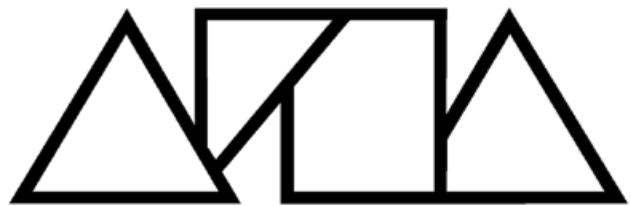


INTRODUCTION TO OUR SERVICES



A F Howland Associates

OUR SERVICES

We are an independent geotechnical and geoenvironmental engineering consultancy based in East Anglia, Lincolnshire and London.

Established in 1981, AF Howland Associates Limited provide technical knowledge and support in both Geotechnical and Geoenvironmental disciplines. Delivering practical solutions trusted by clients and contractors alike.

How can we help you

- Assess ground conditions to support safe, efficient design
- Advise on foundations, earthworks, and slope stability
- Identify and manage land contamination risks
- Assess ground gas and groundwater risks
- Delivering practical, cost-effective investigation solutions



What can we provide



Site Investigation



Geotechnical Services



Geoenvironmental Services



Trenchless Construction Services



Monitoring Services

SITE INVESTIGATION

A site investigation involves an intrusive investigation to assess the soil, rock and groundwater conditions beneath a site to understand the condition of the ground and to ensure the suitability for the proposed project. It provides important information about ground conditions to help design foundations, identify potential hazards and comply with regulations.

Different site investigation techniques are required to allow for a complete picture of the ground conditions to be built. We can offer support through a selection of techniques to collect the appropriate data to give you the answers you need.

Techniques

- Cable Percussive Boreholes
- Windowless Sampling
- Rotary Core Drilling
- Dynamic Probing
- Trial Pits
- Percolation and Soakaway Tests
- Plate Load Testing
- California Bearing Ratio (CBR) Testing



Cable Percussive Boreholes

These are one of the most widely used methods for geotechnical site investigations and is capable of reaching depths of up to 50 meters, depending on ground conditions. It is a versatile technique that delivers reliable data. With the ability to collect disturbed and undisturbed samples for laboratory analysis.

Windowless Dynamic Sampling

Window and windowless sampling are rapid, cost-effective methods for retrieving near-surface soil samples in geotechnical and environmental investigations. By driving cylindrical steel tubes into the ground with a high-frequency percussive hammer, these techniques provide reliable soil samples while minimising disruption to the site.

Investigation depths commonly range from 3 to 5 m, though depths up to 10 m can be achieved in favourable conditions where the borehole remains open without support.

Rotary Core Drilling

This is an investigation technique used to obtain continuous cylindrical samples (cores) of soil or rock from below the ground surface.

The method involves a rotating drill bit that cuts through the ground while a core barrel captures intact samples. These cores provide detailed information on soil and rock stratigraphy, strength, composition and contamination.



Dynamic Probing

Dynamic probing is a quick and effective technique used to assess soil strength and variability. By driving a cylindrical cone into the ground with a high-frequency percussive hammer, we obtain valuable data on soil strength and stratification.

This data helps inform foundation design, identify changes in ground conditions across a site and reduce uncertainty during a project.



Trial Pits

Trial pits offer a quick, cost-effective way to obtain near-surface bulk samples of soils and visually inspect shallow strata. Although this method can cause more surface disruption than percussion drilling, it delivers rapid results.

These can be carried out both by hand excavation, reaching depths of up to 1.2 m, and by mechanical excavation, where depths of up to 5 m can be reached.



Percolation and Soakaway Testing

We carry out site-based investigations to measure how quickly water drains into the soil, essential for assessing suitability for soakaways or septic tanks.

- **BRE Digest 365 Soakaway Tests:** The most common method for designing effective soakaways.
- **Percolation Tests:** Used for septic tank installations and small-scale developments to determine soil infiltration rates.
- **Falling and Rising Head Permeability Tests:** Assess permeable strata at greater depths, providing detailed data for complex sites.

These tests provide the information needed to design safe, efficient, and compliant drainage systems.

Plate Load Testing

These are used to assess how soil will respond to structural loads. By applying controlled loads to a steel plate and measuring the resulting settlement, we provide reliable data on soil strength and bearing capacity. This information helps design safe, stable and cost-effective roads and pavements.



California Bearing Ratio Testing

Build your project on a solid foundation with our California Bearing Ratio (CBR) testing services. Developed by the California State Highway Department, the CBR test is a critical penetration test that evaluates soil strength and load-bearing capacity – vital for designing roads, pavements, and other infrastructure projects.

On site tests

- Light Weight Deflectometer (LWD)
- Dynamic Cone Penetrometer (DCP)
- In-Situ (Static) Plunger Test
- Plate Load Tests

There are also laboratory tests to calculate the CBR value.





GEOTECHNICAL SERVICES

We offer a complete range of geotechnical services to support civil and environmental engineering projects. Our team provides detailed site investigations, robust design solutions and specialist advice to allow you to complete your project.

Foundation Design Support and Settlement Analysis

By assessing soil and rock strength we can calculate the bearing capacity for the material on the site. Along with detailing groundwater conditions and other potential geohazards such as shrink and swell clays. We can provide clear recommendations that inform foundation type, depth and design.

Earthworks and slope stability

We provide expert assessment and design support for earthworks, embankments, cuttings and slopes to ensure safe, stable and durable construction. By understanding soil properties, groundwater conditions and loading effects, we help deliver cost-effective solutions that meet engineering standards and regulatory requirements.

Subsidence Investigation and Analysis

Subsidence can have a severe impact on buildings, often resulting in structural damage due to excessive foundation settlement. At A F Howland Associates, our decades of experience – particularly in the East Anglia region – enable us to identify causes and provide cost-effective solutions to help safeguard your property.



GEOENVIRONMENTAL ENGINEERING

Geoenvironmental investigations are a staged process. We provide a comprehensive service to address planning related concerns and regulatory requirements for a wide range of developments. We specialise in site specific risk assessments and phased investigative approaches to identify, manage and remediate potential contamination issues.

Phase I: Desk Study

A preliminary environmental assessment that reviews existing information to identify potential land contamination risks.

Phase II: Intrusive Investigation

This is the stage where ground investigation works are carried out to confirm the presence, type and extent of any contamination.

Remediation and Validation

The remeditaion stage is where any identified land contamination is handled and additional works are carried out to confirm that the site has been made safe for its intended use.

Soil Waste Classification

It is the process of assessing excavated soils to determine how they should be managed, treated or disposed of in accordance with environmental regulations.

Phase I: Desk Study

A desk study typically includes a review of historical land use, environmental records, geological and hydrogeological conditions, and nearby pollution sources. The report assesses the likelihood of contamination and potential risks to human health, controlled waters and the environment. Then recommends whether further investigation (Phase II site investigation) is required.

Phase II: Intrusive Investigation

A Phase II contamination assessment would include an intrusive investigation of a site, along with any soil and groundwater sampling and ground gas monitoring. It works to assess contaminant concentrations against relevant regulatory criteria. Then using this to evaluate the risks to human health, groundwater and the environment. The data is then used to provide conclusions and recommendations for remediation or further assessment as required.

Remediation and Validation

Remediation involves implementing measures such as soil removal or treatment, capping, groundwater management or gas protection to reduce contamination risks to acceptable levels. Validation then confirms the effectiveness of the remediation through inspections, sampling, testing and documentary evidence. A validation report demonstrates compliance with regulatory requirements and confirms the site is suitable for development or occupation.

Soil Waste Classification

It involves sampling and laboratory testing of soils to identify contamination concentrations, followed by comparison with waste acceptance criteria. The classification defines whether soils are inert, non-hazardous, or hazardous waste, and sets out appropriate handling, transport, treatment and disposal options to ensure legal compliance and environmental protection.

CASE STUDIES

Benacre and Kessingland Flood Risk Management Project, Suffolk

Client: Perfect Circle JV on behalf of the Internal Drainage Board

Contract Value: Circa £205k

Role: Principal Contractor

Project Overview:

This project involved the construction of two flood banks and two pumping stations south of Kessingland, Suffolk. The ground investigation provided essential geotechnical and geoenvironmental data to support the design of the flood banks, new river channel, pumping stations and potential borrow areas for bund fill materials.

Challenges and Site Conditions:

The works were located within the floodplain of the Hundred River, with extensive soft soils including peat and alluvium. Ground conditions were highly variable and groundwater was encountered near the surface, presenting challenges for access and plant stability.

Our Role:

- Deployed tracked dumpers and low-ground-pressure balloon tyres to mobilise drilling rigs and plant across soft ground to drill 14 cable percussive boreholes to depths ranging between 20 m and 25 m
- Utilised tracked plant for trial pitting and crawler-mounted CPT rigs for cone penetration testing to 20 m at 36 locations across the site.
- Implemented piston sampling techniques to obtain high-quality undisturbed samples from soft soils.
- Provided UKAS accredited geotechnical and contamination laboratory testing services on appropriate recovered soil and groundwater samples.
- Conducted staged monitoring of groundwater levels to inform the flood defence design.

Outcome:

Despite access constraints and soft waterlogged terrain, all phases were completed safely and to programme. The data provided enabled detailed design of the flood banks and informed borrow area suitability assessments.



Hobhole Pumping Station Replacement in Fishtoft, Lincolnshire

Client: Perfect Circle JV on behalf of the Internal Drainage Board

Contract Value: Circa £210k

Role: Principal Contractor

Project Overview:

The scheme involved site investigation works for the replacement of the Hobhole Pumping Station and associated infrastructure. The investigation supported design of the new pumping station, cofferdam, crane and piling mats, and access improvements.

Challenges and Site Conditions:

The works were located partly within the Hobhole Drain watercourse and associated flood defences, requiring over-water drilling operations and access within a Site of Special Scientific Interest (SSSI). Variable water levels and tidal influence added complexity to accurate sampling and depth measurements.

Our Role:

- Constructed and operated floating working platforms using modular pontoons fitted with guard rails and spud legs.
- Delivered 6 over-water cable percussive drilling to depths of 20m below bed level.
- Managed safe craning operations for rig and plant placement.
- Excavated 10 Trial Pits to 4 m, 8 sheet pile wall inspection Trial Pits to 1.5 m
- Delivered 30 Road Cores with DCP's to confirm road surface make-up and subbase integrity.
- Coordinated closely with the Environment Agency and ecological clerk of works to ensure compliance with SSSI and FRAP requirements.

Outcome:

All over-water and land-based investigations were successfully completed with no environmental incidents. AF Howland's innovative access solutions enabled safe, accurate drilling in challenging tidal and flood-prone conditions, providing robust design data for the new pumping station.



MONITORING

We provide ongoing monitoring of ground and environmental conditions to ensure safety, compliance and performance throughout a project.



Inclinometer Monitoring

Inclinometer monitoring is used to measure ground or slope movement over time, providing precise data on the direction and rate of lateral displacement. We install standpipe casings in boreholes and use a specialised inclinometer probe to track any shifts in the earth.



Vibration Monitoring

From pile drilling and heavy transport to construction, demolition and trenchless techniques (e.g., directional drilling), our monitoring solutions keep you fully informed and in control.

We deploy Omnidots Swarm Vibration Monitors, positioning them at agreed locations on your site. These monitors continuously track triaxial PPV & VDV in line with BS5228-2, BS7385-2, and BS6472-1, transmitting data via 4G or Wi-Fi for GPS and time-synchronised, off site remote observation.



Water Monitoring and Sampling

We provide water monitoring and sampling services to support both geotechnical and environmental projects. Our work includes:

- **Groundwater Monitoring:** Measuring water levels and seasonal fluctuations to assess hydrogeological conditions.
- **Contaminant Assessment:** Identifying and quantifying chemical and physical contaminants in water, including heavy metals, hydrocarbons, and nutrients.
- **Long Term Monitoring:** Installing monitoring wells and data logging systems to track changes over time, supporting regulatory compliance and risk management.
- **Laboratory Analysis:** Samples are tested in accredited labs to provide accurate and reliable results.

Ground Gas Monitoring and Sampling

We provide specialist ground gas monitoring and sampling to assess the presence and risk of hazardous gases such as methane, carbon dioxide and volatile organic compounds (VOCs).

Our services include:

- **Installation of Gas Monitoring Wells:** Boreholes and standpipes to monitor ground gases.
- **Regular Monitoring:** Measuring gas concentrations, pressure, and flow rates over time to understand site specific variations.
- **Sampling for Laboratory Analysis:** Accurate quantification of ground gas and assessment against regulatory standards.
- **Risk Assessment:** Evaluating potential impacts on human health, buildings and the environment.
- **Mitigation Advice:** Recommendations for gas protection measures.

TRENCHLESS CONSTRUCTION

Delivering geotechnical confidence beneath critical infrastructure.

AF Howland Associates provides specialist geotechnical consultancy services for Horizontal Directional Drilling (HDD) and Cross Carriageway Duct (CCD) installations beneath strategic highway and rail infrastructure. We support contractors, designers and asset owners with technically robust, risk-managed solutions that secure regulatory approval and protect critical assets.

Our Expertise

- Settlement Analysis (Network Rail CD622 compliant)
- Ground Modelling & Interpretation
- HDD Geotechnical Risk Assessment
- Regulatory Submissions (GDR / GFR)
- CRE & DGA Appointments
- National Highways & Network Rail Approvals



CASE STUDIES

M60 J8 to M62 J20 Manchester Smart Motorway Scheme

Scope:
Slip roads and single carriageways – Settlement Analysis and Reporting (CD622 compliant)

- Project Highlights**
- 40 Cross Carriageway Duct (CCD) locations
 - 305 mm bore diameter
 - 2 x 125 mm ducts per crossing
 - CD622 compliant reporting

- Our Role**
- Detailed settlement assessments
 - Geotechnical interpretation and compliance reporting
 - CD622 compliant Geotechnical Report
 - Geotechnical Certification
 - Construction arrangement assessment

Result
Approval of complex HDD installations beneath live motorway infrastructure through robust settlement justification.

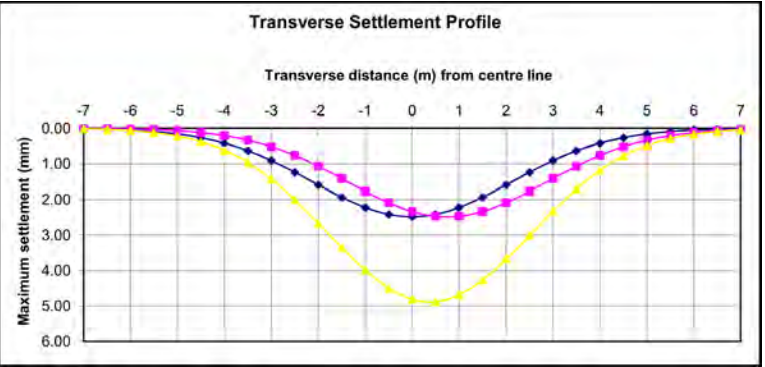
Hornsey 3: High Risk Asset Crossings

Asset Interfaces:
Network Rail and National Highways

- Our Roles**
- Contractors Responsible Engineer (CRE)
 - Designer’s Geotechnical Advisor (DGA)

- Submission Packages Delivered**
- Form A & Form B
 - CAT 3 Calculation checks
 - Geotechnical Feedback Reports (GFR)
 - Geotechnical Design Reports (GDR)
 - CD622 compliant submissions
 - Full technical approval documentation

Result
Successful consent to drill beneath nationally critical rail and highway infrastructure.



GEODASY

Geotechnical Database System is a total data management system currently used by many geotechnical specialists throughout the UK. Developed with over 40 years of expertise, GEODASY has been a leading system in geotechnical data management since its introduction in 1985.

It is an efficient, yet flexible way of providing report quality borehole records and laboratory test results. It also allows the same data to be interrogated and manipulated for fast interpretation and analysis.

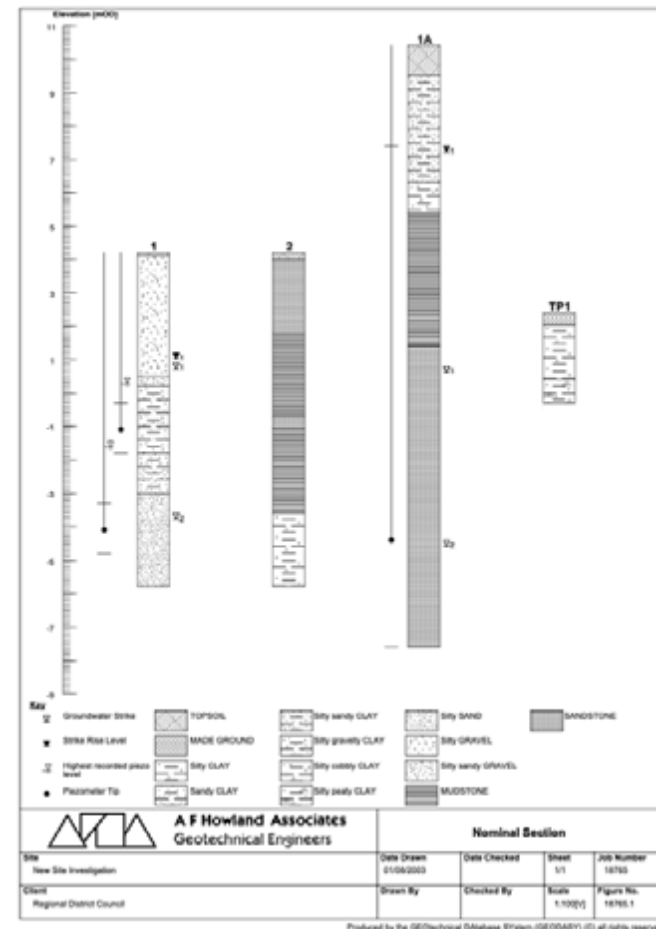
GEODASY enables users to

- Produce high quality borehole logs and field records
- Manage laboratory testing data and sample information
- Generate professional reports and graphical outputs
- Store, retrieve and analyse geotechnical datasets

Key Features

- Simple Data Entry
- Optional AGS 3/4 Output
- Archive Data Management
- Optional Field Tests including Plate Load and CBR

To learn more, visit: www.geodasy.co.uk



Graphic Log and Nominal Section

 A F Howland Associates Geotechnical Engineers				Site New Site Investigation		Bore Number 1		
Boring Method Cable Percussion		Diameter 150mm cased to 4.50m open hole to 10.00m		Ground Level (mOD) 4.20	Client Regional District Council	Job Number 187		
		Location See Plan		Dates 03/01/1993- 05/01/1993	Engineer Director of Road Improvements	Sheet 1/1		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Log (mOD) Depth (m) (Thickness)	Description	Legend	
					4.10	0.10	TOPSOIL - Humic	
							Subrounded fine gravel with dark brown silty sand and fine roots and rootlets	
1.00 1.00-1.40	D U	0.90	DRY	15 blows				
1.60-1.96 1.96 1.96-2.20	SPT N=16 D U	1.40 1.70	DRY	4.5/4.5,3.4 20 blows		(3.60)		
2.00	D			03/01/1995 DRY 04/01/1995 DRY				
2.60 2.60-3.00	D U	2.50	DRY	25 blows				
3.10 3.25-3.65	D U	3.00	DRY	30 blows				
3.70 4.00	D B			Water shrink(1) at 3.50m, rise to 3.20m in 20 mins, sieved at 4.60m.	0.50 0.20	3.70 (0.30) 4.00	Loose and medium dense slightly silty, slightly sandy fine to coarse grained subgrade to subrounded grey brown and cream fine GRAVEL.	
4.50-4.95	SPT N=67	4.40	2.20	8,743,7,8,9			Soft brown slightly silty CLAY with some occasional fine to medium grained fine and chalk gravel	
4.80 5.00	W B			04/01/1995:4.25m 05/01/1995:4.35m		(2.00)		
5.40 5.60-5.90	D U	4.50	4.40	35 blows				
6.00	D				-1.80	6.00	Soft brownish slightly fine grained sandy CLAY with small pockets of black and dark brown peat becoming predominantly grey in colour with depth	
6.50	K-C3.E-4			Falling head test				

Cable Percussive Borehole Log

A F Howland Associates Geotechnical Engineers						Laboratory Test Results					
Site : New Site Investigation											Job Number 1876
Client : Regional District Council											Sheet 1 / 1
Engineer: Director of Road Improvements											
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX											
Spectrophotometric Test File	Depth (m)	Sample	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Group Symbol	Description
				Percentage %	Moisture Content %						
1	5.30	U	21	94	24	34	15	19	0.47	CL	Very stiff dark grey fissured silty CLAY with occasional dark olive streaks
1	8.00	U	18	100	18	35	16	19	0.11	CL/CI	Very stiff dark grey fissured silty CLAY with occasional claystone fragments
3	1.20	U	16	100	16	45	11	34	0.15	CI	Orange/brown very clayey SAND with occasional medium ironstone fragments
3	2.90	U	22	100	22	52	10	42	0.29	CH	Stiff mottled grey, yellowish orange/brown and dr olive brown silty CLAY
3	5.00	U	25	100	25	37	17	20	0.40	CI	Firm/stiff very dark grey silty CLAY with occasional decayed roots
3	6.50	U	25	100	25	45	16	29	0.31	CI	Stiff dark grey closely fissured friable silty CLAY w occasional pale yellow and olive staining
3	8.00	U	20	100	20	52	12	40	0.20	CH	Stiff dark grey fissured silty CLAY
3	9.50	U	18	100	18	21	17	4	0.25	ML	Stiff dark grey fissured silty CLAY with occasional shell fragments
4	1.20	U	32	98	34	47	23	24	0.46	CI	Stiff orange/brown sandy silty CLAY with occasional ironstone and claystone fragments
4	9.20	U	22	930	22	40	12	37	0.27	FI	S&P mottled soft grey, olive and yellowish brown

Summary of Laboratory Test Results

A F Howland Associates Geotechnical Engineers		Laboratory Test Results	
Site : New Site Investigation			Job Number 18765
Client : Regional District Council			Sheet 1 / 1
Engineer : Director of Road Improvements			
DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX			
Borehole / Trial Pit	Depth (m)	Sample	Description
1	5.30	U	Very stiff dark grey fissured silty CLAY with occasional dark olive streaks

Plasticity Index %

Liquid Limit %

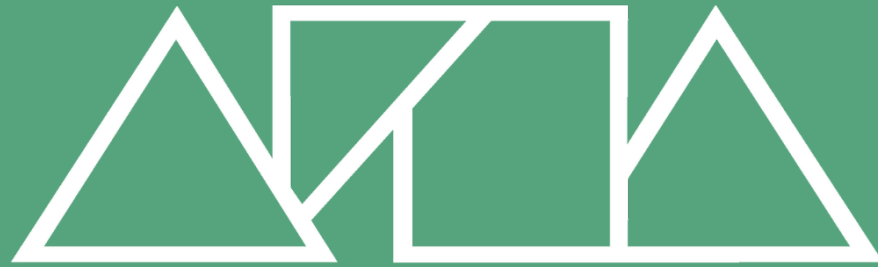
**Casagrande
Plasticity
Chart**

Liquid Limit	34 %	Plastic Limit	15 %
Liquidity Index	0.47	Plasticity Index	19 %
Natural Moisture Content	21 %	Group Symbol	CL

Material Passing 425µm sieve			
Percentage passing	94 %	Corrected Moisture Content	24 %

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations	
Method of Test :	BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index
Remarks :	Test specimens taken from top of U100 tube after removal of disturbed material and tested in vertical orientation

Plasticity Chart



A F Howland Associates

Geotechnical & Geoenvironmental

NORFOLK

01603 250754

SUFFOLK

01787 372690

LONDON

07421 468905

CENTRAL

07780 204755

www.howland.co.uk
admin@howland.co.uk

