

**Project:** VW Hatfield, Comet Way  
**Subject:** Specification for a Ground Investigation and Monitoring Programme  
**Date:** 6 February 2024  
**Prepared By:** James Hallier  
**Reference:** 332610303-SP-3501-V02

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## 1.0 Introduction

A ground investigation is required to install groundwater monitoring standpipes to provide information on the hydrogeological conditions as part of the residential development at VW Hatfield, located on Comet Way, Hatfield in response to objections raised by Affinity Water in regard to condition 8 of the extant planning permission. This document presents details of the ground investigation works required.

## 2.0 Particular Contract Details

The Conditions of Contract shall be the Infrastructure Conditions of Contract - Ground Investigation Version issued in August 2011, jointly by the Association for Consultancy and Engineering and the Civil Engineering Contractors Association (the Conditions of Contract) as amended.

### Summary of Particular Contract Details

Description	Details
Name and Address of Employer	New Ways Construction Limited. 8 Carnival Park, Carnival Close, Basildon, Essex, SS14 3WN Contact: Matt Schofield [mattschofield@newwaysltd.com]
Name and Address of Investigation Supervisor	Stantec UK Limited. 3 <sup>rd</sup> Floor, 50-60 Station Road, Cambridge, CB1 2JH Contact: James Hallier [james.hallier@stantec.com]
Date of Works and Duration	To be confirmed by the Contactor

## 3.0 Description of the Site

The Site is located at National Grid Reference TL 21655 08780, immediately west of Comet Way in Hatfield, as shown on the attached **Figure 1**.

The Site is currently undergoing construction, with the working locations determined to be outside of the main development footprint, but still within secure areas and part of the wider construction site.

## 4.0 Background Project Information

As part of these works, a number of responses from statutory consultees for the site, the Environment Agency and Affinity Water, are also filed ultimately raising objection as the proposed piling depths are shown to penetrate fully through the sand and gravels of the Lowestoft Formation and come close to or be fully penetrating the confining layer of the Diamicton Till of the Lowestoft Formation and entering the lower Kesgrave Catchment Subgroup granular stratigraphy, which is in continuity with the underlying Lewes Nodular Chalk Formation (combined a Principal Aquifer). The Principal Aquifer is known to be contaminated with bromide and bromate.

The piling contractor commenced works on-site without formal discharge of the associated planning condition with numerous piles penetrating the Principal Aquifer groundwater body.

## 5.0 Ground Investigation and Monitoring Works

### 5.1 Aim of the Investigation

The aim of the investigation is to:

- i) Install groundwater monitoring standpipes within the superficial aquifer of the sand and gravels of the Lowestoft Formation.

- ii) Install groundwater monitoring standpipes within the bedrock aquifer of the Kesgrave Catchment Subgroup/Lewes Nodular Chalk Formation.
- iii) To monitoring the depths to groundwater and associated chemical composition within both aquifers across a prescribed monitoring programme.

## 5.2 Scope of the Investigation

The scope of works will consist of:

- i) One borehole (referenced BH101s) to a maximum depth of 10m below ground level (bgl) with the recovery of disturbed soil samples and the installation of a standpipe to the full depth in each borehole.
- ii) One borehole (referenced BH101d) to a maximum depth of 25m below ground level (bgl) with the recovery of disturbed soil samples and the installation of a standpipe to the full depth in each borehole.
- iii) Visit to site, monthly, on twelve occasions to measure ground water levels in the proposed standpipes, and to collect groundwater samples for laboratory analysis.
- iv) Provision of factual investigation and monitoring reports including laboratory analysis results

## 5.3 Ground Conditions

Based on previous ground investigations the expected ground conditions are summarised in the following table. No assurance is given to its accuracy.

### Summary of Expected Ground Conditions

Formation	Base of Stratum, m bgl [m OD]	Typical Description
Made Ground	0.3 – 1.7 [75.8 – 74.7]	Sandy gravels of brick and flint, locally with asphalt and concrete cobbles, to clayey sandy flint and chalk gravels.
Lowestoft Formation	1.9 – 2.6 [74 – 73.4]	Yellowish brown slightly sandy slightly gravelly clay
	8.8 – 9.3 [67.3 – 66.6]	Yellow to reddish brown variably gravelly clayey sands or very sandy slightly silty subrounded to rounded gravel
	16.1 – 16.4 [59.8 – 59.7]	Stiff dark grey slightly gravelly slightly sandy silty clay
Kesgrave Catchment Subgroup	19.2 – 21.8 [56.7 – 54.3]	Orange brown variably clayey sands and gravels
Lewes Nodular Chalk Formation	>30 (base unproven)	Recovered as white structureless chalk composed of silty subangular to subrounded chalk fragments with some flint

It is expected that the risk of significant concentrations of potential contaminants being present in the ground is low. Based on the available information the Site should be classified as 'Yellow' in terms of the BDA contaminated site classification, with the majority of the Made Ground and associated gross contamination having been removed from Site as part of the remedial works.

It should be noted that the Principal Aquifer is known to be contaminated with bromate and bromide, and as such aquifer protection measures will be required to be installed during the progression of the boreholes to prevent the mixing of the two aquifers.

## 5.4 Required Standards and Supervision

The ground investigation works are to be carried out in accordance with UK Specification for Ground Investigation (Third edition) published in 2022 and all other appropriate standards and guidance.

The Contractor shall provide for the duration of the site work a suitably experienced and qualified geotechnical engineer or engineering geologist with a minimum of 2 years experience relevant to this type of ground investigation and the expected ground conditions to (a) supervise all elements of the ground investigation, and (b) log the exploratory holes in accordance with the requirements of BS EN ISO 14688/14689 (2018) or BS:5930 (2020).

### 5.5 General requirements

The Contractor shall determine appropriate methods and techniques for completing the required ground investigation works based on the expected ground conditions and any constraints on access and working areas. Allowance should be made for the provision of all plant and health and safety equipment as required for carrying out ground investigations within a Yellow category site.

Services information, where available, will be made available to the Contractor however no assurance is given as to the accuracy of any such information provided. The Contractor shall conduct as necessary his own searches and investigations with respect to underground services, from which the Contractor shall satisfy himself on the nature and location of the underground services. The Contractor shall be liable for any damage to underground services, installations and utilities and the consequences thereof.

The contractor shall comply with the requirements of existing landowner and occupier with regard to reinstatement of exploratory hole locations. Allowance should be made for reinstating the access and location of each exploratory hole to match the existing surfacing to the satisfaction of the *Employer's Representative* and the *Investigation Supervisor*. There will be no facility on site for the disposal of surplus spoil arising from the exploratory holes. Allowance should be made for the disposal of all arisings and waste materials off-site to a suitably licensed disposal facility.

The locations of the exploratory holes shall be determined relative to National Grid coordinates. The elevations of the exploratory holes shall be determined relative to Ordnance Datum.

### 5.6 Borehole requirements

The technique for advancing the boreholes is to be determined by the Contractor, based upon the following requirements:

- i) An inspection pit shall be excavated ahead of all boreholes to locate any existing underground services. The exact location of all boreholes will be determined once the location of any underground services have been identified and marked;
- ii) The ground conditions shall be investigated by the recovery of disturbed samples (small and bulk sizes);
- iii) Aquifer protection measures will be required to be installed (within the deeper cohesive deposits of the Lowestoft Formation) during the progression of the boreholes to prevent the mixing of the two aquifers; and,
- iv) On completion the boreholes standpipe installations are to be created. The use of arisings to backfill the boreholes will not be permitted.

### 5.7 Instrumentation and monitoring requirements

The standpipes to be installed in each borehole shall be formed of HDPE well screen and well casing with a nominal internal diameter of 50mm. The standpipes shall be slotted as directed by the Investigation Supervisor and fitted with a bottom cap and a screw fit top cap. The covers to the observation wells are to be lockable and are to be flush with ground level once installed. The standpipe design should be confirmed with the Investigation Supervisor prior to installation. Indicative standpipe installation depths are provided in the table below however these will be confirmed following completion of the borehole drilling and confirmation of the encountered ground conditions. Bentonite must be used to form a seal above the standpipe response zone up to the top of the headworks.

**Indicative Standpipe Installation Design (to be confirmed on-site upon completion of each borehole)**

Borehole	Standpipe Response Zone	
	Top (m bgl)	Base (m bgl)
BH101s	3	9
BH101d	20	25

A minimum of 48 hours following installation, each observation well shall be developed by abstraction of at least three times the calculated observation wetted well volume following installation and prior to commencing monitoring. Detailed records and descriptions of the well development shall be recorded and provided.

Automatic dataloggers will be installed during the first monitoring visit including 1 barometric recording device at the site. The data logger will be set to take readings at a frequency of 1 per hour. The data from the loggers should be downloaded at each monitoring visit with the unit reinstated following the groundwater sampling.

During the monitoring visits, each of the proposed standpipes shall be physically monitored to determine water level and depth to base of well and to collect representative groundwater samples for laboratory analysis. Inspection shall also monitor for the potential presence of free phase liquids within the well. Following retrieval of the datalogger unit and prior to the collection of a groundwater sample the monitoring well is to be purged by abstraction of at least three times the calculated observation well volume. The volume of water purged should be recorded including descriptive observations on the purge water. Following purging a sample will be taken from each standpipe for laboratory analysis.

The laboratory analysis shall be carried out by a laboratory with UKAS and MCERTS accreditation for the specific tests required. Allowance should be made for the following testing, with a single water sample from each standpipe at each visit (2no. in total for each monitoring visit).

#### Laboratory Analysis Requirements

Determinand	Reporting Units	Required Detection Limit
pH	-	± 0.1 units
Bromate (as $\text{BrO}_3$ )	µg/l	2
Bromide (as Br)	µg/l	1

#### 5.8 Scope of reporting

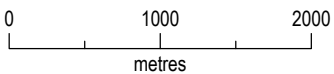
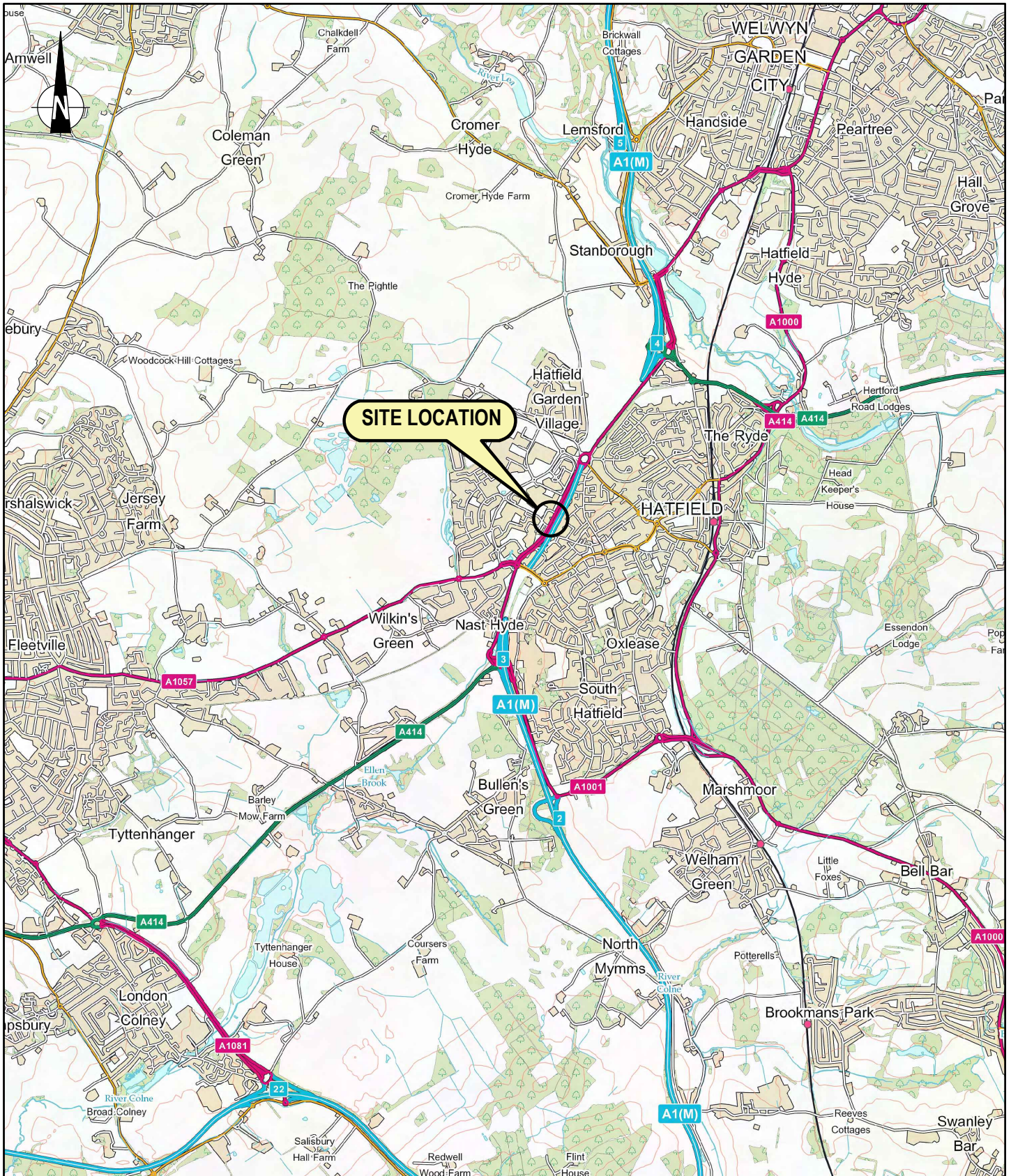
A factual ground investigation report presenting the exploratory hole records in accordance with the requirements of BS EN 1997-2, is to be provided upon completion of the standpipe installations.

A separate factual monitoring report (including the recorded groundwater levels, and laboratory analysis) is to be submitted quarterly following the completion of three consecutive monitoring visits. The factual reports shall be presented in a single document in pdf format. Supporting MS Excel data files comprising datalogger data, water level monitoring data and chemical testing results will be provided.

All data from the investigation is also to be provided in a single digital data file in AGS4 format.

## Figures





Site Grid Ref: TL 216 087

**COMET WAY, HATFIELD**  
**SITE LOCATION PLAN**

Client  
**New Ways  
Construction Limited**



stantec.com/uk

Date of 1st Issue: 03.01.2024  
Drawn by: JH

A4 Scale: 1:500  
Checked by: CR

Figure Number: 1

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GOLDSMITH WAY

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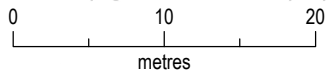
De Havilland Gatehouse

COMET WAY

76.5m

JETLINER WAY

BH101d  
BH101s



### NOTES

1. ALL DIMENSIONS ARE INMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATIVE TO ORDNANCE DATUM NEWLYN UNLESS NOTED OTHERWISE.
3. ALL COORDINATES ARE IN METRES RELATIVE TO ORDNANCE SURVEY NATIONAL GRID.

### LEGEND

- APPROXIMATE SITE BOUNDARY
- PROPOSED BOREHOLE LOCATION

REFERENCE	EASTING	NORTHING
BH101s	521663.6	208732.3
BH101d	521660.0	208734.3

COMET WAY, HATFIELD  
 PROPOSED EXPLORATORY HOLE  
 LOCATION PLAN

Client <b>NEW WAYS CONSTRUCTION LIMITED</b>	
Date of 1st Issue 08.01.2024	Drawn by JH
A3 Scale 1:500	Checked by OB
Figure Number <b>2</b>	



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