BOWMER + KIRKLAND

Golden Valley Innovation Centre Cheltenham.

Construction Environmental Management Plan

Project Details	
Name	Golden Valley Innovation Centre
Address	Land At West Cheltenham, Southern Parcel, Fiddlers Green Lane, Cheltenham.

Approval	Prepared By	Reviewed By	Approved By
Name	Paul Smith, PIEMA	Phil Gibbs	Cheltenham Borough Council through Planning Application ref: 23/01875/ OUT and associated Reserve Matters
Position	Environment and IMS Manager	Contracts Manager	
Date	3rd March 2026	3rd March 2026	

Issue	Date	Reason
P1	30th May 2025	For Internal Review / Comment
P2	11th June 2025	Minor Updates
P3	17th July 2025	Updates for comments from edp.
P4	10th September 2025	Update Bat mitigation following addtional surveys
P5	1st December 2025	Update to Introduction
P6	13th February 2026	Updates for comments from EHO, Tree officer and Archaeology
P7	19th February 2026	Arboriculture mitigation updated
P8	3rd March 2026	Arboriculture mitigation amended

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Appendices

1. Introduction

B+K

1. Introduction

This Construction Environmental Management Plan (CEMP) has been developed to identify the environmental mitigation measures and management controls for construction of the Cheltenham Innovation Centre (CIC) and Mobility Hub.

Bowmer and Kirkland have implemented a Integrated Management System (IMS) which is externally verified by a UKAS accredited certification body, BM Trada to ISO9001, ISO 14001 and ISO 45001 (See **Appendix D**).

Quality

Bowmer and Kirkland recognise the importance of developing our business through continued improvements in quality. By consistent and effective implementation of a robust Quality Management System (QMS) we believe that we can add value to the project development process for the benefit of Clients and users of our buildings. Our Quality Management System complies with ISO 9001:2015, and delivers the objectives of our Quality Policy (see **Appendix B**)

Environment

Bowmer and Kirkland are committed to sound management practices that minimise the potential effects of building activities on the environment. By encouraging the sustainable use of natural resources, minimising environmental pollution, reducing waste and encouraging recycling, we aim to contribute to improving the world in which we work and live.

We believe that a proactive approach for promoting awareness of environmental issues with our employees, together with our development of various environmental initiatives, helps us to grow an even more sustainable business to the future.

Bowmer and Kirkland's Environmental Policy (see **Appendix B**) sets out the company's strategy for minimising the environmental impact of our site and office operations. Through promoting the prevention of pollution, energy efficiency and the sustainable use of natural resources in all our construction activities and those of our sub-contractors, we endeavour to achieve a high standard of environmental performance.

Our Environmental Management System complies with ISO 14001:2015, and delivers the objectives of our Environmental Policy.

Health & safety and Well-being

Bowmer and Kirkland has the highest regard for the well-being of all persons involved in its activities and others who may be affected by them. We are committed to working with our Clients and external stakeholders to manage and control Health & Safety Risks. It is our belief that all accidents and occupational ill health can be prevented by adherence to our policies and procedures. We take a sensible, positive approach to Health & Safety.

Through the company's Health & Safety Policy (see **Appendix B**) the importance of discharging our statutory obligations and duties, and our leadership and commitment to effective Health & Safety management is defined. Best practice is accepted as a core aim throughout business operations and integral to maintaining a strong, positive safety culture. To facilitate this aim, the company's management system and procedures has gained accreditation to ISO 45001:2018

Corporate and Social Responsibility

Bowmer and Kirkland is underlining its commitment to sustainability through compliance with BS ISO 26000:2010 (see certificate in **Appendix D**). This Standard presents a framework for Bowmer and Kirkland to ensure that socially responsible behaviour is incorporated into its existing policies, procedures, and performance. Bowmer and Kirkland has a strong commitment to ethical practices in its business operations and hopes to strengthen these through a more rigorous assessment of its social responsibility policies. Adherence to the Standard will create multiple benefits, not only improving the company's environmental credentials and enhancing its brand reputation, but also supporting more cost -effective business practice to build a long-term competitive advantage. Engaging staff to improve the company's environmental performance can also improve employee motivation and bring sustainability into mainstream corporate communications. Meanwhile, monitoring environmental performance can present an insight into potential risks and opportunities to the business.

1. Introduction

This Construction Environmental Management Plan will identify the impacts and relevant mitigation that will be implemented by B+K throughout the project to minimise the impact to the local environmental from the construction activities.

This CEMP has been produced to support the outline planning application ref: 23/01875/OUT, condtion 19 (as extracted below) and associated reservded matters application for the proposed new Golden Valley Innovation Centre and Mobility Hub as well as the HBD X Factory Outline CEMP, ref SPSL21107.

Construction Environmental Management Plan (CEMP)

Prior to the commencement of development of any phase (including site clearance works), a Construction Environmental Management Plan (CEMP) for that phase shall be submitted to and approved in writing by the local authority. The CEMP shall include or be accompanied by details of the following where relevant:

- *Protected Species protection measures; Section 5*
- *Tree and hedgerow protection measures; Section 5*
- *Construction Operations and Access detail including:*

  - Construction vehicle routing; Section 10

  - Measures to ensure that vehicles leaving the site do not deposit mud or other detritus on the public highway; Section 10

  - Details of site operative parking areas, material storage areas and the location of site operatives' facilities (offices, toilets etc); Section 10 and appendix B

  - The hours that delivery vehicles will be permitted to arrive and depart, and arrangements for unloading and manoeuvring. Section 5
- *Details of any temporary construction accesses and their reinstatement; Section 10*
- *A highway condition survey and timescale for re-inspections;*
- *Demolition works; (no demolition works under B+K)*
- *Nuisance mitigation measures including:*

  - Noise and vibration; Section 6 - Noise and Section 8 - Vibration

  - Mitigation of the impacts of lighting proposed for the construction phase, and Section 5

  - Hours of working. Section 5
- *Pollution control measures including measures for controlling leaks and spillages, managing silt and pollutants; and Section 9*
- *Soil handling measures, including moisture conditions, storage and re-use of soils on-site. Section 5 & 11*

The CEMP shall also include details of the ecological protective measures to be used during construction, including measures to comply in full with the recommendations made in the Ecological Appraisal (EDP, October 2023). Provision shall be made within the CEMP for the appointment of an Ecological Clerk of Works (ECoW) to undertake site visits and to supervise ecologically sensitive operations.

The development hereby approved shall be carried out at all times (including during all ground and vegetation clearance works) in accordance with the approved CEMP. Any modifications to the approved CEMP details, for example as a result of requirements of a protected species license, must be submitted to and agreed in writing by the Local Planning Authority and prior to the implementation of any modifications.

In addition the measures identified in this CEMP, Bowmer and Kirkland intend to ensure the implementation of sound environmental management practices for all issues by the implementation of their Environmental Management System (EMS) in the project. Bowmer and Kirkland's EMS is registered to meet the requirements of ISO14001:2015 by a UKAS accredited certification body, BM TRADA (Certificate No. 1133 included in **Appendix B** of this document).

1. Introduction

The CEMP will also support the following conditions:

15) Tree Protection

No development within each phase shall commence until details of tree protection measures for that phase have been submitted to and approved by the local planning authority. The approved measures shall be carried out in accordance with the requirements of BS5837:2012 and retained in accordance with the approved details for the duration of the construction phase.

If, within five years from the completion of the development within each phase, a retained tree, shrub or hedgerow is removed, destroyed, dies or becomes, in the opinion of the local planning authority, seriously damaged or defective, a replacement tree (as the case may be) shall be planted within the site of such species and size, and shall be planted at such time as specified in writing by the local planning authority. *See Section 5 & Appendix A*

27) Nesting Birds

If works are proposed within the nesting bird period (March to August inclusive), nesting bird checks shall be completed by a suitably qualified ecologist to ensure that no breeding birds would be adversely affected including by disturbance by the works. Where checks for nesting birds are required, they shall be undertaken no more than 48 hours prior to the removal of vegetation. If nesting birds are found, a 5m buffer zone shall be implemented and works shall not be carried out in that area until the chicks have fledged.

In addition the measures identified in this CEMP, Bowmer and Kirkland intend to ensure the implementation of sound environmental management practices for all issues by the implementation of their Environmental Management System (EMS) in the project. Bowmer and Kirkland's EMS is registered to meet the requirements of ISO14001:2015 by a UKAS accredited certification body, BM TRADA (Certificate No. 1133 included in **Appendix B** of this document).

2. Organisation and Responsibilities

B+K

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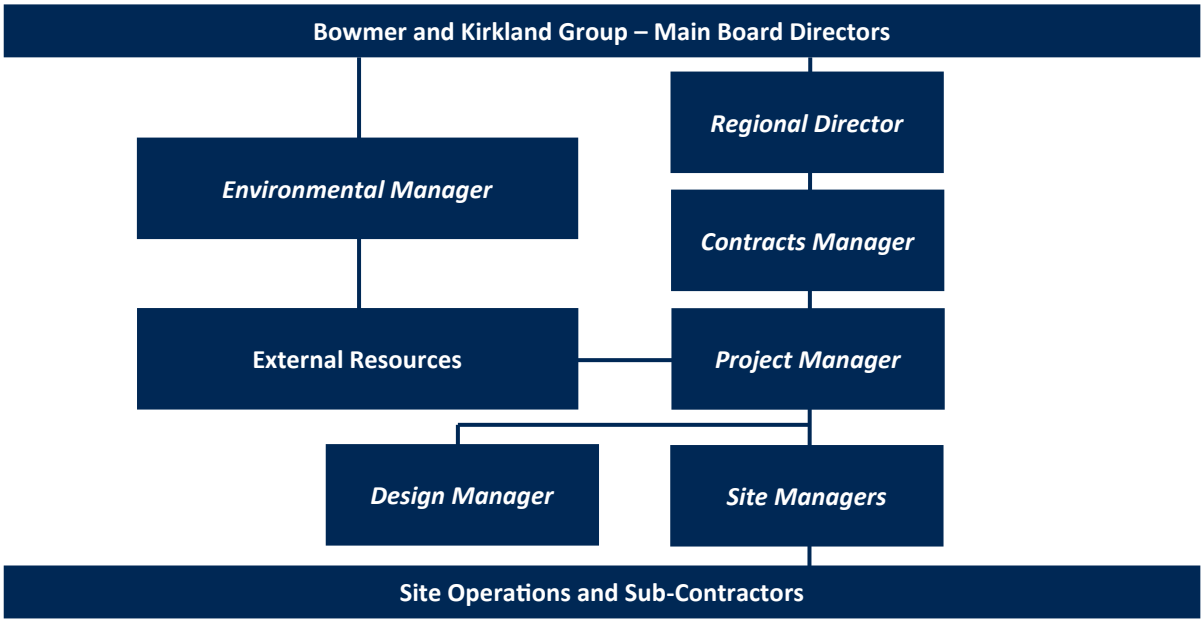

Regional Director

The Regional Director takes overall responsibility for all projects conducted by the construction region responsible for delivering the project and will visit the site on a regular basis.

Contracts Manager

The Contracts Manager (CM) takes Senior Management Responsibility for the overall project. The Contracts Manager will not be permanently on site but will visit the project 1-2 days per week to ensure the requirements of this CMS and Bowmer and Kirkland's IMS are fully implemented and effective. The Contracts Manager will conduct a formal inspection of the Site Operations on a monthly basis to assess the adequacy of Health, Safety and Environmental controls.

The Contracts Manager along with the Project Manager is responsible for liaison with the public and community groups during construction. The Contracts Manager will manage communication with the public and wider community which will include meetings, notices, news-letters and site visits as appropriate. This includes overseeing the resolution of any complaints raised relating to nuisance during the work.

Project Manager

The Project Manager is responsible for the day to day management of the project and will be permanently on site during the works. This includes the selection of competent sub-contractors and the inclusion of control measures in their sub-contracts. The Project Manager, in conjunction with the Site Managers, will monitor the works on a daily basis to ensure the specified controls are implemented and effective. In addition, the Project Manager will ensure that the project is inspected on a weekly basis for compliance with Health, Safety and Environmental compliance. The Project Manager will assist the Contracts Manager in liaison with the public and community groups during construction. The Project Manager will assist in communication with the public and wider community which will include meetings, notices, news-letters and site visits as appropriate. This includes assisting with the resolution of any complaints raised relating to nuisance during the works.

Design Manager

The Design Manager is responsible for the management of the design consultants to ensure that the project specification is established in accordance with project requirements, building regulations and relevant standards. The Design Manager will be permanently on site during the early stages of the project and will visit site regularly during the later stages of the project. The Design Manager will liaise with relevant parties on the final scheme design and ensure advice is provided to the Project Manager on the potential impact of proposed construction methods.

2. Organisation and Responsibilities (Continued)

Site Managers

Site Managers are based permanently on site during the works, the number of site managers will vary depending on the construction output. The Site Managers are responsible for monitor ing the implementation and effectiveness of the specified controls on a day to day basis. This includes the induction of all sub-contractor's operatives and liaison with their management; should improvements be required. The Site Managers, under instruction from the Project Manager, will formally inspect the works on a weekly basis for compliance with Health, Safety and Environmental compliance.

Environmental Manager

The Environmental Manager takes overall responsibility for the organisational legal compliance of the Bowmer and Kirkland Group of Companies. This includes ensuring our EMS recognises current regulatory and other requirements and the specified controls are effective in achieving compliance, preventing pollution and reducing the environmental impact of the organisation. The Environmental Manager will monitor the compliance of the project from information provided by external resources (see below) and site visits.

External Resources

The following resources are employed by the Bowmer and Kirkland Group:

Ecoloigcal Clark of Works - Specilist advise with regards ecological impacts in accordance Precautionary Method of Working Statement (PWMS)

RG Wilbrey Consultants – conduct Health, Safety & Environmental inspections of the project bi-weekly

Adler & Allen – provide pollution response 24/7 mobilising resources where required.

Barbour Consolidated – provide legislation updates and specialist legal advice where required.

Complaints Procedure

Although the measures set out within this CEMP are intended to minimise the impacts of construction activities on the local community by ensuring that neighbouring residents are informed of the construction programme and timescales through either door step introduction, newsletters and regular communication during the works, it is possible that complaints may be raised concerning construction activities. As previously detailed, contact details and information concerning construction will be provided to local residents, and the Site Managers will be available to meet and explore issues with concerned parties directly via appointment.

Any complaints received will be taken seriously and addressed immediately by the construction team and designated Site Managers. All complaints that are received will be reviewed in regular site meetings to ensure that any required actions are communicated to all employees, as appropriate.

B+K use Work Wallet on site as a means of members of the public to report issues both positive and negitive, these are reported directly to B+K Head Office and reviewed by H&S / Business Development for action. A QR Code for the site will be displayed on the site entrance.

WORK WALLET

Records of complaints are recorded within our Management System as well as through Considerate Constructors Scheme of whom B+K have been a Partner Member for the last 10 years.

CONSIDERATE CONSTRUCTORS
PARTNER
10 YEARS

Emergency Contact details of the B+K Site Manager will be displayed on the site entrance, including 24 hr contact number.

3. Scope of Work

B+K

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Construction of the Cheltenham Innovation Centre and Mobility Hub along with associated external works including access roads, landscpaing and car parking.

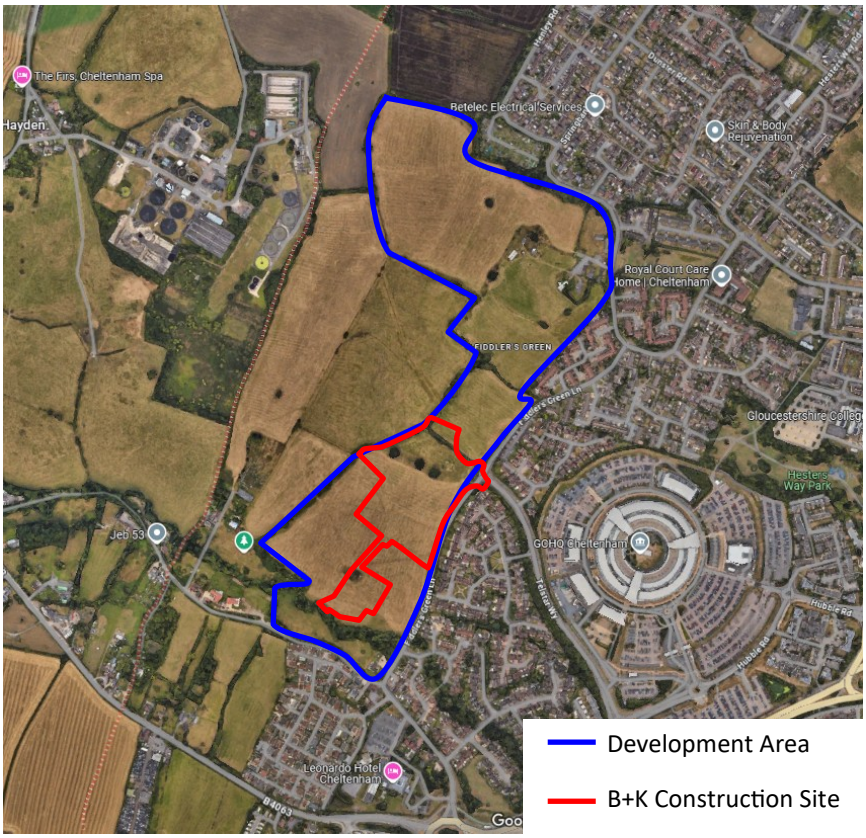

Fig 1 – Site Location (source: www.bing.com/maps)

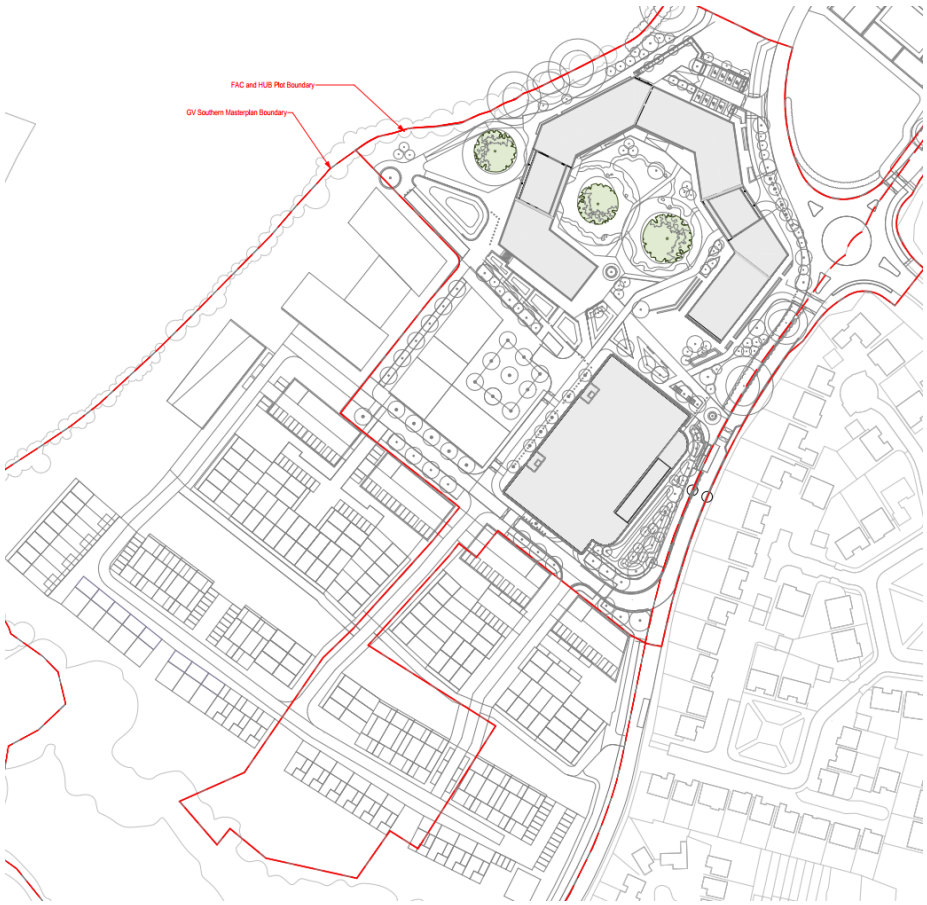

Fig 2 – Proposed Site Plan

4. Construction Impacts

4. Construction Impacts

The following table summarises the current key features on and around the development site which may be impacted by Bowmer and Kirkland's operations. In assessing the significance of the impact potential on these receptors we have taken into consideration reports received to date and publicly available information.

		Potential Impact Severity								
Receptor	**Description**	Noise	Vibration	Dust	Fumes	Visual	Physical Harm	Flooding	Pollution	Heritage
General Community	The site is located west of the Cheltenham urban area, and currently comprises six fields. The Site is surrounded by: North: further development area with residential beyond East: Fiddlers Green Lane and residential beyond and GCHQ Cheltenham. South: further development area, Hatherley Brook with residential beyond West: Agricultural Fields and sewerage treatment plant beyond.	L	L	L	L	L			L	
Residential Areas	The nearest residential receptors to construction works are located adjacent to Fiddlers Green Lane, properties on Niven Close 35m east of the mobility hub and properties on Brosnan Drive and Lazenby Court 40m to the east from the main building construction.	M	L	L	L	M				
Ground Conditions	A Phase 1 Site Investigation has been undertaken by Buro Happold, Southern Parcel. The site is natural topsoil to 0.9m over Charmouth mudstone, made ground has not been encountered, the site is considered to be natural occurring soils including topsoil. **Waste classification and WAC** has not been undertaken, this should be carried out to identify any contamination and confirm suitability for re-use of site won soils and for offsite disposal. In accordance with Waste Frame Directive, article 2, clean natural occurring soils and other uncontaminated soils are excluded from being a waste where they can be used on the site of production as excavated and there is a certainty of use. **Ground water** the nearest bore hole to the proposed site was BH12 located to the south, this recorded water levels on average 1.4m AOD, it is expected that any excavations deeper than 1.5m may require dewatering levels depths maybe subject to seasonal changes and therefore may be shallower during wetter winter season.							M		
Arboriculture	An arboriculture impact assessment has been undertaken by Tree Frontiers, trees and hedgerows have been identified that will require removal to facilitate the development. An arboriculture method statement (AMS) and tree protection plan (TPP) has been provided that identifies how to protect retained trees/hedgerows and those that will require removal to facilitate the development. All retained trees will be protected via a Construction Exclusion Zone (CEZ). Should any works within the Root Protection Area (RPA) of retained trees be required, that are not contained within the AMS and TPP, then arboriculture advice will be sought and approved methods that minimise harm adopted. It has been advised the council will be looking to issue TPO's for retained trees prior to construction, as an interested party in the land B+K will be expecting formal notification of the order as well as a Regulation 5 notice, this is to ensure that B+K are fully aware which trees will then be protected under a TPO. Any retained trees/hedgerows close to construction works will require tree protection fencing to be erected and specific methods detailed in the AMS and TPP adhered too.						M			

KEY:	Insignificant	Low	Medium	High

4. Construction Impacts

Receptor	Description	Potential Impact Severity								
		Noise	Vibration	Dust	Fumes	Visual	Physical Harm	Flooding	Pollution	Heritage
Ecology	Ecological baseline report by EDP, July 2023, with an updated survey reported in the Precautionary Method of Working Statement (PMWS) (report ref: edp3132_r048), July 2025. **Statuary Designated sites** - the nearest site being Badgeworth SSSI located 1.4km to the south, due to separate distance and residential areas the impact will be insignificant. **Non-statutory wildlife sites** Fiddlers Green Meadow an unconfirmed non-statutory designation forms the north part of the site, due to poor management the site was removed from the LSW list in 2017. **Otters** - evidence of otters (single spraint) has been confirmed within Hatherley Brook, precautionary measure require during works to install the outfall. **GCN's** - The Outline Great Crested Newt Mitigation Strategy (report reference: edp3132_r030), it is considered that the risk of encountering GCN during site works is sufficiently low that it does not warrant licencing. Precautionary working methods are set out to further reduce and mitigate the risk. In the unlikely event that GCN are encountered during such works or update surveys identify their presence. Update surveys in June 2025 have not identified any closer populations to the proposed works. **Dormouse** - Only two records returned 2km from the site, with no evidence recorded in previous site surveys there are also no significant blocks of woodland or well-connected and continuous stretches of hedgerow/linear habitat directly connected to the Site, making it highly unlikely this species would disperse into the Site from surrounding habitat, therefore scoped out. **Birds** - Potential for nesting birds within trees and vegetation to be removed to facilitate the development. **Bats -** Followed Bat survey June 2025, Tree T28 (T32 arb report) an aerial climbing inspection was undertaken and did not identify any sign of bat roosts as such was downgraded to PRM-I and no further surveys required, and will be removed as planned. Tree T30 (T28 arb report) further surveys will be required prior to planned pruning works. **Hedgerows -** a single hedgerow transects the proposed B+K site as such this will require removal, mitigation for nesting birds and mammals will be required. **Badgers and other mammals) -** Potential for encountering badgers and other mammals during the course of works, precautionary measures will be required. **Invasive Species** Himalayan balsam has been identified close to the river bank, works to construct the new outfall maybe impacted as such precautionary measures will be required.						M			

KEY:	Insignificant	Low	Medium	High

4. Construction Impacts

Receptor	Description	Potential Impact Severity								
		Noise	Vibration	Dust	Fumes	Visual	Physical Harm	Flooding	Pollution	Heritage
Watercourse	Hatherley Brook (designated main river) is located 270m to the south of the B+K site, the temporary welfare area will be closer approx. 130m and topsoil stockpile will be located approx. 60m from the river, risk from surface water runoff will be low due to separation distance. A flood zone 3 (from lates flood model) area is located along the west boundary of the site associated with a drainage ditch the reminder of the site is flood zone 1, note this ditch was previous flood zone 1 in the 2023 model. Surface water is proposed to be discharged to the drainage ditch on the west boundary, as an ordinary watercourse this will require a Land Drainage Consent from the local flood authority (Gloucestershire county Council) B+K's scope includes the new outfall to Hatherley Brook as such a Flood Risk Activity Permit will be required from the Environment Agency.							L	L	
Archology	Following archaeology trails and area to the south east has been identified as an area of importance, a 10m exclusion zone will be required to prevent damage by tracking plant. See site plan **appendix A**									H

4. Construction Impacts

The following tables summarises impacts to the receptors on and around the development site which may be impacted by construction activities and the overall risk to receptors from noise, dust and vibration.

General Construction Activities Risk Assessment

Construction Activity	Dust Emission Risk	Noise Emission Risk	Vibration Emission Risk
Substructure	Medium	High	Low
Superstructure	Low	High	Low
Façade	Insignificant	Low	Insignificant
Roofing	Insignificant	Low	Insignificant
Fitout	Insignificant	Low	Insignificant
Soft Landscaping	Low	Medium	Low
Hard Landscaping	Low	Medium	Low

* dependent on concrete finish to achieve specification and weather conditions.

Construction Impacts to Receptors

Receptor	Dust	Noise	Vibration
Commercial	Low	Low	Low
Residential	Medium	Medium	Low
Ecological	Low	Low	Low

5. Construction Mitigation

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In order to reduce the impact of the construction phase of the development Bowmer and Kirkland propose to implement our Integrated Management System (IMS) for the project. Our IMS is registered to meet the requirements of the international standard ISO 9001, ISO14001 and ISO 45001 by a UKAS registered certification body, BM TRADA (see **Appendix B** for certificate). Bowmer and Kirkland's IMS includes standard controls to mitigate the impact of our construction activities during normal construction operations. Site specific issues requiring project specific mitigation have been considered and are summarised in the following table:

	Potential Impact								
Description	**Noise**	**Vibration**	**Dust**	**Fumes**	**Visual**	**Physical Harm**	**Flooding**	**Pollution**	**Heritage**
Workings Hours / Delivery Hours Working hours for site will be: Monday to Friday 07:30 – 18:00 Saturday 08:00 – 13:00 Where normal construction activities are expected to exceed these working hours then LPA & EHO will be informed in writing at least 10 days prior to commencing works. Newsletter drops to the local area will also carried our at least quarterly or additional as required.	✓	✓	✓	✓					
Statutory Nuisance - Noise To minimise issues caused by noise during construction, Best Practise Means will be employed in accordance with BS5228:2009+A1 2019 Part 1 during each phase of the project. Noise mitigation in accordance with BS 5228 Part 1, see **Section 6 Noise Mitigation**, that will be implemented during construction.	✓								
Statutory Nuisance – Dust The control of dust is a prime concern for all construction projects, particularly during periods of dry and windy weather, there are also ecological receptors which may be impacted by dust. Details of dust mitigation can be found in **Section 7 Dust Management**			✓		✓			✓	
Statutory Nuisance - Vibration To minimise issues caused by vibration during construction, Best Practicable Means will be employed in accordance with BS5228:2009 Part 2 that gives guidance on vibration levels that could be used to assess the likely impacts of construction activities on the local environment and residential receptors. CMC piles will be used, these are vibration free displacement piles infilled within a cement grout, augured piles are a recommend vibration mitigation within BS 5228 Part 2 Any complaints with regards vibration will be recorded and managed, any additional mitigation will be actioned to reduce the impact for construction activities as per BS 5228, Part 2. Details of Vibration mitigation can be found in **Section 8 Vibration Mitigation**		✓							
Traffic Management Traffic Management Plans have been included in ***Section 10.*** All deliveries will be booked in with Bowmer and Kirkland's Site Management who will avoid slots at peak hours. Roads will be kept clean by the provision of wheel cleaning facilities and road sweepers as required.	✓	✓	✓	✓	✓	✓		✓	✓

5. Construction Mitigation (Continued)

Description	Potential Impact								
	Noise	Vibration	Dust	Fumes	Visual	Physical Harm	Flooding	Pollution	Heritage
Lighting / Bats Construction phase temporary lighting shall be designed to minimise effects beyond the site boundary. • Site lighting will be LED which virtually eliminates upward glare; • Warm white spectrum (<2700k) lamps to be used; • Lights will be shrouded / pointed downward; • Pointed away for areas of vegetation and residential properties • Site Compound will use LED Flood lights; • Site hoarding along footpaths and haul routes will use 10w LED Bulkheads.					✓				
Waste Management Bowmer and Kirkland will apply the waste hierarchy to the project to minimise waste production and subsequent landfill burden. No waste removed from site will be permitted to leave without the provision of an adequately completed waste transfer note and copy of valid waste carrier licence for the person removing the waste and environmental permit for the site where the waste is being taken. The burning of waste is banned on all B+K construction sites. In order to implement these requirements and monitor the amount of waste being produced by the project a Site Waste Management Plan will be prepared and maintained throughout the course of the construction phase. **See also Section 11 Waste Management**	✓	✓	✓		✓	✓	✓	✓	
Dewatering Methods for dealing with water within excavations are detailed **section 9 Surface Water Management.** With regards shallow ground water, excavations deeper than 1.5m may require dewatering.								✓	
Surface Water The risk to controlled waters (Hatherley Brook) is low due to separation distance, as a precaution measures can be taken to prevent runoff during wet weather periods, this can include cut off trench's or earth bunds adjacent. **Section 9 Surface Water Management.** Flood risk activity exemption (FRA12) was applied for by Buro Happold, where exemption requirements can not be achieved then a bespoke permit will be required								✓	
Spillage Emergency Planning An emergency plan for spills of fuels, oils or other CoSHH materials will be prepared for the project and briefed to all operatives. All minor spills will be cleared and consigned off site as hazardous waste. An emergency response contractor, Adler and Allan, will be retained to attend site in the event of a major spill or spill which may affect any water course.						✓		✓	
Re-use of Soils The site is deemed to be natural occurring topsoil and subsoil, as such in accordance with the Waste Frame Work Directive article 2 clean natural occurring and other uncontaminated soils are not classified as a waste where they can be re-used on the site of production with a certainty of use. Where soils are re-used then details of volumes retained and were used should be maintained along with evidence of excess soils being removed from site as a waste.						✓			

5. Construction Mitigation (Continued)

Description	Potential Impact								
	Noise	Vibration	Dust	Fumes	Visual	Physical Harm	Flooding	Pollution	Heritage
Arboriculture An arboriculture method statement (AMS) and tree protection plan (TPP) will be implemented on commencement on site, all retained trees will be protected via a Construction Exclusion Zone (CEZ), tree protection erected in accordance with BS 5827 and appropriate signage displayed. Should any works within the Root Protection Area (RPA) of retained trees be required, that are not contained within the AMS and TPP, then arboriculture advice will be sought and approved methods that minimise harm adopted. Any works to be carried out within a RPA will be under strict issue of a permit to work by B+K Site Management. It is B+K manadatroy requirement to use vacuum excavation within RPA's, as well as other approved methods of no-dig construction. On issue of a TPO order for trees within the site, this will be communicated on site. Once the TPO has been granted any further works required to the TPO trees would required separate planning permission. Any retained trees/hedgerows close to construction works will require tree protection fencing to be erected and specific methods detailed in the AMS and TPP adhered too.						✓			
Ecological Mitigation Ecological mitigation measures are detailed within the Precautionary Method of Working Statement (PMWS) by edp, July 2025 and will be implemented during construction, the PMWS includes precautionary measures for: • Protective Fencing • Vegetation Clearance • Lighting Strategy • Non-Native, Invasive Species – Himalayan Balsam • Bats, further surveys to tree T30 (T28 arb plan) • Birds • Badgers and Otters (and other mammals) • Amphibians and Reptiles						✓			

6. Noise Management

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Noise Monitoring

The significance criteria for the construction noise assessment are based on 'The ABC Method' from BS 5228-1:2009+A1:2014. An extract describing this method is provided below.

BS 5228:2009 Part 1 Significance Criteria (Table E.1) Residential Properties			
Assessment category and threshold value period (LAeq)	Threshold value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (23:00-07:00)	45	50	55
Evenings (19:00-23:00 weekdays) and Saturdays (13:00-23:00)	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

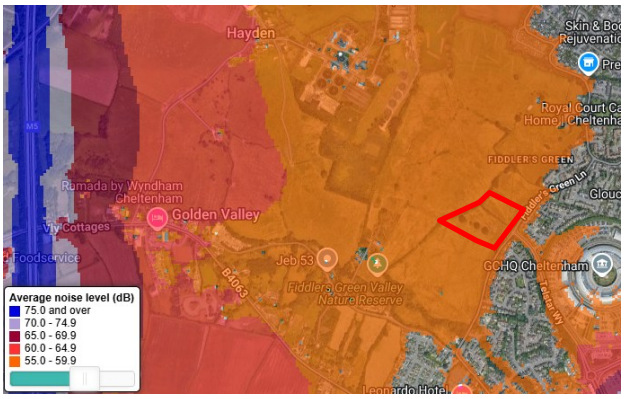
Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

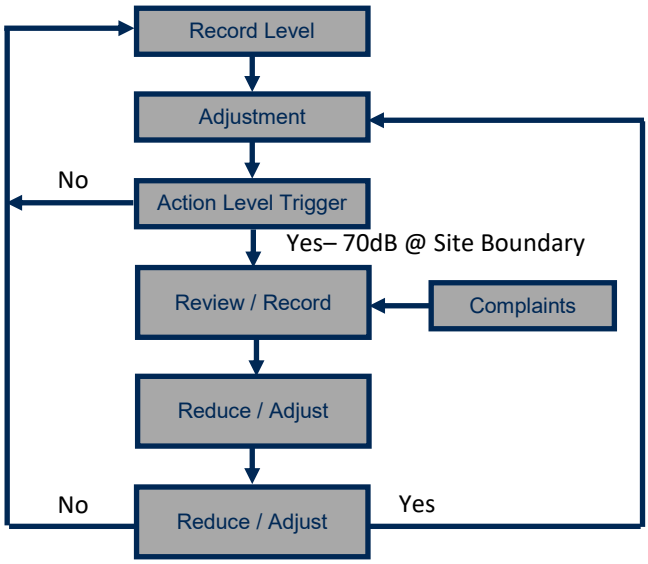
Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

Noise Survey undertaken by Buro Happold recorded background noise associated with Fiddlers Green Lane of upto 70dB $L_{Aeq\ 16hrs}$, with further noise monitoring for southern parcel recording background levels of 55 $L_{Aeq\ 15mins}$, as such the level for significant impact using the ABC Method will be 65dB Monday to Friday and 55dB for Saturdays will be used as a guide for the nearest building.

The Extrium Noise map shows that the site is located within the noise impact area form the M5 with site noise levels of upto 60dB.



Noise Monitoring and Action Process



Construction Activity	Plant Type (Table C.4)	L_{Aeq} at 10m (BS 5228:1) Table C.4	Nearest Receptor	Distance from Nearest Construction Activity	Adjustments: Dis-tance (-dB)	Adjustments: Screen-ing (-dB)	Adjustments: Reflection (+dB)	Resultant $L_{Aeq(t)}$	Duration of activity (hrs)	Corrected % time	Correction to L_{Aeq} (F.5)	Activity $L_{Aeq(8hr)}$	Threshold for Significant Impact Mon-Fri 8am to 6pm	Total Predicted Combined Noise Levels $L_{Aeq(8hr)}$
Enabling Works														
Excavation	Tracked excavator (22t)	78	Bronsnan Drive & Lazenby Court	40	5	5	0	68	5	50%	3	**65**	**65**	**69**
Excavation	Tracked excavator (15t)	73		40	5	5	0	63	5	50%	3	**60**		
Working Platform	Vibratory roller 12t	80		40	5	5	0	70	4	40%	4	**66**		
Substructure														
Excavation	Tracked excavator (14t)	70	Bronsnan Drive & Lazenby Court	45	6	5	3	62	5	50%	3	**59**	**65**	**70**
CFA Piling	Crawler Mounted Rig (35t)	79		45	6	5	3	71	5	50%	3	**68**		
Pumping Concrete	Concrete pump + concrete mixer truck (Discharge and	75		50	7	5	3	66	4	40%	4	**62**		
Superstructure														
Lifting Operations	Tower crane	71	Bronsnan Drive & Lazenby Court	60	8	5	3	61	5	50%	3	**58**	**65**	**68**
Pumping Concrete	Concrete pump + concrete mixer truck (Discharge and	76		50	7	5	3	67	5	50%	3	**64**		
Erecting Structure	MEWP Cherry Picker	73		40	5	5	3	66	4	40%	4	**62**		
Material Movements	Telehandler	70		40	5	5	3	63	4	40%	4	**59**		
External Works														
Excavation	Tracked excavator (14t)	70	Bronsnan Drive & Lazenby Court	40	5	5	3	63	2	20%	7	**56**	**65**	**66**
Laying base course	Vibratory roller 12t	80		40	5	5	3	73	2	20%	7	**66**		

Construction Activity	Plant Type (Table C.4)	L_{Aeq} at 10m (BS 5228:1) Table C.4	Nearest Receptor	Distance from Nearest Construction Activity	Adjustments: Distance (-dB)	Adjustments: Screening (-dB)	Adjustments: Reflection (+dB)	Resultant $L_{Aeq(t)}$	Duration of activity (hrs)	Corrected % time	Correction to L_{Aeq} (F.5)	Activity $L_{Aeq(8hr)}$	Threshold for Significant Impact Mon-Fri 8am to 6pm	Total Predicted Combined Noise Levels $L_{Aeq(8hr)}$
Enabling Works														
Excavation	Tracked excavator (22t)	78	Niven Courtyard	35	5	5	0	68	5	50%	3	**65**	**65**	69
Working Platform	Vibratory roller 12t	80		35	5	5	0	70	4	40%	4	**66**		
Substructure														
Excavation	Tracked excavator (14t)	70	Niven Courtyard	35	5	5	0	60	5	50%	3	**57**	**65**	67
Bored Piling	Crawler Mounted Rig (35t)	79		40	5	5	0	69	5	50%	3	**66**		
Pumping Concrete	Concrete pump + concrete mixer truck (Discharge and Pump)	75		70	9	5	0	61	4	40%	4	**57**		
Superstructure														
Lifting Operations	Mobile Crane (100t)	71	Niven Courtyard	60	8	5	0	58	5	50%	3	**55**	**65**	64
Fixing Steel	Oil Impact Gun (not in table C.4)	73		40	5	5	0	63	4	40%	4	**59**		
Erecting Structure	MEWP Cherry Picker	73		40	5	5	0	63	5	50%	3	**60**		
Material Movements	Telehandler	70		45	6	5	0	59	4	40%	4	**55**		

6. Noise Management

Summary of Predicted Noise Levels

Predictions for noise from construction activities to the nearest receptors being on Brosnan Drive and Lazenby Court and Niven Courtyard have been calculated in accordance with BS 5228 Part 1. Noise levels to the nearest receptors during the main construction works will generally be within 5dB of the threshold of significant impact of 65dB $L_{Aeq\ (15min)}$ with predictions between 66dB and 70dB $L_{Aeq\ (8hr)}$, these levels are similar to that recorded on Fiddlers Green Lane, although construction noise will be noticeable the levels would be similar or lower than road noise.

It should be noted that these predictions are worse case scenario and do not take into account additional noise mitigation measures that can be implemented to reduce the impact.

Noise levels would tend to be lower owing to greater separation distance and the building structure itself as the works progress. They would also tend to reduce over a 10-hour working day (week-day, 5 hours Saturday) owing to periods of plant inactivity. B+K will review construction activities and noise mitigation measures being implemented during construction and demolition to reduce the potential impact further using mitigation detailed below.

Noise Mitigation Measures - General

The quietest and lowest impact processes that are reasonably practicable will be employed on-site in the undertaking of all construction works and in accordance with the best practise under BS5228:2009+A1 2014, Part 1. Suitable mitigation measures will be implemented as a means of minimising noise include:

Construction / Demolition Mitigation

- Newsletter drops to businesses that will include works up and coming, progress, specific activities that may generate increased noise;
- Businesses will be advised of the start and finishing dates and times of particularly noisy activities and these will be timed to minimise the disruption to local residents as far as possible;
- Construction working hours will be carefully managed to ensure normal working hours are adhered to, with the exception for some construction activities that will may exceed normal working hours, examples include abnormal deliveries and concrete curing, where this I will occur then the LPA/EHO will be notified in writing at least 10 days prior.
- Minimize drop height of materials;
- Radios and other noise-generating devices are not permitted on site.
- Keep voices and conversation outside of the perimeter of the site to a minimum and low in volume;
- Use of work equipment designed to reduce noise should be consider by sub-contractors;
- Specific construction activities maybe required to achieve the specification finish and as such may cause extended periods or works;
- Noise monitoring will be used on site boundary and assessed periodically during construction, to identify effectiveness of noise mitigation measures on site;
- Avoid nosier activities at the start of the working day;
- For higher risk sites or where required for planning active noise monitoring can be used with action and warning levels being set.

Site Plant

- Temporary builders supply (TBS) will be used along with a battery system to provide power therefore eliminating the need for site generators
- The quietest vehicles, tools and machinery shall be used as far as is reasonably practicable;
- Avoid unnecessary revving of engines and switch off equipment when not required;
- Start up plant and vehicles sequentially rather than all together;
- No machinery will be permitted to start up on-site before 08:00 hrs;
- Plant to be fitted with effective silencers;
- Reversing alarms should be white noise;
- No engines left running whilst vehicles are stopped on-site;
- Fit suitably designed muffler or sound reduction equipment to reduce noise without impairing machine efficiency;
- Utilise acoustics screens and encloses to reduce noise from site.

6. Noise Management

Enclosures

The use of enclosures can significantly reduce noise. These range form localised enclosures to the erection of noise reducing fencing around larger activities. Enclosures will be designed in accordance with BS5228:2009+A1 2014, Part 1, Appendix A and be installed to manufactures requirements to ensure effectives of the noise barriers. Noise monitoring can be carried out to ensure the effectiveness of any enclosure.

Plant	Enclosure Type	Noise Reduction
Site Generators	Ventilated acoustic enclosure	Up to 20dB
Pneumatic breakers, drills	Portable or Fixed enclosure	Up to 20dB
Rotary Drills, Diamond Drilling	Ventilated Acoustic Shed	Up to 15dB
Pumps	Acoustic enclosure with allowance for engine cooling and exhaust	Up to 20dB
Large Plant	Acoustic Screen / Fence	Dependant on design
Scaffolding Acoustic Sheeting	Acoustic Sheeting to Scaffolding Elevations	Up to 19dB

Methods of reducing Noise from Construction Plant

The following table (as extracted from BS 5228: Part 1) provides examples of noise reduction measures that can be used for site plant.

Plant	Noise reduction of plant			Alternative plant
	Source of noise	Possible remedies (to be discussed with machine manufacturers)	A-weighted sound reduction dB	
Hammer drive piling equipment	Pneumatic/diesel hammer or steam winch vibrator driver Sheet pile	Enclose hammer head and top of pile in acoustic screen Acoustically dampen sheet steel piles to reduce levels of resonant vibration	5 to 10	Bored piling Vibratory system Drop hammer completely enclosed in box with opening at top for crane access
	Impact on pile	Use resilient pad (dolly) between pile and hammer head. Packing needs to be kept in good condition		
	Cranes cables, pile guides and attachments	Careful alignment of pile and rig		Steel jacket completely enclosing drop hammer with dolly and polystyrene chips fed to impact surface to dissipate energy Pressed-in piling which generates its driving force from the frictional restraint of other piles
	Power units or base machine	Fix more efficient sound reduction equipment or exhaust. Acoustically dampen panels and covers. When intended by the manufacturer, engine panels need to be kept closed. Use acoustic screens when possible		
Earth-moving plant: bulldozer, compactor, crane, dump truck, excavator	Engine	Fit more efficient exhaust sound reduction equipment Manufacturers' enclosure panels need to be kept closed	5 to 10	Alternative super silenced plant might be available. Consult manufacturers for details
Compressors and generators	Engine Compressor or generator body shell	Fit more efficient sound reduction equipment Acoustically dampen metal casing	Up to 10	Super silenced plant is available. Consult manufacturers for details Electric-powered compressors are available as opposed to diesel or petrol Sound-reduced compressor or generator can be used to supply several pieces of plant. Use centralized generator system
	Total machine	Erect acoustic screen between compressor or generator and noise- sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured	Up to 10	
		Enclose compressor or generator in ventilated acoustic enclosure	Up to 20	
Pneumatic concrete breaker, rock drills and tools	Tool	Fit suitably designed muffler or sound reduction equipment to reduce noise without impairing machine efficiency	Up to 15	Hydraulic and electric tools are available For large areas of concrete, machine designed to break concrete in bending can be used
		Ensure all leaks in air line are sealed		
	Bit	Use dampened bit to eliminate ringing		
	Total machine	Erect acoustic screen between compressor or generator and noise- sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured	Up to 10	Thermic lance
		Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation	Up to 20	
Rotary drills, diamond drilling and boring	Drive motor and bit	Use machine inside acoustic shed with adequate ventilation	Up to 15	Thermic lance
Pumps	Engine pulsing	Use machine inside acoustic enclosure with allowance for engine cooling and exhaust	Up to 20	
Concrete mixers	Cleaning	Do not hammer the drum		
Materials handling	Impact of material	Do not drop materials from excessive heights. Screen dropping zones, especially on conveyor systems. Line chutes and dump trucks with a resilient material	Up to 15	

7. Dust Management

7. Dust Management

An Air Quality Risk Assessment by Cundall for entire development site has assessed as a High Risk in accordance with IAQM *Guidance on the assessment of dust from demolition and construction*" . This assessment is based on a total area of 254,000m^2 the B+K site is approximately 25,000m^2 as such the risk will be **Medium**.

Dust Management

During works it is anticipated that the primary air pollution emissions will be associated with dust generated from plant movement and construction works on site. The following **Highly Recommended** mitigation measures for **Medium Risk** sites will be adopted (where applicable to the site) as extracted from IAQM "Guidance on the assessment of dust from demolition and construction" .

Key to tables: H Highly recommended | D Desirable | N Not required

Mitigation measure	Medium Risk
Communications	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	H
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary.	H
Display the head or regional office contact information.	H
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP will include methods for monitoring of dust deposition, dust flux or where real time PM10 continuous monitoring is required.	H
Site Management	
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H
Make the complaints log available to the local authority when asked	H
Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.	H
Monitoring	
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	D
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	H
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H
Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction (IAQM, 2023)	H

7. Dust Management

Mitigation measure	Medium Risk
Preparing and maintaining the site	
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. No stockpiles are proposed due to site constraints.	H
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.	H
Avoid site runoff of water or mud.	H
Keep site fencing, barriers and scaffolding clean using wet methods.	H
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	H
Cover, seed or fence stockpiles to prevent wind whipping.	H
Operating vehicle/machinery and sustainable travel	
Ensure all vehicles switch off engines when stationary - no idling vehicles.	H
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	D
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	H
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	D
Operations	
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate	H
Use enclosed chutes and conveyors and covered skips.	H
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	H
Waste management	
Avoid bonfires and burning of waste materials.	H
Reuse and recycle waste to reduce dust from waste materials	H

7. Dust Management

Mitigation measure - Earthworks	Medium Risk
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	D
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	D
Only remove the cover in small areas during work and not all at once.	D
Mitigation measure - Trackout	**Medium Risk**
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	H
Avoid dry sweeping of large areas.	H
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	H
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	D
Record all inspections of haul routes and any subsequent action in a site log book.	D
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	D
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	D
Access gates to be located at least 10 m from receptors where possible.	H
Mitigation measure - Construction	**Medium Risk**
Avoid scabbling (roughening of concrete surfaces), if possible	D
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place	H
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery	D
For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust	D
Mitigation measure - Demolition	**Medium Risk**
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	N/A
Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	N/A
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	N/A
Bag and remove any biological debris or damp down such material before demolition.	N/A

7. Dust Management

Site Specific Dust Mitigation

During works dust management will be critical due to the proximity of the occupied commercial buildings in close proximity to the works.

Highly recommended mitigation measure for **Medium Risk** Site will be implemented in accordance with the following tables.

Communications

- The project team will arrange pre-start community engagements and issue regular newsletter updates and works progress.
- The Project Manager is responsible for site issues, contact details will be displayed on the site entrance including 24hr emergency number.

Site Management / Monitoring

- B+K use work wallet app to record all incidents, as well as being a means of members of the public to raise complaints. Details of complaints will be available for inspection by the LPA/EHO on request.
- Daily inspections are carried out as standard, inspections will be increased during and following wet weather conditions, this frequency can further increase were high numbers of vehicle movements.
- Dust monitoring will initial be through visual inspections due to medium risk and limited open ground during construction. Measures to reduce dust emissions from the site this will include dust suppression of haul roads / routes especially during enabling works, use of temporary hard surface ideally blacktop.
- Should active Dust Monitoring be required this will be for nearby residential receptors for PM10 the locations of any active monitoring will be agreed within the air quality consultant including duration of monitoring, should prevailing winds blow in a westerly or easterly direction, the consideration for impact to the residential areas will be taken in to account when carrying out site inspections especially drying dry weather periods.

Preparing and maintaining the site

- Details on proposed site setup including types of hoarding and welfare locations are detailed in section 10 of this CEMP.
- Section 9 of this CEMP includes measure to control surface water runoff.

Operations

- B+K operate standard procedures as part of out ISO 45001 and ISO 14001 management system this includes SP 10.13 Environmental Dust and Mud. that is aligned to the IAQM guidance.

Waste Management

- Details of waste management are include in section 11 of this CEMP.
- It is B+K policy to not permit the burning of any waste on site.

Operating vehicle/machinery and sustainable travel

- Site Logistics are detailed in section 10 of this CEMP.

Earthworks

- Due to scope of works ground will only be opened in phases to limit the size of exposed area reduce risk of dust.
- Due to site constraints stockpiling of materials will be very limited.

Trackout

- Site Logistic details are including in section 10 of the CEMP include measures to control mud on roads.
- Existing tarmac road will be utilized for construction vehicles reducing risk of mud tracking out of site

Demolition

- The use of water suppression in form of mist blowers or point source suppression will be utilised by demolition contractors, the use of a domestic hose pipe is not deemed suitable by B+K.
- All demolition works following soft strip will be by mechanical means only.
- Demolition will be by mechanical means only.

8. Vibration Management

8. Vibration Management

Introduction

Bowmer and Kirkland will seek to maximise any opportunities to influence the decisions made during the design stage of construction projects to reduce the levels of vibration leaving site or impacting on existing structures. Where possible, vibration will be minimised through design, specification and the use of alternative methods particularly where there are sensitive receptors adjacent to the works, e.g. schools, public areas, sites of special scientific interest (SSSI's) and listed buildings.

Vibration Risks

- High vibration levels over sustained periods can cause damage to buildings, roads and utilities.
- Lower vibration levels can cause nuisance to residents.
- Vibration may also cause disruption to wildlife and damage to geological and archaeological sites.

Evaluate the Potential for Vibration

- Some construction activities will cause significant vibration through the ground, e.g. piling, plant and vehicle movements.
- The transmission of vibration is highly dependent upon ground conditions, where there is underlying sloping hard strata this can transmit vibration underground undetected for several hundred metres until the strata is nearer the surface.
- Activities causing low levels of vibration could become significant in occupied buildings / work on party walls, e.g. power floating, minor demolition and strip out. This can become an issue for sensitive building occupiers, e.g. libraries, laboratories.
- Liaise with Regulatory bodies and other interested parties including Environment Agency, Canals and Rivers Trust, Network Rail etc (there may be time / seasonal restrictions).
- Monitor conditions before work starts for sensitive structures / neighbours

Construction Vibration Assessment Criteria - Overview

BS 5228-2:2009 'Code of practice for noise and vibration control on construction and open sites – Part 2', gives guidance on vibration levels that could be used to assess the likely impacts of construction activities, including piling, on the environment and people. The main vibration impacts could arise from piling activities or heavy construction vehicle movements near sensitive receivers (typically within 20m).

Annex B of BS 5228 Part 2 gives guidance on the significance of vibration effects in terms of human response to vibration and structural response to vibration.

BS5228 Part 2 Transient vibration guide values for cosmetic damage

Type of Building	Vibration Level 4 Hz to 15 Hz	Vibration Level > 15 Hz
Reinforced or framed structures Industrial	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Heavy commercial buildings		
Unreinforced or light framed structures	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 4 H z increasing to 50 mm/s at 15 Hz
Residential or light commercial buildings		

BS5228 Part 2 Guidance on Human Response to Vibration Levels

Vibration Level	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration
0.3 mm/s	Vibration might be just perceptible in residential environments
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation is given to residents
10 mm/s	Vibration is likely to be intolerable for any more than a brief exposure at this level

8. Vibration Management

Vibration Mitigation

Due to the soft ground foundations will be Continuous Flight Auger (CFA) or Controlled Modulus Columns (CMC) both methods use an auger with little to no vibration, under BS 5228 Part 2 the use of augured piles is a recommend mitigation for vibration, as a precaution the following will be implemented:

- Inform Neighbours - consult residents or businesses in the vicinity of the works to explain the type and duration of the works.
- Should complaints be received then B+K will assess the works undertaken and propose further suitable mitigations required, this may include were appropriate vibration monitoring.
- Consider vibration caused by plant and vehicles when establishing traffic management – early black topping / provision of engineered haul roads can significantly reduce vibration from traffic movements.

9. Surface Water Management

9. Surface Water Management

Surface Water Management During Construction

The management of surface water during construction will be dependant on the specific site factors. The table below identfies the sources of flooding risk and there impact on the site and if mitigation is required:

Source of Risk	Impact to Site	Risk	Mitigation Required
Ground Water	Ground water monitoring carried out, the nearest borehole BH12 located to the south recorded water levels on an average 1.4m AOD.	**Medium**	The dewatering of excavations >1.4bgl will require dewatering, the preferred method would be to discharge back to the same strata as an excluded activity. Clean water can discharge or ground to soak away where it will not cause any pollution or erosion issues. Abstraction rates will be limited to 100m3 per day on 6 mths as an exempt activity, any discharge will be to foul under a trade effluent consent only.
Fluvial Flooding	The site is predominantly within flood zone 1, with flood zone 3 being the drainage ditch to the west boundary.	**Low**	No further action
Pluvial Flooding	There are limited excavations planned, where rain water does accumulate that mitigation is required. .	**Medium**	Dewatering of excavation after rainfall events maybe required, this typically can be managed by removing silts and discharging to surface water under EA RPS 261 or small quantities this can be pumps to soft ground to soak away. For clean rain water via RVT Lamela Tanks (or similar) and discharged to surface water, the discharge must be un-contaminated and suspended solids removed (visible clear).
Sewers	The sewer network around the site may have limited capacity which could be exceeded in an extreme storm event.	**Low**	Monitor sewer levels in extreme storm events.

The following actions will be implemented to manage surface water during construction. The actions required will be dependant on the amount of rainfall / groundwater that the site will be subject to.

- Low rainfall (normal weather) - site will experience normal rainfall that results in some rainwater collecting in excavations.
- Medium Rainfall (yellow/amber weather warning) - The amount of rainfall is prolonged, with open ground being waterlogged that will reduce the effectiveness of dewatering to soakaway.
- Heavy Rain Fall (red weather warning) - significant rainfall that will cause high levels of surface water on site.
- Groundwater - Dependent on presence of ground water abstraction permits maybe required.

Source	Method for Dewatering 1. On to open ground	2. Direct to SUDS	3. Discharge to Surface Water	4. Discharge to Foul Sewer
Low (Normal weather)	Yes	Yes	Yes (comply with RPS261)	Temporary Discharge Consent Required
Medium Rainfall (yellow warnings)	Yes	Yes	Yes (comply with RPS261)	
Heavy Rainfall (amber / red warnings)	Yes	Yes	Yes (comply with RPS261)	
Groundwater	Were suitable and drinking water quality	No	Yes limits an daily volumes without EA permit	

9. Surface Water Management

Dewatering Activities during Construction

The following defines the activities that can be carried out for the control of surface water during construction. The method used will be determined by the source and extent of water onsite.

Activity	Permit	Amount of water	Actions
1. Discharge off site - Clean Rainwater (eg roofs pile caps)	No	Low Volume	Early works to attenuation tanks and drainage runs will allow the connection of clean rain water from roofs that is permitted to be discharged direct to surface water systems. This will reduce the amount of surface water on site during construction.
2. Dewatering rain water to soak away on site.	No	Low Volume	The dewatering of rainwater from construction areas can be carried out effectively by pumping to a designated soak away area on site that will not pose a risk, this is the normal preferred method to eliminate need to discharge offsite.
3. Dewatering of wholly or mainly rainwater to a watercourse.	RPS	Medium/High Volumes	Excavations can be dewatered direct to surface water system under the Environmental Agency Regulatory Position Statement 261 for "*Temporary dewatering from excavations to surface water*" a permit is not required If: • A short term (max 3 months), temporary discharge of uncontaminated water which is wholly or mainly rainwater, from an excavation to surface water (such as pumping water out of excavations on a building site) • Comply with all the conditions in this Regulatory Position Statement (RPS 261) - **See page 28**
4. Discharge groundwater to soak away. .	No - Exempt Activity.	Medium/High Volumes	Discharge groundwater that meets drinking water quality standards onto ground when: • Discharge activity is temporary and is for a maximum duration of 30 consecutive days • Quality of the groundwater is either naturally at drinking water quality standards, or is groundwater of mains quality that has been treated to drinking water quality standards • Location (ground) where the discharge is to occur is free from any obvious sources of contamination • Volume and rate of discharge will not cause pollution or any other adverse environmental impacts, including flooding, to the underlying groundwater or any adjacent surface waters or habitats.
5. Dewatering excavations of groundwater for discharge to a watercourse. (>6mths)	Permit	Medium/High Volumes	The dewatering of groundwater from excavations that is to be discharged off site via watercourse or foul. • No exemption or permit required for <20m^3 per day • Exemption (schedule 5) with regards the abstraction of up to 100m^3 per day. • Temporary abstraction licence >100m^3 per day • Discharge to foul will require separate consent. **See page 28 & 29 for Requirements.**
6. Discharge Silty Rainwater to foul.	Yes	High Volume and Contaminated Water	Foul/combined sewers can be used for the discharge of dirty water, this will be under a trade effluent consent and treatment prior to discharge would be required such as reduction of suspended solids. Discharges to foul will be restricted including contamination levels (suspended solids) and flow rate, a discharge rate of 3 to 5 litres per second is the norm this will be defined in the consent. **See page 29**
7. Removal of contaminated water as waste	Waste Disposal	Contaminated Water	The management of contaminated water may be required to be removed by tanker from site. This is often used for remediation of contaminated land, where it is not permitted to be discharged to foul to due the contamination levels.

KEY:	Applicable to Site	Suitable to Site	Optional to Site	Not Applicable

9. Surface Water Management

Permit Requirements for Dealing with Groundwater

The dewatering operation may abstract water from the ground and produce trade effluent to be discharged. Both of these operations have the potential to require licences/permits by the regulatory framework. Licences required will depend upon the quantities produced and where the trade effluent is discharged to.

Abstraction of Ground Water

An Environmental Permit is generally required for all abstractions that withdraw >20m^3 of water per day. However, small scale dewatering of construction sites is excluded from Environmental Permitting and therefore does not require a permit or exemption to be registered. Small scale dewatering is considered as temporary abstractions providing it is not going to continue for >6 months and the water is immediately discharged to foul or surface water of upto 100m^3 per day or 50m^3 should there be an abstraction point within 250m or Wildlife site within 500m downstream.

Where abstracted ground water is put straight back into the same strata this is an excluded 'de-minimis' activity and will not require a an EA permit.

The timeframe to obtain an abstraction permit is circa 12 months the cost depends on the type and source of abstracted water, a groundwater risk assessment would be required.

Discharge of Ground Water

An Environmental Permit is generally required for ground water activities including discharge. However, 'de-minimis' activities are excluded from Environmental Permitting and therefore do not require Permits or exemptions to be registered. Recirculation of water back into the same strata is considered as 'de-minimis' providing it is of natural background quality and is unaltered.

A discharge permit will be required for volumes discharge to surface water exceed 5m^3 per day.

Discharged to foul will be under a Temporary Trade Effluent Consent with the relevant sewer undertaker, discharge rates will be defined within each consent based on the capacity of the foul, this is typically between 3 to 7 Litres per second, when discharging to foul a Groundwater discharge permit is not required.

Small volumes of clean ground water can be allowed to soak away onto ground as long as that discharge does not cause further impacts.

Licencing Summary Table				
	Licence Required			
Likely Dewatering Scenarios [+]	Abstraction (EA Permit)	Groundwater Discharge	Surface Water Discharge	Trade Effluent
Abstracted water is discharged directly back into the same strata	No	No	No	No
Abstract water and discharged to surface water or foul at <20 m^3 / day.	No	**Yes**	**Yes**	**Yes**
Abstracted water is discharged into different strata with <100 m^3 / day	No	**Yes**	No	No
Abstracted water is discharged into different strata with >100 m^3 / day	**Yes**	**Yes**	No	No
Abstracted water is discharged into Surface Water with <100 m^3 / day	No	No	**Yes**	No
Abstracted water is discharged into Surface water with >100 m^3 / day	**Yes**	No	**Yes**	No
Abstracted water is discharged into foul sewer with <100 m^3 / day abstracted	No	No	No	**Yes**
Abstracted water is discharged into foul sewer with >100 m^3 / day abstracted	**Yes**	No	No	**Yes**

[+] Assumes discharge is < 6 months in duration and discharge is of natural background quality and untreated

9. Surface Water Management

RPS 261 Temporary dewatering from Excavations to Surface Water (Regulatory Position Statement)

When discharging clean rainwater (wholly or mainly) to surface water systems the following must be adhered to in accordance with the Regulatory Position Statement.

The discharge must:

- discharge only uncontaminated, clean water
- discharge only to surface water
- discharge for no more than 3 consecutive months
- plan how to minimise the level of contaminants such as silt entering the excavation
- plan how to dispose of water that enters the excavation
- plan not to use machinery in excavations while dewatering is taking place
- minimise water entering the excavation, for example from rainfall, runoff, groundwater ingress or high water table
- consider using sustainable urban drainage construction methods
- have a method statement that minimises the risk of pollution
- contact the Environment Agency if your discharge rate is more than 10% of the dry weather flow (Q95 low flow) rate of the surface water and dilution is low – a high discharge rate may increase flood risk or have other local environmental consequences
- keep records for 2 years that show you have complied with this RPS and make these records available to the Environment Agency on request.

The discharge must not:

- pollute surface water
- contain any chemical dosing agents, flocculants or coagulants
- be from a site which is contaminated by oil, metals, hydrocarbons, solvents or pesticides or other polluting substances
- result in the spread of non-native invasive species, parasites or disease
- cause flooding from surface water
- cause erosion of the banks or bed of the receiving watercourse
- contain concrete wash water even if it has been treated
- contain site drainage from surface areas such as haul roads, storage or working areas
- be from a site with naturally elevated concentrations of substances which exceed environmental quality standards

Before starting work on site:

- plan how to minimise the level of contaminants such as silt entering the excavation
- plan how to dispose of water that enters the excavation
- plan not to use machinery in excavations while dewatering is taking place
- minimise water entering the excavation, for example from rainfall, runoff, groundwater ingress or high water table
- consider using sustainable urban drainage construction methods

The discharge must not be located within, or less than 500 metres upstream of:

- Sites of Special Scientific Interest (SSSI)
- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)
- candidate SACs, possible SACs, potential SPAs and sites of community importance
- internationally designated Ramsar sites
- other nature conservation sites, such as ancient woodlands, local and national nature reserves
- local wildlife sites

A bespoke permit will be required where the conditions in the RPS can not be achieved.

9. Surface Water Management

Discharge to Foul / Combined Sewer

All discharges to a foul / combined sewer will be defined as a trade effluent and will require a Trade Effluent Consent from a sewerage undertaker. Due to the market being opened up to competition, these should be applied for through a 'Retailer', this can delay the application process.

Discharge to foul, will include specific requirements that will be defined by the local water authority. Trade Effluent Consents normally take around 4 – 6 weeks to grant, these are less likely to be granted during periods of heavy rainfall.

To apply for a Trade Effluent Consent you will need the following information:

- The source of the trade effluent
- Any treatment processes that will be applied.
- The amount of water that will need to be discharged (volume per day and maximum flow rate)
- Any known contaminants that will be in the trade effluent (for ground water refer to SI)
- The drain which you want to discharge to and how the amount discharged will be measured

The Trade Effluent Consent will apply limits to what can be discharged, these will normally be:

- Maximum quantity discharged in 24 hour period (typically 50 m^3 – 150 m^3)
- Maximum flow rate of discharge (typically 2 l/s – 5 l/s)
- Amount of suspended solids (typically 200 mg/l – 1,000 mg/l)
- No hydrocarbons (oils)
- Limits on any known contaminants

The discharge needs to be sampled and monitored to ensure the limits are adhered to as follows:

- Discharge quantity must be measured, usually by a water meter, and volumes given regularly to the sewerage undertaker (they will use this information to charge for the discharge)
- A sample must be taken and tested by a UKAS laboratory against the limits of the Trade Effluent Consent before any water is discharged
- Regular sampling may be required (frequency to be agreed with sewerage undertaker)
- Before each discharge a sample should be taken and assessed for visual clarity (see below)

If there are no known contaminants then visual monitoring for suspended solids and oil is acceptable using the following procedure:

- Take photograph of sample(s) sent to UKAS laboratory against a surface of regular colour (e.g. wall of site cabin) – this is used as a controlled sample
- Take photograph of sample(s) before discharge in sample bottle of same dimensions against the same surface as the control sample
- Compare the photographs of the current sample and control sample
- If the current sample is lighter than the control and there are no visible signs of oil then discharge can commence

9. Surface Water Management

General Mitigation:

Excavated ground and exposed ground

Due to the on-going nature of the work it is generally not possible to protect exposed surfaces until the project is completed. That said there are measures that can be adopted to mitigate contamination / sedimentation referred to below.

The following mitigation can be used to protect from runoff during construction:

- Gulley Guards - These will be placed in all existing gulley's that could receive surface water run off and from tracking out. The guards will be inspected daily and cleaned as appropriate to ensure that silt or debris collected in the guards do not impede the flow of water into them
- Use of silt doctors to dewater rain water from open excavations.

Stockpiles

Stockpiles will be located away from existing drainage points to prevent the leaching of contaminants.

- Seeding of stock piles can significantly prevent silt runoff once grass has established.
- Sheeting of stockpiles can reduce dust and protect from heavy rain fall and run off.
- Keep stock pile levels low to reduce impact from wind.
- Use of cut of trench's or earth bunds to prevent surface water runoff.

Existing access ramps & roads

Haul roads (including roads that are in process of construction partially sealed) will be sprayed regularly to keep down dust. If any section of a haul road is hard surfaced, then it will be swept on a regular basis to prevent accumulation of dust and mud.

Once constructed, there could be a residual risk of silt run off from haul roads and stone surfaces. These risks will be controlled by;

- Constructing suitable channels on haul roads to channel water away from any watercourses, surface drains, or green areas.
- Regular environmental inspections of these areas to ensure controls are effective.
- Suitably sized spill kit will be available with spill action plan.

Wheel Wash

A jet wash will be located at the site exit as well as road sweepers being used (see details in section 10)

Oils and Hydrocarbons

Simple measures can be taken to prevent oil and hydrocarbons becoming pollutants, such as:

- Maintenance of machinery and plant
- Drip trays
- Regular checking of machinery and plant for oil leaks
- Correct storage facilities
- Check for signs of wear and tear on tanks
- Care with specific procedures when refuelling
- Designated areas for refuelling
- Emergency spill kit located near refuelling area

Weather / Storm

Weather warnings allow preparation time before any significant rainfall event, weather conditions are reviewed on a weekly basis for the planning of works:

- Early connection of roof outlets to surface water drainage system for discharge off site, will reduce the amount of rainwater impacting the ground.
- Stockpiles of stone and aggregates will be located as far as practical away from surface water drains. Ideally this will be on level ground.
- Fuel and COSHH substances will be stored in a designated area. They will be in double bunded units with 110% capacity and appropriate spill kit. The designated area will be 10m away from any watercourses, surface water drains.

Concrete wash out

Simple measures can be taken to ensure no concrete wash out pollutes the ground around:

- Discharge of water into a lined or proprietary concrete washout system, that is the most preferred due to reduced water usage and construction waste.
- Concrete washout skip (least preferred) is to be placed in it’s own bunded area.
- Sediment skip positioned within a larger skip (to act as a dual slit trap & bund)

10. Construction Logistics

B+K

10. Construction Logisitics

Site accommodation will be located in suitable position for the construction phase. The main site access will be off Fiddlers Green Lane (see full site phasing plans see **Appendix B**).

Due to the site location solid hoarding will be required to public areas. Public interface will be solid hoarding, Heras fencing any also be used (see full site phasing plans see **Appendix B**).

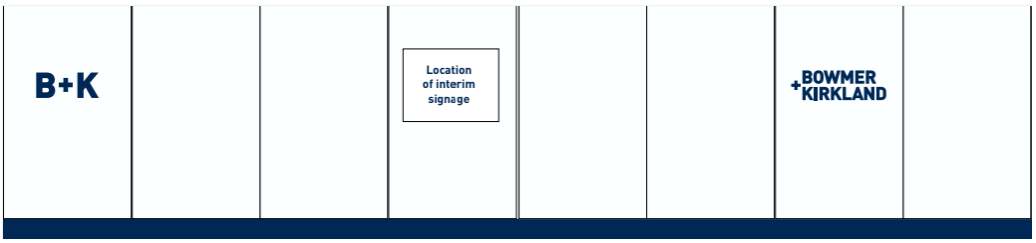
All site fencing including site boundary will be inspected on a daily basis by B+K Site Management and records maintained.

Site Security

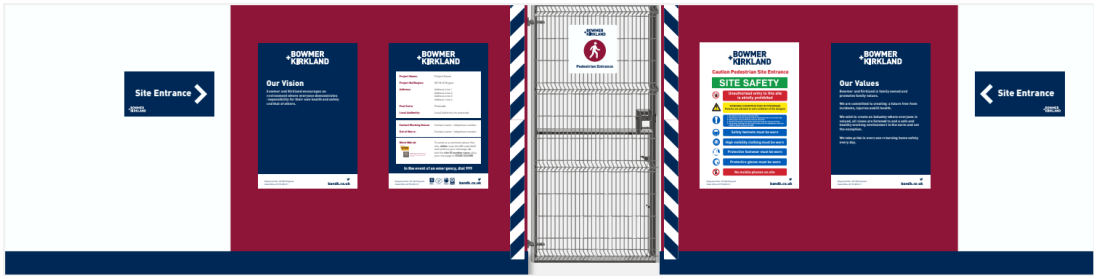
Site Gate's will be manned at all times throughout the construction period to ensure minimum impact to local highways and service yard for deliveries in accordance with the working hours.

The Site will be secured at all times. A separate pedestrian access gate will be provided. Access to site will be controlled via biometrics turnstile control.

B+K Standard Hoarding Design



B+K Standard Pedestrian Access gate



Representative example of B+K Site Entrance.

10. Construction Logisitics (continued)

The Gate Cabin will be the focal point for all vehicles entering / leaving the site. This will be the operational base for our security personnel who will manage access and egress from the site alongside the biometric system.

In order to reduce disruption to neighbouring businesses and residents during the construction periods we will take several steps to ensure as little impact as possible on the roads surrounding the site. These will include the following.

- All subcontractors will be advised of the requirement for site tidiness, and enforcement of this rule will take place.
- Newsletter drops to local community informing of progress and planned works.
- Should any complaints arise, they will be dealt with promptly and courteously, and suitable compromises agreed wherever practicable, subject to the normal restrictions of construction sites, (see Complaints Procedure, page 6)
- B+K Staff and Visitor parking will be provided on site (see **appendix A)**
- Operative parking will be provided on site on site.
- Minimise the accumulation of loose materials on site road by regular sweeping.
- Ensure bulk deliveries/collections are sheeted (where appropriate).

Due to retention of tarmac surfaces for as long as possible within the programme, there will be limited movement of vehicles onto exposed ground, as such will reduce the risk of mud tracked onto the surrounding roads to reduce this impact the following methods can be used:

1) A jet wash will be located at the site exit, for large number vehicle movements dry shaker ramps can be an effective, where there is suitable space on site to be installed.
2) Gully Guards (or similar) can be used to protect existing road gullies from silt, and will be subject to regular inspections. These will be checked daily during wet weather periods.
3) Road sweepers will be used to keep the access roads clear, the table below is a general guide, frequency can also be increased or reduced based on site inspections and conditions, based on proposed works that is limited excavations with loading and unloading of existing hard surface areas the table below is for precautionary measures.

Weather	Activity	Frequency
Dry	Construction	Not required
Damp	Construction	Twice daily
Wet	Construction	4 times per day
Wet	Muck shift	With every HGV leaving site

Storage of Materials

The storage of materials will be provided in areas suitable during each phase of works. A lay down and storage are is also located within the site compound (see **Appendix A**)

Site Welfare

Site welfare (See **Appendix B**) will be provided using either 24x9, 24x10 or 34x10 Portakabin Pacemaker / Solus units that may include:

- Offices,
- Meeting Rooms
- Canteens
- Drying Room, Toilet / Kitchens
- Fire Rated Units, Stores, Gatehouses
- Staircases
- Waste Tanks
- Toilet Platforms and Steps
- Site Generators

Delivery Restrictions

All construction deliveries will be undertaken during the normal working hours, the only exception to this will be for construction critical deliveries such as concrete that may impact the working hours.

Vehicle Dwell Times

Construction delivery vehicles are not anticipated to be required on-site for a period longer than necessary to safely unload, depending on materials being delivered or collected. B+K use a Delivery Management System that requires all deliveries to be pre-booked into to site to allow sufficient times between deliveries to ensure that no vehicles arrive or depart at the same time, to minimise potential disruption to traffic flow on the surrounding local highway network.

Vehicle Compliance

Construction or delivery vehicles must not be parked on any street within the close proximity of site or stop on the access road. The vehicles must not wait or idle-run in the area in order to reduce congestion and vehicle emissions.

Logistics Route

Construction traffic would use strategic roads to access and egress the site as far as possible. Each of these roads are designed to carry high volumes including construction vehicles.

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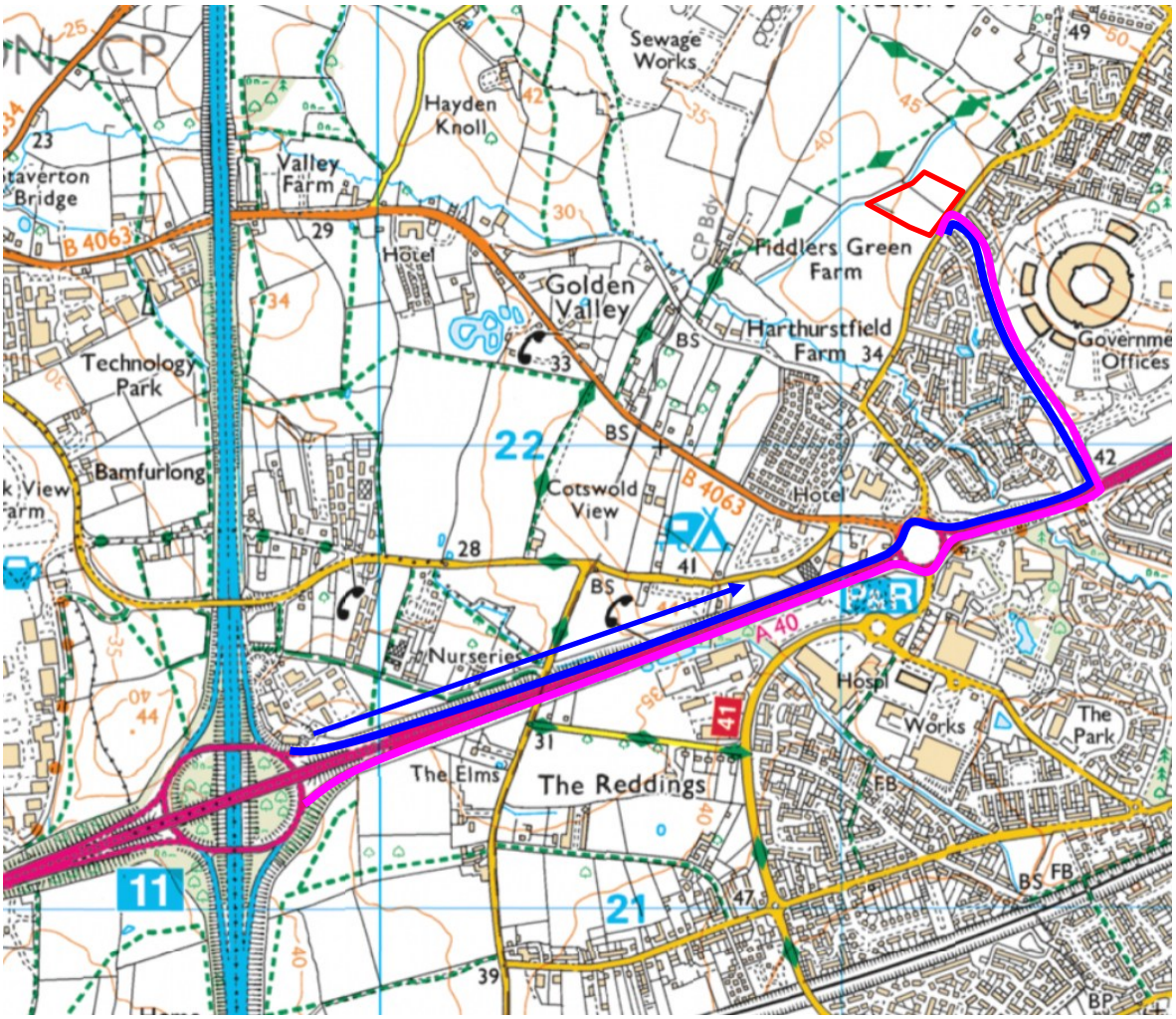
Primary Route (Blue Route)

From M5, Jct 11, at Golden Valley Jct, take the exit for the A40/Cheltenham/Gloucestershire Airport, at Arle Court Roundabout take the 3rd exit onto Gloucester Rd/A40, at the traffic light junction turn left onto Telstar Wy, at the junction with Fiddler Green Lane turn left, the site entrance will be on the right

Route From Site (Pink)

The route from site will be the reverse of the route to site, head down Telstar Way and then follow signs for M5.



Construction Vehicle Movements

The following table details the typical “Large Construction Vehicles” that may be required on site, these numbers will be dependant on the phase of works being undertaken., the numbers stated are indicative of the potential number of vehicle movements and will vary depending on construction programme phasing throughout the project.

For the avoidance of doubt, “Large Construction Vehicle” will be defined as any vehicle larger than a long wheel base transit type van (length 4.1m, width 1.7m, height 1.8m, payload 1200 – 1500kg). Vehicles below these specified dimensions will be defined as “General Construction Vehicles”.

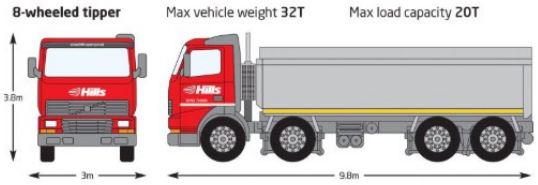
Frequency of Large Construction Vehicles

Construction Activity	Type of Vehicle	Size of Vehicle	Number of Movements (Daily)	Duration
Working Platform	8 Wheel Tipper	10m x 2.5m	40[(1)]	Short
Foundations - Concrete	Concrete Mixer	7.5 x 2.5m	10	Medium
Floors Slabs	Concrete Mixer	7.5 x 2.5m	10	Medium
Superstructure - Steel	Flatbed	16m x 2.5m	6	Long
Roofing	Flatbed / Articulated	16m x 2.5m	5	Medium
Façade	Flatbed / Articulated	16m x 2.5m	7	Long
Building Services & Fit Out	Rigid (<26 ton) / Hiab	12m x 2.5m	20	Long
Landscaping	8 Wheel Tipper / Hiab	10m x 2.5m	3	Short

[(1)] dependant on volume import an distance for material source.

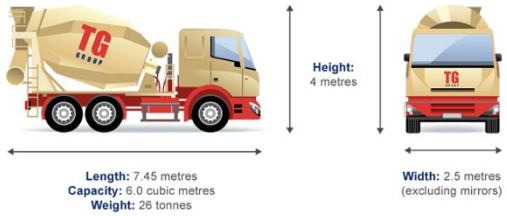
Types of large construction vehicles:

8 Wheel Tipper



Rigid (<26 ton)

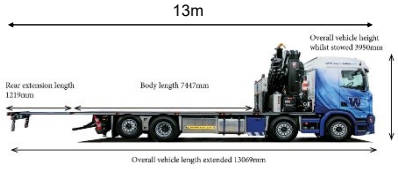
Concrete Mixer



Articulated

Flatbed

Hiab



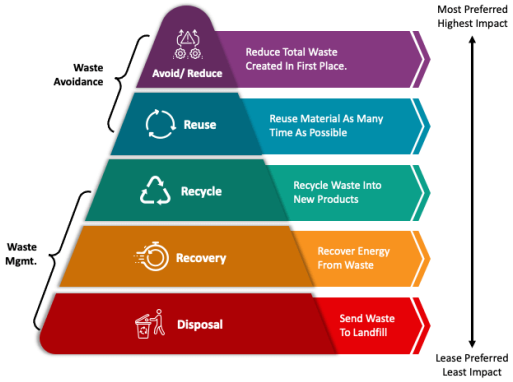
11. Waste Management

11. Waste Management

Bowmer and Kirkland will record all waste generated on site in a SWMP, this will be used to report on the performance of waste management on the site.

Waste Hierarchy

Bowmer and Kirkland will manage waste and develop the SWMP in accordance with the waste hierarchy. Specifically, the amount of waste produced will be minimised by consideration in development of the design and, where produced, will be reused before recycling / disposal options are considered.



Prior to Work Commencing on Site

A project specific Environmental Impact Assessment (EIA) will be undertaken by the construction management team. This assessment will embrace any specific site needs/requirements identified by the team in connection with waste management issues including any existing or generated hazardous material.

A Site Waste Management Plan (SWMP) will be prepared to enable a considered, documented approach to the management of waste on the project, this will include the Planning and Review of waste management for the project.

The person responsible to implement the SWMP is to ensure all relevant B+K personnel are aware of their duties before and during the project.

All Sub-contractors are informed of their general duties under the SWMP during pre-contract meetings and are required to sign up to the SWMP as part of the meeting.

Site Welfare (non-construction waste)

All waste from site welfare will be separated on site and collected separately as:

- Food waste
- Dry Recyclable (glass, metal, plastic & paper/card*)
- General waste

* paper and card combined based on waste contractors written assessment.

Construction Waste

All site operatives will receive an induction on how waste is to be managed on the project before starting work on site, further toolbox talks are to be provided to operatives as required to meet the requirements of the SWMP:

- The site plan is to be updated to include provisions for access, materials storage and location of waste storage areas and containers ensuring minimal damage to materials by excessive handing and inappropriate storage.
- All skips and containers are to be colour coded or signed in line with the national colour coding scheme.
- Site security is to be provided to ensure waste is not removed by unlicensed contractors or contaminated by other waste producers.
- Duty of care checks are to be conducted on all waste management companies before they are permitted to take waste off site ensuring they are licensed to deal with type of waste being sent
- Hazardous waste is to be segregated and stored adequately to prevent contamination.
- Plasterboard and gypsum is to be segregated on site.

Copies of all waste transfer notes and hazardous waste consignment notes are immediately reviewed by the B+K site management team and kept within the SWMP.

11. Waste Management

Disposal directly to landfill sites is generally to be avoided, waste is segregated on site and sent to a transfer station to recover as many reusable or recyclable materials as possible. Where segregation is not possible an agreement with the waste management contractor is to be made to treat the waste in accordance with the landfill regulations, it is B+K policy to achieve at least 95% diversion from landfill.

Records of all waste removals are recorded in the SWMP, this is by inclusion of the waste transfers note or hazardous waste consignment note within the SWMP and inputting of date into the SWMP spread sheet tool.

Regular reports are to be obtained from waste management contractors, these would normally include actual weights received, amount of waste recycled or recovered and amount of water sent to landfill.

The SWMP is to be reviewed on a regular basis by the person responsible for the SWMP to ensure it is up to date and effective. The results of these reviews are discussed with the B+K site management team during internal project review meetings to identify areas for improvement. Any actions agreed during these reviews are communicated externally to the sub-contractors and/or other parties where relevant.

Waste from construction activities will be disposed through an appointed waste management contractor, appointment will be on the basis of their performance of diverting mixed waste, from landfill by the following principles will be employed:

- Pollution from waste will be minimised by using the correct and safe storage of the waste.
- Segregation of different types of waste as they are generated.
- Marking of waste containers clearly with their intended contents.
- Using containers suitable for their contents.
- Disposing of different wastes in the correct containers.
- Checking the condition of waste containers before use.
- Placing containers in impervious bunded areas (if required)
- Ensuring that containers are securely covered (If required)
- Preventing damage to materials during storage

Excavation Waste

Where suitable soils will be retained for reuse on site, this will depend on:

- Cut and fill balance
- Contamination
- Geo-technical suitability

Where made ground or contaminated soils are present a Materials Management Plan under CL:Aire DoWCOP will be used to plan, monitor and report on the re-use of excavated soils on site to ensure that legal obligations are fully complied with.

Clean natural occurring materials are exempt under the Waste framework Directive, article 2 and are not designated a waste where the can be re-used on the site of production in the same state as excavated until they are intended to be discarded.

Where excess soils are be removed from site this will be an appropriately licenced disposal site for re-use off site, such as landfill engineered fill.

Concrete excavated materials or demolition waste crushed on site will be in accordance with the WRAP Quality Protocol for Aggregates which will allow for the re-use of crushed material as it will no longer be designated as a waste. Any excess crushed material can be removed from site as a none waste for re-use offsite.

Duty of Care

Prior to removal of any waste from site Bowmer and Kirkland will carry out the following Duty of Care checks:

- Valid waste carrier's licence
- Ensure the waste carrier is authorised to carry the type of waste for disposal.
- Obtain details of waste disposal sites and verify the waste disposal licence in place.
- Carry out checks of carriers and disposal sites with the Environment Agency Public Register.

Once the checks are completed Bowmer and Kirkland will:

- Maintain records of waste transfer and record in Smartwaste
- Keep copies of all transfer notes of waste sent off-site.
- Check that the waste is going to the correct disposal centre as documented on the transfer notes.

11. Waste Management

Waste Targets

The following waste targets have been calculated based on historical B+K waste data for:

Mobility Hub (19,821m^2) Distribution Project:

Construction Waste Forecast	Target Construction Waste (Tonne)	Target Construction Waste (Tonne) per 100m^2
Top Quartile Performance	368	1.9
Average Performance	614	3
Bottom Quartile Performance	859	4.3

CIC (15,247m^2) Commercial Project:

Construction Waste Forecast	Target Construction Waste (Tonne)	Target Construction Waste (Tonne) per 100m^2
Top Quartile Performance	336	2.2
Average Performance	560	4
Bottom Quartile Performance	784	5.1

Waste Types

The following waste types are typical within a construction project, forecast tonnes are based on historical data of a structural steel frame construction.

EWC code	EWC description	Tonnes Forecast Mobility Hub	Tonnes Forecast CIC
17 01 07	Mixed Concrete, Bricks & Tiles	10	8
17 02 03	Plastic (excluding packaging waste)	10	8
17 02 01	Timber	36	30
17 04 07	Mixed metals	33	28
17 05 04	Soils and stones (non-hazardous)	0	0
17 06 04	Insulation materials (non-hazardous)	5	4
17 08 02	Gypsum-based construction materials	125	100
17 09 04	Mixed construction and demolition wastes (non-hazardous)	493	368
15 01 06	Packaging materials	16	15

12. Implementation and Review

B+K

12. Implementation & Review

The control measures identified in the CEMP, and sub-ordinate documentation, will be implemented by the following means:

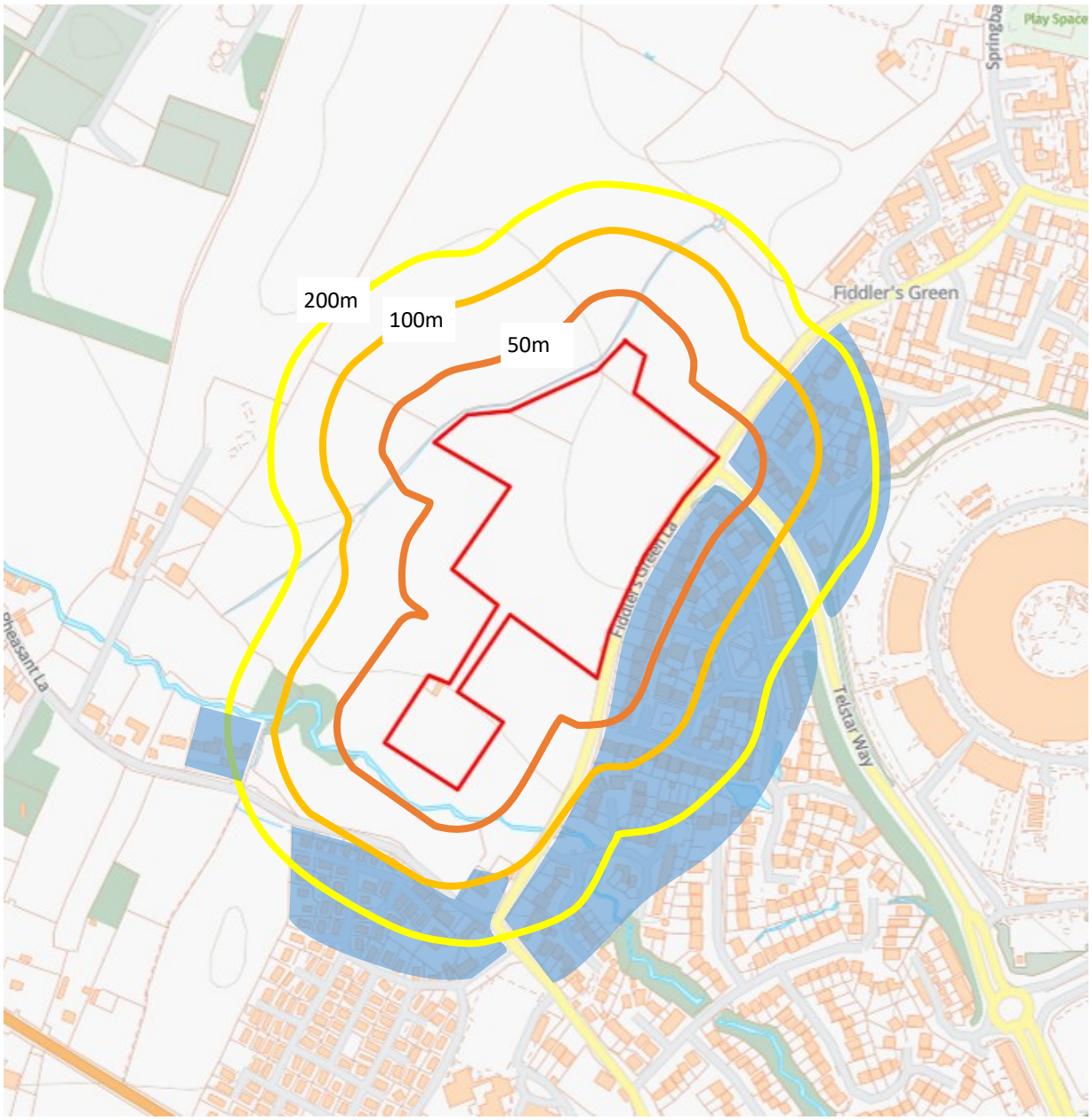
- Relevant information will be communicated to sub-contractors before an order is placed during a pre-contract meeting. An order will only be placed with a sub-contractor following a commitment that they will work to the control measures specified. Where they are required to appoint specific plant, equipment or specialist resources this will be stated in their contract.
- Sub-contractors will be required to submit a detailed method statement for all works they undertake stating detailed control measures. This will be reviewed and authorised by the Site Manager prior to the commencement of operations.
- All sub-contractors will be required to monitor their own works and provide a permanent on-site Supervisor. Where many operatives are provided Supervisors will be required at a ratio of 1:8 with site operatives.
- All operatives, supervisors and managers have to undertake a B+K site induction prior to being allowed onto site to visit or to work unaccompanied and registered on the Biosite System. This takes the form of an online pre-induction during which they enter details of their experience, competency cards, etc and undertake a brief H&S questionnaire.
- On arrival a site specific orientation induction is carried out by B+K Site Management including site location, details of welfare, office and muster points, a detailed overview of the project, risks, hazards, rules, details of any contamination or hazards, mitigation measures, etc. once completed they will be added to the Biometics system for site access.
- The Site Managers will walk the site daily to monitor the works and implementation of the specified controls. Where actions are required to further implement controls these will be raised with the sub-contractor's supervisor. If required they may use a red / yellow card disciplinary and or toolbox talks to improve the implementation of the specified controls.
- Any incidents or visits from regulators will be reported to the Environmental Manager by the Site Manager as an official visit.

In addition to the monitoring described, the implementation and effectiveness of controls will be reviewed as follows:

- The Site Manager will conduct an inspection on general good order and security on a daily basis.
- The Site Manager will conduct an inspection of all environmental controls on a fortnightly basis, this will be alternated with the external inspection described below.
- RG Wilbrey Consultants will conduct an inspection of all environmental controls on a fortnightly basis.
- The Contracts Manager or Regional Director will conduct an inspection of environmental controls on a monthly basis.
- The Environmental Manager will ensure the project will be audited for compliance with our Environmental Management System, controls which have been specified and legal requirements at least once during the project.
- A project meeting will be held on a monthly basis, to be attended by the Site Project Team, to review the results of the above monitoring and inspections. The effectiveness of the specified controls will be considered and any actions required to improve the overall environmental performance of the project agreed and documentation updated accordingly.

Appendix A
Sensitive Receptors

Appendix A - Sensitive Receptors



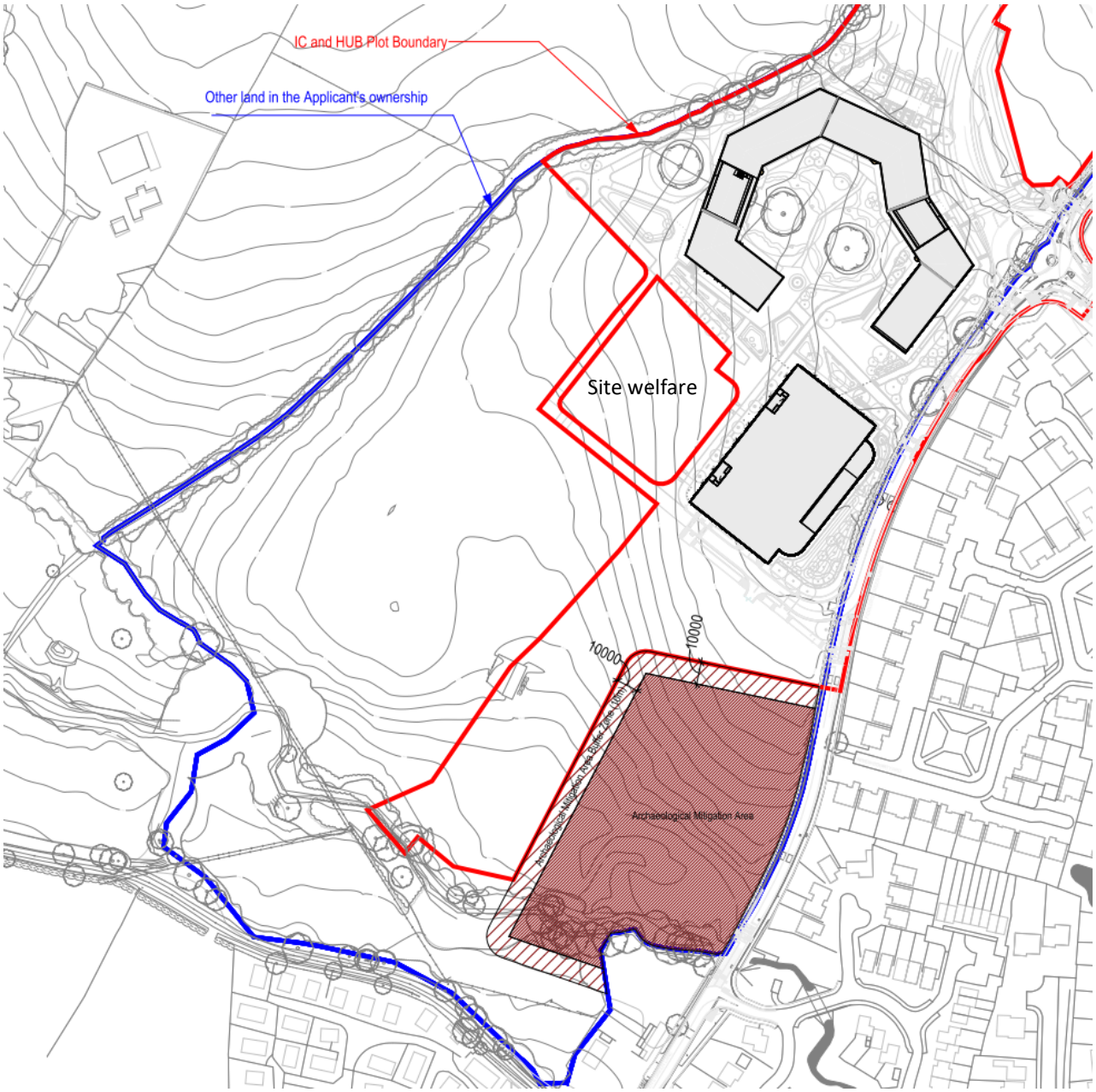
Legend

Residential

Watercourse

Appendix A - Sensitive Receptors - Trees Protection

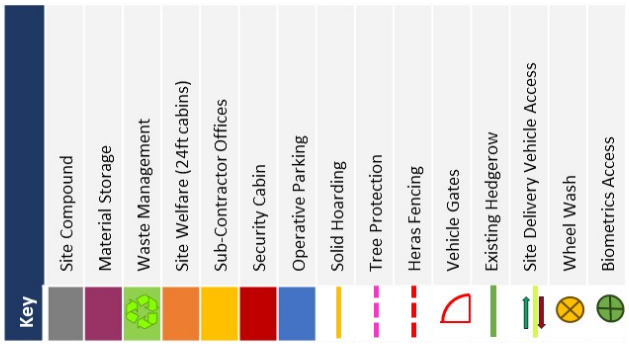
Appendix A - Sensitive Receptors - Archaeology Exclusion Zone



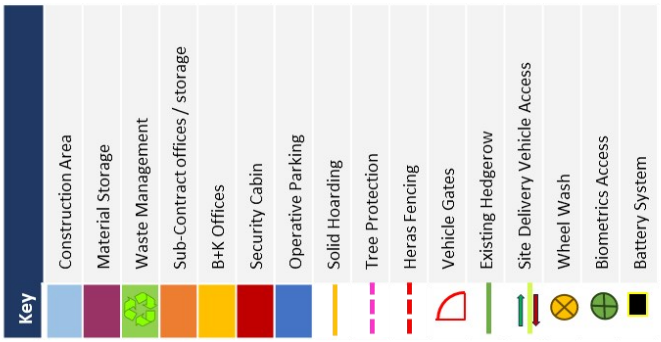
Appendix B
Site Logistics Plans

B+K

Appendix B - Site Logistics Plan



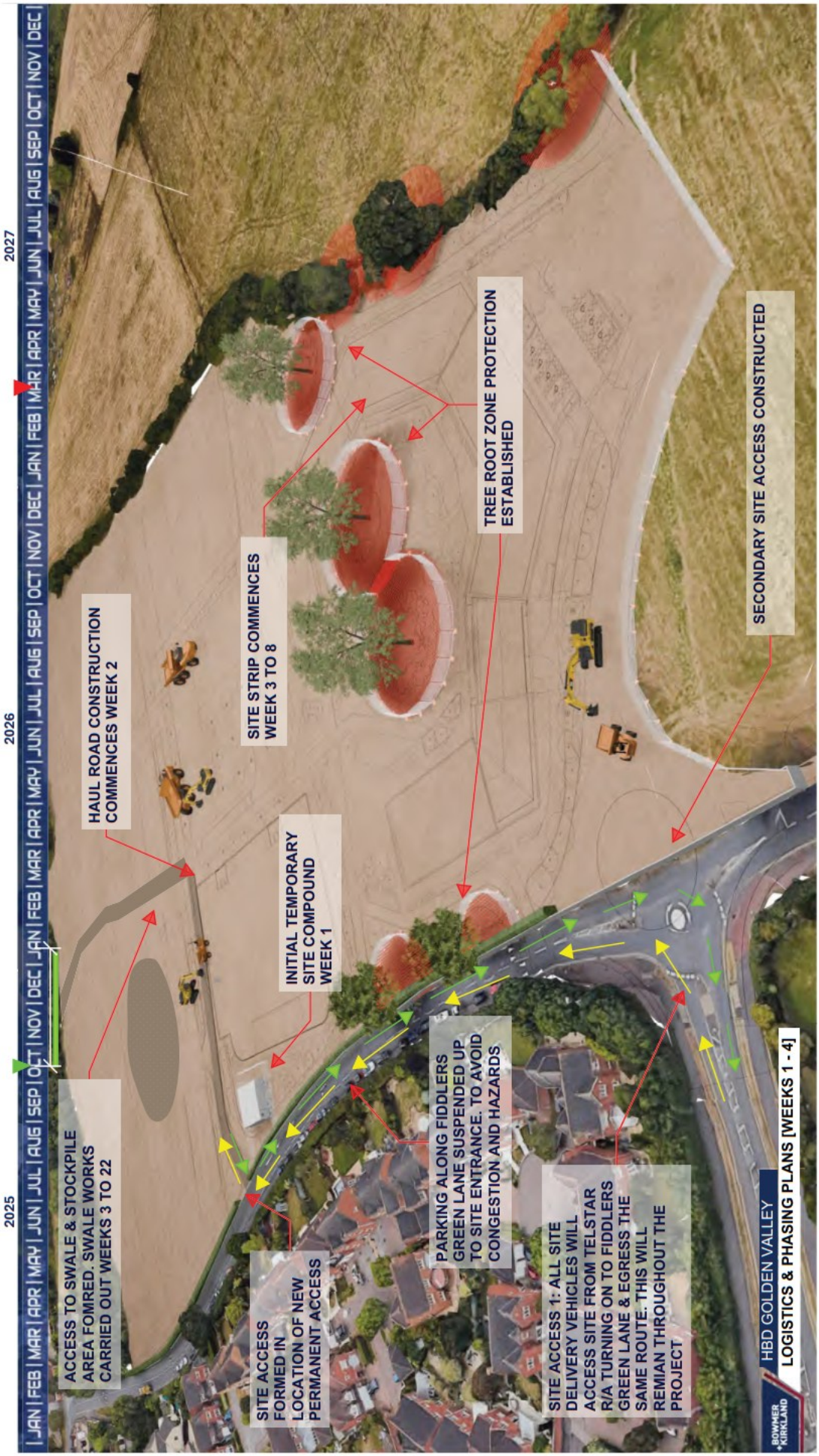
Appendix B - Site Logistics Plan



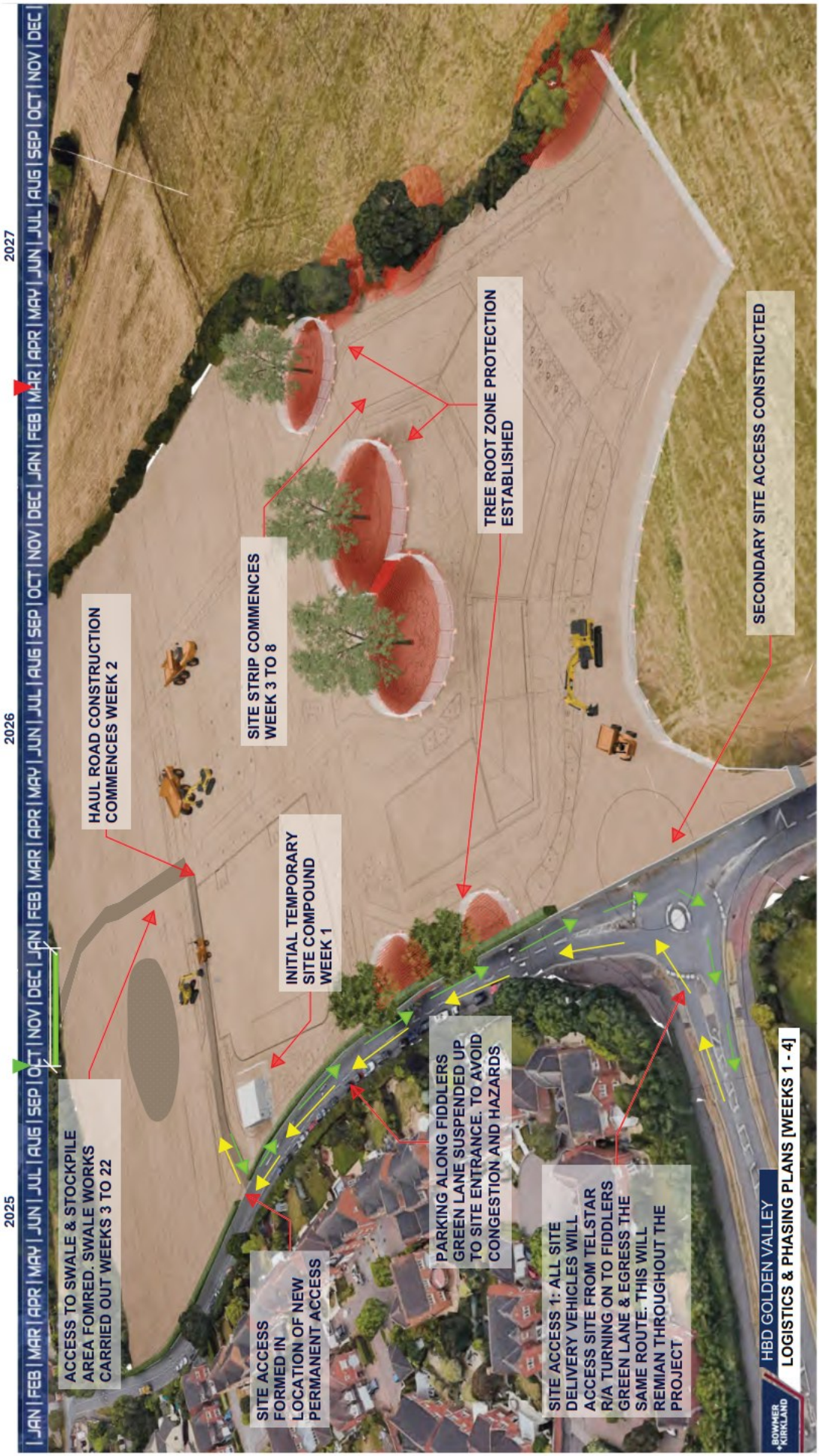
Appendix A - Site Logistics Plan—Root Protection.

Root Protection mats - Stock Image

Appendix A - Site Logistics Plan



Appendix B - Site Logistics Plan



Appendix B - Site Logistics Plan

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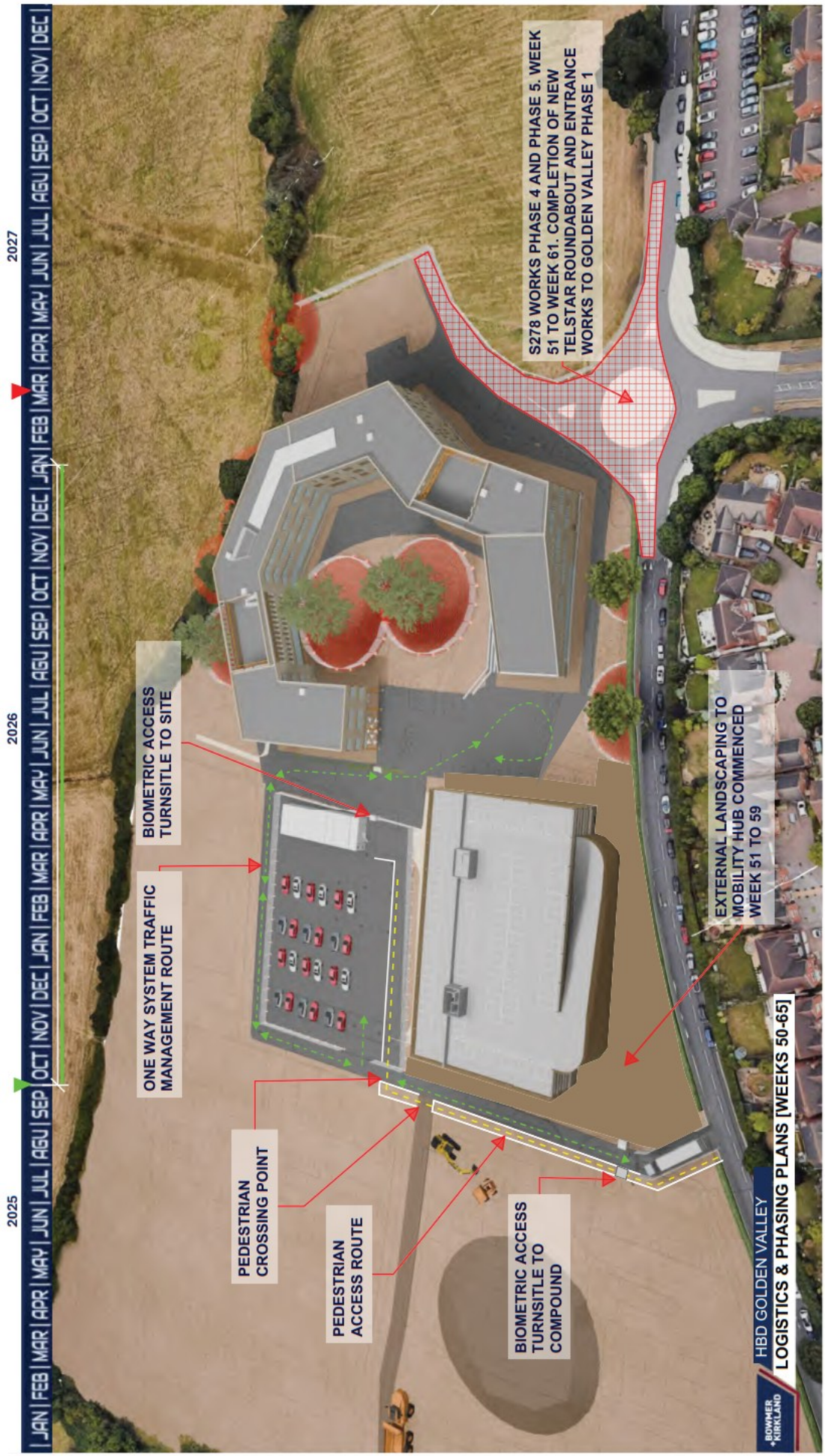


Appendix B - Site Logistics Plan

Appendix C
Quality, H&S and Environmental Policies

B+K

Environmental Policy

Bowmer + Kirkland Limited and its subsidiaries (the Group) are committed to promoting the conservation and sustainable use of natural resources, to preventing environmental pollution and to promote energy efficiency in all of its own construction activities and those of its sub-contractors and suppliers.

To achieve a high standard of environmental performance on our construction projects and related operations, we are committed to operating and maintaining a certified Environmental Management System that complies with ISO 14001: 2015. To promote efficiency this is part of an Integrated Management System which also complies with ISO 9001: 2015 (Quality) and ISO 45001:2018 (Health + Safety).

It is the general policy, therefore, to:

- Minimise any potential effects on the environment arising from site operations
- Liaise with our Clients on any potential environmental and sustainability issues and work with them to address issues and concerns
- Set clear environmental objectives and targets that are regularly reviewed to enable continual improvement in our overall environmental management performance
- Provide appropriate training for our employees
- Foster a constructive working environment through liaison with government and other interested parties, together with the communities in which we work.
- Conserve energy through minimising consumption, maximising efficiency and monitoring our carbon emissions
- Develop management processes and operational procedures to prevent pollution and enable compliance with environmental laws, regulations, codes of practice and other relevant obligations
- Minimise the use of materials which may be harmful to the environment
- Promote efficient purchasing which will avoid waste, incorporate sustainable materials and allow for materials to be recycled at the end of building life.
- Employ sound waste management practices and encourage the efficient use of materials
- Promote prudent environmental practice in design
- Recognise and encourage the contribution every employee can make towards improving the Company's environmental performance

This Environmental Policy, together with our Management System, will be periodically reviewed to ensure their continued suitability within an ever-changing industry.

Signed:

J A C Kirkland - Chairman
Date 1st February 2025

Ecology Policy

Bowmer + Kirkland is committed to safeguarding the environment and promoting the conservation of our natural resources whenever possible in all of our own construction activities and those of our sub-contractors and suppliers.

To achieve a high standard of environmental performance on our construction projects and related operations, we are committed to operating and maintaining a certified Environmental Management System that complies with ISO 14001:2015 that fully supports the company's Environmental Policy.

This Ecology Policy in turn seeks to support the overarching objective of our Environmental Policy to minimise any potential effects on the environment arising from our site operations and to reinforce our commitment to promoting conservation through seeking when possible to enhance habitats, biodiversity and local environments on all our projects through:

- Complying with all relevant ecology legislation, guidance and best practice to protect and enhance the environment in the areas we operate in.
- Identify, assess and manage the ecological aspects on each development, undertaking the environmental impacts on the local ecology of our construction activities before we commence operations.
- Implement in full the requirements of planning conditions relating to the local ecology of a project.
- Engage with specialist ecology consultants to protect the local ecology and implement biodiversity requirements identified by ecology consultants.
- To identify and safeguard wildlife. Where clashes occur between the proposed works and wildlife we will work within the guidance and policies of relevant governing bodies, seeking licencing and permission as applicable.
- Enhance awareness amongst our employees of ecological issues on our construction sites and to promote a working culture that encourages constructive conservation.

This policy is communicated to our employees and sub-contractors through our Intranet and in project pre-construction meetings. The mitigation measures undertaken to reduce the impact of our works on the local environment and any enhancement carried out are to be recorded in the Environment Impact Assessments for each project.

This Ecology Policy, together with our Environmental Management System and environmental risk assessments, will be periodically reviewed to ensure their continued suitability within an ever-changing industry.

Signed:

J A C Kirkland - Chairman
Date 1st February 2025

Quality Policy

At Bowmer and Kirkland, we are dedicated to achieving the highest level of satisfaction for our clients in everything we do. Over time, the company has both grown and adapted, meeting the changing circumstances and priorities of our industry. Whatever the changes and challenges we have faced, we have remained committed to our core principle of always delivering complete client satisfaction.

Across the whole Bowmer and Kirkland Group, we recognise the importance of promoting a quality led culture. We achieve this through consistent development of our businesses and of our people. Consistency is delivered via robust management systems, systems that provide our clients with added value throughout whole project lifecycles. Our systems ensure we can understand and meet regulatory, project, and client specific requirements. Our aim is not only to deliver our client's expectations, but exceed them.

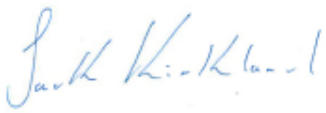
To achieve the quality performance standards on our projects, we are committed to operating and maintaining a Quality Management System (QMS) that complies with ISO 9001: 2015. To promote efficiency, this sits within our other integrated management systems which comply with ISO 14001: 2015 (Environmental) and ISO 45001: 2018 (Health & Safety)

Bowmer and Kirkland is committed to the promotion of effective and efficient performance, delivered by our quality management system, and has set the following strategic aims:

- We will ensure that all employees remain dedicated to looking after our client's best interests
- We will provide adequate support and resource to enable our systems and people to deliver the requirements
- We will invest in our people to develop the skills, knowledge and capability of all existing and new employees so that we can successfully meet the changing needs and expectations of our clients and other interested parties.
- We will monitor the effectiveness of our Quality Management System and promote high standards of quality on all projects undertaken by the company.
- We will set & communicate clear essential business objectives and targets that are regularly reviewed to enable continual improvements.
- We shall support the continual review and development of our management systems to ensure company objectives are aligned with our core principles.

This Quality Policy, together with our management systems, will be periodically reviewed to ensure their continued suitability within an ever-changing industry.

Signed:



J A C Kirkland - Chairman
Date 1st February 2025

Health & Safety Policy Statement

Bowmer + Kirkland Ltd and its subsidiaries (the Group) is a family owned business and promotes family values. Health & Safety is a core business value. We are committed to creating a future free of accidents, incidents, and ill health as a result of our activities.

We are committed to working with our Clients and other external interested parties to manage and control Health & Safety risks. Managing safety, health and wellbeing and engaging with, and training our workforce are integral to how we work along with the consultation and participation of workers

The Group wish to maintain workplaces where everyone is valued, all views are listened to and a safe and healthy working environment is the norm and not the exception.

It is the Group's belief that all accidents and occupational ill health can be prevented by adherence to our policies and procedures. We take a sensible, positive approach towards Health & Safety. We seek to comply with all applicable legislation, reducing risks to the lowest level we reasonably can. Good practice is accepted as core value throughout the business and integral to maintaining a strong, positive safety culture.

Nothing we do is so important that we cannot take the time to do it safely. No one is asked or expected to work unsafely.

We take pride in everyone returning home safely every day, and we will actively target any matters of concern.

All efforts will be made, and sufficient resources will be made available to maintain, as far as reasonably practicable, a safe and healthy environment at every location under the Group's control.

We embrace the principles of leadership and endeavor to help everyone in our business to eliminate hazards and reduce OH&S risks, work safely and prevent unsafe work practices, and will never knowingly walk past an unsafe act or condition on site.

Documented arrangements are maintained in our Health & Safety Management System based upon ISO 45001:2018 and the Company's operational procedures. Compliance and continual improvement are achieved by effective implementation of this Policy and monitoring and audit to evaluate performance and progress This Group Health & Safety Policy is reviewed on an annual basis and monitoring the implementation of this policy is supported by the Group Director of Health & Safety and his Team.

Leadership, passion and commitment are present at all levels. The Group expects and requires all levels of Management and Supervision to actively initiate and pursue ways and means of making the working environment as safe and healthy as possible.

It is the responsibility of ALL our employees and subcontractors to comply with legal, moral and company safety requirements. Good safety behaviour is admired, respected and recognised across the Group. Peer pressure will reinforce policing – acting unsafely is anti-social.

All the Group Companies' Directors acknowledge their responsibility for successful implementation of the Health & Safety Policy and for promoting the continual improvement of Health & Safety within their Company.

Proper management of Health & Safety is critical in the future development of the Group and in safeguarding its reputation. Attitude and behaviour, not just statistics, are a measure of success. Our business welcomes those who support our vision and are willing to work with us – without compromise on safety.

Signed:

J A C Kirkland - Chairman
Date 1st January 2025

Appendix D
Management System Certificates

B+K

bmtrada
Proud to be part of element

CERTIFICATE OF REGISTRATION

This is to certify that

Bowmer and Kirkland Ltd
High Edge Court
Heage
Belper
Derbyshire
DE56 2BW

has been audited and found to meet the requirements of standard
ISO 14001:2015 Environmental Management System

Scope of certification
Building Contracting, including Design & Build.

UKAS MANAGEMENT SYSTEMS
0012

Certificate number: 1133

Issue number: 2023-01

Certificate effective date: 1 February 2023

Certificate expiry date: 18 February 2026

Date of initial certification: 19 February 2008

Vicki Howlett
General Manager - Certification UK

bmtrada
Proud to be part of element

CERTIFICATE OF REGISTRATION

This is to certify that

Bowmer and Kirkland Ltd
High Edge Court
Heage
Belper
Derbyshire
DE56 2BW

has been audited and found to meet the requirements of standard
ISO 45001:2018 Occupational Health and Safety Management System

Scope of certification
Building Contracting, including Design & Build.

Bowmer and Kirkland Ltd is deemed to satisfy and is registered to the SSIP Accredited Registered Scheme, which covers all ISO 45001:2018 certified sites detailed in this certificate, for the duration of this certificate and for the following CDM categories (Principal Contractor, Designer and Principal Designer). This certificate on its own should not be considered evidence of registration. To verify this organisations registration please go to the SSIP Portal: http://www.ssipportal.org.uk/Home

Certificate number: 304

Issue number: 2023-01

Certificate effective date: 1 February 2023

Certificate expiry date: 18 February 2026

Date of initial OHSMS certification: 16 June 2009

Date of initial ISO 45001:2018 Certification: 14 April 2020

Vicki Howlett
General Manager - Certification UK

Issuing Office: Warringtonfire Testing and Certification Limited t/a BM TRADA Chiltern House, Stocking Lane, High Wycombe, Buckinghamshire, HP14 4ND, UK
Registered Office: Warringtonfire Testing and Certification Limited, 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA, UK
Reg No. 11371436.

bmtrada
Proud to be part of element

CERTIFICATE OF REGISTRATION

This is to certify that

Bowmer and Kirkland Ltd
High Edge Court
Heage
Belper
Derbyshire
DE56 2BW

has been audited and found to meet the requirements of standard
ISO 9001:2015 Quality Management System

Scope of certification
Building Contracting, including Design & Build.

Certificate number: C1000

Issue number: 2023-01

Certificate effective date: 1 February 2023

Certificate expiry date: 18 February 2026

Date of initial certification: 1 September 2000

Vicki Howlett
General Manager - Certification UK

Issuing Office: Warringtonfire Testing and Certification Limited t/a BM TRADA Chiltern House, Stocking Lane, High Wycombe, Buckinghamshire, HP14 4ND, UK
Registered Office: Warringtonfire Testing and Certification Limited, 3rd Floor, Davidson Building, 5 Southampton Street, London, WC2E 7HA, UK
Reg No. 11371436.

Planet Positive verifies that Bowmer & Kirkland have aligned their Social Responsibility Policy, Procedures & Practices with ISO 26000:2010

Steve Malkin, CEO Planet Positive
1st May 2012

Planet Positive

ISO 26000:2010 - Social Responsibility

Bowmer & Kirkland's Social Responsibility Policy, Procedures & Practices encapsulate the seven fundamental core principles of social responsibility:

Organisational Governance	*Ensuring that an organisation has an effective system and structure in place to implement its social responsibility policies.*
Human Rights	*The guarantee that Bowmer & Kirkland respects the fundamental rights of the people that it interacts with. It means, for example, promoting equal opportunities and diversity.*
Labour Practices	*Practices to ensure that the health and wellbeing of Bowmer & Kirkland's employees and those working on behalf of B&K are safeguarded, that they are well trained and receive opportunities for development.*
The Environment	*Stems from the recognition that businesses have an impact on their environment, both directly and indirectly. Puts procedures in place to minimise this and wherever possible have a positive impact.*
Fair Operating Practices	*Commits Bowmer & Kirkland to ethical, honest and fair transactions with other parties. Also promotes harmonious working practices bewteen management and Bowmer & Kirkland's employees.*
Consumer Issues	*Gives consumers the confidence that Bowmer & Kirkland have their best interests at heart. Focused primarily on B&K delivering complete customer satisfaction.*
Community Involvement & Development	*Acknowledges the important role that Bowmer & Kirkland plays in the wider community and that Bowmer & Kirkland can promote positive community development through engagement.*

BSI British Standards

BOWMER KIRKLAND