

E. Controlled Waters Management

- Combined Water Management Plan including Plot 9

Appendices

WATER MANAGEMENT PLAN

PROJECT: MIRA Plot 6 & 8/9
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1) Introduction

This Water Management Plan [WMP] has been developed to identify and manage the potential risk of water pollution associated with the construction of plots 6 & 8/9 at MIRA Technology Park, Nuneaton.

This plan complements the Construction Environmental Management Plan by focusing in further detail to specific water pollution prevention measures to be implemented for the site in question.

The purpose of this plan is to ensure that based on specific conditions at the construction site the following steps are taken:

- Identify potential pollution sources.
- Prevent potential for pollution arising from the site.
- Control the potential impacts should pollution occur.
- Ensure methods [and alternative methods] of preventing environmental harm occurring have been adequately considered.

The Water Management Plan is a live dynamic document in which it will be reviewed and updated where necessary during weekly site progress meetings.

2) Site Location

The site is located north of Nuneaton, Leicestershire located on the northern side of the A5 carriageway within the MIRA Technology Park. The ground investigation works were encompassed within National Grid References SP 36253 95537 and SP 36773 95451.

The site is accessed via MIRA Drive from the A5 Watling Street Carriageway with the proposed developments identified to the left of Mira Drive on currently undeveloped land to the north west of the park which has previously been utilised for farmland which farm buildings to the east of the plot serving these. Plot 6 covers an area of approximately 2.4 hectares [ha] & Plot 8/9 approximately 1/8 ha. Site Location is identified in Fig 1 & Fig 2 for both individual plots. The plots are split in nature via a newly constructed access road which is being formed as part of the LIF2 Infrastructure works by a separate entity to GMI.

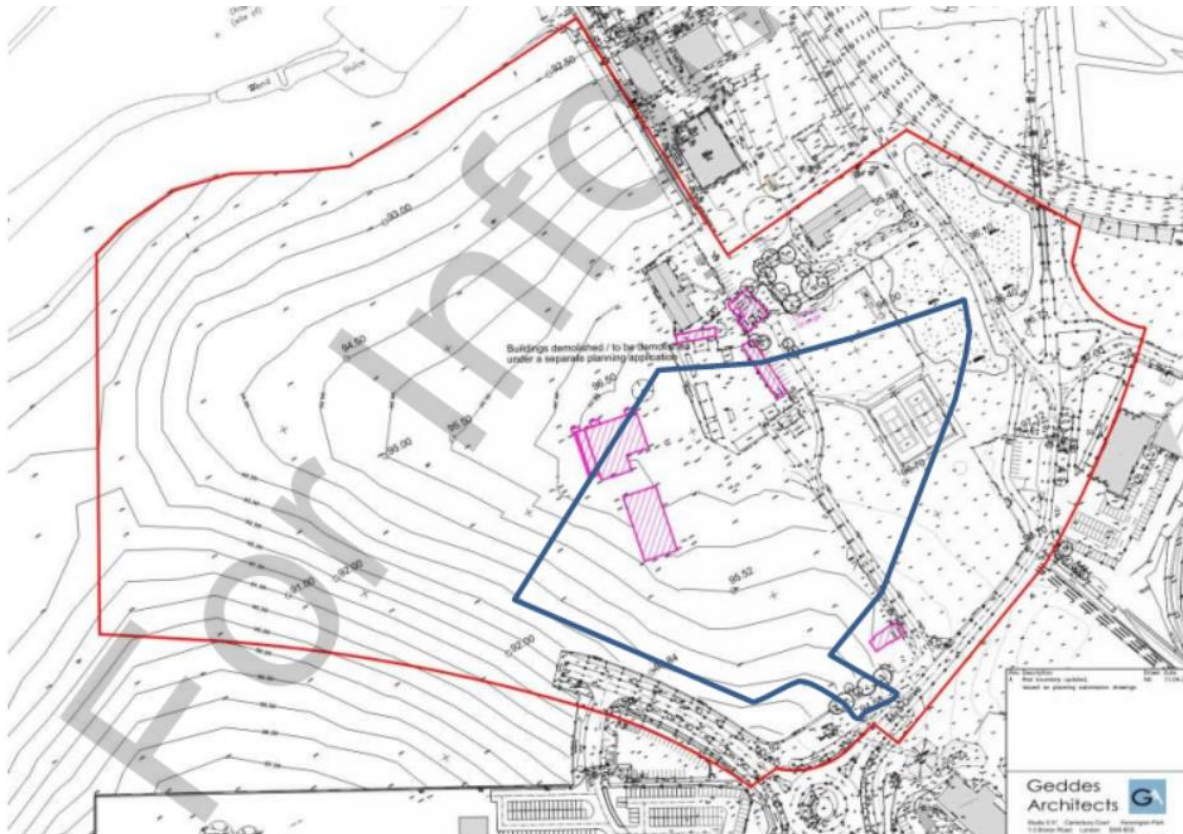


Figure 1 - Plot 6 Boundary



Figure 2 - Plot 8/9 Boundary

4) GMI Surface Water Management

Due to the nature of Construction Activities, it is imperative that specific measures are taken into consideration & actioned in due timing to ensure compliance and best reasonable practice is engaged to minimise impacts of Surface Water Management to the local Areas. To aid this, GMI have split the Water management into 2 relevant phases being 1] Earthworks Cut & Fill exercise to Plot 6 & 8/9 which will also fulfil and substantiate control measures at the earliest convenience in order to undertake phase 2] Main Build works minimising further risk to construction activities.

Water Management Mitigation Measures

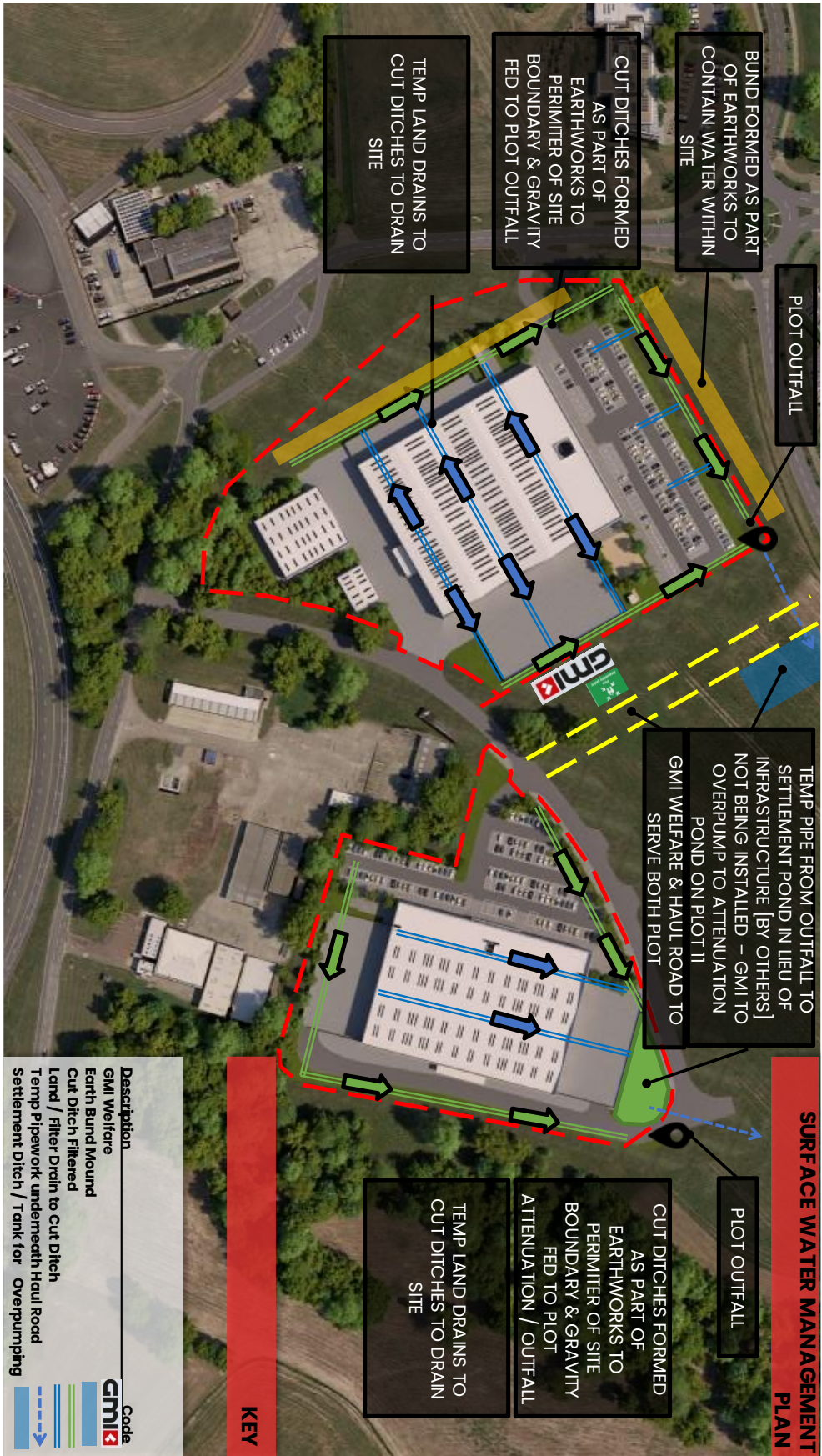
To avoid, minimise and reduce potential adverse effects on the water environment, the mitigation measures detailed below will be implemented during the Earthworks stage of Construction. Our approach will focus on the use of passive silt control options i.e., good working practices, drainage, and settlement as indicated below / demonstrated on Water Management Plan layout which is coded in line with the below chart. During the Earthworks stage where the below is being implemented, bunds will be created to the internal red line boundary with a tractor and bowser on site to dewater / transport to required settlement zones as necessary should it be required.

ACTIVITY	MITIGATION CONTROL MEASURES
Temp Site Drainage (Cut-off Ditches) 	To minimise the risk of turbid water polluting nearby watercourses, the following will be adopted: • GMI to create bunds to prevent water run-off to lower levels into watercourse / adjoining roads • Create cut-off ditches and filter drains, where necessary, to intercept existing drainage to enable the controlled movement of surface water on site. These systems should be connected directly to a settlement lagoon / pond. • Additional ditches should be cut as the project progresses to intercept surface water runoff from any areas with exposed soils and haul roads or to prevent uncontrolled runoff from site. They must be positioned so that they can remain undisturbed for as long as the work programme requires. • Minimise ground disturbance when cutting ditches. Always work uphill of the cut-off ditches. • Move all excavated material away from the ditch for reuse on the scheme. Do not place it on the edge of the ditch unless it is specifically being used as a bund or within the flow path of water. • Cut-off ditches must be profiled with a flat bottom and sloping banks (30° being the steepest) they must be sufficiently deep to intercept any drains and have sufficient capacity to move water by gravity.

	
Bunds / Berms / Silt Fences 	Earth bunds, berms and silt fences will be used to reduce the risk of silty turbid waters from polluting surface watercourses. Due to the topography of each site, these are to be located to the lowest level of the site. Daily Inspection checks are to be completed to ensure good working order & maintenance by the site team. 
Site Drainage (Settlement)	Settlement ponds [formed as part of Infrastructure on Plot 11] will be used to prevent the uncontrolled release of water from the project to surface watercourses. • Create attenuation feature early in the project to allow them to vegetate [completed by LIF2 contractor prior to GMI start on site] • In construction use topsoil over clay, create slope roughness by tracking machines up/down the banks to trap the water on the slope reducing its erosive power and vegetate banks at the earliest opportunity [completed by LIF2 contractor prior to GMI start on site] • Form a stone bund around the outfall or pump head to prevent soft sediments from being drawn through. [to both Headwalls] • The Attenuation ponds are to be fully installed as the permanent solution by the LIF2 Contractor prior to GMI commencement. These will act as a further [secondary] settlement prior to discharge. • Refer to Fig 3 – Wider Infrastructure 
Soil Exposure Minimisation	Compacted stockpiles exposed to inclement weather pose a source of silt pollution due to storm water run-off that may enter drainage systems and / or watercourses. Control measures that will be adopted to prevent silt pollution from exposed ground and stockpiles include: • GMI programme identifies Vegetation stripping will take place immediately prior to earthworks programme commencing. • Topsoil and / or spoil stockpiles will be located at least 10m away from watercourses, drainage system or cut off drains. • Silt fencing or cut off drains will be installed at the toe of any stockpiles leading downhill to a watercourse or surface water drainage system

	• French drainage systems, where practicable, to filter the silt as a secondary containment as identified with green line in below plan. • Topsoil and / or subsoil stockpiles that are to be left in situ for longer than six (6) months will be seeded; hence, reducing erosion losses and the risk of polluting watercourses.
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Plot 6 & 8/9 Water Management Plan



5) WORKING HOURS

The construction hours will be as set out in the planning approval; however, we anticipate these to be in the realm of:

- 7.30am – 6.00pm Monday to Friday
- 8.30am – 2.00pm Saturday's
- Closed Sundays and Bank Holidays

6) EMERGENCY RESPONSE & CONTACT DETAILS

All environmental incidents shall be reported to the Project Manager in the first instance. Where defined with the severity of the incident, categorised within 4 levels [No impact / Minor Impact / Significant Impact / Major Impact] to the environment. The Project Manager dependant on category will raise & report to relevant personal internally & client side. Relevant persons to the scheme are identified below in relevant order.

GMI Construction Group (Midlands)

1st Floor, Crosby Court
28 George Street
Birmingham
B3 1QG

T: 0121 389 2519

Name	Position	Mobile	Email
Eugene Carnell	Snr Project Manager	07814064833	Eugene.Carnell@gmicon.co.uk
Steve Dixon	Contracts Manager	07581 055637	Steve.Dixon@gmicon.co.uk
Jonathan Walsh	Construction Director	07581 051007	Jonathan.walsh@gmicon.co.uk
Gareth Jones	Managing Director	07790 822925	Gareth.jones@gmicon.co.uk

F. Landscaping

- As-built plan for new soft landscaping
- Sampling results for topsoil used in landscaping construction

Appendices





TIM O'HARE ASSOCIATES
SOIL & LANDSCAPE CONSULTANCY

Oliver Cousins
Gavin Jones Ltd
Nursery Court
London Road
Windlesham
Surrey GU20 6LQ

28th November 2024
Our Ref: TOHA/24/1609/SS/Iss2
Your Ref: PO-10067798

Dear Sirs

Topsoil Analysis Report: L040 Mira Plot 9a/9b

We have completed the analysis of the soil samples recently submitted, referenced *Sample 1*, *Sample 2*, *Sample 3* and *Sample 4* for the Mira Plot 9a/9b project, and have pleasure reporting our findings.

The purpose of the analysis was to determine the suitability of the topsoil samples for the proposed landscape re-use. In addition, the samples have been assessed to determine their compliance with the requirements of Clause 610 (*Topsoil Analysis*) and Clause 610B (*Topsoil parameters*) of the supplied Landscape Specification (*The Terra Firma Consultancy Ltd – Horiba MIRA, Nuneaton – Plots 6, 8 & 9 – Doc Ref. 1238-TFC-00-ZZ-SP-L-7001 - September 2022*).

The samples have also been tested in accordance with the chemical contamination parameters listed in Appendix B (*Validation Criteria*) of the *Waterman MIRA Technology Park – LIF 2 Infrastructure, Land North of A5 Remediation Strategy*.

This report presents the results of analysis for the samples submitted to our office, and it should be considered 'indicative' of the subsoil source.

LANDSCAPE TYPES

The landscape design has not been provided for review. At this stage, we assume, the following landscape types are included:

- Tree planting;
- Shrub planting;
- Native woodland and hedge planting;
- Amenity grass;
- Species-rich wildflower grassland;
- Marginal planting;
- SuDS features.

These landscape environments will require a number of soil types (varying in terms of drainage characteristics and fertility status) in order to meet their demands. These are discussed further within the relevant section(s) of this report.

Tim O'Hare Associates LLP
Howbery Park Wallingford Oxfordshire OX10 8BA
T:01491 822653 E:info@toha.co.uk
www.toha.co.uk

SAMPLE EXAMINATION

The samples were reasonably consistent in appearance and were described as dark brown (Munsell Colour 7.5YR 3/2), slightly moist, slightly plastic, non-calcareous to very slightly calcareous MEDIUM CLAY LOAMS, with well developed, very fine to very coarse, granular and sub-angular blocky structures*.

The samples were virtually stone-free. Sample 1 contained one piece of plastic (<14mm) and Sample 4 contained one fragment of brick (<5mm). No unusual odours, other deleterious materials, roots or rhizomes of pernicious weeds were observed.

*This appraisal of soil structure was made from examination of a disturbed sample(s). Structure is a key soil characteristic that may only be accurately assessed by examination in an in-situ state.

ANALYTICAL SCHEDULE

The samples were submitted to a UKAS and MCERTS accredited laboratory for a range of physical and chemical tests to confirm the composition and fertility of the soil, and the concentration of selected potential contaminants. The following parameters were determined:

- detailed particle size analysis (5 sands, silt, clay);
- stone content (2-20mm, 20-50mm, >50mm);
- pH and electrical conductivity values;
- exchangeable sodium percentage;
- major plant nutrients (N, P, K, Mg);
- organic matter content;
- C:N ratio;
- heavy metals (As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn);
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16 suite);
- aromatic and aliphatic TPH (C5-C44 banding);
- benzene, toluene, ethylbenzene, xylene (BTEX);
- asbestos screen.

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

RESULTS OF ANALYSIS

Particle Size Analysis and Stone Content

The samples fell into the *medium clay loam* texture class, which is usually considered suitable for general landscape applications provided the soil's physical condition is satisfactory.

Such soils usually have good water and nutrient retention capacities, but they are also prone to structural degradation and compaction during handling, and especially when plastic in consistency. Any damage to the structural condition of this soil is likely to reduce its drainage and aeration properties.

The clay content of all samples (23-25 %) exceeded the maximum specified limit values (18% clay) and the silt content of Sample 4 (36 %) just exceeded the maximum specified limit (35%) specified in the supplied landscape specification. The total sand content of all samples (40-42 %) fell below the minimum specified limit (50%) from the supplied landscape specification.

Further detailed particle size analysis found the samples to have 25 – 27% combined medium sand and fine sand fraction which fell below the minimum limit specified in the supplied landscape specification (40%).

The stone contents of the samples were low and, as such, stones should not restrict the use of the soil for general landscape purposes.

pH and Electrical Conductivity Values

The samples were slightly acid in reaction (pH 6.0 – 6.8), with pH values that would be considered ideal for general landscape purposes and were compliant with the specification.

The electrical conductivity (salinity) values (water and CaSO₄ extracts) were low, which indicates that soluble salts were not present at levels that would be harmful to plants.

Organic Matter and Fertility Status

In relation to the specified requirements for organic matter and major plant nutrients, the samples were adequately supplied with total nitrogen, extractable phosphorus and extractable magnesium and were deficient in organic matter content (3.1 – 3.4%) and extractable potassium (154 – 168 mg/l) which fell below their respective minimum thresholds.

The C:N ratios of the samples were acceptable for general landscape purposes and compliant with the specification.

Potential Contaminants

With reference to Appendix B of the supplied Waterman remediation strategy, of the potential contaminants determined, none was found at levels that exceeded their maximum specified values.

Phytotoxic Contaminants

Of the phytotoxic (toxic to plants) contaminants determined (copper, nickel, zinc), none was found at levels that exceeded the maximum permissible levels specified in *BS3882:2015 – Table 1*.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil samples for the proposed landscape re-use. In addition, the samples have been assessed to determine their compliance of the supplied Landscape Specification and Remediation Strategy.

From the soil examination and subsequent laboratory analysis, the samples were described as slightly acid, non-saline, non-calcareous medium clay loams with well-developed structures and low stone contents. The samples contained sufficient reserves of total nitrogen, extractable phosphorus and extractable magnesium and were deficient in organic matter and extractable potassium. Of the potential contaminants determined, none exceeded their respective guideline values.

The soils were largely compliant with the supplied landscape specification with the exception of the following parameters:

- clay content (*all samples*);
- silt content (*Sample 4 only*);
- fine sand and medium sand fractions (*all samples*);
- total sand content (*all samples*);
- organic matter content (*all samples*);
- extractable potassium content (*all samples*).

Based on our findings, the soil represented by these samples would be considered suitable for some of likely landscape purposes, provided the deficiencies identified are remedied by a suitable compost application and the physical condition of the soil is maintained. Given their medium soil texture, and vulnerability to physical degradation, they would not be suited to areas of amenity grass anticipated to receive high rates of foot traffic (if included). This topsoil is also not suitable for species-rich habitats and may not be suitable for swales – see further comments below.

On this occasion, these non-compliances are considered minor when reviewed in the context of all the other results. These can easily be remedied by a compost application.

Species-rich Habitats

With regard to establishment of species-rich habitats, including species-rich wildflower grassland, and marginal planting, the overall fertility status of the topsoil (based on its phosphorus content) considered to be high. As such, this topsoil is not suitable to re-use for the creation of species-rich habitats.

If this topsoil is used for this purpose, it would be unlikely to achieve high levels of floral diversity. It should also be borne in mind that the topsoil will have a significant existing seed bank which would require suitable management particularly during the establishment period in order to encourage the required species/sward development and prevent colonisation by aggressive species such as ryegrass, nettle and dock.

Swales

The selection of soils for use within swale features will depend on the necessary performance of the soils. For example, if they are to provide a specialist function such as bioretention or simply to slow rainwater run-off.

There is currently no information available on the required function of any swale systems or attenuation basins to comment on the suitability of the site soils for this purpose. Confirmation should be sought from the project engineer on the suitability of the soils for this purpose.

Summary of Soil Suitability

The following table summarises the suitability of the samples for the assumed landscape types. These are based on the proviso that's the soils have adequate soil structures and the organic matter and extractable potassium deficiencies are addressed.

Planting Environment		Topsoil
Tree Planting (extra heavy standards and semi-mature)		✓
Tree Planting (standards and heavy standards)		✓
Shrub Planting		✓
Native Woodland and Hedge Planting		✓
Amenity Grass	High footfall	X
	Low footfall	✓
Species-rich Wildflower Meadow		X
Marginal Planting		X
Swales		See section on Swales

- ✓ = Soil suited to this landscape type
 X = Soil not suited to this landscape type.

RECOMMENDATIONS

Compost Application

To address the deficiencies in organic matter and extractable potassium, we recommend applying and incorporating suitable compost (e.g. PAS100:2018 /Landscape Institute/WRAP grade (10mm screened) green compost) at a rate of **15%** by volume, ensuring the soil is dry and friable.

For planting purposes, the compost should be incorporated to a depth of 200mm and for grass areas the compost should be worked into the upper 100mm.

Soil Handling Recommendations

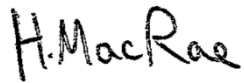
It is important to maintain the physical condition of the soil and avoid structural damage during all phases of soil handling (e.g. resspreading, cultivating, planting, seeding or turfing). As a consequence, soil handling operations should be carried out when soil is sufficiently dry to be non-plastic (friable) in consistency.

It is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery, and soil handling should be stopped during and after heavy rainfall and not continued until the soil is friable in consistency. If the soil is structurally damaged and compacted at any stage during the course of soiling or landscaping works, it should be cultivated appropriately to relieve the compaction and to restore the soil's structure prior to any planting, turfing or seeding.

Further guidance on the management, preparation and handling of soils is provided in the project land scape specification as well as the site *Soil Handling and Re-use Strategy*.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours faithfully



Harriet MacRae
BSc MSc
Soil Scientist



Tim White
BSc MSc MISOilSci CSci
Senior Associate

For & on behalf of Tim O'Hare Associates LLP



Asbestos Screen	ND/D	ISO 17025
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< 0.005	< 0.005	< 0.005	< 0.005
< 0.005	< 0.005	< 0.005	< 0.005
< 0.005	< 0.005	< 0.005	< 0.005
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< 0.005	< 0.005	< 0.005	< 0.005

Not-detected	Not-detected	Not-detected	Not-detected
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H. MacRae

Harriet MacRae
BSc MSc
Soil Scientist

Tim O'Hare Associates LLP Howbery Park Wallingford Oxfordshire OX10 8BA www.toha.co.uk

Our vision

“Engineering a better environment for people and the planet”

Our mission

“To solve complex problems for the benefit of clients, communities and the climate”

Our values

People orientated

Individually and collectively, people are our business.
We strive to create environments for everyone to flourish and thrive.

Flexible

Pragmatic by nature and dedicated to getting the job done to the highest possible standard.

Professional

Operating at pace with integrity to deliver technical and robust solutions.

Environmentally aware

We understand our responsibility to the environment, it shapes our decision making and informs our practice.

Innovative

Our forensic questioning provides the ability to deliver appropriate innovations at every stage on every project.

Relationship focused

We value individuality and the benefits of working collaboratively to achieve positive outcomes for all.

