Specification

Specification	The specification shall be the <i>UK Specification for Ground Investigation</i> 2 nd <i>Edition</i> (2012) published by ICE Publishing, with information, amendments and additions as described in the Schedules.
	Schedule 1. Information and site-specific requirements Schedule 2. Exploratory holes Schedule 3. Investigation Supervisor's facilities Schedule 4. Specification amendments

Schedule 5. Specification additions

Schedules

SCHEDULE 1: INFORMATION AND SITE SPECIFIC REQUIREMENTS

S1.1 Name of Contract

South Road Retaining Wall

S1.2 Investigation Supervisor

твс

S1.3 Description of site

Site Location, Description and Access

The site comprises an approximately 60m length of existing retaining wall with associated footpath and road, namely South Road, at the crest. The retaining wall is up to 3m high, with maximum height at the southern end. Terracing/buttressing has been added to the toe of the retaining wall at its northern extent within the last 12 months.

The footpath has been closed following an inspection by North Somerset Council, which noted a deterioration in condition leading to cracking and rutting of the tarmac. In addition, cracking was also noted on the back face of the retaining wall above pavement level and on the front (retained) face.

The site is located north of Weston-super-Mare town centre on South Road. The site is on a tight radius bend which follows the natural topography upslope of the site. The toe of the retaining wall is in the car park/gardens for Pine Court flats.

Approximate National Grid Reference: 331836, 162341.

The Site has been classified as YELLOW as per the BDA Site Designation.

Ground Cover

At the crest of the retaining wall the ground cover is tarmacadam of the footpath and carriageway of South Road. At the toe of the retaining wall ground cover is generally grass. At the northern end of the retaining wall, there is a section of recently constructed terracing/buttressing.

Topography and Elevation

South Road and its footpath run along ground retainined by the retaining wall. The land falls away to the south east and rises to the north west.

S1.4 The Main works proposed and purpose of this contract

It is understood that the proposed works will consist of works to remediate/stabilise the retaining wall.

The solution is not yet known but may include one or more of the following: ground anchors through the wall, buttressing, improved drainage, or grouting of voids behind the wall.

The purpose of this contract is to:

- 1. Confirm the geology and ground conditions: distribution and engineering properties of the geological formations and any artificial ground
- 2. Investigate the presence of any groundwater or perched water behind the wall
- 3. Determine potential ground aggressiveness with geotechnical testing
- 4. Undertake in-situ and laboratory geotechnical testing of the soils/rocks to provide sufficient data to determine engineering properties of the underlying strata
- 5. Undertake environmental testing on selected samples to identify any potential soil or groundwater contamination, and to characterise for disposal.

S1.5 Scope of investigation

The Contractor shall be appointed as Principal Contractor by North Somerset Council.

It is the Contractors responsibility to supply suitable plant to safely undertake the works detailed within this Specification and shown on the attached drawing.

The Contractor should be aware that the works are adjacent to and within a live carriageway; traffic management will be required.

In addition, service plans from 2016 show: water mains, sewers, gas mains, underground LV cables and underground BT plant, under the carriageway and pavements within the boundaries of the site. It is the Contractors resposibility to identify safe locations to undertake the works as described below. Positions to be agreed with the Investigation Supervisor prior to commencement.

It is the Contractors responsibility to define the extent of traffic management required to undertake the works.

The investigation comprises the following works:

- 5 No. boreholes advanced using a drilling rig capable of both dynamic sampling and rotary coring that can obtain the required samples through possible made ground/fill, superficial deposits and solid geology to a depth of 7 mbgl. Collection UT100 undisturbed samples where possible/appropriate, SPT testing and collection of rock cores. Boreholes shall be a minimum of 1.5m back from the retaining wall.
- 5 no. hand dug observation pits of the retaining wall foundations.
- 3 no. horizontal diamond core holes through the retaining wall to confirm wall thickness and the nature of the materials directly behind the wall.
- Soils to be logged in accordance with BS EN ISO 14688-1:2002+A1:2013 and BS 5930:2015
- Rock to be logged in accordance with BS EN ISO 14689-1:2002, BS 5930:2015
- Geotechnical laboratory testing on selected samples
- Environmental testing on selected samples
- Provision of AGS data
- Ground Investigation Factual Report (as per 16.8.1)

Specific borehole requirements are detailed further in Schedule 1 and Schedule 2. The proposed borehole location plan is attached to this Specification.

S1.6 Geology and ground conditions

The following general assessment of the geology of the site and ground conditions has been inferred from the available information. No assurance is given to its accuracy and the Contractor shall take all steps to assure himself of the likely ground conditions:

- Geology of Britain Viewer, http://mapapps.bgs.ac.uk/geologyofbritain/home.html
- Solid and Drift British Geological Survey: Map Sheet no 279 & pt of 263&295 (Weston-super-Mare)

Published geology indicates that the site is directly underlain by limestone of the Goblin Coombe Oolite.

Made Ground

It is understood that the road and footpath are founded upon retained fill/made ground. Given the age of the structure it is considered likely that the material was not placed to an engineering specification and as such may be poorly compacted with the potential for voids. A trial pit through the footpath indicates the shallow made ground to comprise weathered mudstone and limestone with brick.

Bedrock geology

The BGS describe the Goblin Combe Oolite formation as comprising pale grey to grey, thickly bedded to massive, medium to coarse grained oolite and ooidal limestone with lenses of crinoidal limestone.

Groundwater

There is evidence of water flow or seepage through the wall and through the existing weepholes within the wall.

S1.7 Schedule of drawing(s) and documents

North Somerset Council, Site Location Plan, 1:15000, date May 2016

North Somerset Council, Site Location Plan, 1:1250, date May 2016

Services/utilities- Bristol Water, Virgin, Wales & West, Wessex Water, Western Power Distribution, BT open reach. Dated May 2016

WSP Technical Note, South Road, Site Inspection Report- Revision 1, November 2019

S1.8 General requirements (Specification Section 3) Particular restrictions / relaxations

In addition to the British and European Standards outlined in the Specification, the work should be undertaken in accordance with the following Standards, current on the date of this specification:

- BS EN 1997-1
- BS EN 1997-2
- BS EN ISO 22475-1
- BS EN ISO 14688-1
- BS EN ISO 14688-2
- BS EN ISO 14689-1
- BS EN 24476-3

And any associated National Appendices where applicable;

- BRE Digest 365
- BS EN 17892 Parts 1-12 (Superseeds BS 1377)
- BS 5930
- BS 10175

S1.8.1 Quality management system (Clause 3.3)

Quality management to BS EN ISO 9001.

Prior to commencement of work, the contractor shall submit Method Statements to the Invesitgation Supervisor for agreement; the Contractor shall remain responsible for all operations. These shall be submitted at leat five working days prior to the works commencing. These shall include, but shall not be limited to:

- Type of plan
- Sequence of Works (including setting out)
- Site access arrangements and requirements, including Traffic Management
- Proposals for accessing the site areas
- Temporary works including locations of stockpiles and consumables
- Transportation of materials to, from and around the Site
- Methodology for drilling, sampling and in-situ testing
- Health and Safety requirements including appropriate monitoring
- Details of the proposed Laboratory and the relevant accreditation schedules and certificated for all tests listed in this Specification

The Contractor shall comply with the site regulations imposed by the Client and any specific land issues raised by the landowners.

The Contractor shall prepare a written Health and Safety (H & S) Plan incorporating safety and emergency procedures for the site and submit this to the Client five working days prior to commencement of work. All personnel working on the site shall be given an induction on the contents of the H & S Plan and shall acknowledge receipt of a copy.

A copy of the H & S Plan shall be kept on site at all times.

S1.8.2 Professional Attendance (Clause 3.5.2)

The Contractor shall provide full-time professional attendance to perform those tasks detailed in Specification Note for Guidance 3.5.2 which are relevant to this investigation.

The Contractor shall provide a suitably qualified Geotechnical Engineer/ Engineering Geologist with a minimum of 3 years' relevant experience.

S1.8.3 Provision of ground practitioners and other personnel (Clauses 3.6.1 and 3.6.2)

No other personnel (see Specification Clause 3.6.2) are to be provided by the Contractor.

S1.8.4 Hazardous ground, land affected by contamination and notifiable and invasive weeds (Clauses 3.7.1 and 3.22)

The Contractor shall ensure appropriate H&S measures are in place to protect their people and plant during the works.

The site is within a moderate unexploded bomb (UXO) risk area. Since the retaining wall was constructed post World War Two, the risk is considered to be low within the site.

It is understood that there is Made Ground behind the retaining wall. Despite this, significant contamination is not expected to be encountered on site. Should hazardous ground be encountered during the ground investigation, the Investigation supervisor shall be informed

immediately. Risk mitigation measures shall be agreed between the Contractor and Investigation Supervisor.

S1.8.5 Additional information on services not shown on Contract drawings (Clause 3.7.2)

Up to date services information will be provided to the Contractor by the Client in advance of the works; plans from 2016 are included within this Specification. The Contractor shall take all steps to ensure the accuracy of the service information, the Client accepts no responsibility for the accuracy of the information provided, and take such steps as are considered necessary to ensure avoidance of damage to services. This shall include, but not be limited to "sweeping" the site of each exploratory point using a Cable Avoidance Tool ("CAT") or similar scanning instrument for the detection of services. The technique used shall be appropriate for the sources being detected and shall only be carried out by suitably trained operatives.

S1.8.6 Known/suspected mine workings, mineral extractions etc (Clause 3.7.3)

None anticipated.

S1.8.7 Protected species (Clause 3.7.4)

None anticipated.

S1.8.8 Archaeological remains (Clause 3.7.5)

None anticipated.

S1.8.9 Security of site (Clause 3.11)

Security and safety of all plant and equipment is the responsibility of the Contractor. If plant and equipment remain on site overnight, these must be securely fenced and locked before leaving site, or other secure measures employed.

All plant should be fenced off using herras fencing or solid panel fencing where the Contractor sees fit; during operational and non-operational times. This should include each individual exloratory hole location where activities last greater than a single working day.

All plant should have anti-vandal mechanisms and/or covers to working parts and operational control panels.

The Contractor is to ensure that the compound area is secure at all times.

S1.8.10 Traffic management measures (Clause 3.12)

Traffic management is required.

Appropriate traffic management is the responsibility of the Contractor.

S1.8.11 Restricted working hours (Clause 3.13)

Working hours are generally restricted to daylight hours; Monday to Friday 8am to 5pm.

S1.8.12 Trainee site operatives (Clause 3.14.1)

Trainee operatives are permitted on-site provided they are escorted/mentored on a one to one basis.

Site operatives shall hold a National Vocational Qualification (NVQ), or equivalent European Union Qualification (where available), appropriate to their status and to the type of work being undertaken.

All site operatives employed on the contract shall also hold a valid and current CSCS card for their occupation as issued by Construction Skills Certification Scheme Ltd or an equivalent body in a State of the European Union. In the case of boring and drilling operatives, this should be a CSCS blue skilled (Land Drilling) card but Clause 3.14.3 also applies.

S1.8.13 Contamination avoidance and/or aquifer protection measures required (Clauses 3.15.2 and 3.15.3)

The Goblin Coombe Oolite is a Principal Aquifer, appropriate measures are required to ensure no contamination of the aquifer.

The Contractor is to ensure all drilling techniques and flush medium used do not contaminate the ground surrounding the drilling activities and that no indiscriminate soak away of flush medium occurs.

S1.8.14 Maximum period for boring, pitting or trenching through hard material, hard stratum or obstruction (Clauses 2.8, 4.3 and 6.4)

The agreement of the Investigation Supervisor shall be obtained before drilling through hard materials or obstructions for periods > 1hr.

S1.8.15 Reinstatement requirements (Clause 3.16)

Where installations are not required, the Contractor is to return the exploratory hole location back to its original condition. Photographs shall be taken at each location prior to, and on completion.

On completion of all exploratory locations, any arising created during the drilling and excavation processes must be removed from the exploratory hole location and site at the Contractors time and cost. He shall be responsible for undertaking all Waste Acceptance Testing and ensuring the waste is disposed of in accordance with Waste Management Legislation.

Site reinstatement shall be to the approvial of the Investigation Supervisor.

S1.8.16 Hygiene facilities required (Clauses 2.20 and 3.16.1)

The welfare facilities provided by the Contractor are to be compliant with the regulations stated under CDM Regulations (2015); Schedule 2.

S1.8.17 Unavoidable damage to be reinstated by Contractor (Clause 3.16.1)

All unavoidable damage is to be rectified by the Contractor at his cost.

S1.8.18 Accuracy of exploratory hole locations (Clauses 3.19 and 3.20)

The actual locations will be agreed on site with the Investigation Supervisor prior to commencement of works, in order to accommodate for access and working space restrictions.

Setting out shall be to the accuracy defined in the Specification.

If obstructions, services or traffic management prevent establishment of the agreed exploratory hole locations, then holes may be moved laterally by the Contractor by +/- 1m to avoid that obstruction. A larger relocation may be permitted by the Investigation Supervisor upon reasonable request.

The as-dug location of exploratory holes shall be referenced to +/-0.5m laterally and +/-0.01m vertically.

S1.8.19 Photography requirements (Clause 3.25)

The contractor shall record the following in photographs at each exploratory hole location:

- Ground cover before excavation
- Reinstatement after excavation
- Arisings, including those from inspection pits, hand dug pits and diamond core holes
- Any relevant geotechnical feature found in the exploratory hole to assist the description of the features found
- Any rock cores retrieved

Photographs shall be in digital "JPEG" format and the file names shall be in the format: -"South Road_BH[X]_[Y].jpg" where X is the exploratory hole reference number and Y is the sequential number of the photographs.

S1.8.20 Standing time

With the exception of progressing through hard strata or obstructions, the standing of any crew, plant, or other item supplied by the Contractor shall be communicated immediately to the Investigation Supervisor or his representative. Such standing shall be recorded on daily logs and agreed and countersigned by the Investigation Supervisor or his representative within one working day. Any standing time that has not been subject to this process shall not be paid.

S1.8.21 Programme requirements

The Contractor is to provide a programme at the point of tender.

S1.9 Percussion boring (Specification Section 4) Particular restrictions/relaxations

Contract specific restrictions/relaxations, if any, are inserted below.

S1.9.1 Permitted methods and restrictions (Clauses 4.1 to 4.4)

Not required

S1.9.2 Backfilling (Clause 4.5)

See S1.10.12

S1.9.3 Dynamic sampling (Clause 4.6)

It is the Contractors responsibility to ensure suitable plant are used to safely access the proposed locations as shown on the attached plan.

Dynamic sampling shall be undertaken in locations specified within Schedule 2 using a rig capable of dynamic sampling and rotary coring.

Dynamic methods shall be used to progress the borehole until the base of the made ground is reached, the strata is too stiff to progress, or recovery is very poor, as defined in Clauses 2.8, 4.3, 6.4 and S1.8.14. Upon which an SPT test will be undertaken before continuing with rotary drilling. Prior to changing to rotary coring the Investigation Supervisor, or their representative, will be informed.

Dynamic sampling shall be carried out using hollow steel tubes incorporating a removable liner and cutting shoe in order to recover a nominally continuous sample for retention. The method and diameter of advancing the boreholes shall facilitate the recovery, inter alia, of 102mm diameter thin wall undisturbed samples, the performance of Standard Penetration

Tests, and the installation of groundwater monitoring instrumentation over the full depth range of specified boreholes, as required. Care shall be taken at all times to avoid disturbing or loosening the soil or causing loss of ground around the holes.

S1.10 Rotary drilling (Specification Section 5) Particular restrictions/relaxations

Contract specific restrictions/relaxations, if any, are inserted below.

S1.10.1 Augering requirements and restrictions (Clauses 5.1)

Not required.

S1.10.2 Particular rotary drilling techniques (Clause 5.2)

Rotary follow on drilling will be required on completion of dynamic sampling, as specified in Schedule 2. Rotary drilling shall progress until borehole completion, see Schedule 2.

The Contractor shall endeavour to achieve as close as it is practicable to 100% core recovery, taking into consideration the requirements of in-situ testing. If such core recovery is not being achieved, the Contractor shall take measures to improve core recovery.

Where 90% recovery or less is achieved the Contractor is to reduce subsequent core runs by half (subject to a minimum core run length of 0.5m), replacing worn or damaged equipment. If continued core recovery is below 90%, the Investigation Supervisor reserves the right to increase the core diameter and subsequent barrel size.

If core recovery of less than 50% is achieved during any run a Standard Penetration Test (SPT) shall be performed immediately afterwards and subsequent core runs reduced as above.

The Contractor is to be made aware of the composition, nature and hardness of the solid geology indicated in Schedule S1.6.

Core is required from all rotary drilling operations, unless explicitly stated as not being required in Schedule 2 or instructed by the Investigation Supervisor.

Where a combined rotary drilling rig is used dynamic sampling shall only be carried out where ground conditions are suitable and with the approval of the Investigation Supervisor.

The approval of the Investigation Supervisor shall be sought, either in person or by telephone, before terminating any borehole.

Special precautions shall be taken to control and contain all drilling fluids, water, slurry, arisings, spoil, dust and run-off in order that they do not reach drainage channels, and the like.

A borehole remaining open overnight shall be made safe and measures taken to prevent objects being inserted into the exploratory hole.

S1.10.3 Drilling fluid type and collection (Clause 5.3)

All drilling activities should be completed using an air or air mist flush, to ensure limited additional pressure on the back of the wall.

S1.10.4 Rotary core drilling equipment and core diameter (Clauses 5.4.1 and 5.4.2)

The equipment shall be capable of providing 100mm diameter core of Class 1 standard in accordance with BS EN 22475 and BS 5930.

The Contractor shall bring to site a range of drill bits and core catchers/springs appropriate for the geology, such that the required core recovery detailed within Section S1.10.2 is achievable.

S1.10.5 Core logging (Clause 5.4.6)

All core logging shall be in accordance with Clause 5.4.6 and in accordance with BS EN ISO 14689-1:2002, BS 5930:2015.

Core must be photographed (prior to examination), logged and sub sampled, where required, on site to ensure the natural moisture content is retained. All examination shall be undertaken on site within 48 hours to ensure the moisture from the core samples is not lost.

The contractor is to ensure that core and sub samples are transported securely to ensure core integrity.

Mechanical logging, e.g.; TCR, SCR, RQD and fracture index is to be undertaken.

S1.10.6 Core sub-samples for laboratory testing (Clause 5.4.7)

The following suitable samples are required per metre run of solid core, where possible: 1 sample for UCS testing, 3 samples for point load testing.

The core preparation, preservation and storage of samples from rotary cores for laboratory testing will be as follows, and conducted on site:

(1) The following equipment is needed on site to conform to the requirements of this Specification:

- a thermostatically controlled wax bath capable of maintaining the wax at a temperature of approximately 65°C
- low melting point wax, comprising 50% petrolatum and 50% paraffin wax (or similar approved)
- heavy-duty cling film and aluminium foil to the approval of the Engineer
- two counter-rotating saws capable of cutting the plastic liner into two halves along its long axis
- soil lathe for trimming the samples.

(2) Each core run shall be handled with extreme care at all times.

(3) As soon as possible after recovery of the core run from the drill hole, the inner liner containing the core shall be taken to the saw for cutting. The saw shall be set such that only the liner is cut, leaving the sample unscored. If necessary a sharp safety knife may be used for final separation of the two halves of the liner, if the saw has not already penetrated the full thickness of the liner.

(4) The sample, still in the two halves of the liner, shall be placed on a clean flat work surface. The top half of the liner shall be removed carefully and any excess drilling fluid gently removed from the surface of the sample, using a clean dry cloth or absorbent paper towel. Gentle axial tapping at one end of the top half of the liner is permissible to ease removal. The sample shall then be rotated through 180 degrees, so that the other half of the liner can be removed and the remainder of the sample surface cleaned of drilling fluid.

(5) The preservation technique for samples is as follows. The entire sample shall be fully wrapped carefully in a single layer of aluminium foil with the shiny surface of the foil on the outside to dissipate the heat from the molten wax. The foil shall be carefully smoothed to remove any air pockets that may form between the sample and the aluminium foil. Care should be taken to avoid excess foil on the ends of the sample or the formation of air pockets. The sample shall be carefully covered (including its ends) with a smooth layer of low melting point wax. It may be necessary to coat the ends of the sample in wax as a separate action. The sample shall then be stood on its end on a flat clean surface to cool, maintaining its correct orientation.

(6) When the wax has solidified, the sample shall be wrapped tightly in heavy-duty cling-film under tension, overlapping at least 30mm on to both ends of the sample. Before using the cling film, it shall be dipped into the wax bath so that it is coated with a thin film of wax. Care

should be taken to avoid the formation of air pockets. Each end of the sample shall then be wrapped tightly in heavy-duty cling-film. The cling film shall overlap at least 30mm onto the curved surface of the sample. Before using the cling film, it shall be dipped into the wax bath so that it is coated with a thin film of wax.

(7) The sample should then be dipped into the bath of low melting point wax and rotated until all the cling film (including that at the ends of the sample) is entirely covered in a second coat of wax. It may be necessary to dip the ends of the sample in wax as a separate action. The wax should then be allowed to cool.

(8) When the wax on the surface of the sample has solidified, the sample shall be wrapped in a second layer of cling film dipped in wax, as described above. The cling film shall cover the curved surface and both ends of the sample. Any joins in the cling film shall overlap by at least 30mm. Heavy duty adhesive tape shall then be wrapped around the bottom edges of both ends to protect the cling film from becoming damaged at these locations.

(9) The sample shall be clearly identified on its outside with the following information: contract number, borehole number, sample number and depth and with an arrow pointing to the top of the sample (and labelled as such). If a label is attached to the sample, it shall be secured beneath a further layer of tightly wrapped cling film. All marking shall be in indelible ink.

(10) When the sample has been sealed as described above, it shall be protected from damage by laying it inside a protective 'sleeve' made from split drain pipe, guttering, or rigid liner. The sample shall be secured inside its protective sleeve by binding the package with adhesive tape. The sample shall be stored on site in a temperature controlled environment that is free of vibrations. The Contractor shall take all reasonable measures to maintain the temperature of the samples between 10° and 15°C. Under no circumstances shall the temperature of the sample be allowed to drop below 5°C.

(11) When transporting samples to the laboratory, the samples shall be handled with great care and shall be protected during the journey from vibration, sudden movement and excessive changes in temperature or humidity. They shall not be transported in the core boxes but in a separate padded box to minimise sudden movement, vibration etc.

(12) Samples shall be stored in the laboratory in a temperature and humidity controlled environment that is free of vibrations. The temperature shall be maintained between 10°C and 12°C and the relative humidity between 90 and 95%. Under no circumstances shall the temperature of the samples be allowed to drop below 5°C.

(13) The Contractor may also be required to take small disturbed samples from the rotary cores, as instructed by the Engineer. These shall be taken in accordance with Clause 7.6 and stored in accordance with Clause 7.5. S1.10.7 Address for delivery of selected cores (Clauses 5.4.8 and 5.4.9)

The core shall be transported with extreme care and with minimal changes to environmental conditions as possible. The location of delivery will be specified accordingly for laboratory samples as well as the rest of the core samples which do not require laboratory testing, this will be done in agreement with the Investigation Supervisor.

S1.10.7 Address for delivery of selected cores (Clauses 5.4.8 and 5.4.9)

Not required.

S1.10.8 Rotary open hole drilling general requirements (Clause 5.5.1)

Rotary open hole drilling is not scheduled; however the Investigation Supervisor reserves the right to use open hole drilling methods should they see fit. If rotary open hole techniques are

being utilised in superficial materials, the contractor is to terminate drilling and notify the investigation supervisor immediately when solid geology is encountered. The Investigation Supervisor will subsequently advise on any further requirements of the exploratory position.

In-situ SPT testing may be requested by the Investigation Supervisor where the depth to solid geology has not been clearly identified.

Any open hole progressed location is required to be of sufficient diameter to enable core recovery as stated in S1.10.4. Core recovery at an open hole progressed location may be requested by the Investigation Supervisor.

Rotary open hole drilling for locating mineral seams, mine workings etc (Clause 5.5.2) S1.10.9

Not required.

S1.10.10 Open-hole resonance (sonic) drilling (Clause 5.6.1)

Not required.

S1.10.11 Resonance (sonic) drilling with sampling or continuous coring (Clause 5.6.2)

Not required.

S1.10.12 Backfilling (Clause 5.7)

The Contractor is to return the exploratory hole location back to its original condition, backfilled with bentonite pellets. Backfilling of boreholes with soil arisings is not permitted. Any arising created during the drilling process must be removed from site at the Contractors time and cost. He shall be responsible for undertaking all Waste Acceptance Testing and ensuring the waste is disposed of in accordance with Waste Management Legislation.

Where backfilling of boreholes takes up to two times the borehole volume without attaining the instructed backfill level, the Contractor is to 'dip' the borehole to establish the level of back fill achieved and then contact the Investigation Supervisor immediately for further instruction.

Where installations are scheduled, installation and back filling details shall be provided by the Investigation Supervisor by way of a site instruction, on completion of the hole. The Contractor should use the Environment Agencies following guidelines: 'Good practice for decommissioning redundant boreholes and wells, where applicable and/or instructed by the Investigation Supervisor.

S1.10.13 Core photographic requirements (Clause 5.8)

As per the Specification.

S1.10.14 **Recording groundwater levels**

Groundwater levels shall be recorded at the beginning and at the end of each working shift or other rest periods greater than 30 minutes.

Where a 'groundwater strike' occurs, drilling activity is to be stopped, the groundwater level recorded, and then left to stabilise for no less than 20 minutes before another level reading is recorded before drilling re-commences.

On each occasion when groundwater is recorded by the Contractor, the depth of the exploratory hole, the depth of any casing and the time on a 24 hour clock should also be recorded.

The groundwater monitoring methodology for groundwater strikes above is to undertaken as part of the drillers day work activities and shall not be included as 'standing time'.

Where artesian conditions are encountered, the Contractor shall immediately inform the Investigation Supervisor and agree a method for dealing with the conditions.

S1.11 Pitting and trenching (Specification Section 6) Particular restrictions / relaxations

Contract specific restrictions/relaxations, if any, are inserted below

S1.11.1 Indirect detection of buried services and inspection pits (Clauses 3.8.3 and 6.1)

All exploratory hole locations shall be scanned using CAT, genny or other type of detection device, prior to any excavation. The technique used shall be appropriate for the sources being detected and shall only be carried out by suitably trained operatives.

Safe digging practices, in accordance with HSE publication HSG 47 "Avoiding Danger from Underground Services", must be used to verify and establish the actual positions of any mains, pipes, services and other apparatus on site before any mechanical plant is used.

Existing services drawings are for indicative purposes only. The position of existing PUBLIC MAINS, SERVICES and SEWERS shown on the drawings have been extracted from plans provided by the Statutory Undertakers and/or Public Authority and the accuracy of the positions is not guaranteed in any way. Privately owned services and connections are not shown but should be anticipated.

In addition, inspection pits to a depth of 1.2m below ground level are required at borehole positions. All inspection pits shall be logged and sampled by a competent Engineer.

If scanning indicates the presence of an underground service, then the Contractor is required to identify an alternative location in close proximity to the scheduled position that is not affected by services. This position is to be agreed with the Investigation Supervisor.

S1.11.2 Restrictions on plant or pitting/trenching methods (Clauses 6.2 and 6.3)

The observation pits at the toe of the wall shall be excavated by hand to determine the size, depth, nature and condition of the existing retaining wall foundations.

S1.11.3 Entry of personnel (Clause 6.5)

Personnel shall not enter any excavation.

S1.11.4 Alternative pit and trench dimensions (Clause 6.7)

See Schedule 2.

S1.11.5 Abstracted groundwater from land affected by contamination (Clause 6.9.2) Not required.

S1.11.6 Backfilling (Clause 6.10)

Hand dug observation pits to be backfilled with arisings, in reverse order. Arisings shall be placed in layers and compacted. Ground surface to be reinstated to its original condition.

S1.11.7 Photographic requirements (Clause 6.12)

See S1.8.19.

To include photographs of the foundations.

S1.11.8 Artificial lighting (Clause 6.12.2)

Not required.

S1.11.9 Provision of pitting equipment and crew for Investigation Supervisor's use (Clause 6.13)

Not required.

S1.11.10 Recording groundwater levels

Not required.

S1.12 Sampling and monitoring during intrusive investigation (Specification Section 7) Particular restrictions / relaxations

Contract specific restrictions/relaxations, if any, shall be inserted below.

S1.12.1 Address for delivery of selected geotechnical samples (Clause 7.6.1)

Not required.

S1.12.2 Retention and disposal of geotechnical samples (Clause 7.6.2)

Samples shall be retained until all geotechnical testing is complete and only after agreement with the Investigation Supervisor.

S1.12.3 Frequency of sampling for geotechnical purposes (Clause 7.6.3 to 7.6.11)

See S1.12.11 for details on geo-environmental samples.

Initial UT100 sample / SPT to be taken from 0.5m below the base of the inspection pit, as appropriate to the ground conditions.

Stratum	SPT	UT100	Disturbed	Bulk	Core sub samples
Made Ground	1.0m intervals	Alternating with SPT, if appropriate	Any topsoil, at each change in strata or consistency and midway between successive UT100/ SPTs. In addition, where the split barrel sampler is used this shall be retained as a small disturbed sample. Of any cohesive material recovered in diamond concrete core holes	At 0.5m and 1.0m within inspection pits and of any deeper granular material Of any granular material recovered in diamond concrete core holes	N/A
Goblin Coombe Oolite	1.5m intervals	N/A	At location of SPTs in weathered stratum	Of any weathered stratum	The following suitable samples are required per metre run of solid

					core: 1 sample for UCS testing, 3 samples for point load testing
--	--	--	--	--	--

<u>General</u>

Samples should be of sufficient volume to provide sufficient sample material for a wide range of geotechnical analysis, specifically those listed in Bills K.

All samples should be stored in appropriate sealed containers.

All samples shall be removed from the site of the boreholes at the end of each day's work and shall be protected from frost damage or excessive heat by being stored on or near the site in a structure which is under cover and secure from interference. All samples shall be removed from the site so as to reach the laboratory within a maximum five days of being taken.

A description of all samples scheduled for testing shall be included on the testing record.

The frequency of sampling and in situ testing is dependent on the ground conditions. In the absence of particular requirements or instructions from the Investigation Supervisor sampling shall be as follows;

- a) Cohesive Soils First undisturbed tube sample (UT100) in all boreholes 0.5m below the base of the hand dug pit, thereafter at alternate 1.0 m intervals to 5.0m and 1.5m intervals below. Piston samples should be used in soft ground. Sampling should alternate with SPTs. If a sample is not obtained, this should be followed immediately by an SPT. Small disturbed samples should be taken at each change in soil type or consistency and from every SPT.
- b) Granular Soils Small disturbed samples shall be taken at each change in soil type or consistency, and at every SPT depth. Samples shall be taken from the liners or from the SPTs if split spoon samplers are used, at the time of logging. Bulk samples should be taken midway between each successive SPT.
- c) Extremely weak Rock SPT's every 1.5m until refusal (100 blows)
- d) Inspection pits Small disturbed and bulk samples shall be taken of the topsoil and at each change in soil type or consistency.

S1.12.4 Open-tube and piston sample diameters (Clause 7.6.5)

Where practicable, open tube samplers of the OT/T/W (thin walled) type shall be adopted for undisturbed samples. If this is not practicable due to stiffness of stone content of soils, then samples of the OT-TK/W (thick walled) type shall be used with the prior agreement of the Investigation Supervisor.

Open tube samplers shall be of nominal diameter 100 mm.

S1.12.5 Retention of cutting shoe samples (Clause 7.6.5)

Material from cutting shoes should be retained as a small disturbed sample.

S1.12.6 Delft and Mostap sampling (Clause 7.6.12)

Not required.

S1.12.7 Groundwater level measurements during exploratory hole construction (Clause 7.7)

Where a 'groundwater strike' occurs, drilling activity is to be stopped, the groundwater level recorded, and then left to stabilise for no less than 20 minutes before another level reading is recorded before drilling re-commences.

On each occasion when groundwater is recorded by the Contractor, the depth of the borehole and the time on a 24 hour clock should also be recorded.

The groundwater monitoring methodology for groundwater strikes above is to undertaken as part the excavation activities and shall not be included as 'standing time'.

Samples of any encountered groundwater shall be taken.

S1.12.8 Special geotechnical sampling (Clause 7.8)

Not required.

S1.12.9 Address for delivery of selected samples (Clause 7.9.2)

Not required.

S1.12.10 Retention and disposal of contamination/WAC samples (Clause 7.9.3)

Disposal of contamination samples is the responsibility of the Contractor.

All untested/contaminated samples shall be kept for a period of 28 days after submission of the approved final report. After this time the Investigation Supervisor's permission shall be sought for their disposal. The Contractor shall dispose of all samples in accordance with the Waste Disposal Regulations. Samples submitted to the chemical testing laboratory for analysis shall be disposed of 28 days after submission unless otherwise instructed

S1.12.11 Frequency of sampling (Clause 7.9.4)

As specified in S1.12.3 for geotechnical samples.

Additionally, soil samples for environmental assessment should be taken from each exploratory location based on the following criteria:

- The first contamination sample shall be taken in topsoil where present, or beneath any hard standing or sub-base materials, within 0.5m of ground level;
- Samples through Made Ground shall be taken every 1.0m or at changes in the nature of the Made Ground.
- In natural soils, contamination samples shall be taken within 500mm of penetrating the stratum. In the event that visual or olfactory evidence of contamination is noted below this depth, then further samples shall be taken as directed by the Investigation Supervisor.
- Targeted samples if any visual or olfactory evidence of contamination is observed should also be collected.

The quantity of material and containers used will depend on specific laboratory requirements for the specified analysis. The Contractor is to ensure that sufficient sample material is taken at each sample point for the tests specified in Suite E and F.

In addition, it is the Contractors responsibility to ensure that Suite E is appropriate to the likely contaminants on site and should be amended if necessary. The samples are to be collected and sent to the laboratory on the same day as sampling. Chain of custody schedules are to be provided to the Investigation Supervisor within 24hrs of sampling. Any samples which are received by the laboratory outside of their holding time and are classified as non-compliant shall be re-sampled at the Contractors own cost.

It is recommended that a waste characterisation is undertaken on the results of the chemical analyses and it is assumed that these should be representative of any material to be removed

from site. Full WAC samples and analysis will be required on the specific material requiring disposal at the time of construction.

S1.12.12 Sampling method (Clause 7.9.5)

Samples are to be taken in accordance with BS10175:2011 +A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice.

S1.12.13 Headspace testing (Clause 7.9.8)

Not required.

- S1.13 Probing and cone penetration testing (Specification Section 8) Particular restrictions/relaxations
- S1.13.1 Type(s) and reporting of dynamic probing (Clauses 8.1.1 and 8.1.2)

Not required.

- S1.13.2 Capacity and equipment requirements for cone penetration testing (Clause 8.2.1) Not required.
- S1.13.3 Reporting of cone penetration testing parameters (Clause 8.2.4) Not required.
- S1.13.4 Seismic cone equipment requirements (Clause 8.3.1)

Not required.

S1.13.5 Interpretation of seismic cone tests (Clause 8.3.4)

Not required.

- S1.14 Geophysical testing (Specification Section 9) Particular restrictions / relaxations Not Required.
- S1.15 In situ testing (Specification Section 10) Particular restrictions/relaxations Contract specific restrictions/relaxations, if any, shall be inserted below.

S1.15.1 Tests in accordance with British Standards (Clause 10.3)

Standard Penetration Testing in accordance with BS EN ISO 22476-3.

Calibration/energy certificates to be provided for all SPT hammers used on site.

Below the solid geology interface SPT failure threshold is required to be raised from 50 blows to 100.

SPTs to be continued until refusal. Should any weaker strata be encountered below, SPTs should be re-commenced.

S1.15.2 Hand penetrometer and hand vane for shear strength (Clause 10.4.1)

Hand shear vane tests, as appropriate, shall be carried out on suitable samples of cohesive materials from rotary core samples. Both peak and remoulded strength is required for hand vane tests when undertaken.

Hand penetrometer testing is not permitted.

S1.15.3 Self-boring pressuremeter and high pressure dilatometer testing and reporting (Clause 10.5.1)

Not required.

- S1.15.4 Driven or push-in pressuremeter testing and reporting requirements (Clause 10.5.2) Not required.
- S1.15.5 Menard pressuremeter tests (Clause 10.5.3) Not required
- S1.15.6 Soil infiltration test (Clause 10.6) Not required.
- S1.15.7 Special in situ testing and reporting requirements (Clause 10.7) Not required.
- S1.15.8 Interface probes (Clause 10.8) Not required.
- S1.15.9 Contamination screening tests (Clause 10.9) Not required.
- S1.15.10 Metal detection (Clause 10.10) Not required.
- S1.16Instrumentation (Section 11) Particular restrictions/relaxationsContract specific restrictions/relaxations, if any, shall be inserted below.
- S1.16.1Protective covers for installations (Clause 11.2)Flush covers shall be required in the event installations are instructed.
- S1.16.2 Protective fencing (Clause 11.3) Not required.
- S1.16.3 Standpipe and standpipe piezometer installations (Clauses 11.4.1 and 11.4.2) Standpipes to be installed as instructed by the Investigation Supervisor, with consideration of the encountered ground and groundwater conditions.
- S1.16.4 Other piezometer installations (Clause 11.4.3) Not required.
- S1.16.5 Development of standpipes and standpipe piezometers (Clause 11.4.5) Not required.

- S1.16.6 Ground gas standpipes (Clause 11.5) Not required.
- S1.16.7 Inclinometer installations (Clause 11.6) Not required.
- S1.16.8 Slip indicators (Clause 11.7) Not required.
- S1.16.9 Extensometers and settlement gauges (Clause 11.8) Not required.
- S1.16.10 Settlement monuments (Clause 11.9) Not required.
- S1.16.11 Removal of installations (Clause 11.10) Not required.
- S1.16.12 Other instrumentation (Clause 11.11) Not required.
- S1.17Installation Monitoring and Sampling (Specification Section 12) Particular Restrictions/
RelaxationsContract specific restrictions/relaxations, if any, shall be inserted below.

S1.17.1 Groundwater level readings in installations (Clause 12.2)

Groundwater readings to be undertaken at the end of the intrusive works.

- S1.17.2 Groundwater sampling from installations (Clause 12.3.1) Not required.
- S1.17.3 Purging/micro-purging (Clause 12.3.2) Not required.
- S1.17.4 Ground gas monitoring (Clause 12.4) Not required.
- S1.17.5 Sampling from ground gas installations (Clause 12.5) Not required.
- S1.17.6 Other monitoring (Clause 12.8) Not required.
- S1.17.7 Sampling and testing of surface water bodies (Clause 12.9) Not required.
- S1.18 Daily records (Specification Section 13) Particular restrictions/relaxations

Contract specific restrictions/relaxations, if any, shall be inserted below.

S1.18.1 Information for daily records (Clause 13.1)

Daily information recorded should be as specified in Clause 13.2.

Exploratory hole records shall be submitted to the Investigation Supervisor within 24 hours of completion of each exploratory hole, with drillers' logs and draft preliminary engineer's logs, including details of in situ testing, and the sample schedule submitted within 48 hours of the completion of each exploratory hole.

The sample schedule should include a comment column on the sample sufficiency to different tests i.e. should the sample be damaged, undersized for PSD testing, unsuitable for triaxial testing etc.

S1.18.2 Special in situ tests and instrumentation records (Clause 13.4)

On completion of the exploratory hole.

S1.19 Geotechnical laboratory testing (Specification Section 14) Particular restrictions/relaxations

Contract specific restrictions/relaxations, if any, shall be inserted below.

S1.19.1 Investigation Supervisor or Contractor to schedule testing (Clause 14.1.1)

The Contractor shall provide blank laboratory schedules completed with all samples recovered for the use of the Investigation Supervisor within 48 hours of completion of each exploratory hole.

S1.19.2 Tests required (Clause 14.1.2)

Laboratory testing shall be scheduled by the Investigation Supervisor following completion on the ground investigation. The testing shall be appropriate to the ground conditions encountered and the works proposed on the site.

The Bill of Quantities has been populated with likely laboratory tests however this may require amendment once the ground conditions are known.

S1.19.3 Specifications for tests not covered by BS 1377 and options under BS 1377 (Clauses 14.2.1 and 14.4)

Where rock testing is required, this shall be completed to the standard laid out by the International Society for Rock Mechanics (ISRM).

S1.19.4 UKAS accreditation to be adopted (Clause 14.3)

All laboratories shall be UKAS accredited.

S1.19.5 Rock testing requirements (Clause 14.5)

The list as follows is not exhaustive and only lists those tests likely to be used in this contract; natural moisture content, uniaxial compressive strength, point load strength and direct shear strength, to determine joint shear strength.

S1.19.6 Chemical testing for aggressive ground/groundwater for concrete (Clause 14.6) (Test suites A-D are overleaf)

Testing suites Suite C (Brownfield pyrite absent) is required.

S1.19.7 Laboratory testing on site (Clause 14.7)

Not required.

S1.19.8 Special laboratory testing (Clause 14.8)

Not required.

S1.20 Geo-environmental laboratory testing (Specification Section 15) Particular restrictions/relaxations

Contract specific restrictions/relaxations, if any, shall be inserted below.

S1.20.1 Investigation Supervisor or Contractor to schedule testing (Clause 15.1)

Sufficient chemical testing for soils shall be undertaken to define the contamination status of the site.

All geo-environmental and contaminative testing will be scheduled by the Investigation Supervisor. The chain of custody schedule and preliminary engineering logs are to be provided within 24hours of sampling to the Investigation Supervisor.

S1.20.2 Accreditation required (Clause 15.2)

All laboratories should be UKAS and MCERTS accredited.

S1.20.3 Chemical testing for contamination (Clause 15.3) (Test suites E-F are overleaf)

Indicative suites of testing, Suite E (soil samples) and Suite F (leachate samples) and Suite G (water samples) are provided in the bill of quantities for costing purposes. However the schedule of geoenvironmental analysis will be determined based on visual and olfactory observations as well as headspace tests. All testing must be MCERTS accredited unless unavailable for a specific determinant.

It is the Contractors responsibility to ensure that Suites, E, F and G are appropriate to the likely contaminants on site and should be amended if necessary. Contractor will detail limits of detection, test methods and accreditation which can be offered for each individual determinand.

Before the ground investigation commences the Contractor must notify the Investigation Supervisor detailing the laboratory to be used for the testing and the testing results turnaround.

Testing will be undertaken on the laboratories standard turnaround which should be no longer that 10 working days.

SCHEDULE 1.19.6 (Derived from BRE Special Digest SD1)

Sheet 1 of 1

Sample Type	Determinand	Recommended Test Methods	Test Method Specified / Offered ¹
Soil	pH in 2.5:1	BR 279 Electrometric	
	water/soil extract	BS 1377 Part 3, Method 9	
	SO ₄ in 2:1 water/soil extract	BR 279 Gravimetric method, cation exchange or ion chromatography	
		BS 1377 Part 3 Method 5.3 + 5.5	
		TRL 447 Test 1	
	Mg (only required	BR 279 AAS ² method	
	if water soluble SO ₄ > 3000 mg/l)	Commercial lab in-house procedure - variant of BR279 using ISP-AES ³	
	NO_3 in 2:1 water/soil extract (only required if pH < 5.5)	BR 279	
	Cl in 2:1	BR 279	
	water/soil extract (only required if pH < 5.5)	BS 1377 Part 3, Method 7.2	
Groundwater	рН	BR 279 Electrometric	
		BS 1377 Part 3, Method 9	
	SO ₄	BR 279 Gravimetric method, cation exchange or ion chromatography	
		BS 1377 Part 3 Method 5.4 + 5.5	
		Commercial lab in-house procedure – determination of sulphur by ICP-AES ³	
	Mg (only required	BR 279 AAS ² method	
	if water soluble SO₄ ≥ 3000 mg/l)	Commercial lab in-house procedure – Mg in solution by ICP-AES ³	
	NO ₃ (only required if pH < 5.5)	BR 279	
	CI (only required if	BR 279	
	pH < 5.5)	BS 1377 Part 3 Method 7 2	

CHEMICAL TESTS ON POTENTIALLY AGGRESSIVE GROUND/GROUNDWATER

¹ Either Investigation Supervisor to specify method required or Contractor to detail method(s) offered

² AAS: atomic absorption spectrometry

³ICP-AES: inductively coupled plasma atomic emission spectroscopy

SCHEDULE 1.20.3

Sheet 1 of 3

CHEMICAL LABORATORY TESTING FOR CONTAMINATION

Nominated Test Laboratory: Contractor to specify proposed laboratory

Required Testing Turnaround Times: 10 days

NB 1. This proforma Schedule MUST be reviewed in the light of site-specific desk study results and amended accordingly to include any additional determinands likely to be required.

2. Limits of detection should reflect the guideline/threshold values against which the test results will be compared.

Suite E – Soil samples			
Determinand (Procurer to list required determinands)	Limit of detection offered ¹	Test method offered ¹	Accrediation offered ¹
Arsenic			
Boron			
Cadmium			
Hexavalent chromium			
Total chromium			
Copper			
Lead			
Mercury			
Selenium			
Nickel			
Zinc			
рН			
Water soluble sulphate (So ₄)			
Soil Organic Matter			
Speciated Total Petroleum Hydrocarbons (TPH CWG)			
BTEX			
Speciated polyaromatic hydrocarbons (USEPA 16)			
Polychlorinated Biphenyls (PCBs)			
Phenol			
Cyanide (free and total)			
Asbestos screen (Quantifiication as required)			
VOC			
SVOC			

¹Contractor to detail what can be offered under each of these categories. See also Specification Note for

Guidance 15.5.

SCHEDULE 1.20.3

Sheet 2 of 3

CHEMICAL LABORATORY TESTING FOR CONTAMINATION

Nominated Test Laboratory: Contractor to specify proposed laboratory

Required Testing Turnaround Times: 10 days

NB 1. This proforma Schedule MUST be reviewed in the light of site-specific desk study results and amended accordingly to include any additional determinands likely to be required.

2. Limits of detection should reflect the guideline/threshold values against which the test results will be compared.

Suite F – (Soil derived) Leachate			
samples Determinand (Procurer to list required determinands)	Limit of detection	Test method offered ¹	Accrediation offered ¹
Arsenic			
Boron			
Cadmium			
Hexavalent chromium			
Total chromium			
Copper			
Lead			
Mercury			
Selenium			
Nickel			
Zinc			
рН			
Water soluble sulphate (So ₄)			
Speciated Total Petroleum Hydrocarbons (TPH CWG)			
BTEX			
Speciated polyaromatic hydrocarbons (USEPA 16)			
Phenol			
Cyanide (free and total)			
VOC			
SVOC			

¹Contractor to detail what can be offered under each of these categories. See also Specification Note for Guidance 15.5.

SCHEDULE 1.20.3 CHEMICAL LABORATORY TESTING FOR CONTAMINATION

Sheet 3 of 3

Nominated Test Laboratory: Contractor to specify proposed laboratory

Required Testing Turnaround Times: 10 days

NB 1. This proforma Schedule MUST be reviewed in the light of site specific desk study results and amended accordingly to include any additional determinands likely to be required.

2. Limits of detection should reflect the guideline/threshold values against which the test results will be compared.

Suite G – Water samples			
Determinand (Procurer to list	Limit of detection	Test method	Accrediation
required determinands)	offered ¹	offered ¹	offered ¹
Arsenic (dissolved)			
Boron (dissolved)			
Cadmium (dissolved)			
Hexavalent chromium (dissolved)			
Total chromium (dissolved)			
Copper (dissolved)			
Lead (dissolved)			
Mercury (dissolved)			
Nickel (dissolved)			
Selenium (dissolved)			
Zinc (dissolved)			
Calcium (dissolved)			
рН			
Water soluble sulphate (So ₄)			
Dissolved Organic Carbon (DOC)			
Spediated Total Petroleum			
Hydrocarbons (TPH CWG)			
BTEX			
Speciated polyaromatic			
hydrocarbons (USEPA 16)			
Polychlorinated Biphenyls (PCBs)			
Phenol			
Cyanide (free and total)			
VOC			
SVOC			

¹Contractor to detail what can be offered under each of these categories. See also Specification Note for Guidance 15.5.

- S1.20.4 Waste characterisation (Clause 15.4) Contractor to carry out assessments.
- S1.20.5 Waste Acceptance Criteria testing (Clause 15.5) (Test suites H-J are overleaf) Not required.
- S1.20.6 Laboratory testing on site (Clause 15.6) Not required.
- S1.20.7 Special laboratory testing (Clause 15.7) Not required.

S1.21 Reporting (Specification Section 16) Particular restrictions/relaxations

Contract specific restrictions/relaxations, if any, shall be inserted below. All test (geotechnical and chemical) results to be reported in PDF, AGS and Excel format.

S1.21.1 Form of exploratory hole logs (Clauses 16.1 and 16.2.1)

Contractor to submit a blank set of proformas or example records to the Investigation Supervisor for approval.

S1.21.2 Information on exploratory hole logs (Clause 16.2.2)

As per the Specification.

S1.21.3 Variations to final digital data supply requirements (Clause 16.5.1)

Data to be provided in AGS.

Digital data must be received as a single file.

All data shall be checked for errors/integrity prior to issue.

Contractor to detail the data in AGS version 4 or higher.

The following project information will be used:

- PROJ_ID: TBC
- PROJ_NAME: South Road Retaining Wall
- PROJ_LOC: TBC
- PROJ_CLNT: North Somerset Council

All disks, or other agreed transmission media, shall be securely labelled and clearly marked with:

- The title 'AGS Format Data'
- The project identification (PROJ_ID)
- The project location (PROJ_LOC)
- The date of issue to the Investigation Supervisor (PROJ_DATE)
- The name of the Contractor (PROJ_CONT)
- The name of the investigation Supervisor (PROJ_ENG)
- The unique issue sequence number

No specialised or additional groups, fields or codes are to be used.

The standard legend codes; GEOL_LEG, will be used and included in the ABBR group.

The contractor shall interpret the geological strata encountered in the ground investigation and include geology codes GEOL_GEOL.

The GEOL_GEO2 fields shall be defined by the main constituents; any abbreviations shall be included in the ABBR group.

When full penetration of 450mm has been achieved, the N value shall be reported in the ISPT_NVAL field as a whole number. When full penetration has not been achieved, this field shall remain empty.

The ISPT_REP field shall be used to present incomplete tests, i.e. 50/160mm.

The WETH group shall be used to define the weathering grade.

S1.21.4 Preliminary digital data (Clause 16.5.3)

Final digital data only is required.

S1.21.5 Type(s) of report required (Clause 16.6)

Full factual Ground Investigation Report; Clause 16.8.

S1.21.6 Electronic report requirements (Clause 16.6.3)

All reports to be provided in a single unprotected digital file that can be read by PDF software. All images and photographs must be provided in JPEG data file uncompressed and no larger than 5mb per image or photograph.

S1.21.7 Format and contents of Desk Study Report (Clause 16.7)

Not required.

- S1.21.8 Contents of Ground Investigation Report (or specified part thereof) (Clause 16.8) Not required.
- S1.21.9 Contents of Geotechnical Design Report (or specified part thereof) (Clause 16.9) Not required.

S1.21.10 Times for supply of electronic information (Clause 16.10.1)

A full PDF set of logs, a spreadsheet schedule of samples and an AGS data file shall be supplied 1 week following the completion of the site works. (Interim issues may be by electronic medium at the Contractor's discretion).

Upon completion of the works, a final AGS data file shall be supplied. It is desirable that AGS files are updated and version controlled, to contain all the information available to date, rather than individual packets of data.

S1.21.11 Electronic information transmission media (Clause 16.10.2)

The Contractor is to choose one of the following data transfer methods: electronic mail, file transfer server (ftp server), USB Drive or CD/DVD ROM.

S1.21.12 Report approval (Clause 16.11)

One electronic copy of the draft Factual Investigation Report must be submitted to the Investigation Supervisor no later than 4 weeks after completion of the ground investigation fieldworks.

The draft report must clearly be marked with a 'DRAFT' watermark.

Investigation Supervisor's comments on the draft Ground Investigation Report and associated digital data to be issued within 2 weeks from receipt of the draft report.

No later than 1 week from approval of the draft report the Contractor is to submit a final copy to the Investigation Supervisor.

SCHEDULE 2: EXPLORATORY HOLES

Hole	Scheduled	Approxi	mate NGR*	Approximate	Instrumentation	Bomorko
No	depth (m)	E (m)	N (m)	GL* (m AOD)	instrumentation	Remarks
BH01	7					Dynamic sampling until refusal through made ground and
BH02	7				Standpipes to be	heavily weathered rock with rotary core follow on to borehole termination depth,
BH03	7				installed if water is encountered, with agreement of the Investigation Supervisor	with the agreement of the Investigation Supervisor with appropriate in-situ
BH04	7					testing and sampling throughout for geotechnical and geo-chemical
BH05	7	Approxi attached	mate positions s Proposed Expl	hown on the oratory Hole		laboratory testing.
OP01		Location Pl on site with their repre undergrour	an. Final position the Investigation sentative, with co nd services and retaining wall	ns to be agreed n Supervisor, or onsideration of proximity to the l.		
OP02						
OP03	of the base of the retaining wall foundation- assume 1.5m					Dimensions of the wall foundation to be noted along with strata descriptions, including the founding strata
OP04						
OP05						

Hole	Scheduled	Approxir	nate NGR*	Approximate	Instrumentation	Bomorko
No	depth (m)	E (m)	N (m)	GL* (m AOD)	instrumentation	Remarks
DC01				_		To determine this thickness of the wall and the nature of the
DC02	0.5m (Horizontal				None	material behind the wall.
	penetration)				Nono	Small disturbed and bulk samples
DC03						appropriate to the ground conditions encountered.

Notes:

It is the Contractors responsibility to supply suitable plant to safely undertake the works detailed within this Specification and shown on the attached drawing.

The Contractor should be aware that the works are adjacent to and on a live carriageway.

*Borehole locations are presented on the attached exploratory hole location plan, however the actual locations will be agreed on site with the Investigation Supervisor prior to commencement of works, in order to accommodate for the presence of services and limits of any traffic management.

SCHEDULE 3: INVESTIGATION SUPERVISOR'S FACILITIES

S3.1 Accommodation

Not required.

- S3.2 Furnishings Not required.
- S3.3 Services Not required.
- S3.4 Equipment Not required.
- S3.5 Transport Not required.
- S3.6 Personal Protective Equipment for Investigation Supervisor Not required.

SCHEDULE 4: SPECIFICATION AMENDMENTS

The following clauses are amended					
Section number	Clause number	Delete the following	Substitute the following		

SCHEDULE 5: SPECIFICATION ADDITIONS

The following clauses are added to the Specification				
Section number	Clause number	Clause wording		

ANNEX 1 Bill of Quantities for Ground Investigation

Preamble amendments and additions

The following clauses are amended or added to the Preamble:

None

Bill A General items, provisional services and additional items

Number	Item description	Unit	Quantity	Rate	Amount £
A	General items, provisional sums and additional items				
A1	Offices and stores for the Contractor	sum	Not required		
A2	Establish on site all plant, equipment and services for a Green Category site	sum	1		
A3	Extra over Item A2 for a Yellow Category site	sum	1		
A4	Maintain on site all site safety equipment for a Yellow Category site	week	Not required		
A5	Decontamination of equipment during and at end of intrusive investigation for a Yellow Category site	sum	Not required		
A6	Appropriate storage, transport and off- site disposal of contaminated arisings and any PPE equipment, excluding laboratory testing	provisional sum			
A7	Provide professional attendance in accordance with Clause 3.5.2				
A7.1	Provide Technician	p.day	1		
A7.2	Provide Graduate Ground Engineer	p.day	Not required		
A7.3	Provide Experienced Ground Engineer	p.day	5		
A7.4	Provide Registered Ground Engineering Professional	p.day	Not required		
A7.5	Provide Registered Ground Engineering Specialist	p.day	Not required		
A7.6	Provide Registered Ground Engineering Advisor	p.day	Not required		
A8	Establish the location and elevation of the ground at each exploratory hole	sum	1		
A9	Preparation of Health and Safety documentation and Safety Risk Assessment	sum	1		
A10	Facilities for the Investigation Supervisor	sum	Not required		
A11	Vehicle(s) for the Investigation Supervisor	v.wk	Not required		
A12	Fuel for vehicle for the Investigation Supervisor	provisional sum	Not required		
A13	Investigation Supervisor's telephone and facsimile charges	provisional sum	Not required		
A14	Deliver selected cores and samples to the specified address	provisional sum	Not required		

Number	Item description	Unit	Quantity	Rate	Amount £	
A15	Special testing and sampling required by Investigation Supervisor	provisional sum	Not required			
A16	Traffic safety and management	provisional sum	1			
A17	One master copy of the Desk Study Report	sum	Not required			
A18	Additional copies of the Desk Study Report	nr	Not required			
A19	One master copy of the Ground Investigation Report (or specified part thereof)	sum	1			
A20	Additional copies of the Ground Investigation Report (or specified part thereof)	nr	Not required			
A21	Electronic copy of Ground Investigation Report (or specified part thereof)	sum	1			
A22	One master copy of the Geotechnical Design Report (or specified part thereof)	sum	Not required			
A23	Additional copies of the Geotechnical Design Report (or specified part thereof)	nr	Not required			
A24	Electronic copy of Geotechnical Design Report in (or specified part thereof)	sum	Not required			
A25	Digital data in AGS transfer format	sum	1			
A26	Hard-copy photographs	nr	Not required			
A27	Photographic volume	nr	Not required			
A28	Long term storage of geotechnical samples (Appendix B)	provisional sum	Not required			
A29	Long term storage of geoenvironmental samples (Appendix B)	provisional sum	Not required			
	Contract specific additional bill items					
A30	Service clearance- appropriate technique the responsibility of the Contractor	sum	1			
Total secti	Total section A carried to summary					

Bill B Percussion Boring

Number	Item description	Unit	Quantity	Rate	Amount £
В	Percussion Boring				
B1	Move boring plant and equipment to the site of each exploratory hole and set up	nr	Not required		
B2	Extra over Item BI for setting up on a slope of gradient greater than 20%	nr	Not required		
В3	Break out surface obstruction where present at exploratory borehole	h	Not required		
B4	Advance borehole between existing ground level and 10 m depth	m	Not required		
B5	As Item B4 but between 10 m and 20 m depth	m	Not required		
B6	As Item B4 but between 20 m and 30 m depth	m	Not required		
B7	As Item B4 but between 30 m and 40 m depth	m	Not required		
B8	As Item B4 but between 40 m and 50 m depth	m	Not required		
B9	Advance borehole through hard stratum or obstruction	h	Not required		
B10	Provide aquifer protection measures at a single aquiclude/aquifer boundary or cross contamination control measures at a single soil boundary in a borehole	nr	Not required		
B11	Backfill borehole with cement/bentonite grout or bentonite pellets	m	Not required		
B12	Standing time for borehole plant, equipment and crew	h	Not required		
	Dynamic sampling				
B13	Move dynamic sampling equipment to the site of each exploratory hole and set up	nr	5		
B14	Extra over Item BI3 for setting up on a slope of gradient greater than 20%	nr	Not required		
B15	Advance dynamic sample hole between existing ground level and 5 m depth	m	15		
B16	As Item B15 but between 5 m and 10 m depth	m	Rate only		
B17	As Item B15 but between 10 m and 30 m depth	m	Not required		
B18	Standing time for dynamic sampling equipment and crew	hr	Rate only		
B19	Provision of dynamic sampling equipment and crew for sampling as directed by the Investigation Supervisor; maximum depth 15 m	day	Not required		
B20	Backfill dynamic sampling hole with cement/bentonite grout or bentonite pellets	m	15		

Contract specific additional bill items None	Number	Item description	Unit	Quantity	Rate	Amount £
None		Contract specific additional bill items				
		None				

Total section B carried to summary

Bill C Rotary Drilling

Number	Item description	Unit	Quantity	Rate	Amount £
с	Rotary drilling				
	Hand augering		Not required		
	Continuous flight and hollow stem flight augering		Not required		
	Rotary drilling with and without core recovery				
C15	Move rotary drilling plant and equipment to the site of each exploratory drillhole and set up	nr	Included in B13		
C16	Extra over Item C15 for setting up on a slope of gradient greater than 20%	nr	Not required		
C17	Extra over Item C15 for setting up drilling plant for inclined drillhole	nr	Not required		
C18	Break out surface obstructions where present at exploratory drillhole	h	Not required		
C19	Standing time for rotary drilling plant, equipment and crew	h	Rate only		
C20	Provide aquifer protection measures at a single aquiclude/aquifer boundary in a drillhole	nr	Not required		
	Drilling without cores				
	Drilling to obtain cores				
C34	Rotary drill in materials other than hard strata to obtain cores of the specified diameter between existing ground level and 10 m depth	m	Rate only		
C35	As Item C34 but between 10 m and 20 m depth	m	Not required		
C36	As Item C34 but between 20 m and 30 m depth	m	Not required		
C37	As Item C34 but between 30 m and 40 m depth	m	Not required		
C38	As Item C34 but between 40 m and 50 m depth	m	Not required		
C39	Extra over Items C34 to C38 for use of semi-rigid core liner	m	Rate only		
C40	Extra over Items C34 to C38 for coring inclined rotary drillhole	m	Not required		
C41	Rotary drill in hard strata to obtain cores of the specified diameter between existing ground level and 10 m depth	m	20		
C42	As Item C41 but between 10 m and 20 m depth	m	Rate only		
C43	As Item C41 but between 20 m and 30 m depth	m	Not required		

Number	Item description	Unit	Quantity	Rate	Amount £
C44	As Item C41 but between 30 m and 40 m depth	m	Not required		
C45	As Item C41 but between 40 m and 50 m depth	m	Not required		
C46	Extra over items C41 to C45 for use of semi-rigid liner	m	Not required		
C47	Extra over items C41 to C45 for coring inclined rotary drillhole	m	Not required		
C48	Backfill rotary drillhole with cement/bentonite grout or bentonite pellets	m	20		
C49	Core box to be retained by client	nr	Not required		
	Rotary percussive drilling		Not required		
	Resonance (sonic) drilling		Not required		
	Sonic drilling without cores		Not required		
	Sonic drilling to obtain cores		Not required		
	Contract specific additional bill items				
	None				

Total section C carried to summary

Bill D Pitting and Trenching

Number	Item description	Unit	Quantity	Rate	Amount £
D	Pitting and trenching				
	Inspection pits				
D1	Excavate inspection pit by hand to 1.2 m depth	nr	5		
D2	Extra over Item D1 for breaking out surface obstructions	h	2.5		
	Trial pits and trenches		Not required		
	Observation pits and trenches		Not required		
D14	Move equipment to the site of each observation pit or trench of not greater than 4.5m depth	nr	5		
D15	Extra over Item D14 for setting up on a slope of gradient greater than 20%	nr	Not required		
D16	Extra over Item D14 for trial pit or trench between 4.5 and 6m depth	nr	Not required		
D17	Excavate observation pit between ground level and 3.0m depth	m	7.5		
D18	As Item D17 but between 3.0m and 4.5m depth	m	Not required		
D19	As Item D17 but between 4.5m and 6.0m depth	m	Not required		
D20	Extra over Item D17 for hand excavation	m	7.5		
D21	Excavate observation trench between ground level and 3.0m depth	m²	Not required		
D22	As Item D21 but between 3.0m and 4.5m depth	m²	Not required		
D23	As Item D21 but between 4.5m and 6.0m depth	m²	Not required		
D24	Extra over Item D21 for hand excavation	m²	Not required		
D25	Extra over Items D17 to D19 and D21 to D23 for breaking out hard strata or obstructions	h	Not required		
D26	Extra over Items D17 D21 for breaking out hard strata or obstructions by hand	h	Rate only		
D27	Standing time for excavation plant, equipment and crew for machine dug observation pit or trench	h	Not required		
D28	Standing time for excavation plant, equipment and crew for hand dug observation pit or trench	h	Rate only		
	Daily provision of pitting crew and equipment		Not required		
	General		Not required		

Number	Imber Item description Unit Quantity Rate						
	Contract specific additional bill items						
	Provision of plant and crew for horizontal diamond concrete core holes through the retaining wall	sum	sum 1				
Total section D carried to summary							

Bill E Sampling and monitoring during intrusive investigation

Number	Item description	Unit	Quantity	Rate	Amount £
E	Sampling and monitoring during intrusive investigation				
	Samples for geotechnical purposes				
E1	Small disturbed sample	nr	30		
E2	Bulk disturbed sample	nr	33		
E3	Large bulk disturbed sample	nr	Rate only		
E4.1	Open tube sample using thick-walled (OS-TK/W) sampler	nr	Rate only		
E4.2	Open tube sample using thin-walled (OS- T/W) sampler	nr	Rate only		
E5	Piston sample	nr	Not required		
E6	Groundwater sample	nr	Rate only		
E7	Ground gas sample	nr	Not required		
E8	Cut, prepare and protect core sub sample	nr	20		
	Continuous or semi-continuous sampling		Not required		
	Containers for contamination assessment and WAC testing				
E14.1	Provision of containers and collection of samples for contamination Suite E (S1.20.3)	nr	23		
E14.2	Provision of containers and collection of samples for contamination Suite F (S1.20.3)	nr	Rate only		
E14.3	Provision of containers and collection of samples for contamination Suite G (S1.20.3)	nr	Rate only		
E15.1	Provision of containers and collection of samples for WAC Suite H (S1.20.5)	nr	Not required		
E15.2	Provision of containers and collection of samples for WAC Suite I (S1.20.5)	nr	Not required		
E15.3	Provision of containers and collection of samples for WAC Suite J (S1.20.5)	nr	Not required		
	Contract specific additional bill items				
	None				
L	1	1	L	1	

Total section E carried to summary

Bill F Probing and cone penetration testing

Number	Item description	Unit	Quantity	Rate	Amount £
F	Probing and cone penetration testing				
	Dynamic probing		Not required		
	Cone penetration testing		Not required		
	Contract specific additional bill items				
	None				

Total section F carried to summary

Bill G Geophysical testing

Number	Item description	Unit	Quantity	Rate	Amount £
G	Geophysical testing				
	Land based mapping techniques		Not required		
	Land based profiling techniques		Not required		
	Land based borehole techniques		Not required		
	<u>Overwater</u>		Not required		
	Contract specific additional bill items				
	None				
	None				

Total section G carried to summary

Bill H In situ testing

HInsitu testingIH1Standard penetration test in boreholenr10H2Standard penetration test in rotary alliholenr15H3In situ density testingnrNot requiredH3.10Small pouring cylinder methodnrNot requiredH3.20Large pouring cylinder methodnrNot requiredH3.31Water replacement methodnrNot requiredH3.42Core cutter methodnrNot requiredH3.43Nuclear methodnrNot requiredH3.44Core cutter methodnrNot requiredH4California Bearing Ratio testnrNot requiredH5Vane shear strength test in boreholenrNot requiredH6Penetration vane test, penetration from ground levelNot requiredH7Hand vane test (set of 3 readings)nrRate onlyH8Hand vane test (set of 3 readings)not requiredLarge portug pressuremeterNot requiredNot requiredFish pressure dilatometerNot requiredNot requiredLind pressure dilatometerNot requiredNot requiredMacellaneous site testingNot requiredNot requiredMacellaneous site testingNot requiredNot requiredMacellaneous site testingNot requiredNot requiredNoneNot requiredNot required	Number	Item description	Unit	Quantity	Rate	Amount £
H1Standard penetration test in boreholen10H2Standard penetration test in rotary drillholen15H3In situ density testingnNot requiredH3.1Small pouring cylinder methodnNot requiredH3.2Large pouring cylinder methodnNot requiredH3.3Water replacement methodnNot requiredH3.4Core cutter methodnNot requiredH3.4Core cutter methodnNot requiredH3.4California Bearing Ratio testnNot requiredH4California Bearing Ratio testnNot requiredH5Vane shear strength test in boreholenNot requiredH6Penetration vane test, penetration from ground levelNot requiredH7Hand penetrometer test (set of 3 readings)Not requiredH8Hand vane test (set of 3 readings)Not requiredH8Hand vane test (set of 3 readings)Not requiredH9Permeability testingNot requiredSelf-boring pressuremeterNot requiredH9pressure dilatometerNot requiredIntern or push-in pressuremeterNot requiredSoli infiltration testNot requiredMiscellaneous site testingNot requiredMiscellaneous site testingNot requiredNoneNot required	н	In situ testing				
H2Standard penetration test in rotary drillhole15H3In situ density testingnrNot requiredH3.10Small pouring cylinder methodnrNot requiredH3.20Large pouring cylinder methodnrNot requiredH3.31Water replacement methodnrNot requiredH3.40Core cutter methodnrNot requiredH3.41Core cutter methodnrNot requiredH3.42Core cutter methodnrNot requiredH3.43Nuclear methodnrNot requiredH4California Bearing Ratio testnrNot requiredH5Vane shear strength test in boreholenrNot requiredH6Penetration vane test, penetration from ground levelNot requiredH7Hand penetrometer test (set of 3 readings)Not requiredH8Hand vane test (set of 3 readings)nrNot requiredH8Hand vane test (set of 3 readings)Not requiredH9Permeability testingNot requiredH9Permeability testingNot requiredH9Permeability testingNot requiredH9Not polysh-in pressuremeterNot requiredH9Inigh pressure dilatometerNot requiredH9Inight pressuremeterNot requiredH9Inight pressuremeterNot requiredH9Inight pressuremeterNot requiredH9Inight pressuremeterNot requiredH9Inight pressuremeterNot requ	H1	Standard penetration test in borehole	nr	10		
H3In situ density testingIn	H2	Standard penetration test in rotary drillhole	nr	15		
H3.1Small pouring cylinder methodInterpairedNot requiredH3.2Large pouring cylinder methodInnNot requiredH3.3Water replacement methodInnNot requiredH3.4Core cutter methodInnNot requiredH3.5Nuclear methodInnNot requiredH3.4California Bearing Ratio testInnNot requiredH4California Bearing Ratio testInnNot requiredH5Vane shear strength test in boreholeInnNot requiredH6Penetration vane test, penetration from ground levelNot requiredH7Hand penetrometer test (set of 3InnNot requiredH8Hand vane test (set of 3 readings)InnRate onlyH8Fermeability testingInnNot requiredInterpreterInterpreterNot requiredInterpreterNot requiredNot requiredH1InterpreterNot requiredInterpreterInterpreterNot requiredInterpreterInterpret	НЗ	In situ density testing				
H3.2Large pouring cylinder methodIn mNot requiredH3.3Water replacement methodIn mNot requiredH3.4Core cutter methodIn mNot requiredH3.5Nuclear methodIn mNot requiredH4California Bearing Ratio testIn mNot requiredH5Vane shear strength test in boreholeIn mNot requiredH6Penetration vane test, penetration from ground levelNot requiredIn modelH7Hand penetrometer test (set of 3 readings)Not requiredIn modelH8Hand vane test (set of 3 readings)Not requiredIn modelJ0ther testsIn modelNot requiredIn modelPermeability testingIn modelNot requiredIn modelHigh pressure dilatometerIn modelNot requiredIn modelJ0tiven or push-in pressuremeterNot requiredNot requiredMiscellaneous site testingIn tequiredNot requiredMiscellaneous site testingIn tequiredIn tequiredNoneIn modelIn tequired	H3.1	Small pouring cylinder method	nr	Not required		
H3.3Water replacement methodInNot requiredH3.4Core cutter methodInNot requiredH3.5Nuclear methodInNot requiredH4California Bearing Ratio testInNot requiredH5Vane shear strength test in boreholeInNot requiredH6Penetration vane test, penetration from ground levelNot requiredNot requiredH7Hand penetrometer test (set of 3InNot requiredH8Hand vane test (set of 3 readings)InRate onlyH8Ediforing pressuremeterNot requiredNot requiredPermeability testingInNot requiredHigh pressuremeterInNot requiredHigh pressuremeterNot requiredNot requiredMinard pressuremeterNot requiredNot requiredSelf-boring pressuremeterNot requiredNot requiredMinard pressuremeterNot requiredNot requiredSoli infiltration testNot requiredInMiscellaneous site testingNot requiredInNoneInNot requiredIn	H3.2	Large pouring cylinder method	nr	Not required		
H3.4Core cutter methodIntNot requiredH3.5Nuclear methodIdayNot requiredH4California Bearing Ratio testIntNot requiredH5Vane shear strength test in boreholeIntNot requiredH6Penetration vane test, penetration from ground levelNot requiredIntH7Hand penetrometer test (set of 3 readings)Not requiredIntH8Hand vane test (set of 3 readings)IntRate onlyH8Hand vane test (set of 3 readings)Not requiredIntJ0ther testsIntNot requiredIntSelf-boring pressuremeterNot requiredNot requiredHigh pressure dilatometerIntNot requiredMenard pressuremeterIntNot requiredSoli infiltration testIntNot requiredMiscellaneous site testingIntNot requiredNoneIntNot required	H3.3	Water replacement method	nr	Not required		
H3.5Nuclear methoddayNot requiredH4California Bearing Ratio testnrNot requiredH5Vane shear strength test in boreholenrNot requiredH6Penetration vane test, penetration from ground levelNot requiredNot requiredH7Hand penetrometer test (set of 3 readings)Not requiredImage: Self-boring pressuremeterH8Hand vane test (set of 3 readings)Not requiredNot requiredDther testsNot requiredNot requiredImage: Self-boring pressuremeterSelf-boring pressuremeterNot requiredNot requiredHingh pressure dilatometerNot requiredImage: Self-boring pressuremeterMenard pressuremeterNot requiredNot requiredSoli infiltration testNot requiredNot requiredMiscellaneous site testingNot requiredImage: Self-boring pressuremeterNoneImage: Self-boring pressuremeterNot required	H3.4	Core cutter method	nr	Not required		
H4California Bearing Ratio testnrNot requiredImage: Second Sec	H3.5	Nuclear method	day	Not required		
H5Vane shear strength test in boreholeIn not requiredNot requiredH6Penetration vane test, penetration from ground levelNot requiredNot requiredH7Hand penetrometer test (set of 3 readings)Not requiredInternational penetrometer test (set of 3 readings)Not requiredH8Hand vane test (set of 3 readings)International penetrometer test (set of 3 readings)Not requiredInternational penetrometerH8Hand vane test (set of 3 readings)International penetrometerNot requiredInternational penetrometerDetre testsInternational penetrometerNot requiredInternational penetrometerInternational penetrometerDriven or push-in pressuremeterInternational penetrometerNot requiredInternational penetrometerDriven or push-in pressuremeterNot requiredNot requiredInternational penetrometerMiscellaneous site testingInternational penetrometerNot requiredMoneInternational penetrometerNot required	H4	California Bearing Ratio test	nr	Not required		
H6Penetration vane test, penetration from ground levelnnNot requiredImmH7Hand penetrometer test (set of 3 readings)nnNot requiredImmH8Hand vane test (set of 3 readings)nnRate onlyImmOther testsNot requiredNot requiredImmPermeability testingNot requiredNot requiredImmSelf-boring pressuremeterNot requiredNot requiredImmHigh pressure dilatometerNot requiredNot requiredImmDriven or push-in pressuremeterNot requiredImmImmSoil infiltration testNot requiredNot requiredImmMiscellaneous site testingImmNot requiredImmNoneImmImmImmImm	H5	Vane shear strength test in borehole	nr	Not required		
H7Hand penetrometer test (set of 3 readings)nrNot requiredH8Hand vane test (set of 3 readings)nrRate onlyOther testsNot requiredNot requiredPermeability testingNot requiredImage: Self-boring pressuremeterHigh pressure dilatometerNot requiredNot requiredDriven or push-in pressuremeterNot requiredImage: Self-boring dilatometerMenard pressuremeterNot requiredNot requiredSoil infiltration testNot requiredNot requiredMiscellaneous site testingNot requiredImage: Self-boring dilatometerNoneImage: Self-boring pressuremeterNot required	H6	Penetration vane test, penetration from ground level	nr	Not required		
H8Hand vane test (set of 3 readings)nrRate onlyRate onlyOther testsNot requiredNot requiredImage: Set Fooring pressuremeterNot requiredPermeability testingImage: Set Fooring pressuremeterNot requiredImage: Set Fooring pressuremeterHigh pressure dilatometerNot requiredNot requiredDriven or push-in pressuremeterNot requiredImage: Set Fooring pressuremeterMenard pressuremeterNot requiredNot requiredSoil infiltration testNot requiredImage: Set Fooring pressuremeterMiscellaneous site testingImage: Set Fooring pressuremeterNot requiredNoneImage: Set Fooring pressuremeterImage: Set Fooring pressuremeter	H7	Hand penetrometer test (set of 3 readings)	nr	Not required		
Other testsNot requiredPermeability testingNot requiredSelf-boring pressuremeterNot requiredHigh pressure dilatometerNot requiredDriven or push-in pressuremeterNot requiredMenard pressuremeterNot requiredSoil infiltration testNot requiredMiscellaneous site testingNot requiredNoneImage: Self testing	H8	Hand vane test (set of 3 readings)	nr	Rate only		
Permeability testingNot requiredSelf-boring pressuremeterNot requiredHigh pressure dilatometerNot requiredDriven or push-in pressuremeterNot requiredMenard pressuremeterNot requiredSoil infiltration testNot requiredMiscellaneous site testingNot requiredNoneImage: Soli infiltration test		Other tests		Not required		
Self-boring pressuremeterNot requiredHigh pressure dilatometerNot requiredDriven or push-in pressuremeterNot requiredMenard pressuremeterNot requiredSoil infiltration testNot requiredMiscellaneous site testingNot requiredNoneImage: Soil infiltration test		Permeability testing		Not required		
High pressure dilatometerNot requiredDriven or push-in pressuremeterNot requiredMenard pressuremeterNot requiredSoil infiltration testNot requiredMiscellaneous site testingNot requiredContract specific additional bill itemsINoneI		Self-boring pressuremeter		Not required		
Driven or push-in pressuremeterNot requiredMenard pressuremeterNot requiredSoil infiltration testNot requiredMiscellaneous site testingNot requiredContract specific additional bill itemsImage: Contract specific additional bill itemsNoneImage: Contract specific additional bill items		High pressure dilatometer		Not required		
Menard pressuremeter Not required Soil infiltration test Not required Miscellaneous site testing Not required Contract specific additional bill items Image: Contract specific additional bill items None Image: Contract specific additional bill items		Driven or push-in pressuremeter		Not required		
Soil infiltration test Not required Miscellaneous site testing Not required Contract specific additional bill items Image: Contract specific additional bill items None Image: Contract specific additional bill items		Menard pressuremeter		Not required		
Miscellaneous site testing Not required Contract specific additional bill items Image: Contract specific additional bill items None Image: Contract specific additional bill items		Soil infiltration test		Not required		
Contract specific additional bill items None		Miscellaneous site testing		Not required		
None		Contract specific additional bill items				
		None				

Total section H carried to summary

Bill I Instrumentation

Number	Item description	Unit	Quantity	Rate	Amount £
I	Instrumentation				
	Standpipes and piezometers				
11	Backfill exploratory hole with cement/bentonite grout below standpipe or standpipe piezometer	m	Rate only		
12	Provide and install standpipe (19 mm)	m	Rate only		
13	Provide and install standpipe piezometer (19 mm)	m	Not required		
14	Provide and install standpipe piezometer (50 mm)	m	Not required		
15	Provide and install standpipe piezometer (75 mm)	m	Not required		
16	Provide and install ground gas monitoring standpipe (19 mm)	m	Not required		
17	Provide and install ground gas monitoring standpipe (50 mm)	m	Not required		
18	Provide and install ground gas monitoring standpipe (75 mm)	m	Not required		
19	Provide and install headworks for ground gas monitoring standpipe, standpipe or standpipe piezometer	nr	Not required		
110	Provide and install protective cover (flush)	nr	Rate only		
111	Provide and install protective cover (raised)	nr	Not required		
112	Extra over Item I10 for heavy duty cover in highways	nr	Rate only		
113	Supply and erect protective fencing around standpipe or piezometer installation	nr	Not required		
114	Supply and erect 1.5 m high marker post	nr	Not required		
115	Standpipe and piezometer development				
l15.1	Supply equipment and personnel to carry out development by surging	nr	Not required		
115.2	Develop standpipe or piezometer by surging	h	Not required		
115.3	As Item I15.1 but by airlift pumping	nr	Not required		
l15.4	As Item I15.2 but by airlift pumping	h	Not required		
l15.5	As Item I15.1 but by over pumping	nr	Not required		
l15.6	As Item I15.2 but by over pumping	h	Not required		
l15.7	As Item I5.1 but by jetting	nr	Not required		

l15.8	As Item I15.2 but by jetting	h	Not required		
115.9	Disposal of development water, not including chemical testing	Provisional sum	Not required		
	Inclinometer		Not required		
	Slip indicators		Not required		
	Contract specific additional bill items				
	None				
Total section I carried to summary					

Bill J Installation monitoring and sampling

J J1 J2 (Installation monitoring and sampling (during Fieldwork Period) Reading of water level in standpipe or standpipe piezometer during fieldwork period Ground gas measurement in gas	nr	Rate only	
J1 5 J2 (Reading of water level in standpipe or standpipe piezometer during fieldwork period Ground gas measurement in gas	nr	Rate only	
J2 (Ground gas measurement in gas			
r F	monitoring standpipe during fieldwork period	nr	Not required	
J3 S i S f	Set of inclinometer readings (as defined in Specification Clause 11.6.5 or Schedule S1.16.7) per installation during fieldwork period and report results	nr	Not required	
J4 (i	Check for ground slippage in slip indicator installation during fieldwork period	nr	Not required	
J5 \ 5 F	Water sample from standpipe or standpipe piezometer during fieldwork period, including purging or micro-purging up to 3.0 hours	nr	Not required	
J6 E	Extra over Item J5 for purging or micro- purging in excess of 3.0 hours	h	Not required	
J7 (Ground gas sample from gas monitoring standpipe during fieldwork period	nr	Not required	
J8 F L	Reading of free product level in standpipe using an interface probe during fieldwork period	nr	Not required	
l l	Installation monitoring and sampling (post Fieldwork Period)		Not required	
(Contract specific additional bill items]		
1 I	None			

Total section J carried to summary

Bill K Geotechnical laboratory testing

Number	Item description	Unit	Quantity	Rate	Amount £
к	Geotechnical laboratory testing				
K1	Classification				
K1.1	Moisture content	nr	7		
K1.2	Liquid limit, plastic limit and plasticity index	nr	7		
K1.3	Volumetric shrinkage	nr	Not required		
K1.4	Linear shrinkage	nr	Not required		
K1.5	Density by linear measurement	nr	Not required		
K1.6	Density by immersion in water or water displacement	nr	Not required		
K1.7	Dry density and saturation moisture content for chalk	nr	Not required		
K1.8	Particle density by gas jar or pyknometer	nr	Not required		
K1.9	Particle size distribution by wet sieving	nr	Rate only		
K1.10	Particle size distribution by dry sieving	nr	20		
K1.11	Sedimentation by pipette	nr	Rate only		
K1.12	Sedimentation by hydrometer	nr	Not required		
К2	Chemical and electrochemical				
K2.1	Organic matter content	nr	Not required		
K2.2	Mass loss on ignition	nr	Not required		
K2.3	Sulphate content of acid extract from soil	nr	Not required		
K2.4	Sulphate content of water extract from soil	nr	Not required		
K2.5	Sulphate content of groundwater	nr	Not required		
K2.6	Carbonate content by rapid titration	nr	Not required		
K2.7	Carbonate content by gravimetric method	nr	Not required		
K2.8	Water soluble chloride content	nr	Not required		
K2.9	Acid soluble chloride content	nr	Not required		
K2.10	Total Sulphur content	nr	Not required		
K2.11	Total dissolved solids	nr	Not required		
K2.12	pH value	nr	Not required		
K2.13	Resistivity	nr	Not required		

Number	Item description	Unit	Quantity	Rate	Amount £
K2.14	Redox potential	nr	Not required		
КЗ	Compaction related				
K3.1	Dry density/moisture content relationship using 2.5 kg rammer	nr	Not required		
K3.2	Dry density/moisture content relationship using 4.5 kg rammer	nr	Not required		
K3.3	Dry density/moisture content relationship using vibrating rammer	nr	Not required		
K3.4	Extra over Items K3.1, K3.2 and K3.3 for use of CBR mould	nr	Not required		
K.3.5	Maximum and minimum dry density for granular soils	nr	Not required		
K3.6	Moisture Condition Value at natural moisture content	nr	Not required		
K3.7	Moisture Condition Value/moisture content relationship	nr	Not required		
K3.8	Chalk crushing value	nr	Not required		
K3.9	California Bearing Ratio on recompacted disturbed sample	nr	Not required		
K3.10	Extra over Item K3.9 for soaking	day	Not required		
K4	Compressibility, permeability, durability				
K4.1	One-dimensional consolidation properties, test period 5 days	nr	Not required		
K4.2	Extra over Item K4.1 for test period in excess of 5 days	day	Not required		
K4.3	Measurements of swelling pressure, test period 2 days	nr	Not required		
K4.4	Measurement of swelling, test period 2 days	nr	Not required		
K4.5	Measurement of settlement on saturation, test period 1 day	nr	Not required		
K4.6	Extra over Items K4.3 to K4.5 for test period in excess of 2 or 1 day (s)	day	Not required		
K4.7	Permeability by constant head method	nr	Not required		
K4.8	Dispersibility by pinhole method	nr	Not required		
K4.9	Dispersibility by crumb method	nr	Not required		
K4.10	Dispersibility by dispersion method	nr	Not required		
K4.11	Frost heave of soil	nr	Not required		
K5	Consolidation and permeability in hydraulic cells		Not required		
K6	Shear strength (total stress)				
K6.1	Shear strength by the laboratory vane method (set of 3)	nr	Not required		

Number	Item description	Unit	Quantity	Rate	Amount £
K6.2	Shear strength by hand vane (set of 3)	nr	Not required		
K6.3	Shear strength by hand penetrometer (set of 3)	nr	Not required		
K6.4	Shear strength of a set of three 60 mm × 60 mm square specimens by direct shear, test duration not exceeding 1 day per specimen	nr	10		
K6.5	Extra over Item K6.4 for test durations in excess of 1 day per specimen	sp.day	Not required		
K6.6	Shear strength of a single 300 mm × 300 mm square specimen by direct shear, test duration not exceeding 1 day	nr	Rate only		
K6.7	Extra over Item K6.6 for test durations in excess of 1 day	day	Rate only		
K6.8	Residual shear strength of a set of three $60 \text{ mm} \times 60 \text{ mm}$ square specimens by direct shear, test duration not exceeding 4 days per specimen	nr	Not required		
K6.9	Extra over Item K6.8 for test durations in excess of 4 days per specimen	sp.day	Not required		
K6.10	Residual shear strength of a 300 mm square specimen by direct shear, test duration not exceeding 4 days	nr	Not required		
K6.11	Extra over Item K6. 10 for test duration in excess day of 4 days	day	Not required		
K6.12	Residual shear strength using the small ring shear apparatus at three normal pressures, test duration not exceeding 4 days	nr	Not required		
K6.13	Extra over Item K6.12 for test duration in excess of 4 days	day	Not required		
K6.14	Unconfined compressive strength of 38 mm diameter specimen	nr	Not required		
K6.15	Undrained shear strength of a set of three 38 mm diameter specimens in triaxial compression without the measurement of pore pressure	nr	Not required		
K6.16	Undrained strength of a single 100 mm diameter specimen in triaxial compression without the measurement of pore pressure	nr	Rate only		
K6.17	Undrained shear strength of single 100 mm diameter specimen in triaxial compression with multistage loading and without measurement of pore pressure	nr	Not required		
K7	Shear strength (effective stress)				
K7.1	Consolidated undrained triaxial compression test with measurement of pore pressure (set of three 38 mm specimens), test duration not exceeding 4 days per specimen	nr	Not required		

Number	Item description	Unit	Quantity	Rate	Amount £
K7.2	As K7.1 but single-stage or multi-stage test using 100 mm diameter specimen	nr	Not required		
К7.3	Consolidated drained triaxial compression test with measurement of volume change (set of three 38 mm specimens), test duration not exceeding 4 days per specimen	nr	Not required		
K7.4	As Item K7.3 but single stage or multi stage test using 100 mm diameter specimen, test duration not exceeding 4 day	nr	Rate only		
K7.5	Extra over Items K7.1 and K7.3 for test duration in excess of 4 days per specimen	sp.day	Not required		
K7.6	Extra over Items K7.2 and K7.4 for test duration in excess of 4 days	day	Rate only		
K8	Rock testing				
K8.1	Natural water content of rock sample	nr	15		
K8.2	Porosity/density using saturation and calliper techniques	nr	Not required		
K8.3	Porosity/density using saturation and buoyancy	nr	Not required		
K8.4	Slake durability index	nr	Not required		
K8.5	Soundness by magnesium sulphate	nr	Not required		
K8.6	Magnesium sulphate test	nr	Not required		
K8.7	Shore scleroscope	nr	Not required		
K8.8	Schmidt rebound hardness	nr	Not required		
K8.9	Resistance to fragmentation	nr	Not required		
K8.10	Aggregate abrasion value	nr	Not required		
K8.11	Polished stone value	nr	Not required		
K8.12	Aggregate frost heave	nr	Not required		
K8.13	Resistance to freezing and thawing	nr	Not required		
K8.14	Uniaxial compressive strength	nr	15		
K8.15	Deformability in uniaxial compression	nr	Not required		
K8.16	Indirect tensile strength by Brazilian test	nr	Not required		
K8.17	Undrained triaxial compression without measurements of porewater pressure	nr	Not required		
K8.18	Undrained triaxial compression with measurement of porewater pressure	nr	Not required		
K8.19	Direct shear strength of a single specimen	nr	10		

Number	Item description	Unit	Quantity	Rate	Amount £
K8.20	Swelling pressure test	nr	Not required		
K8.21	Measurement of point load strength index of rock specimen (set of ten individual determinations)	nr	Not required		
K8.22	Single measurement of point load strength on core sample (either axial or diametral test	nr	45		
	Ground/groundwater aggressivity				
K9.1	Suite A (Greenfield site – pyrite absent), Schedule 1.19.6	nr	Not required		
K9.2	Suite B (Greenfield site – pyrite present), Schedule 1.19.6	nr	Not required		
K9.3	Suite C (Brownfield site – pyrite absent) , Schedule 1.19.6	nr	15		
K9.4	Suite D (Brownfield site – pyrite present), Schedule 1.19.6	nr	Not required		
	Contract specific additional bill items				
	None				
Total section K carried to summary					

Bill L Geoenvironmental laboratory testing

Number	Item description	Unit	Quantity	Rate	Amount £	
L	Geoenvironmental laboratory testing					
	Contamination testing					
L1.1	Suite E (Soil samples Schedule S1.20.3)	nr	10			
L1.2	Suite F (Leachate samples Schedule S1.20.3)	nr	Rate only			
L1.3	Suite G (Water samples Schedule S1.20.3)	nr	Rate only			
	Waste acceptance criteria testing					
L2.1	Suite H (Inert waste landfill Schedule S1.20.5)	nr	Not required			
L2.2	Suite I (Stable non-reactive hazardous waste in non-hazardous waste landfill Schedule S1.20.5)	nr	Not required			
L2.3	Suite J (Hazardous waste landfill Schedule S1.20.5)	nr	Not required			
	Contract specific additional bill items					
	None					
Total agation L corriged to surgeous						

Total section L carried to summary

Summary of Bill of Quantities

		£
Α.	General items and provisional sums	
В.	Percussion boring	
C.	Rotary drilling	
D.	Pitting and trenching	
E.	Sampling during intrusive investigation	
F.	Probing and cone penetration testing	
G.	Geophysical testing	
Н.	In situ testing	
I.	Instrumentation	
J.	Installation monitoring and sampling	
K.	Geotechnical laboratory testing	
L.	Geoenvironmental laboratory testing	
	Total tender	

CV of Supervising Engineer enclosed Method Statements enclosed	Yes/No Yes/No
Signature	
Signed By	
On Behalf of (Company)	
Date	

Appendix A.	Rates for	Ground	Practitioners	and other	Personnel

Item	Item Description	Unit	Rate
1	Technician	h	
2	Graduate ground engineer	h	
3	Experienced ground engineer	h	
4	Registered Ground Engineering Professional	h	
5	Registered Ground Engineering Specialist	h	
6	Registered Ground Engineering Advisor	h	
7	Expenses incurred by staff on site visits who are resident by agreement with the Investigation Supervisor	day	
8	Rate per kilometer ¹ from Contractor's premises and return for Items 1, 2 and 3	km ¹	
9	As above but for Items 4, 5 and 6	km ¹	
10	All other expenses incurred in conjunction with a site visit where a return journey is made on the same day for Items 1, 2 and 3	visit	
11	As above but for Items 4, 5 and 6	visit	
12	All other expenses incurred in connection with a visit where an overnight stay is necessary for Items 1, 2 and 3	overnight	
13	As above but for Items 4, 5 and 6	overnight	
¹ where	e considered more appropriate, 'mile' may be used		

Estimate of costs under Appendix A to the Bill of Quantities where the provision of the Contractor's staff for work in accordance with Specification Clauses 3.5.2, 3.6.1 and 3.6.2 cannot be adequately specified at tender. **(To be assessed by the Investigation Supervisor)**

Appendix B. Long-term sample storage

Item	Item Description	Unit	Rate
Geote	chnical Samples		
1	Dynamic (windowless) samples	nr	
2	Rotary drilling core in core box	nr	
3	Rotary drilling core sub-samples	nr	
4	Bulk samples	nr	
5	Large bulk samples	nr	
6	Open-tube samples (thick-wall sampler)	nr	
7	Open-tube samples (thin-wall sampler)	nr	
8	Disturbed samples	nr	
9	Groundwater samples	nr	
10	Delft samples	nr	
11	Mostap samples	nr	
12	Piston Samples	nr	
Conta	mination Samples	nr	
13	Soil samples in plastic tubs	nr	
14	Soil samples in glass containers	nr	
15	Groundwater samples	nr	
16	Gas samples	nr	
Where s	samples comprise more than one container, the rate entered shall be per er		

Estimate of costs under Appendix B to the Bill of Quantities for long-term storage of samples where required in S1.12.2 and S1.12.10. (To be assessed by the Investigation Supervisor)

(Drawings & Documents)



	N	IOTES		DO NOT SCALE	Ē					
D	 BASED ON SOUTH ROAD LOCATION PLAN, DATED 24th MAY 2016 SUPPLIED BY NORTH SOMERSET COUNCIL, FOR USE BY WSP. 									
	2. BOREHOLE LOCATIONS ARE APPROXIMATE ONLY DUE TO THE PRESENCE OF SERVICES. EXACT LOCATIONS TO BE DETERMINED FOLLOWING SERVICE IDENTIFIACTION WITH AGREEMENT OF THE INVESTIGATION SUPERVISOR.									
	3. BOREHOLES TO BE A MINIMUM OF 1.5m FROM THE $\underline{\text{KEY}}^{\text{RETAINING WALL}}$									
		HOLE - THROUGH WALL								
		REF HAND DUG OBSERVATION PIT								
	P01	09/03/2020	ІМ	FIRST ISSUE		xxx	xxx			
	REV	DATE	BY	DESCRIPTION		снк	APP			
	DRAWI	NG STATUS:								
			S0	- WORK IN PROGRE	ESS					
	wsp									
	_ 3rd Floor, Kings Orchard, 1 Queen St, Bristol, BS2 0HQ, UK T+ 44 (0) 1179 306 200 wsp.com									
	CLIENT:		1	North						
	ARCHITE	CT:								
「「「「「「「」」」	PROJECT:									
	TITLE: PROPOSED EXPLORATORY HOLE LOCATION PLAN									
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	DRAWING No: REV: 70062814-GEO-001 P01									
	© WSP UK Ltd									
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Date: 25/05/16

Scale: 1:1343

Data updated: 01/04/16

Information in this plan is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work may not exactly match that shown. Bristol Water does not accept liability for inaccuracies. In carrying out any works, you accept liability for the cost of any repairs to Bristol Water apparatus damaged as a result of your works. You are advised to commence excavations using hand tools only. Mechanical digging equipment should not be used until pipe work has been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your property or a property to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. Building over or near Bristol Water's apparatus is not permitted. This plan is produced by Bristol Water plc (c) Crown copyright and database rights 2016 Ordnance Survey 100018106. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Bristol Water plc, PO Box 218, Bridgwater Road, Bristol, BS99 7AU Tel (0117) 9665881 Fax (0117) 9634576.

Water Main	Fitting	♦ tom.t
Communication Pipe	Hydrant	0 36W
Slip Lined Main	Meter	
Abandoned Main	Valve	•

Map Centre: 331854,162369

Clean Water Plan A3



oroadway@n-somerset.gov.uk

36 / J01C

Thank you for your enquiry. We attach a copy of the ordnance survey sheet upon which we have marked the sizes and approximate positions of our mains and service pipes which are normally laid with 750 mm of cover in footpaths/verges and 900 mm of cover in roads. Should you propose to carry out any excavation in the vicinity of our apparatus please contact our Customer Services Helpline, on telephone number 0845 702 3797, preferably five working days prior to starting work, and ask to speak to a Network District Manager or Network Administrator.

Should you require any further information concerning the section of service pipe belonging to the company, we suggest that you contact our Customer Services Helpline to arrange a site meeting. The section of service pipe belonging to the company normally runs from our water main to the boundary of the property or the highway boundary - whichever is appropriate.

If our apparatus could be affected, we should be pleased to receive more details of your proposed works, including changes in level, reduction in cover and method of working, in order that we may comment further.

Please ensure that no street furniture (i.e. poles, bollards or similar apparatus) is positioned over or within one and a half metres of our mains or service pipes.

Any works in the vicinity of our trunk mains(mains with greater diameter than 250mm or 10 inch), as indicated on the enclosed plan, should be referred to our Strategic Operations Team, via our Customer Services Helpline, on telephone number 0845 702 3797 and ask to speak to a Strategic Operations District Manager.

Please note that no trees or large shrubs are to be planted over or within 3.0 metres of our apparatus unless suitable root restriction measures are taken. If root restriction is to be considered it should extend at least 1.5 metres below finished surface level, in which case the minimum clearance between the wall of our pipeline/apparatus and the root restrictor can be reduced to 0.5 metre. However, should our pipeline have to pass between two trees/large shrubs, even with root restrictors, a minimum clearance of at least 3.0 metres must be maintained between their respective boles to facilitate vehicular access.

Please note that Bristol Water does not deal with enquiries concerning drainage/sewerage in this area and we advise you to contact Wessex Water direct. Their address is: Wessex Water Developers Group, Operations Centre, Claverton Down Road, Claverton Down, Bath, BA2 7WW, or www.wessexwater.co.uk/developers.





Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the 'Affected Postcodes.pdf', which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2016 Ordnance Survey 100019209.





tom.broadway@n-somerset.gov.uk

Maps by email Plant Information Reply



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Easting/Northing : (centre) 331848,16235

FOOTNOTE: WARNING IT IS ESSENTIAL THAT YOU CONTACT NATIONAL NETWORK HANDLING CENTRE BY EMAIL nnhc@openreach.co.uk BEFORE PROCEEDING WITH ANY WORK IN THE HATCHED AREA

a BT Group business





works or purchase. Building over or near Wessex Water's apparatus is not normally permitted.

Map Scale - 1:1195

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