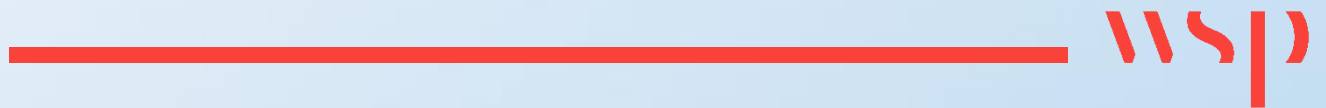


Appendix B

MINERALS SAFEGUARDING STATEMENT





A29 Phase 1 - Minerals Statement

| | | | |
|----------------|----------------------------------|------------------------|--------|
| TO | West Sussex County Council | FROM | WSP |
| DATE | August 2020 | CONFIDENTIALITY | Public |
| SUBJECT | A29 Phase 1 – Minerals Statement | | |

TERMS OF REFERENCE

WSP UK Limited (WSP) was instructed by West Sussex County Council (WSCC, the Client) to provide a Minerals Statement to support the proposed planning application for the land in Eastergate, West Sussex (the site) as part of the A29 road scheme project.

This statement is required as the site falls within a Minerals Safeguarding Area for Sharp Sand and Gravel as shown in the West Sussex Joint Minerals Plan (**Appendix A**), which was adopted by the council in July 2018.

PROPOSED DEVELOPMENT

The proposed development scheme involves creation of a new 1.3km, single carriageway road in an arc shape connecting the eastern side of the A29 to the northern side of the B2233. It is the intention that Phase 2 from Barnham Road to a new junction on the A29 south of Lidsey Bends, will be delivered by the developer. This report focuses solely on the Phase 1 section of the route.

The site locations and current site layout of the A29 Phase 1 are presented as **Figures 1 to Figure 3** in **Appendix A**.

SCOPE OF THE ASSESSMENT

The report provides details of the geological site setting through review of existing site information and borehole logs, provides commentary of the mineral resource underlying the site in the context of the Local Plan and comments on the potential impacts of the proposed development on the underlying mineral deposits.

SOURCES OF INFORMATION

The following relevant sources of information were used in the production of this report:

- West Sussex County Council, Joint Minerals Local Plan, July 2018
- WSP (2018) A29 Realignment Project, Preliminary Sources Study Report, West Sussex County Council, 70031782/GEO/002, July 2018;
- WSP (2019), A29 Realignment Project – Route 6, Ground Investigation Report, 70031782/GEO/002, January 2019;
- WSP (2020) A29 Phase 1, Preliminary Risk Assessment, West Sussex County Council, 70031782-WS1, June 2020; British Geological Survey (BGS) Online Viewer (<https://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>) accessed 4 June 2020; and,
- BGS map – Chichester & Bognor, England and Wales Sheet 317/332, Solid and Drift Geology, 1:50 000 (1996) accessed 4 June 2020.



LIMITATIONS

This report is addressed to and may be relied upon by WSCC and may not be relied upon or transferred to any other parties without the express written agreement of WSP.

This report should be read and used in full. No responsibility will be accepted where this report is used, in its entirety or in part, by any other party. WSP cannot be held liable for third party information.

LOCAL MINERALS DESIGNATION

WSCC adopted the Joint Minerals Local Plan (MLP) in July 2018. The MLP provides a strategy for mineral supply in West Sussex until 2033, and includes designated areas with 'Mineral Safeguard Area' (MSA) status. **Appendix E** of the MLP shows that the site is located within a MSA for Sharp Sand and Gravel. The MLP includes Policy M9: 'Safeguarding Minerals' which states: -

'...Soft sand (including potential silica sand), sharp sand and gravel, brick-making clay, building stone resources and chalk reserves are safeguarded against sterilisation. Proposals for non-mineral development within the Minerals Safeguarded Areas (as shown on maps in Appendix E) will not be permitted unless:

(i) Mineral sterilisation will not occur; or

(ii) it is appropriate and practicable to extract the mineral prior to the development taking place, having regards to the other policies in this Plan; or

(iii) the overriding need for the development outweighs the safeguarding of the mineral and it has been demonstrated that prior extraction is not practicable or environmentally feasible.'

The MLP is in place to ensure that valuable mineral resources are not unnecessarily sterilised, and that where non-mineral development is permitted that due consideration is given to ensuring that appropriate investigations are undertaken to establish if any viable mineral deposits can be recovered as part of the development process (from full prior extraction to incidental extraction). However, there is also an acknowledgement in the MLP that development may be permitted to effectively sterilise the mineral where the merits of the development outweigh safeguarding.

With the proposed development of the site as a new single two-lane carriageway road with associated infrastructure being situated in a Sharp Sand and Gravel MSA, there is the potential to sterilise the underlying Sharp Sand and Gravel resource.

WSP (2019) GROUND INVESTIGATION

WSP was commissioned by WSCC to provide a ground investigation for 'Route 6' of A29 Realignment Project, which is the section of the proposed route covered by this assessment; 'Phase 1'. The investigation was undertaken between October to November 2018 by Geotechnics Ltd, with supervision and interpretive reporting by WSP. The investigation comprised the following;

- 9 No. Cable Percussive Boreholes;
- 14 No. Trial Pits;

- 3 No. Dynamically Sampled Boreholes; and,
- 4 No. Dynamic Cone Penetration tests.

ENCOUNTERED GEOLOGY

The Ground Investigation (WSP, 2019) encountered 3-stratigraphies comprising Gravel Head Deposit over a Raised Beach Deposit, over the London Clay formation. Exploratory hole logs are present in **Appendix B**. Made Ground was encountered as, land raise related, fill towards the southern end of the site and as a bund on the southern extent of the site. Generally, small volumes of topsoil / Made Ground were identified.

Head Deposits

The Head Deposits comprised a cream gravelly silt, frequently interbedded with a light brown gravelly silty clay. The gravel comprised fine to coarse angular flints with occasional angular flint cobbles. A variable mixture of granular to more cohesive stratum was noted. **Appendix C** presents a table which identifies the varying thicknesses of cohesive stratum identified during the investigation.

A cross section of the underlying geology of the proposed route is presented in **Appendix D**, the section demonstrates that the head deposits deepen towards the middle of the site. This generally follows the topography of the land.

Raised Beach Deposits

Raised beach deposits were generally identified beneath the Head Deposits. The deposit were described as brown sandy clay associated with the upper stratum before grading into a loose brown fine sand. Towards the base this material was described as gravelly with fine to medium sub-angular flint fragments.

London Clay Formation

The London Clay formation was encountered underlying the Raised Beach Deposits and proven to a depth of 15m bgl. Generally described as a blueish grey silty clay. Locally sandy and becoming mudstone towards the base of the boreholes.

LABORATORY TESTING

Particle Size Distribution (PSD) laboratory testing was undertaken as part of the ground investigation (WSP, 2019). PSD testing expresses the size of the particles comprising a soil in terms of percentages by weight of individual sizes. This analysis is used for classification of sands and gravels and coarser particles.

A total of 22 PSDs were carried out on Head deposits stratum. The PSD results indicate the material is generally a multigraded sandy gravelly Silt or sandy clayey Gravel, with fines varying between 94.90% and 8.90%, which supports the descriptions provided in the exploratory hole logs (**Appendix B**) that there is a high percentage of fines (clay and silt) within the sand and gravel resource underlying the site.

GROUNDWATER

Groundwater levels were monitored within three installations following the ground investigation (WSP, 2019), these wells were monitored on six occasions post site works, between November 2018 and April 2019 (i.e. the winter months). The monitoring groundwater levels were identified to fluctuate, with two of the boreholes recorded groundwater levels encroaching towards the surface. This would indicate the gravel head fills relatively quickly, especially during periods of heavy rain.



SUMMARY STATEMENT

The shallow superficial deposits (i.e. the mineral resource strata) underlying the proposed route are recorded on BGS maps to be granular in nature, this data is assumed to have informed the MSA designation. However, the ground investigation findings have identified the underlying stratum to be a mix of both granular and cohesive deposits, with both soil descriptions and laboratory gradings identifying a high percentage of cohesive fines (silt and clay) within these deposits. Whilst it would be possible to recover the sand and gravel deposits (where present) and wash / sieve the material to form an aggregate product, the refinement of the stratum is likely to incur significant additional processing costs, thereby reducing the economic viability of recovery and reuse of the resource.

In summary, the scheme will sterilise the underlying land, as set out on **Figure 3**, in the context of mineral extraction aligned to WSCC adopted the Joint Minerals Local Plan. However, based on the pertinent available data it is unlikely to be economically viable to extract the underlying mineral deposits (sands and gravels) due to the high percentage of recorded clay cohesive bands. Pockets of higher quality granular stratum could be recovered as part of the construction/earthworks phases on the scheme. However, although it is considered that the implementation of a small-scale incidental / opportunistic approach to mineral extraction may be possible the costs are likely to outweigh the benefits of extraction and sale/reuse of the aggregate.

Appendix A - Figures

Appendix B – 2019 Exploratory Hole Logs

Appendix C - Head Deposits – Cohesive Stratum

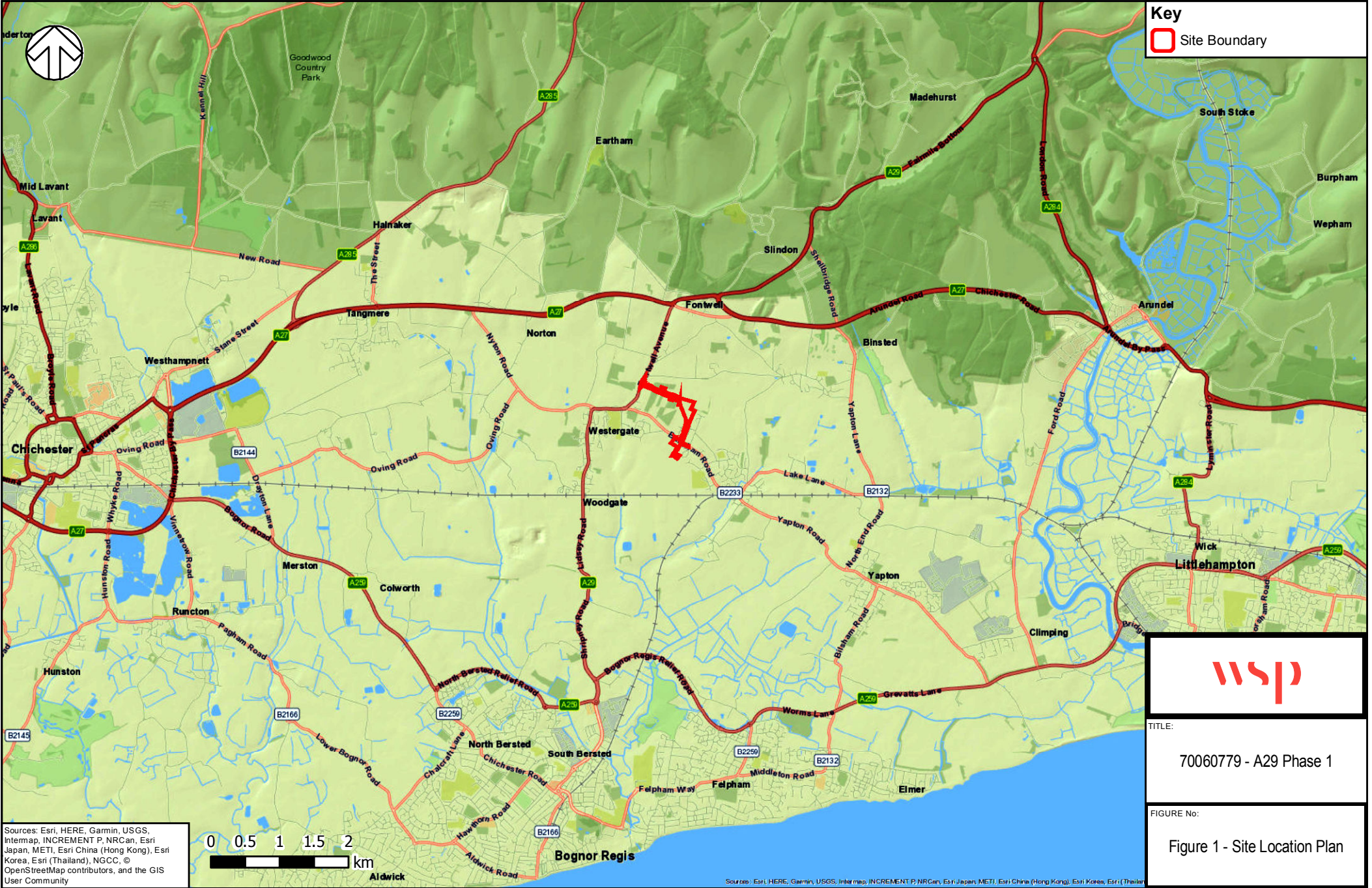
Appendix D – Geological Cross Section Along Proposed Route


Matthew Harper BSc MSc FGS

Senior Geo-Environmental Consultant



Appendix A – Figures



Key
 Site Boundary



TITLE:
 70060779 - A29 Phase 1

FIGURE No:
 Figure 1 - Site Location Plan

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand)



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

 Redline Boundary

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| Revision Details | By | Date | Suffix |
|------------------|-------|------|--------|
| | Check | | |

Drawing Status: **FINAL**

Job Title: **A29 Phase 1 Planning Application**

Drawing Title: **Aerial view of the Site**

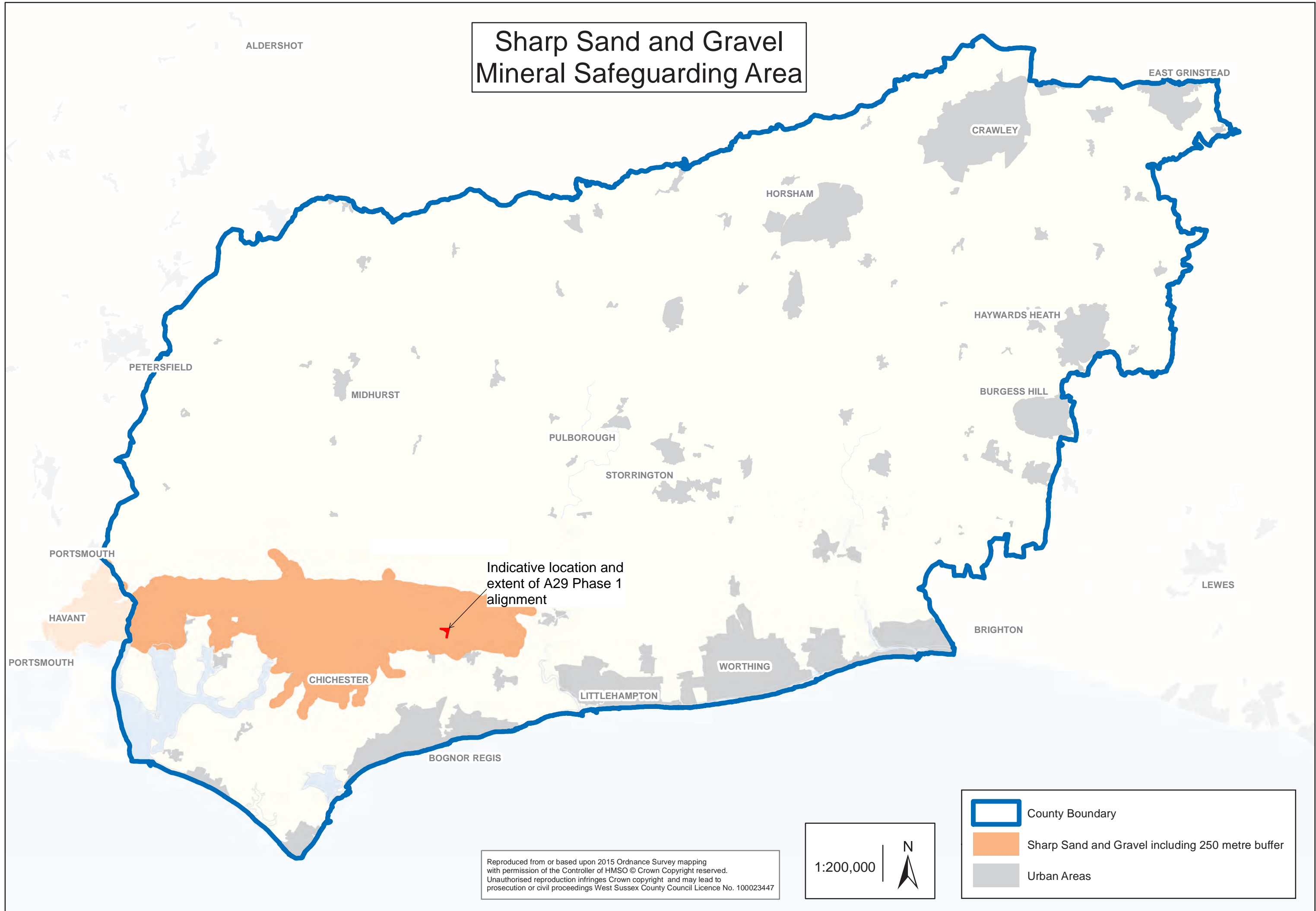
Scale at A3

| | | | |
|---------------|---------------|------------|------------|
| Drawn | UKCJR003 | | |
| Stage 1 check | Stage 2 check | Originated | Date |
| AS | DY | DY | 25/08/2020 |



Drawing Number

Sharp Sand and Gravel Mineral Safeguarding Area



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| | |
|--|--|
| | County Boundary |
| | Sharp Sand and Gravel including 250 metre buffer |
| | Urban Areas |



Appendix B – 2019 Exploratory Hole Logs

BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE** Engineer **WSP** Borehole **BH01**
 Project No **PE181522**
 Client **WSP** National Grid Coordinates **49677.916 E**
105946.393 N Ground Level **15.91 m OD**

| Sampling | | | Properties | | | Strata | | | Scale 1:50 | | |
|--|-----------------------|--------------------------|--------------|-----|-------|--|--------------|--------|---------------|--|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | | |
| 0.30 0.40- 0.60 0.60 | E B E | | | | | Soft to firm light brown slightly sandy silty CLAY. Occasional sub-angular to sub-rounded fine to coarse flint gravel. | G.L. | | 15.91 | | |
| 0.90 1.00- 1.20 1.20- 1.70 1.20- 1.65 1.20 | E B B D E | 0 (DRY) | | | S8 | Brown sandy clayey very silty angular to sub-rounded fine to coarse GRAVEL. Fine to coarse sand, flint gravel. | 1.00 | | 14.91 | | |
| 2.00 2.00- 2.45 | D D | 0 (DRY) | | | S18 | Pale creamy brown slightly sandy slightly gravelly CLAY, fine to coarse sand of chalk and flint, angular to sub-rounded fine to coarse flint gravel, calcareous. At 2.40m: brown, gravelly. | 2.00 | | 13.91 | | |
| 3.00 3.00- 3.45 | D D | 0 (DRY) | | | S28 | At 3.00m: pale creamy brown. | | | | | |
| 4.00- 4.45 4.00 | D D | 0 (DRY) | | | S23 | | | | | | |
| 5.00- 5.50 5.00 5.00- 5.45 5.40 | B D D EW | 0 (DRY) | | | S10 | | | | | | |
| 6.00 | D | | | | | Brown sandy CLAY. Fine to coarse sand, occasional fine to medium flint gravel. | 5.80 6.00 | | 10.11 9.91 | | |
| 6.50- 7.00 6.50- 6.95 | B D | 6.50 (5.40) | | | S16 | Medium dense brown fine SAND. | | | | | |
| 8.00- 8.45 | D | 8.00 (6.30) | | | S15 | | | | | | |
| 9.50- 9.95 | D | 9.50 (6.50) | | | S18 | | | | | | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | | G.I. | 0 | | 08/11/18 | 08:00 | 5.40 | 0 | | 20 | | Water did not rise. |
| 15.50 | 0.15 | Cable Percussion | | 15.50 | 11.0 | DRY | 08/11/18 | 18:00 | | | | | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 Borehole backfilled with bentonite pellets on completion.

Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
 Checked by **MY**
 Figure **1 of 2**
 09/01/2019

BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Borehole **BH01**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **49677.916 E**
105946.393 N

Ground Level **15.91 m OD**

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|-------------|-------------|--------------------------|--------------|-----|-------|---|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 10.50-10.95 | UT100 | | | | | Stiff grey silty CLAY. Occasional sand partings and bioturbation. | 10.50 | | 5.41 | |
| 11.00 | D | | | | | | | | | |
| 12.00 | D | 11.00 (DRY) | | | S27 | Between 12.00m and 13.00m: sandy, fine grained sand. | | | | |
| 12.00-12.45 | D | | | | | | | | | |
| 13.00 | D | | | | | | | | | |
| 13.50-13.95 | UT100 | | | | | | | | | |
| 14.00 | D | | | | | | | | | |
| 15.00 | D | 11.00 (DRY) | | | S30 | End of Borehole | | | | |
| 15.00-15.45 | D | | | | | | | | | |
| | | | | | | | 15.50 | | 0.41 | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|-----------|------|---------------|-------------|----------------|------|------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| | | | | | | | | | | | | | | |

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **2 of 2**
09/01/2019

BOREHOLE RECORD - Cable Percussion

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Borehole BH02
Project No PE181522

Client WSP

National Grid Coordinates 494743.050 E
105922.022 N

Ground Level 15.99 m OD

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|----------------------------|-------------|--------------------------|--------------|-----|-------|--|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 0.30 0.40- 0.60 0.60 | E D E | | | | | Firm brown slightly sandy silty CLAY. Rare angular fine to medium flint gravel. | G.L. | | 15.99 | |
| 0.90 1.00- 1.20 1.20 | E B E | | | | S14 | Firm brown slightly sandy gravelly CLAY. Fine to coarse sand. Angular fine to medium flint gravel. | 1.20 | | 14.79 | |
| 1.20- 1.65 1.60- 2.00 | E B | 0 (DRY) | | | | Pale creamy brown clayey very sandy angular to sub-rounded fine to coarse GRAVEL. Fine to coarse sand of chalk and flint, gravel of flint. Calcareous. | 1.60 | | 14.39 | |
| 2.00 2.00- 2.45 | D D | 0 (DRY) | | | S27 | | | | | |
| 3.00 3.00- 3.45 | D D | 0 (DRY) | | | S28 | At 3.00m: Light brown, slightly sandy, low flint cobble content. | | | | |
| 4.00 4.00- 4.45 | D D | 0 (DRY) | | | S29 | At 4.00m: Pale creamy brown, sandy. | | | | |
| 5.00- 5.45 5.00 | D D | 0 (DRY) | | | S12 | At 5.00m: Angular to sub-rounded fine to medium flint gravel. | | | | |
| 5.40 5.50- 6.00 | EW B | | | | | | | | | |
| 5.90 5.90 | D E | | | | | | | | | |
| 6.50- 7.00 6.50- 6.95 | B D | 6.50 (5.40) | | | S21 | Medium dense brown fine SAND. | 6.50 | | 9.49 | |
| 8.00- 8.45 | D | 8.00 (5.40) | | | S20 | | | | | |
| | | | | | | End of Borehole | 8.50 | | 7.49 | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | | G.I. | | | 09/11/18 | 08:00 | 5.40 | 0 | | 20 | | Water did not rise. |
| 8.50 | 0.15 | Cable Percussion | | 8.50 | 8.0 | 5.4 | 09/11/18 | 13:00 | | | | | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 Borehole backfilled with bentonite pellets on completion.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019



BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Borehole **BH03**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **494908.809E
105880.997N**

Ground Level **15.33 m OD**

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|------------|-------------|--------------------------|--------------|-----|---------|---|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 0.30 | ES | | | | | Soft to firm brown slightly sandy silty CLAY. Sand is fine to coarse, rare gravel of angular fine to medium flint. | G.L. | | 15.33 | |
| 0.40- 0.60 | B | | | | | | | | | |
| 0.60 | ES | | | | | | | | | |
| 0.90 | ES | | | | S16 | Below 0.90m, slightly gravelly. | | | | |
| 1.00- 1.20 | B | | | | | | | | | |
| 1.20- 1.65 | D | Nil (Dry) | | | | | | | | |
| 1.20 | ES | | | | S50/170 | Medium dense brownish grey slightly clayey sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse flint and chalk. Calcareous. | 1.20 | | 14.13 | |
| 1.60- 2.00 | B | | | | | | | | | |
| 2.00- 2.32 | D | Nil (Dry) | | | | | | | | |
| 2.40 | | | | | S43 | Firm pale brown slightly sandy gravelly SILT. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. | 2.40 | | 12.93 | |
| 3.00 | D | | | | | | | | | |
| 3.00- 3.45 | D | Nil (Dry) | | | | | | | | |
| 4.00- 4.45 | D | Nil (Dry) | | | S27 | Below 4.00m, Gravelly. | | | | |
| 5.00 | D | | | | | | | | | |
| 5.20- 5.65 | D | Nil (Dry) | | | | | | | | |
| 5.40 | W | | | | S12 | Medium dense brown fine SAND. | 5.50 | | 9.83 | |
| 6.00- 6.60 | B | | | | | | | | | |
| 6.50- 6.95 | D | 5.90 (5.40) | | | | | | | | |
| 8.00- 8.45 | D | 5.40 (8.00) | | | S37 | Below 8.00m, Dense. | 8.50 | | 6.83 | |
| | | | | | | | | | | |
| | | | | | | End of Borehole | | | | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | | | 06/11/18 | 08:00 | 5.40 | | 5.40 | 20 | No | |
| 8.50 | 0.15 | Cable Percussion | SEDS | 2.45 | Nil | Dry | 06/11/18 | 18:00 | | | | | | |
| | | | | 2.45 | Nil | Dry | 07/11/18 | 08:00 | | | | | | |
| | | | | 8.50 | 8.00 | 6.40 | 07/11/18 | 18:00 | | | | | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 Borehole terminated at target depth.
 Backfill details from base of hole: bentonite seal up to ground level.
 Chiselling: 2.00-2.40m for 30 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
 Checked by **MY**
 Figure **1 of 1**
 09/01/2019

BOREHOLE RECORD - Cable Percussion

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Borehole BH04
Project No PE181522

Client WSP

National Grid Coordinates 495024.064E
105813.202N

Ground Level 14.27 m OD

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|------------|-------------|--------------------------|--------------|-----|-------|--|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 0.30 | ES | | | | | TOPSOIL: Soft light brown slightly gravelly CLAY. Gravel is angular fine to medium flint. | G.L. | | 14.27 | |
| 0.40- 0.60 | B | | | | | Light brown sandy very clayey angular fine to medium GRAVEL. Sand is fine to coarse chalk and flint. Gravel is angular fine to medium flint. At 1.00m, Becoming dark brown. | 0.20 | | 14.07 | |
| 0.60 | ES | | | | | | | | | |
| 0.90 | ES | | | | S5 | | | | | |
| 1.00- 1.20 | B | | | | | | | | | |
| 1.20- 1.65 | D | Nil (Dry) | | | | | | | | |
| 1.20 | ES | | | | | | | | | |
| 1.60- 2.00 | B | | | | | | 1.60 | | 12.67 | |
| 2.00- 2.45 | D | Nil (Dry) | | | S42 | Brownish grey clayey sandy angular to subrounded fine to coarse GRAVEL of flint and low flint cobble content. At 2.00m, becoming dense. | | | | |
| | | | | | | End of Borehole | 2.50 | | 11.77 | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|--------------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | Nil | Dry | 05/11/18 | 08:00 | | | | | | Not encountered during boring. |
| 2.50 | 0.15 | Cable Percussion | SEDS | 2.50 | | | 05/11/18 | 18:00 | | | | | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 Borehole aborted on refusal - suspected flint band.
 Backfill details from base of hole: bentonite seal up to ground level.
 Chiselling: 1.90-2.10m for 45 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by MK
 Checked by MY
 Figure 1 of 1
 09/01/2019

BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Borehole **BH04A**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **495021.706 E**
105807.514 N

Ground Level **14.30 m OD**

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|------------|-------------|--------------------------|--------------|-----|-------|---|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| | | | | | | See borehole BH04 for strata, samples and test details. | G.L. | | 14.30 | |
| 3.00- 3.10 | B | | | | | | | | | |
| 3.00- 3.45 | D | Nil (Dry) | | | S29 | Medium dense brown clayey sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse. Matrix of firm brown silty clay. | 3.00 | | 11.30 | |
| 4.00- 4.10 | B | | | | | | | | | |
| 4.00- 4.45 | D | Nil (Dry) | | | S28 | At 4.00m, Occasional cobbles of flint. | | | | |
| 4.20 | W | | | | | | | | | |
| 5.00- 5.50 | B | | | | | | | | | |
| 5.00 | D | | | | | | 4.60 | | 9.70 | |
| 5.00- 5.45 | D | Damp (5.00) | | | S15 | Soft pale brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint and chalk. Medium dense brown fine SAND. | 4.80 | | 9.50 | |
| 6.50- 6.95 | D | Damp (6.50) | | | S7 | Around 6.50m, Loose. | | | | |
| 8.00- 8.45 | D | Damp (8.00) | | | S46 | Below 8.00m, Dense. | | | | |
| 8.30- 8.60 | B | | | | | At 8.30m, Gravelly subangular to subrounded fine to coarse flint gravel. | | | | |
| 9.00 | D | | | | | | 8.90 | | 5.40 | |
| 9.00- 9.45 | UT70 | 9.00 (Dry) | | | | Firm grey slightly sandy (fine grained) silty CLAY with occasional sand partings. Stiff grey silty CLAY. | 9.00 | | 5.30 | |
| 9.50 | D | | | | | | | | | |
| 10.00 | D | | | | | | | | | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | | | 05/11/18 | 08:00 | | | | | 4.50 | Standing at |
| 15.50 | 0.15 | Cable Percussion | SEDS | 4.50 | Nil | Dry | 05/11/18 | 18:00 | | | | | | 4.20m at start |
| | | | | 4.50 | Nil | 4.20 | 06/11/18 | 08:00 | | | | | | of shift. |
| | | | | 15.50 | 9.00 | Dry | 06/11/18 | 18:00 | | | | | | |

Remarks Borehole carried out adjacent to BH04 which refused at 2.50m depth. Inspection pit hand excavated to 1.20m depth and no services were found. Borehole terminated at target depth. A 50mm standpipe piezometer was installed to 8.50m with a slotted section from 1.00m to 8.50m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 8.50m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 3.80-4.60m for 60 minutes.

Logged by **MK**
Checked by **MY**
Figure **1 of 2**
09/01/2019

All dimensions are in metres. Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Borehole **BH04A**
Project No **PE181522**


Client **WSP**

National Grid Coordinates **495021.706 E**
105807.514 N

Ground Level **14.30 m OD**

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|-------------|-------------|--------------------------|--------------|-----|-------|---|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 10.50-10.95 | D | Dry (9.00) | | | S25 | | | x | | |
| 11.00 | D | | | | | | | x | | |
| 12.00 | D | | | | | Around 12.00-14.00m, slightly sandy (thin bands). | | x | | |
| 12.00-12.45 | UT100 | | | | | | | x | | |
| 12.30 | D | | | | | Around 12.50-14.00m, Occasional sand partings. | | x | | |
| 13.00 | D | | | | | | | x | | |
| 13.50-13.95 | D | Dry (9.00) | | | S29 | | | x | | |
| 14.00 | D | | | | | | | x | | |
| 15.00 | D | | | | | | | x | | |
| 15.00-15.45 | UT100 | 9.00 (Dry) | | | | | | x | | |
| 15.40 | D | | | | | End of Borehole | 15.50 | x | -1.20 | |


| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|-----------|------|---------------|-------------|----------------|------|------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| | | | | | | | | | | | | | | |

Remarks 

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **2 of 2**
09/01/2019



BOREHOLE RECORD - Cable Percussion

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Borehole BH05
Project No PE181522

Client WSP

National Grid Coordinates 495186.072E
105712.368N

Ground Level 12.56 m OD

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|------------|-------------|--------------------------|--------------|-----|---------|--|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 0.10 | ES | | | | | TOPSOIL: Firm light brown slightly sandy gravelly clay. Gravel is angular to subangular fine to coarse flint. Sand is fine to and rootlets. | G.L. | | 12.56 | |
| 0.30 | ES | | | | 0.12 | | | 12.44 | | |
| 0.60- 0.70 | B | | | | | Light brown slightly sandy very clayey angular to subangular fine to coarse GRAVEL. Sand is fine to coarse, with low flint cobble content. | 0.50 | | 12.06 | |
| 0.60 | ES | | | | | | | | | |
| 0.90 | ES | | | | | Light creamy brown clayey sandy angular fine to coarse GRAVEL. Sand is fine to coarse, gravel is of flint, with a high flint cobble content. | | | | |
| 1.10- 1.20 | B | | | | | | | | | |
| 1.20 | ES | | | | | | | | | |
| 1.20- 1.65 | | Nil (Dry) | | | C21 | | | | | |
| 2.00- 2.50 | B | | | | | Light creamy brown very silty very sandy subangular to subrounded fine to coarse GRAVEL. Sand is fine to coarse, gravel is of flint. Calcareous. | 2.00 | | 10.56 | |
| 2.00 | B | | | | | | | | | |
| 2.00- 2.44 | ES | Nil (Dry) | | | C50/285 | | | | | |
| 3.00 | D | | | | | Stiff light brown sandy very gravelly SILT. Fine to coarse sand, angular to subrounded fine to coarse flint gravel, with a low flint cobble content. Calcareous. At 4.00m, Becoming sandy. | | | | |
| 3.00- 3.45 | D | Nil (Dry) | | | S19 | | | | | |
| 3.80- 4.00 | B | | | | | | | | | |
| 4.00- 4.50 | B | | | | | | | | | |
| 4.00- 4.45 | D | Nil (Dry) | | | | Loose light brown slightly gravelly fine SAND. Gravel is subangular to subrounded fine to medium flint, rare shell fragments.. | 3.80 | | 8.76 | |
| 4.20 | W | | | | S18 | | | | | |
| 5.00- 5.50 | B | | | | | Below 6.50m, Dense. | 4.90 | | 7.66 | |
| 5.00- 5.45 | | 5.00 (3.80) | | | C7 | | | | | |
| 6.00 | D | | | | | At 7.00m, Gravelly, gravel is subangular to subrounded fine to coarse flint | | | | |
| 6.50- 6.95 | D | 6.90 (4.20) | | | S39 | | | | | |
| 7.00- 7.50 | B | | | | | Dense light brown sandy subangular to subrounded fine to coarse flint GRAVEL with a low flint cobble content. | 8.00 | | 4.56 | |
| 8.00- 8.50 | B | | | | | | | | | |
| 8.00 | D | | | | | | | | | |
| 8.00- 8.45 | | 8.00 (5.10) | | | | End of Borehole | 8.50 | | 4.06 | |
| | | | | | C30 | | | | | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | | | 30/10/18 | 08:00 | | | 3.00 | 5 | | |
| 8.50 | 0.15 | Cable Percussion | SEDS | 8.50 | 8.50 | 5.10 | 30/10/18 | 18:00 | 4.20 | none | 3.00 | 10 | | |
| | | | | | | | | | | | 2.90 | 15 | | |
| | | | | | | | | | | | 2.70 | 20 | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 Borehole terminated at target depth.
 Backfill details from base of hole: bentonite seal up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
 Checked by MY
 Figure 1 of 1
 09/01/2019

BOREHOLE RECORD - Cable Percussion

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Borehole BH06
Project No PE181522

Client WSP

National Grid Coordinates 495264.319E
105614.585N

Ground Level 11.76 m OD

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|------------|-------------|--------------------------|--------------|-----|-------|---|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 0.10 | ES | | | | | Stiff light brown slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint. At 0.50m, With frequent cobbles of flint. | G.L. | | 11.76 | |
| 0.30 | ES | | | | 0.50 | | 11.26 | | | |
| 0.60- 0.70 | B | | | | | Dark brown sandy very clayey angular to subrounded fine to coarse GRAVEL. Sand is fine to coarse, gravel is flint. | | | | |
| 0.60 | ES | | | | | | | | | |
| 0.90 | ES | | | | | Firm light creamy brown slightly sandy slightly gravelly SILT. Sand is fine to coarse chalk and flint. Gravel is subangular to subrounded fine to coarse chalk and flint. Calcareous. | | | | |
| 1.10- 1.20 | B | | | | | | | | | |
| 1.20- 1.70 | B | | | | | At 5.00m, Flint gravel. | | | | |
| 1.20 | ES | | | | | | | | | |
| 1.20- 1.65 | ES | Nil (Dry) | | | C17 | Light brown sandy subangular to subrounded fine to coarse GRAVEL of flint. Between 5.30m and 5.50m, Bed of brown fine SAND. | | | | |
| 1.50 | ES | | | | | | | | | |
| 2.00- 2.50 | B | | | | | Medium dense light creamish brown clayey sandy subangular to subrounded fine to coarse GRAVEL. Sand is fine to coarse chalk and flint. Calcareous. | | | | |
| 2.00 | D | | | | | | | | | |
| 2.00- 2.45 | D | Nil (Dry) | | | S8 | At 5.00m, Flint gravel. | | | | |
| 2.00 | ES | | | | | | | | | |
| 3.00 | D | | | | | Stiff grey silty CLAY with occasional sand partings and rare shell fragments. | | | | |
| 3.00- 3.45 | D | Nil (Dry) | | | S13 | | | | | |
| 3.30- 3.50 | B | | | | | End of Borehole | | | | |
| 3.60 | W | | | | | | | | | |
| 4.00 | D | | | | | End of Borehole | | | | |
| 4.00- 4.45 | D | 4.00 (2.30) | | | S26 | | | | 7.76 | |
| 5.00 | D | | | | | End of Borehole | | | | |
| 5.00- 5.45 | D | 5.00 | | | S7 | | | | | |
| 5.50- 6.00 | B | | | | | End of Borehole | | | | |
| 6.50- 7.00 | B | | | | | | | | | |
| 6.50- 6.95 | B | 6.50 (6.00) | | | C17 | End of Borehole | | | | |
| 8.00 | D | | | | | | | | | |
| 8.00- 8.45 | D | 7.00 (Dry) | | | S21 | | | | | |
| | | | | | | | 8.50 | | 3.26 | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | | | 31/10/18 | 08:00 | | | 3.30 | 5 | | |
| 8.50 | 0.15 | Cable Percussion | SEDS | 8.50 | 7.00 | Dry | 31/10/18 | 12:00 | 3.60 | | 3.00 | 10 | 6.80 | |
| | | | | | | | | | | | 2.70 | 15 | | |
| | | | | | | | | | | | 2.10 | 20 | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Borehole terminated at target depth. Backfill details from base of hole: bentonite seal up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019

BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE** Engineer **WSP** Borehole **BH07**
 Project No **PE181522**
 Client **WSP** National Grid Coordinates **495313.050E**
105470.962N Ground Level **10.98 m OD**

| Sampling | | | Properties | | | Strata | | | Scale 1:50 | | |
|--|--------------------|--------------------------|--------------|-----|-------|--|--------------|--------|----------------|--|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | | |
| 0.30 0.50 | ES D | | | | | TOPSOIL: Firm light brown slightly sandy silty clay with frequent rootlets. Sand is fine to medium. | G.L. 0.10 | | 10.98 10.88 | | |
| 0.80 1.00 | ES D | | | | | Light brown clayey sandy angular to subrounded fine to coarse GRAVEL. Sand is fine to coarse. Gravel is flint. At 0.40m, Gravelly with a low flint cobble content. | 1.10 | | 9.88 | | |
| 1.20- 1.70 1.20 1.20 1.20- 1.65 | B D D D | Nil (Dry) | | | C9 | Pale creamy brown sandy to very sandy clayey subangular to subrounded fine to coarse GRAVEL. Sand is fine to coarse chalk and flint, gravel is flint. Calcareous. | | | | | |
| 2.00- 2.50 2.00 2.00 2.00- 2.45 | B D ES ES | 2.00 (1.50) | | | C7 | | | | | | |
| 3.00 3.00- 3.45 | D D | 3.00 (2.40) | | | S11 | At 3.00m, Very silty. | | | | | |
| 4.00- 4.50 4.00 4.00 4.00- 4.45 | B D W D | 4.00 (3.10) | | | S9 | | | | | | |
| 5.00 5.00- 5.45 | D D | 5.00 (4.30) | | | S9 | Loose multicoloured sandy angular to subrounded fine to coarse GRAVEL of flint. Sand is fine to coarse flint. | 5.00 5.20 | | 5.98 5.78 | | |
| 5.50- 6.00 | B | | | | | Stiff grey silty CLAY with occasional sand partings and rare shell fragments. | | | | | |
| 6.00 6.00 6.00- 6.45 | D ES UT100 | | | | | | | | | | |
| 6.50 6.50- 6.95 | D D | 5.30 (Dry) | | | S19 | At 6.50m, Very stiff. | | | | | |
| 7.00 | D | | | | | | | | | | |
| 7.50- 7.95 | UT100 | | | | | | | | | | |
| 8.00 8.00- 8.45 | D D | 5.30 (Dry) | | | S30 | | | | | | |
| | | | | | | End of Borehole | 8.50 | | 2.48 | | |

| Boring | | | | Progress | | | | Groundwater | | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | | | 31/10/18 | 08:00 | 1.40 | | 1.40 | 5 | 5.30 | Slow seepage. |
| 8.50 | 0.15 | Cable Percussion | SEDS | 5.00 | 5.00 | 3.40 | 31/10/18 | 18:00 | | | 1.30 | 10 | | |
| | | | | 5.00 | 5.00 | 2.40 | 01/11/18 | 08:00 | | | 1.20 | 15 | | |
| | | | | 8.50 | 5.30 | Dry | 01/11/18 | 18:00 | | | 1.20 | 20 | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 Borehole terminated at target depth.
 A 50mm standpipe piezometer was installed to 5.00m with a slotted section from 1.00m to 5.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 5.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
 Checked by **MY**
 Figure **1 of 1**
 09/01/2019

BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Borehole **BH08**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **495273.567E**
105301.102N

Ground Level **11.61 m OD**

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|--|------------------|--------------------------|--------------|-----|-------|--|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 0.30 0.50 | ES D | | | | | Grass over firm reddish brown slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. | G.L. | | 11.61 | |
| 0.80 1.00 | ES D | | | | | | | | | |
| 1.20- 1.70 1.20- 1.65 1.20 | B D ES | Nil (Dry) | | | S29 | Stiff pale brown slightly clayey slightly sandy slightly gravelly SILT. Sand is fine to coarse chalk, gravel is subangular to subrounded fine to coarse flint. Calcareous. | 1.20 | | 10.41 | |
| 2.00 2.00- 2.45 2.00 | D D ES | Nil (Dry) | | | S11 | | | | | |
| 3.00 3.00- 3.45 3.00 3.20- 3.90 | D D W B | Nil (Damp) | | | S6 | Brown very sandy very clayey GRAVEL. Sand is fine to coarse, gravel is subangular to subrounded fine to medium flint. | 3.20 | | 8.41 | |
| 4.00 4.00- 4.45 | D D | 4.00 (3.00) | | | S6 | Loose brown silty fine SAND. | 3.90 | | 7.71 | |
| 5.00- 5.45 | D | 5.00 (3.10) | | | S27 | Below 5.00m, Medium dense. | | | | |
| 5.50- 5.00 | B | | | | | | | | | |
| 6.00 | D | | | | | Firm grey silty CLAY with occasional sand partings and rare shell fragments. | 5.80 | | 5.81 | |
| 6.50 6.50- 6.95 | ES UT100 | 6.00 (Dry) | | | | | | | | |
| 7.00 7.00- 7.45 | D D | 6.00 (Dry) | | | S27 | | | | | |
| 7.50- 8.00 | B | | | | | | | | | |
| 8.00- 8.45 | D | 6.00 (Dry) | | | S33 | | | | | |
| End of Borehole | | | | | | | 8.50 | | 3.11 | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|----------------------|----------------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | | | 01/11/18 | 08:00 | 3.00 | Nil | 3.00 | 5 | 6.00 | |
| 8.50 | 0.15 | Cable Percussion | SEDS | 8.50 | 6.00 | Dry | 01/11/18 | 18:00 | | | 2.80 2.70 2.30 | 10 15 20 | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 Borehole terminated at target depth.
 Backfill details from base of hole: bentonite seal up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
 Checked by **MY**
 Figure **1 of 1**
 09/01/2019

BOREHOLE RECORD - Cable Percussion

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Borehole BH09
Project No PE181522

Client WSP

National Grid Coordinates 495189.652E
105115.848N

Ground Level 11.16 m OD

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|------------|-------------|--------------------------|--------------|-----|-------|--|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| | | | | | | Grass over firm brownish grey sandy SILT. Sand is fine to medium. Occasional rootlets. Rare subangular to subrounded fine to medium flint gravel. | G.L. | | 11.16 | |
| 0.30 | ES | | | | | | | | | |
| 0.50- 0.80 | B | | | | | | | | | |
| 0.50 | D | | | | | At 0.50m, Orangish brown, occasional black staining. | | | | |
| 0.80 | ES | | | | | | | | | |
| 1.00 | D | | | | | | | | | |
| 1.20- 1.65 | D | Nil (Dry) | | | S8 | At 1.20m, Clayey, slightly gravelly. | | | | |
| 1.20 | ES | | | | | | 1.40 | | 9.76 | |
| 1.50- 2.00 | B | | | | | Firm pale brown slightly sandy slightly gravelly SILT. Sand is fine to coarse chalk and flint. Gravel is subangular to subrounded fine flint. Rare angular to subrounded fine to coarse gravel of flint. Calcareous. | | | | |
| 2.00- 2.50 | B | | | | | | | | | |
| 2.00- 2.45 | D | Nil (Dry) | | | S7 | | | | | |
| 2.00 | ES | | | | | | | | | |
| 3.00 | D | | | | | | | | | |
| 3.00- 3.45 | D | Nil (Dry) | | | S7 | At 3.00m, Gravel is angular to subrounded fine to coarse flint, occasional fine chalk. | | | | |
| 3.20 | W | | | | | | | | | |
| 3.50- 4.00 | B | | | | | | | | | |
| 4.00- 4.45 | D | 4.00 (2.50) | | | S13 | Medium dense orangish brown fine SAND. | 3.60 | | 7.56 | |
| 4.00 | ES | | | | | | | | | |
| 4.20 | ES | | | | | | | | | |
| 5.00- 5.50 | B | | | | | | | | | |
| 5.00 | D | | | | | Below 5.00m, Dense. | | | | |
| 5.00- 5.45 | D | 5.00 (2.50) | | | S36 | | | | | |
| 5.00 | D | | | | | | 5.30 | | 5.86 | |
| | | | | | | Firm greyish brown silty CLAY. | 5.50 | | 5.66 | |
| 6.00- 6.45 | D | 6.00 (5.50) | | | S17 | Multicoloured subangular to subrounded fine to coarse GRAVEL of flint with medium flint cobble content. | 5.80 | | 5.36 | |
| | | | | | | Stiff grey silty CLAY. | | | | |
| 6.50- 7.00 | B | | | | | | | | | |
| 7.00- 7.45 | UT100 | 7.00 (4.30) | | | | | | | | |
| 7.40 | D | | | | | At 7.40m, Becoming sandy (fine grained). | | | | |
| 8.00 | B | | | | | | | | | |
| 8.00- 8.45 | B | 7.50 (7.50) | | | S42 | At 8.00m, Very sandy | | | | |
| 8.50- 8.95 | D | | | | | | | | | |
| 9.00 | B | | | | | | | | | |
| 10.00 | D | | | | | | | | | |

| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|------------------|------|---------------|-------------|----------------|----------|-------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| 1.20 | 0.30 | Inspection Pit | SEDS | G.I. | | | 02/11/18 | 08:00 | 3.20 | | 3.00 | 5 | | Medium Seepage. |
| 15.00 | 0.15 | Cable Percussion | SEDS | 15.00 | 9.00 | 11.90 | 02/11/18 | 18:00 | | | 2.30 | 10 | | |
| | | | | | | | | | | | 2.30 | 15 | | |
| | | | | | | | | | | | 2.30 | 20 | | |

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Borehole terminated at target depth.

A 50mm standpipe piezometer was installed to 5.00m with a slotted section from 1.00m to 5.00m with flush lockable protective cover. Backfill details from base of hole: bentonite seal up to 5.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 2
09/01/2019

BOREHOLE RECORD - Cable Percussion

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Borehole **BH09**
Project No **PE181522**


Client **WSP**

National Grid Coordinates **495189.652E**
105115.848N

Ground Level **11.16 m OD**

| Sampling | | | Properties | | | Strata | | Scale 1:50 | | |
|-----------------|-------------|--------------------------|--------------|-----|---------|---|-------|------------|------------|--|
| Depth | Sample Type | Depth Cased & (to Water) | Strength kPa | w % | SPT N | Description | Depth | Legend | Level m OD | |
| 10.00-10.45 | UT100 | 9.00 (11.00) | | | | Between 10.30 and 11.00m, Sandy frequent sand partings. | | x | | |
| 10.50 | D | | | | | | | x | | |
| 11.00 | D | | | | | At 11.00m, Sandy. | | x | | |
| 11.50-11.95 | D | 9.00 (9.50) | | | S40 | | | x | | |
| 12.00 | B | | | | | | | x | | |
| 13.00 | D | | | | | | | x | | |
| 13.00-13.45 | UT100 | 9.00 (10.60) | | | | | | x | | |
| 13.40 | D | | | | | | | x | | |
| 14.00 | D | | | | | Around 14.00-14.50m, Sand not observed. | | x | | |
| 14.50-14.94 | D | 9.00 (12.70) | | | S50/285 | At 14.50m, Sandy (fine grained). | | x | | |
| End of Borehole | | | | | | | 15.00 | x | -3.84 | |


| Boring | | | | Progress | | | | | Groundwater | | | | | |
|--------|----------|-----------|------|---------------|-------------|----------------|------|------|--------------|-------------|---------|---------|--------------|------------------------|
| Depth | Hole Dia | Technique | Crew | Depth of Hole | Depth Cased | Depth to Water | Date | Time | Depth Struck | Depth Cased | Rose to | in Mins | Depth Sealed | Remarks on Groundwater |
| | | | | | | | | | | | | | | |

Remarks 

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
 Checked by **MY**
 Figure **2 of 2**
 09/01/2019



TRIAL PIT RECORD

Trial Pit

Project **A29 REALIGNMENT, EASTERGATE**








Engineer **WSP**

Trial Pit **TP02**
Project No **PE181522**


Client **WSP**

National Grid **494668.632E**
Coordinates **105981.968N**

Ground Level **15.89 m OD**

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|---|------------|---|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | MADE GROUND: Grass over firm brown slightly sandy slightly gravelly SILT. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. Occasional cobbles of flint and rare brick fragments (possibly Roman). | G.L. |  | 15.89 |
| 0.30 | B | | | Firm brown slightly sandy gravelly SILT. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. | 0.40 |  | 15.49 |
| 0.30 | D | | | | | | |
| 0.30 | ES | PID=0.0 | | | | | |
| 0.50 | ES | PID=0.0 | | | | | |
| 0.90 | B | | | Brown slightly sandy clayey angular to subrounded fine to coarse flint GRAVEL. Low flint cobble content. Firm brown clay matrix. | 0.80 |  | 15.09 |
| 0.90 | D | | | | | | |
| 1.50 | B | | | Pale creamy brown sandy silty angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse chalk and flint. Low flint cobble content. Calcareous. | 1.20 |  | 14.69 |
| 1.50 | D | | | | | | |
| 1.50 | ES | PID=0.0 | | | | | |
| | | | | Firm brown slightly sandy gravelly SILT. Gravel is angular to subrounded fine to coarse flint. Low flint cobble content. Sand is fine to coarse. | 1.70 |  | 14.19 |
| 2.50 | B | | | | | | |
| 2.50 | D | | | Brown sandy angular to subrounded silty GRAVEL (fine to coarse) and COBBLES of flint. | 1.90 |  | 13.99 |
| | | | | | | | |
| | | | | Pale creamy brown silty sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse chalk and flint. Medium flint cobble content. Calcareous. | 2.40 |  | 13.49 |
| | | | | | | | |
| | | | | End of Excavation | 2.60 | | 13.29 |


| Excavation | | | | Groundwater | | |
|------------|---------------------------|-----------------|------------|----------------|--------------|------------------------------------|
| Plant | Wheeled Excavator | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 3.10 | | | |
| Shoring | None. | Date Backfilled | 08/11/2018 | | | Not encountered during excavation. |
| Stability | stable during excavation. | | | | | |

Remarks  The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **1 of 1**
09/01/2019



TRIAL PIT RECORD

Trial Pit

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Trial Pit Project No **TP03**
PE181522

Client WSP

National Grid Coordinates 494776.178E
105915.271N

Ground Level 15.95 m OD

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|---|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | TOPSOIL. Grass over firm brown slightly sandy slightly gravelly SILT. Gravel is angular to subrounded fine to coarse flint. Some rootlets. Friable. | G.L. | | 15.95 |
| 0.30 | B | | | | 0.25 | | 15.70 |
| 0.30 | D | | | | | | |
| 0.30 | ES | | PID=0.0 | | | | |
| 0.80 | D | | | Firm brown slightly gravelly sandy SILT. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. | | | |
| 0.80 | ES | | PID=0.0 | | | | |
| 1.20 | B | | | At 0.30m, Fragment of fire-cracked flint. | | | |
| 1.20 | D | | | | | | |
| 1.20 | ES | | PID=0.0 | | 1.35 | | 14.60 |
| 1.60 | B | | | Below 0.35m, Very stiff - unable to penetrate with hand vane. | | | |
| 1.60 | D | | | | | | |
| 1.60 | ES | | PID=0.0 | Below 1.00m, Gravelly with a low flint cobble content. | | | |
| | | | | At 1.20m, Very gravelly. | | | |
| 2.50 | B | | | Off white very clayey very sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse chalk and flint. Weakly cemented, 5 - 10% voids in places. Calcareous. | | | |
| 2.50 | D | | | | 2.80 | | 13.15 |
| | | | | At 1.80m, Becoming harder to excavate. | | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|---------------------------|-----------------|------------|----------------|--------------|------------------------------------|
| Plant | Wheeled Excavator. | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 2.80 | | | |
| Shoring | None. | Date Backfilled | 08/11/2018 | | | Not encountered during excavation. |
| Stability | stable during excavation. | | | | | |

Remarks Trial pit was terminated upon encountering effective refusal. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Trial Pit **TP06**
Project No **PE181522**

Client **WSP**

National Grid **494974.135E**
Coordinates **105827.565N**

Ground Level **14.78 m OD**

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|--|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | | G.L. | | 14.78 |
| 0.30 | B | | | Firm brown slightly sandy clayey SILT. Fine sand, occasional angular to sub-rounded fine to coarse flint gravel, friable. | 0.25 | | 14.53 |
| 0.30 | D | | | | | | |
| 0.30 | E | | PID=0.0 | | | | |
| 0.35 | VN | | 35 | Firm to stiff light brown slightly sandy clayey SILT. Fine sand, occasional angular to sub-rounded fine to coarse flint gravel. | 0.60 | | 14.18 |
| 0.35 | VNR | | 12 | | | | |
| 0.70 | B | | | | 1.00 | | 13.78 |
| 0.70 | D | | | | | | |
| 0.70 | E | | PID=0.0 | | | | |
| 0.90 | B | | | Stiff light orange brown slightly sandy gravelly SILT. Angular to sub-rounded fine to coarse flint gravel, occasional flint cobbles. | | | |
| 0.90 | D | | | | | | |
| 1.20 | B | | | At 0.80m: Very gravelly. | | | |
| 1.20 | D | | | | | | |
| 1.20 | E | | PID=0.1 | | | | |
| 2.10 | B | | | Pale creamy brown very silty sandy angular to sub-angular fine to coarse flint GRAVEL. Sand is fine to coarse chalk and flint, low flint cobble content, pockets up to 300mm of brown gravelly silt, calcareous. | 2.20 | | 12.58 |
| 2.10 | D | | | | | | |
| | | | | At 1.40m: Pockets decreased to 100mm. | | | |
| | | | | At 1.70m: Becoming harder to excavate. | | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|--------------------------------------|-----------------|------------|------------------------------------|--------------|---------|
| Plant | Backhoe excavator. | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 2.60 | | | |
| Shoring | None. | Date Backfilled | 09/11/2018 | Not encountered during excavation. | | |
| Stability | some spalling between 0.0m and 1.0m. | | | | | |

Remarks Trial pit was terminated upon encountering effective refusal. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **1 of 1**
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Trial Pit Project No **TP07**
PE181522

Client WSP

National Grid Coordinates 495057.885E
105792.485N

Ground Level 14.09 m OD

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|--|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | | G.L. | | 14.09 |
| 0.30 | B | | | | 0.20 | | 13.89 |
| 0.30 | D | | | | | | |
| 0.30 | E | PID=0.1 | | | 0.60 | | 13.49 |
| 0.90 | B | | | | | | |
| 0.90 | D | | | | | | |
| 0.90 | E | PID=0.0 | | | 1.20 | | 12.89 |
| 1.50 | B | | | | | | |
| 1.50 | D | | | | | | |
| 1.50 | E | PID=0.1 | | | 2.40 | | 11.69 |
| | | | | Between 1.20m and 2.10m: Large pockets of brown clayey gravel and cobbles 300-600mm. | | | |
| | | | | At 1.50m: Pale creamy brown material becomes hard to excavate. | | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|--|-----------------|------------|----------------|--------------|-------------------------------------|
| Plant | Backhoe excavator. | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 3.00 | | | |
| Shoring | None. | Date Backfilled | 09/11/2018 | | | None encountered during excavation. |
| Stability | some spalling between 0.20m and 1.20m depth. | | | | | |

Remarks The trial pit was terminated upon encountering effective refusal. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Trial Pit Project No TP08 PE181522

Client WSP

National Grid Coordinates 495117.850 E 105760.574 N

Ground Level 13.38 m OD

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|---|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | | G.L. | | 13.38 |
| 0.30 | B | | | | 0.20 | | 13.18 |
| 0.30 | D | | | | 0.40 | | 12.98 |
| 0.30 | E | PID=0.1 | | | | | |
| 0.80 | B | | | | 1.00 | | 12.38 |
| 0.80 | D | | | | | | |
| 0.80 | E | PID=0.0 | | | | | |
| 1.80 | B | | | | 2.30 | | 11.08 |
| 1.80 | D | | | | | | |
| 1.80 | E | PID=0.2 | | | | | |
| | | | | At 0.80m: Pockets of pale brown silty sandy flint gravel 200mm. | | | |
| | | | | At 1.20m: Hard digging. | | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|---------------------------|-----------------|------------|----------------|--------------|-------------------------------------|
| Plant | Backhoe excavator. | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 3.00 | | | |
| Shoring | None. | Date Backfilled | 09/11/2018 | | | None encountered during excavation. |
| Stability | stable during excavation. | | | | | |

Remarks Trial pit was terminated upon encountering effective refusal. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Checked by MY
Figure 1 of 1
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Trial Pit **TP09**
Project No PE181522

Client WSP

National Grid Coordinates 495210.910E
105691.895N

Ground Level 12.55 m OD

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|--|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | Grass over firm brown slightly sandy gravelly SILT. Angular to subrounded fine to coarse flint gravel, sand is fine to coarse. | G.L. | | 12.55 |
| 0.40 | B | | | At 0.30m, Medium flint cobble content. | | | |
| 0.40 | D | | | | | | |
| 0.40 | ES | PID=0.0 | | At 0.60m, Becoming very gravelly. | 0.70 | | 11.85 |
| 0.80 | B | | | | | | |
| 0.80 | D | | | Brown slightly sandy clayey rounded to subangular fine to coarse flint GRAVEL. Sand is fine to coarse, low flint cobble content. | 0.90 | | 11.65 |
| 1.00 | ES | PID=0.0 | | | | | |
| | | | | Stiff brown sandy gravelly CLAY. Sand is fine to coarse, gravel is angular to rounded fine to coarse flint, low flint cobble content. | 1.20 | | 11.35 |
| 1.80 | B | | | | | | |
| 1.80 | D | | | Stiff pale creamy brown clayey sandy angular to rounded fine to coarse GRAVEL. Sand is fine to coarse chalk and flint, gravel is flint, high flint cobble content, calcareous. | | | |
| 1.80 | ES | PID=0.0 | | | | | |
| 2.50 | B | | | End of Excavation | | | |
| 2.50 | D | | | | | | |
| 3.30 | B | | | | 3.40 | | 9.15 |
| 3.30 | D | | | | | | |

| Excavation | | | | Groundwater | | |
|------------|----------------------|-----------------|------------|----------------|--------------|--|
| Plant | Wheeled excavator | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 2.80 | 3.00 | | Rose to 2.70 in 10 mins, High flow at 3.40m. |
| Shoring | None. | Date Backfilled | 07/11/2018 | | | |
| Stability | Collapsing at depth. | | | | | |

Remarks The Trial Pit was terminated at a depth of 3.40m due to instability of the pits sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Trial Pit TP10
Project No PE181522

Client WSP

National Grid Coordinates 495241.214 E
105655.949 N

Ground Level 12.16 m OD

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|---|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | Grass over firm brown slightly sandy gravelly CLAY. Sand is fine to coarse, gravel is angular to subrounded fine to coarse flint, low flint cobble content. | G.L. | | 12.16 |
| 0.30 | B | | PID=0.0 | Brown clayey sandy angular to sub-rounded fine to coarse flint GRAVEL. Fine to coarse sand, low flint cobble content. | 0.50 | | 11.66 |
| 0.30 | D | | | | | | |
| 0.30 | ES | | | | | | |
| 1.00 | B | | PID=0.0 | At 2.50m, Light brown, slightly clayey, medium flint cobble content. | | | |
| 1.00 | D | | | | | | |
| 1.00 | ES | | | | | | |
| 1.80 | B | | PID=0.0 | End of Excavation | | | |
| 1.80 | D | | | | | | |
| 2.00 | ES | | | | | | |
| 2.80 | B | | | End of Excavation | 2.90 | | 9.26 |
| 2.80 | D | | | | | | |

| Excavation | | | | Groundwater | | |
|------------|----------------------|-----------------|------------|----------------|------|-----------|
| Plant | Wheeled excavator | Width (B) | 0.40 | Depth Observed | 2.30 | Details |
| Date | | Length (C) | 2.20 | Depth of Pit | | See page. |
| Shoring | None. | Date Backfilled | 07/11/2018 | | | |
| Stability | Collapsing at depth. | | | | | |

Remarks The Trial Pit was terminated at a depth of 2.90m due to instability of the pits sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Trial Pit **TP11**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **495286.440 E**
105575.669 N

Ground Level **11.53 m OD**

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|--|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | Grass over friable brown silty sandy angular to subrounded GRAVEL of flint with medium flint cobble content. Sand is fine to coarse. | G.L. | | 11.53 |
| 0.30 | B | | PID=0.0 | | | | |
| 0.30 | D | | | | | | |
| 0.30 | ES | | | | | | |
| 0.80 | ES | | PID=0.0 | Brown sandy very clayey angular to sub-rounded fine to coarse flint GRAVEL. Sand is fine to coarse, low flint cobble content. | 0.70 | | 10.83 |
| 1.00 | B | | | | | | |
| 1.00 | D | | | | | | |
| | | | | Below 1.70m, Thin beds/pockets of black manganese staining. | | | |
| 1.90 | B | | PID=0.0 | | | | |
| 1.90 | D | | | | | | |
| 1.90 | ES | | | | | | |
| | | | | End of Excavation | 2.30 | | 9.23 |

| Excavation | | | | Groundwater | | |
|------------|----------------------|-----------------|------------|----------------|--------------|---------|
| Plant | Wheeled excavator | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 3.20 | 1.90 | | |
| Shoring | None. | Date Backfilled | 07/11/2018 | | | |
| Stability | Collapsing at depth. | | | | | |

Remarks The Trial Pit was terminated at a depth of 2.30m due to instability of the pits sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **1 of 1**
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Trial Pit TP12
Project No PE181522

Client WSP

National Grid Coordinates 495296.947E
105545.832N

Ground Level 11.55 m OD

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|---|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | Grass over firm brown slightly sandy slightly gravelly SILT. Sand is fine to coarse, gravel is angular to subrounded fine to coarse flint, low flint cobble content, friable. | G.L. | | 11.55 |
| 0.30 | B | | PID=0.0 | | | | |
| 0.30 | D | | | | | | |
| 0.30 | ES | | | | | | |
| 0.80 | ES | | PID=0.0 | At 0.50m, Becoming gravelly. | | | |
| 1.40 | B | | PID=0.0 | Pale brown clayey sandy angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse chalk and flint, low flint cobble content, calcareous. | 1.20 | | 10.35 |
| 1.40 | D | | | | | | |
| 1.40 | ES | | | | | | |
| 2.20 | B | | | Light brown sandy very clayey angular to sub-rounded fine to coarse flint GRAVEL. Sand is fine to coarse, pockets of white/cream and dark brown sandy gravelly clay. | 2.10 | | 9.45 |
| 2.20 | D | | | | | | |
| 3.30 | B | | | Firm off white cream sandy gravelly SILT. Gravel is angular to subrounded fine to coarse flint, sand is fine to coarse chalk and flint, calcareous. | 2.90 | | 8.65 |
| 3.30 | D | | | End of Excavation | 3.40 | | 8.15 |

| Excavation | | | | Groundwater | | |
|------------|----------------------|-----------------|------------|----------------|--------------|----------------|
| Plant | Wheeled excavator | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 2.60 | 2.20 | | Seepage. Flow. |
| Shoring | None. | Date Backfilled | 07/11/2018 | 3.10 | | |
| Stability | Collapsing at depth. | | | | | |

Remarks The Trial Pit was terminated at a depth of 2.30m due to instability of the pits sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Trial Pit **TP13**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **495307.563E**
105424.883N

Ground Level **10.93 m OD**

| Samples and Tests | | | | Strata | | Scale 1:50 | |
|-------------------|------|------------|---------|---|-------|------------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | Grass over dark greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse flint, sand is fine to coarse. | G.L. | | 10.93 |
| 0.30 | B | | | At 0.40m, Gravelly. | 0.60 | | 10.33 |
| 0.30 | D | | | | | | |
| 0.30 | ES | | PID=0.0 | | | | |
| 0.70 | B | | | Off white cream sandy silty angular to subrounded fine to coarse flint GRAVEL. Sand is fine to coarse chalk and flint, weakly cemented, calcareous. | 1.25 | | 9.68 |
| 0.70 | D | | | | | | |
| 0.70 | ES | | PID=0.0 | | | | |
| 1.50 | B | | | Brown sandy very clayey angular to subrounded fine to coarse flint GRAVEL. Medium flint cobble content. | 1.70 | | 9.23 |
| 1.50 | D | | | | | | |
| 1.50 | ES | | PID=0.0 | | | | |
| | | | | At 1.40m, Slightly clayey. | | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|----------------------|-----------------|------------|----------------|--------------|---------|
| Plant | Wheeled Excavator | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 2.40 | 1.40 | | |
| Shoring | None. | Date Backfilled | 08/11/2018 | | | |
| Stability | Collapsing at depth. | | | | | |

Remarks The Trial Pit was terminated at a depth of 1.70m due to instability of the pits sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **1 of 1**
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Trial Pit **TP14**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **495300.843E**
105377.810N

Ground Level **11.06 m OD**

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|--|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | Grass over firm brown slightly sandy slightly gravelly SILT. Gravel is angular to subrounded fine to coarse flint, sand is fine to coarse. | G.L. | | 11.06 |
| 0.30 | B | | | | | | |
| 0.30 | D | | | | | | |
| 0.30 | ES | | PID=0.0 | At 0.20m, Becoming orangish brown. | | | |
| 0.80 | D | | | | | | |
| 0.80 | ES | | PID=0.0 | Below 0.30m, Gravelly. | 0.95 | | 10.11 |
| 1.10 | B | | | | | | |
| 1.10 | D | | | | | | |
| 1.10 | ES | | PID=0.0 | Firm brown slightly sandy gravelly CLAY. Fine to coarse sand, angular to sub-rounded fine to coarse flint gravel. | 1.40 | | 9.66 |
| 1.60 | B | | | | | | |
| 1.60 | D | | | | | | |
| 1.60 | ES | | PID=0.0 | Brown sandy very clayey angular to subrounded fine to coarse flint GRAVEL. Fine to coarse sand, low flint cobble content. | 2.00 | | 9.06 |
| 2.00 | B | | | | | | |
| 2.00 | D | | | | | | |
| 2.00 | D | | | Below 1.70m, slightly clayey. | | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|----------------------|-----------------|------------|----------------|--------------|---------|
| Plant | Wheeled Excavator | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 3.00 | 1.60 | | |
| Shoring | None. | Date Backfilled | 08/11/2018 | | | |
| Stability | Collapsing at depth. | | | | | |

Remarks The Trial Pit was terminated at a depth of 2.00m due to instability of the pits sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **1 of 1**
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project **A29 REALIGNMENT, EASTERGATE**

Engineer **WSP**

Trial Pit **TP15**
Project No **PE181522**

Client **WSP**

National Grid Coordinates **495256.708E**
105248.196N

Ground Level **11.59 m OD**

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|----------|--|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | Grass over firm brown slightly sandy CLAY with rare angular to subrounded fine to coarse flint gravel. Sand is fine to coarse. | G.L. | | 11.59 |
| 0.30 | ES | | PID=0.0 | | 0.35 | | 11.24 |
| 0.60 | B | | | Firm orange brown slightly sandy CLAY. Sand is fine to coarse. | | | |
| 0.60 | D | | | | | | |
| 0.90 | D | | | | | | |
| 0.90 | ES | | | | | | |
| 0.90 | HV | | Av=64kPa | | 1.20 | | 10.39 |
| 0.90 | | | PID=0.00 | | | | |
| 1.40 | B | | | Brown sandy very clayey angular to sub-rounded fine to coarse GRAVEL. Sand is fine to coarse, flint gravel. | 1.60 | | 9.99 |
| 1.40 | D | | | | | | |
| 1.40 | ES | | PID=0.0 | | | | |
| 1.90 | B | | | Pale creamy brown very clayey sandy angular to subrounded fine to medium GRAVEL. Sand is fine to coarse chalk and flint, gravel is flint and chalk, calcareous. | 2.50 | | 9.09 |
| 1.90 | D | | | | | | |
| 1.90 | ES | | PID=0.0 | | | | |
| 2.70 | B | | | Off white cream slightly gravelly sandy CLAY. Gravel is angular to sub-rounded fine to coarse flint. Sand is fine to coarse chalk and flint, low flint cobble content, calcareous. | 2.90 | | 8.69 |
| 2.70 | D | | | | | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|----------------------|-----------------|------------|----------------|------|----------|
| Plant | Wheeled excavator | Width (B) | 0.40 | Depth Observed | 2.30 | Details |
| Date | | Length (C) | 2.40 | Depth of Pit | | Seepage. |
| Shoring | None. | Date Backfilled | 07/11/2018 | | | |
| Stability | Collapsing at depth. | | | | | |

Remarks The Trial Pit was terminated at a depth of 2.90m due to instability of the pit sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **1 of 1**
09/01/2019

TRIAL PIT RECORD

Trial Pit

Project A29 REALIGNMENT, EASTERGATE

Engineer WSP

Trial Pit **TP16**
Project No PE181522


Client WSP

National Grid Coordinates 495230.152E
105250.000N

Ground Level 11.51 m OD

| Samples and Tests | | | | Strata | Scale 1:50 | | |
|-------------------|------|------------|---------|--|------------|--------|------------|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | Level m OD |
| | | | | | G.L. | | 11.51 |
| 0.20 | ES | | PID=0.5 | MADE GROUND: Grass over firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse, gravel is angular to subrounded fine to coarse flint, rare brick and plastic fragments, low cobble content of granite and brick. | | | |
| 0.50 | B | | | | | | |
| 0.50 | D | | | Stiff orange brown slightly gravelly (<5%) slightly sandy silty CLAY. Gravel is sub-angular to sub-rounded fine to coarse flint, sand is fine to coarse. | 0.60 | | 10.91 |
| 0.60 | ES | | PID=0.9 | | | | |
| 0.75 | B | | | | | | |
| 0.75 | D | | | | | | |
| 1.00 | ES | | PID=0.4 | Stiff pale creamy brown slightly sandy slightly gravelly SILT. Fine to coarse sand of flint and chalk, gravel is angular to subrounded fine to coarse flint, calcareous. | 1.40 | | 10.11 |
| 1.60 | B | | | | | | |
| 1.60 | D | | | | | | |
| 1.60 | ES | | PID=0.5 | Below 2.20m, Becoming gravelly. | | | |
| 2.50 | B | | | | | | |
| 2.50 | D | | | | | | |
| 2.50 | ES | | PID=0.3 | Orangish brown fine grained SAND. | 3.10 | | 8.41 |
| 3.15 | D | | | | | | |
| 3.25 | B | | | End of Excavation | 3.30 | | 8.21 |
| | | | | | | | |


| Excavation | | | | Groundwater | | |
|------------|-------------------------------|-----------------|------------|----------------|--------------|----------------|
| Plant | Wheeled excavator | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | 05/11/2018 | Length (C) | 2.40 | 3.15 | | Water Seepage. |
| Shoring | None. | Date Backfilled | 05/11/2018 | | | |
| Stability | Collapsing below 3.10m depth. | | | | | |

Remarks  The Trial Pit was terminated at a depth of 3.30m due to instability of the pits sides. The trial pit was backfilled with arisings compacted in layers.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by MK
Checked by MY
Figure 1 of 1
09/01/2019



TRIAL PIT RECORD

Inspection Pit

Project **A29 REALIGNMENT, EASTERGATE**

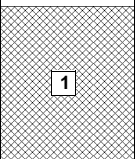
Engineer **WSP**

Trial Pit
Project No


TP18
PE181522

Client **WSP**

National Grid Coordinates **495238.000E**
105250.000N

| Samples and Tests | | | | Strata | | Scale 1:50 | |
|-------------------|------|------------|---------|--|-------|---|--|
| Depth | Type | Stratum No | Results | Description | Depth | Legend | |
| 0.30 | ES | | | MADE GROUND: Firm to stiff brown slightly sandy slightly gravelly silty clay. Gravel is angular to subrounded fine to coarse flint. Sand is fine to coarse. Occasional cobbles of flint and brick. At 0.50m, Occasional metal and plastic fragments. | G.L. |  | |
| 0.80 | ES | PID=0.3 | | | 1.00 | | |
| | | | | End of Excavation | | | |

| Excavation | | | | Groundwater | | |
|------------|---------------------------|-----------------|------------|------------------------------------|--------------|---------|
| Plant | Hand Tools | Width (B) | 0.40 | Depth Observed | Depth of Pit | Details |
| Date | | Length (C) | 0.40 | | | |
| Shoring | None. | Date Backfilled | 06/11/2018 | Not encountered during excavation. | | |
| Stability | stable during excavation. | | | | | |


Remarks  Inspection pit backfilled with arisings on completion.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by **MK**
Checked by **MY**
Figure **1 of 1**
09/01/2019





Appendix C - Head Deposits – Cohesive Stratum

Thickness of Cohesive Stratum Encountered 2019 Ground Investigation

| Exploratory Hole | Depth (m BGL) | Thickness (m) |
|------------------|---------------|---------------|
| BH01 | 2-6 | 4 |
| BH02 | 1.2-1.6 | 0.4 |
| BH03 | 0-0.9 | 0.9 |
| BH03 | 2.4-5.5 | 3.1 |
| BH04 | 4.6-4.8 | 0.2 |
| BH05 | 3.8-4.9 | 1.1 |
| BH06 | 1.7-4 | 2.3 |
| BH07 | 0.1-1.1 | 1 |
| BH08 | 0-3.2 | 3.2 |
| BH09 | 0-3.6 | 3.6 |
| TP02 | 0-0.8 | 0.8 |
| TP02 | 1.7-1.9 | 0.2 |
| TP03 | 0-1.35 | 1.35 |
| TP06 | 0-1 | 1 |
| TP07 | 0-0.6 | 0.6 |
| TP08 | 0-0.2 | 0 |
| TP09 | 0-0.7 | 0.7 |
| TP09 | 0.9-1.2 | 0.3 |
| TP10 | 0-0.5 | 0.5 |
| TP12 | 0-1.2 | 1.2 |
| TP12 | 2.9 | 3.4 |
| TP13 | 0-0.6 | 0.6 |
| TP14 | 0-1.4 | 1.4 |
| TP15 | 0-1.2 | 1.2 |
| TP15 | 1.6-2.9 | 1.3 |
| TP16 | 0-3.1 | 3.1 |



Appendix D – Geological Cross Section Along Proposed Route

Appendix D - Geological Cross Section of the proposed route

