INVESTIGATION

LAND OFF TILSTOCK ROAD, TILSTOCK

FOR

BONINGALE HOMES LIMITED

17 March 2025

48888-ECE-XX-XX-RP-C-0008

PHASE 2
GEOTECHNICAL AND GEO-ENVIRONMENTAL SITE INVESTIGATION

LAND OFF TILSTOCK ROAD, TILSTOCK

FOR

BONINGALE HOMES LIMITED

ISSUE 2

Job No.	:	48888
Report Status	:	Issue 2
Document Date	:	17 March 2025
Approved	:	Kate Edwards

Kate Edwards
Technical Director

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Appendix 2 Soakaway Logs – SA01 to SA02A and SA04

Trial Pit Logs – TP01, TP03, TP04, TP06 to TP09, TP11, TP13 to 16 and TP18

Cable Percussive Borehole Logs – CP01 to CP07

Site Investigation Photographs

Appendix 3 Geotechnical Test Results – PSL Report 24/8061

Mexecone Probe Test Results – MP01 to MP11

Infiltration Rate Calculations

Appendix 4 Chemical Test Results - i2 Analytical Report 24-045716-2 & 24-051219-1

Table of Assessment Values – Residential with Homegrown Produce

Appendix 5 Ground Gas and Groundwater Monitoring Results

Table of Atmospheric Pressures

1.0 EXECUTIVE SUMMARY

1. The approximately 4.1-hectare site is located to the east of Tilstock Road, north of Tilstock in Shropshire. The site is currently part of a larger field and features two small circular (<5%) surface-flooding features in the south east and central north west of the site and a pond is present on the north western boundary, surrounded by trees. The site has had no previous development other than small, localized ponds.

2. Seventeen trial pits and seven cable percussive boreholes have been undertaken. Below an average 0.44 m of topsoil lies natural interbedded sand and soft to firm clay (superficial glaciofluvial deposits). The CP boreholes recorded these strata to extend to between 5.5 and 10.2 m.

3. Below the superficial glaciofluvial deposits, a firm to stiff dark brown clay with varying sand and clay content was proven to at least 15 m depth by most of the cable percussive boreholes. This stratum is expected to be the Lias Group.

4. Made ground comprising very soft dark grey and black slightly sandy slightly gravelly clay with wood fragments was encountered locally two trial pits in the south east of the site to depths of between 1.8 and 2.1 m, associated with a backfilled pond.

5. A shallow water table is present, with most exploratory holes recording water ingresses in the upper 3 m, which frequently caused side collapse. Most of the monitoring wells have recorded water at around 0.3 to 1.3 m bgl, during the autumn and winter seasons.

6. The shallow superficial deposits are of variable type and strength. The most suitable foundations are considered to be piled foundations driven into the deeper superficial deposits or the underlying Lias Clay.

7. Should seasonal fluctuations in the water table level occur, meaning in warmer, drier months the water table lies at a greater depth, there may be some opportunity to utilise spread foundations in the shallow superficial deposits. This would likely only apply to a proportion of plots and additional investigation would be required at the time of construction to ensure the shallow ground provides a suitable bearing capacity.

8. A number of the trial pits experienced side instability. Where trial pits were left open, the collapse occurred within 1 to 3 hours. Running sand was also encountered in all trial pits with water ingress. Groundwater control may be required for deeper excavations.

9. Lab results indicate CBR values of <1% may be recorded, although insitu Mexecone probes indicate slightly higher CBR values of around 2% could be achieved. CBR tests should be undertaken at road formation. Should low CBRs be recorded, a thickened road construction may be necessary, potentially including geogrid. An allowance for excavating soft spots and replacing with compacted granular material should also be made.

10. Four soakaway test pits were undertaken. None of the tests drained, and one of the test pits collapsed during monitoring. Soakaway drainage will not be viable.

11. No radon precautions are required. The gas monitoring has recorded slightly elevated concentrations of methane and carbon dioxide in the south of the site for the first two rounds. No elevated concentrations of methane and carbon dioxide have been were recorded in the remaining four rounds. No gas measures other than a ventilated void are considered to be required.

12. None of the samples of topsoil, made ground or natural ground recorded elevated concentrations. Landscaped areas can be completed with a minimum 100 mm topsoil growing medium.

13. Should evidence of unrecorded pond backfill be encountered during construction, samples will be required for chemical testing to ensure the above conclusion still applies.

14. DS-2 AC-2 sulphate precautions should be assumed for below ground concrete. The chemical test results will need to be submitted to the water supplier for review.

15. The conclusions made in this report are subject to agreement by the approving bodies and your warranty provider.

2.0 INTRODUCTION

2.1 Terms of Reference

This report presents the findings of a Phase 2 Geotechnical and Geo-environmental Site Investigation carried out by Eastwood Consulting Engineers (ECE) for, and on the behalf of Boningale Homes Limited. Any other parties using the information in this report do so at their own risk and any duty of care is excluded.

2.2 Context

ECE previously produced a Phase 1 Geotechnical and Geo-environmental Site Investigation for the site, reference 48888-ECE-XX-XX-RP-C-0003, dated 11 September 2024.

This Phase 2 report should therefore be read in conjunction with the Phase 1 report.

2.3 Aims and Objectives

The aims and objectives of this investigation were as follows:

- Detail the ground conditions enabling outline foundation and drainage proposals to be made for the proposed residential development;
- Carry out tiered risk assessment to establish the likely risks to future receptors, involving the use of generic assessment criteria and where unacceptable risks are identified, site specific assessment criteria within a detailed quantitative risk assessment;
- Identify feasible remediation options if unacceptable risks are highlighted; and
- Develop an appropriate remediation strategy where remediation is required.

2.4 Scope of Investigation

This part of the investigation consisted of intrusive works and laboratory analysis. The findings were used to test the conceptual model and produce a final risk assessment. The intrusive works comprised trial pits and cable percussive boreholes which were undertaken to enable:

- Examination of the shallow ground conditions;
- In situ description of soils, enabling any localised lateral and vertical changes in soil conditions to be logged;
- Infiltration tests to be undertaken;

- Assessment of any contamination identified using visual and olfactory methods;
- Collection of soil samples for chemical and geotechnical testing; and
- Installation of ground gas and groundwater monitoring wells.

2.5 Limitations of Investigation

This report is based on the assumption that the site will be developed with residential properties, associated landscaping and hardstanding areas. It is assumed that existing ground levels will not alter significantly. If this is not the case, then the advice given in this report may not be appropriate.

Where assessments of site areas affected in particular ways are given, these are approximate. All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, on the results of laboratory testing carried out as part of the investigation and information gained from a geological and historical desk study. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata and water conditions between or below investigation points. It should be noted that groundwater levels vary due to seasonal or other effects, and may at times differ from those measured during the investigation.

This report considers the ground and groundwater and does not cover any buildings or their fabric or the constituents of any existing hardstanding materials. Generally, testing has only been carried out for contaminants identified as potentially present, with no assessment made of biological contamination. Risks to ecological receptors, such as bats, have not been considered.

3.0 THE SITE

The approximately 4.1-hectare site is located to the east of Tilstock Road, north of Tilstock in Shropshire, centred on grid reference 354285, 338120. Access to the site at the time of this investigation was via farmland to the east of the site. A gate to the site is also present in the south west corner, but this was not open at the time of the investigation.

The site is currently part of a larger field and features two small circular (<5%) surface-flooded features in the south east and central north west of the site. A pond is present on the north western boundary, surrounded by trees. Overhead cables (communication) cross the south western site access.

The site surface has an appearance of a gentle slope down to the east. A topographical survey has been reviewed; there is a localised elevated area at around 106.6 m AOD in the centre of the site. Ground levels appear to generally fall to around 102 m AOD in the south east (average gradient 1 in 35), 105.6 m AOD in the north west and 105 m AOD in the south west.

A wooden fence is present in the south western (<5%) of the site, which restricts access to this part of the site.

The southern boundary is formed of large mature trees with residential buildings to the south whilst the northern and western boundaries are formed of a hedgerow with Tilstock Road to the west. An electric fence denotes the eastern boundary, with a pond visible beyond to the north east.

In the surrounding area, there are agricultural fields to the north and east of the site, and an overhead power cable in the eastern field in a north south orientation. The village of Tilstock is located to the south of the site.

Photographs from the site investigation are included in Appendix 2.

4.0 PHASE 1 SUMMARY

4.1 History

Historically, the site was agricultural land dating back to 1880, comprising open fields with a large pond approximately 30 m in length, in the centre of the site. A second pond is also indicated on the northwestern boundary. A track also crosses the site in a northeast, southwest orientation. The western boundary is formed by a tree-lined road. The southern boundary comprises a field boundary. A road follows the western boundary of the site and the village of Tilstock is located adjacent to the south western boundary of the site with properties present adjacent to the road to the south west of the site.

By the 1920s, housing had been built around 150 m southeast of the site. One of the larger ponds around 225 m south west of the site had been infilled by the 1970s.

Between 1955 and 1971, the central pond and the track are no longer shown. By 1971 a field boundary crosses the northern third of the site in a north-west, south-east orientation. By 1995, this field boundary has been removed.

Satellite imagery dated 2018 shows there is a circular feature to the south east which is assumed to be a surface water feature. By satellite imagery dated 2022, there is a circular feature to the central north of the site, potentially another location of a surface water feature. Historical aerial photography dated 2000 shows a circular feature approximately 75 m to the east of the site. Satellite imagery dated 2012 shows this circular feature to be a surface water feature.

The map dated 2023 confirms the southeastern feature is a pond.

No further significant changes are shown to the present day.

4.2 Geology & Extractive Industries

The geological maps, SJ53NW (1:10,000), Nantwich 122 (1:50,000), and the British Geological Survey (BGS) Online Viewer have been consulted. The solid geology beneath the site is shown to comprise Lias Group mudstone, overlain by superficial glaciofluvial deposits (i.e., sand and gravel)

The solid geology is shown to dip approximately 25 degrees to the north west.

No faults are indicated to be present on site.

Nearby boreholes located approximately 225 m to the south east and south of the site, recorded superficial deposits to be at least 15 m thick, comprising of marl with sand and gravel bands. Water strikes were recorded at around 5 to 16 m bgl.

Two sand pits are present on the historical maps approximately 700 to 850 m to the south of the site, labelled as 'old' on the 1902 map. The outline of the pit is still visible up until the 1973 map, when it is no longer shown and is presumed to have been infilled. There is no evidence on the geological or historical maps to indicate sand extraction has taken place on the site.

The Coal Authority Interactive Map indicates that the site is not within a coal mining reporting area.

4.3 Hydrology, Hydrogeology & Flooding

The superficial deposits beneath the site are classified as a Secondary A Aquifer, defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The underlying bedrock is classified as Unproductive Strata, defined as strata that is unable to provide usable water supplies.

According to the Envirocheck, the nearest surface water feature is a pond, located in the southeast of the site.

Two groundwater abstractions are situated within 250 m of the site, located 73 m to the west and 180 m to the south. Both abstractions are used for 'general farming and domestic'.

The Envirocheck states that the site does not lie within a Groundwater Source Protection Zone.

A small area (<5%) to the south east of the site is at low risk (1000-year return) of flooding from surface water. The entire site has the potential for groundwater flooding of property situated below ground level to occur.

4.4 Ground Gas

No radon protection levels are necessary.

Given the site history, a significant depth of made ground is not anticipated below the site. The exception would be within the backfilled pond, which may contain organic material.

No active or historic landfill sites are recorded by the Envirocheck within 500 m of the site.

The Envirocheck records four potentially infilled water features within 250 m of the site. This includes in the north west, 153 m to the southwest, 208 m to the south and 243 m to the west of the site.

A gas monitoring programme will be required to determine if plots in close proximity to the backfilled ponds require gas measures.

4.5 Outline Conceptual Model

The following table details the possible sources and associated contaminants of concern, pathways and receptors, highlighted by the Desk Study as potentially present:

Source	Potential Contaminants	Potential Pathways	Potential Receptors
Made ground	Heavy metals/metalloids Asbestos PAHs	Ingestion Inhalation Direct contact Biological uptake Migration through ground	Site residents and visitors to the site Site construction workers Aquifers: • Secondary A (superficial); • Unproductive (bedrock); Plants Water supply pipes
Made or natural ground	Sulphates Low pH	Direct contact	Below ground concrete
Pond backfill	Ground gas	Inhalation Migration through ground	Site residents and visitors to the site Site construction workers Buildings

4.6 Unexploded Ordnance (UXO)

According to Zetica's online viewer, the site (and the wider Tilstock area) lies within a 'low' risk of encountering UXO.

5.0 GROUND INVESTIGATION

5.1 Site Works

ECE attended the site on 1 October 2024, and undertook seventeen trial pits (SA01, SA02, SA02A, SA04 and TP01, TP03, TP04, TP06 to TP09, TP11, TP13 to TP16 and TP18). The trial pits reached depths of between 2.0 and 3.8 m below ground level (bgl).

Infiltration tests were undertaken within four pits (SA01, SA02, SA02A and SA04).

Seven cable percussive boreholes were also undertaken (CP01 to CP07) in order to determine the thickness of the shallow superficial deposits. The boreholes reached a depth of 15 or 15.5 m bgl with CP01 extending to 4 m as its purpose was to install a monitoring well only. Wells were also installed in all other CP boreholes to depths of between 2.5 and 4.0 m bgl.

During the site investigation, access to the southwest corner of the site was restricted (<5%) due to a wooden fence, preventing investigation in this area.

The locations of the exploratory holes are shown on the Exploratory Hole Location Plan (Appendix 1). The trial pit and borehole logs, and photographs of the exploratory holes are presented in Appendix 2.

A gas monitoring programme has been completed comprising six rounds undertaken between October 2024 and February 2025 with the results included in Appendix 5. A seventh round of monitoring took place in March 2025 to monitor groundwater only; the results are discussed in Section 6.3.

5.2 Laboratory Testing

Five samples of cohesive strata and one sample of made ground (reworked clay) were sent for plasticity testing and three samples of natural clay for CBR testing to Professional Soils Laboratory in Doncaster. The geotechnical test results are presented in Appendix 3, and discussed further in Section 7.

Sixteen samples of topsoil, two samples of made ground and nineteen samples of natural ground were despatched for chemical testing. Soil samples were taken in 500 g plastic tubs and 250 ml amber glass jars and analysed at i2 Analytical Limited, using MCERTs accredited methodologies, where available. The chemical test results are presented in Appendix 4, and discussed further in Sections 8 and 9.

6.0 GROUND CONDITIONS

6.1 Surface Covering & Made Ground

The entirety of the site is covered by between 200 and 800 mm of topsoil (average thickness 440 mm) predominantly as a described as a slightly gravelly clayey sand.

Made ground was encountered in TP01 and SA02A within the southeast of the site, recording reworked black organic clay with wood fragments to a depth of between 1.8 and 2.1 m. This material likely represents pond backfill.

Two trial pits were excavated within the backfilled pond which was shown on historical maps in the centre of the site, but no evidence of made ground was encountered.

6.2 Natural Ground

Within the trial pits the shallow natural ground comprised interbedded sand and predominately firm clay (locally soft) belonging to superficial glaciofluvial deposits. Where soft clay was noted, a higher proportion of sand and gravel was present, which may be the cause of the 'soft' strength description.

These strata extended to between 5.5 and 10.2 m within the cable percussive boreholes. Standard penetration tests (SPTs) were undertaken at ~1.5 m centres. The results are discussed in Section 7.0.

Below the superficial glaciofluvial deposits, a firm to stiff dark brown clay with varying sand and clay content was proven to at least 15 m depth by most of the cable percussive boreholes. This stratum in expected to be the Lias Group.

6.3 Groundwater

Surface water was noted in the south east of the site, likely present on a semi-continuous basis depending on weather and time of year. CP01 and SA01, SA02 and SA02A were excavated within and around the surface water. CP01, SA02 and SA02A recorded water ingress from surface runoff. SA02 and SA02A were noted to collapse during excavation.

Water ingresses and damp ground were noted in most exploratory holes, occasionally as shallow as 0.2 m but often from around 1 to 4 m depth. Where water ingresses occurred in the granular deposits, running sand conditions occurred.

During the seven rounds of monitoring, the following table displays how shallow the groundwater was recorded:

	Initial Depth to Groundwater (m)						
	9 Oct	24 Oct	21 Nov	18/12/2024	23/01/2025	21/02/2025	07/03/2025
CP01	0.33	0.50	0.50	0.48	0.50	0.52	0.50
CP02	3.55	3.35	3.38	3.43	3.48	3.51	3.52
CP03	1.10	0.65	1.00	1.01	0.97	1.01	0.99
CP04	1.17	1.25	1.26	1.24	1.00	1.22	1.14
CP05	0.83	0.75	0.75	0.78	0.76	0.81	0.79
CP06	0.30	0.43	0.43	0.40	0.45	0.42	0.49
CP07	0.71	0.73	0.63	0.58	0.62	0.58	0.55

The water level in all monitoring wells except CP02 was lowered by bailing in all seven rounds, and the time taken to recharge to original measured depth recorded.

	Comment
CP01	Around 45 minutes to 2 hours to recharge
CP02	No bailing occurred due to deeper depth of water compared to other wells
CP03	Around 15 to 70 minutes to recharge
CP04	Around 2 to 10 minutes to recharge
CP05	Around 1 to 6 minutes to recharge
CP06	Around 10 to 60 minutes to recharge
CP07	Around 9 to 20 minutes to recharge

The rapid recharge rates could be indicative of a locally shallow water table.

7.0 GEOTECHNICAL APPRAISAL

7.1 General

It is proposed that the site will be developed with residential properties of conventional construction with private gardens.

Ground Conditions

Below an average 0.44 m of topsoil lies natural interbedded sand and soft to firm clay, expected to comprise superficial glaciofluvial deposits. The CP boreholes recorded these strata to extend to between 5.5 and 10.2 m.

Below the superficial glaciofluvial deposits, a firm to stiff dark brown clay with varying sand and clay content was proven to at least 15 m depth by most of the cable percussive boreholes. This stratum is expected to be the Lias Group.

Made ground comprising very soft dark grey and black slightly sandy slightly gravelly clay with wood fragments was encountered locally two trial pits in the south east of the site to depths of between 1.8 and 2.1 m, associated with a backfilled pond.

A shallow water table is present, with most exploratory holes recording water ingresses in the upper 3 m, which frequently caused side collapse. Most of the monitoring wells have recorded water at around 0.3 to 1.3 m bgl, during the autumn and winter seasons.

The Party Wall Act will need to be considered for structures associated with neighbouring properties along the site boundaries.

Geotechnical Testing

Five samples of natural cohesive strata and one sample of made ground (reworked clay) were sent for plasticity testing and three samples of natural clay for CBR testing to the Professional Soils Laboratory, in Doncaster. The plasticity results are summarised in the following table:

Sample	Lab Description of Sample	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Modified Plasticity Index (%)	Volume Change Potential
SA02A 2.0 m	Reddish brown slightly clayey SAND & GRAVEL.	15.0	-	-	-	Non plastic
TP03 1.1 m	Reddish brown sandy slightly gravelly CLAY.	14.9	29	15	13.2	Low
TP06 1.4 m	Reddish brown sandy slightly gravelly CLAY.	15.0	27	14	12.1	Low
TP09 1.7 m	Reddish brown sandy slightly gravelly CLAY.	18.4	29	15	13.2	Low
TP11 1.2 m	Reddish brown sandy slightly gravelly CLAY.	18.5	24	14	8.1	Non plastic
TP14 1.4 m	Reddish brown sandy slightly gravelly CLAY.	17.6	27	14	12.5	Low

Cohesive strata can be considered to be of low volume change potential in accordance with NHBC Chapters.

SPTs were undertaken in six CP boreholes at periodic centres, recording the following N values:

Test Depth (m)	CP02	CP03	CP04	CP05	CP06	CP07
1.5	8	3	1	8	11	6
3.0	7	4	17	15	16	5
4.5	11	15	23	15	27	19
6.0	15	23	19	17	8	23
7.5	22	11	19	24	15	14
9.0	9	12	20	29	9	16
10.5	14	22	24	18	12	19
12	26	23	24	25	13	22
13.5	27	29	26	25	22	24
15	22	26	32	27	31	27
Key	**Superficial**					
	Lias Clay					

The upper 3 to 4.5 m of superficial deposits recorded variable N values of between 1 and 27. The lower layers recorded higher results of between 15 and 29.

The upper layer of the Lias Clay occasionally recorded lower N values of between 8 and 14 indicative of firm cohesive strata. With depth, the N values generally improved, recording at least 22 (indicative of stiff strata) in most boreholes below 10.5 m.

Hand shear vane readings were undertaken in the natural clay at a range of depths and recorded undrained shear strengths of between 14 and 129 kPa (average 65 kPa). Occasionally, a soft clay was encountered within which a reading could not be taken.

Where the shallow superficial deposits are holding water, the granular ground may only provide a safe bearing capacity of <40 kPa. The shallow cohesive strata may also provide a range of bearing capacities, potentially as low as 90 kPa, depending on its granular and water content.

7.2 Foundations

The shallow superficial deposits are of variable type and strength. A number of trial pits were left open to assess trench side stability; after between 1 and 3 hours, the trial pit sides collapsed. A proportion of the exploratory holes recorded a shallow water table, which would account for the softened clays, and for side collapse within excavations.

For the proposed development, the most suitable foundations are considered to be piled foundations driven through any made or soft ground and into the deeper superficial deposits or the underlying Lias Clay.

A gas and groundwater monitoring programme has been carried out across the autumn and winter seasons. Should seasonal fluctuations in the water table level occur, meaning in warmer, drier months the water table lies at a greater depth, there may be some opportunity to utilise spread foundations in the shallow superficial deposits. This would likely only apply to a proportion of plots and additional investigation would be required at the time of construction to ensure the shallow ground provides a suitable bearing capacity. Spread foundations would likely comprise thickened, reinforced footings and deepening due to trees or drainage should be avoided in case groundwater is encountered. Minimum footing depth would be 750 mm in cohesive strata and 600 mm in granular ground, constructed in accordance with NHBC Standards.

For piled foundations, heave precautions would need to be allowed for in plots within influence of trees, in accordance with NHBC Standards Chapter 4.2.

7.3 Ground Floors

It is considered that precast concrete floors with a minimum 150 mm high ventilated void (increasing to 200 mm for plots where heave precautions are required) will be required for all plots.

7.4 Superstructure Precautions

Additional superstructure precautions are not considered to be required assuming piled foundations are to be utilised.

7.5 Excavation Problems and Obstructions

A number of trial pits experienced side instability during excavation, particularly SA02, SA02A and TP01. Where trial pits were left open, collapse occurred within 1 to 3 hours. The stability of trenches may be poor where left open for a significant length of time, and if shallow groundwater is encountered.

Groundwater control will likely be required for deeper excavations.

Temporary shoring or support will be required where access to trenches greater than 1.2 m depth, or less where there is risk of collapse, is required in accordance with current Health & Safety Regulations.

7.6 Roads & Hardstanding

Eleven mexecone probe test locations were completed along the route of the proposed road. The results are appended in Appendix 3 and are summarised in the table below.

Location	Average CBR Result (%)
MP01	1.79
MP02	2.78
MP03	3.08
MP04	2.77
MP05	1.83
MP06	1.50
MP07	2.30
MP08	2.28
MP09	1.56
MP10	3.50
MP11	2.50

Three CBR test were undertaken on three bulk samples. The results are appended in Appendix 3 and summarised in the table below.

Location	Depth (m)	CBR Result (%)		Overall Average CBR Result (%)
		Sample Top	Sample Bottom	
CP03	0.50	0.20	0.20	0.20
CP06	0.50	0.20	0.30	0.25
CP07	0.50	0.30	0.40	0.35

The Mexecone probes indicate a CBR value of around 2% may be appropriate for the majority of the proposed road design, However, the lab results recorded much lower CBR values.

Insitu CBR tests should be taken along proposed roads. A shallow water table is also expected to be present, which may soften exposed surfaces. Should low CBRs be recorded, a thickened road construction may be necessary, potentially including a geogrid. An allowance for excavating soft spots and replacing with compacted granular material should be made.

The ground should be assumed to be frost susceptible and a minimum construction thickness of 450 mm will therefore apply.

7.7 Surface Water Drainage

Infiltration tests were undertaken in three trial pits (SA01, SA02 and SA04). SA02A was intended to be used for infiltration tested but was terminated immediately as total side wall collapse occurred during excavation.

- SA01's test was monitored for over 5 hours; the water level drained by around 70 mm before rising back up to original level.
- SA02 was terminated after 15 minutes due to total side wall collapse once water was added.
- SA04's test drained around 170 mm over around 3 hours.

Given the cohesive nature of the natural ground, the presence of a shallow groundwater and the absence of drainage in the infiltration tests, soakaway drainage is not considered to be a viable form of surface water drainage.

8.0 REFINEMENT OF OUTLINE CONCEPTUAL MODEL

8.1 Source Characterisation

An outline conceptual model, detailing the possible sources and associated contaminants of concern, potential pathways and receptors identified in the Phase 1 was detailed in Section 4.6.

This section of the report documents the works undertaken to obtain information to test and refine this model enabling a risk assessment to be produced and, where significant risks are expected, remediation recommendations.

8.2 Ground Gas

No radon precautions are required.

Seven ground gas and groundwater monitoring wells have been installed and a monitoring programme is being undertaken which comprises six rounds at times of low or falling atmospheric pressure. The following results have been recorded to date:

- A maximum peak methane concentration of 2.1% in CP02 in the 1st round which quickly dropped to zero. CP01 also recorded 1.2% methane, which also dropped to a steady zero. All other readings were either 0.3% or zero;
- A maximum carbon dioxide concentration of 5.4% in CP02 in the 1st round. The third round recorded 5.2% from this well. All other concentrations from this well and the others recorded less than 4.8%;
- Carbon monoxide was detected in four wells within the first round, with a peak in CP01 of 140 ppm which dropped to 0ppm and CP03 and CP07 recording a steady rate of 10 ppm. No concentration was detected in the remaining 5 rounds;
- Hydrogen sulphide was detected in CP01 in the first two rounds, recording a peak of 50 ppm in the first round dropping to 0 ppm and a steady 12 ppm in the second round. No concentrations were detected in the remaining 4 rounds;
- A number of wells recorded peak flows, ranging between 2.0 and 32.7 l/hr. All but one of these flows were recorded where water was trapped above the monitoring well's response zone. Given these flows are not representative of actual gassing conditions, they can be discounted. No positive steady flows occurred where the response zone was not flooded;

- Groundwater was encountered in the upper 1 m in most monitoring wells, as shallow as 0.3 m in CP06.

8.3 Investigation of Potential Contamination Sources

Source	Potential Contaminants	Exploratory Hole Used to Investigate Source
Made ground	Heavy metals / metalloids PAHs Asbestos	Made ground was encountered in two exploratory holes within a backfilled pond.
Natural and made ground	Sulphates	Natural ground was encountered in all exploratory holes:
Infilled ponds	Ground gas	Monitoring wells installed in seven boreholes and monitoring programme is ongoing

8.4 Chemical Testing

Sixteen samples of topsoil, eight samples of shallow natural ground and two samples of made ground were analysed for the suite of contaminants listed below.

Contaminant Type	Actual Contaminants
Metals/Metalloids	Arsenic, cadmium, chromium, lead, mercury, nickel, selenium, copper and zinc
pH	pH
PAHs	Speciated PAH
Sulphates*	Water soluble sulphate, acid soluble sulphate, total sulphur
Asbestos**	Fibres

*Made & natural ground only

**Topsoil and made ground only

In addition to the above testing:

- Four topsoil samples, two made ground samples and three samples of natural ground were tested for total organic carbon (TOC);
- Eleven samples of deeper natural ground were tested for pH and a sulphates suite only;

The chemical test results are included in Appendix 4.

8.5 Assessment Criteria

Assessment criteria relating to residential with homegrown produce use have been used. Tables detailing the relevant assessment concentrations used are included in Appendix 4.

8.6 Chemical Test Results

8.6.1 Topsoil

TOC concentrations of 1.3 and 1.5 % were recorded, averaging 1.45% which corresponds to an average soil organic matter (SOM) content of 2.5%. Assessment criteria derived using 2.5% SOM have therefore been used.

None of the samples tested recorded elevated concentrations in exceedance of their respective human health or phytotoxic assessment values, and no asbestos fibres have been detected.

8.6.2 Made Ground

TOC concentrations of 5.6 and 11% were recorded, corresponding to SOM contents of 9.6% and 18.9%. Assessment criteria derived using 6% SOM have therefore been used.

None of the samples tested recorded elevated concentrations in exceedance of their respective human health or phytotoxic assessment values, and no asbestos fibres have been detected.

8.6.3 Natural Ground

TOC concentrations of between 0.3 and 2.2% were recorded, corresponding to an average TOC of 0.93% and an average SOM content of 1.6%. Assessment criteria derived using 1% SOM have therefore been used.

None of the samples tested recorded elevated concentrations in exceedance of their respective human health or phytotoxic assessment values.

8.6.4 Sulphates

In accordance with BRE Special Digest 1, the site comes under the classification of ‘greenfield’ and groundwater is expected to be mobile. The following table details a summary of the results:

Made Ground	Range of Results	Characteristic Value
Water Soluble Sulphate (mg/l)	33, 49	33
Total Sulphur (%)	0.04, 0.06	-
Total Potential Sulphate (%)	0.12, 0.18	0.12
pH	6.2, 6.4	6.2
Natural Ground - Superficials	**Range of Results**	**Characteristic Value**
Water Soluble Sulphate (mg/l)	9.22 to 44.4	39.8
Total Sulphur (%)	<0.005 to 0.17	-
Total Potential Sulphate (%)	0.015 to 0.51	0.31
pH	6.7 to 8.6	6.75
Natural Ground – Lias Clay	**Range of Results**	**Characteristic Value**
Water Soluble Sulphate (mg/l)	23.2 to 57.9	56.7
Total Sulphur (%)	0.019 to 0.039	-
Total Potential Sulphate (%)	0.057 to 0.117	0.10
pH	8.2 to 8.6	8.3

8.7 Significant Pollutant Linkages

The significant pollutant linkages identified are documented in the following table:

Source	Contaminant	Pathway	Receptor
Pond backfill	Ground gas	Inhalation Migration through ground	Site users and visitors to the site Site construction workers Buildings

9.0 RISK ASSESSMENT

9.1 Human Health: Future Site Users

Topsoil & Natural Ground

None of the samples recorded elevated concentrations. The materials can be considered suitable for re-use.

Landscaped areas can be completed with a minimum 100 mm topsoil growing medium.

Made Ground

No elevated concentrations were found within the made ground samples tested indicating no remedial measures in the form of capping are considered to be required.

Should evidence of unrecorded pond backfill be encountered during construction, samples will be required for chemical testing to ensure the above conclusion still applies.

9.2 Human Health: During Construction

Groundworkers employed during the construction phase of the development are most at risk of harm due to them having direct contact with the affected soils. However, the contact is generally of short duration, and all competent ground workers will be aware of the potential risks associated with the made ground soils. Therefore, the overall risk to the health of construction workers is considered to be low.

Normal site procedures, such as the wearing of gloves when handling soils and the washing of hands prior to eating, should be implemented at all times, plus any additional protective measures deemed appropriate.

9.3 Plants

No determinants were recorded to be elevated relative to their respective assessment value for phytotoxicity.

9.4 Ground Gas

No radon protective measures are required.

Evidence of organic matter was encountered within the pond backfill material found in TP01 and SA02A in the form of wood fragments. Samples of this material also recorded an organic matter content of 20%.

Six rounds of gas monitoring have been completed. Two wells installed in the south of the site, CP01 and CP02 have recorded slightly elevated methane and carbon dioxide concentrations within the first round of monitoring. CP01 was installed within the area of a known backfilled pond however no ponds are thought to have existed near CP02.

A maximum methane concentration of 2.1% and a maximum carbon dioxide concentration of 5.4% have been recorded. From the wells where the response zone has not been flooded, no positive steady flows have been recorded.

In accordance with BS8485:2015, the following gas screening values (GSVs) can be calculated using a flow of 0.1 l/hr which is the detection limit of the gas monitor:

- Methane = 0.002 l/hr
- Carbon Dioxide = 0.005 l/hr

Both of these GSVs indicate the gassing regime can be classified as Characteristic Situation 1.

In the 1st and 2nd round respectively, carbon monoxide with a steady rate of 10 ppm and hydrogen sulphide concentrations with a steady rate of 12 ppm were detected. No other concentrations were detected in the remaining four rounds, indicating the initial results may have been anomalous.

It is understood that all plots will be installed with a precast concrete beam and block floor with a minimum 150 mm ventilated void below. Although slightly elevated concentrations have been detected early on in the monitoring programme, the ventilated void below the plots is expected to be sufficient in dispersing the low volume of ground gases which may migrate into the void. To summarise, the only gas measures required is the installation of a minimum 150 mm ventilated void below all plots.

9.5 Construction Materials

Based on the pH and sulphate results, DS-2 AC-2 sulphate precautions should be assumed for concrete that is in contact with the superficial deposits. Since these deposits cover the site, it is expected all below ground concrete will require this level.

The results of the chemical testing will need to be forwarded to the water company so that appropriate water supply pipes can be selected.

9.6 Controlled Waters

The superficial deposits beneath the site are classified as a Secondary A Aquifer. According to the Envirocheck, the nearest surface water feature is a pond, located in the south east of the site and the site does not lie within a Groundwater Source Protection Zone.

Given that no significant contamination was identified in the investigation, the risk to controlled waters can be considered to be low.

Standard good site practice during the construction phase of the development must still be adhered to in terms of surface water run-off control measures, to ensure that there is no risk to controlled waters.

9.7 Unexpected Contamination

Should any unusual, brightly coloured, ashy, oily, fibrous or odorous material or material suspected of containing asbestos be encountered during construction this should be brought to the attention of the site staff and investigated.

9.8 Disposal of Material

If material needs to be removed, it should to be taken to a suitably licensed landfill or waste treatment facility. The costs of disposal and landfill tax can be substantial. The disposal of material should therefore be seen as a last resort with options such as treatment and reuse either on-site or off-site considered where possible.

The category of landfill which can accept the waste (inert, non-hazardous or hazardous) would need to be determined and will also have a significant effect on the costs. Additional testing may be required by the landfill operator and the acceptance of material is generally at their discretion.

Appendix 1

Exploratory Hole Location Plan – Drawing 48888-ECE-XX-XX-DR-C-0010 P02

Key:

- Approximate position of trial pit excavated by Eastwood Consulting Engineers on 01.10.2024.
- Approximate position of soakaway completed by Eastwood Consulting Engineers on 01.10.2024.
- Approximate position of CP boreholes drilled by Eastwood Consulting Engineers between 01.10.2024 - 08.10.2024.
- Approximate position of mexecone probe conducted by Eastwood Consulting Engineers on 24.10.2024.
- 0.40 — Depth to base of topsoil (m).
- 1.80 — Depth to base of made ground (m).
- W@2.20 — Depth of water ingress (m).
- Approximate position of former pond taken from historical maps.

REV	DESCRIPTION	CHK	DATE
P02	Mexecone probes added. Topsoil, made ground & water ingress depths added.	KE	29.11.2024
P01	First Issue.	KE	17.10.2024

BONINGALE HOMES

TILSTOCK ROAD, TILSTOCK

EXPLORATORY HOLE LOCATION PLAN

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CONSULTING ENGINEERS
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ECE PROJECT No	SCALE AT A1	STATUS	SUITABLE FOR
48888	1:500	S0	Initial

DRAWING NUMBER: 48888 - ECE - XX - XX - DR - C - 0010 (Project - Originator - Zone - Level - Type - Role - Number) REV: P02

Appendix 2

Soakaway Logs – SA01 to SA02A and SA04

Trial Pit Logs – TP01, TP03, TP04, TP06 to TP09, TP11, TP13 to 16 and TP18

Cable Percussive Borehole Logs – CP01 to CP07

Site Investigation Photographs

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TrialPit No
SA01
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354291.00 - 338012.00	Date
Tilstock Road	48888	Level: 102.77	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: 1.90m x 0.65m Depth: 2.30m	Scale 1:25
Client: Boningale Homes			Logged LF

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					REWORKED TOPSOIL: Dark brown clayey slightly gravelly SAND with rootlets. Gravel is fine to coarse subangular to subrounded of quartzite and brick and occasional pottery fragments.
			0.40	102.37		
0.70	ES					Orange brown mottled grey slightly clayey slightly gravelly medium to fine grained SAND with fine thin grey clay bands. Gravel is fine to subangular of mudstone.
			1.40	101.37		Reddish brown clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded of quartzite, mudstone and marl.
1.90 - 2.00	B					
						Band of firm clay at 2 m.
2.10	D					
			2.30	100.47		Trialpit Complete at 2.300m

Remarks: Trial pit terminated at 2.3 m for infiltration testing purposes. No groundwater encountered.

Stability: Stable

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TrialPit No
SA02
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354325.00 - 338001.00	Date
Tilstock Road	48888	Level: 102.36	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: 2.10m, 0.65m, Depth: 2.70m	Scale 1:25
Client: Boningale Homes			Logged LF

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					REWORKED TOPSOIL: Brown slightly clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded of quartzite with rootlets and occasional gravels of pot.
			0.40	101.96		
0.50	ES					Reddish brown slightly clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded of quartzite and mudstone and with occasional cobbles of marl.
1.40	D					
			1.50	100.86		Firm brown sandy slightly gravelly CLAY. Gravel is fine to medium of quartzite marl and mudstone.
2.50	B					
			2.70	99.66		Trialpit Complete at 2.700m

Remarks: Trial pit terminated at 2.7 m for infiltration testing purposes. Groundwater encountered at the surface.

Stability: Unstable

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TrialPit No
SA02A
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354304.00 - 337994.00	Date
Tilstock Road	48888	Level: 102.38	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 2.10m m	Scale 1:25
Client: Boningale Homes			Logged LF

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					REWORKED TOPSOIL: Greyish brown clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded of quartzite and brick with rootlets and occasional gravels of pot.
			0.40	101.98		MADE GROUND: Dark brown to black slightly clayey SAND.
0.80	D		0.80	101.58		MADE GROUND: Dark brown mottled orange sandy slightly gravelly CLAY with weathered wood fragments.
0.80	ES					
0.80	ES					
			1.80	100.58		Reddish brown slightly clayey gravelly thinly laminated SAND. Gravel is fine to coarse subangular to subrounded of mudstone, marl and quartzite.
2.00	D					
			2.10	100.28		Trialpit Complete at 2.100m

Remarks: Trial pit terminated at 2.1 m for infiltration testing purposes. Groundwater encountered at the surface.

Stability: Unstable

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TrialPit No
SA04
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354356.00 - 338127.00	Date
Tilstock Road	48888	Level: 104.75	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: 1.80m x 0.65m	Scale 1:25
Client: Boningale Homes		Depth: 2.00m	Logged LF

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					TOPSOIL: Dark brown slightly clayey slightly gravelly SAND. Gravel is fine subangular of sandstone.
			0.40	104.35		Yellowish brown mottled grey slightly clayey slightly gravelly SAND. Gravel is fine to medium subangular to subrounded of quartzite and mudstone.
						Subangular mudstone cobble at 0.8 m.
1.20	D					
			1.30	103.45		Firm becoming stiff reddish brown sandy slightly gravelly CLAY with a low cobble content. Gravel is fine to coarse of quartzite and mudstone with cobble content of marl.
1.80	D					
			2.00	102.75		Trialpit Complete at 2.000m

Remarks: Trial pit terminated at 2.0 m for infiltration testing purposes. Groundwater encountered at 1.3 m.

Stability: Stable

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TrialPit No
TP01
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354310.00 - 338048.00	Date
Tilstock Road	48888	Level: 103.10	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 2.40m m	Scale 1:25
Client: Boningale Homes			Logged LF

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					TOPSOIL: Brown clayey slightly gravelly SAND with rootlets. Gravel is fine to coarse rounded to well rounded of quartzite and marl.
			0.50	102.60		MADE GROUND: Soft reddish brown sandy CLAY.
			1.00	102.10		MADE GROUND :Very soft dark grey and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of marl, sandstone with wood fragments. [Possible Pond Backfill]
1.50	D					
						Marl boulder at 1.8m (0.3 x 0.05x0.05)
			1.90	101.20		MADE GROUND :Very soft light grey slight sandy slightly gravelly CLAY. Gravel is fine subangular of red coarse grained sandstone with wood fragments.
2.10	D		2.10	101.00		Soft sandy slightly gravelly CLAY. Gravel is fine to coarse rounded of quartzite and sandstone.
			2.40	100.70		Trialpit Complete at 2.400m

1
2
3
4

Remarks: Trial pit terminated at 2.4 m due to side wall collapse. Groundwater encountered at 1 m.

Stability: Unstable

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TrialPit No
TP03
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354194.00 - 338001.00	Date
Tilstock Road	48888	Level: 105.40	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 3.80m m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES		0.25	105.15		TOPSOIL: Brown slightly gravelly clayey SAND with rootlets. Gravel is fine to coarse rounded to well rounded marl.
0.60	ES					Reddish brown slightly gravelly very clayey fine to medium grained SAND. Gravel is fine to coarse rounded to well rounded quartzite and marl.
1.00		HVP=56	1.00	104.40		
1.10	ES					Firm medium strength reddish brown slightly gravelly sandy CLAY. Gravel is fine to coarse rounded to well rounded quartzite.
			1.50	103.90		Reddish brown gravelly very clayey fine to medium SAND. Gravel is fine to coarse subrounded to rounded marl sandstone and quartzite.
						Sidewall collapse at 1.7 to 2.5 m.
						Running sands at 2 m.
						From 2.2 m a low cobble content of marl.
						Damp from 2.8 m
			2.90	102.50		Soft very low strength slightly gravelly sandy CLAY. Gravel is fine to coarse rounded quartzite and sandstone.
3.30		HVP=14	3.30	102.10		Light brown gravelly silty SAND. Gravel is fine to coarse subrounded to rounded quartzite.
			3.80	101.60		Trialpit Complete at 3.800m

Remarks: Trial pit terminated at 3.8 m due to reaching maximum reach of machine. Groundwater encountered at 2m. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377. Trial pit left opened for 2 hours, by which time the trial pit had fully collapsed.

Stability: Unstable

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TrialPit No
TP04
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354263.00 - 338049.00	Date
Tilstock Road	48888	Level: 104.94	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 2.40m m	Scale 1:25
Client: Boningale Homes			Logged LF

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES		0.20	104.74		TOPSOIL: Brown clayey slightly gravelly SAND with rootlets. Gravel is fine to coarse rounded to well rounded quartzite and marl.
1.80	ES					Reddish brown slightly clayey slightly gravelly SAND. Gravel is fine to coarse subangular to subrounded of marl, mudstone and quartzite.
						Becomes gravelly from 2m.
			2.40	102.54		Trialpit Complete at 2.400m

Remarks: Trial pit terminated at 2.4 m due to side wall collapse. No groundwater encountered.

Stability: Unstable

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TrialPit No
TP06
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354186.00 - 338051.00	Date
Tilstock Road	48888	Level: 105.91	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 3.60m m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.20	105.71		TOPSOIL: Brown slightly gravelly clayey SAND with rootlets.Gravel is fine to coarse rounded to well rounded quartzite.
						Firm medium strength reddish brown slightly gravelly sandy CLAY. Gravel is fine to coarse subrounded to rounded quartzite. Damp.
0.90	ES					
1.20		HVP=55				
1.40	D					
1.40		HVP=52				
1.80		HVP=26				*300 mm band of soft low strength clay, possible water softened.*
2.20	D					
2.20		HVP=50				
			2.60	103.31		Light brown slightly gravelly very clayey fine to medium grained SAND. Gravel is fine to coarse rounded sandstone.
			3.40	102.51		Light brown slightly silty gravelly fine to medium grained SAND. Gravel is fine to coarse rounded quartzite and marl.
3.50	D		3.60	102.31		Trialpit Complete at 3.600m

Remarks: Trial pit terminated at 3.6 m due to reaching maximum reach of machine. Groundwater encountered at 0.2m. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377

Stability: Unstable

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TrialPit No
TP07
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354187.00 - 338088.00	Date
Tilstock Road	48888	Level: 105.78	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 3.50m m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					TOPSOIL: Brown slightly gravelly clayey SAND with rootlets. Gravel is fine to coarse rounded to well rounded quartzite and marl.
			0.30	105.48		Light reddish brown slightly gravelly clayey fine to medium grained SAND. Gravel is fine to medium rounded quartzite and sandstone.
0.60	ES					*Gravelly from 0.8 with sandstone gravel*
			1.00	104.78		Reddish brown clayey very gravelly fine to medium grained SAND with a low cobble content. Gravel is fine to coarse rounded to well rounded marl and sandstone.
1.40	D					
			1.90	103.88		Reddish brown clayey sandy GRAVEL with a low cobble content. Gravel is fine to coarse rounded to well rounded quartzite and sandstone. Cobbles are rounded sandstone.
			2.30	103.48		Firm reddish brown slightly gravelly sandy CLAY. Gravel is fine to coarse rounded quartzite and sandstone.
2.70		HVP=90				*Becoming stiff from 2.7 m.*
3.30		HVP=129				
			3.50	102.28		Trialpit Complete at 3.500m

Remarks: Trial pit terminated at 3.5 m due to reaching maximum reach of machine. Groundwater encountered at 2.2 m. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377

Stability: Unstable between 1.9 m and 2.3 m due to flowing sands.

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TrialPit No
TP08
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354249.00 - 338081.00	Date
Tilstock Road	48888	Level: 105.30	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: m Depth: m 3.80m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					REWORKED TOPSOIL: Brown slightly gravelly very clayey SAND with rootlets. Gravel is fine to coarse rounded to well rounded quartzite and occasional ceramic and brick.
			0.60	104.70		Stiff reddish brown slightly gravelly sandy CLAY. Gravel is fine to medium subrounded to rounded sandstone and quartzite.
						Running sands from 0.6 to 1.6 m.
						Sand in western end of pit.
0.90		HVP=83				
1.00	ES					
1.40		HVP=124				
			2.10	103.20		Reddish brown gravelly very clayey fine to medium SAND. Gravel is fine to coarse rounded sandstone and quartzite.
2.20 - 2.70	B					
						Slightly clayey from 3.5 m
			3.80	101.50		Trialpit Complete at 3.800m

Remarks: Trial pit terminated at 3.8 m due to reaching maximum reach of machine. Groundwater encountered at 0.6 m. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377. Trial pit left opened for 3 hours, by which time the trial pit had fully collapsed.

Stability: Unstable

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TrialPit No
TP09
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354254.00 - 338090.00	Date
Tilstock Road	48888	Level: 105.20	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 3.80m m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL: Brown slightly gravelly sandy CLAY with rootlets. Gravel is fine to coarse rounded to well rounded quartzite and sandstone
0.20	ES		0.25	104.95		Firm reddish brown slightly gravelly sandy CLAY. Gravel is fine to coarse subrounded to rounded sandstone.
						Light brown sand to 0.4 m.
0.70	ES					
1.00		HVP=116				*Becomes stiff from 3.3m.*
			1.60	103.60		Soft reddish brown slightly gravelly sandy CLAY. Gravel is fine to medium subrounded to rounded quartzite and sandstone.
1.70	D					
1.70		HVP=39				*Thick band of running sands at 1.8 m.*
2.30		HVP=16				*Becomes very stiff from 2.3m.*
			2.40	102.80		Firm reddish brown slighly sandy gravelly CLAY. Gravel is fine to coarse subrounded to rounded sandstone.
3.30		HVP=93				
			3.60	101.60		Light brown slightly silty gravelly fine to medium SAND. Gravel is fine to medium subrounded to rounded sandstone and marl.
			3.80	101.40		Trialpit Complete at 3.800m

Remarks: Trial pit terminated at 3.8 m due to reaching maximum reach of machine. Groundwater encountered at 1.8 m. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377. Trial pit left opened for 1 hour., by which time the trial pit had fully collapsed.

Stability: Unstable

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TrialPit No
TP11
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354307.00 - 338082.00	Date
Tilstock Road	48888	Level: 105.12	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 2.30m m	Scale 1:25
Client: Boningale Homes			Logged LF

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					TOPSOIL: Brown sandy slightly gravelly CLAY with rootlets. Gravel is fine to coarse rounded to well rounded quartzite and sandstone
			0.40	104.72		Reddish brown slightly clayey slightly gravelly SAND .Gravels are fine to medium subrounded quartzite and rare mudstone.
1.20	D		1.20	103.92		Firm reddish brown sandy slightly gravelly CLAY. Gravel is fine to medium subangular grey mudstone.
			1.40	103.72		Reddish brown slightly clayey slightly gravelly SAND. Gravel is fine to medium subrounded quartzite and rare mudstone.
2.00	D					
			2.30	102.82		Trialpit Complete at 2.300m

Remarks: Trial pit terminated at 2.3 m due to collapse. Groundwater encountered at 1.1 m.

Stability: Unstable - Side wall collapses

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TrialPit No
TP13
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354311.00 - 338127.00	Date
Tilstock Road	48888	Level: 106.08	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: m Depth: m 2.20m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					TOPSOIL: Brown clayey slightly gravelly SAND with rootlets.
			0.60	105.48		
0.80 - 1.00	B					Grey and light grey slightly gravelly clayey fine to medium grained SAND. Gravel is fine to coarse subrounded to rounded sandstone and marl.
0.90	ES					
			2.20	103.88		Trialpit Complete at 2.200m

Remarks: Trial pit terminated at 2.2 m due to side wall collapse. No groundwater encountered.

Stability: Unstable

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TrialPit No
TP14
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354224.00 - 338129.00	Date
Tilstock Road	48888	Level: 105.01	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 2.40m m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					TOPSOIL: Brown gravelly clayey SAND with rootlets. Gravel is fine to coarse rounded sandstone.
			0.35	104.66		Firm reddish brown slightly gravelly sandy CLAY. Gravel is fine to medium rounded sandstone.
0.90		HVP=88				*Becomes stiff from 0.9m.*
1.00	ES					
1.40	D					
1.40		HVP=71				
			1.60	103.41		Firm reddish brown mottled light grey very sandy CLAY.
1.70		HVP=44				
2.00	D					
			2.40	102.61		Trialpit Complete at 2.400m

Remarks: Trial pit terminated at 2.4 m due to reaching target depth. No groundwater encountered. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377. Trial pit left opened for 2 hours, by which time the trial pit had fully collapsed.

Stability: Stable during excavation, but collapsed after 2 hours.

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TrialPit No
TP15
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354255.00 - 338171.00	Date
Tilstock Road	48888	Level: 106.15	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: m Depth: m 2.60m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.30	ES					TOPSOIL: Dark brown slightly gravelly clayey SAND with rootlets. Gravel is fine to medium rounded quartzite and sandstone.
			0.80	105.35		Reddish brown and light grey slightly gravelly very clayey fine to medium SAND. Gravel is fine to coarse subrounded to rounded sandstone and quartzite.
1.20	ES					*Running sands at 1.6 m*
			2.60	103.55		Trialpit Complete at 2.600m

Remarks: Trial pit terminated at 2.6 m due to reaching target depth. Groundwater encountered at 1.6 m. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377.

Stability: Stable

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TrialPit No
TP16
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354267.00 - 338172.00	Date
Tilstock Road	48888	Level: 105.57	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: Depth: 2.60m m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	ES					TOPSOIL: Dark brown slightly gravelly clayey SAND with rootlets. Gravel is fine to coarse rounded to well rounded sandstone. (Possibly reworked).
			0.60	104.97		Firm orange and light brown sandy CLAY.
0.90		HVP=42				*Becoming reddish brown mottled light grey at 1.6m.*
			1.30	104.27		Firm reddish brown very sandy CLAY.
1.50		HVP=65				
			2.60	102.97		Trialpit Complete at 2.600m

Remarks: Trial pit terminated at 2.6 m due to collapse. No groundwater encountered.

Stability: Unstable

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TrialPit No
TP18
Sheet 1 of 1

Project Name	Project No.	Co-ords: 354269.00 - 338206.00	Date
Tilstock Road	48888	Level: 105.77	01/10/2024
Location: Land off Tilstock Road, Tilstock		Dimensions: m Depth: m 2.60m	Scale 1:25
Client: Boningale Homes			Logged DJ

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10 - 0.20	ES					TOPSOIL: Brown slightly gravelly clayey SAND with rootlets. Gravel is fine to coarse rounded to well rounded quartzite.
			0.40	105.37		Reddish brown and light brown slightly gravelly very clayey SAND. Gravel is fine to coarse rounded sandstone and quartzite.
			0.60	105.17		Firm reddish brown mottled light brown slightly gravelly sandy CLAY. Gravel is fine to medium subrounded to rounded sandstone.
0.90		HVP=60				*Running sands at 1 m*
1.60		HVP=60				
			2.20	103.57		Reddish brown gravelly very clayey fine to medium SAND . Gravel is fine to coarse rounded sandstone.
						Running sands at 2.3 m
			2.60	103.17		Trialpit Complete at 2.600m

Remarks: Trial pit terminated at 2.6 m due to reaching target depth. Groundwater encountered at 1.0 m. HSV (19mm) results indicate the undrained shear strength, presented as sets of peak (HVP) values (kPa), corrected to BS1377.

Stability: Stable

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Borehole No.
CP01
Sheet 1 of 1

Project Name: Tilstock Road	Project No.: 48888	Co-ords: 354313E - 338007N	Hole Type: CP
Location: Land off Tilstock Road, Tilstock		Level: 102.42	Scale: 1:100
Client: Boningale Homes		Dates: 08/10/2024	Logged By: LF

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	▼				0.50	101.92		TOPSOIL: Dark brown SAND. (Drillers description).
								Reddish brown silty clayey SAND.
					3.55	98.87		End of Borehole at 3.550m
			Type	Results				

Remarks

Borehole complete at 3.55 m. Borehole was undertaken with a Dando 30000 Cable Percussive borehole rig, using open hole drilling with water flush. Groundwater encountered at the surface. Ground gas and groundwater monitoring well installed to a depth of 3.55m.

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Borehole No.
CP02
Sheet 1 of 1

Project Name: Tilstock Road	Project No.: 48888	Co-ords: 354210E - 338005N	Hole Type: CP
Location: Land off Tilstock Road, Tilstock		Level: 105.47	Scale: 1:100
Client: Boningale Homes		Dates: 01/10/2024	Logged By: LF

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.50	104.97		TOPSOIL: Dark brown silty SAND. (Drillers description).
					1.00	104.47		Orange brown slightly clayey SAND.
		1.50	D					Loose reddish brown slightly clayey gravelly SAND. Gravel is fine subangular of marl, sandstone and mudstone.
		1.50	SPT	N=8 (1,1/1,2,3,2)				*Becomes orange at 1.6m.*
		3.00	D					
		3.00	SPT	N=7 (1,2/2,1,2,2)				
		4.50	D					
		4.50	SPT	N=11 (2,3/3,2,3,3)				*Medium dense at 4.5m*
		6.00	D					
		6.00	SPT	N=15 (2,3/3,4,4,4)				
					6.70	98.77		Medium dense reddish brown sandy GRAVEL. Gravel is fine to coarse subrounded to subangular of marl.
		7.50	SPT	N=22 (2,4/4,5,6,7)				
		8.00 - 8.50	B					
		9.00	SPT	N=9 (2,3/2,2,2,3)	8.70	96.77		Firm dark brown slightly sandy CLAY.
		10.50	SPT	N=14 (3,3/3,4,3,4)				
		11.00 - 11.50	B					
		12.00	SPT	N=26 (4,5/5,7,6,8)				*Becomes stiff at 12m.*
		13.50	SPT	N=27 (3,4/6,5,7,9)				
		15.00	SPT	N=22 (4,4/4,5,6,7)	15.00	90.47		End of Borehole at 15.000m
			Type	Results				

Remarks

Borehole complete at 15m. Borehole was undertaken with a Dando 30000 Cable Percussive borehole rig, using open hole drilling with water flush. Groundwater encountered at 7m rising to 3.2m after 20 minutes. Ground gas and groundwater monitoring well installed to a depth of 3.55m.

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Borehole No.
CP03
Sheet 1 of 1

Project Name: Tilstock Road	Project No.: 48888	Co-ords: 354325E - 338072N	Hole Type: CP
Location: Land off Tilstock Road, Tilstock		Level: 103.68	Scale: 1:100
Client: Boningale Homes		Dates: 08/10/2024	Logged By: LF

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.50 - 1.00	B		0.40	103.28		TOPSOIL: Dark brown SAND. (Drillers description).
								Very loose brown silty slightly clayey slightly gravelly SAND. Gravel is fine to medium subangular of sandstone and marl.
		1.50	D					
		1.50	SPT	N=3 (1,0/1,1,0,1)				*Becomes less clayey below 1.3m.*
		3.00	D					
		3.00	SPT	N=4 (1,2/1,1,1,1)				
		4.50	SPT	N=15 (1,2/2,3,4,6)				*Becomes medium dense at 4.5m.*
		6.00 - 6.50	B					
		6.00	SPT	N=23 (2,3/4,6,6,7)				
					6.90	96.78		Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is fine subangular of marl.
		7.50	D					
		7.50	SPT	N=11 (2,2/2,3,3,3)				
		9.00	D					
		9.00	SPT	N=12 (2,3/2,3,3,4)				
		10.50	SPT	N=22 (3,4/5,5,6,6)				*Becomes stiff at 10.5m.*
		12.00	D					
		12.00	SPT	N=23 (3,3/4,5,7,7)				
		13.50	D					
		13.50	SPT	N=29 (5,5/6,7,8,8)				
		15.00	D		15.00	88.68		
		15.00	SPT	N=26 (5,6/5,6,7,8)				End of Borehole at 15.000m
			Type	Results				

Remarks

Borehole complete at 15m. Borehole was undertaken with a Dando 30000 Cable Percussive borehole rig, using open hole drilling with water flush. Groundwater encountered at 3.6m rising to 1.9m after 20 minutes. Ground gas and groundwater monitoring well installed to a depth of 3.20m.

Eastwood
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Borehole No.
CP04
Sheet 1 of 1

Project Name: Tilstock Road	Project No.: 48888	Co-ords: 354224E - 338087N	Hole Type: CP
Location: Land off Tilstock Road, Tilstock		Level: 105.41	Scale: 1:100
Client: Boningale Homes		Dates: 02/10/2024	Logged By: LF

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.80	104.61		TOPSOIL: Dark brown clayey SAND. (Drillers description).
		1.00	D					
		1.50 - 2.00	B					
		1.50	SPT	N=1 (1,0/0,1,0,0)				Very soft light grey sandy CLAY.
					2.10	103.31		
		3.00	D					Stiff light brown slightly sandy gravelly CLAY. Gravel is fine to medium subangular of marl.
		3.00	SPT	N=17 (2,3/3,4,5,5)				
		4.50	D					
		4.50	SPT	N=23 (3,4/5,6,6,6)	4.80	100.61		
		5.00 - 5.50	B					Medium dense dark brown clayey SAND. (Damp).
					5.80	99.61		
		6.00	D					Stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is fine subangular of marl.
		6.00	SPT	N=19 (2,3/3,5,5,6)				
		7.50	D					
		7.50	SPT	N=19 (3,4/3,4,5,7)				
		9.00	D					
		9.00	SPT	N=20 (3,3/4,5,5,6)				
		10.50	D					
		10.50	SPT	N=24 (4,5/6,6,6,6)				
		12.00	D					
		12.00	SPT	N=24 (3,4/5,6,6,7)				
		13.50	D					
		13.50	SPT	N=26 (4,5/6,6,7,7)				
		15.00	D		15.00	90.41		
		15.00	SPT	N=32 (5,6/7,8,8,9)				End of Borehole at 15.000m
		Type		Results				

Remarks

Borehole complete at 15m. Borehole was undertaken with a Dando 30000 Cable Percussive borehole rig, using open hole drilling with water flush. Groundwater encountered at 4.8m. Gas and groundwater monitoring well installed to a depth of 3.85m.

Eastwood
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Borehole No.
CP05
Sheet 1 of 1

Project Name: Tilstock Road	Project No.: 48888	Co-ords: 354266E - 338129N	Hole Type: CP
Location: Land off Tilstock Road, Tilstock		Level: 106.37	Scale: 1:100
Client: Boningale Homes		Dates: 03/10/2024	Logged By: LF

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.60	105.77		TOPSOIL: Dark brown clayey SAND. (Drillers description).
		1.50	D					Firm reddish brown sandy slightly gravelly CLAY . Gravel is fine to coarse subangular of sandstone.
		1.50	SPT	N=8 (1,2/2,2,2,2)				
		3.00	D					*Becomes more dense at 3m.*
		3.00	SPT	N=15 (2,3/3,4,4,4)				
		4.50	D					
		4.50	SPT	N=15 (3,4/4,3,4,4)				
		5.00 - 5.50	B					
		6.00	D					
		6.00	SPT	N=17 (2,3/3,4,5,5)				
		7.50	D		6.70	99.67		Medium dense reddish brown clayey slightly silty SAND with clay bands and occasional gravel.
		7.50	SPT	N=24 (4,4/4,5,7,8)				
		9.00	SPT	N=29 (3,4/5,7,7,10)	8.10	98.27		Medium dense reddish brown gravelly SAND with clay bands.
		9.50 - 10.00	B					
		10.50	D					
		10.50	SPT	N=18 (3,4/4,4,5,5)	10.20	96.17		Stiff dark brown slightly sandy gravely CLAY. Gravel is fine to medium subangular of marl.
		12.00	D					
		12.00	SPT	N=25 (4,5/4,6,7,8)				
		13.50	D					
		13.50	SPT	N=25 (4,5/5,6,6,8)				
		15.00	D		15.00	91.37		End of Borehole at 15.000m
		15.00	SPT	N=27 (5,5/5,6,8,8)				
			Type	Results				

Remarks

Borehole complete at 15m. Borehole was undertaken with a Dando 30000 Cable Percussive borehole rig, using open hole drilling with water flush. . Groundwater encountered at 7m rising to 5.1m after 20 minutes. Ground gas and groundwater monitoring well installed to a depth of 3.10m.

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Borehole No.
CP06
Sheet 1 of 1

Project Name: Tilstock Road	Project No.: 48888	Co-ords: 354354E - 338166N	Hole Type: CP
Location: Land off Tilstock Road, Tilstock		Level: 105.60	Scale: 1:100
Client: Boningale Homes		Dates: 04/10/2024	Logged By: LF

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.50 - 1.00	B		0.40	105.20		TOPSOIL: Dark brown sandy CLAY. (Drillers description).
								Reddish brown sandy CLAY.
		1.50 1.50	D SPT	N=11 (2,3/3,2,3,3)	1.60	104.00		Medium dense reddish brown SAND with clayey bands. (Drillers description).
		3.00 3.00	D SPT	N=16 (2,3/4,4,4,4)				
		4.10 - 4.50	B		4.10	101.50		Medium dense reddish brown slightly sandy GRAVEL.
		4.50	SPT	N=27 (4,5/5,6,7,9)				
					5.50	100.10		Firm becoming stiff dark brown slightly sandy CLAY.
		6.00	SPT	N=8 (2,2/2,2,2,2)				
		7.50 7.50	D SPT	N=15 (2,3/3,4,4,4)				
		9.00 9.00	D SPT	N=9 (2,2/2,3,2,2)				
		10.50 10.50	D SPT	N=12 (2,2/3,3,3,3)				*Becomes less sandy and slightly gravelly at 10.3m . Gravel is fine subangular of marl.*
		12.00 12.00	D SPT	N=13 (2,3/3,4,4,2)				
		13.50 13.50	D SPT	N=22 (3,4/5,5,5,7)				
		15.00 15.00	D SPT	N=31 (5,5/6,9,8,8)	15.45	90.15		End of Borehole at 15.450m
			Type	Results				

Remarks

Borehole complete at 15.45m. Borehole was undertaken with a Dando 30000 Cable Percussive borehole rig, using open hole drilling with water flush. Groundwater encountered at 2.1m. Ground gas and groundwater monitoring well installed to a depth of 2.50m.

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Borehole No.
CP07
Sheet 1 of 1

Project Name	Project No.	Co-ords:	Hole Type
Tilstock Road	48888	354294E - 338192N	CP
Location: Land off Tilstock Road, Tilstock		Level: 105.98	Scale 1:100
Client: Boningale Homes		Dates: 07/10/2024	Logged By LF

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.50 - 1.00	B		0.50	105.48		TOPSOIL: Dark brown sandy CLAY. (Drillers description).
		1.50 1.50	D SPT	N=6 (1,1/2,1,2,1)				Firm reddish brown slightly gravelly sandy CLAY. Gravel is fine to medium subangular of sandstone and marl.
		3.00 3.00	D SPT	N=5 (1,1/1,1,2,1)				
		4.50	SPT	N=19 (2,2/4,5,5,5)	4.20	101.78		Medium dense reddish brown gravely SAND. Gravel is fine subangular of marl.
		5.00 - 5.50	B					
		6.00	SPT	N=23 (4,3/5,5,6,7)				
		7.50 7.50	D SPT	N=14 (2,2/3,3,4,4)	7.30	98.68		Firm reddish brown slightly sandy gravelly CLAY. Gravel is fine to medium subangular of sandstone and marl.
		9.00 9.00	D SPT	N=16 (3,3/3,4,4,5)				*Becomes stiff from 9m.*
		10.50 10.50	D SPT	N=19 (3,2/4,4,5,6)				
		12.00 12.00	D SPT	N=22 (3,3/3,5,6,8)				
		13.50 13.50	D SPT	N=24 (3,2/5,5,7,7)				
		15.00 15.00	D SPT	N=27 (4,5/5,7,7,8)	15.00	90.98		End of Borehole at 15.000m
			Type	Results				

Remarks

Borehole complete at 15m. Borehole was undertaken with a Dando 30000 Cable Percussive borehole rig, using open hole drilling with water flush. . Groundwater encountered at 4.2m. Ground gas and groundwater monitoring well installed to a depth of 4m.

Overview of the site taken from the Northeast of the site facing south west

Photo taken from the northeast of the site facing east, showing the adjacent pond crossing over the site boundary

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	1 & 2

LAND OFF TILSTOCK ROAD, TILSTOCK

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SITE INVESTIGATION PHOTOS

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Sheffield, S11 9AS

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Photo showing the entrance in the southeast of the field from the adjacent fields

Photo from the centre of the site facing the west boundary

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	3 & 4

LAND OFF TILSTOCK ROAD, TILSTOCK

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Photo from the centre of the site facing to the south of the site showing surface water

SA01

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	5 & 6

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SA02: Showing water ingress

SA02 Arisings

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	7 & 8

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SA02A: Showing water ingress

SA02A Arisings: Showing a dark brown to black clay with patches of red clay. (Possible pond backfill).

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	9 & 10

LAND OFF TILSTOCK ROAD, TILSTOCK

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SA04: Showing water ingress and running sand

SA04 Arisings

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	11 & 12

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TP01: Showing a dark brown to black soft clay at the base (possible pond backfill) and water ingress.

TP01 Arisings: Showing dark brown to black soft clay (possible pond backfill).

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	13 & 14

LAND OFF TILSTOCK ROAD, TILSTOCK

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TP03

TP04: Showing side wall collapse and water ingress.

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	15 & 16

LAND OFF TILSTOCK ROAD, TILSTOCK

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TP06: Showing side wall collapse

TP07: Showing water ingress and running sand

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	17 & 18

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TP08: Showing water ingress

TP09: Showing water ingress

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	19 & 20

LAND OFF TILSTOCK ROAD, TILSTOCK

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TP11: Showing water ingress and running sand

TP13: Showing side wall collapse

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	21 & 22

LAND OFF TILSTOCK ROAD, TILSTOCK

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TP14

TP15: Showing water ingress and partial side wall collapse

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	23 & 24

LAND OFF TILSTOCK ROAD, TILSTOCK

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SITE INVESTIGATION PHOTOS

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TP16

TP18

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	25 & 26

LAND OFF TILSTOCK ROAD, TILSTOCK

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CP05 – Recovered samples

CP03 – Recovered samples

Prepared	LF	Checked		Job No.	48888	Date	01/10/2024	Photograph No.	27 & 28

LAND OFF TILSTOCK ROAD, TILSTOCK

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SITE INVESTIGATION PHOTOS

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Appendix 3

Geotechnical Test Results – PSL Report 24/8061

Mexecone Probe Test Results – MP01 to MP11

Infiltration Rate Calculations

LABORATORY REPORT

Contract Number: PSL24/8061

Report Date: 19 November 2024

Client's Reference: 48888

Client Name: Eastwood Consulting Engineers
St Andrews House
23 Kingfield Road
Sheffield
S11 9AS

For the attention of: Louise Flynn

Contract Title: Land off Tilstock Road, Tilstock

Date Received: 4/11/2024
Date Commenced: 4/11/2024
Date Completed: 19/11/2024

Notes: Opinions and Interpretations are outside the UKAS Accreditation

Checked and Approved Signatories:

A Watkins (Managing Director)
R Berriman (Associate Director)
S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)
S Eyre (Senior Technical Coordinator)
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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
SA02A		D	2.00		Reddish brown slightly clayey SAND & GRAVEL.
TP03		D	1.10		Reddish brown sandy slightly gravelly CLAY.
TP06		D	1.40		Reddish brown sandy slightly gravelly CLAY.
TP09		D	1.70		Reddish brown sandy slightly gravelly CLAY.
TP11		D	1.20		Reddish brown sandy slightly gravelly CLAY.
TP14		D	1.40		Reddish brown sandy slightly gravelly CLAY.
CP06		B	0.50		Reddish brown sandy slightly gravelly CLAY.
CP03		B	0.50		Reddish brown clayey slightly gravelly SAND.
CP07		B	0.50		Reddish brown sandy slightly gravelly CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Land off Tilstock Road, Tilstock

Contract No:

PSL24/8061

Client Ref:

48888

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377 - Part 2 : 2022 in accordance with BS EN ISO 17892 (as below)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Water Content %	Linear Shrinkage	Particle Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 0.425mm %	Remarks
SA02A		D	2.00		15.0				NP			
TP03		D	1.10		14.9			29	15	14	94	Low Plasticity CIL
TP06		D	1.40		15.0			27	14	13	93	Low Plasticity CIL
TP09		D	1.70		18.4			29	15	14	94	Low Plasticity CIL
TP11		D	1.20		18.5			24	14	10	81	Low Plasticity CIL
TP14		D	1.40		17.6			27	14	13	96	Low Plasticity CIL

Water Content - BS 1377 - Part 2 : 2022 : Clause 4 in accordance with BS EN ISO 17892 - 1 : 2014 + A1 : 2022
Linear Shrinkage - BS 1377 - Part 2 : 2022 : Clause 7
Particle Density (Gas Jar method) - BS 1377 - Part 2 : 2022 : Clause 9
Liquid, Plastic Limit & Plasticity Index - BS 1377 - Part 2 : 2022 : Clause 5 & 6 in accordance with BS EN ISO 17892 - 12 : 2018 + A2 : 2022

SYMBOLS : NP = Non Plastic

UKAS TESTING 4043

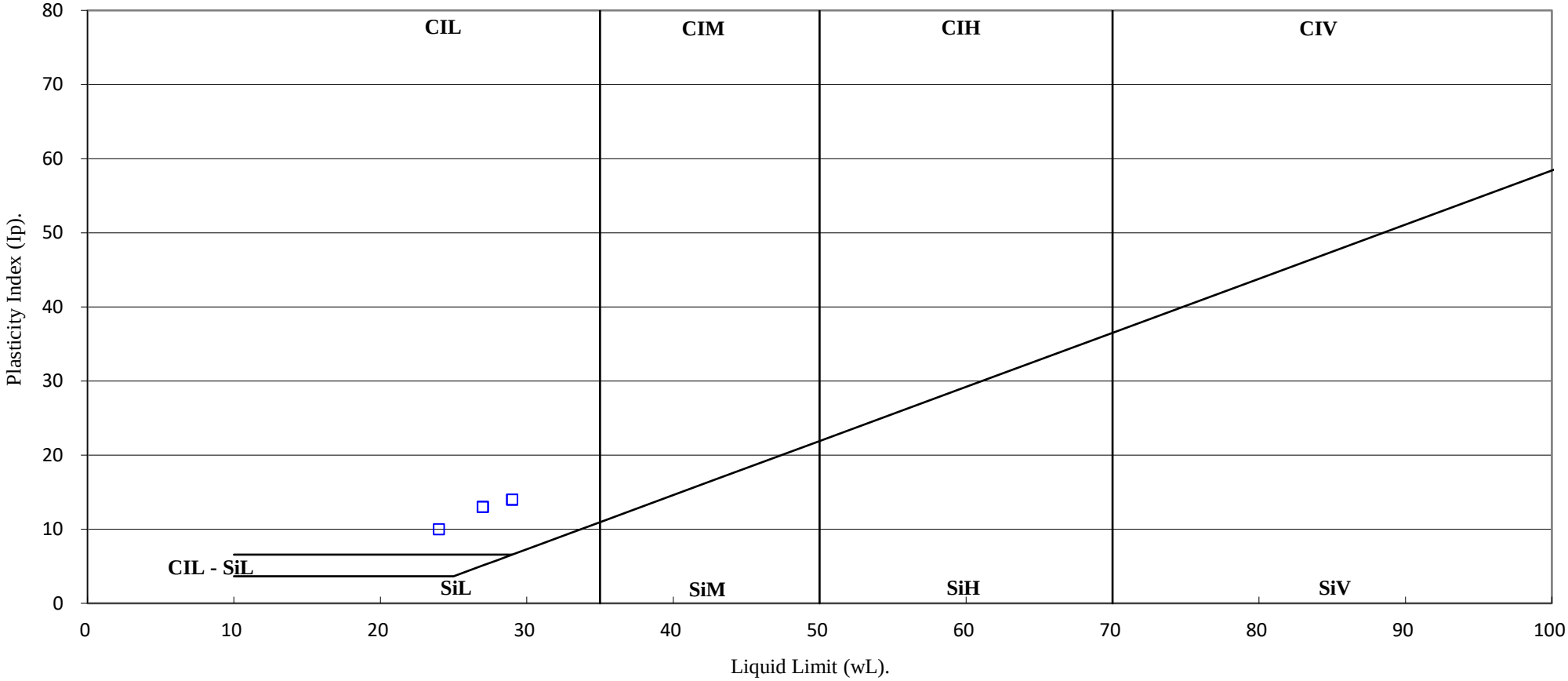
PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Land off Tilstock Road, Tilstock

Contract No:
PSL24/8061
Client Ref:
48888

PLASTICITY CHART

BS EN ISO 14688-2:2017 Clause 4.4



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Land off Tilstock Road, Tilstock**	**Contract No:**
		PSL24/8061
		Client Ref:

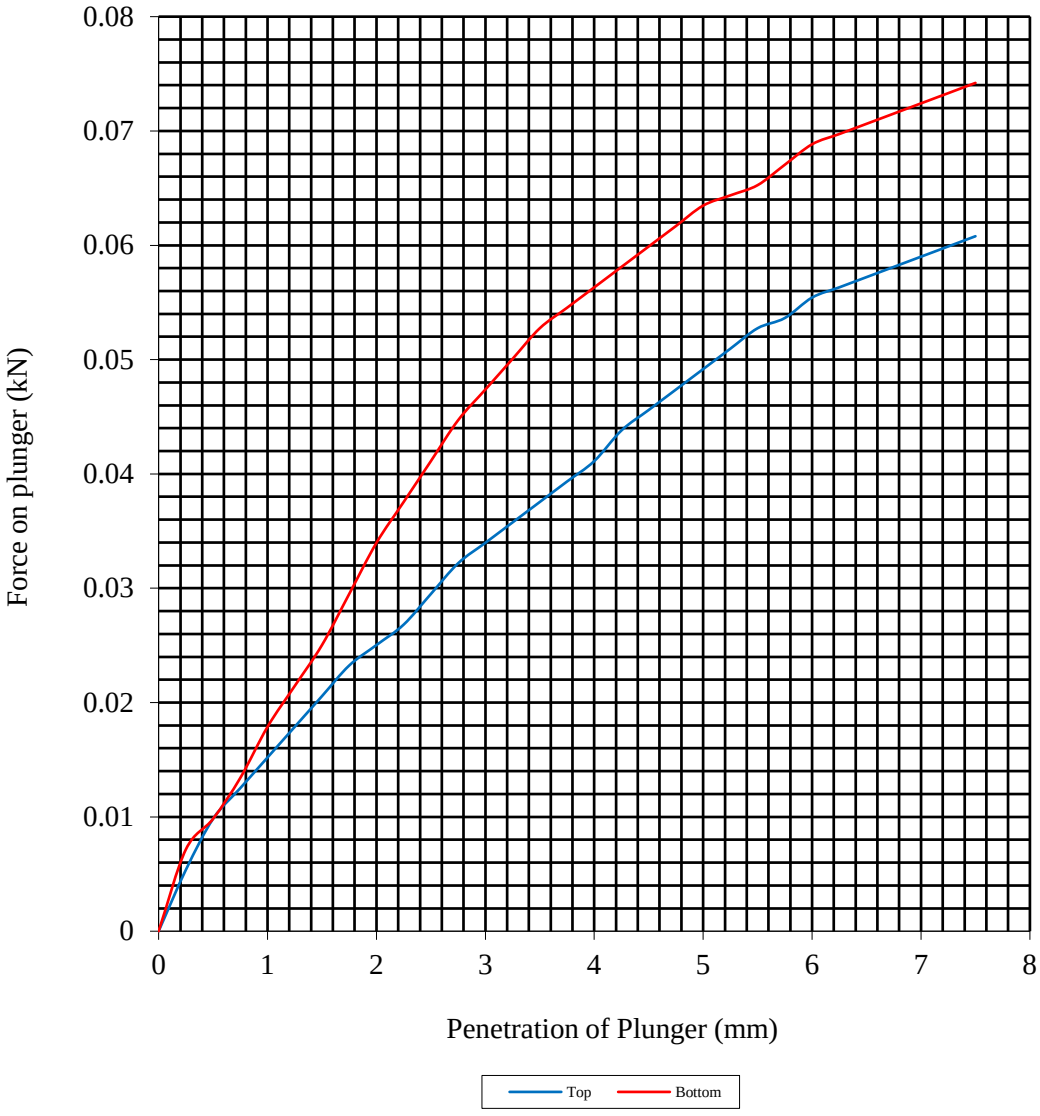
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: CP06 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	15.5	Surcharge Kg:	4.00	Sample Top	16.1	Sample Top	0.2
Bulk Density Mg/m3:	2.13	Soaking Time hrs	96	Sample Bottom	15.7	Sample Bottom	0.3
Dry Density Mg/m3:	1.84	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			4				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Land off Tilstock Road, Tilstock

Contract No: PSL24/8061

Client Ref: 48888

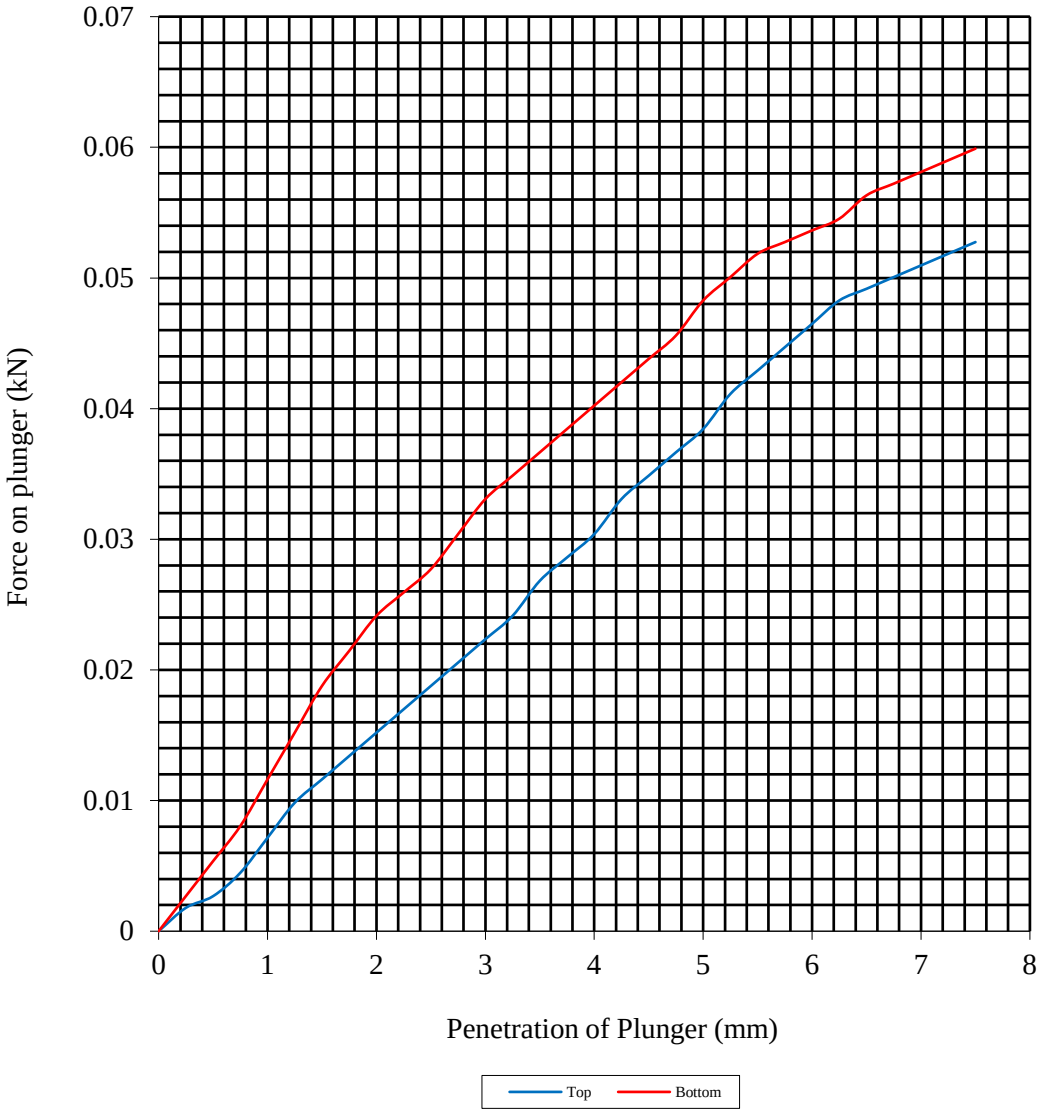
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: CP03 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	15.7	Surcharge Kg:	4.00	Sample Top	16.2	Sample Top	0.2
Bulk Density Mg/m3:	2.06	Soaking Time hrs	96	Sample Bottom	16.0	Sample Bottom	0.2
Dry Density Mg/m3:	1.78	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Land off Tilstock Road, Tilstock

Contract No: PSL24/8061

Client Ref: 48888

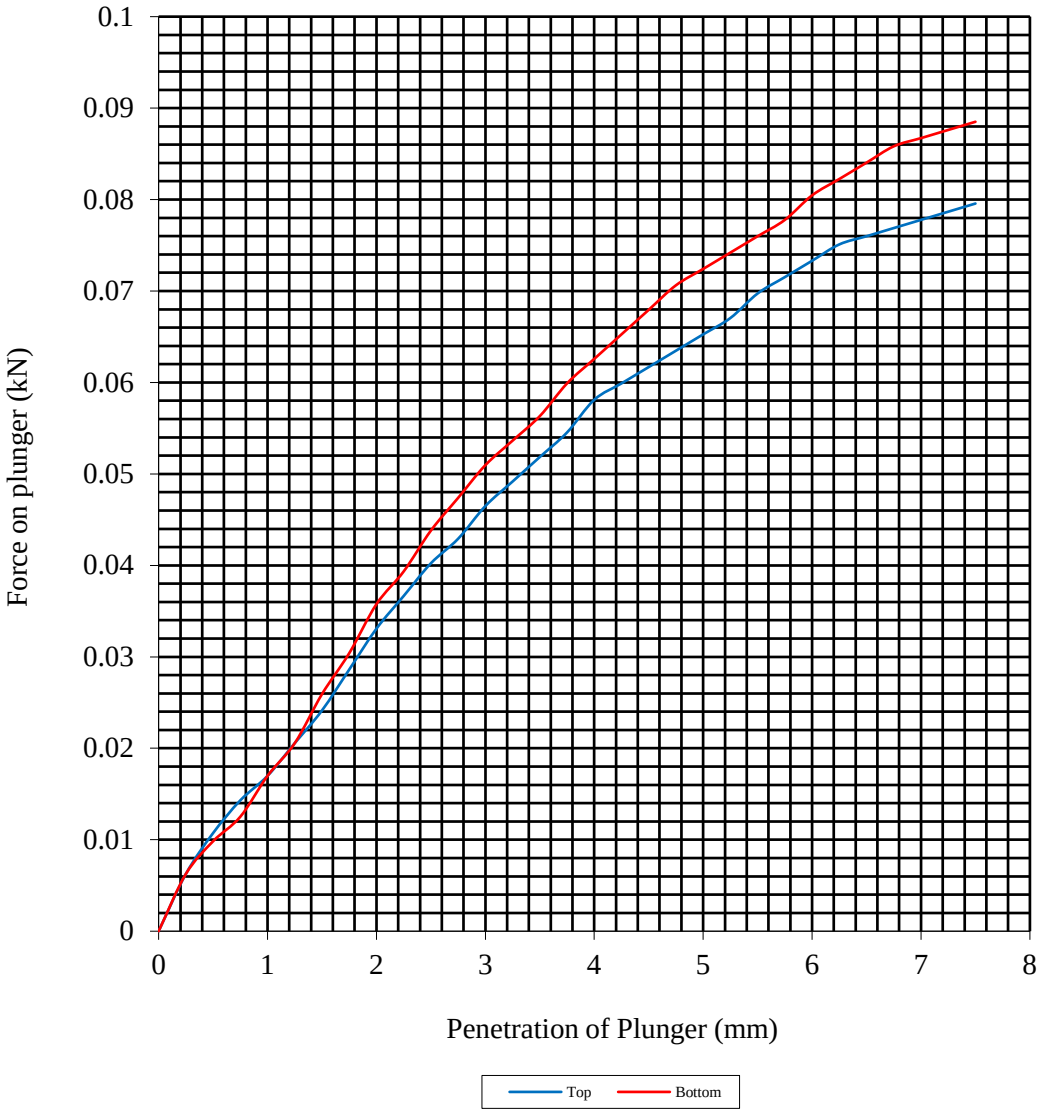
CALIFORNIA BEARING RATIO (CBR)

BS 1377 - Part 2 : Clause 15 : 2022

Hole Number: CP07 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Water Content %		C.B.R. Value %	
Water Content:	16.1	Surcharge Kg:	4.00	Sample Top	16.3	Sample Top	0.3
Bulk Density Mg/m3:	2.13	Soaking Time hrs	96	Sample Bottom	16.2	Sample Bottom	0.4
Dry Density Mg/m3:	1.83	Swelling mm:	0.10	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Land off Tilstock Road, Tilstock

Contract No: PSL24/8061

Client Ref: 48888

48888 Land off Tilstock Road, Tilstock – Summary of Mexecone Probe CBR Results

(Tests started at base of topsoil)

MP01						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450	3	2	1		
	525	2	1.75	1		
	600	7*	4*	5*		
	Test Average	2.50	1.88	1.00		
	Overall Average	**1.79**				

***** - Probe felt to be pushing past gravel during this test segment. Value discounted for calculation of average.

MP02						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450	2	2	3		
	525	4	2	3		
	600	3	4	2		
	Test Average	3.00	2.67	2.67		
	Overall Average	**2.78**				

MP03						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225	2.5	2	3		
	300	2	2	3		
	375	4	4	2		
	450	3.5	2.5	2.5		
	525	5	3	3		
	600	6*	5	3		
	Test Average	3.40	3.08	2.75		
	Overall Average	**3.08**				

***** - Probe felt to be pushing past gravel during this test segment. Value discounted for calculation of average.

48888 Land off Tilstock Road, Tilstock – Summary of Mexecone Probe CBR Results

MP04						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300	2.25	2	3.5		
	375	4.5	1.5	3.5		
	450	5.5*	1.5	4		
	525	2.25	1.75	3.5		
	600	6*	6.5*	6.5*		
	Test Average	3.00	1.69	3.63		
	Overall Average	**2.77**				

* - Probe felt to be pushing past gravel during this test segment. Value discounted for calculation of average.

MP05						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450					
	525	2	3	1		
	600	1.5	2	1.5		
	Test Average	1.75	2.50	1.25		
	Overall Average	**1.83**				

MP06						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450	12*	1.5	3		
	525		6*	4		
	600		6.5*	5		
	Test Average	-	1.5	-		
	Overall Average	**1.50**				

* - Probe felt to be pushing past gravel during this test segment. Value discounted for calculation of average.

48888 Land off Tilstock Road, Tilstock – Summary of Mexecone Probe CBR Results

MP07						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300	1.5	3.5	2		
	375	1.5	2.5	1.5		
	450	2.5	3	1.5		
	525	2	3	1		
	600	2	2	5		
	Test Average	1.90	2.80	2.20		
	Overall Average	**2.30**				

MP08						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450	1.5	1.5	1.5		
	525	3	3	2		
	600	3	2	3		
	Test Average	2.50	2.17	2.17		
	Overall Average	**2.28**				

MP09						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450	2	1	2.5		
	525	1		2.5		
	600	1		2		
	Test Average	1.33	1.00	2.33		
	Overall Average	**1.56**				

48888 Land off Tilstock Road, Tilstock – Summary of Mexecone Probe CBR Results

MP10						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450	3	4	3		
	525	4		2		
	600	5		6*		
	Test Average	4.00	4.00	2.50		
	Overall Average	**3.50**				

* - Probe felt to be pushing past gravel during this test segment. Value discounted for calculation of average.

MP11						
	Mexecone Probe CBR Results (%)					
Start Depth (m bgl)	**Depth (mm)**	**Test 1**	**Test 2**	**Test 3**		
GL	Base of Cone					
	75					
	150					
	225					
	300					
	375					
	450					
	525	6.5*	2	3		
	600	10*	10*	12*		
	Test Average	-	2.00	3.00		
	Overall Average	**2.50**				

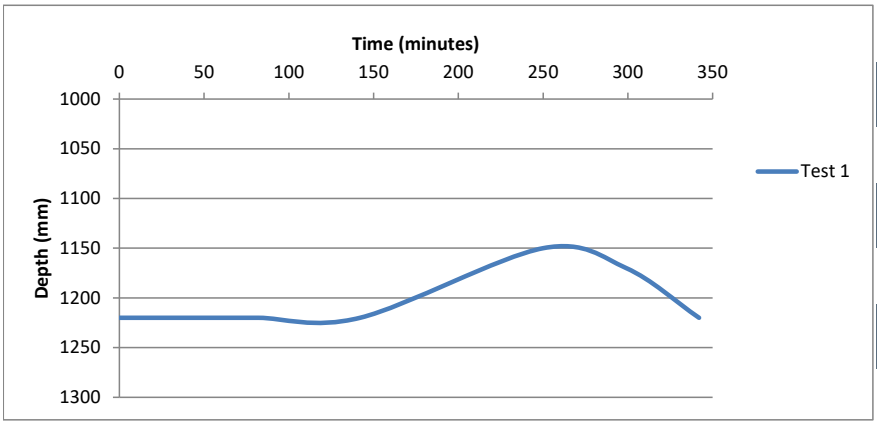
* - Probe felt to be pushing past gravel during this test segment. Value discounted for calculation of average.

Eastwood
CONSULTING ENGINEERS

Infiltration Test Results and Calculation of Infiltration Rates

Site: Tilstock Road, Tilstock
Client: Boningale Homes Ltd
Test Reference: SA01

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			1900	Trial pit length (mm)				Trial pit length (mm)			
Trial pit width (mm)			650	Trial pit width (mm)				Trial pit width (mm)			
Trial pit depth (mm)			2300	Trial pit depth (mm)				Trial pit depth (mm)			
Plan area (m^2)			1.235	Plan area (m^2)				Plan area (m^2)			
Time to discharge water (s)			31	Time to discharge water (s)				Time to discharge water (s)			
Depth to water at start of test (mm)			1220	Depth to water at start of test (mm)				Depth to water at start of test (mm)			
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
01/10/2024	10:18	1220	0								
01/10/2024	10:30	1220	12								
01/10/2024	10:34	1220	16								
01/10/2024	10:36	1220	18								
01/10/2024	10:38	1220	20								
01/10/2024	10:42	1220	24								
01/10/2024	10:48	1220	30								
01/10/2024	10:53	1220	35								
01/10/2024	11:00	1220	42								
01/10/2024	11:10	1220	52								
01/10/2024	11:40	1220	82								
01/10/2024	12:40	1220	142								
01/10/2024	14:28	1150	250								
01/10/2024	15:17	1170	299								
01/10/2024	16:00	1220	342								
Final depth		1220	342								
75% Effective depth (mm)			1490	75% Effective depth (mm)				75% Effective depth (mm)			
25% Effective depth (mm)			2030	25% Effective depth (mm)				25% Effective depth (mm)			
Time at 75% effective depth - t_{p75} (min)			N/A	Time at 75% effective depth - t_{p75} (min)				Time at 75% effective depth - t_{p75} (min)			
Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)				Time at 25 % effective depth - t_{p25} (min)			
Effective Storage volume of water (m^3)			1.3338	Effective Storage volume of water (m^3)				Effective Storage volume of water (m^3)			
V_{p75-25} (m^3)			0.6669	V_{p75-25} (m^3)				V_{p75-25} (m^3)			
Internal surface area - a_{p50} (m^2)			3.989	Internal surface area - a_{p50} (m^2)				Internal surface area - a_{p50} (m^2)			
t_{p75-25} (sec)			N/A	t_{p75-25} (sec)				t_{p75-25} (sec)			
BR365 Soil Infiltration Rate			**N/A**	**BR365 Soil Infiltration Rate (f)**				**BR365 Soil Infiltration Rate (f)**			
Average Soil Infiltration Rate			**N/A**	**Average Soil Infiltration Rate**				**Average Soil Infiltration Rate**			



Testing completed by	LF
Date	01/10/2024

Calculation completed by	CAW
Date	02/10/2024

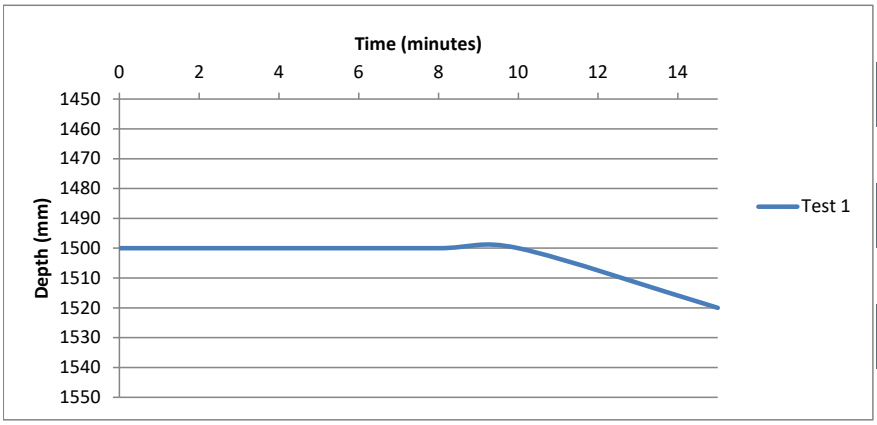
Calculation checked by	DJ
Date	06/11/2024

Eastwood
CONSULTING ENGINEERS

Infiltration Test Results and Calculation of Infiltration Rates

Site: Tilstock Road, Tilstock
Client: Boningale Homes Ltd
Test Reference: SA02

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			2100	Trial pit length (mm)				Trial pit length (mm)			
Trial pit width (mm)			650	Trial pit width (mm)				Trial pit width (mm)			
Trial pit depth (mm)			2700	Trial pit depth (mm)				Trial pit depth (mm)			
Plan area (m^2)			1.365	Plan area (m^2)				Plan area (m^2)			
Time to discharge water (s)			22	Time to discharge water (s)				Time to discharge water (s)			
Depth to water at start of test (mm)			1500	Depth to water at start of test (mm)				Depth to water at start of test (mm)			
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
01/10/2024	11:25	1500	0								
01/10/2024	11:27	1500	2								
01/10/2024	11:29	1500	4								
01/10/2024	11:33	1500	8								
01/10/2024	11:35	1500	10								
01/10/2024	11:40	1520	15								
Final depth		1520	15								
75% Effective depth (mm)			1800	75% Effective depth (mm)				75% Effective depth (mm)			
25% Effective depth (mm)			2400	25% Effective depth (mm)				25% Effective depth (mm)			
Time at 75% effective depth - t_{p75} (min)			N/A	Time at 75% effective depth - t_{p75} (min)				Time at 75% effective depth - t_{p75} (min)			
Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)				Time at 25 % effective depth - t_{p25} (min)			
Effective Storage volume of water (m^3)			1.638	Effective Storage volume of water (m^3)				Effective Storage volume of water (m^3)			
V_{p75-25} (m^3)			0.819	V_{p75-25} (m^3)				V_{p75-25} (m^3)			
Internal surface area - a_{p50} (m^2)			4.665	Internal surface area - a_{p50} (m^2)				Internal surface area - a_{p50} (m^2)			
t_{p75-25} (sec)			N/A	t_{p75-25} (sec)				t_{p75-25} (sec)			
BR365 Soil Infiltration Rate			**N/A**	**BR365 Soil Infiltration Rate (f)**				**BR365 Soil Infiltration Rate (f)**			
Average Soil Infiltration Rate			**3.8E-06**	**Average Soil Infiltration Rate**				**Average Soil Infiltration Rate**			



Testing completed by	LF
Date	01/10/2024

Calculation completed by	CAW
Date	02/10/2024

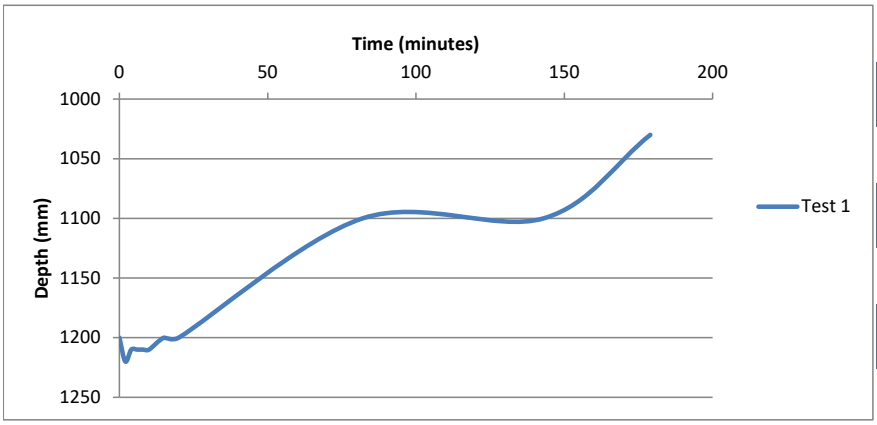
Calculation checked by	DJ
Date	06/11/2024

Eastwood
CONSULTING ENGINEERS

Infiltration Test Results and Calculation of Infiltration Rates

Site: Tilstock Road, Tilstock
Client: Boningale Homes Ltd
Test Reference: SA04

Test 1				Test 2				Test 3			
Pit Dimensions				**Pit Dimensions**				**Pit Dimensions**			
Trial pit length (mm)			1800	Trial pit length (mm)				Trial pit length (mm)			
Trial pit width (mm)			650	Trial pit width (mm)				Trial pit width (mm)			
Trial pit depth (mm)			2000	Trial pit depth (mm)				Trial pit depth (mm)			
Plan area (m^2)			1.17	Plan area (m^2)				Plan area (m^2)			
Time to discharge water (s)			22	Time to discharge water (s)				Time to discharge water (s)			
Depth to water at start of test (mm)			1200	Depth to water at start of test (mm)				Depth to water at start of test (mm)			
Time to soakaway				**Time to soakaway**				**Time to soakaway**			
Time		Depth to Water	Duration	Time		Depth to Water	Duration	Time		Depth to Water	Duration
Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes	Day	Time	(mm bgl)	Minutes
01/10/2024	12:58	1200	0								
01/10/2024	13:00	1220	2								
01/10/2024	13:02	1210	4								
01/10/2024	13:04	1210	6								
01/10/2024	13:06	1210	8								
01/10/2024	13:08	1210	10								
01/10/2024	13:13	1200	15								
01/10/2024	13:18	1200	20								
01/10/2024	14:20	1100	82								
01/10/2024	15:21	1100	143								
01/10/2024	15:57	1030	179								
Final depth		1030	179								
75% Effective depth (mm)			1400	75% Effective depth (mm)				75% Effective depth (mm)			
25% Effective depth (mm)			1800	25% Effective depth (mm)				25% Effective depth (mm)			
Time at 75% effective depth - t_{p75} (min)			N/A	Time at 75% effective depth - t_{p75} (min)				Time at 75% effective depth - t_{p75} (min)			
Time at 25 % effective depth - t_{p25} (min)			N/A	Time at 25 % effective depth - t_{p25} (min)				Time at 25 % effective depth - t_{p25} (min)			
Effective Storage volume of water (m^3)			0.936	Effective Storage volume of water (m^3)				Effective Storage volume of water (m^3)			
V_{p75-25} (m^3)			0.468	V_{p75-25} (m^3)				V_{p75-25} (m^3)			
Internal surface area - a_{p50} (m^2)			3.13	Internal surface area - a_{p50} (m^2)				Internal surface area - a_{p50} (m^2)			
t_{p75-25} (sec)			N/A	t_{p75-25} (sec)				t_{p75-25} (sec)			
BR365 Soil Infiltration Rate			**N/A**	**BR365 Soil Infiltration Rate (f)**				**BR365 Soil Infiltration Rate (f)**			
Average Soil Infiltration Rate			**N/A**	**Average Soil Infiltration Rate**				**Average Soil Infiltration Rate**			



Testing completed by	LF
Date	01/10/2024

Calculation completed by	CAW
Date	02/10/2024

Calculation checked by	DJ
Date	06/11/2024

Appendix 4

Chemical Test Results - i2 Analytical Reports 24-045716-2 & 24-051219-1

Table of Assessment Values – Residential with Homegrown Produce

Eastwood Consulting Engineers

e: Louise.Flynn@eastwoodce.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 24-045716

Replaces Analytical Report Number: 24-045716, issue no. 1
Additional analysis undertaken.
TOC added to sample 337701 as per client's request.

Project / Site name:	Land off Tilstock Road, Tilstock	Samples received on:	03/10/2024
Your job number:	48888	Samples instructed on/ Analysis started on:	03/10/2024
Your order number:		Analysis completed by:	22/10/2024
Report Issue Number:	2	Report issued on:	26/10/2024
Samples Analysed:	26 soil samples		

Signed:

Rachel Chappell
Key Account 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.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337683	337684	337685	337686	337687
Sample Reference				SA01	SA02	SA02A	TP01	SA04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.20
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	14	17	16	18
Total mass of sample received	kg	0.1	NONE	0.9	1.1	1.2	1.1	1.2
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN	SPU	SPU
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	6.7	7	6.3	6.1	6.9
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	-
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	1.5	1.5	-
Total Organic Carbon (TOC) – Manual	%	0.1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
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	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337683	337684	337685	337686	337687
Sample Reference				SA01	SA02	SA02A	TP01	SA04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.20
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.5	4.5	3.8	3.5	5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10	15	13	12	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	11	12	11	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	23	23	21	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.1	9.5	8.4	7.1	9.3
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	36	37	33	32	45

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337688	337689	337690	337691	337692
Sample Reference				TP03	TP04	TP06	TP07	TP08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.10	0.20	0.10
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	15	15	15	16
Total mass of sample received	kg	0.1	NONE	0.6	1.2	0.7	0.8	0.7
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	SPU	SPU	SPU
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	6.1	6.3	6.5	7.3	6.3
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	-
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) – Manual	%	0.1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.16	< 0.05	0.09	0.32	0.1
Pyrene	mg/kg	0.05	MCERTS	0.16	< 0.05	0.1	0.36	0.11
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05	< 0.05	0.26	0.07
Chrysene	mg/kg	0.05	MCERTS	0.11	< 0.05	< 0.05	0.28	0.06
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.22	< 0.05	< 0.05	0.46	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	0.2	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.13	< 0.05	< 0.05	0.36	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05	0.21	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.1	< 0.05	< 0.05	0.24	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.06	< 0.80	< 0.80	2.75	< 0.80

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337688	337689	337690	337691	337692
Sample Reference				TP03	TP04	TP06	TP07	TP08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.10	0.20	0.10
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.6	4.9	4.8	7.1	4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	12	13	18	11
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	12	12	24	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	23	24	41	23
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.5	8	8.6	13	7.2
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	43	36	39	70	39

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337693	337694	337695	337696	337697
Sample Reference				TP09	TP11	TP13	TP14	TP15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.30
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	17	12	18	18	18
Total mass of sample received	kg	0.1	NONE	0.6	0.6	0.7	0.6	0.6
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KSZ	KSZ	KSZ	KSZ	KSZ
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	6.6	6.7	6.5	6.8	6.9
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	-	-	-
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.5	-	-	1.3	-
Total Organic Carbon (TOC) – Manual	%	0.1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	0.07
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.07	0.08
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
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	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337693	337694	337695	337696	337697
Sample Reference				TP09	TP11	TP13	TP14	TP15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.30
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.6	3.4	5	5.9	5.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	9.8	13	22	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	11	12	14	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16	10	27	25	27
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	7.4	9	14	9.7
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	30	37	47	48

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337698	337699	337700	337701	337702
Sample Reference				TP18	SA02A	TP01	TP01	SA01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	1.50	2.10	0.70
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	18.6	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	47	31	40	13
Total mass of sample received	kg	0.1	NONE	0.7	1.1	1.1	1.2	1.2
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	KSZ	KSZ	KSZ	KSZ	-
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	6.7	6.2	6.4	7.6	7.7
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.079	0.055	0.181	0.027
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	49	33	69	18
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.0244	0.0166	0.0342	0.00922
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	24.4	16.6	34.2	9.22
Total Sulphur	mg/kg	50	MCERTS	-	630	370	1700	190
Total Sulphur	%	0.005	MCERTS	-	0.063	0.037	0.172	0.019
Organic Matter	%	0.1	MCERTS	-	20	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	5.6	2.2	0.3
Total Organic Carbon (TOC) – Manual	%	0.1	MCERTS	-	11	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
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	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337698	337699	337700	337701	337702
Sample Reference				TP18	SA02A	TP01	TP01	SA01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	1.50	2.10	0.70
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.5	2	11	4.8	3.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	4.6	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	23	32	9.4	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	20	30	13	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	12	11	4.3	6.2
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	8.5	27	9.1	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.2	1	1.1	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	46	13	53	17	29

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337703	337704	337705	337706	337707
Sample Reference				SA04	TP08	TP09	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.00	0.70	0.90	1.00
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	13	14	14	17
Total mass of sample received	kg	0.1	NONE	1.2	0.7	0.7	0.6	0.6
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	-	-	-	-	-
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.3	8.2	6.8	7.3	6.7
Total Sulphate as SO_4	%	0.005	MCERTS	0.019	0.028	0.015	0.01	0.028
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	58	70	20	23	60
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0289	0.0351	0.0101	0.0116	0.0301
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	28.9	35.1	10.1	11.6	30.1
Total Sulphur	mg/kg	50	MCERTS	310	180	58	< 50	120
Total Sulphur	%	0.005	MCERTS	0.031	0.018	0.006	< 0.005	0.012
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	0.3	-	-	-
Total Organic Carbon (TOC) – Manual	%	0.1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
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	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337703	337704	337705	337706	337707
Sample Reference				SA04	TP08	TP09	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.00	0.70	0.90	1.00
Date Sampled				01/10/2024	01/10/2024	01/10/2024	01/10/2024	01/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.1	6.1	7.1	< 1.0	6.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	26	38	6.6	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.2	18	32	6.5	27
Lead (aqua regia extractable)	mg/kg	1	MCERTS	7.3	7.4	9.7	2.8	8.9
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	25	42	5.3	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	32	39	63	19	45

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337708
Sample Reference				TP15
Sample Number				None Supplied
Depth (m)				1.20
Date Sampled				01/10/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	11
Total mass of sample received	kg	0.1	NONE	0.7

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.9
Total Sulphate as SO_4	%	0.005	MCERTS	0.035
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	29
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0143
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14.3
Total Sulphur	mg/kg	50	MCERTS	210
Total Sulphur	%	0.005	MCERTS	0.021
Organic Matter	%	0.1	MCERTS	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-
Total Organic Carbon (TOC) – Manual	%	0.1	MCERTS	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80

Analytical Report Number: 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				337708
Sample Reference				TP15
Sample Number				None Supplied
Depth (m)				1.20
Date Sampled				01/10/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	5.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	23

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

* 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 *
337683	SA01	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337684	SA02	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337685	SA02A	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337686	TP01	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337687	SA04	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337688	TP03	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337689	TP04	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337690	TP06	None Supplied	0.1	Brown loam and sand with gravel and vegetation
337691	TP07	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337692	TP08	None Supplied	0.1	Brown loam and sand with gravel and vegetation
337693	TP09	None Supplied	0.2	Brown loam and clay with gravel and vegetation
337694	TP11	None Supplied	0.2	Brown loam and sand with gravel and vegetation
337695	TP13	None Supplied	0.2	Brown loam and clay with gravel and vegetation
337696	TP14	None Supplied	0.2	Brown loam and clay with gravel and vegetation
337697	TP15	None Supplied	0.3	Brown loam and sand with gravel and vegetation
337698	TP18	None Supplied	0.1	Brown loam and sand with gravel and vegetation
337699	SA02A	None Supplied	0.8	Brown clay and loam with gravel and vegetation
337700	TP01	None Supplied	1.5	Brown clay and sand with gravel and vegetation
337701	TP01	None Supplied	2.1	Light grey clay and sand with gravel and vegetation
337702	SA01	None Supplied	0.7	Brown sandy clay with gravel
337703	SA04	None Supplied	1.2	Brown sandy clay with gravel and vegetation
337704	TP08	None Supplied	1	Brown clay and sand with gravel and vegetation
337705	TP09	None Supplied	0.7	Brown clay and sand with gravel and vegetation
337706	TP13	None Supplied	0.9	Light grey sand with gravel
337707	TP14	None Supplied	1	Brown clay and sand with gravel and vegetation
337708	TP15	None Supplied	1.2	Brown sandy clay with gravel

Analytical Report Number : 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

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 dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L023B	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 (Walkley Black Method)	In-house method	L023B	D	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	L038B	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS

Analytical Report Number : 24-045716
Project / Site name: Land off Tilstock Road, Tilstock

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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Analytical Report Number : 24-051219

Project / Site name:	Land off Tilstock Road, Tilstock	Samples received on:	31/10/2024
Your job number:	48888	Samples instructed on/ Analysis started on:	31/10/2024
Your order number:		Analysis completed by:	07/11/2024
Report Issue Number:	1	Report issued on:	08/11/2024
Samples Analysed:	11 soil samples		

Signed:

Dominika Liana
Junior Reporting Specialist
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

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-051219
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				365895	365896	365897	365898	365899
Sample Reference				CP02	CP02	CP03	CP04	CP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				6.00	10.50	7.50	4.50	6.00
Date Sampled				01/10/2024	01/10/2024	08/10/2024	02/10/2024	02/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Stone Content	%	0.1	NONE	2.3	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6.1	11	12	9.3	12
Total mass of sample received	kg	0.1	NONE	0.9	1	0.8	0.9	0.8

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.5	8.2	8.5	8.2	8.6
Total Sulphate as SO_4	mg/kg	50	MCERTS	590	240	290	430	300
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	46	55	66	89	120
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	23.2	27.7	33.1	44.4	57.9
Total Sulphur	mg/kg	50	MCERTS	190	240	230	340	390

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-051219
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				365900	365901	365902	365903	365904
Sample Reference				CP05	CP05	CP06	CP06	CP07
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.50	10.50	3.00	7.50	7.50
Date Sampled				03/10/2024	03/10/2024	04/10/2024	04/10/2024	07/10/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	19	17	11	14
Total mass of sample received	kg	0.1	NONE	0.9	0.8	0.9	1	0.9

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.6	8.4	8.5	8.5	8.4
Total Sulphate as SO_4	mg/kg	50	MCERTS	770	340	380	230	230
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	51	110	28	72	61
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	25.3	55.5	14.2	36	30.5
Total Sulphur	mg/kg	50	MCERTS	260	300	130	210	190

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-051219
Project / Site name: Land off Tilstock Road, Tilstock

Lab Sample Number				365905
Sample Reference				CP07
Sample Number				None Supplied
Depth (m)				9.00
Date Sampled				07/10/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	13
Total mass of sample received	kg	0.1	NONE	1

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.5
Total Sulphate as SO_4	mg/kg	50	MCERTS	230
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	63
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	31.5
Total Sulphur	mg/kg	50	MCERTS	280

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-051219
Project / Site name: Land off Tilstock Road, Tilstock

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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 *
365895	CP02	None Supplied	6	Brown sand with gravel and stones
365896	CP02	None Supplied	10.5	Brown clay
365897	CP03	None Supplied	7.5	Brown clay
365898	CP04	None Supplied	4.5	Brown sand
365899	CP04	None Supplied	6	Brown clay
365900	CP05	None Supplied	4.5	Brown clay
365901	CP05	None Supplied	10.5	Brown clay
365902	CP06	None Supplied	3	Brown clay and sand
365903	CP06	None Supplied	7.5	Brown clay and sand
365904	CP07	None Supplied	7.5	Brown clay and sand
365905	CP07	None Supplied	9	Brown clay and sand

Analytical Report Number : 24-051219
Project / Site name: Land off Tilstock Road, Tilstock

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

Sample Deviation Report

Analytical Report Number : 24-051219
Project / Site name: Land off Tilstock Road, Tilstock

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
CP02	N/A	S	365895	c	pH in soil (automated)	L099-PL	c
CP02	N/A	S	365896	c	pH in soil (automated)	L099-PL	c
CP04	N/A	S	365898	c	pH in soil (automated)	L099-PL	c
CP04	N/A	S	365899	c	pH in soil (automated)	L099-PL	c
CP05	N/A	S	365900	c	pH in soil (automated)	L099-PL	c
CP05	N/A	S	365901	c	pH in soil (automated)	L099-PL	c

Inorganic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)
Arsenic	37
Cadmium	11
Chromium (III)	910
Chromium (VI)	6
Lead	200
Mercury	1.2
Nickel	180
Selenium	250
Copper	2400
Zinc	3700

Organic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz(a,h)anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd)pyrene	27	36	41
Benzo(g,h,i)perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310

Prepared	LM	Checked	KE	Date	28.11.24	Job No	48888

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LAND OFF TILSTOCK ROAD, TILSTOCK

ASSESSMENT CRITERIA – RESIDENTIAL WITH HOMEGROWN PRODUCE

Contaminant	Phytotoxicity			
	pH 5.0 to 5.5	pH 5.5 to 6.0	pH 6.0 to 7.0	pH >7.0
Arsenic	50			
Cadmium	3			
Chromium	400			
Lead	300			
Mercury	1			
Nickel	50	60	75	110
Copper	80	100	135	200
Zinc	200	200	200	300

The assessment concentration for lead is the Category 4 Screening Level produced by Contaminated Land: Applications in Real Environments (CL:AIRE) and outlined in Appendix H of their report SP1010. The others have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, *'The LQM/CIEH S4ULs for Human Health Risk Assessment'*, Land Quality Press, Nottingham. The metals/metalloids are based on a sandy loam soil and 6% soil organic matter. The assessment values are not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. Instead, the modified mean value should be compared with the assessment concentration.

The assessment values for phytotoxicity are the levels at which plant growth is thought to be affected. They are taken from the maximum permissible and advisable concentrations in soil after application of soil sludge given in the *'The Code of Good Agricultural Practice for the Protection of Soil*', MAFF, 1998.

The assessment of sulphate, water soluble sulphate, elemental sulphur and sulphide is to determine the aggressive nature of the ground with respect to concrete and consequently the results are compared with BRE Special Digest 1:2005 '*Concrete in Aggressive Ground*'.

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TPH Fraction	Intended Land Use Residential (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130 (48)[vap]	330 (118)[vap]	760 (283)[vap]
Aliphatic EC >12-16	1100 (24)[sol]	2400 (59)[sol]	4,300 (142)[sol]
Aliphatic EC >16-35	65,000 (8.48)[f,sol]	92,000 (21)[f,sol]	110,000[f]
Aliphatic EC >35-44	65,000 (8.48)[f, sol]	92,000 (21)[f,sol]	110,000[f]
Aromatic EC 5-7	70	140	300
Aromatic EC >7-8	130	290	660
Aromatic EC>8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260[f]	540[f]	930[f]
Aromatic EC >21-35	1,100[f]	1,500[f]	1,700[f]
Aromatic EC >35-44	1,100[f]	1,500[f]	1,700[f]

[f] oral, dermal, and inhalation exposure compared with oral HCV

[sol] S4UL presented exceeds the solubility saturation limit, which is presented in brackets

[vap] S4UL presented exceed the vapour saturation limit, which is presented in brackets

The assessment criteria for each of the petroleum hydrocarbon fractions have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, *'The LQM/CIEH S4ULs for Human Health Risk Assessment'*, Land Quality Press, Nottingham. These are also all based on a sandy loam soil.

Within the Environment Agency Science Report P5-080/TR3, Askari, K. & Pollard, S., 2005 *'The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils'* it is stated that the assessment values should not be considered individually; instead the potential additive effects should be calculated. This is achieved by calculating an individual Hazard Quotient (HQ) for each fraction. The HQ is the proportion of the assessment concentration represented by the recorded concentration. The HQs are then added together to form a Hazard Index (HI) and where this exceeds unity a potential significant risk to human health may exist.

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ASSESSMENT CRITERIA – RESIDENTIAL WITH HOMEGROWN PRODUCE

Appendix 5

Ground Gas Monitoring Results

Table of Atmospheric Pressures

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48888 - Tilstock

Date	09.10.2024
Atmospheric Pressure mb	973
Atmos. Pressure Trend	Falling
Monitor	13581
Date of Last Calibration	29/01/2024

Key

Methane	Carbon Dioxide
1.0 to 4.9%	5.0 to 9.9%
5.0 to 19.9%	10.0 to 29.9%
>20.0%	>30.0%

Water within plain pipe section

Hole ID	Methane %		Carbon Dioxide %		Oxygen %		Carbon Monoxide (ppm)		Hydrogen Sulphide (ppm)		Flow l/hr		Depth to Water	Depth to Well Base	Response Zone
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	m	m	m
CP01	1.2	0	0.7	0	21.2	21.2	140	0	50	0	0.0	0.0	0.33	3.53	1.00-3.53
CP02	2.1	0	5.4	4.7	16	14.5	22	0	0		0.0	0.0	3.55	3.55	1.00-3.55
CP03	0	0	0.8	0.5	20.4	20.4	10	10	0		2.8	0.0	1.10	3.20	1.00-3.20
CP04	0	0	2.3	2.3	19.5	18.7	0		0		0.0	0.0	1.17	3.82	1.00-3.82
CP05	0	0	0.2	0.2	20.7	20.6	0		0		2.0	0.3	0.83	3.08	1.00-3.08
CP06	0	0	0.5	0.1	20.5	20.5	0		0		7.6	0.2	0.30	2.47	1.00-2.47
CP07	0	0	0.3	0.3	20.5	20.3	10	10	0		9.3	1.3	0.71	3.96	1.00-3.96

Remarks

AP started at 974 upon arrival, dropped to 973 during visit
Weather = heavy rain switching to rain in the PM
CP01 - CH4 and CO2 both recorded 0 after 240secs. CO - 140ppm at 30secs / 88ppm at 60secs / 11ppm at 180secs / 0ppm at 240secs. H2S - 0ppm upto 100secs / 50ppm at 120secs / 0ppm at 180secs.
CP02 CO - 22ppm at 15secs / 10ppm at 30secs / 0ppm after 60secs

All boreholes, once no longer in use for monitoring, should be decommissioned following the Environment Agency guidance laid out in Section 5.5 of the publication “Guidance on the design and installation of groundwater quality monitoring points”, Science Report SC020093, January 2006. This is to remove potential preferential pathways for ground gas migration to future receptors which may be created by the wells.

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48888 - Tilstock

Date	25.10.2024
Atmospheric Pressure mb	1001
Atmos. Pressure Trend	Falling
Monitor	13581
Date of Last Calibration	29/01/2024

Key

Methane	Carbon Dioxide
1.0 to 4.9%	5.0 to 9.9%
5.0 to 19.9%	10.0 to 29.9%
>20.0%	>30.0%

Water within plain pipe section

Hole ID	Methane %		Carbon Dioxide %		Oxygen %		Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow l/hr		Depth to Water	Depth to Well Base	Response Zone
	Peak	Steady	Peak	Steady	Peak	Steady	Steady	Steady	Peak	Steady	m	m	m
CP01	0.3	0	0.6	0.2	21.1	21.1	0	12	0	0	0.50	3.40	1.00-3.40
CP02	0	0	4.8	4.8	17.8	15.5	0	0	0	0	3.35	3.55	1.00-3.55
CP03	0.3	0	0.6	0.3	20.7	20.7	0	0	0	0	0.65	3.20	1.00-3.20
CP04	0	0	1.8	1.7	20.2	20.2	0	0	0	0	1.25	3.80	1.00-3.80
CP05	0	0	1.1	1.1	20.4	20	0	0	25.6	3	0.75	3.05	1.00-3.05
CP06	0	0	3.2	3.2	19.9	17.8	0	0	-2.9	0	0.43	2.45	1.00-2.45
CP07	0	0	1.4	0.9	20	20	0	0	0	0	0.73	3.95	1.00-3.95

Remarks

Weather = drizzle / cloud

No changes to site from previous visit.

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48888 - Tilstock

Date	21.11.2024
Atmospheric Pressure mb	985
Atmos. Pressure Trend	Falling
Monitor	13581
Date of Last Calibration	29/01/2024

Key

Methane	Carbon Dioxide
1.0 to 4.9%	5.0 to 9.9%
5.0 to 19.9%	10.0 to 29.9%
>20.0%	>30.0%

Water within plain pipe section

Hole ID	Methane %		Carbon Dioxide %		Oxygen %		Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow l/hr		Depth to Water m	Depth to Well Base m	Response Zone m
	Peak	Steady	Peak	Steady	Peak	Steady	Steady	Steady	Peak	Steady			
CP01	0	0	0.4	0.1	20.3	20.1	0	0	0.5	0	0.50	3.40	1.00-3.40
CP02	0	0	5.2	5.2	16.9	14.7	0	0	0	0	3.38	3.55	1.00-3.55
CP03	0	0	2.1	0.6	21.4	21.4	0	0	0	0	1.00	3.09	1.00-3.09
CP04	0	0	2.4	2.4	19.8	19.8	0	0	0	0	1.26	3.80	1.00-3.80
CP05	0	0	4.1	4.1	14.1	13.4	0	0	32.7	0	0.75	3.05	1.00-3.05
CP06	0	0	0.4	0.4	20.2	20.2	0	0	24.7	0	0.41	2.38	1.00-2.38
CP07	0	0	2.3	2.3	18.2	17.7	0	0	0	0	0.63	3.92	1.00-3.92

Remarks

Weather: Cold, cloudy and snow on ground
AP taken from reader

All boreholes, once no longer in use for monitoring, should be decommissioned following the Environment Agency guidance laid out in Section 5.5 of the publication “Guidance on the design and installation of groundwater quality monitoring points”, Science Report SC020093, January 2006. This is to remove potential preferential pathways for ground gas migration to future receptors which may be created by the wells.

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48888 - Tilstock

Date	18.12.2024
Atmospheric Pressure mb	992
Atmos. Pressure Trend	Falling
Monitor	13581
Date of Last Calibration	29/01/2024

Key

Methane	Carbon Dioxide
1.0 to 4.9%	5.0 to 9.9%
5.0 to 19.9%	10.0 to 29.9%
>20.0%	>30.0%

Water within plain pipe section

Hole ID	Methane %		Carbon Dioxide %		Oxygen %		Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow l/hr		Depth to Water m	Depth to Well Base m	Response Zone m
	Peak	Steady	Peak	Steady	Peak	Steady	Steady	Steady	Peak	Steady			
CP01	0	0	0.3	0.3	20.1	20.1	0	0	0	0	0.48	3.40	1.00-3.40
CP02	0	0	4.8	4.6	18.2	16.7	0	0	0	0	3.43	3.55	1.00-3.55
CP03	0	0	1.9	1.8	20.6	20.6	0	0	0	0	1.01	3.09	1.00-3.09
CP04	0	0	3.6	3.6	17.5	16.8	0	0	0	0	1.24	3.80	1.00-3.80
CP05	0	0	3.8	3.8	15.6	15.3	0	0	29.2	0	0.78	3.05	1.00-3.05
CP06	0	0	0.5	0.4	20.4	20.3	0	0	26.4	0	0.40	2.38	1.00-2.38
CP07	0	0	4.2	3.7	19.5	19.5	0	0	0	0	0.58	3.92	1.00-3.92

Remarks

Weather: Cold, cloudy and snow on ground
AP taken from reader

All boreholes, once no longer in use for monitoring, should be decommissioned following the Environment Agency guidance laid out in Section 5.5 of the publication “Guidance on the design and installation of groundwater quality monitoring points”, Science Report SC020093, January 2006. This is to remove potential preferential pathways for ground gas migration to future receptors which may be created by the wells.

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48888 - Tilstock

Date	23.01.2025
Atmospheric Pressure mb	974
Atmos. Pressure Trend	Falling
Monitor	13581
Date of Last Calibration	28/01/2025

Key

Methane	Carbon Dioxide
1.0 to 4.9%	5.0 to 9.9%
5.0 to 19.9%	10.0 to 29.9%
>20.0%	>30.0%

Water within plain pipe section

Hole ID	Methane %		Carbon Dioxide %		Oxygen %		Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow l/hr		Depth to Water m	Depth to Well Base m	Response Zone m
	Peak	Steady	Peak	Steady	Peak	Steady	Steady	Steady	Peak	Steady			
CP01	0	0	2.6	2.2	18.6	18.5	0	0	0	0	0.50	3.40	1.00-3.40
CP02	0	0	3.2	3.1	19.6	19.6	0	0	0	0	3.48	3.55	1.00-3.55
CP03	0	0	3.8	3.8	18.8	18.7	0	0	0	0	0.97	3.09	1.00-3.09
CP04	0	0	0.9	0.9	19.4	19.3	0	0	0	0	1.00	3.80	1.00-3.80
CP05	0	0	3.1	3.1	16.4	16.4	0	0	22.5	0	0.76	3.05	1.00-3.05
CP06	0	0	0.9	0.8	19.9	19.9	0	0	14.8	0	0.45	2.38	1.00-2.38
CP07	0	0	3.2	3.2	18.2	18.1	0	0	0	0	0.62	3.92	1.00-3.92

Remarks

Weather: rain

AP taken from reader

All boreholes, once no longer in use for monitoring, should be decommissioned following the Environment Agency guidance laid out in Section 5.5 of the publication “Guidance on the design and installation of groundwater quality monitoring points”, Science Report SC020093, January 2006. This is to remove potential preferential pathways for ground gas migration to future receptors which may be created by the wells.

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48888 - Tilstock

Date	21.02.2025
Atmospheric Pressure mb	992
Atmos. Pressure Trend	Falling
Monitor	13581
Date of Last Calibration	28/01/2025

Key

Methane	Carbon Dioxide
1.0 to 4.9%	5.0 to 9.9%
5.0 to 19.9%	10.0 to 29.9%
>20.0%	>30.0%

Water within plain pipe section

Hole ID	Methane %		Carbon Dioxide %		Oxygen %		Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Flow l/hr		Depth to Water m	Depth to Well Base m	Response Zone m
	Peak	Steady	Peak	Steady	Peak	Steady	Steady	Steady	Peak	Steady			
CP01	0	0	3.1	3.1	17.7	17.7	0	0	0	0	0.52	3.40	1.00-3.40
CP02	0	0	3.8	3.6	19.1	16.5	0	0	0	0	3.51	3.55	1.00-3.55
CP03	0	0	3.9	3.9	19.9	19.9	0	0	0	0	1.01	3.09	1.00-3.09
CP04	0	0	1.2	1.2	17.5	17.5	0	0	0	0	1.22	3.80	1.00-3.80
CP05	0	0	3.5	3.5	16.5	16.5	0	0	14.7	0	0.81	3.05	1.00-3.05
CP06	0	0	1.2	0.9	20	19.9	0	0	19.2	0	0.42	2.38	1.00-2.38
CP07	0	0	3.8	3.8	19.8	19.8	0	0	0	0	0.58	3.92	1.00-3.92

Remarks

AP taken from reader

All boreholes, once no longer in use for monitoring, should be decommissioned following the Environment Agency guidance laid out in Section 5.5 of the publication “Guidance on the design and installation of groundwater quality monitoring points”, Science Report SC020093, January 2006. This is to remove potential preferential pathways for ground gas migration to future receptors which may be created by the wells.

Date	Atmospheric Pressure (mb)	Atmospheric Trend	Relative Humidity (%)	Temp (ºC)	Weather
07.10.24	994	Falling	86	17	Cloud/rain
08.10.24	990	Falling	91	16	Cloud/rain
09.10.24	989	Falling	92	13	Cloud/rain
10.10.24	1006	Rising	77	10	Cloud/rain
11.10.24	1015	Rising	80	12	Cloudy
23.10.24	1029	Rising	81	15	Cloud/sun
24.10.24	1014	Falling	84	15	Cloudy
25.10.24	1012	Falling	80	12	Cloud/sun
26.10.24	1019	Rising	81	12	Cloud/rain
27.10.24	1024	Rising	83	13	Cloud/sun
19.11.24	1002	Falling	91	3	Cloud/sleet/rain
20.11.24	1011	Rising	80	4	Sunny
21.11.24	1002	Falling	81	3	Cloud/sun
22.11.24	1010	Rising	83	4	Sunny
23.11.24	987	Falling	98	10	Cloud/rain
16.12.24	1029	Rising	82	11	Cloud/sun
17.12.24	1019	Falling	89	11	Cloudy
18.12.24	1006	Falling	82	14	Cloud/rain
19.12.24	1013	Rising	78	7	Cloud/rain/sun
20.12.24	1022	Rising	85	9	Cloud/sun
21.01.25	1011	Rising	87	6	Cloud/rain
22.01.25	1005	Falling	93	6	Cloudy
23.01.25	998	Falling	93	7	Cloud/rain
24.01.25	989	Falling	71	10	Cloud/rain/sun
25.01.25	1004	Rising	74	6	Cloud/sun
19.02.25	1014	Falling	79	9	Cloud/rain
20.02.25	1009	Falling	85	14	Cloud/rain
21.02.25	1005	Falling	81	14	Cloud/rain
22.02.25	1016	Rising	74	12	Cloud/sun
23.02.25	1016	Steady	82	12	Cloud/rain

Taken from BBC Weather website
Highlighted rows denote gas monitoring visits.

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LAND OFF TILSTOCK ROAD, TILSTOCK

ATMOSPHERIC CONDITIONS

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