

TENDER

Demolition Method Statement

Project: Reading Gasholder Dismantling

Location: Alexander Turner Close, Reading

Client: Scotia Gas Network PLC (SGN)

Contract Number: T 1422

Document Reference Number: MS/001/TENDER/AS

Document Prepared By: ANTHONY SNELL

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Position: Contracts Manager

Date: 27th May 2020

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Date: 27th May 2020

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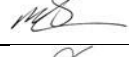
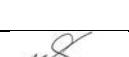
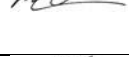
Name: Martin Smith

Position: SHE Manager

Date: 27th May 2020

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Relevant Parties	
Principal Contractor	Robinson and Birdsell Ltd
Client	Scotia Gas Networks PLC(SGN)
Principal Designer	Robinson and Birdsell Ltd
Local Authority	Reading Borough Council
Document Title	Reading Gasholder Demolition
Document Ref	MS/001/TENDER/AS
First Issue Date	

Issue History			
Company	Issue Date & Revision	Brief Description of Change's	Approvers Signature
R&B / SGN	Revision A	Issued for Review	
R&B / SGN	September 2020 Revision B	Removal of Breaking Out of Gasholder Concrete Base	
R&B / SGN	October 2020 Revision C	Inclusion of extra appendices to cover enabling works.	
R&B / SGN	October 2020 Revision D	Inclusion of extra paragraphs to cover addition elements for planning approval.	
R&B /SGN	December 2020 Revision E	Inclusion of extra highway information and workings of cups inside of Gasholder	
R&B / SGN	January 2021 Revision F	Confirmation of letter drop to residents and dust mitigation measures	
R&B / SGN	January 7 th 2021	Dust mitigation, RICS survey and SGN letter drop template.	

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Introduction

This Document has been prepared to describe the Methods and Techniques proposed for the Dismantling of above ground Column Guided 4lift Gasholder No4, associate buildings and Water Tower at Reading Gasholder Station, Alexander Turner Close Reading, RG1 3FQ. This Method Statement must be read in conjunction with a produced Health and Safety Plan, Permit Procedures and Rescue Plans for the Project and various Risk Assessment Documents

As well as the Health & Safety Management System developed by Robinson & Birdsell Limited, the following Documents should be used in conjunction with this Method Statements and collectively they make up the Safe System of Work for this task;

- Task Specific Risk Assessment
- PPE Assessment
- Manual Handling Assessment
- Drawings (see appendices at end of method statement)

All Operatives as they first attend the Site will undertake a Site-specific induction; during this induction all Site hazards and risks identified within the Construction Plan will be discussed.

Visitors to Site will be given a talk on the hazards present on that specific day; visitors will be accompanied on Site by an identified representative at all times.

Prior to work commencing on site, a letter-drop informing local residents of work commencement shall be distributed in the immediate area.

Site Working Hours

No construction, Demolition or associated deliveries shall take place outside of the following Hours.

Mondays to Fridays 0800hrs to 1800hrs and Saturdays 0800hrs to 1300hrs.

No deliveries shall take place on Sundays and Bank or Statutory Holidays without prior written approval from the Local Planning Authority.

Gasholder Heritage Details

Prior to dismantling of the Gasholder structure, a formal photographic record of the Gasholder shall be made and passed on to Berkshire Archaeology. Thus, providing a record of this heritage asset for future generation to come.

Also, on site is a cast iron column base structure dating back to 1887, this shall be safely uplifted and placed into an area away from any demolition activities and stored until after all the works are complete before a decision is made on its future resting place.

Highways

i. All loading and unloading of construction vehicles will be confined within the SGN inner site boundary fence line. No parking of vehicles will be permitted on adjacent roads near the Gasholder site throughout the duration of the demolition project.

ii. It is not anticipated that any vehicle other than a roll-on off skip wagon will be used for the safe transportation of scrap metal off-site.

However, the exception to this rule will be the delivery of demolition plant, where the use of a low loading wagon will be necessary. Generally, this would be at the start and finish of the works but due to programme requirements the delivery of a tower / mobile crane will be necessary part way through the works. It should be noted, that movement orders are required and shall be in place with the Police and the Highways Authority prior to these deliveries onto site. (Please see Appendix-H Tipper Tracker Plan)

iii. A joint condition road survey by SGN and their Principal Contractor Robinson and Birdsell Ltd, will be completed prior to the project commencing.

Photographic evidence and a written statement will be compiled to cover all road and street furniture

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conditions both Pre and Post works. Where damage is identified post demolition and specifically caused by our road movements, it will be our intension to rectify this prior to the site demobilising.

SGN and their gasholder contractor Robinson and Birdsell (R&B) will agree to the monitoring of the roads condition from the SGN site to the junction of Gas Works Drive and Kenavon Drive on the following basis: -

1. A full joint detailed walkover will be undertaken with the Council Highways department and Bellway management group to agree the condition of the road and record any defects at the start of the project.
2. Any defects identified will be recorded and these will be the responsibility of Highways or Bellway to rectify.
3. R&B will monitor the road on a daily basis and record any defects. These will be reported to Bellway management company and the highways department on a weekly basis.
4. A full joint detailed walkover will be undertaken with the Council and Bellway management group at the end of the project to agree the condition of the road and record any defects and ascertain responsibility for any repairs taking into account all vehicles using the road

R&B will also be installing a camera to log and record traffic movements along Robert Parker Drive throughout the project.

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Residents Template Letter

Please see below SGN template letter to be distributed to local residents to inform them of the up and coming works in the area. Dates to be confirmed prior to distribution. Also, see catchment area photo where letter drop will take place. This letter shall be sent out at least a week in advance of works commencing.



The Occupier

Date XXXXXXXXXX

Dear Resident,

Dismantling XXXXXXXXX redundant gas holder

As you may already be aware, for a number of months, SGN have been planning to dismantle XXXXX redundant gas holder.

We have now been given the approval from the local authority to commence with these works. The following is a brief introduction to the project and outlines some key information you may find useful.

The reason for dismantling gas holders

Major investment into gas distribution has resulted in changes to the way we now store gas. Gas previously stored in holder tanks is now more efficiently stored underground in the gas pipe network.

The majority of Gas holders in the UK are no longer operational, their ageing structures continue to require significant maintenance to keep them in a safe and visually acceptable condition - it's not a safe or sustainable option to maintain these redundant structures long term.

From an environmental perspective, we are keen to see the land the holders occupy regenerated for beneficial use.

What work is involved?

We will be taking the holder structure down and leaving the ground where it currently sits level, there are no plans to excavate the land beneath.

Before we can dismantle the gas holder and structure, we need to remove the build-up of water and debris inside the tank. This process is called de-watering, there will be no noise or disruption on site during this process.

Following the de-watering, we will commence with deconstruction work to take the gas holder and associated structures down. We will be using heavy machinery and cranes, there will be noise and vibration caused by these works, these will be kept to a minimum.

Structural Inspections - to reassure residents of properties within close proximity (30 metres to the work on the same side of the river), we will carry out internal and external building assessments with an appointed RICS surveyor before the works are commenced, these reports will be shared with the individual home owners. Those properties where building surveys were undertaken can expect to receive further communication regarding these arrangements.

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Our specialist contractors Robinson and Birdsell will be carrying out the deconstruction/dismantling process on our behalf. Their priority will be to complete this work safely with the minimum impact to the local community and SGN will be monitoring and visiting the works on a regular basis.

Programme timeline

De-watering XXXXXXXX
 Mechanical Deconstruction XXXXXXXX
 Complete: XXXXXXXX

Hours of work: Monday – Friday 8am to 6pm (contractors may be on site from 7am setting up), Saturday mornings as required.

There is no planned requirement for weekend work – noise levels will be closely monitored, and restricted hours of work will apply.

Capturing local history

We appreciate that to many these industrial structures represent a visual reminder of your local town's history. As part of the wider dismantling programme, we are committed to working closely with communities and historic societies to ensure the history of your holder is captured for future generations to learn from. If you have any stories you would like to share with us, please email myself susan.day@sgn.co.uk

If you have any questions regarding this project or the wider dismantling programme, please contact our customer service team on 0800 912 1700 or via customer@sgn.co.uk

Yours faithfully
 Susan Day
 Stakeholder and Community Manager

SGN is a brand name of Southern Gas Networks plc
 Registered in England & Wales No. 05167021
 Registered Office: St Lawrence House | Station Approach | Horley | Surrey RH6 9HJ

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Catchment area for letters to be issued outlined in red

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Environmental Protection (contamination)

It must be stated that during all dismantling works no breaking of ground exercises will be undertaken.

All works are down to concrete slab level and these will stay in-situ. The site is mainly covered in tarmac the rest is concrete apart from isolated areas near the site boundary fence line adjacent to the river and railway. However, we shall not encroach into these areas during our works.

Predominantly any de-sludging of the Gasholder after dewatering as taken place that may have been of concern is eliminated by the method of work adapted to remove the sludge from within the Gasholder inner tank. (Please see Appendix J – Management of contamination of Water and Sludge.) This document describes work procedures that eliminate any contamination issues associated with this work.

Please note that no fires or burning of any waste materials will be permitted on site at any time during the demolition works.

Government Guidance on Covid 19 matters shall be followed at all times and a specific risk assessment shall be produced before commencement of the works, that will reflect guidelines at the time.

Section 80- Demolition – Notice.

Please see Appendix K – Section 80 demolition notice documents duly filled in and sent for approval to building control.

Explanation of working cups

1 – The cups are connected to the bottom of the inner lifts. When the Gasholder is filled with gas, the cups, which are filled with water, rise up with the lift and catch the grips at the top of the next inner lift which is then automatically lifted to its next position.

This process continues until the gasholder is full of stored gas. When the gas is pumped out the Gasholder descends and the inner lifts

Are lowered back into their original position. (see photo attached of the inner lifts with the cups connected to the bottom.)

2 – The photo shows the outer shell with the inner lifts and cups removed.

3 – The outer shell stays in-situ until the second clean has been completed, thus containing any run off water within the inner tank footprint.

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Enabling Works

- Undertake a full Site Condition Survey of all Site boundary fences and access roads with SGN Project Manager. Photographic evidence to be compiled.
- Complete a full Utility Detection Survey of the entire Site to PAS 128 TYPE B, Specification.
- Implement any specified Plant Protection Measures as required.
- Noise, Dust and vibration monitoring equipment shall be strategically placed around the site to capture all relevant details of the above. If during the works our set limits are exceeded, a text message is directly sent to the site manager and our head office and mitigation measures are immediately implemented at site level. Dust suppression equipment in the form of Dust Boss sprays shall be positioned daily inline with site prevailing winds. SGN shall also have access to the text messaging alerts and weekly/ monthly data shall be supplied for their and our records. (See Appendix I – Environmental Plan)

Should any breach of dust limits be recorded during working hours, work on site shall be stopped and the specific area of site where breach occurred will be investigated.

Dependant on the outcome of the investigation, steps will be taken to ensure the breach doesn't occur again and appropriate action will be taken to clean the area up, i.e., road sweeper for road areas.

It is envisaged that the boundary Monarflex sheeting shall protect surrounding properties and our water surpressent regime will be robust enough to stop any dust from encroaching on to neighbouring properties. The Monarflex sheeting will be secured to the 2.5m palisade fence along the west boundary of the site.

- Any dust generation expected from dismantling operations will be dampened down with water to control dust, any run off from the dampening down process will be contained and treated and disposed of via the foul drain via a discharge consent with Thames Water. In addition, any surface water drains will be protected and additional filters will be installed.
- Vegetation clearance to take place within Dismantling Areas with reference to the following document. Appendix B, Green Ecological Solutions, Gasholder Site Reading, Arboricultural Impact and Assessment and Method Statement, Revision B. Please refer to Page 15 for Drawing Title: Tree Protection Plan, for precise locations of tree's to be protected. Onsite guidance shall be sought from a qualified Arboriculturist to implement this tree protection plan before commencement of demolition works. Should vegetation clearance be undertaken outside the core breeding period for birds, the necessary procedures will be undertaken in accordance with the updated PEA (Appendix L).

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- Ecological Constraints will have a Management Plan in place prior to work commencement.
- Where required ACM's will be removed by a trained and competent person, working to appropriate RAM's for the Works. It's unlikely that a Licensed Contractor and a 14 Day Notification will be required as noted within the Asbestos Survey Summary.
- R&B to liaise with Network Rail to obtain a BAPA (Basic Asset Protection Agreement) prior to work commencing.
- Pre-Demolition Structural Survey.
- Inform relevant Emergency Services of ongoing Works, especially the Fire Service in case of smoke being generated during any Hot-Works and public rising an alarm.
- Install a Time Lapse Video from the commencement of the Project to the completion of the Project.
- When required, construct an artificial perching Site for known Peregrine Falcons to Client's specification that is contained in the Site Information Document.
- BUILDING SURVEYS: Provide a full RICS Building Survey of each and every residential property within 30m of the western Site boundary, prior to commencement of Demolition Works.

The reason that 30m distance was chosen for the immediate houses closest to the gasholder site will be undertaken as a precaution, this is not normal practise. We don't see it is appropriate to survey the houses on the opposite side of the river, the river will act as a buffer.

• Final Site Restoration.

The majority of the site has a tarmac surface. The majority of the tarmac surface will be left in situ. The only change of surface conditions will be in the footprint of the gasholder, the void will be infilled with suitable materials and compacted to minimise any future dust generation.

Scope of Works. (Drawing HD/Reading 4/01)

- Dewatering of Gasholder No4. (Advanced Dewatering may have taken place)
- Removal of Filming Oil, approximately 25m³
- Removal of Residual Water, approximately 340m³
- Removal of Gasholder Sludge, approximately 340m³
- The complete Dismantling and removal from Site of Gasholder No4, including above Ground Column Structure, Outer Tank Shell, 4 Inner Lifts and Crown Structure plus all associated Steelwork and Small Plant.
- Removal of Bit-Sand from under the Gasholder Base Plate.
- Backfilling of Siphon / Valve Pits after appropriate cleaning has taken place and photographic evidence
- Backfilling of Gasholder Void after Demolition to Clients specification.

Please Refer to Drawing HD / Reading 4 / 01 for Specific Site Locations.

- Demolition of Antifreeze Boiler House/ Electric Room / Store And Associated Pipework with adjacent Transformers. (5.1)
- Demolition of the Communication Building to base level. (5.2)
- Removal of the GRP Booster Roof (5.3)
- Demolition and removal of Electric Building No2 to base level (5.4)
- Demolition and removal of Instrument Kiosk to base level (5.5)
- Demolition and removal of redundant Portacabin No1 (5.6)
- Demolition and removal of redundant Portacabin No2 (5.7)
- Remove any residual water / liquid from the Water Tower, dismantle and removal of Water Tower this to include Concrete Supports and Associated Pipework. (5.8)
- Dismantle and remove the Storage Bunkers (5.9)

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- Dismantle and remove redundant Fencing (5.10)
- Dismantle and remove above Ground Pipework (5.11)
- Dismantle and remove various unclassified minor structures, including Concrete Plinths, Instrument and Switchgear Cabins, Site Lighting Columns and Concrete Ducks throughout the Site areas. (5.12)
- OPTIONAL: Portacabin Building (either to be moved in advance of the works by SGN or retained on Site) (5.13)

Programme for The Works.

The work proposed in this Method Statement will be executed over the period as shown on the latest Project Programme.

Asbestos

Where required ACM's will be removed by a trained and competent person, working to appropriate RAM's for the works. It's unlikely that a Licensed Contractor And a 14- day notification will be required as noted within the Asbestos Survey Summary.

A separate Method Statement will be produced for these Works.

Waste Disposal

All Waste Disposal will be handled in accordance with all statutory current legislation with all Waste Transfer Documents, Notifications etc. being made available for SGN inspection in Site Office.

The Waste produced on this Project is expected to fall into the following categories.

- Filming Oil
- Dewatering Water
- Residual Water
- Gasholder Sludge
- Scrap Metal from Demolition Works
- Concrete, Brick and Rubble
- Electric Cables and Equipment
- Lagging and Insulation Materials
- Possible Asbestos Materials

Fire Prevention

See R&B Emergency Plan

Working at Height

All Height Work to be conducted under HSW Working at Height Regulations 2005. Copy to be held in Site Office at all times during the Project.

Plant and Equipment

2 x Demolition Excavators	1x Cherry Picker	Cold-Cutting Equipment
Dewatering Equipment	Heras Fencing	Hot-Cutting Equipment
High Reach Excavator	Diesel Bowser	Water Bowser
PPE	Safety Harnesses	Compacting Equipment
Firefighting Equipment	Mobile / Tower crane's	Scrap Wagons
Infill Wagons	Breaker	Life Line Equipment

Site Set Up

If possible, utilisation of on Site Portacabins may be an option for our Welfare Facilities. However, the following standard set up shall be implemented if this is not a viable option.

Site Office	Mess Cabin	Water Bowser
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Stores	Meeting Room	Drying Room
Toilet Block	Shower Unit	60 KVA Generator
Diesel Bowser	Various Cables	Power Distribution Board

Site Personnel

Robinson and Birdsell Personnel

Site Manager
Site Foreman
2 x Machine Operators
3 x Demolition Operatives

Sub- Contractor Personnel

Dewater Site Manager
4 x Dewatering Operatives
Specialist Core Cutting Team
Various Wagon Drivers

Access to Site

Access and Egress to the SGN Gasholder Site is via a residential housing complex using the following roads. Oscar Wilde Road, Robert Parker Road and finally Alex Turner Road. This then leads to a double Palisade Gate at the Gasholder Site Entrance.

Access and Egress onto the Site is via this Entrance only. The Traffic Management Plan (Appendix G) shall be distributed to all our Suppliers and Subcontractors.

Site Security

Robinson & Birdsell Ltd shall provide a Dual Locking System (*Daisy Chain*) to the main access entrance gate; this shall allow SGN EMERGENCY access onto Site 24/7 if required.

Robinson & Birdsell Ltd to provide 24-hour security to Site at all times. During working hours R&B personnel shall control Site access.

Out of hours will then be covered by a designated Security Company by either Static Guard or CCTV.

All visitors to Site MUST sign in at the Site Office before entry to Site is allowed. They shall also be given a Visitor's Induction prior to being escorted around the Work Area by R&B personnel.

Training

All Training Records both R&B and the Subcontractors shall be made available for inspection in the Site Office when required by Client's representatives.

Emergency procedures

Please see Emergency Plan in Tender Documents.

Mandatory Site Personal Protective Equipment

The Site has a minimum level of PPE which is as follows: -

- Hard Hat
- Safety Footwear
- Hi Viz jacket
- Gloves
- Light Eye Protection
- Flame retardant Overalls when undertaking Hot Works

A specific PPE Assessment will be provided for any additional PPE identified for this task.

Communication

The contents of this Safe System of Work will be clearly communicated to all Site Operatives involved in this task. Operatives will undertake Daily Team Safety Briefs at the start of each working day. A minimum of one Toolbox Talk will be conducted by the Site Manager weekly to all Operatives on Site on behalf of Robinson & Birdsell Limited.

ENABLING WORKS

1.	Organise Site hand over with SGN Project Manager and complete Condition Survey Site Managers Signature Date	Hold point
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2.	Complete Utilities Detection Survey to PAS 128 type B Specification. Site Managers Signature Date	Hold Point
3.	Implement Plant Protection Measures to establish RED and GREEN Areas through Site, Minimum Road Plate Protection. Site Managers Signature.....Date.....	Hold Point
4.	Install Welfare Facilities in Designated Area (see Site Layout Plan, DRG /1422/01) Site Managers Signature Date ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Hold point
5.	Vegetation clearance where required across work areas shall be under guidance from onsite Arboriculturist following the Tree Protection Plan contained within Appendix B, Greenspace Ecological Solutions Document, Ref: Page 15. Site Managers Signature Date	Hold point
6.	Confirmation that all Live Services to Gasholder have been terminated and Isolation / Purge Certificates have been produced and issued. Site Managers Signature.....Date.....	Hold Point
7.	Structural Survey of Gasholder Stairs and Walkways Plus Water Tower Ladder. Site Managers Signature Date	Hold Point
8.	Full RIC's Building Survey of each and every residential property within 30m of the western Site boundary fence line to be completed and recorded in Daily Site Diary by Site Manager, prior to commencement of any Demolition Works. Site Managers Signature Date	HOLD POINT
9.	Network Rail BAPA (Basic Asset Protection Agreement) to be in place prior to works commencing. Site Managers Signature Date	HOLD POINT
10.	Installation of Time Lapse Video, to be positioned to capture all Site Dismantling Works. Site Managers Signature Date	HOLD POINT
11.	After Dismantling of the Water Tower, the installation of a Peregrine Falcon Perch shall be constructed to Client's specifications (Appendix F - design already supplied by SGN) in designated area on Site.	
12.	DISMANTLING METHOD SEQUENCE	
13.	Cold-Cut Crown Plate and Vent Gasholder, this will be achieved by using an Evolution Circular Saw or Rivet Buster. (see Appendix C - Dismantling Sequence Stages 1 to 4, DRG / 1422/ 04). Working around the Crown Plate circumference approximately $\frac{3}{4}$ of the way up from the Inner Lifts, a full circular section of Plate approximately 25cm wide shall be cut out to allow natural Venting of the Gasholder. (see Appendix C – Demolition Sequence Drawing). To complete this task safely, Operatives shall attach a Safety Line across the full diameter of the Gasholder Crown. With Collar Chains and Shackles the line will be	

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	secured to appropriate carriage rollers on top of the inner lifts. Operatives to wear Harnesses and attach their Lanyards to the Safety Line during all Cold-Cutting Operations. This shall eliminate any anticipated falls from height during the Venting operations.	
14.	To complete Cold-Cutting Operations to sectionalise the remaining Crown Plate, Operatives shall use the same Cold-Cutting Method as above. Working from the circular section already established for Venting, they will strike down 4 vertical lines to the edge of the Crown Plate adjacent to the Inner Lifts, stopping approximately 100cm from the edge. With the Crown Plate now quartered a Sever Line will be inserted around the full circumference of the Tank approximately 100cm from the Inner Handrail surrounding the Tank. This is turn will allow a safer and more efficient roof removal for the Excavator during the Dismantling process.	
15.	To create Access and Emergency Egress Entrances into Gasholder for the Dewatering Team, the Outer Steel Plate will be Cored with an approximate, 300mm hole to allow access for the Plate Shear to cut out a square, approximately 5m wide x 6m in height, for main Access Entrance, then a smaller entrance to act as an Emergency Access. <i>(separate Method Statement for Core Cutting into Outer Tank Shell shall be produced).</i>	
16.	The sections of Plate shall be cut out between selected Columns on the east side for the Main Entrance and the south side for the Emergency Exit on Gasholder No4. We shall leave the Upper and Lower Circumference Plate's in-situ thus maintaining the integrity of the Tank. Lower Circumference Plate shall not be cut lower than 1m from ground level. This is to ensure we don't impact below the Residual Water Level which should be Approximately 200mm above the bottom of the Tank.	
17.	Once the Outer Shell Section has been removed, the Inner Shells will then be pierced with the "Rhino Horn" on the Plate Shear, this will then allow access for the Shear Blade to continue to cut out the Inner Shell Section. This will be repeated on all four Inner Lifts until both Entrance ways have been created.	
18.	Confirmation that a Spill Drill has been undertaken prior to the commencement of the 1st Sludge Clean. Site Managers Signature..... Date.....	Hold Point
19.	With access now achieved to the Inner Tank, the Dewatering Team can commence their work programme. Initially, the Oil Deposit on top of the Residual Water shall be skimmed off and weight / cubage recorded before disposal off Site. <i>(See Dewatering Rams for Tank access and proceeding Plan of Work, Separate Document).</i> The following sequence shall be implemented as a minimum by the Dewatering Team, Residual Water Removal, Sludge Dip in presence of SGN Project Manager, First Annulus Sludge Clean.	
20.	While the above is ongoing, R&B Operatives shall commence the Demolition of the onsite buildings in accordance with the SGN Scope of Work Drawing. This shall be a two-phase operation. Phase No 1 shall consist of the following: 5.1 to 5.7 and 5.9 to 5.11. Phase No2 shall consist of 5.8,5.12 and possibly 5.13.	
21.	Where ACM's have been identified within the buildings, these shall be removed under Separate Rams. <i>Please double check that all Utility Services have been disconnected prior to work commencement. (will be signed off in enabling works section of theses Rams).</i>	
22.	Soft Stripping of all Non-Constructional Materials using Hand Tools shall be undertaken prior to full Demolition taking place. All arisings shall be placed into Waste Skips for disposal off Site.	
23.	A Sequence of Works shall be decided on Site by the Site Manager after	

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	consideration of other works taking place.	
24.	In this Phase 1 Operation, after the above has been completed, traditional demolition techniques shall be applied to demolish the buildings. This will involve an Excavator with Selector Grab attachment, carefully imploding the buildings into their own footprint before loading out arising into a Designated Laydown Area for either Site re-use and being analysed or disposal from Site.	
25.	When the Dewatering Team have completed the First Sludge Clean, R&B Operatives shall re-commence the Gasholder Dismantling. The Machine Entrance way shall then be opened up by the Excavator to expose the Roof Structure in this area.	
26.	Before entering the Inner Tank, the Cups will be removed from in front of the Entrance and stockpiled on the Gasholder Base ready for cleaning at a later date. The in-situ open cup ends will be Sandbagged off to stop contamination of the imported Stone that's required to make a small ramp onto the Gasholder Base. The stone shall be compacted by the Excavator Operator using the back of the Bucket until a firm compaction has been achieved and the Ramp is accessible for the Excavators to Access and Egress The Inner Tank safely. <i>(imported materials to match criteria for Client's specification).</i>	
27.	The Machine Operator shall then proceed to Shear Down the Inner Roof Structure and the Crown Plate, eventually making his way into the Inner Gasholder Tank. From here working systematically around the circumference of the Inner Tank, the Roof Structure shall be sized reduced and stockpile near the Entrance way. Once all the Roof Structure has been dismantled the Inner Tank Floor Base shall be cleared of all Scrap Arisings, and placed outside of the Tank for disposal off Site.	
28.	Working systematically around the inner circumference of the Gasholder Tank, the Machine Operator shall commence Shearing the Inner Lifts into manageable sections. Where possible the cups will be severed off the lifts and their contents of sludge tipped onto the Gasholder Base Plate in a Designated Area. A second Machine will the fold the sections of Lifts and load them out on to transport for disposal off Site. This process shall be repeated around the full inner circumference until all the Inner Lifts have been removed.	
29.	Confirmation that a Spill Drill has been undertaken prior to the commencement of the 2 nd Sludge Clean. Site Managers Signature..... Date.....	Hold Point
30.	The Dewatering Team shall now return to Site and complete the Second Annulus Clean, followed by the Siphon/ Valve Pit Clean. Photographic evidence of Pits shall be taken prior to Backfilling.	
31.	The columns on Gasholder No4 shall now require Dismantling. The Use of a Mobile Self-Erecting Tower Crane Together with either a Cherry Picker or Mobile Crane with Man-Basket Attachment shall be used to gain access for the sectionalising of the columns. Hot-cutting Methods shall be implemented for this section of work. To stop unnecessary oversailing of the Tower Crane over local infrastructures i.e. Houses and Railway Line, a Slewing Restrictor will be commissioned as part of the Lifting Plan. <i>A daily check of the restrictor will be conducted and recorded in the Site Diary by a competent person. Under NO circumstances shall any Lifting be done without this check being implemented.</i>	
32.	A full Lifting Plan will be developed on award of Contract However, the simple procedure shall take the following format. <i>(See Appendix D - Crane Lifting Plan and Appendix E - Lifting Plan and Water Tower Dismantling Drawing, DRG /1422 / 05).</i> • A Cross Beam between two Columns shall first be Hot-Cut Free and Lifted from situ.	

Contract No:	T 1422		Document Ref No.:	MS/001/TENDER/AS
Site Manager	TBC		Revision:	

	- The x shaped Wind Bracing between the Columns shall also be cut and slung has one unit before being removed from situ. - Leaving the next full section in place, we shall move to the next adjacent one and repeat the above procedure of removal. - With this achieved we will now remove the Middle Section as one unit cutting both supporting Columns where they connect to the Main Structure. This procedure shall be repeated around the full circumference of the Gasholder until all the Column Guided Structure has been dismantled. Designated Laydown Areas possibly inside the Gasholder Footprint shall be implemented during all Lifting Operations. (see Appendix D – Lifting Plan Dwg 1422/05).	
33.	Once all the columns have been dismantled and processed, the Arisings shall be cleared from the Gasholder Base and disposed of from Site. The Outer Shell of the Gasholder shall now be dismantled using the Excavators.	
34.	Working in unison the two Excavators will systematically work around the circumference of the Outer Shell Shearing and Folding the Shell Plate onto the Inner Base Plate. Further processing will take place prior to disposal off Site. (HOT-CUTTING OF OUTER SHELL MAY ALSO BE ADOPTED IF REQUIRED).	
35.	The Steel Base Plate will then be progressively Folded back and cut into manageable sections by the Excavators. All Arisings shall then be disposed of from Site.	
36.	The Bit-Sand layer beneath the Base Plant would already have been sampled to determine the correct waste stream. With this determined the Bit-Sand shall be loaded out on transport for disposal.	
37.	After removing and disposing of the Pipework from the Valve Pits, they shall be Backfilled with appropriate Material in line with SGN Specification.	
38.	A Post Works CCTV Survey of the Drains shall be completed to confirm no damage to the system was caused during the Dewatering Works.	
39.	The Gasholder Void shall be Backfilled with Imported Materials. These Materials shall be analysed as per SGN Criteria and then compacted in line with SGN Guide Lines for Backfilling of Gasholder Voids.	
40.	While the above is ongoing, Phase No2 of the Scope of Work Demolition will be completed. One Team shall concentrate on the 5.12 Structures and possibly 5.13 if instructed to do so by SGN. The Water Tower, 5.8, shall be completed by a High Reach Excavator.	
41.	Please check that the BAPA from Network Rail (if required) is valid and in place before proceeding with the Tower Demolition. This work may require a line possession and possible weekend working and must be programmed in to the satisfaction of all parties involved.	
42.	Before Dismantling Works proceed, any Contaminated Water within the Tower Structure shall be removed by our Dewatering Team. (Separate Rams Will Be Produced For This Operation) only when this operation has been completed, can the Dismantling of the Tower commence. (See Appendix E - Lifting Plan and Water Tower Dismantling Drawing, DRG 1422 /05).	
43.	Exclusion Zones and Banksman to be positioned in advantageous areas around the Structure and be in Radio Contact with Site Manager and Machine Operator at all times during this Dismantling Process.	
44.	The High Reach Machine Operator shall take up a position on the south side of the Tower, when he is satisfied that the Machine is in a safe position, he will commence work.	

Contract No:	T 1422		Document Ref No.:	MS/001/TENDER/AS
Site Manager	TBC		Revision:	

45.	He will start by working the Top Ring Beam down around the full circumference of the Tower. From here he will open the front up a couple of metres, thus exposing the Inner Cone. He will then Pulverise the Inner Cone Section, pulling the Arisings out of the front open section, keeping the Footprint of the Tower clear at all times.	
46.	Once the Inner Cone Section is complete, the Machine Operator shall steadily keep on working around the circumference taking layers of 300 to 400mm off at a time plus making sure no excessive weight gathers on the Tower Platform during this process.	
47.	With the high part of the Tower now down to the Base, which is connected to the Tower Legs, the Machine Operator shall commence to Pulverise the Platform away. This in turn will expose the Tower Legs, he will then steadily work each Leg down to the Cross Beams that are tying the Leg construction together.	
48.	Starting on the south side, the Machine Operator shall Pulverise away the Cross Beam, by either munching along the full length of the Beam or Pulverising each end where it joins the next Leg. Once he has taken two Beams out, he will steadily fold the Legs into the Tower Footprint before Pulverising them of their Plinths. This process shall be repeated to remove the final two Legs. The Tower Leg Plinths shall then be Pulverised down to Slab Level or broken down to Slab Level using a Breaker Attachment. All Arisings shall then be either Crushed on Site for re-use in the Gasholder Void or if deemed not suitable be disposed of from Site.	
49.	Installation of Peregrine Falcon Perch adjacent to where Water Tower was situated. Please see, (<i>Appendix F - Peregrine Falcon Perch Specification</i>), as supplied by SGN.	
50.	With all Phase Two Works complete a final clearance of Debris around Site will be undertaken by Robinson and Birdsell Operatives.	
51.	All the above Works shall be undertaken in accordance with BS6187 Code of Practice for Full and Partial Demolition.	
52.	The Site shall be left Hazard and Trip Free. After successful inspection by the SGN Project Manager, Robinson and Birdsell Ltd shall hand the Site back to SGN and complete their De-mobilisation of the Work Area.	

Contract No:	T 1422		Document Ref No.:	MS/001/TENDER/AS
Site Manager	TBC		Revision:	

APPENDICES

Appendix A - Site Layout Plan (DRG /1422 / 01)

Appendix B - Greenspace Arboricultural Impact and Assessment and Method Statement

Appendix C - Dismantling Sequence Stages 1 to 4 (DRG /1422 /04)

Appendix D - Crane Lifting Plan

Appendix E - Lifting Plan and Water Tower Dismantling (DRG / 1422 /05)

Appendix F - Peregrine Falcon Perch Specification

Appendix G - Traffic Management Plan.

Appendix H – Tipper Tracker Plan

Appendix I - Environmental Plan

Appendix J – Management of contamination. **Appendix K** - Section 80 – Demolition – Notice

Appendix L – Greenspace Ecological Solutions Preliminary Ecological Appraisal (April 2019) and
Greenspace Updated PEA Oct 2020

Contract No:	T 1422		Document Ref No.:	MS/001/TENDER/AS
Site Manager	TBC		Revision:	

NOTES:

- (i) General housekeeping issues are to be addressed on a daily basis, with a walk through of the Site being undertaken by the Site Manager and Foreman; any unsafe conditions or acts observed will be actioned immediately.
- (ii) All Hold Points must be signed off before work commences.
- (iii) All PPE provided by Robinson & Birdsell Limited for this task must be worn at all times whilst carrying out the task.
- (iv) It is the responsibility of the Employee to maintain the equipment, report any damage, worn, lost or defective items to my immediate Manager / Supervisor, and sort replacement, items before carryout any further work tasks.

KEY:

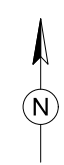
Black writing indicates standard description.

Red writing indicates a signature is required before proceeding to the next step/ phase of works.

Green writing indicates a safety point that must be adhered to.

Blue writing indicates an action is required to be followed.

APPENDIX A- Site Layout Plan



1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETRES (mm).
3. ALL LEVELS ARE IN METRES (m).

	BUILDINGS TO BE DEMOLISHED
	BUILDINGS TO REMAIN
	SGN SITE BOUNDARY
	CONTRACTORS SITE BOUNDARY
	PEDESTRIAN ROUTE ONTO SITE
	'LIVE' BELOW GROUND GAS PIPE
	PROTECTION OVER 'LIVE' GAS PIPE
	CONTRACTOR WELFARE FACILITIES
	TRAFFIC FLOW AROUND SITE

DRAWING STATUS: TENDER

TENDER



CLIENT:

SGN

PROJECT

GAS HOLDER DEMOLITION
READING No.4 SITE

1	TITLE
---	-------

SITE LAYOUT PLAN

PROJECT No:	DRAWING No:	REV:
1422	DRG / 1422 / 01	A

© Robinson-Birdsell



APPENDIX B- Greenspace Ecological Solutions Document.

Gas Holder Site, Reading

Arboricultural Impact Assessment and
Method Statement

Revision B

A Report for Danescroft (Kenavon Drive
Project Management) LLP

July 2019



www.greenspace-ecology.co.uk

info@greenspace-ecology.co.uk

Gas Holder Site, Reading

Arboricultural Impact Assessment and Method Statement

July 2019

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

This report was written by Neil Taylor and proof read by James Johnston

The content of this report is the responsibility of Greenspace Ecological Solutions Ltd. It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 24 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.

Report Number J20563_Arb_Rev_B

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DRAWINGS

Tree Protection Plan	J20563_Arb_TPP
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APPENDICES

APPENDIX A –	Tree Survey Schedule
APPENDIX B –	Programme of Site Monitoring
APPENDIX C –	Section 4, Extracted from NIUG 4

1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: Gas Holder Site, Alexander Turner Close, Reading RG1 3DH

Attending Surveyors: Neil Taylor

Survey Dates: 4th July 2018

Site Proposals: Redevelopment of an existing contaminated brownfield site and new residential development with associated parking.

Associated Planning Reference Number: Not yet submitted

Source of Relevant Documents:

Document:	Source:
Site Location Plan:	Google Earth Pro
Site Plans:	Collado Collins Architects and Farrer Huxley Associates

2 INTRODUCTION

2.1 Context

2.1.1 To inform the associated planning application, Greenspace Ecological Solutions has been commissioned by Danescroft (Kenavon Drive Project Management) LLP to undertake an arboricultural survey of Gas Holder site, Alexander Turner Close, Reading.

2.1.2 Henceforth referred to as 'the site', works that are likely to affect retained trees include the construction of new hard surfaces and the movement of construction vehicles.

2.1.3 The aim of this report is to present the results of the survey, including a Tree Survey Schedule (TSS), an Arboricultural Implications Assessment (AIA), and an Arboricultural Method Statement (AMS). A Tree Protection Plan (TPP) has also been produced and accompanies this report as a separate drawing.

2.1.4 This report in no way constitutes a health and safety survey report. Where concerns for tree health and safety exist, the necessary and appropriate tree inspections should be carried out.

2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736. The location of the site is depicted in Image 1.

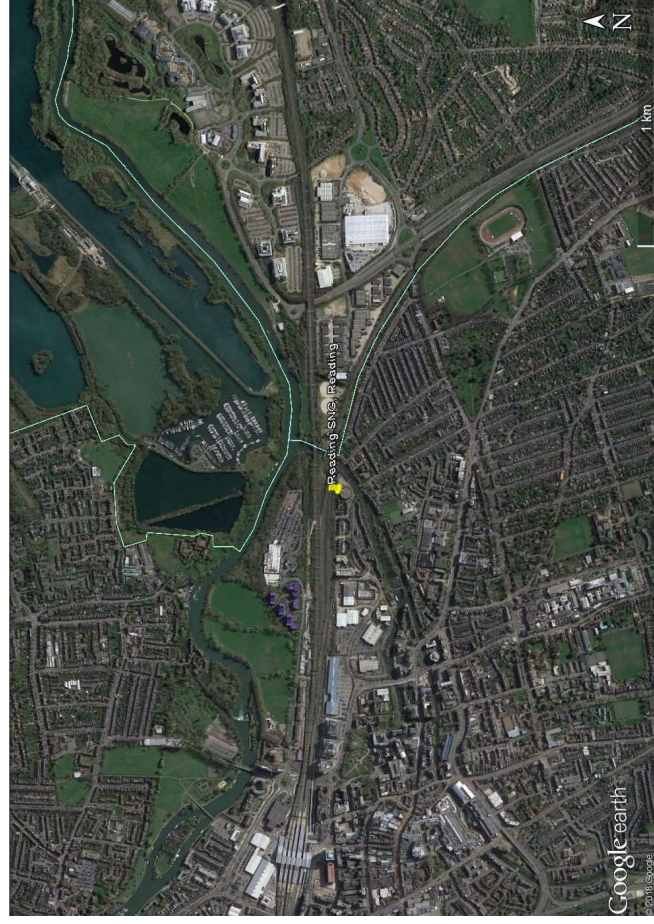


Image 1 – Site Location of SGN Reading

2.3 Site Description

- 2.3.1 The site occupies approximately 0.71ha and comprises of areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder can be found within the site.
- 2.3.2 The site is bound by residential dwellings to the east; the River Kennett to the south and east; and the National railway to the north. The wider landscape is one of industrial units to the east and west and pockets of scrubland to the north, beyond the railway.

3 SURVEY METHODOLOGY

- 3.1 The trees were inspected from ground level by consultant arboriculturist Neil Taylor on 4th July 2018. Measurements were taken in accordance with the recommendations set out in the BS 5837:2012. Canopy spreads were measured and plotted to the four compass points.
- 3.2 Where direct access was not possible, measurements have been estimated. The surveyed trees are colour coded on the accompanying tree survey drawing according to their relevant BS category.
- 3.3 The tree data collected is used to enable the current canopy spread of the surveyed trees and the Root Protection Area (RPA) to be plotted on the accompanying TPP. The RPA is defined by the formula in paragraph 4.6 from the BS 5837:2012 and may be refined by taking into account current on-site constraints to root activity such as buildings, earthworks and hard paving. This forms part of the design process for the proposed development.

4 ASSESSMENT

4.1 Tree Character Groups

4.1.1 The detailed results of the tree survey are provided in the TSS, in Appendix A. In summary, thirteen individual trees and five groups of trees were recorded on and adjacent to the site. The trees within the survey area vary considerably in terms of condition and the amenity value that they provide to the wider landscape. The trees can be divided into two distinct character groups as follows:

1. The first character group includes the larger, middle aged trees found growing on the site's boundaries. In the main, the trees in this character group are in a good condition and bring a sense of maturity to the site.
2. The second character group includes the smaller, young trees found growing across the site. The trees in this character group are in a good condition but due to their size are of limited amenity value.

5 ARBORICULTURAL IMPLICATIONS ASSESSMENT (AIA)

5.1 Methodology

5.1.1 The AIA uses the information obtained in the tree survey to identify areas where the proposed construction may be at odds with accepted standards, in terms of a tree’s requirements, for space in which to maintain existing roots and shoots, and space for future growth.

5.1.2 The quality and relative importance of each tree is illustrated as a coloured polygon. The colour used relates to the BS categories as follows: A - green, B - blue, C - grey and R - red (see accompanying drawing reference J20563_TPP). In general the design process will try to retain A and B category trees. Proposed construction will therefore normally be excluded from the RPA of A and B category trees. Red trees are discounted as they are recommended for removal.

5.1.3 Details of the trees surveyed are given in the TSS (Appendix 1). The juxtaposition of the proposed development in relation to existing tree locations are shown on the accompanying TPP drawing, reference J20563_TPP.

5.1.4 The AIA considers existing site conditions and the effect that they may have on the development of the surveyed trees root systems. Hard structures such as building and paved roads and paths can influence the root activity of trees by reducing the availability of both moisture and nutrients.

5.2 Assessment

5.2.1 Refer to the accompanying TPP drawing (Ref: J20563_TPP) for the relationship between the proposed development and the trees on and adjacent to the site.

- The following groups of trees will be removed to enable the proposed development:

G1	to enable the construction of an apartment building
G3	to enable the planting of new trees and shrubs
G4	to enable the planting of new trees and shrubs
G5	to enable landscape improvements

- The following trees will require pruning prior to the construction phase:

T1	reduce overhanging branches back to boundary
T2	Re-pollard
G2	reduce overhanging branches back to boundary

- The following trees will be affected by the removal of the existing hard surface from within the RPA:
T3-T7 and T9-T13
The existing hard surface will remain in situ for the main construction phase and will only be removed when the construction of the apartment buildings is complete. The hard surface will be removed in accordance with the methodology outlined in Section 6.2 below.
- The following trees will be affected by the construction of a hard surfaces within the RPA:
T1 and T2
Where the proposed hard surface is within the RPA, the existing hard surface is to remain in situ and used as a sub base.
- The following trees will be affected by the construction of gabion walls within the RPA:
T3, T10 and T11
The gabions are to be installed on the existing hard surface, no excavations will be required.
- The retention of the 'C' category trees on the riverside has been considered due to their current condition. The removal of the existing hard surface and the replacement with topsoil will improve the rooting environment of the trees and give them a chance to recover.

6 ARBORICULTURAL METHOD STATEMENT (AMS)

6.1 Methodology

6.1.1 The AMS provides the means by which retained trees can be protected throughout the development.

6.1.2 The movement of demolition and construction machinery in close proximity to trees may cause compaction of the soil which affects the tree's ability to absorb moisture and nutrients.

6.1.3 Prior to the demolition of the existing buildings, the RPAs of retained trees will be protected by a tree protection barrier as described in paragraph 5.5 below and shown on the accompanying TPP, drawing reference J20563_TPP.

6.2 Demolition within the RPA of Retained Trees

6.2.1 Once the construction of the buildings is complete, the existing hard surface within the RPA of the retained trees will be broken up using hand operated tools only and will be removed by excavator with a toothless bucket. Any machinery used will be stood outside of the RPA at all times. As soon as roots are encountered, removal of the sub base by machine will cease and the remaining material will be raked out of the RPA by hand.

6.3 Construction within the RPA of Retained Trees

Construction of Hard Surfaces:

6.3.1 No excavations will be required for the construction of new hard surfaces that are within the RPA of a retained tree as the existing hard surface will be used as a sub base.

6.3.2 No materials or spoil is to be stored within the RPA of a retained tree unless on an existing hard surface.

6.3.3 To avoid damage to the retained trees, the tree surgery and felling work identified in the accompanying tree survey schedule will be carried out prior to the occupation of the site by the building contractor. The work will be carried out in accordance with BS 3998:2010.

6.4 Services

6.4.1 The proposed locations of service runs are not known at this stage but are likely to be located outside the RPA of the trees on and adjacent to the site. Where it is not possible to achieve this, the section of service run which passes within the RPA of a tree will be hand dug in accordance with 'broken trenches' described in NJUG 4 Section 4, an extract of which can be found in Appendix C. This will ensure that tree roots are not damaged during the installation

of the service. All root pruning will be agreed beforehand with the named Arboriculturist in consultation with the local authority Arboricultural officer. All root pruning will be in accordance with current best working practice. All routes for overhead services will aim to avoid the trees. Where this is unavoidable any tree work will be agreed prior to commencement with the Council's Arboricultural Officer.

- 6.4.2 If the conditions are suitable on site and there is sufficient space, underground services may cross the RPA if a low impact method is used. Such low impact methods include: moleing, directional drilling and thrust boring. It is important that all entry and exit pits remain outside of the RPA and the services are installed at a sufficient depth (at least 600mm) so as to avoid the tree rooting system.

6.5 Tree Protection

- 6.5.1 All trees that are to be retained on the site will be protected by the use of a tree protection barrier erected in the location shown on the accompanying TPP, drawing number J20563_TPP. The fence will consist of "Heras" type panels or similar braced at appropriate intervals and secured to keep in place. The tree protection barrier will be erected prior to the occupation of the site by the demolition contractor and will only be removed once the construction phase is complete.
- 6.5.2 The exception will be where hard surfacing is to be removed from within the RPA of a retained tree. In this instance, once the construction of the apartment buildings is complete, the tree protection barrier will be relocated to the position closest to the tree as shown on the accompanying TPP, drawing number J20563_TPP.

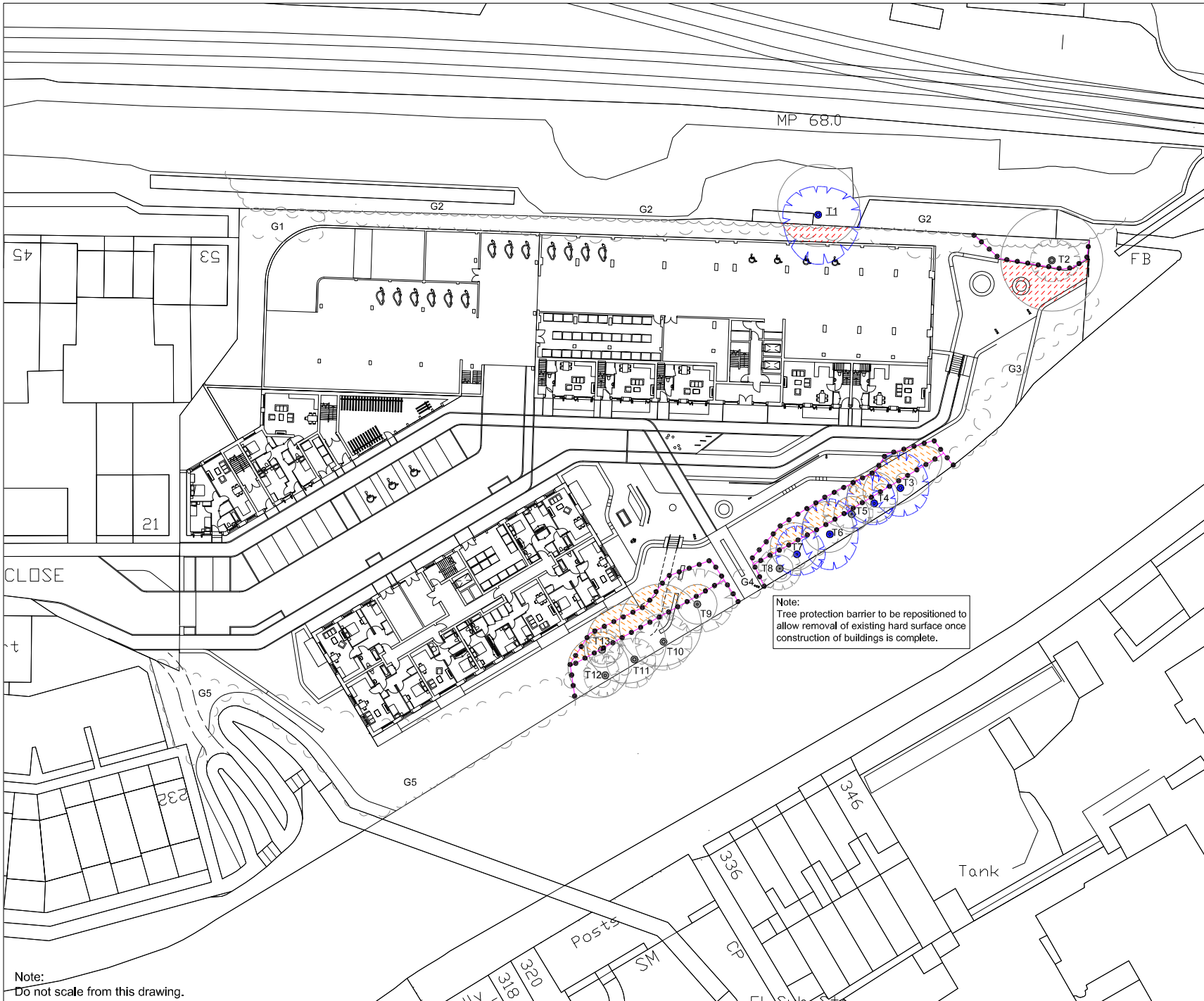
6.6 Site Monitoring and Supervision

- 6.6.1 The process of reporting to the client and LPA Tree Officer will be by emailing the checklist form appended in Appendix B. Site monitoring is to be at a frequency agreed and approved by the LPA. It will involve a site visit by the arboriculturist to ensure that the appropriate tree protection measures, as detailed in the approved drawings and method statements, are continually adhered to.

7 CONCLUSION

- 7.1 Greenspace Ecological Solutions was commissioned by Danescroft (Kenavon Drive Project Management) LLP to carry out an arboricultural survey of the site. The results of the survey indicate that the trees within the survey area vary considerably in terms of quality and contribution to the amenity value within the local area.
- 7.2 A total of four groups of trees will be removed to facilitate the proposals. The trees to be removed are considered to be of low amenity value in the context of the wider area.
- 7.3 The development of the site provides an opportunity to plant new trees as part of a landscape scheme which will increase the age range and species diversity of the trees in the local area.
- 7.4 Through the specified tree protection measures, it will be possible to minimise the impact of the proposed development on the retained trees.
- 7.5 Overall, there are no known overriding arboricultural constraints which would prevent the proposed development from going ahead, subject to the protection measures and construction methodologies specified within this report being correctly implemented.

DRAWINGS



Tree Categories

- Root protection area (RPA)
 - Diameter of trunk
 - Tree number as recorded on Survey Schedule
 - Tree canopy
 - Coloured symbol indicating BS category as shown below
- Category A tree
BS5837 2012
 - Category B tree
BS5837 2012
 - Category C tree
BS5837 2012
 - Category U tree
BS5837 2012

Arboricultural Strategy

- Tree to be retained
Colour reference in accordance with the categories defined by BS5837
- Tree group/hedge to be retained
Colour reference in accordance with the categories defined above
- Tree group/hedge or part of tree group/hedge to be removed
Colour reference in accordance with the categories defined above
- Line along which Tree Protection Barrier should be installed, Refer to accompanying tree survey report for specification
- Area of existing hard surface to remain in situ and used as a sub base for the proposed re-surfacing
- Area of existing hard surface to remain in situ and used as a ground protection during construction phase. Once complete, to be removed in accordance with accompanying report

Drawing Reference : J20563_Arb_TPP

Project Title
Gas Holder Site, Reading

Drawing Title
Tree Protection Plan

Date : 22-03-19 Checked : GN

Drawn : NT Approved : N/A

Status : Final Scale : 1:500@A3

Note:
Do not scale from this drawing.

APPENDICES

APPENDIX A – TREE SURVEY SCHEDULE

Project:	Former SGN Site, Kenavon Drive, Reading							BS 5837 2012 Trees in relation to design, demolition and construction- recommendations			Surveyed by		NAT		 Greenspace Ecological Solutions		
Ref:	J20563_Arb										Weather		Clear and Bright				
Date:	04.07.18										Tagged		No				
Client:	Danescroft LLP																
				Canopy Spread													
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Sens	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category		
T1	sycamore (Acer pseudoplatanus)	12	480	4	6	7	5	1	2	MA	Good - offi site	Good	None	40+	B2		
T2	sycamore (Acer pseudoplatanus)	7	600	3	4	3	3	1	1.5	MA	Good - pollard	Fair - weakly attached regrowth	None	10-20	C1		
T3	alder (Alnus glutinosa)	9	380	5	4	4	4	1	3	MA	Good	Good	None	40+	B2		
T4	alder (Alnus glutinosa)	10	300	4	3	3	4	1	3	MA	Good	Good	None	40+	B2		
T5	alder (Alnus glutinosa)	10	210	4	3	2	4	1	3	MA	Good	Good	None	40+	C1		
T6	red oak (Quercus rubra)	10	300	5	4	5	4	1	3	MA	Good	Good	None	40+	B2		
T7	silver birch (Betula pendula)	9	280	4	4	3	3	1	2.5	MA	Good	Good	None	40+	B2		
T8	common lime (Tilia x europaea)	7	160	3	3	3	3	1	2	Y	Good	Good	None	40+	C1		
T9	silver maple (Acer saccharinum)	9	283	5	5	4	5	3	2	MA	Good	Fair - triple stem	None	10-20	C1		
T10	sycamore (Acer pseudoplatanus)	9	480	4	4	4	4	1	3	MA	Fair - thinning upper crown	Good	None	10-20	C1		
T11	sycamore (Acer pseudoplatanus)	8	470	3	3	4	4	1	3	MA	Fair - thinning upper crown	Good	None	10-20	C1		
T12	sycamore (Acer pseudoplatanus)	8	360	3	2	3	3	1	2	MA	Fair - thinning upper crown	Good	None	10-20	C1		
T13	hornbeam (Carpinus betulus)	7	210	3	3	2	2	1	2	Y	Good	Good	None	40+	C1		
G1	elder, sycamore	Up to 5	Varied							Y	Good - self sown scrub	Good	None	40+	C1		

Project:	Former SGN Site, Kenavon Drive, Reading							BS 5837 2012 Trees in relation to design, demolition and construction- recommendations			Surveyed by		NAT		 Greenspace Ecological Solutions		
Ref:	J20563 Arb										Weather		Clear and Bright				
Date:	04.07.18										Tagged		No				
Client:	Danescroft LLP																
				Canopy Spread													
Tree No.	Species	Height (m)	DBH (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category		
G2	sycamore, silver birch	Up to 10	Varied								Y-MA	Good - self sown embankment group. Some overhanging branches	Good	None	40+	C1	
G3	sycamore, hawthorn, cotoneaster, rowan	Up to 8	Varied								Y	Good - self sown off site boundary group	Good	None	40+	C1	
G4	elm, dogwood, sycamore, rowan, ash, common lime	Up to 8	Varied								Y	Good - self sown understory boundary group	Good	None	40+	C1	
G5	butterfly bush, hornbeam, rowan, svcamore	Up to 4	Varied								Y	Good - self sown scrub	Good	None	40+	C1	

APPENDIX B – PROGRAMME OF SITE MONITORING

SGN Gasholder Site, Reading
Site Monitoring Form

To be completed by the named arboriculturist and emailed to the client and tree officer at the completion of each operation.

Arboriculturist.....

Client.....

Project Manager.....

Tree Officer.....

(The above to be filled in with names and contact numbers)

OPERATION	TIMING	DATE	COMMENTS
Pre-commencement meeting or contact with project/site manager.	Before any works or pre-works on site		
Spot check of tree protection barrier	Before demolition begins		
Spot check of tree protection barrier	Before construction begins		
Completion of development	Once all construction activity has been completed		

APPENDIX C – SECTION 4, EXTRACTED FROM NJUG 4

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 Fine Roots

Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 Precautions

The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – 'Tree Protection Zone'.

4.1.3 Realignment

Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless

Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones. In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug

This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

c) Continuous Trench - Hand-dug

The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material cigging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 Backfilling

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – 'Legislation and Bibliography'**). In England this relates to the requirements of the code of practice – 'Specification for the Reinstatement of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.
- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.
- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

4.1.6 Additional Precautions near Trees

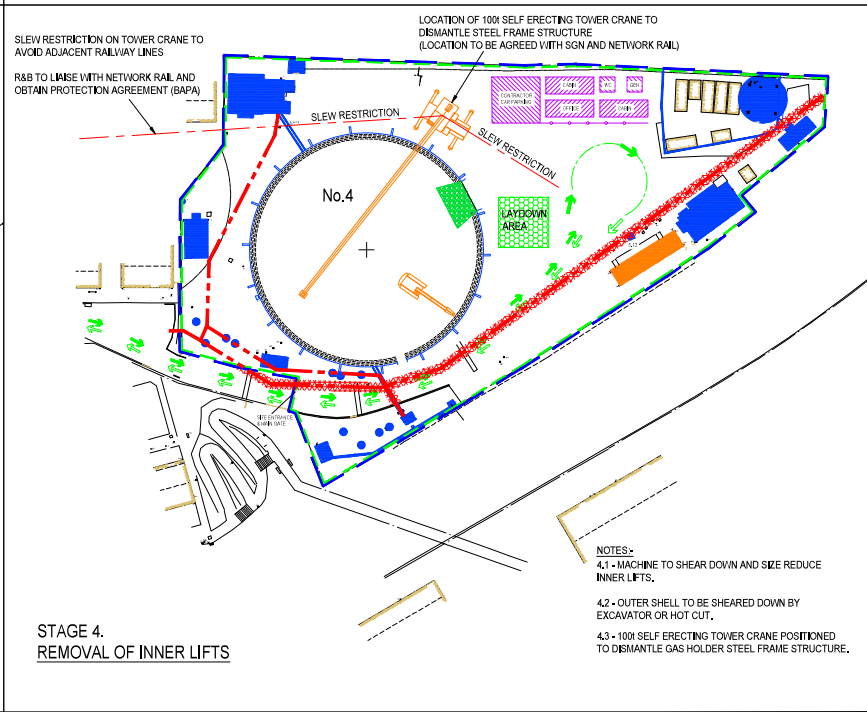
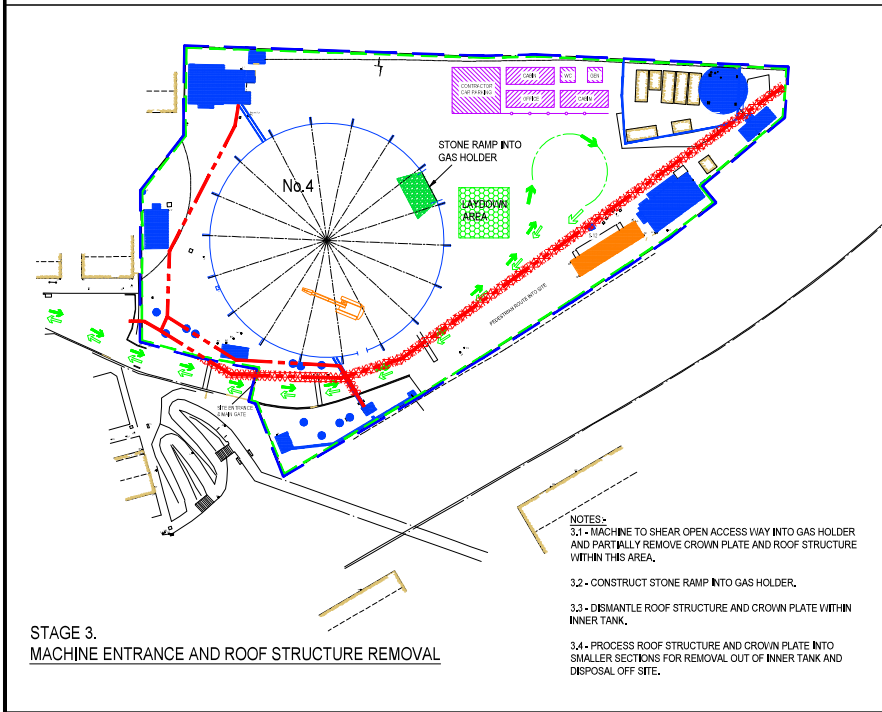
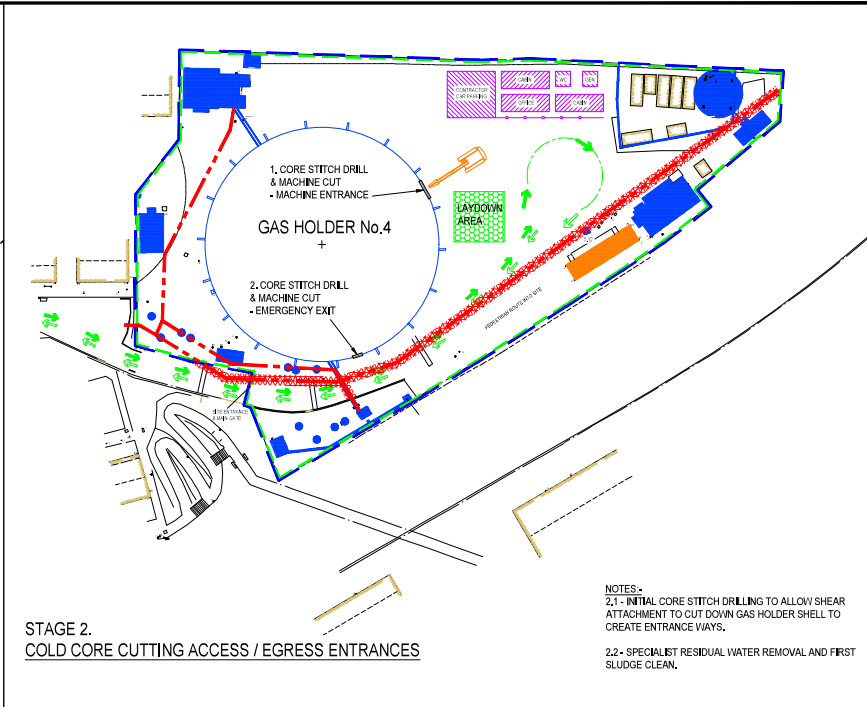
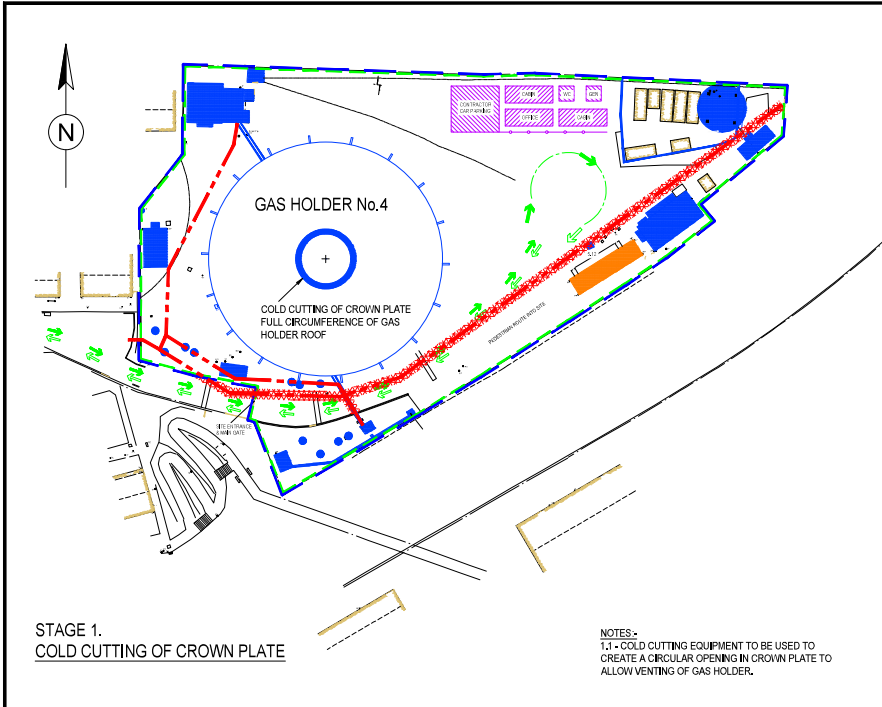
- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.
- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –Prevention of Damage to Trees Below Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 1 - Prevention of Damage to Trees Below Ground

Causes of Damage	Type of Damage	Implications to Tree	Precautions
Trenching, mechanical digging etc.	Root severance	• The tree may fall over • Death of the root beyond the point of damage • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	• The tree may fall over • If the damage circles the root it will cause the death of the root beyond that point • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	• Death of the whole tree • Death of individual branches Damage to leaves and shoots.	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management

APPENDIX C- Dismantling Sequence Stages 1 to 4



NOTES:-

- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES (mm).
- ALL LEVELS ARE IN METRES (m).

KEY:-

- BUILDINGS TO BE DEMOLISHED
- BUILDINGS TO REMAIN
- SGN SITE BOUNDARY
- CONTRACTORS SITE BOUNDARY
- PEDESTRIAN ROUTE ONTO SITE
- 'LIVE' BELOW GROUND GAS PIPE
- PROTECTION OVER 'LIVE' GAS PIPE
- CONTRACTOR WELFARE FACILITIES
- TRAFFIC FLOW AROUND SITE

REV	DATE	BY	DESCRIPTION	CHK	APP
A	22.05.20	MP	ISSUED FOR TENDER	TS	TS

DRAWING STATUS: TENDER

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CLIENT: SGN

PROJECT: GAS HOLDER DEMOLITION READING No.4 SITE

TITLE: DISMANTLING SEQUENCE STAGES 1. - 4.

SCALE @ SIZE	CHECKED	TS	APPROVED	TS
1:250 @ A1 SIZE	TS		TS	

DATE: 18 MAY '20

PROJECT NO.	DRAWING NO.	REV
1422	DRG / 1422 / 04	A

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APPENDIX D- Crane Lifting Plan

APPENDIX: - OUTLINE LIFTING PLAN - GASHOLDER No.4

Gasholder Dismantling at Reading Gasholder Station.

Lifting Procedure – Preparation:

This Procedure describes the Method which will be employed to dismantle the columns on Gasholder No.4 at the above Site.

The Lift will be carried out in accordance with the requirements of BS 7121 Part 1: 1989 3 & 4.

The Lift Dimensions are: -	Length	-	TBC
	Width	-	TBC
	Height	-	TBC
	Weight	-	TBC

The Crane will be a 100-ton self-erecting Tower Crane, which has a safe working load of **TBC** at a radius of 45m with a jib length of **(TBC)**.

All Certification will be provided by the Crane Hire Company for the Crane, Lifting Gear and Driver in accordance with the requirements of the user. All Certification will be inspected and approved by the users Appointed Person prior to allowing the Lift to take place.

Method:

Driver to be Site Inducted and taken through the Lifting Plan, indicating all potential hazards associated with all Lifts.

The Crane will be positioned as agreed between the users Appointed Person and the Crane Driver, taking into account any proximity hazards, space availability and suitability of the ground or foundations – or as per a previously prepared Drawing of the Site.

The Crane Driver shall set up as per the manufacturer's guidelines.

Crane is to be sited as per the Berthing Plan; Banksman to assist and control traffic during Crane Erection Duties.

Attached Lifting Gear – NB. Where the Lifting Gear has been provided by the user, the Appointed Person should ensure that all Certification has been inspected and approved as above.

Describe briefly the Motions the Crane will go through from Lifting to Landing:

Lift equipment clear, derrick out, then under instruction from Banksman slew over section of steelwork to be removed. Lower chains and wait for Banksman / Slinger to connect load on to chains.

Take weight of section and then wait until instructed before Lifting section clear. Slew in direction indicated by the Banksman / Slinger. Land the section of steelwork into Designated Laydown Area.

Banksman to disengage Lifting chains and Crane Driver to hoist Lifting Gear clear of load. Reposition Crane over next Lift and begin same process to remove next section, this procedure to be repeated until job is complete.

Once the Crane is erected all Safety Devices, where practically possible, will be Tested or Inspected to ensure they are operational and fit for use, a slew restrictor device shall also be activated prior to Lifting operations commencing. Should the Tests prove unsatisfactory no Lifting Operations will be undertaken.

Lifting Chains to be placed onto main Crane Hook Block by the Slinger / Banksman; checking that a Safety Retaining Device is fitted to prevent inadvertent disconnection during use.

An Exclusion Zone is to be established around area where Lifting Operations are taking place. This is to be defined with Red & White Barrier Tape. Banksman to be in attendance at all times during Lifting Operations to control this area.

Clear communication to be established between Crane Driver and Banksman before commencement of Lifting Operations i.e. hand signals / radios.

Under the instruction of the Banksman, the Crane Driver will hoist the chains and slew the Crane over the first section of steel bracing to be removed.

The Slinger / Banksman will then secure the section to be removed. The Topman Burner will then Hot-Cut the steel bracing free.

Following the Lifting Sequence below. The Gasholder Column Structure shall be dismantled until all steel bracings and columns have been removed.

The Slinger / Banksman shall disengage chain after the above sequence of work has been completed and all dismantled steelwork placed into Laydown Areas for size reducing and disposal from Site.

Lower hook and disengage Lifting gear.

Crane Driver to de-rig crane, ready to move off Site.

Additional Information

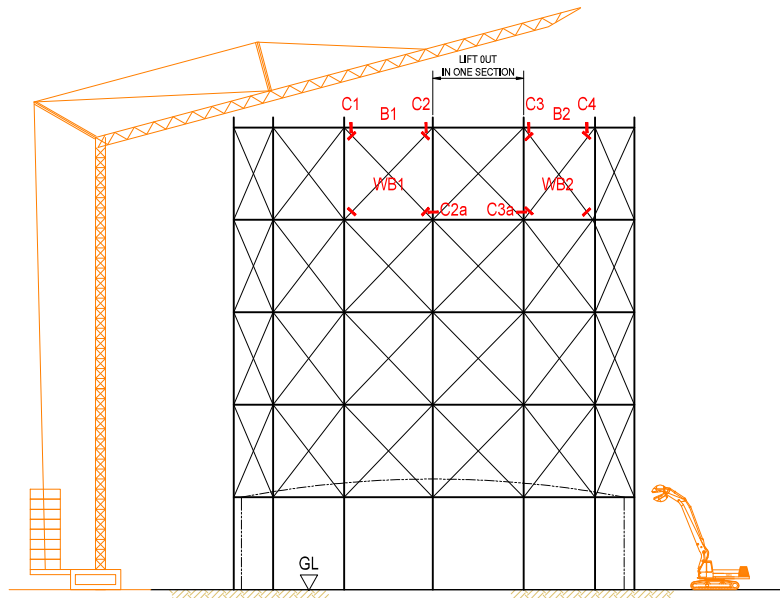
Road Plate may be laid in certain areas of site if required.

Lifting Sequence (see below)

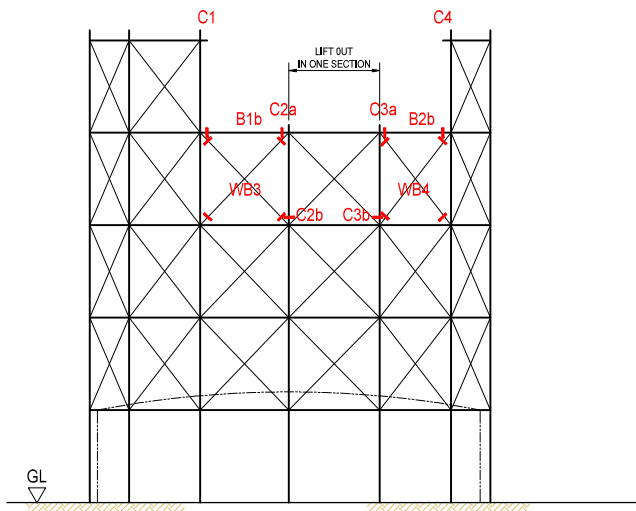
- Cut and remove bracing B1 between columns C1 and C2
- Cut and remove bracing B2 between columns C3 and C4
- Cut and remove wind bracings WB1 as one unit between columns C1 and C2
- Cut and remove wind bracings WB2 as one unit between columns C3 and C4
- Using spreader beam and chains, attach C2 and C3 as one unit.
- Cut column base at C2A.
- Cut column base at C3A.
- Lift out both C2 and C3 as one unit and place into laydown area.
- Cut and remove bracing B1B between columns C1 and C2A
- Cut and remove bracing B2B between columns C3A and C4.
- Cut and remove wind bracing WB3 as one unit between columns C1 and C2A
- Cut and remove wind bracing WB4 as one unit between columns C3A and C4
- Using spreader beam and chains, attach C2A and C3A
- Cut column base of C2A.
- Cut column base of C3A.
- Lift out both C2A and C3A as one unit and place into laydown area.

This Lifting Sequence shall be repeated around the full circumference of the Gasholder. but will be determined by the weight of the columns as to what can be Lifted down safely i.e. it should be possible to dismantle the whole Gasholder Column Structure using this sequence. However, if this cannot be achieved an amendment at Site level will be implemented to change the Lifting Process.

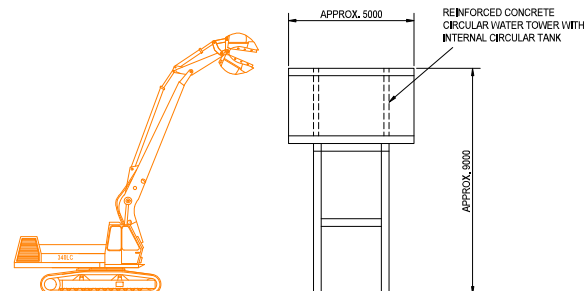
APPENDIX E- Lifting Plan and Water Tower Dismantling



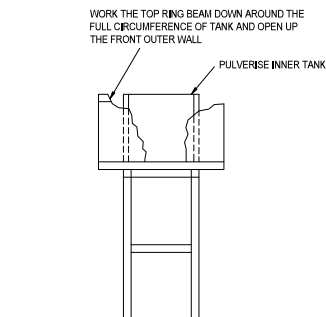
ELEVATION ON GAS HOLDER No.4
SHOWING COLUMN DISMANTLING SEQUENCE 1.



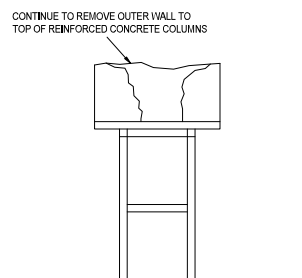
ELEVATION ON GAS HOLDER No.4
SHOWING COLUMN DISMANTLING SEQUENCE 2.



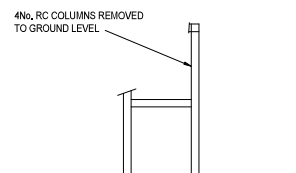
STAGE 1.
HIGH REACH EXCAVATOR WORKS
FROM SOUTH SIDE OF WATER TOWER



STAGE 2.
REMOVE PART OF OUTER TANK TO
EXPOSE INNER TANK



STAGE 3.
INNER AND OUTER TANKS REMOVED



STAGE 4.
DISMANTLE 4No. REINFORCED
CONCRETE COLUMNS TO GROUND

NOTES:-

- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND SPECIFICATIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES (mm).
- ALL LEVELS ARE IN METRES (m).

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REV	DATE	BY	DESCRIPTION	CHK	APP

TENDER

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CLIENT:

SGN

PROJECT:

GAS HOLDER DEMOLITION
READING No.4 SITE

TITLE:

LIFTING PLAN AND
WATER TOWER DISMANTLING

SCALE & SIZE:
1:250 & 1:100 @ A1 SIZE

CHECKED:
TS

APPROVED:
TS

DWG FILE:

DESIGNED/DRAWN:
PERRIN

DATE:
18 MAY '20

PROJECT NO:
1422

DRAWING NO:
DRG / 1422 / 05

REV:
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APPENDIX F - Peregrine Falcon Perch Specification



TECHNICAL SPECIFICATION

DATE:	02 April 2020	CONFIDENTIALITY:	Confidential
SUBJECT:	SGN Reading – Bird Mast Specification		
PROJECT:	70070233	AUTHOR:	Mark Wheeler
CHECKED:	Liam Barber	APPROVED:	Mark Wheeler

1 INTRODUCTION

WSP UK Ltd has been instructed by SGN (the Client) to prepare an outline specification for a bird mast at a site in Reading. The mast is to provide a perch for Peregrine Falcons whilst existing structures at the site are removed and until new structures are complete. Outline details of the mast are provided below:

Location	The proposed mast location within the site is shown on Collado Collins Architects drawing 16035 P0-010 Rev P dated 28-03-19 which is attached to this document.
Height	It is a requirement that the mast is 30m tall.
Sway	Movement (sway) at the top of the mast is to be limited to less than 0.75m from centre of the vertical mast. Although also refer to Section 2, paragraph 3.1.4 for further details.
Perch Requirements	A sketch is included in Section 3 showing the anticipated perch size and details.
Ground Conditions / Foundation Details	A ground investigation for the whole site has been undertaken for the site and is included as a separate report within the tender documents. The closest exploratory hole logs are included in this note for convenience, however the full ground investigation report (including exploratory hole location plan) must be consulted and understood for the foundation design.

2 MAST AND FOUNDATION DETAILS

WSP has approached CU Phosco (Lighting) and discussed requirements for the mast. The details below (including outline foundation design) are for mast type PC-3522 and are relevant only to this mast. If the Tenderer wishes to provide a different mast then the requirements of this specification are to be adhered to and a full set of supporting calculations for the mast and foundation design are to be provided.

1. General
 - 1.1 The High Mast shall comprise of an un-stayed (free standing) tapering galvanised steel monopole of nominal height of 30m for the purpose of mounting a peregrine falcon perch.



TECHNICAL SPECIFICATION

DATE:	02 April 2020	CONFIDENTIALITY:	Confidential
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PROJECT:	70070233	AUTHOR:	Mark Wheeler
CHECKED:	Liam Barber	APPROVED:	Mark Wheeler

2. Accreditation
 - 2.1 The manufacturer of the High Mast shall be Quality Assured to BS EN ISO 9001.
3. Structural Performance
 - 3.1 The High Mast structural design shall be fully in accordance with the UK publication Institution of Lighting Professionals - Professional Lighting Guide 07 (ILP PLG 07) and shall take into account the structural strength of the mast required to:
 - 3.1.1 withstand dead weight of the mast shaft, perch box and supporting steelwork;
 - 3.1.2 withstand cantilever loads due to the wind loading on the mast and attachments due to the 10-minute mean wind velocity measured at 10m above ground level and with a return period of 25 years for the Ultimate Limit State condition. The design value of the 10-minute mean wind velocity shall be taken as 22.0 m/s for the Reading area in accordance with the UK National Annex to BS EN 1991-1-4:2005+A1:2010;
 - 3.1.3 withstand cumulative second order (P-delta) effects of eccentric loads on the mast; and
 - 3.1.4 remain within a deflection limit of $1/40^{\text{th}}$ x Height at a 10-minute mean wind velocity of 15.0 m/s for the Serviceability Limit State condition.
 - 3.2 Wind excited oscillation shall be damped by the method of construction and adequate allowance made for the related stress.
 - 3.3 The shape coefficient of the mast cross-section shall have been derived by independent wind tunnel testing.
 - 3.4 The design life of the high mast shall be 25 years.
 - 3.5 The site altitude shall be taken as 50m above mean sea level.
 - 3.6 The Terrain Category to EN 1991-1-4 shall be taken as II (two) and the site distance from the sea shall be taken as 50 km.
 - 3.7 For the purposes of the mast design the nesting box shall be assumed to have a nominal size of 1.0m x 1.0m x 1.0m (h x w x d) and mass 100 kg. The shape coefficient shall be taken as 1.0.
4. Mast Construction
 - 4.1 All steel used in the construction of the mast shall comply with BS EN 10025 of appropriate grade.
 - 4.2 All welding shall be in accordance with BS EN ISO 1011.
 - 4.3 Manufacturer shall CE mark the structure to BS EN 1090 based on Execution Class 2.
 - 4.4 The mast shall be continuously tapered and be constructed from steel plates cut and folded to form 20-sided polygon sections, telescopic jointed and seam welded with the exception of site overlap joints.
 - 4.5 Each mast section over 6m in length shall include a telescopic and welded joint to provide diaphragm stiffness and to maintain the structural section during delivery.
 - 4.6 The mast shaft to base flange connection shall be of the pass-through type with a multi-pass fillet weld on the top side and a sealing weld on the underside. The base flange connection to the mast shaft shall fully develop the strength of the section. In addition, supplementary gussets shall be provided between bolt holes. Butt welded connections between the mast shaft to base flange will not be acceptable.
5. Corrosion Protection.
 - 5.1 All sections of the mast shall be hot dip galvanised after fabrication, internally and externally, in accordance with BS EN ISO 1461.



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6.

Perch Box Mounting

6.1 Details of the perch box and any supporting steelwork will be provided by the perch box supplier.
7.

Mast Holding Down System

7.1 Grade 8.8 galvanised holding down studs shall be supplied complete with a steel anchor plate for casting into the foundation.

7.2 A precision made steel template with tubed holes to ensure correct vertical and horizontal stud alignment shall also be provided.

7.3 The holding down studs shall consist of 10 (ten) M27 x 850mm equi-spaced on a 838mm pitch circle diameter.

7.4 The holding down studs shall be installed in accordance with the mast manufacturers recommendations.
8.

Foundation Pad

8.1 The mast foundation shall consist of a reinforced concrete pad footing.

8.2 Subject to ground conditions the foundation may require under pinning or screw piling. Alternatively, any soft alluvial material that is unsuitable to act as the formation shall be excavated and removed sufficient to expose material with a suitable bearing capacity and shear strength.

8.3 Any resulting void from excavation of soft spots shall be infilled using a suitable material form founding the concrete foundation pad, e.g. lean mix mass concrete or subject to approval, uncontaminated crushed aggregate recycled from elsewhere on the site.

8.4 The RC foundation pad shall use cement suitable to the soil conditions indicated on the Geotechnical Investigation for the site.

8.5 The concrete mix design shall be suitable to develop the required concrete compressive strength at 28 days from pouring.

8.6 The mast shall not be installed on the RC foundation until 28 days after pouring.

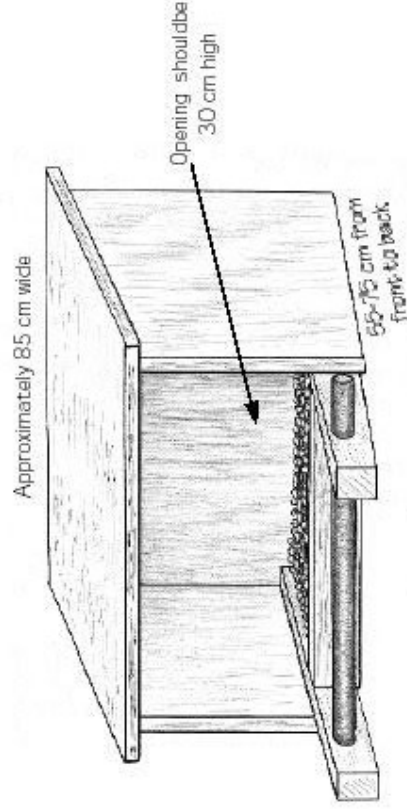
8.7 The steel reinforcement shall be supplied to site as a prefabricated cage to drawing W-140503-02. The design and fabrication of the reinforcement cage shall be suitable to allow the installation and levelling of the mast foundation studs and anchor plate through the top face of the reinforcement, without the need for cutting reinforcement. Loose steel bars may be used to finish the top reinforcement after installing the holding down studs.

TECHNICAL SPECIFICATION

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PROJECT:	70070233	AUTHOR:	Mark Wheeler
CHECKED:	Liam Barber	APPROVED:	Mark Wheeler

3 PERCH DETAILS

An indicative detail of the perch box is provided in the sketch below which includes dimensions. The Tenderer is to provide exact details and dimensions of the proposed perch for approval by Greenspace Ecology.



4 GROUND CONDITIONS AND MAST FOUNDATION

4.1 GEOLOGY

The ground investigation has shown the sequence of soils to be Made Ground over alluvial soils, river terrace sands and gravels over chalk. The closest exploratory hole records to the proposed mast location are WS202 and HP102. Unfortunately, neither of these locations penetrated through the Made Ground, with WS202 stopped due to presence of an underground utility. The nearest deeper exploratory holes are BH106 and BH204.

The alluvial soils are described as very soft in places and descriptions include notes of 'peat'. Neither of the Made Ground or peaty/soft alluvium are considered suitable founding strata. Groundwater strikes are noted as being at 1.6m and 1.7m below ground level in the two boreholes. The design presented is based on an allowable bearing of 125kPa, therefore all soft spots are to be removed and replaced with either concrete or Type 1.

Attention is drawn to the possibility that after removal of soft spots the formation may be below water level. The Contractor is to propose how to place concrete below the water level or keep the excavation free from standing water during placement of concrete. Placement of Type 1 below water level is not permitted.



TECHNICAL SPECIFICATION

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SUBJECT:	SGN Reading – Bird Mast Specification		
PROJECT:	70070233	AUTHOR:	Mark Wheeler
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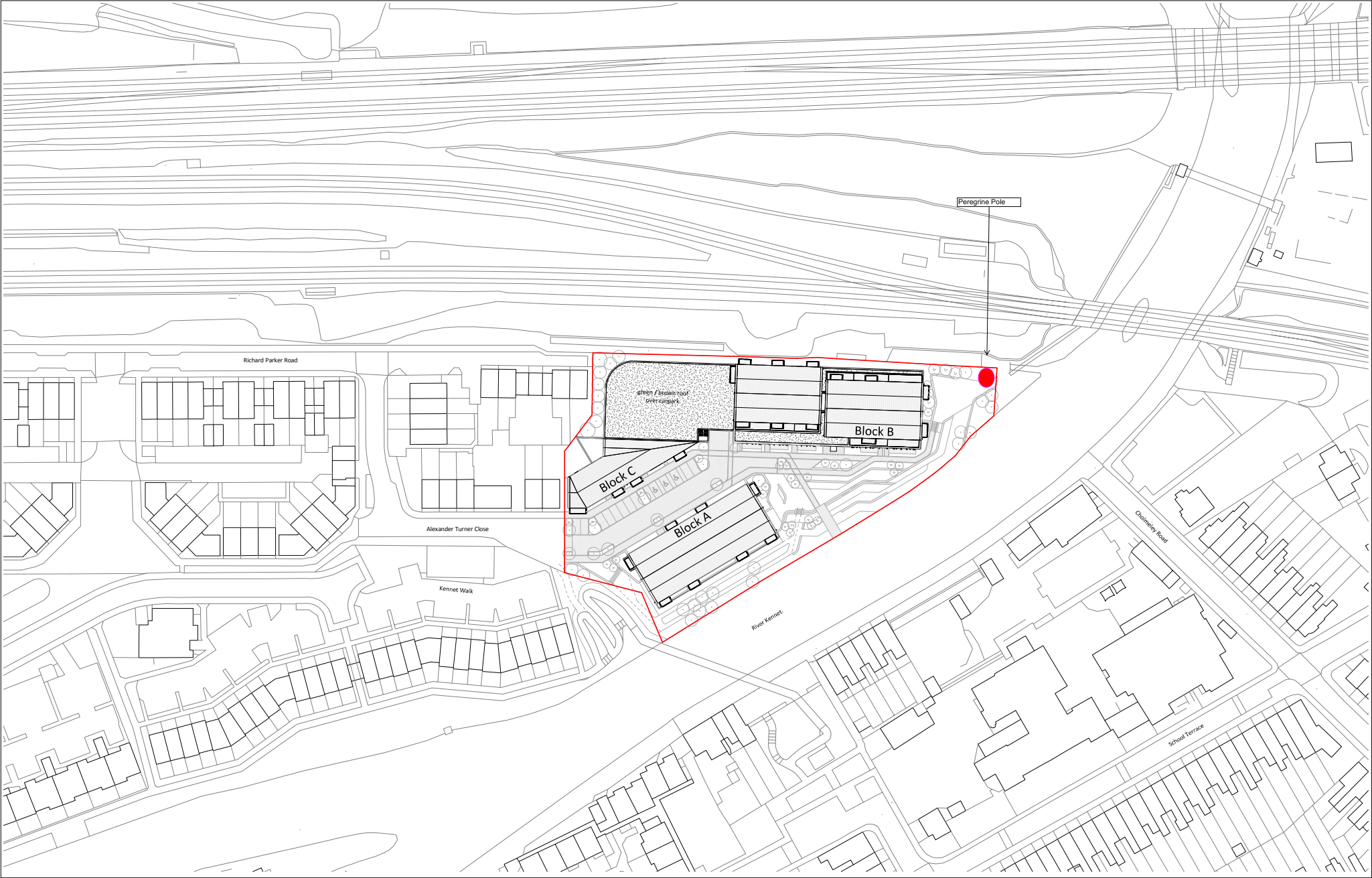
The Tenderer is to satisfy themselves that sufficient ground investigation (GI) exists for the design of the foundation at the proposed location. This Note has acknowledged that ground investigation exploratory holes at the proposed mast location is limited and further GI may be required.

The proposed foundation detail shown on drawing W-140503-02 (dated 20-03-20) is for this mast type only and the assumed bearing capacity of 125kPa. The Tenderer is to provide full calculations for the foundation should a different mast be proposed.

5 NOTES ON LIMITATIONS

This section provides a series of comments regarding this specification, the proposed design and associated aspects of the project which may be linked to the provision and installation of the mast.

- This appointed Contractor is to be responsible for classifying, handling and disposal of arisings from the foundation excavation. This includes arisings that may be or are contaminated.
- The mast is located close to the site boundary with Network Rail tracks beyond. The Contractor is to liaise with Network Rail and is responsible for gaining any approvals required for the mast including construction stage.
- The mast is also located close to a river. The Contractor is responsible for obtaining any approvals, licences or permits for work in close proximity to the water.
- The Contractor is responsible for ensuring the foundation design is complied with or that an alternative is proposed. Particular attention is drawn to the bearing capacity requirements in the design and the ground conditions identified in the GI. The Contractor is to satisfy themselves that the GI is sufficient for the design requirements.
- The Contractor is responsible for the construction of the pad foundation. Particular attention is drawn to the possibility of shallow groundwater and how the pad is to be constructed either below water level or keeping the excavation free from standing water.



NOTES

CONSULTANTS

- Refer to highways consultant's drawings for details.

- Refer to landscape consultant's drawings for details.

- Landscaping layout is indicative only.

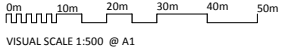
AREAS

- Refer to area schedule

N

© Copyright Reserved: ColladoCollins Partners LLP

Rev	Notes	Date	By	Auth
P	Planning Application	28/03/19		



ColladoCollins Architects

17-19 Foley Street
London W5W 6DHW
T 020 7548 3400
F 020 7548 2817
info@colladocollins.com
www.colladocollins.com

Date: 28/03/19
Drawn by: LK
Checked by: RJC
Scale @ A1: 1:500
Scale @ A3: 1:1000
CAD File No:

Danescroft (KDPM) LLP
Gas Holder, Reading
Proposed Site Plan

PLANNING
16035

PO-010

BOREHOLE LOG

Tel:

Project Reading Gasholder No. 4		BOREHOLE No BH106	
Job No 287642I	Date 12-11-15	Ground Level (m) 37.27	Co-Ordinates () E 472,947.4 N 173,714.4
Contractor Geotechnical Engineering Ltd / Heathrow Contractors Ltd		Sheet 1 of 2	

SAMPLES & TESTS				STRATA				Geology	Instrument/
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
				37.23		0.04	TARMACADAM		
				36.37		(0.86)	CONCRETE		
1.10	ES	0.2				0.90	Orange SAND and GRAVEL. Gravel is fine to coarse subangular flint and occasional flint cobbles. (MADE GROUND)		
1.10	PID					(0.60)			
1.50	SPT	N=2		35.77		1.50	Gravelly sandy CLAY. Gravel is fine to medium angular fragments of brick and flint. (MADE GROUND)		
1.70	PID	17.7		35.67		1.60	Dark green to grey mottled black soft SILT with occasional white shell fragments. Possible slight hydrocarbon odour.		
				34.87		(0.80)			
						2.40	Light grey-green SILT		
3.00	SPT	N=2				(1.45)	3.50 Frequent white shell fragments		
3.60	PID	51.8		33.42		3.85	Black SAND and GRAVEL. Sand is fine to coarse. Gravel is fine to coarse subrounded to angular fragments of flint		
4.50	SPT	N=6							
6.00	SPT	N=10				(3.55)			
7.50	SPT	N=28		29.87		7.40	7.10 Becoming orange		
							Structureless CHALK composed of white slightly gravelly slightly clayey SAND. Gravel is fine to coarse subrounded to subangular fragments of weak highly weathered low to medium density chalk and occasional angular cobbles of flint (Grade Dc).		

Boring Progress and Water Observations				Chiselling Details				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Water Depth	From	To	Time Taken	
								Geology inferred from Vac Ex arisings to 1.5 mbgl.

All dimensions in metres Scale 1:50	Client SGN	Method/ Plant Used Vac Ex to 1.5 mbgl. Pioneer rig dynamic sampling.	Logged By EW	Checked By GW
--	---------------	--	-----------------	------------------

BOREHOLE LOG

Tel:

Project
Reading Gasholder No. 4

BOREHOLE No
BH106

Job No
287642I

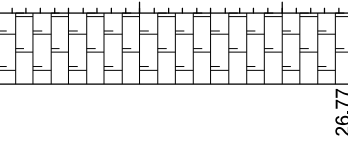
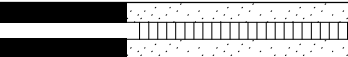
Date
12-11-15

Ground Level (m)
37.27

Co-Ordinates ()
E 472,947.4 N 173,714.4

Contractor
Geotechnical Engineering Ltd / Heathrow Contractors Ltd

Sheet
2 of 2

SAMPLES & TESTS				STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
9.00 9.20	SPT PID	N=34 9.8				(3.10)	Structureless CHALK composed of white slightly gravelly slightly clayey SAND. Gravel is fine to coarse subrounded to subangular fragments of weak highly weathered low to medium density chalk and occasional angular cobbles of flint (Grade Dc). (continued)		
10.50	SPT	N=40		26.77		10.50			

Boring Progress and Water Observations				Chiselling Details			GENERAL REMARKS
Date	Time	Depth	Casing Depth	Water Depth	From	To	
							Geology inferred from Vac Ex arisings to 1.5 mbgl.

All dimensions in metres
Scale 1:50

Client SGN

Method/ Plant Used
Vac Ex to 1.5 mbgl. Pioneer rig dynamic sampling.

Logged By
EW

Checked By
GW

Hand Pit Log

Tel:

Project Reading Gasholder No. 4				HAND PIT No HP102	
Job No 287642I	Date 04-11-15	Ground Level (m) 37.30	Co-Ordinates () E 472,976.7 N 173,712.5		
Contractor Geotechnical Engineering Ltd / Heathrow Contractors Ltd			Sheet 1 of 1		

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.50	ES PID	0ppm		37.12		0.18	CONCRETE		
0.50				36.50		(0.62) 0.80	Dark brown clayey gravelly SAND. Gravel is medium brick, coal and flint. Sand is fine with potential ashy deposits. (MADE GROUND)		
1.20	ES PID	0ppm		36.00		1.30	Brown sandy gravelly CLAY with fine rootlets. Gravel is subangular medium flints with occasional brick and coal fragments. (MADE GROUND)		
1.20							End of hand pit at 1.3 mbgl.		

GENERAL REMARKS	
Located in eastern corner of site adjacent to water tower.	

All dimensions in metres Scale 1:75	Client SGN	Method/ Plant Used	Hand digging	Logged By EW	Checked By GW
--	---------------	-----------------------	--------------	-----------------	------------------

WSP UK

Kings Orchard, 1 Queen Street
Bristol BS2 0HQ
Telephone: 0117 930 6200

Job No

70031882

Contractor / Driller

Geotechnical Engineering

Method/Plant Used

Pioneer Rig

Client

Danescroft LLP

Logged By

Edward Jollands

Project

Reading Gasholder No.4

Sheet

1 of 3

Job No

70031882

Client

Danescroft LLP

Contractor / Driller

Geotechnical Engineering

Method/Plant Used

Pioneer Rig

Logged By

Edward Jollands

Co-Ordinates (NGR)

E 472948.248
N 173693.617

Date

27-03-19
28-03-19

Ground Level (m AOD)

37.299

Hole No.

BH204

SAMPLES & TESTS					STRATA				Install / Backfill Dia. mm		
Depth	Type	Test Result	$\frac{Q}{\sigma'_v}$ (ppm)	$\frac{HSV}{\sigma'_v}$ (kN/m ²)	$\frac{P_u}{\sigma'_v}$ (kN/m ²)	Water	Elev. (mAOD)	Depth (Thick-ness)	Description	Legend	Geology
-0.30-0.40	ES		<0.1				37.28	0.04	ASPHALT.		TARMAC
-0.60-0.70	ES		<0.1				37.10	0.20	CONCRETE.		CONC
-1.10-1.20	ES		<0.1				36.90	0.40	Very dark brown gravelly medium and coarse SAND. Gravel is fine to coarse angular to rounded of brick, concrete, flint and clinker. (MADE GROUND)		TARMAC
-1.80-2.00	ES		<0.1				36.75	0.55	0.30 Becoming brown		GMG
-2.20-2.70	B		0.5				36.30	1.00	Red brick layer.		GMG
-2.60-2.70	D		0.6				(0.70)		Dark brown gravelly fine to coarse SAND. Gravel is fine and medium of brick, chalk and flint. (MADE GROUND)		CMG
-3.50-3.60	D		0.7				35.60	1.70	Grey and greyish blue and orangish brown slightly sandy gravelly CLAY. Gravel is fine and medium angular to subangular of flint. (MADE GROUND)		ALV
			0.6				35.20	2.10	Very soft locally soft grey speckled black CLAY with occasional shell fragments. (ALLUVIUM)		ALV
			0.6					(1.00)	Very soft locally soft grey sandy CLAY with abundant shell fragments. (ALLUVIUM)		ALV
			0.7				34.20	3.10	2.20 - 2.70 Rare chalk and flint fine subangular gravel.		ALV
			0.7					(0.60)	Very soft brown CLAY with occasional decaying wood fragments. (PEAT)		ALV
			0.7				33.60	3.70	Grey clayey GRAVEL. Gravel fine to coarse angular to sub angular of flint and rare chalk. (RIVER TERRACE GRAVELS)		RT
			0.8					(1.00)	3.70 - 4.30 No recovery		RT
			1.1				32.60	4.70	Brown and cream gravelly slightly clayey fine to coarse SAND. Gravel fine to coarse rounded to angular of flint and occasional chalk. (RIVER TERRACE GRAVELS)		RT
			1.2					(0.80)	4.70 Slight hydrocarbon odour		RT
			1.2				31.80	5.50	5.00 - 5.50 No recovery		RT
			1.2					(1.20)	Brown and cream sandy clayey GRAVEL. Gravel fine to coarse rounded to angular of flint and occasional chalk. (RIVER TERRACE GRAVELS)		RT
			1.5					6.70	6.00 - 6.70 No recovery		RT
			1.5				30.60		Brown and black and orange and cream fine to coarse angular to rounded GRAVEL of flint. (RIVER TERRACE GRAVELS)		RT
			1				30.20	7.10	Pale brown slightly gravelly coarse SAND. Gravel fine angular of flint. (RIVER TERRACE GRAVELS)		RT
			0.9				30.00	7.30	Grey sandy CLAY with numerous wood fragments. (PEAT)		PEAT
			0.8				29.85	7.45	Brown and black and orange and cream fine to coarse angular to rounded GRAVEL of flint. (RIVER TERRACE GRAVELS)		RT
			0.8				29.15	8.15	7.45 - 7.50 Sandy gravel		SECK
			0.8					(2.35)	Structureless CHALK, composed of: cream slightly gravelly CLAY, Gravel very weak, low density and white. (Seaford Chalk Formation and Newhaven Chalk Formation, Grade Dm)		SECK
			0.8						9.00 - 10.50 No recovery		SECK

Boring Progress					Water Strikes				
Date	Time	Depth	Casing Dpt	Water Dpt	Date	Time	Strike	Minutes	Casing
					28-03-19		1.60		
Chiselling									
From	To	Hours	Tool	Water Added					
					General Remarks				
					Hole terminated at 15.0m bgl Geology inferred from Vac Ex arisings to 1.70m bgl				
Scale 1:62.5					Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.				

17 WSP BH LOG 70031882 - READING GASHOLDER 4.GPJ WSPTEMPLATE7.00.GDT 10/7/19

WSP UK

Kings Orchard, 1 Queen Street

Bristol BS2 0HQ

Telephone: 0117 930 6200

Job No

70031882

Contractor / Driller

Geotechnical Engineering

Method/Plant Used

Pioneer Rig

Client

Danescroft LLP

Logged By

Edward Jollands

Project

Reading Gasholder No.4

Sheet

2 of 3

Hole No.

BH204

Date

27-03-19

28-03-19

Ground Level (m AOD)

37.299

SAMPLES & TESTS					STRATA			Install / Backfill Dia. mm			
Depth	Type	Test Result	T _D (ppm)	HSV (K/m ²)	T _D Pen (K/m ²)	Water	Elev. (mAOD)	Depth (Thick-ness)	Description	Legend	Geology
-10.50-11.50	B		0.3				26.80	10.50	Structureless CHALK, composed of slightly silty subangular to subrounded, medium to coarse GRAVEL. Gravel is very weak to weak, low density, white with frequent brown speckles. (Seaford Chalk Formation and Newhaven Chalk Formation, Grade Dc)		SECK
-11.00-11.10	D		0.5				26.10	11.20			SECK
-11.90-12.00	D		0.5				25.40	11.90	Very weak to weak medium occasionally high density white with frequent brown specks CHALK. Fractures (Seaford Chalk Formation and Newhaven Chalk Formation, approx Ciria Grade A4)		SECK
-12.30-12.40	D						25.20	12.10	Structureless CHALK, composed of slightly silty subangular to subrounded, medium GRAVEL. Gravel is very weak, low density, white with frequent brown speckles, ((Seaford Chalk Formation and Newhaven Chalk Formation, Grade Dc)		SECK
-13.40-13.50	D		<0.1				24.80	12.50	Weak to very weak, medium density white CHALK. Fractures are horizontal to verticle planar very closely spaced (50) clean and closed (0/0/0) with brown and dark grey speckling (Seaford Chalk Formation and Newhaven Chalk Formation, approx Ciria Grade A4)		SECK
-14.20-14.30	D		<0.1				23.80	13.50	Medium, medium density cream CHALK. Fractures are horizontal undulating to planar, closely to medium spaced (100, 100, 170) clean and tight (0/0/1), with slight grey speckling. With occasional subrounded medium to coarse flint gravel. (Seaford Chalk Formation and Newhaven Chalk Formation, approx Ciria Grade A3)		SECK
-14.42-14.60	CORE		0.2				23.40	13.90	12.50 - 12.80 Recovered as clay putty due to SPT		SECK
-14.73-14.90	CORE						22.90	14.40	Structureless CHALK, composed of subangular to subrounded, mainly medium and coarse GRAVEL. Gravel is weak, medium density, white with orange staining and faint brown speckles, (Seaford Chalk Formation and Newhaven Chalk Formation, approx. Grade Dc)		SECK
-14.90-15.00	D						22.30	15.00	Weak to medium strong medium density white to cream CHALK. Fractures are subhorizontal to verticle very closely spaced (10/10/40) open with fine chalk gravel infilling (3) with black speckles (Seaford Chalk Formation and Newhaven Chalk Formation, approx Ciria Grade C4)		SECK
									Weak to medium strong medium to high density white to cream CHALK. Fractures are horizontal (10/10/180) clean and closed (0) unstained sometimes with trace of cream clay. (Fractures potentially drilling induced); Rare fine sub angular to medium flint gravel. (Seaford Chalk Formation and Newhaven Chalk Formation, approx Ciria Grade A3)		END
									Borehole terminated at 15m bgl		

Boring Progress					Water Strikes				
Date	Time	Depth	Casing Dpt	Water Dpt	Date	Time	Strike	Minutes	Casing
Chiselling									
From	To	Hours	Tool	Water Added					
				From To					
					General Remarks Hole terminated at 15.0m bgl Geology inferred from Vac Ex anisings to 1.70m bgl				
Scale 1:62.5					Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.				

17 WSP BH LOG - READING GASHOLDER 4.GPJ WSPTEMPLATE7.00.GDT 10/7/19

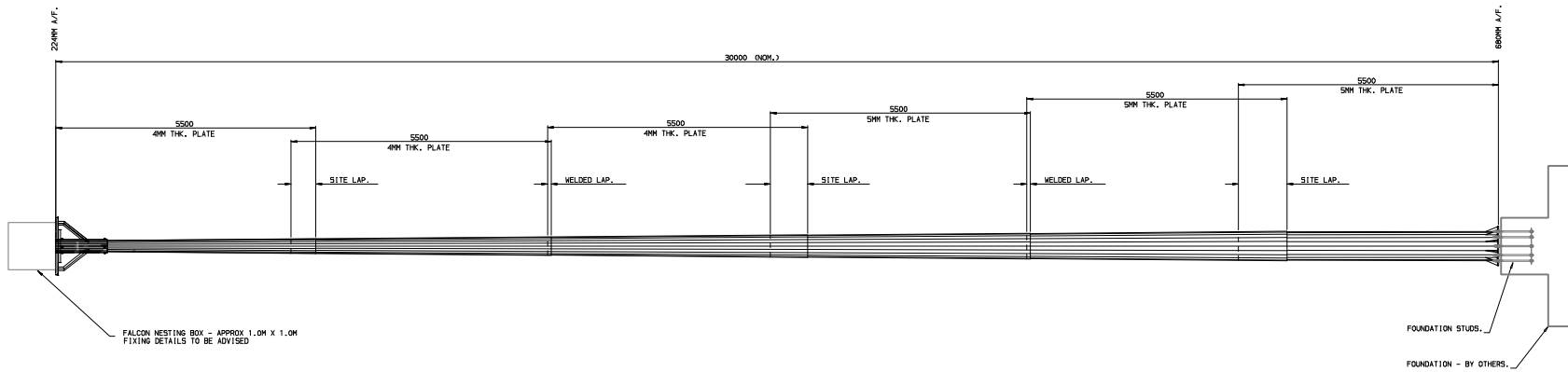
 WSP UK Kings Orchard, 1 Queen Street Bristol BS2 0HQ Telephone: 0117 930 6200		WINDOW SAMPLE LOG		Hole No. WS202	
Project		Reading Gasholder No.4			
Job No 70031882		Client Danescroft LLP		Date 04-04-19 04-04-19	
Contractor / Driller Geotechnical Engineering		Method/Plant Used Hand digging		Logged By Edward Jollands	
		Co-Ordinates (NGR) E 472976.542 N 173712.216		Ground Level (m AOD) 37.260	

SAMPLES & TESTS							STRATA				Install / Backfill		
Depth	Type	Test Result	PH	HSV (ppmV)	P _{Pen} (kN/m ²)	Water	Elev. (mAOD)	Depth (Thick-ness)	Description	Legend	Geology	Dia. mm	
1.10-1.30	ES						37.16	0.10	CONCRETE. Brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of flint concrete, clinker and brick. Occasional sub rounded concrete cobbles, (MADE GROUND)		CONC	25	
								(1.25)				GMG	
							35.91	1.35	1.20 Frequent brick cobbles 1.20 - 1.30 Burnt odour Window sample terminated on plastic or brick pipe running east to west at 1.35m bgl Plastic or brick pipe running east to west		END		

Hole Diameter		Recovery		Water Strikes							
Depth	Diameter (mm)	Remarks	Core Top (m)	Core Base (m)	% Recovery	Date	Time	Strike	Minutes	Standing	Casing
						General Remarks Hole refused at 1.35m bgl on a unidentified service potential plastic pipe. Hand pit dry.					
Scale 1:37.5		Notes: All dimensions in metres. Logs should be read in accordance with the provided Key. Descriptions are based on visual and manual identification.									

NOTES:

ALL DIMENSIONS IN MM.
ALL PLATE TO BS EN 10025; MAST SHAFT - GRADE S355JR, FLANGEPLATE - GRADE S275J2.
ALL WELDING TO BS EN 1011.
FABRICATION OF STEELWORK TO BS EN 1090-2 FOR EXC2.
FINISH: H.D.G. TO BS EN ISO 1461
SCALE 1:35 (A0 SHEET) - UNLESS STATED OTHERWISE.



DETAIL OF FLANGEPLATE.

SCALE 1:20

DATA DIAMETER : 940MM.

THICKNESS : 30MM.

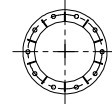
WITH 10 No. 35MM DIA. HOLES ON A 838MM PCD.

FOUNDATION STUDS.

DATA TYPE : GRADE 8.8 HIGH TENSILE STUDS.

DIAMETER : M27

LENGTH : 850MM.



0 1 2 3 4 5 6 7 8 9 10 CMS.

1st ANGLE PROJECTION

02	NOT REVISIT DURING FROM	1.6	1.6	20/03/20
ISS	REVISION	SIGN	CHECK	DATE

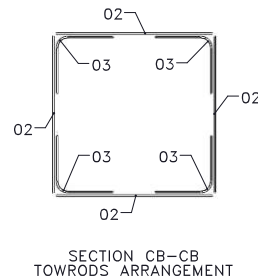
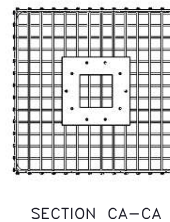
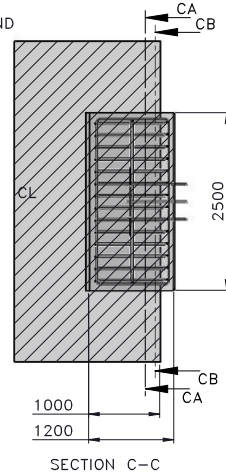
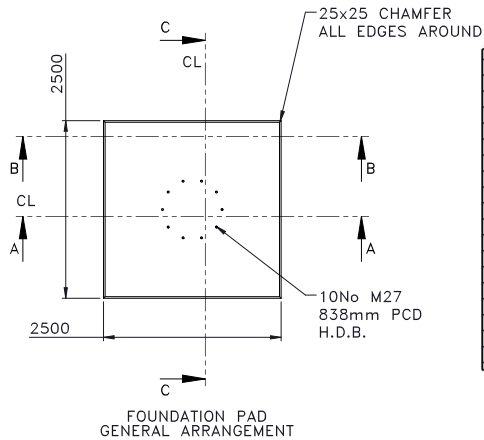
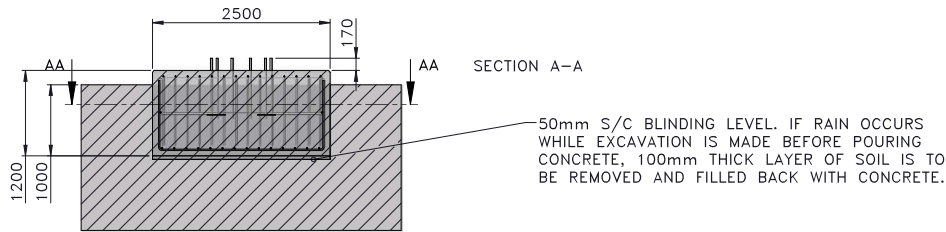
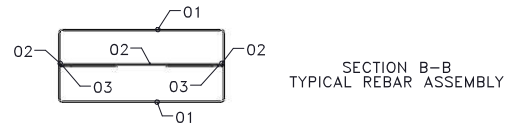
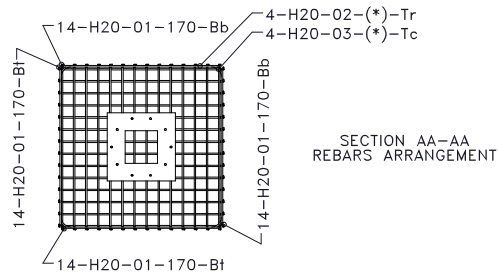
CU
WARE HERTS

TITLE:
GENERAL ARRANGEMENT OF
30M HIGH MAST (EX HMA9350)
FALCON NEST BOX
READING GAS WORKS
WSP - PC3522

DRAWN: R.G. CHECKED: S.B.
DATE: 16/03/20
DRWG No: S-1001282-02

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WITHOUT PERMISSION OF CU HLT.

IF IN DOUBT ASK - GET IT RIGHT 1st TIME.



Bar mark	Type and size	No. of		Total	Length of each bar	Shape code	Section length				
		mm	bars in each				A' [mm]	B' [mm]	C' [mm]	D' [mm]	E' [mm]
01	H20		56	56	4225	21	980	2330	980		
02	H20		4	4	2200	00	2190				
03	H20		4	4	1575	11	800	800			
04											
05											
06											
07											
08											
* specified in multiples of				5	mm for section length						
* specified in multiples of				25	mm for total length						

Notation for reinforcing steels (from BS8666:2005 including amendment)

Notation Type of steel reinforcement

H For ≤ 12 mm, Grade B500A, B500B or B500C conforming to BS 4449:2005

A Grade B500A according to BS4449:2005

B Grade B500B or Grade B500C according to BS 4449:2005

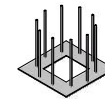
C Grade B500C according to BS 4449:2005

X A specified grade and type of ribbed stainless steel conforming to BS 6744:2001

Note1: In the grade description B500A, etc. "B" indicates reinforcing steel

Note2: Within the ranges given, the grade(s) supplied for notations H and B are at the supplier's discretion

FOUNDATION CALCULATION REFERENCE:
PC3522 EN1997-1-2004 FPD V1.3.7



H.D. BOLTS ASSEMBLY
AS PER RELEVANT DWG
10No. M27 ON A 838mm PCD

- NOTES:
- ALL DIMENSIONS IN mm UNLESS STATED OTHERWISE.
 - CONCRETE SPECIFIED TO BS8500 TO BE SUITABLE FOR THE APPLICATION.
 - ALL CONCRETE MECHANICALLY VIBRATED.
 - ALL EXPOSED SURFACE FAIR FINISHED.
 - ALL EXPOSED ARISES FINISHED WITH A 75mm EDGING TROWEL.
 - ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
 - ALL REINFORCEMENT TO BE HIGH YIELD STEEL IN ACCORDANCE WITH BS8110: PART 1: 1997, TABLE 3.1.
 - ALL REINFORCEMENT TO BE BENT IN ACCORDANCE WITH BS 8666:2005.
 - THE MINIMUM CONCRETE COVER TO ALL REINFORCEMENT TO BE 75mm UNLESS STATED OTHERWISE.
 - BARS ARE TO BE DISPLACED LOCALLY TO AVOID HOLES OR OBSTRUCTIONS LESS THAN 50mm IN LENGTH OR DIAMETER.
 - ADDITIONAL REINFORCEMENT AS REQUIRED TO MAINTAIN BARS IN POSITION AS DETAILED SHALL BE PROVIDED.
 - APPROVED SPACER BLOCKS TO BE USED AND ALL REINFORCEMENT TO BE TIED WITH 16 GAUGE BLACK ANNEALED IRON WIRE.
 - TENSION LAPS SHALL BE A MINIMUM OF 35 x BAR DIA BUT NOT LESS THAN 400mm.
 - H10=400 H20=700mm H25=875mm H32=1120mm
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIALISTS DRAWINGS AND SPECIFICATIONS.
 - REINFORCEMENT BARS ARE CALLED UP AS FOLLOWS: 21-H32-01-200-B
- LOCATION ABBREVIATIONS ARE CALLED UP AS FOLLOWS:
Bt - Base top, Bb - Base bottom, Tr - Tow rod, Tc - Tow rod corner, Ur - Upright, Tb - Top rod, Ts - Top stirrup
18. THE SPACING OF REINFORCEMENT MAY BE LOCALLY ADJUSTED TO ALLOW FOR CAST IN INSERTS, RECESSES, HOLDING DOWN BOLTS ETC.
17. DESIGN AND DETAILS OF ALL TEMPORARY WORKS BY OTHERS.
18. ALL SOFT SPOTS ENCOUNTERED IN THE EXCAVATIONS TO BE BACKFILLED WITH TRENCH MIX CONCRETE GRADE 16/20 OR COMPACTED HARDCORE TYPE 1 LAID AT LAYERS OF 150-200mm DEPTH AND COMPACTED AT EACH LAYER ACCORDINGLY.
19. ASSUMED LOAD BEARING CAPACITY 125 kN/m². TO BE CONFIRMED BY SITE ENGINEER PRIOR TO CASTING BLINDING.

* 02	* Mast height changed	* LB	* DGL	* 20/03/20
01	For Pricing	LB	DGL	11/03/20
ISS	REVISION	SIGN	CHKD	DATE

SCALE: 1:50 (FOR A2 SHEET SIZE) UNLESS STATED OTHERWISE.



TITLE:
STANDARD FOUNDATION PAD DESIGN
GENERAL ARRANGEMENT AND RC DETAILS

30.0m HEIGH MAST
PEREGRINE FALCON NESTING
READING, BERKS

CU REF.: PC3522

DRAWN: LB CHECKED: DGL
DATE: 20/03/2020
DRWG No: W-140503-02

0 1 2 3 4 5 6 7 8 9 10 CMS.

1st ANGLE PROJECTION

NO PART OF THIS DRAWING MAY BE REPRODUCED WITHOUT PERMISSION OF CU LTD.

APPENDIX G- Traffic Management Plan

Traffic Management Plan

Project: Reading Gasholder No4 Site

Location: Alexander Turner Close, Reading, RG1 3FQ

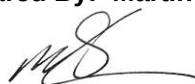
Client: SGN

Contract Number: Tender

Document Reference Number: TMP/Tender/MS

Document Prepared By: Martin Smith

Signature:



Name: Martin Smith

Position: Health, Safety & Environmental Manager

Date: 19th May 2020

Checked By: Peter MacDonald

Signature:



Name: Peter McDonald

Position: Consultant

Date: 19th May 2020

Approved by: John Wilson

Signature:



Name: John Wilson

Position: Contracts Manager

Date: 19th May 2020

Contract No:	Tender		Document Ref No.:	TMP/Tender/MS
Site Manager	Danny Williamson		Revision:	A

DOCUMENT CONTROL SHEET

Relevant Parties	
Principal Contractor	Robinson & Birdsell Limited
Client	SGN
Principal Designer	Robinson & Birdsell Limited
Local Authority	Reading Borough Council
Document Title	Traffic Management Plan
Document Ref	MS/TMP/Tender/MS
Original Issue Date	19 th May 2020

Issue History			
Company	Issue Date & Revision	Brief Description of Change's	Approvers Signature
SGN, R&B	May 2020 Revision "A"	Issued for Tender	

Contract No:	Tender		Document Ref No.:	TMP/Tender/MS
Site Manager	Danny Williamson		Revision:	A

Scope of work:

This Traffic Management Plan has been developed to facilitate the Demolition of the one Above Ground Gasholder identified as No4 at the Site location below.

Site Location

The Site is located at the following addresses below:-

SGN
Gasholder Station
Alexander Turner Close
Reading
RG1 3FQ

This Plan describes the Traffic Routes and the precautions required to reduce the potential for injury On Site and Off Site from vehicular movements as well as the deconstruction activities associated with the building demolition.

This Plan also outlines the arrangements and controlling measures to be implemented for vehicle movements into the Site entrances and safely past parked vehicles and along the temporary road to the demolition area.

Proposed Traffic Route to Site and the Site Compound Layout.

Drawing

- TMP/Tender/1/MS – Initial On Site Traffic Management Route Site
- TMP/Tender/2/MS – Proposed Traffic route to and from Site
- TMP/Tender/3/MS – Proposed Traffic route to and from Site

A Speed Limit of 5 mph will be imposed on Site, and suitable signage implemented to advertise and promote this.

On Site Operatives and will be advised of the Traffic Management proposal at the Site Induction, for deliveries it will be communicated at the procurement stage.

Delivery Restrictions

Plant deliveries should be coordinated during quiet times under traffic movements coordinated with the local police to further reduce interface issues.

Due to the roads in very close proximity to the Site we are considering using bulkers to remove the steel for recycle, as this will reduce traffic movements. However, if required we will also consider the use of 8 Wheeler Skip Vehicles, which are smaller but would increase traffic movements. Car and van can safely make the route to Site but will need to consider local traffic. We do have sufficient space on Site to make use of a turning circle on Site as indicated in Drawing TMP/Tender/1/MS – On Site Traffic Management Plan.

As the immediate area around the Site is residential, we will restrict traffic movements to before 09:15am and after 15:00 where practically possible.

During the delivery of removal of waste all vehicle drivers should be provided with a visitor induction, and only allowed out of the vehicles to use the welfare if they have the appropriate PPE.

The Site and associated entrance will be shared with SGN operations who have Live Equipment and a current Depot on Site.

The Site has a narrow entrance off Alexander Turner Close which is managed by a Traffic Light System to manager interface risks when entering or leaving the Site

The Site also has an Overhead Pipe Track which will be removed as part of the Project Works. For normal vehicles entering and leaving this should not be a problem. However, this will be assessed for the delivery of welfare and large plant items

Contract No:	Tender		Document Ref No.:	TMP/Tender/MS
Site Manager	Danny Williamson		Revision:	A

1.	This Plan has been fully developed at Tender Stage and would be fully developed by Robinson & Birdsell Ltd should we be appointed for the Project.	
2.	All walkways / pavements both within the Site and outside will be kept clear of debris and /or material to prevent slip, trip and fall hazards. These will be checked on a regular basis during the working day.	
3.	During the course of the Works walkways may change on Site due to the nature of the Demolition Works, any changes will be fully communicated to all demolition Site Operatives and visitors during the induction. The interface risk has been considered between the On-Site parking area and the welfare across the Site entrance. However, with vehicle movements anticipated at three per day the risk is considered low. In mitigation suitable signage will be displayed showing safe pedestrian routes on Site. At no time will Site vehicles be allowed to park outside of the Site on the public highway.	
4.	The Demolition Site Gates will be locked shut when not in use to mitigate interface issues with others. On the access road into the Site height restriction signage will be displayed showing the height of the pipe bridge close to the Site gates. SGN have live operational equipment on the Site; as well as a current depot which is to be closed for the duration of the demolition phase. To ensure security the Site Entrance Gate will need to be daisy chained with the appropriate locks to allow for 24hr uninterrupted access should SGN operations require access.	
5.	Robinson & Birdsell Ltd will use the existing entrance off Alexander Turner Close and final access route to Site, it is at this point that interface with the general public is a high risk. Robinson & Birdsell will ensure that all deliveries are given a set delivery time to approach Site along with the Site delivery time restrictions should allow use to manage this risk.	
6.	Banksman will use Two-Way Radios to communicate with each other and the Delivery Driver to ensure that we eliminate all the risks associated with this task. As noted above, we do not anticipate more than three of these vehicle movements a day at its peak.	
7.	On Site traffic movements for the Main Site will be controlled predominately by limiting vehicular access into the main demolition / deconstruction area, and only allowing essential vehicles onto the Welfare Section of the Site.	
8.	For delivery / waste vehicles accessing the Site, suitable arrangements must be made so that a Marshal is in attendance to guide the vehicle safely onto the Site should demolition works be underway at the Site Entrance. Given the size of this Demolition Project we expect no more than 70 vehicle movements in total to complete the works (approximately 2-3 per day) Traffic and Pedestrian interface measures are noted on Drawing No TMP/Tender/1/MS, the drawing identifies the following information;	

Contract No:	Tender		Document Ref No.:	TMP/Tender/MS
Site Manager	Danny Williamson		Revision:	A

	• Site Entrance and Safe Traffic Route around the Site. • Proposed pedestrian route. • Any Traffic / Pedestrian signage locations. • Welfare area and proposed segregation mitigation. • Muster Point. • First Aid Point.																																																													
9.	Should there be any further risk of injury to pedestrians or damage to vehicles on the approach to or from Site by Site Traffic; works will stop and issues discussed with the Client and Safety Department to develop a safe way forward.																																																													
10.	The following Traffic Route will be adopted for all deliveries and removal of plant and materials from Site. Drawings TMP/Tender/2/MS & TMP/Tender/2/MS. Note care must be taken when organising deliveries or materials removal from Site. Clear instruction must be given regarding the appropriate times to avoid our imposed restriction times noted in the delivery restriction section of this document.																																																													
11.	All drivers will be given a Site-Specific Induction on first arrival on Site; this is to ensure that everyone understands the Site traffic requirements and precaution to prevent injury. Unless drivers have the appropriate minimum Site PPE they will be asked to stay in their vehicles, however it may be appropriate (if required) for drivers to be escorted from their vehicles to the welfare for both the induction and use of the facilities.																																																													
12.	Site vehicles i.e. Excavator, will only be driven and operated by persons that are trained and competent with the appropriate licence, skills and knowledge. Prior to works starting all personnel will be given a Site-Specific Induction and orientation to the Site, this will be conducted by the Site manager who will advise personnel on any specific safety requirement that are required during the course of the project.																																																													
13.	Areas within the Site will be deemed Traffic Free Zones, these will typically be around the Main Welfare Facility Area and access and egress point this will be managed by the Site Manager during daily walk rounds.																																																													
14.	Directions from Site to M4, from this road there is good access to both the east and west. Summary: 7 miles (12 minutes) <table><tr><th>Time</th><th>Mile</th><th>Instruction</th><th>For</th></tr><tr><td>09:00</td><td>0.0</td><td>Depart A329(M), Winnersh, Wokingham RG41 5 on A329(M) (West) Junction 10 M4</td><td>1.2 mi</td></tr><tr><td>09:01</td><td>2.2</td><td>Road name changes to A3290</td><td>2.2 mi</td></tr><tr><td>09:03</td><td>3.4</td><td>Keep LEFT onto Ramp</td><td>0.2 mi</td></tr><tr><td>09:03</td><td>3.6</td><td>At roundabout, take the FIRST exit onto A4 [London Road]</td><td>1.1 mi</td></tr><tr><td>09:06</td><td>4.8</td><td>Turn RIGHT (North) onto Sidmouth Street</td><td>0.2 mi</td></tr><tr><td>09:06</td><td>4.9</td><td>Road name changes to Local road(s)</td><td>10 yds</td></tr><tr><td>09:07</td><td>4.9</td><td>Turn RIGHT (East) onto A329 [Queen's Road]</td><td>0.2 mi</td></tr><tr><td>09:07</td><td>5.1</td><td>Take Local road(s) (RIGHT) onto A329 [King's Road]</td><td>120 yds</td></tr><tr><td>09:07</td><td>5.2</td><td>Turn LEFT (North-East) onto Gas Works Road</td><td>0.2 mi</td></tr><tr><td>09:08</td><td>5.3</td><td>Turn RIGHT (East) onto Kenavon Drive</td><td>120 yds</td></tr><tr><td>09:09</td><td>5.4</td><td>At the roundabout take the 1st exit Oscar Wild Road</td><td>0.5 mi</td></tr><tr><td>09:09</td><td>5.4</td><td>After 100yds follow the road around to the right</td><td>100yds</td></tr><tr><td>09:11</td><td>5.9</td><td>Turn right onto Robert Parker Road</td><td>0.5 mi</td></tr><tr><td>09:12</td><td>6.0</td><td>Turn right onto Alexander Turner close and Site entrance</td><td></td></tr></table>	Time	Mile	Instruction	For	09:00	0.0	Depart A329(M), Winnersh, Wokingham RG41 5 on A329(M) (West) Junction 10 M4	1.2 mi	09:01	2.2	Road name changes to A3290	2.2 mi	09:03	3.4	Keep LEFT onto Ramp	0.2 mi	09:03	3.6	At roundabout, take the FIRST exit onto A4 [London Road]	1.1 mi	09:06	4.8	Turn RIGHT (North) onto Sidmouth Street	0.2 mi	09:06	4.9	Road name changes to Local road(s)	10 yds	09:07	4.9	Turn RIGHT (East) onto A329 [Queen's Road]	0.2 mi	09:07	5.1	Take Local road(s) (RIGHT) onto A329 [King's Road]	120 yds	09:07	5.2	Turn LEFT (North-East) onto Gas Works Road	0.2 mi	09:08	5.3	Turn RIGHT (East) onto Kenavon Drive	120 yds	09:09	5.4	At the roundabout take the 1 st exit Oscar Wild Road	0.5 mi	09:09	5.4	After 100yds follow the road around to the right	100yds	09:11	5.9	Turn right onto Robert Parker Road	0.5 mi	09:12	6.0	Turn right onto Alexander Turner close and Site entrance		
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Contract No:	Tender		Document Ref No.:	TMP/Tender/MS
Site Manager	Danny Williamson		Revision:	A

15.	On certain occasions the deployment of Banksman may also be used to guide and advise pedestrian or vehicle users.	
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Sketches/ Photographs (As Required):

MS/TMP/Tender/1/MS – Initial Propose on Site Traffic Management

MS/TMP/Tender/2/MS – Proposed Traffic Route to and from Site

MS/TMP/Tender/3/MS – Proposed Traffic Route to and from Site

Notes:

- (i) General housekeeping issues are to be addressed on a daily basis, with a walk through of the Site being undertaken by the Site Manager and Foreman; any unsafe conditions or acts observed will be actioned immediately.
- (ii) All Hold Points must be signed off before work commences.
- (iii) The minimum Site PPE requirements apply to these tasks, which are, Hard Hats, Safety Footwear, and Hi Visibility Garment. Unless this document is accompanied by a task specific PPE Assessment.
- (iv) All PPE & RPE provided by Robinson & Birdsell Ltd for this task must be worn at all times whilst carrying out the task.
- (v) It is the responsibility of the Employee to maintain the equipment, report any damage, worn, lost or defective items to my immediate Manager / Supervisor, and sort replacement, items before carryout any further work tasks.

KEY:

Black writing indicates standard description.

Red writing indicates a signature is required before proceeding to the next step/ phase of works.

Green writing indicates a safety point that must be adhered to.

Blue writing indicates an action is required to be followed.

APPENDIX H- Tipper Tracker Plan



APPENDIX I- Environmental Plan

Outline Tender Air Quality, Noise and Vibration Control and Monitoring Approach

Project: Reading Gasholder No4 Site

Location: Alexander Turner Close, Reading, RG1 3FQ

Client: SGN

Contract Number: Tender

Document Reference Number: MS/EMP/Tender/MS

Document Prepared By: Martin Smith

Signature:



Name: Martin Smith

Position: Health, Safety & Environmental Manager

Date: 17th July 2020

Checked By: Peter MacDonald

Signature:



Name: Peter MacDonald

Position: Consultant

Date: 17th July 2020

Approved by: Anthony Snell

Signature:



Name: Tony Snell

Position: Contracts Manager

Date: 17th July 2020

The Aims of the Environmental Monitoring Plan are: -

- (a) To minimise disturbance and annoyance to humans both within and out of buildings.
- (b) To develop a Noise, Vibration and Air Quality Control Strategy which can be implemented during the Works.
- (c) To provide advice on the implementation of a Noise, Vibration and Air Quality Monitoring Strategy during the Works.

In summary, we aim to promote efficient on-Site practices and satisfy reasonable levels of human tolerance.

Identified Environmental High Risks / Hazards

- Noise
- Dust and Fumes including potential impact upon local residents and businesses
- Fire and associated smoke
- Odour
- Vibration
- River Thames & River Kennet
- Railway Line
- Visual impact on local environment
- Interference with or disturbance of wildlife, including impact upon disturbance to nesting and breeding birds
- Traffic Management and impact upon local road systems to the Site entrance
- Asbestos
- Waste Disposal including hazardous waste
- Fuel and Substance storage and management
- Site Management and security breaches

Scope of the Works

Proposed disposal and development of the land currently forming the Gasholder Station at Reading No 4 Site, Alexander Turner Close, Reading RG1 3FQ requires the dismantling of the Gasholder and associated plant, along with a Water Tower and additional buildings currently occupying the Site. Following Gasholder dismantling the Gasholder Tank and other Pits will require infilling. In addition, the Site needs to be remediated and Appendix F of the Tender Information identifies the relevant Works Information for the aspect of this Project. The objective of the Remediation Works is to render the Site suitable for the intended residential end use, to a position of 'No Further Action' from a regulatory perspective and ready for construction without any further remediation works.

Site Access Arrangements

The Site is accessed via a new housing development to the west. Access to the SGN depot yard is gained through a gate in the southwest corner. The palisade compound which houses the gas holder is accessed through the SGN depot yard via double gates in the palisade compound. The depot is manned and is utilised primarily for storage of plant and equipment. The yard has an asphalt surface cover and contains three portable offices which are located along the southern Site boundary and a metal storage container. Signage, lights, barriers and plant are stored within the yard area. A small palisade fenced compound area is located adjacent to the northern Site boundary (accessed through the yard) which contains a disused concrete water tower and seven metal storage containers.

Sensitive Receptors

Table 1 below lists out the Sensitive Receptors near the Site. The following resource classifications have been used: non-residential and residential. We will satisfy ourselves that no further sensitive receptors exist in proximity to the Site.

Table 1: Sensitive Receptors

Category	Sensitive Receptor / Land Use
Commercial	The nearest ancient woodland Site is located 1.2km from the Site, which is well beyond the 15m buffer recommended by Natural England the Forestry Commission when working near ancient woodland Sites. The development of this Site will have no detrimental impact on any area of ancient woodland.
	The closest UK BAP priority habitat is 0.1km from the Site and beyond the railway line. As a result, it will not be affected by the development.
Special	The habitats within the Site are common and widespread and no further botanically specific surveys are required in this instance.
	No statutory designated Sites are located within 2km of the Site and none will be affected by the proposed. The closest non-statutory Site is 0.2km north of the Site and lies beyond the railway line. The small-scale and localised nature of development is not considered likely to adversely impact this Site or any other designated Site.

	No evidence of Badger was recorded, and no historical evidence of Badgers has been reported within or near the Site. No further Surveys for Badgers are required. PRF recorded on the building denoted B1 were limited and in isolation the structure would be considered Negligible for its suitability to support roosting Bats. However, historical records of nine species of Bat exist within the desk study area and the foraging and commuting habitat in the form of the river and railway which lies adjacent to the Site, offer excellent habitat for Bats. Consequently, the building denoted B1 has 'Negligible/Low' suitability. As a precautionary measure, to determine its use by roosting Bats, should this building be affected\ by the development, it should be subject to a single Evening Emergence Survey.
Leisure	
Listed Buildings and Conservation Areas	
Wider Community	The Site has several Tree protection orders see TPO drawing attached to this document

From information obtained via the Magic Website, there are no immediate areas for ecology concerns as noted in Drawing EMP/Tender/1/MS.

Habitats

Bats – Foraging and Commuting Habitat

Foraging and commuting habitat is present in the form of tree/vegetation lines on the northern and southern boundaries. Should any boundary tree or vegetation require removal, it is recommended that additional boundary planting is undertaken to maintain the continuity of this habitat.

Birds

Suitable nesting habitat is present on Site in the form of trees, scrub and buildings.

As all breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended) it is recommended that works to these areas and any other areas deemed suitable for nesting birds, such as trees, are conducted outside the core breeding period for birds of Late February – August inclusive.

Great Crested Newt

Although a restricted area of suitable terrestrial habitat exists within the Site, the Site and wider area lack the network of waterbodies that great crested newts require to breed. Great crested newts are therefore considered unlikely to be present on the Site. No further surveys for the species are required.

Great Crested Newt

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Drawing No EMP/Tender/2/MS shows the habitats on Site.

Noise, Dust, Odour and Vibration Monitoring Regime

It is the intention of Robinson & Birdsell Ltd to undertake continuous Noise, Dust and Odour Monitoring at the identified location points on the attached drawing.

Monitoring Stations are listed as:

- Station 1 – Continuous Monitoring for Noise, Dust, Vibration and Odour.
- Station 2 – Continuous Monitoring for Dust, Vibration and Odour.
- Station 3 – Continuous Monitoring for Vibration and Odour.
- Station 4 – Continuous Monitoring for Noise, Dust, Vibration and Odour.
- Station 5 – Continuous Monitoring for Noise, Dust, Vibration and Odour.

The locations of the Noise, Dust, Vibration and Odour Stations can be seen on the attached Noise, Dust and Vibration Monitoring Stations Drawing EMP/Tender/1/MS.

Noise

Noise Monitoring will be undertaken continuously, a Trigger Limit of 75db(A) will be applied and an email generated should this level be surpassed, this can be sent to various emails. This can then be accessed online to determine the cause of the noise spike.

Dust

Continuous Dust Monitoring will be undertaken in the PM¹⁰ particulate range. Again, Trigger Levels will be set in a similar manner to the Noise Reporting when levels have been surpassed. The trigger level for dust will be set at 50µ/m³ over a 1-hour period.

Odour

Daily Odour Monitoring will be undertaken twice daily at the locations noted using a Benzene Monitor, as this is the closest chemical to determine Gasholder odours.

The criteria are identified as:-

1. No Detected Odour
2. Faint Odour (barely detected, need to be standing still and inhale facing into the wind)
3. Moderate Odour (odour easily detected while walking & breathing normally, possible offensive)
4. Strong Odour (bearable, but offensive odour)
5. Very Strong Odour (very offensive, possible causing nausea)

The results of this daily monitoring during the Dewatering and Desludging Works will be recorded on SCP09-81 and retained on Site.

Vibration

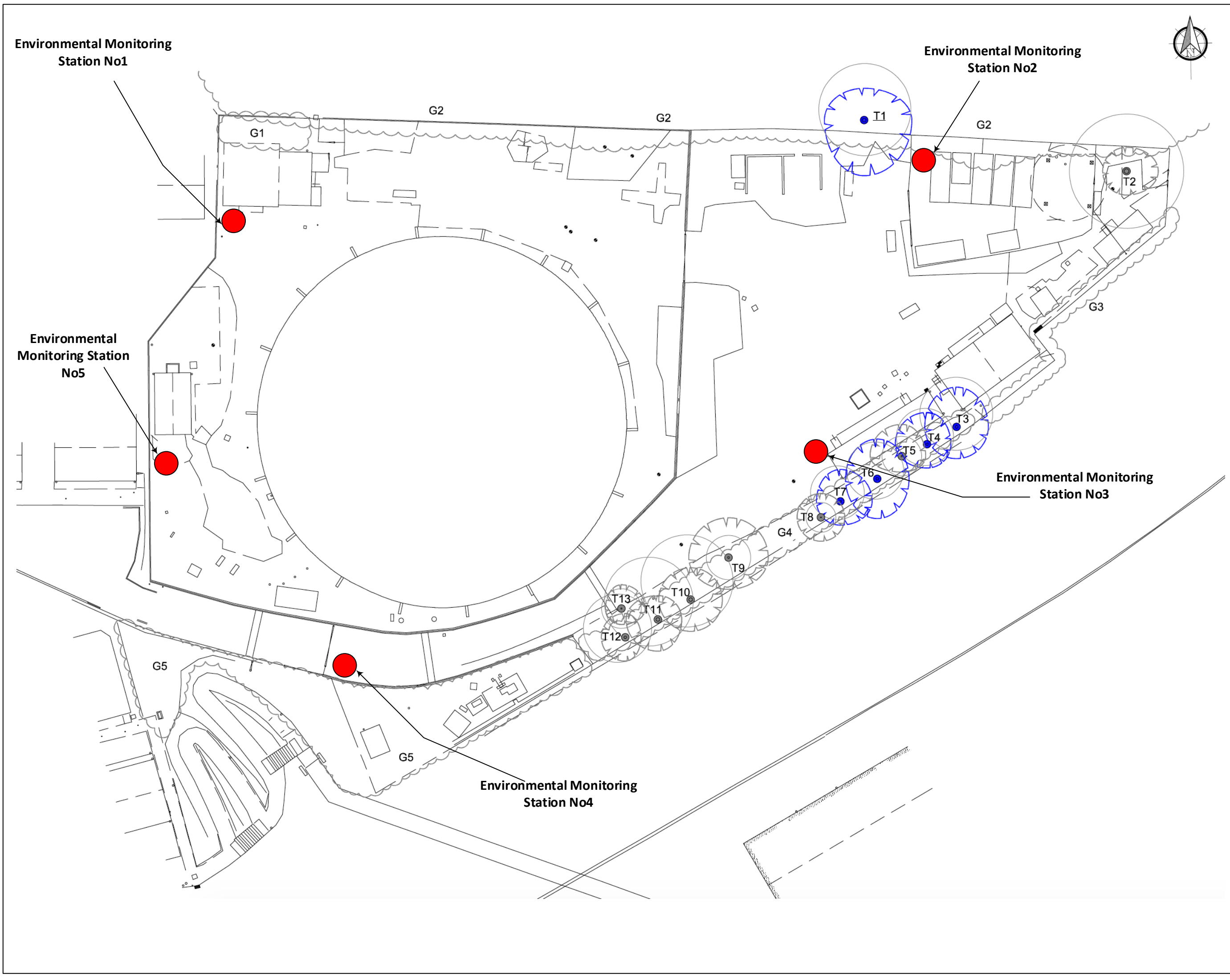
Continuous Vibration Monitoring will be undertaken to determine peak vibration levels on a 24 hours basis again, should the set Trigger Level be exceeded, and note separate levels can be set of all Monitoring Stations. The trigger level for vibration will be set at 4mm/s.

Monitoring Strategy

By adopting a continuous monitoring regime all environmental factors can be captured 24 hours a day. The system is accessible via the internet to view each Station on a real time basis, with a function to generate Monthly Reports against all Monitoring Criteria. However, should we have any complaints or significant breaches Daily Reports can be generated for all or individual Monitoring Stations.

Building Assessments & Surveys

We will also undertake a Photographic Dilapidation Survey of the surrounding structures including residential dwellings. If required, we will also at the request of the local residents undertake a full Building Condition Assessment in advance of the start of the physical demolition works.



Notes:

- Station No1 is located along the western boundary with the residential dwellings beyond
- Station No2 is located on the northern boundary close to the water tower and the railway line
- Station No3 is located along the southern boundary with the structure to be retained
- Station No4 again, is located along the southern boundary with the River Kennet
- Station No5 is located along the western boundary with the residential dwellings beyond

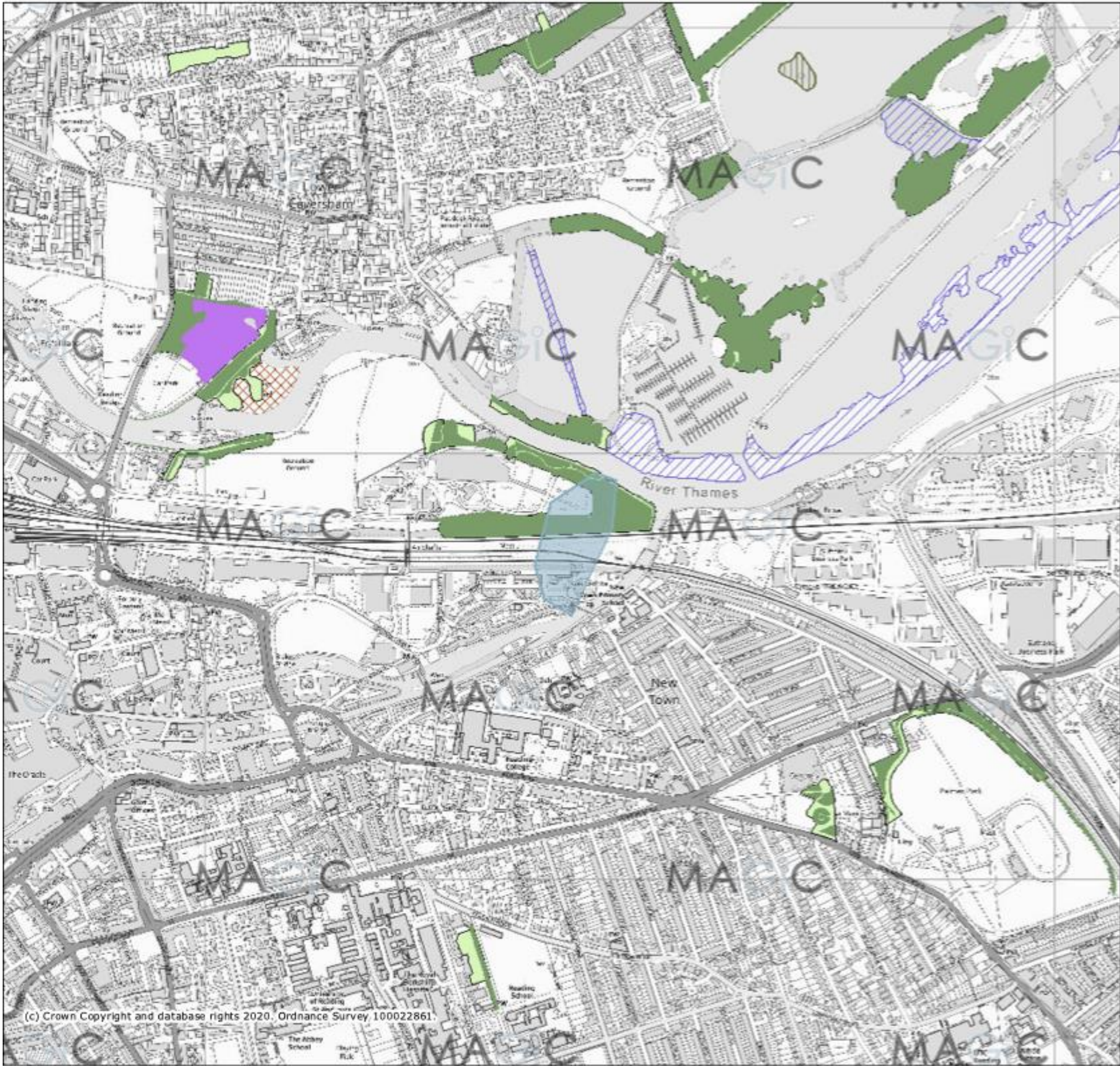


Audby House
Audby Lane
Wetherby
West Yorkshire
LS22 7FD

T: 01937 548 800
F: 01937 548 801

Project	Reading Gas Holder No4 Site
Client	SGN
Drawing	Environmental Monitoring Plan
Role	Demolition
Drawing Status	Rev A - Tender
Drawing Number	EMP/Tender/1/MS

Notes:



Legend

- Priority Habitat Inventory - Coastal Saltmarsh (England)
- Priority Habitat Inventory - Coastal Sand Dunes (England)
- Priority Habitat Inventory - Coastal Vegetated Shingle (England)
- Priority Habitat Inventory - Maritime Cliffs and Slopes (England)
- Priority Habitat Inventory - Mudflats (England)
- Priority Habitat Inventory - Saline Lagoons (England)
- Saline Lagoons (Wales)
- Saltmarsh (Wales)
- Sand Dunes (Wales)
- Priority Habitat Inventory - Calaminarian Grassland (England)
- Priority Habitat Inventory - Coastal and Floodplain Grazing Marsh (England)
- Priority Habitat Inventory - Good quality semi-improved grassland (Non Priority) (England)
- Priority Habitat Inventory - Lowland Calcareous Grassland (England)
- Priority Habitat Inventory - Lowland Dry Acid Grassland (England)
- Priority Habitat Inventory - Lowland Meadows (England)
- Priority Habitat Inventory - Purple Moor Grass and Rush Pasture (England)
- Priority Habitat Inventory - Upland Calcareous Grassland (England)
- Priority Habitat Inventory - Upland Hay Meadows (England)
- Priority Habitat Inventory - Lowland Heathland (England)
- Priority Habitat Inventory - Mountain Heaths and Willow Scrub (England)
- Priority Habitat Inventory - Upland Heathland (England)
- Priority Habitat Inventory - Limestone Pavements (England)

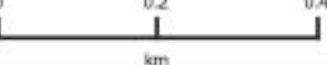
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xmin = 471100

ymin = 172600

xmax = 474600

ymax = 175000



Audby House
Audby Lane
Wetherby
West Yorkshire
LS22 7FD

T: 01937 548 800
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Project

Reading Gas
Holder No4 Site

Client

SGN

Drawing

Area Ecology
Plan

Role

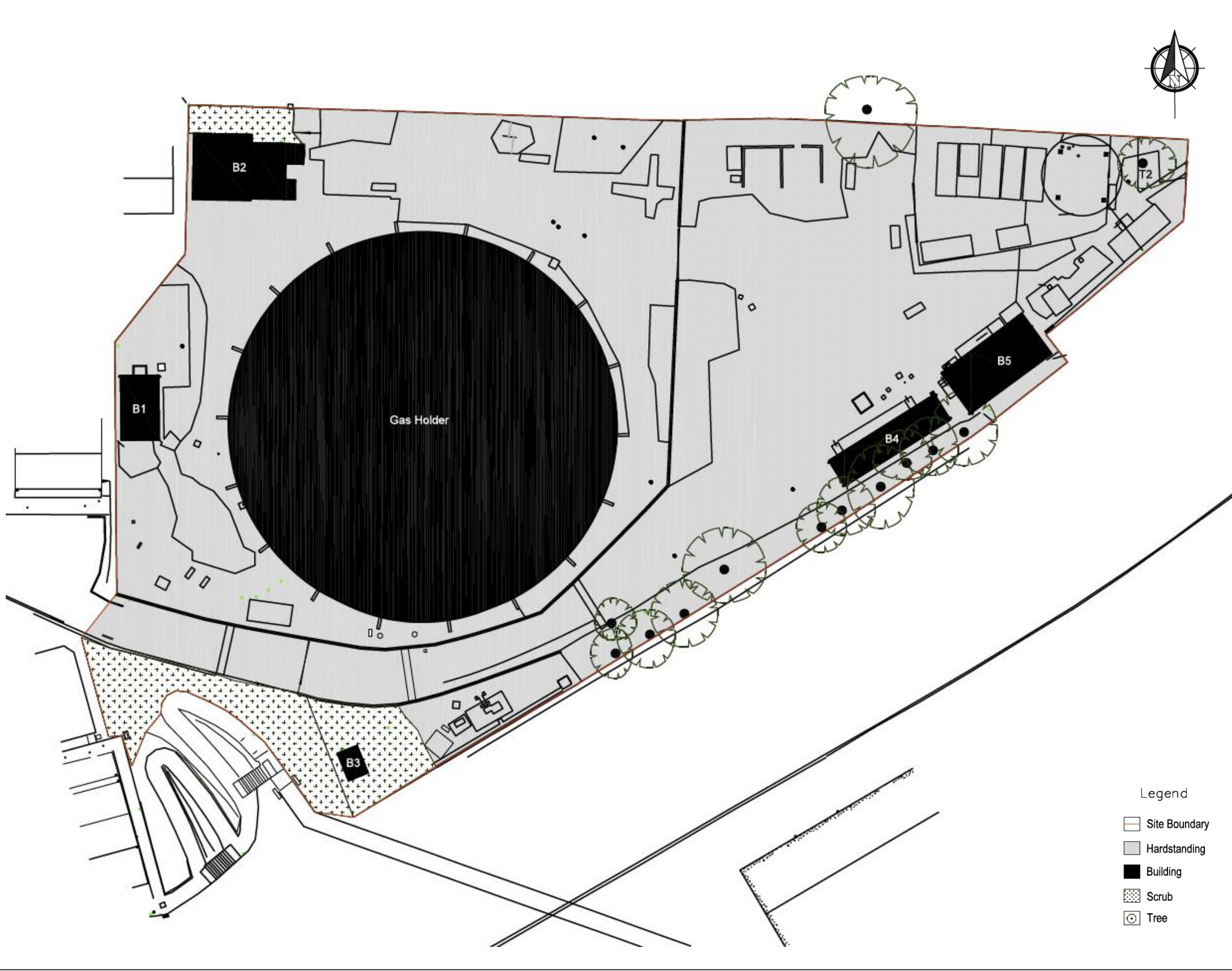
Demolition

Drawing
Status

Rev A - Tender

Drawing
Number

EMP/Tender/1/MS



Notes:

B1 and T2 has potential to support roosting bats and to determine their suitability for the species further surveys / inspections have been recommended. B1 requires 1 x emergence survey as a precaution. Should it be affected by the proposed, T2 requires an elevated inspection ideally no more than 6 months prior to commencement of associated works.



Audby House
Audby Lane
Wetherby
West Yorkshire
LS22 7FD

T: 01937 548 800
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Legend

- Site Boundary
- Hardstanding
- Building
- Scrub
- Tree

Project	Reading Gas Holder No4 Site
Client	SGN
Drawing	On Site Ecology
Role	Demolition
Drawing Status	Rev A - Tender
Drawing Number	EMP/Tender/2/MS



Notes:



Audby House
Audby Lane
Wetherby
West Yorkshire
LS22 7FD

T: 01937 548 800
F: 01937 548 801

Project

Reading Gas
Holder No4 Site

Client

SGN

Drawing

Tree Protection
Order Plan

Role

Demolition

Drawing
Status

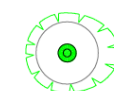
Rev A - Tender

Drawing
Number

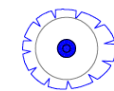
EMP/Tender/3/MS



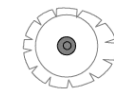
Root Protection Area
Diameter of trunk
Tree number as recorded
on Survey Schedule
Tree canopy
Coloured symbol indicating
BS category as shown
below



Category A tree
BS5837 2012



Category B tree
BS5837 2012



Category C tree
BS5837 2012



Category U tree
BS5837 2012



Group of Trees/Hedge
Colours same as BS5837 2012
categories for trees (above)

APPENDIX J- Management of contamination

Reading GH No4

Management of Contamination (*Water & Sludge*)

Works starts with the Dewatering of the Gasholder which is undertaken under Discharge Consent License from Thames Water. This was applied for by SGN. This specifies the rate of water which can pump into the Foul Sewer as well as the Chemical Content contained within the water. The water is sampled weekly by us to confirm that it meets the requirements of the Discharge Consent set by Thames Water. Thames Water as come to Site to make spot checks and take their own Water Samples. The majority of the Gasholder Water has already been Discharged by SGN's Contractor. The remaining water is still to be Discharged with a rate for this project at 5L/s. This is going to take a further 1.5 weeks to Dewater the remaining 2500 cubic meters of water. The water is pumped out of the Gasholder through continuous Hoses through a series of Filters and Scrubbers finishing off passing through a Carbon Filter before entering the Foul Sewer. Note the entire equipment set up to undertake this task is located with a Bund, the Bund has a level Float System for any leaks will be contained, if the Level gets to the Level Float the Pumps are automatically switched off preventing a loss of containment.



During the Dewatering Process as the water passes through the Methane Stripper this can cause odours similar to Gas, during this phase the Contractor will deploy its Odour Suppressant System. This comprises of a 100m Line featuring 50 Dispersant Nozzles spraying a fine mist dosed with Odour Surfactant which will help mitigate and eliminate nuisance odours. An Odour Scoring System will be used throughout the Works, please see the Odour Monitoring Record Documents. If odours become problematic throughout other Hydrotec Operations, the Odour System will be installed.

The Dewatering will be stopped when the water level is 400mm above the Sludge. The Sludge within the Gasholder can have a varied chemical composition. As the Gasholder has open lift sections windblow items such as leaves as well as fallout from the actual mas making process. Again, from experience we have found that Gasholder closers to the former Gas Manufacturing Site are typically more contaminated than those further afield.

To remove the Sludge, we use a Specialist Contractor, Hydrotec Industrial Services Ltd. We will create safe access and egress into the Gasholder for the Contractor. The wet Sludge material will be

mixed with a suitable Polymer to achieve Flocculation of the solids present and also associated release of remaining free water.

Access into and out of the Gasholder is controlled through a Decontamination Unit to ensure that we don't bring out the Sludge and contaminate the ground around the Gasholder.



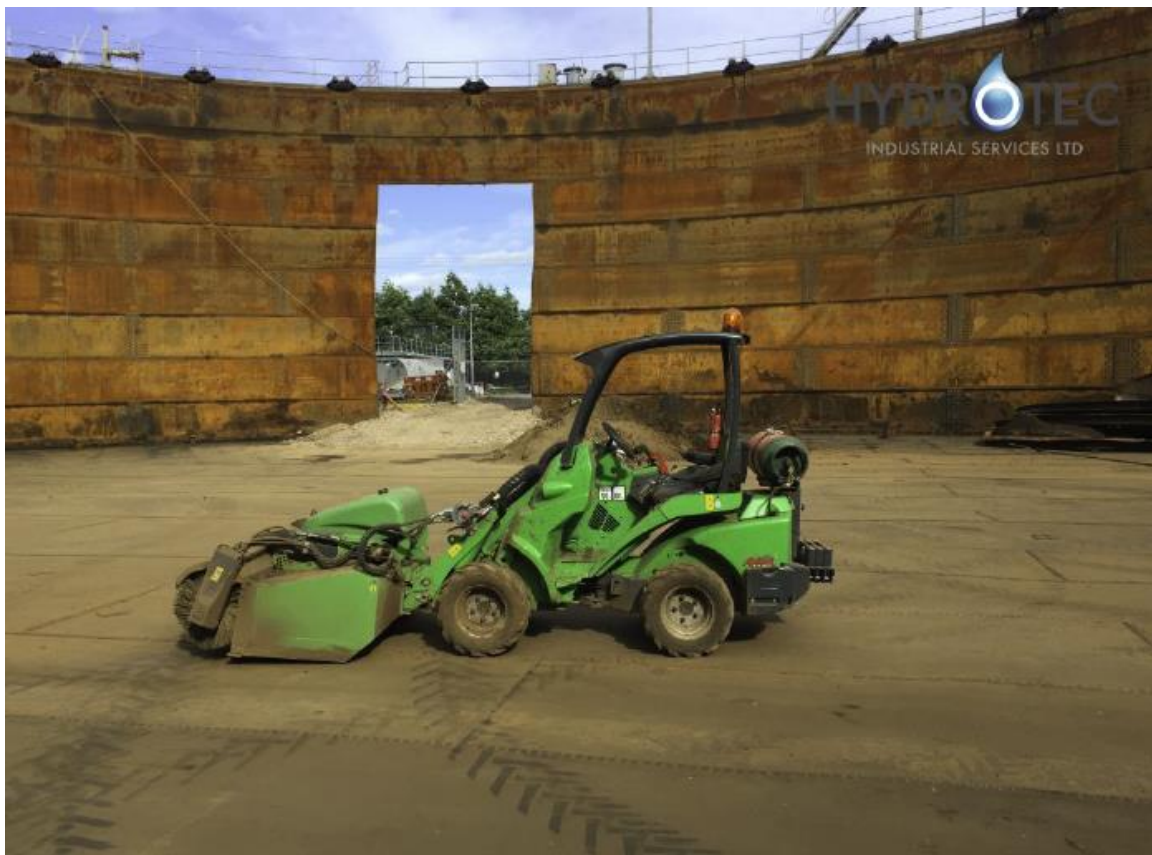
This run off water will be pumped through a Filter Vessel inside the Gasholder and Discharged through the Thames Water Discharge Consent License. The remaining “treated” wet Sludge will be transferred into Filter Dewatering Bags for draining. Note this process is still undertaken from with the Gasholder which minimise the risk of ground contamination.

Again, any Runoff Water is treated through the Water Discharge Filtration System. The remaining solidified Sludge will then be loaded onto a flatbed vehicle still inside their Filtration Bags for onward disposal. All Sludge is transported under Waste Consignment Notes direct to the end treatment location; this is typically Aegean at Peterborough.

The Sludge is removed in two phases, the first being the longest at approximately 5 - 7 days, the second phase Sludge clean can only be undertaken following a significant amount of Gasholder Deconstruction. The second phase typically takes 3-4 days. Again, like the Dewatering, both Phases can create a Gaseous Odour and so we will again deploy our Odour Suppressant System.



This how the Gasholder looks following both Phases of Sludge removal;



We hereby give notice under Section 80 of The Building Act 1984 to Reading Borough Council of our intention to demolish a building or structure:

1 It is our intention to commence the demolition of:

READING GASHOLDER, ALEXANDER TURNER CLOSE, READING, ENGLAND, RG1 3FQ
Reading Gas Holder Station, Demolition of Gas Holder No 4, former boiler house, pump house and water tower.

Demolition is intended to commence on 4th January 2021 which is a minimum of six weeks from the date of this notice.

2 Demolition contractors details (please give **FULL** name, postal address and contact details)

Mr/ Mr Name: Martin Smith Address:
Robinson & Birdsell Ltd, Audby House, Audby Lane, Wetherby, West Yorkshire

Postcode: LS22 7FD Tel/Mobile: 01937 548 800 / 07969179252

Email: ms@robinson-birdsell.co.uk

Would you prefer to receive correspondence by email? YES

3 Applicant/owners details (please give **FULL** name, postal address and contact details)

Mr/Mrs/Miss/Ms Mr Name: Scott Lewis

Address: SGN PLACE, OXFORD SOLITH DEPOT, 1 WOODSTOCK ROAD
KIDLINGTON, ENGLAND

Postcode: OX5 1NY Tel/Mobile: 07583685958

Email: scott.lewis@sgn.co.uk

Would you prefer to receive correspondence by email? YES

We give notice under Section 80 (2) (a) of The Building Act 1984, that it is our intention to carry out the work of demolition listed above. We also agree to comply with the provisions of the Act and the conditions in any subsequent notice issued by Reading Borough Council.

I enclose the demolition charge of £240

☐

(Cheque made payable to 'Reading Borough Council')

Name: Martin Smith Signature:  Date: 14th October 2020

(To be signed by the person responsible for the demolition work)

YOUR RESPONSIBILITIES TO GIVE ADDITIONAL NOTICE:

Section 80 of the Building Act 1984 requires that the person undertaking the demolition notifies the following:

- Occupiers of all buildings adjacent to the building to be demolished
- The gas supplier
- The electricity supplier
- The Health & Safety Executive

NOTES

No notice needs to be given under Section 80 of the Building Act 1984 for the following work:

- A demolition pursuant to an order under the Housing Act 1957.
- Demolition of an internal part of a building, where the building is occupied and is intended that it should continue to be occupied.
- A building that is no greater than 1750 cubic feet (50m³) or where it is a greenhouse, conservatory, shed or prefabricated garage forming part of a larger building.

Notification should be given to the Health & Safety Executive and if the building is thought to contain asbestos.

Together with this notice you should submit a site location plan of the building to be demolished, and a method statement where available.

No demolition work must commence before this notice is given under section 80 of the Building Act 1984 and either the Council has given notice under the Act or six weeks has elapsed from serving this notice.

Persons proposing to carry out building work are reminded that permission under the Town & Country Planning Acts may be necessary.

RISK ASSESSMENT

Document Ref No MS/001/T1422/ AS



Project Title:	DISMANTLING OF GASHOLDER No4 READING			Document Ref No:	MS/001/T1422/AS
Assessor's Name:	Anthony Snell	Contract No:	C1422	Review Date (no later than):	August 2020

Brief Task Description	Site Location:		Alexander Turner Close, Reading RG1 3FQ
	Persons at Risk - Affected Groups:		
	A – R&B Group Operatives		E - Environment
	B – Site Visitors		
	C – Members of the Public		
Dismantling Of Gasholder No4, Water Tower And Associated Structures.		D – Other Contractors	

This Risk Assessment is Supported by the following documents	PPE Assessment (Ref)..... MS/001/T1422/AS.....	Permits to WorkGeneral, working at height
	Manual Handling Assessment (Ref)..... MS/001/ T1422/AS	Hot Work Permit.....
	COSHH Assessments.....	Noise Assessments.....
	Vibration Assessments.....	Other.....

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Collision with Plant Equipment	A, B, D.	High	Clear Pedestrian and Traffic Routes identified on the Site. Operatives to be informed not to enter into the machines working circle whilst the machine is running/ turned on. Keep out of Crane radius when lifting operations are taking place.	Low	Briefing session to be undertaken by the Site Manager to explain all the hazards associated with this task and Operatives to endorse the signature sheet at the rear of this document. Banksman to control Crane lifting Exclusion Zones at all times during lifting operation plus when Crane is moving into new berthing positions around Site.	Low

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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Plant Equipment	All	High	Plant Equipment to be maintained as per the manufacturer's instructions. Plant Equipment to be visually checked each day before first use and mechanical parts greased where practically possible, every seven days a written record of the check must be entered onto form SCP09-8. Plant Equipment to be fitted with demolition safety cage system. Cranes to have slewing lock devices engaged during all lifting operations.	Low	Site Manager to ensure that the Plant Operators have a current license to operate current plant Equipment. All faults identified via the daily or weekly check must be communicated to the Site manager so that repairs can be implemented. A daily record of slewing lock engagement to be recorded within the Site Diary by the Site Manager.	Low
Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Communication	All	High	Demolition Works are inherently high-risk operations and therefore communication is essential at all levels in both written and verbal forms. Before work each day the Site Manager will undertake a Toolbox Talk on the pertinent risk and associated activities to be undertaken on that day, so that everyone understands the What, When Where and How, these Toolbox Talks and points discussed are recorded and are made available by the Site Manager on request. Banksman to be deployed to advise both pedestrians and vehicular traffic of the risks during the pinch point Works All Safe Systems of Work (Method Statements/ Risk Assessments) are discussed at length by the Site Manager with all personnel associated with or who may be directly affected by the task. All risk controlling measures are addressed at this	Low	Banksman to be in attendance at all times during all work activities. During column structure dismantling operations, two-way radios shall be used by all Operatives involved in this activity. Only when the all clear has been given by the competent person controlling the lift operations shall any section of steel be lifted from situ. It shall then be landed safely into a designated Laydown Area before being released from the lifting chains by a competent Slinger Banksman. This procedure to be implemented on every lift. During Pulverisation of the Water	Low

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			discussion; each individual then signs the Method Statement Signature Sheet to confirm their understanding and agreement to abide by the control measures indicated. Third party stakeholders to be informed of intended Works/deliveries 24 hours prior to their arrival. Local Emergency Services to be informed of commencement of work on Site.		Tower, again Two-Way Radios shall be used by Banksman and high reach Machine Operator to control the Exclusion Zones. Network Rail BAPA to be in place prior to column structure and Water Tower dismantling.	
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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Structural Stability of Gasholder and Water Tower. Plus Associated Buildings on Site.	A, B, C, D.	High	Gasholder and Water Tower to be deconstructed in the sequence described in the method statement to maintain stability of the Gasholder and Water Tower during the dismantling Works. Both structures shall be left in a safe and structurally sound condition at the end of each working shift. Exclusion Zones to be in place throughout the dismantling Works of both structures.	Low	No structure to be left in an unsafe condition either at end of shift or at meal breaks. The execution of the Exclusion Zones by the Banksman is paramount to the success of the dismantling operations at all times. Network Rail to be kept informed of all lifting operations on Gasholder Column Structure and pulverising operations on the Water Tower when required throughout the Project.	Low

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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Asbestos Containing Materials	All	High	Asbestos Gasket material where possible will be left in-situ within the Pipe Work and disposed of through the scrap metal waste route. However, should Operatives find what they feel may be an Asbestos containing product not identified in the Demolition and Refurbishment Survey; they should stop work and inform the Site Manager immediately.	Low		Low

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Vehicle Movements	All	High	Specific Vehicular and Pedestrian Routes will be created to separate traffic with crowd barriers. Speed limit imposed at 5MPH whilst in the confines of the Gasholder Site. Clear signage to be displayed identifying specific access routes for the separation of vehicles and pedestrian	Low	Banksman to be deployed to control vehicle and plant movements throughout the Project. Visitors to be escorted at all times around Site by R&B personnel.	Low

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Slips Trips and Falls	A	High	Safe clear access routes to be identified within and around the Gasholder, these areas must be checked on a regular basis and any hazards identified must be rectified promptly. Operatives to be made aware of the risk of trips and slips and have good awareness of the	Low	Daily Safety Briefs to be conducted by Site Manager each morning before work commencement; this is to take in changing Site conditions. When working on the Gasholder Base Plate adjacent to the inlet	Low

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			surrounding surface. Suitable protection to man access/egress entrance ways into Gasholder Tank during residual water and first clean, i.e. foam insulation to be placed around any rough edges where Hot Cutting/ Machine Shearing has affected the Tank steelwork.		and Outlet Pipes care to be taken noting that these areas may be open and appropriate barriers/ cones shall be erected to warn of any falls or trips. The Base may also have raised flanges spotted about and care should be taken, especially if any water ingress is present at the time of working in the base area. Morning Briefs to pick any problems associated with water ingress.	
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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Pedestrian Safety	A	High	Safe Access Routes will be identified around the Site using a combination of marked walkways and barriers walkways. Safety Exclusion Zones implemented using physical barriers.	Low	All visitors shall be escorted around Site at all times by R&B personnel and only after they have been given a specific Visitors Site Induction.	Low

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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Dust & Odours	A, E	High	Because of the nature of the Works, there is always a risk that odour, fume and dust is generated, odour suppression will be implemented at the point of Works where de-sludging is taking place. This will be monitored by the Site Manager on a daily basis during the high-risk Desludging activity; records of Sniff Testing will be recorded in the EMP. While the Water Tower pulverisation is ongoing, water suppression for the dust shall be implemented. This will also apply to the on-Site building demolition.	Low	An Environmental Management Plan has been developed which outlines additional controlling measures. Our Sub-contractor Dewatering Team will also implement a number of additional controlling measures noted in their RAMS.	Low

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Falling Debris	A	High	Safety Exclusion Zones to be implemented around the Gasholder, Water Tower and associated buildings, these Zones shall be set back a sufficient distance to capture all materials that are created as a result of the Demolition Works. Safety Exclusion Zone to be constructed from Heras / Barrier Fencing to prevent inadvertent access by other Site users or trespassers Temporary Zones to be implemented during all demolition operations to minimise access into potentially hazardous areas. Hard Hats to be worn by all Operatives even when transiting from the Excavators or other Site plant to Site Welfare facilities.	Low	All Operatives are to retreat from the work area while Excavator Operator is lowering sections of inner lifts and outer tank plates to ground level. (this to be implemented during any Hot-Works) Gasholder entrance to be barriered off each night to prevent illegal entry into the Gasholder. Area around Water Tower to be secured at the end of shift to prevent illegal entry into the Tower vicinity.	Low

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			Plant Machinery are fitted with Cab Protection Systems should any loose debris strike the machine			
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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Noise	A, E, C.	Medium	Noise levels generated from the Gasholder Site during the Demolition are anticipated to be low. However, they shall be monitored during all aspects of the Works taking into account the proximity of the neighbouring residential buildings	Low	A Noise Monitoring Plan has been developed within the Environmental Management Plan that indicates Noise Monitoring Station and the monitoring frequency that they will be carried out at.	Low

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Live Services SGN RED and GREEN AREAS	A, E, C.	Medium	All services to Gasholder No4 identified for Demolition should have been terminated by SGN prior to us taking custody of the Gasholder Site. Isolation Certificates to be issued by SGN prior to commencement of Works. This shall also apply to the Water Tower and associated buildings earmarked for Demolition. Red and Green Areas shall be identified and marked with Paint plus Road Plated or other protection as specified by SGN Project Manager	Low	Plant Protection measures to be confirmed by SGN before heavy plant arrives on Site. These measures to be instigated as and when required.	Low

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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Falls from Height While Cold Cutting Vent Hole in Gasholder Crown Plate.	A, E, C.	Medium	Operatives to erect life line to the closest roller carriage brackets and connect with collar chains and shackles. Tirfor and Wire to be used for Safety Line. This to be securely anchored at both ends to the Gasholder Roller Carriage. Operatives to clip on to lifeline with lanyard connected to harness, at all times. A section of the Crown Plate is to be Cold-Cut around the full circumference of the Gasholder Roof Structure, approximately $\frac{3}{4}$ of the way up from the inner first lift. It shall be no more than 10" inches wide therefore eliminating the risk of someone falling into the Gasholder. The Access Gate to Staircase locked when not in use and secondary fence/gate in place at the top to restrict access while work is being carried out.	Low	Only Operatives with Harness Training allowed on Gasholder Roof during this procedure. Safety Man to be present at all times while Cold-Cutting Operations are taking place. Working at Height Permit System to be implemented by R&B. A Structural Survey of Gasholder stairs and walkways plus the Water Tower Ladder shall be commissioned prior to use.	Low

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Machine Shearing of Inner Lifts	A, B, D, E	High	During the shearing of the Gasholder Inner Lifts, no Operatives will be allowed within the Inner Tank Work Area. No lowering of sections to take place until supervisor is confident that work area has been cleared. Machine Operator to take instruction from relevant person controlling these lowering of plate operations.	Low	One nominated person to control lowering of Inner Lift Operations. All other Operatives to be positioned outside of Exclusion Zone Work Area while these operations are taking place.	Low

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Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Hot Works on Outer Tank Shell	ALL	High	Trained Operatives only to undertake any Hot Works. Bottles to be fitted with flashback arrestors. Fire Extinguisher or a fully charged Fire Hose to be in attendance at all times. Fire Watcher to be in attendance at all times. Hot Works to be stopped 1 hour before the end of the working day, area to be inspected for visual signs of smouldering 30 minutes after all Hot Works have ceased. Equipment to be checked daily for visible signs of damage, any faults should be reported and Equipment removed from service. To be stored separately in lockable cages with appropriate signage displayed, identifying full from empties. All Operatives to vacate Inner Tank Area while Excavator Operator lowers sections onto Gasholder Base Plate. Competent person to instruct Excavator Operator when it is safe to lower outer shell section onto Inner Tank Base Plate.	Low	Hot Work Permit System to be implemented by R&B. Site Manager, all Operatives to sign onto permit. Oxy-Propane Hoses only to be repaired with the appropriately sized connectors with crimp fastenings not jubilee clips Stored facility must be located in a well-ventilated area. Exclusion Zones to be implemented during all lowering of Outer Shell Sections.	

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Environmental Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Asbestos Containing Materials	All	High	Albeit the Asbestos Phase of the Works should have been undertaken prior to the commencement of the Demolition, it is not unforeseeable that additional materials may be exposed during the Demolition Works, should any suspicious materials become exposed Works should be stopped and area made safe. The Site Manager should organise for samples to be taken to determine the nature of the material. Should it be proved to contain Asbestos it should be removed in controlled conditions by trained and competent persons, note this may require notification via an ASB5 Notification to the Health & Safety executive.	Low	All Operatives have undertaken Asbestos Awareness Training which is refreshed annually. It is only anticipated that Gaskets may be present in some of the Pipework.	Low

Environmental Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Noise, Dust & Vibration	All	Medium	Robinson & Birdsell will implement designated monitoring stations covering continuous Noise, Dust & Vibration Monitoring, results will be collated monthly. However the system has high level triggers which instigate emails alerting R&B Management to breaches.	Low	SGN will be provided with login details to the Monitoring Dashboard.	Low
		Medium	A full RICS Building Survey of each and every residential property within 30 metres of the western Site boundary shall be commissioned prior to work commencing.	Low		

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Environmental Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Fuel / Spillages	E	High	To mitigate the risk of spills on Site R&B has developed a Refuelling Procedure WI016. Spill Kits to be available in close proximity to the Fuel Bowser. Fuel Bowser to be double skinned / self-bunded.	Low		Low

Environmental Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level
Tree Protection	E	HIGH	Implement appropriate measures for Tree Protection and Tree Root Protection where identified around the Site.	Low		

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The section below has been left blank for any additional risk to be added prior to or during the Works

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level

Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level

Environmental Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level

Environmental Hazard/ Risk Identified	Affected groups	Risk level before controls	Engineering Controls (Training, Information, Physical Controls)	Risk level After controls	Additional Controls Required to achieve ALARP	Final Risk Level

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Additional Comments/Notes:

Risk Assessment Reviewed On- Date

Risk Assessment Reviewed On- Date

This Risk Assessment has been developed to reduce the Risks to as low as is reasonably practicable (ALARP)

Assessor's Name: ANTHONY SNELL

Signature:

Date: 22nd MAY 2020

RISK ASSESSMENT

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Site Manager	TBC	Task Description:	DISMANTLING OF GASHOLDER No4 AND ASSOCIATED STRUCTURES
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The employees detailed below have signed to confirm that they: -

- (a) Have received a briefing from their Site Manager on the hazards involved with their undertaking.
- (b) Understand the requirements of this Method Statement and the associated Risk Assessments.
- (c) Shall work to the requirements of the Method Statement and control measures identified by the Risk Assessment.
- (d) Will notify their Site Manager, should there be any abnormalities or areas of concern regarding the Works.
- (e) Shall advise the Site Manager of any current medical condition which may give rise to health risks whilst undertaking the task

Name	Signature	Date

Name	Signature	Date

I confirm acceptance of the method of work and understanding of the Risk Assessments and Controls to be applied.

Site Manager Signature:		Date:
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Employee Comments.

Employees can use this Sheet to comment on the development of this Method Statement, this Sheet can also be to comment on the Works as it progresses. Employees can sign or leave their comments anonymously.

APPENDIX K- Section 80 – Demolition - Notice



**BUILDING ACT 1984
SECTIONS 81 and 82**

NOTICE TO PERSON UNDERTAKING DEMOLITION

To: Mr Martin Smith Audby House, Audby Lane, Wetherby, West Yorkshire, LS22 7FD

Whereas on the 21 October 2020 you served a notice on the Reading Borough Council (hereinafter called "the Council") specifying certain works to be carried out in respect of the building known as: **Gas Holder, Alexander Turner Close, Reading, RG1 3EA**. TAKE NOTICE that the Council pursuant to Section 81(1) Building Act 1984, HEREBY REQUIRE you within **12 weeks** from the date of service of this notice on you to take the following action, that is to say:-

- 82-1**
- (a) to shore up any building adjacent to which the notice relates;
 - (b) to weatherproof any surfaces of an adjacent building that are exposed by the demolition;
 - (c) to repair and make good any damage to an adjacent building caused by the Demolition or by the negligent act or omission of any person engaged in it;
 - (d) to remove material or rubbish resulting from the demolition and clearance of the site;
 - (e) to disconnect and seal, at such points as the local authority may reasonably require, any sewer or drain in or under the building;
 - (f) to remove any such sewer or drain, and seal any sewer or drain with which the sewer or drain is connected;
 - (g) to make good to the satisfaction of the local authority the surface of the ground disturbed by anything done under paragraph (e) or (f) above;
 - (h) to make arrangements with the relevant statutory undertakers for the disconnection of the supply of gas, electricity and water to the building;
 - (i) to make such arrangements with regard to the burning of structures or materials on the site as may be reasonably required:-
 - (i) if the building is or forms part of special premises, by the Health and Safety Executive and the fire authority, and
 - (ii) in any other case, by the fire authority, and

- (j) to take such steps relating to the conditions subject to which the demolition is to be undertaken, and the condition in which the site is left on completion of the demolition, as the local authority may consider reasonably necessary for the protection of the public and the preservation of public amenity. (see attached schedule)

82-2 No one shall be required under paragraph (c), (e) or (f) of subsection (1) above to carry out any work in land outside the premises on which the works of demolition are being carried out if he has no right to carry out that work, but, subject to section 101 below, the person undertaking the demolition, or the local authority acting in his default, may break open any street for the purpose of complying with any such requirement.

82-3 Before a person complies with a requirement under paragraph (e), (f) or (g) of subsection (1) above, he shall give to the local authority:-

- (a) at least **48 hours' notice**, in the case of a requirement under paragraph (e) or (f), or
 - (b) at least 24 hours' notice, in the case of a requirement under paragraph (g),
- and a person who fails to comply with this subsection is liable on summary conviction to a fine not exceeding level 2 on the standard scale.

82-4 This section does not authorise interference with apparatus or works of statutory undertakers authorised by an enactment to carry out an undertaking for the supply of electricity or gas or with apparatus or works of a water undertaker or sewage undertaker.

82-5 Without prejudice to the generality of subsection (4) above, this section does not exempt a person from:-

- (a) the obligation to obtain any consent required under section 167 of the Water Act 1989 (interference with water supplies or with water works).
- (b) criminal liability under any enactment relating to the supply of gas or electricity, or
- (c) the requirements of regulations under section 18 of the Gas Act 1986 (public safety).

82-6 Section 99 below applies in relation to a notice given under section 81(1) above.

Signed



Giorgio Framalicco

Assistant Director Planning, Transport & Regulatory Services

2CN (BC111 Rev E)

Dated: 21 October 2020

- 83-1** Section 102 below applies in relation to a notice given under section 81 above.
- 83-2** Among the grounds on which an appeal may be brought under section 102 below against such a notice are-
- (a) in the case of a notice requiring an adjacent building to be shored up, that the owner of the building is not entitled to the support of that building by the building that is being demolished, and ought to pay, or contribute towards, the expenses of shoring it up,
 - (b) in the case of a notice requiring any surfaces of an adjacent building to be weatherproofed, that the owner of the adjacent building ought to pay, or contribute towards, the expenses of weatherproofing those surfaces.
- 83-3** Where the grounds on which an appeal under section 102 below is brought include a ground specified in subsection (2) above-
- (a) the appellant shall serve a copy of his notice of appeal on the person or persons referred to in that ground of appeal, and
 - (b) on the hearing of the appeal the court may make order as it thinks fit-
- (i) in respect of the payment of, or contribution towards, the cost of the works by any such person, or
 - (ii) as to how any expenses that may be recoverable by the local authority are to be borne between the appellant and any such persons
- 99-1** A notice in relation to which it is declared by any provision of this section applies shall indicate the nature of the works to be executed and state the time limited by the notice-
- 99-2** Subject to any right of appeal conferred by section 102 below, if the person required by such a notice to execute works fails to execute them within the time limited by the notice-
- (a) the local authority may themselves execute the works and recover from the expenses reasonably incurred by them in doing so, and
 - (b) without prejudice to the power, he is liable on summary conviction to a fine not exceeding level 4 on the standard scale and to a further fine not exceeding £2 for each day on which the default continues after he is convicted.
- 99-3** This section has effect subject to any modification specified in the provision under which the notice is given.
- 102-1** Where a person is given a notice in relation to which it is declared by any provision of this Act that this section applies, he may appeal to a magistrates' court on any of

the following grounds that are appropriate in the circumstances of the particular case-

- (a) that the notice or requirement is not justified by the terms of the provision under which it purports to have been given,
- (b) that there has been some informality, defect or error in, or in connection with, the notice,
- (c) that the authority have refused unreasonably to approve the execution of alternative works, or that the works required by the notice to be executed are otherwise unreasonable in character or extent, or are unnecessary,
- (d) that the time within which the works are to be executed is not reasonably sufficient for the purpose,
- (e) that the notice might lawfully have been served on the occupier of the premises in question instead of on the owner, or on the owner instead of on the occupier, and that it would have been equitable for it to have been so served,
- (f) where the works are for the common benefit of the premises in question and other premises, that some other person being the owner, or occupier of premises to be benefited, ought to contribute towards the expenses of executing any works required.

102-2 If and in so far as an appeal under this section is based on the ground of some informality, defect or error in or in connection with the notice, the court shall dismiss the appeal, if it is satisfied that the informality, defect or error was not a material one.

102-3 The appellant

- (a) shall, where the grounds upon which the appeal is brought include a ground specified in subsection (1) (e) or (f) above, serve a copy of his notice of appeal on each other person referred to, and
- (b) may, in the case of any appeal under this section, serve a copy of his notice of appeal on any other person having an estate or interest in the premises in question,

103-1 Where this Act provides-

- (a) for an appeal to a magistrates' court against a requirement, refusal or other decision of a local authority, or
- (b) for a matter to be determined by, or for an application in respect of a matter to be made to, a magistrates' court

the procedure shall be by way of complaint for an order.

103-2 The time within which such an appeal may be brought is 21 days from the date on which notice of the local authority's requirement, refusal or other decision was served upon the person desiring to appeal, and for the purposes of this subsection the making of the complaint is deemed to be the bringing of the appeal.

103-3 In case where such an appeal lies, the document notifying to the person concerned the local authority's decision in the matter shall state the right of appeal to a magistrates' court and the time within which such an appeal may be brought.

Appendix L- Ecological Solutions Preliminary Ecological Appraisal

Gas Holder Site, Reading

Preliminary Ecological Appraisal

April 2019



GES

**Greenspace
Ecological
Solutions**

Gas Holder Site, Reading

Preliminary Ecological Appraisal

A Report for Danescroft (Kenavon Drive
Project Management) LLP

April 2019



www.greenspace-ecology.co.uk

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Gas Holder Site, Reading

Preliminary Ecological Assessment

April 2019

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

This report was written by Tanya Rowlinson and proof read by James Johnston

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.*

Report Number J20563_Rev B

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FIGURES

Figure 1 Phase I Habitat Plan

APPENDICES

Appendix A Site Photographs

Appendix B Categories of Bat Roost Potential

Appendix C Minimum Number of Surveys Required in Most Instances

1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: SGN Gasholder No 4, Kenavon Drive, Reading, RG1 3DH.

Attending Ecologists: James Johnston

Survey Date: 04th July 2018

Site Proposals: Redevelopment of an existing contaminated brownfield site and new residential development with associated parking.

Associated Planning Reference Number: Not yet Submitted

Source of Relevant Documents:

Document:	Source:
Site Location Plan:	Google Earth Pro
Desk Study:	Thames Valley Environmental Records Centre (TVERC) Magic.gov.uk
Site Plans:	Collado Collins Architects

2 INTRODUCTION

2.1 Context

2.1.1 To inform the associated planning application, Greenspace Ecological Solutions has been commissioned by Danescroft (Kenavon Drive Project Management) LLP to undertake an Preliminary Ecological Appraisal (PEA) of the Gas Holder Site, Alexander Turner Close, Reading.

2.1.2 Henceforth referred to as 'the site', proposals involve the redevelopment of an existing contaminated brownfield site and new residential development with associated parking.

2.1.3 The site's potential to support protected species and habitats has been assessed and appropriate recommendations have been provided. Trees and buildings likely to be affected have been assessed for their potential to support roosting bats. Ecological features of interest are depicted in Figure 1.

2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736. The location of the site is depicted in Image 1.

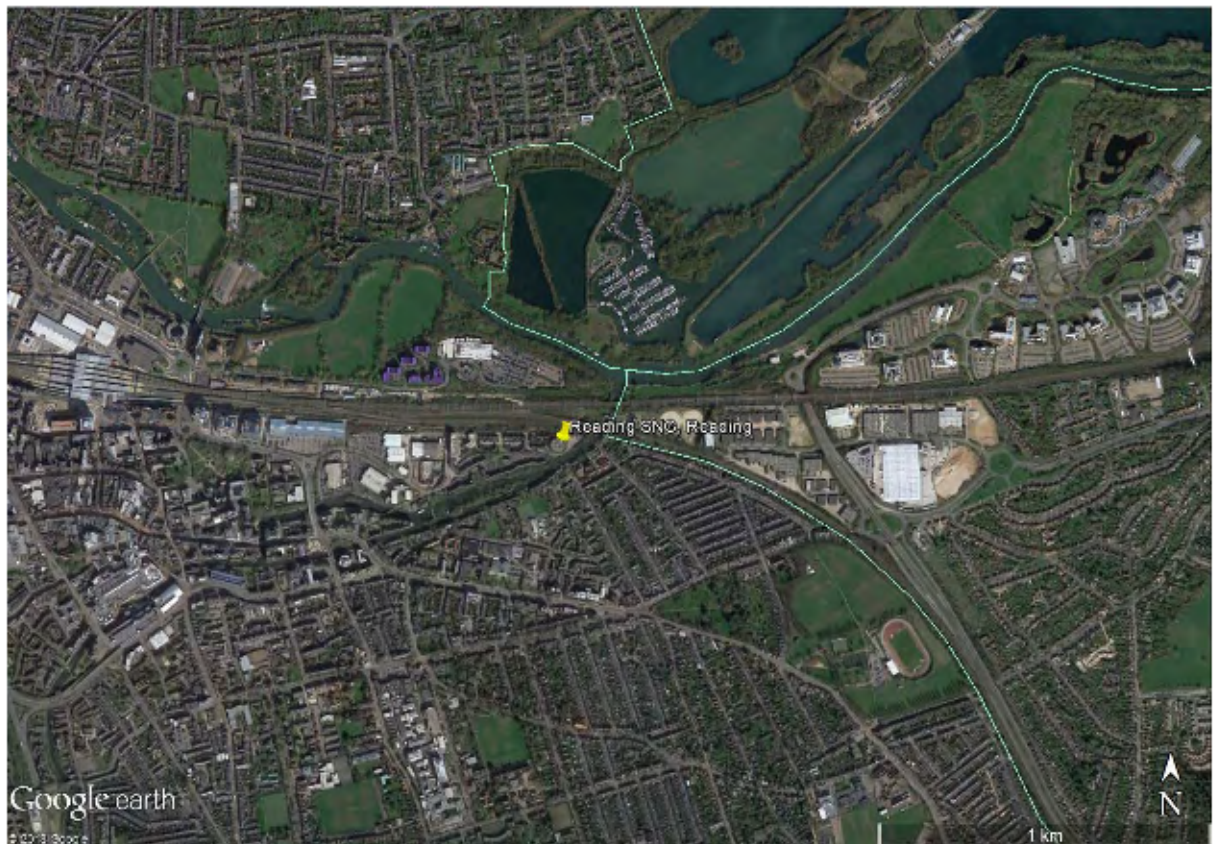


Image 1 – Site Location of Gas Holder Site at Alexander Turner Close, Reading

2.3 Site Description

- 2.3.1 The site occupies approximately 0.71ha and comprises of areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder can be found within the site.
- 2.3.2 The site is bound by residential dwellings to the east; the River Kennett to the south and east; and the National railway to the north. The wider landscape is one of industrial units to the east and west and pockets of scrubland to the north, beyond the railway.

2.4 Legislation and Policies

National Planning Policy Framework

- 2.4.1 The main legislation that applies to ecological issues within England and Wales are:
- The Conservation of Habitat and Species Regulations 2010 transposes European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. These regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' and the adaptation of planning controls for the protection of such sites and species. Under the regulations, public bodies have a duty in exercising their functions to have regard to the EC Habitats Directive.
 - The Wildlife and Countryside Act 1981 (as amended) provides detail on a range of protection and offences relating to wild birds, other animals, and plants. The level of protection depends on which Schedule of the Act the species is listed on. Licences are available for specific purposes to permit actions that would otherwise constitute an offence in relation to species.
 - The Natural Environment and Rural Communities (NERC) Act 2006 imposes an obligation on all public bodies, including local authorities, to consider whether their activities can contribute to the protection of wildlife. The duty is created by section 40(1) of the Act, which states that: "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."
 - Hedgerows Regulations Act 1997 serves to; enforce under the Environment Act 1995, restrict the removal of hedgerows, or parts of hedgerows which are over 20m in length. In this case, removal includes digging up and replanting elsewhere, as well as removing

from the land completely or destroying in the course of other actions. This includes developments or activities which destroy the roots, causing the vegetation to die.

- The Protection of Badgers Act 1992 exists for welfare reasons, to protect badgers (*Meles meles*) from cruelty. Under the act it is a criminal offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so, or to intentionally or recklessly interfere with a sett.

2.4.2 The above summary serves as guidance only – the reader is referred to the original legislation for definitive interpretation.

UK Planning Policy

2.4.3 The recommendations of this report are in line with the key principles of the National Planning Policy Framework (ref. 1) and Government Circular 06/05 (ref. 2).

2.4.4 Local planning policies relating to ecology are invariably based on the conservation of species protected under the above legislation, including species and habitats of principal importance listed under Section 41 of the NERC Act 2006; and the protection of designated sites. All of these features are considered within the scope of this preliminary ecological appraisal and therefore any recommendations made herein are likely to be in line with this policy.

2.5 Objectives of the Survey

2.5.1 The objectives of the survey were to:

- Classify the main habitats present within the site;
- Evaluate the ecological importance of these habitats;
- Assess buildings and trees for their potential to support roosting bats;
- Evaluate the potential for other protected species to occur within the site; and
- Provide appropriate recommendations for further surveys and mitigation where required.

2.6 Survey Constraints

2.6.1 Access to the interior of buildings B1 and B2 was not possible and these structures were assessed from the exterior only.

2.6.2 All measurements and indications of area given within this report are approximate.

3 SURVEY METHODOLOGY

3.1 Desk Study

3.1.1 A desk study was undertaken to determine the presence of sites and habitats of conservation importance together with historical records of protected and notable species within a 2km radius of the site.

3.1.2 The following bodies were consulted for the desk study:

- Magic.gov.org
- Thames Valley Environmental Records Centre (TVERC)

3.2 Preliminary Ecological Appraisal

Habitats

3.2.1 The site was surveyed using the methodology outlined in 'The Handbook for Phase I Habitat Survey: A Technique for Environmental Audit' (JNCC, 2010). This involves identifying the main plant communities present on the site and classifying the habitat types following the JNCC methodology. This technique provides an inventory of the basic habitat types present and enables areas of greater botanical interest which may require further, more detailed, surveys to be identified. Any occurrences of recognised invasive species as listed on Schedule 9 of the Wildlife and Countryside Act (as amended) were also noted.

3.2.2 A map of the habitats and areas of interest (using a variation of the JNCC 2010 protocol for Phase I Habitat plans) is provided in Figure 1. Photographs of features of interest are presented in Appendix A.

Protected Species

3.2.3 The Phase I Habitat Survey was extended to include an assessment of the site's potential to support protected and notable species. This involved assessing the suitability of the habitats present on the site for these species as well as connectivity to the site from other areas of potentially suitable habitat nearby.

Badger

3.2.4 Evidence of badger activity on site (and where possible within the distance generally considered to be the zone of disturbance) was assessed by searching for signs such as:

- Presence of setts, indicated by suitably sized holes or burrows
- Evidence of badger latrines, badger hair and/or footprints
- Evidence of well-used runs supported by secondary evidence such as foraging signs

Bats

- 3.2.5 Specific survey work was undertaken on the buildings and trees to assess their suitability to support roosting bats. In this instance, a high-powered torch was used to search for any bat roosting features.
- 3.2.6 The results of a scoping survey enable the buildings and trees to be categorised as having Confirmed, High, Moderate, Low or Negligible potential to support roosting bats. An outline of categorisation procedure for classifying bat potential is presented in Appendix B.
- 3.2.7 In accordance with current best practice guidance (Collins, 2016), the level of potential determines the need or not for further summer emergence surveys. Although left to the discretion of the appointed ecologist, in most instances High potential requires three, Moderate potential requires two and Low potential requires one evening emergence or pre-dawn re-entry survey/s (although trees with Low potential do not require further emergence or pre-dawn re-entry surveys). Greater detail on the minimum number of surveys recommended in most instances is presented in Appendix C.

Birds

- 3.2.8 The site was assessed for its potential to support nesting and breeding birds. Factors considered include suitable cover and feeding habitat, the presence of used and disused nests and birds displaying nesting characteristics.

Dormouse

- 3.2.9 The site was surveyed for suitable dormouse habitat, such as the presence of a well-connected understorey broadleaf habitat, hedgerows and suitable food sources such as oak, hazel and other nut-bearing trees, fruiting trees and shrubs, flowers and invertebrates.

Great Crested Newt

- 3.2.10 No waterbodies were identified within 250m of the site during the desk study. Therefore, no further reference to great crested newts is included within this report.

Reptiles

- 3.2.11 The site was assessed for its potential to support reptile populations. Suitable habitat for reptiles includes long grass, scrub, woodland and hedgerow borders and wood/rubble piles that act as hibernacula.

Other species

- 3.2.12 Consideration was given to the site's suitability to support other protected and notable species.

4 SURVEY RESULTS

4.1 Desk Study

Designated Sites

- 4.1.1 There are no statutory designated sites within 2km of the site.

Non-statutory Designated Sites

- 4.1.2 Non-statutory designated sites within 2km of the site are provided below in Table 1.

Table 1 – Non-Statutory Designated Sites

Site Name	Distance from site
The Coal, Kennetmouth and Kings Meadow East	0.2km N
Henley Road Gravel Pit	0.3km NE
Reading Cemetery	0.6km SE
Whiteknights Park	1.6km SE
Thames Valley Park	1.7km NE
River Kennet/ Kennet and Avon Canal	1.8km SW
Whitley Park Farm/St Patricks Hall Pond	2km S
Holy Brook	2km SW

Ancient Woodland

- 4.1.3 There are 2 areas of Ancient Semi-Natural Woodland (ASNW) within 2km of the site. The nearest ancient woodland is located approximately 1.2km north-east of the site.

UK BAP Priority Habitats

- 4.1.4 UK BAP Priority Habitats within 2km of the site are listed below in Table 2.

Table 2 – UK BAP Priority Habitats

Site Name	Distance from site
Deciduous Woodland	0.1km N
Good quality semi-improved grassland	0.9km NW
Wood-pasture and Parkland	1.3km SE
Lowland ferns	1.9km NE

*Protected or Notable Species**Bats*

4.1.5 Table 3 provides details of the species records closest to the site.

Table 3 – Bat Species Recorded within 2km of the site

Species	Scientific Name	Legal Protection / Conservation Priority Status
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	HabDir:A4; Berne:A3; Bonn:A2; WCA5
Soprano pipistrelle	<i>P. pygmaeus</i>	HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5
Brown long-eared bat	<i>Plecotus auritus</i>	HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5; KRDB2
Long-eared bat	<i>Plecotus</i>	HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b
Noctule	<i>Nyctalus noctula</i>	HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5; KRDB2
Lesser bat	<i>N. leisleri</i>	HabDir:A4; Berne:A2; Bonn:A2; WCA5; KRDB1
Daubenton's bat	<i>Myotis daubentonii</i>	HabDir:A4; Berne:A2; Bonn:A2; WCA5
Serotine	<i>Eptesicus serotinus</i>	HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b
Nathusius pipistrelle	<i>Pipistrellus nathusii</i>	HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b

Other Mammals

4.1.6 Table 4 below provides details of those records closest to the site.

Table 4 – Relevant other mammals Records within 2km of the Site

Common Name	Scientific Name	Legal Protection / Conservation Priority Status	Closest record	Date
Eurasian Badger	<i>Meles meles</i>	Bern_III, Badger Act	0.94km NE	2009
European Otter	<i>Lutra lutra</i>	HabDir-A2np; HabDir-A4	0.3km S	2016
European Hedgehog	<i>Erinaceus europaeus</i>	Bern_III	1km E	2006
European Water Vole	<i>Arvicola amphibius</i>	WACA-Sch5-s9.4a/s9.4b/s9.4c	1.3km NE	2012

Birds

- 4.1.7 Recorded species of conservation concern of potential relevance to the site are presented in Table 5.

Table 5 – Relevant Bird Records within 2km of the Site

Common Name	Scientific Name	Legal Protection / Conservation Priority Status
Yellow Wagtail	<i>Motacilla flava</i>	BAP; Berne:A2; BoCC4:Red; S41; KRDB2
Grey Wagtail	<i>Motacilla cinerea</i>	Berne:A2; BoCC4:Red
Dunnock	<i>Prunella modularis</i>	BAP; Berne:A2; BoCC4:Amber; S41
Tawny Owl	<i>Strix aluco</i>	Berne:A2; BoCC4:Amber; Bonn:A2; KRDB3
Mistle Thrush	<i>Turdus viscivorus</i>	Berne:A3; BoCC4:Red; BirdsDir:A2.2
Song Thrush	<i>Turdus philomelos</i>	BAP; Berne:A3; BoCC4:Red; BirdsDir:A2.2; KRDB2; S41
Redwing	<i>Turdus iliacus</i>	Berne:A3; BoCC4:Red; BirdsDir:A2.2; WCA1
Starling	<i>Sturnus vulgaris</i>	BAP; BoCC4:Red; BirdsDir:A2.2; S41; KRDB2
House Sparrow	<i>Passer domesticus</i>	BAP; BoCC4:Red; KRDB2; S41
Tree Sparrow	<i>Passer montanus</i>	BAP; Berne:A3; BoCC4:Red; KRDB2; S41
Kestrel	<i>Falco tinnunculus</i>	BirdsDir-A1; WACA-Sch1-p1
Linnet	<i>Carduelis cannabina</i>	BAP; Berne:A2; BoCC4:Red; KRDB2; S41
Bullfinch	<i>Pyrrhula pyrrhula</i>	BAP; Berne:A3; BoCC4:Amber; S41
Red Kite	<i>Milvus milvus</i>	BirdsDir-A1; WACA-Sch1-p1
House Martin	<i>Delichon urbica</i>	Berne:A2; BoCC4:Amber

Amphibians

- 4.1.8 Amphibian species of conservation concern that are likely to utilise the site are presented in Table 6.

Table 6 – Relevant Amphibian Records within 2km of the Site

Species	Scientific Name	Legal Protection / Conservation Priority Status	Closest Record	Date
Grass snake	<i>Natrix natrix</i>	Bern_III, WCA5(p)	0.41km NW	2008
Slow-worm	<i>Anguis fragilis</i>	Bern_III, WCA5(p)	0.89km W	1982
Great crested newt	<i>Triturus cristatus</i>	ECH_II, Bern_II, WCA5, CRoW	0.94km NW	2017
Smooth Newt	<i>Lissotriton vulgaris</i>	Bern_III, WCA5(p)	1.3km N	1988

Reptiles

4.1.9 Reptile records closest to the site are presented in Table 7.

Table 7 – Relevant Reptile Records within 2km of the Site

Species	Scientific Name	Legal Protection / Conservation Priority Status	Closest record	Date
Adder	<i>Vipera berus</i>	Bern_III, WCA5(p)	1.7km N	2008
Common Lizard	<i>Zootoca vivipara</i>	Bern_III, WCA5(p)	1.78km NE	2013

Invertebrates -

4.1.10 BAP priority species of potential relevance to the site that were highlighted within the desk study area are presented in Table 8.

Table 8 – Invertebrates within 2km of the Site

Common Name	Scientific Name	Legal Protection / Conservation Priority Status
Stag Beetle	<i>Lucanus cervus</i>	Notable-B, UKBAP_P, NERC_S.41

4.2 Phase I Habitat Survey

4.2.1 The following habitat types were recorded within the site:

- Hardstanding
- Dense scrub
- Trees
- Buildings

Hardstanding

4.2.2 The majority of the site is covered by hardstanding. Totalling an area of approximately 6,700m², this habitat is in reasonable condition and is subject to regular use by SGN workers. An access track leads to the area of hardstanding and buildings currently used by SGN. The hardstanding has become vegetated in places and species identified include buddleia *Buddleja davidii*. These areas are, however, trimmed regularly.

Dense scrub

4.2.3 An area of approximately 340m² of dense scrub is present along the southern boundary of the site. This area is dominated by bramble *Rubus fruticosus*, ivy *Hedera helix*, dogwood *Cornus*

sp., buddleia and herb Robert *Geranium robertianum*. A small area of scrub (50m²) comprising buddleia is present in the north-western corner of the site.

Trees

- 4.2.4 Mature trees are present on the sites southern boundary. Species recorded include sycamore maple *Acer pseudoplatanus*, rowan *Sorbus aucuparia*, elm *Ulmus sp.*, common alder *Alnus glutinosa*, silver birch *Betula pendula* and Norway maple *Acer platanooides*. There is an area of bare ground beneath the trees.

Buildings

- 4.2.5 Five buildings are present on site. These are described in more detail in section 4.3 below.

4.3 Protected Species

Badgers

- 4.3.1 No evidence of badgers was noted during the survey.

Bats Roosting Habitat - Buildings

Building 1

- 4.3.2 B1 is a single storey building measuring approximately 7.5m x 4.8m in size. The walls are of brick construction to a height of 3.8m and the roof has a covering of concrete tiles. Overall the walls, fascia's and roof are in good condition. However, Potential Roosting Features (PRF) and access points for bats are present within the building's exterior in the form of raised tiles and gaps under the soffits.

- 4.3.3 Access to the interior of the building was not available during the survey.

Building 2

- 4.3.4 B2 is a single storey building measuring approximately 7.5m x 4.8m in size. The walls are of brick construction to the height of 4m with a concrete tiled flat roof. The walls, soffits, fascia's and roof are in good condition. PRF's and access points for bats are limited to a single hole in the brick work.

- 4.3.5 Access to the interior of the building was not available during the survey.

Building 3-5

- 4.3.6 B3-B5 are single storey buildings. B3 is a sub station and B4-B5 are used by SGN staff as an office. None offer any PRF for bats.

Bats Roosting Habitat - Trees

- 4.3.7 Trees with potential to support roosting bats are described in Table 10 below. Tree locations are provided in Figure 1. For clarity tree numbers are matched to those in the associated

arboricultural report (J20563_Arb). All other trees present within the site are healthy and in good condition and show no potential bat roosting features.

Table 9 – Tree Survey Results

Tree No.	Species	DBH / mm	Description of features	Level of Potential
T2	Sycamore	600	Old pollard. WPH on eastern aspect at 5 metres - may extend.	Moderate

Foraging and Commuting Habitat

- 4.3.8 The site offers limited habitat for foraging. However, its immediate surroundings offer suitable foraging habitat and commuting routes in the form of the tree/vegetation lines on the northern and southern boundaries. The site is well connected to suitable foraging areas in the wider landscape including the River Kennett to the south and the railway line to the north.

Birds

- 4.3.9 Suitable nesting habitat is limited to the area of scrub and the vegetated boundaries. No evidence of nesting birds was recorded during the survey.

Dormouse

- 4.3.10 No suitable dormouse habitat is present within the site. The scrub and boundary vegetation are too fragmented to offer suitable habitat and the wider landscape is also unsuitable.

Great Crested Newt

- 4.3.11 No waterbodies are mapped within 250m and so no assessment of the terrestrial habitat was required.

Reptiles

- 4.3.12 The site offers a limited area of suitable reptile habitat. The adjacent railway which runs along the sites northern boundary provides suitable reptile habitat and connectivity to areas of reptile habitat in the wider landscape.

Other species

- 4.3.13 No evidence of other protected species was recorded.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Designated Areas

- 5.1.1 No statutory designated sites are located within 2km of the site and none will be affected by the proposed development.
- 5.1.2 The closest non-statutory site is 0.2km north of the site and lies beyond the railway line. The small-scale and localised nature of development is not considered likely to adversely impact this site or any other designated site.

5.2 Ancient Woodland

- 5.2.1 The nearest ancient woodland site is located 1.2km from the site, which is well beyond the 15m buffer recommended by Natural England the Forestry Commission when working near ancient woodland sites. The development of this site will have no detrimental impact on any area of ancient woodland.

5.3 Habitats and Botanical Species of Interest

- 5.3.1 The closest UK BAP priority habitat is 0.1km from the site and beyond the railway line. As a result, it will not be affected by the development.
- 5.3.2 The habitats within the site are common and widespread and no further botanically specific surveys are required in this instance.
- 5.3.3 Should any boundary trees require removal, it is recommended that they are compensated by like-for-like replacement within the site. Should any non-native trees require removal, compensatory planting using UK native tree species is recommended. Some suitable tree species are provided in Section 6 below.
- 5.3.4 Protection of retained trees is discussed in the associated arboricultural report (J20563_Arb).

5.4 Protected Species

Badger

- 5.4.1 No evidence of badger was recorded, and no historical evidence of badgers has been reported within or in close proximity to the site. No further surveys for badgers are required.

Bats

Roosting Habitat- Buildings

- 5.4.2 PRF recorded on the building denoted B1 were limited and in isolation the structure would be considered Negligible for its suitability to support roosting bats. However, historical records of nine species of bat exist within the desk study area and the foraging and commuting habitat

in the form of the river and railway which lies adjacent to the site, offer excellent habitat for bats. Consequently, the building denoted B1 has **'Negligible/Low'** suitability. As a precautionary measure, to determine its use by roosting bats, should this building be affected by the development, it should be subject to a single evening emergence survey.

- 5.4.3 As development of the site will likely result in the loss and/or disturbance of any bat roost present in B1, no works to B1 should take place until further survey for bats has been undertaken.

- 5.4.4 No further surveys are required for buildings B2-B5, which have been classified as having **'Negligible'** potential.

Roosting Habitat- Trees

- 5.4.5 Potential roosting features for bats have been identified in the tree T2 and should this tree require removal and/or works that are likely to impact on the woodpecker hole of interest, it should be subject to an elevated inspection, prior to the start of works. Note: tree roosts for bats are highly dynamic and application of climb and inspect would ideally be conducted <6 months prior to commencement of works that will impact the tree. Consequently, application of this survey should not be considered restrictive to approval of the planning application.

- 5.4.6 Should evidence of bats or features suitable to support bats be identified during the elevated inspection, then further surveys and/or a European Protected Species Mitigation Licence may be required prior to the start of works.

Bats – Foraging and Commuting Habitat

- 5.4.7 Foraging and commuting habitat is present in the form of tree/vegetation lines on the northern and southern boundaries. Should any boundary tree or vegetation require removal, it is recommended that additional boundary planting is undertaken to maintain the continuity of this habitat.

- 5.4.8 Although best set out upon completion of the above-mentioned bat survey, lighting can be detrimental to how bats use a site for foraging and commuting and consideration to a sensitive lighting strategy should be implemented within the design.

Birds

- 5.4.9 Suitable nesting habitat is present on site in the form of trees, scrub and buildings.
- 5.4.10 As all breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended) it is recommended that works to these areas and any other areas deemed suitable for nesting

birds, such as trees, are conducted outside the core breeding period for birds of Late February – August inclusive.

- 5.4.11 Should this timeframe be unobtainable, a thorough search for the presence of breeding birds should be conducted by a suitably experienced ecologist prior to the start of works. Should evidence of breeding birds be recorded, works within 5m of the nest, or works that have potential to destroy the nest, should stop until the eggs have hatched and the chicks fledged, or the nest is deemed by a suitably experienced ecologist to have been abandoned.

- 5.4.12 Although no evidence to suggest historic or current use by the species was recorded, it is understood that a peregrine falcon *Falco peregrinus* is known to use the gas holder for the purposes of roosting (*Pers comms*). Having identified the sites suitability to support the species, inclusion of a peregrine nest ledge has been included within the design.

Dormouse

- 5.4.13 No suitable dormouse habitat is present, and no historical records of dormice were identified within the desk study area. No further dormouse surveys are required.

Great Crested Newt

- 5.4.14 Although a restricted area of suitable terrestrial habitat exists within the site, the site and wider area lack the network of waterbodies that great crested newts require to breed. Great crested newts are therefore considered unlikely to be present on the site. No further surveys for the species are required.

Reptiles

- 5.4.15 A small area of scrub in the south of the site provides suitable reptile habitat and historical records of reptiles exists within the wider area. However, the suitable habitats lack connectivity with the railway and or alternate suitable habitats and reptiles are considered likely to be absent. No further surveys for reptiles are required.

Other species

- 5.4.16 There are no obvious and immediate issues regarding other protected species on the site and no further surveys to determine the presence of other protected species is required in this instance.
- 5.4.17 However, should at any point during the development a protected or notable species be identified within the site, then all works should **stop** and the appointed ecologist consulted on the appropriate manner in which to proceed.

6 ECOLOGICAL ENHANCEMENTS

6.1 Opportunities to include biodiversity enhancements within the proposed development exist and in accordance with the requirements of the NPPF the following recommendations are considered appropriate for this site:

- To benefit a diversity of bird species 5 x integrated bird boxes, such as those provided by <http://www.habibat.co.uk/category/bird-boxes> should be erected into the elevations of the proposed buildings. To maximise suitability the boxes should be installed on sheltered aspects close to vegetation at a height of 2-3m, preferably on north, north-east or north-west facing elevations.
- To benefit a diversity of bat species 5 x integrated bat boxes, such as those provided by <http://www.habibat.co.uk/category/bat-boxes> should be erected into the elevations of the proposed buildings. To maximise suitability the boxes should be installed on sheltered aspects close to vegetation at a height of 3 - 8m, preferably on north, east or west facing elevations.
- The incorporation of a native wildlife-friendly planting scheme within the grounds post-development would be of benefit to invertebrates, and subsequently species such as amphibians, birds and bats.
- The boundary vegetation should be enhanced through the planting of native species rich hedgerows and trees.
- All tree planting should be undertaken using native species such as pedunculate oak, small leaved lime *Tilia cordata*, black poplar *Poplar nigra*, wild service tree *Sorbus torminalis* or similar.
- To account for the nearby historical record of hedgehog, the incorporation of hedgehog boxes at suitable locations within vegetated areas of the site would provide an enhancement for this species. Boxes should ideally be located within the northern or southern boundary vegetation. The design of the houses should loosely follow those available at the following link; <https://www.britishhedgehogs.org.uk/hedgehog-homes/>

7 SUMMARY

- 7.1 In response to proposed redevelopment of the Gas Holder Site at Alexander Turner Close, Reading, the site has been subject to a Preliminary Ecological Appraisal.
- 7.2 The site's potential to support protected species and habitats has been assessed and appropriate recommendations provided.
- 7.3 The small-scale, localised development is considered unlikely to result in a negative impact to designated sites, ancient woodland or priority habitats.
- 7.4 Like-for-like replacement planting is recommended for any trees lost to the development. Should any non-native trees require removal, compensatory planting using UK native tree species is recommended
- 7.5 B1 and T2 has potential to support roosting bats and to determine their suitability for the species further surveys / inspections have been recommended. B1 requires 1 x emergence survey as a precaution. Should it be affected by the proposed, T2 requires an elevated inspection ideally no more than 6 months prior to commencement of associated works.
- 7.6 Suitable nesting habitat for birds will be affected. Consequently, recommendations in regard to timings and methods of best practice for breeding birds have been provided. To offset the loss of the peregrine falcon nesting habitat, a suitable ledge has been provided in the final design.
- 7.7 The likelihood of other protected and notable species to occur within the site is considered negligible and no further surveys for other protected species are required. However, should at any point during the development a protected or notable species be identified within the site then all works should stop and the appointed ecologist consulted on the appropriate manner in which to proceed.
- 7.8 In accordance with the requirement of the NPPF, recommendations to enhance the site's suitability for wildlife have been provided.

8 REFERENCES

Collins, J. (ed.) 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). Bat Conservation Trust, London.

JNCC (2010). Handbook for Phase I Habitat Survey; A Technique for Environmental Audit. Peterborough.

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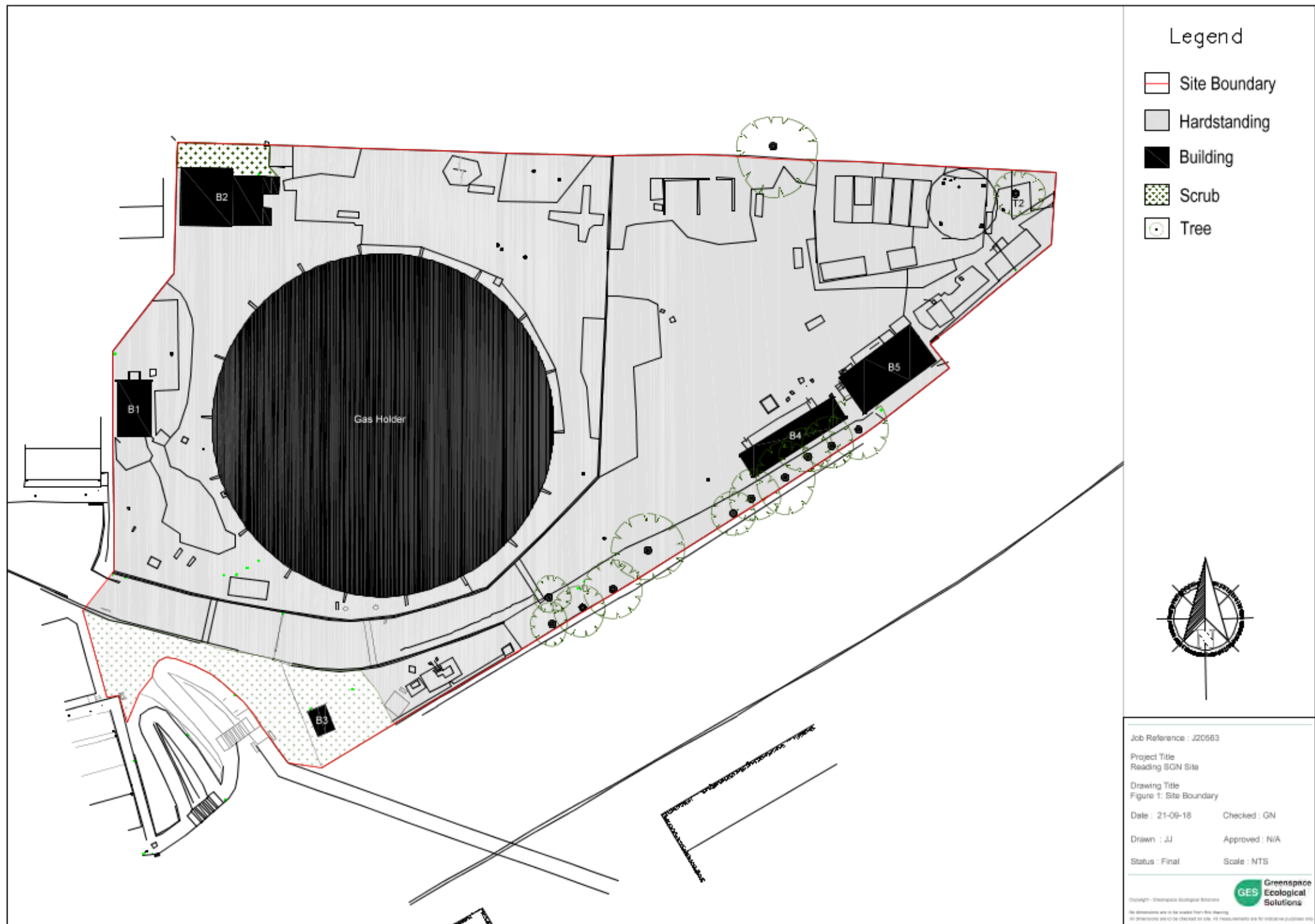
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Figures



Appendices

APPENDIX A – PHOTOGRAPHS



Plate 1. Areas of vegetated hard standing



Plate 2. Gasholder located within the site



Plate 3: Building 2



Plate 4. Building 2



Plate 5. Area of dense scrub

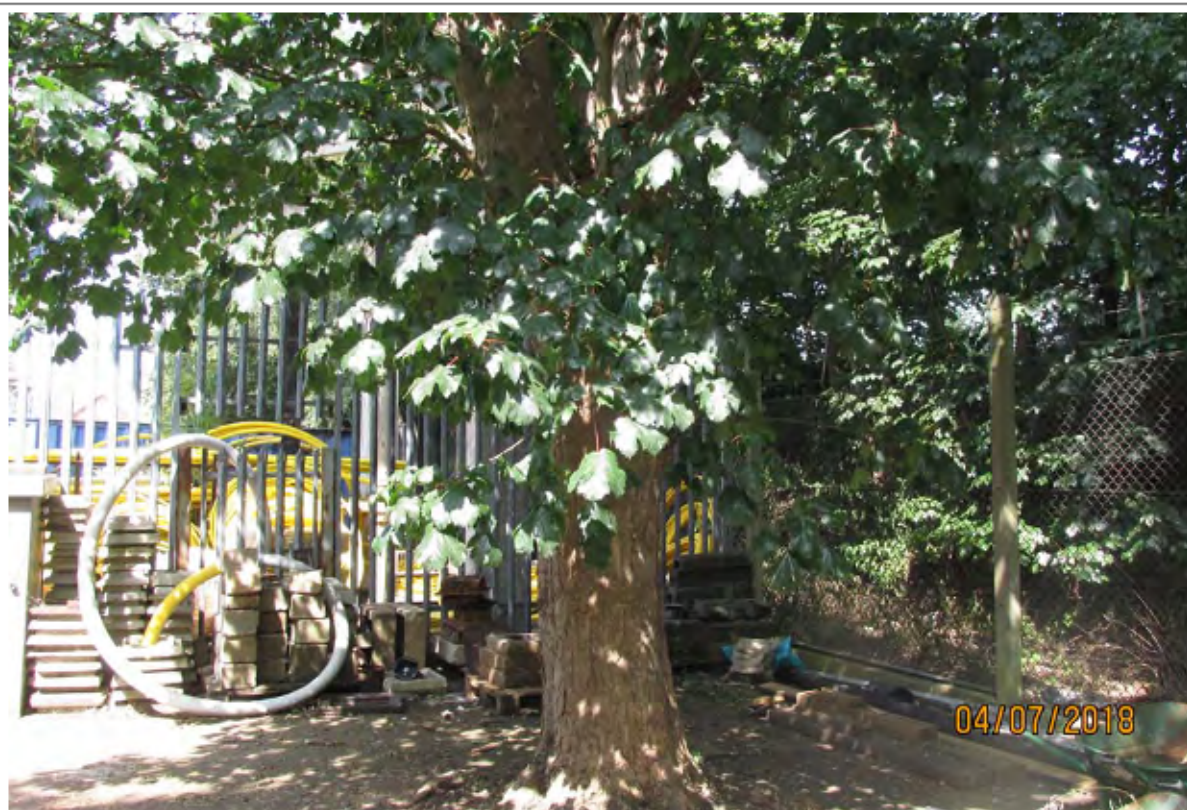


Plate 6. T2

APPENDIX B

Categories of Bat Roost Potential

Roost type Level of potential	Summer Roost used by Non- Breeding Bats	Maternity Roost	Hibernation Roost
Confirmed roost	Presence of bats or evidence of bats identified. Confirmation of a roost will likely require further surveys.		
High	Building/Structure or tree with multiple opportunities for one or more species of roosting bat. Optimal orientation. Good connectivity to optimal foraging habitats.	Building/Structure or tree with multiple roosting opportunities for pregnant female bats and young pups. Optimal orientation. Good connectivity to optimal foraging habitats.	Building/Structure or tree that has suitable thermal stability and levels of humidity to support torpid bats throughout the winter months.
Moderate	Building/Structure for tree with some opportunities for roosting bats. Preferable orientation. Connectivity to moderate to high quality foraging habitat available.	Building/Structure or tree with some roosting opportunities for pregnant female bats and young pups. Good orientation. Good connectivity to moderate to high quality foraging habitats.	Building/Structure or tree that has suitable thermal stability and levels of humidity to support torpid bats for some of the winter months. Moderate connectivity to suitable foraging areas.
Low	Building/Structure or tree with limited opportunities for roosting bats. Poor connectivity to foraging habitat.	Building/Structure or tree with limited opportunities for breeding bats. Poor connectivity to foraging habitat.	Building/Structure or tree with limited potential to support hibernating bats due to instable environmental conditions.
Negligible	Building/Structure or tree with no or very limited opportunities for roosting bats. Little to no connectivity to foraging habitat	Building/Structure or tree with no or very limited opportunities for breeding bats. Little to no connectivity to foraging habitat.	No suitable roosting opportunities for hibernating bats.

APPENDIX C

Minimum Number of Bat Surveys Required in Most Instances

Negligible	Low roost potential	Moderate roost potential	High roost potential*
Dusk emergence and/or pre-dawn re-entry surveys unlikely to be required.	Structures: 1 survey visit. 1 dusk emergence or pre-dawn re-entry survey^a. To be conducted during May – August. Trees: Dusk emergence and/or pre-dawn re-entry surveys unlikely to be required.	2 separate survey visits. 1 dusk emergence survey and 1 pre-dawn re-entry survey^b. To be conducted during May-September with at least one of the surveys May – August.	3 separate survey visits. At least 1 dusk emergence survey and a separate pre-dawn re-entry survey. The third visit could be either a dusk or dawn survey^b. To be undertaken during May-September with at least two of the surveys between May and August.
^a Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case by case basis. If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category. ^b Multiple survey visits should be spread out to sample as much of the recommended survey period as possible; It is recommended that surveys are spaced out at least two weeks apart, preferably more. A dawn survey immediately after a dusk survey is considered one visit. If there is potential for a maternity colony, then consideration should be given to seasonal detectability and the ecologist should use their professional judgement to design the most appropriate survey regime. *For the purpose of this exercise a confirmed roost is considered under the criteria of 'High roost potential'			

Appendix L- Part 2- Greenspace Updated PEA

Mr A. Robson
Danescroft Land Limited
4th Floor
40-42 Parker Street
London
WC2B 5PQ

**By Email:
26th October 2020**

Job Ref: J20563_P5_Reading SGN Gas Holder Site_uPEA

Dear Mr Robson,

Site – Reading SGN Gas Holder No. 4, Kenavon Drive, Reading, Berkshire, RG1 3DH

In response to proposed development of the Reading SGN Gas Holder Site no. 4, an updated Preliminary Ecological Appraisal (PEA) assessment was undertaken by Greenspace Ecological Solutions (GES) on 20th October 2020.

Henceforth referred to as ‘the Site’, development proposals are understood to involve the redevelopment of the existing contaminated brownfield site into a new residential development with associated parking and landscaping. For clarity, photographs of the Site are provided in Appendix A.

Please note, as the information below is provided as an update only, for clarity this letter should be read in conjunction with the following associated reports:

- PEA (J20563_Rev C; GES, 2019) (Appendix B);
- Bat Emergence Survey Report (J20563_P2; GES, 2019) (Appendix C); and
- Bat Roost & Bat Activity Survey Report (J20563_P2_Rev A; GES, 2019) (Appendix D).

Introduction

Due to time elapsed since the previous ecological surveys, the land to be impacted by the proposed development has been subject to an update PEA.

The update Site assessment was undertaken on 20th October 2020 by suitably experienced ecologist Matthew Rohner of GES. The findings of the survey serve to determine if the Site and surrounds have undergone any significant change regarding their suitability to support protected habitats/species since the previous ecological surveys.

Site Location

The Site is located on the eastern periphery of the town of Reading, Berkshire, at National Grid reference: SU 728 736. The Site occupies approximately 0.71ha and comprises of areas of scrub, scattered trees, and buildings within areas of hard standing. A prominent gas holder is present within the Site.

The Site is bound by residential dwellings to the east, the River Kennett to the south and east, and a railway line to the north. The wider landscape is one of industrial units to the east and west, with pockets of scrubland to the north, beyond the railway.

Survey Methodology

Habitats were surveyed using the PEA methodology outlined in 'The Handbook for Phase I Habitat Survey: A Technique for Environmental Audit' (JNCC, 2010). Any changes to the habitats since the previous surveys were noted. The Phase I Habitat Survey was extended to include an assessment of the Site's potential to support protected and notable species., comprising assessment of the suitability of the habitats present within the Site to support these species, as well as connectivity to the Site from other areas of potentially suitable habitat nearby.

Survey Constraints

PEA can be undertaken at any time of the year however, the optimum time of year for these surveys to be undertaken is between April and September (inclusive) to enable the majority of botanical species to be detected. As this survey was undertaken outside of this optimum period, there is a possibility that some annual species may not have been recorded. Mapping and description of broad habitat types has however, still been possible.

Results

Phase I Habitat Survey

The habitat types and their suitability to support protected species remain broadly the same as was found during the previous surveys (GES, 2019). The results of the aforementioned surveys, therefore, remain valid with the following exceptions:

1. Scattered scrub is encroaching onto the Site along the northern and western boundaries. These areas comprise predominantly pioneer species, such as willowherbs *Epilobium* spp., with negligible potential to support protected or notable species.
2. A small rubble pile is present adjacent to the eastern Site boundary.
3. A small pile of vegetation waste is present adjacent to the aforementioned rubble pile.

Conclusions and Recommendations

With no significant change to the status of the Site, the conclusions and recommendations set out within the previous appended reports (GES, 2019a, b and c) remain current and valid.

The rubble and vegetation piles have the potential to provide sheltering opportunities for amphibians and reptiles. It is recommended that these piles be removed by hand during the active season for herpetofauna of March – October. In the unlikely event that a protected species is identified during removal, works to these areas of the Site should **stop** and the appointed ecologist is to be contacted to advise on the manner in which to proceed.

I trust that you find the above information of use, but if you have any questions or queries please do not hesitate to contact us.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M. Rohner', with a stylized flourish at the end.

Matthew Rohner MSc Grad CIEEM
Ecologist

REFERENCES

Collins, J. (ed). (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.)*. Bat Conservation Trust. London.

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Wildlife and Countryside Act (as amended) 1981 [online]. Available at: <http://jncc.defra.gov.uk/page-1377>

APPENDIX A – PHOTOGRAPHS



Plate 1. Rubble pile.



Plate 2. Vegetation pile.

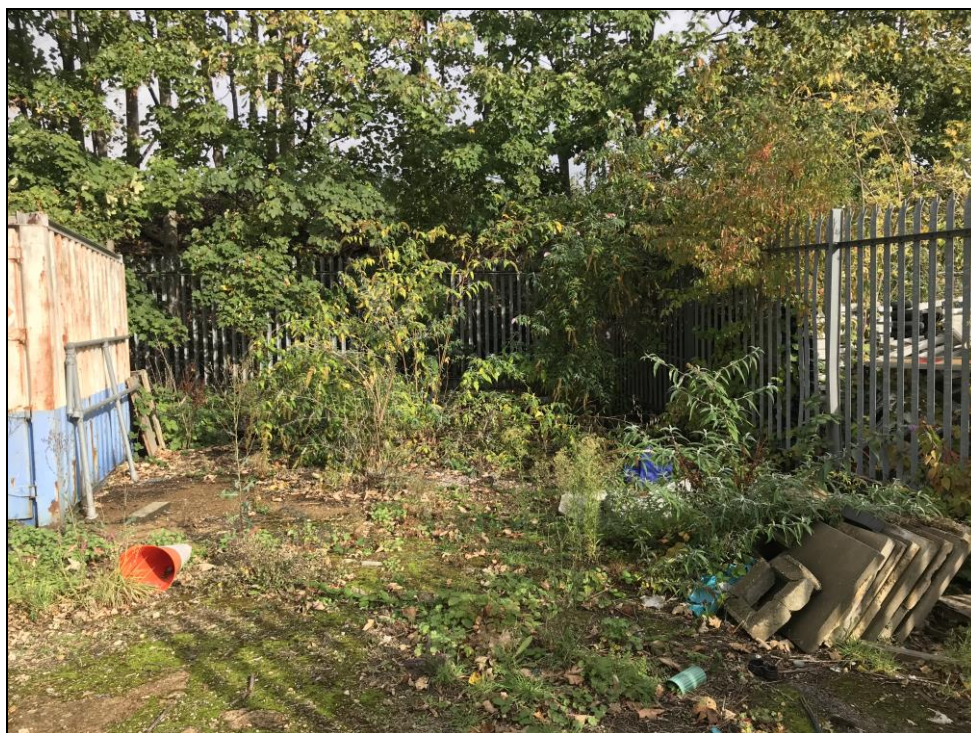


Plate 3. Scattered scrub along the northern Site boundary.



Plate 4. Scattered scrub along the north-eastern Site boundary.

Appendix B

Gas Holder Site, Reading

Preliminary Ecological Appraisal

April 2019



Gas Holder Site, Reading

Preliminary Ecological Appraisal

A Report for Danescroft (Kenavon Drive
Project Management) LLP

April 2019



**Greenspace
Ecological
Solutions**

www.greenspace-ecology.co.uk

info@greenspace-ecology.co.uk

Gas Holder Site, Reading

Preliminary Ecological Assessment

April 2019

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

This report was written by Tanya Rowlinson and proof read by James Johnston

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.*

Report Number J20563_Rev B

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FIGURES

Figure 1 Phase I Habitat Plan

APPENDICES

Appendix A Site Photographs

Appendix B Categories of Bat Roost Potential

Appendix C Minimum Number of Surveys Required in Most Instances

1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: SGN Gasholder No 4, Kenavon Drive, Reading, RG1 3DH.

Attending Ecologists: James Johnston

Survey Date: 04th July 2018

Site Proposals: Redevelopment of an existing contaminated brownfield site and new residential development with associated parking.

Associated Planning Reference Number: Not yet Submitted

Source of Relevant Documents:

Document:	Source:
Site Location Plan:	Google Earth Pro
Desk Study:	Thames Valley Environmental Records Centre (TVERC) Magic.gov.uk
Site Plans:	Collado Collins Architects

2 INTRODUCTION

2.1 Context

2.1.1 To inform the associated planning application, Greenspace Ecological Solutions has been commissioned by Danescroft (Kenavon Drive Project Management) LLP to undertake an Preliminary Ecological Appraisal (PEA) of the Gas Holder Site, Alexander Turner Close, Reading.

2.1.2 Henceforth referred to as ‘the site’, proposals involve the redevelopment of an existing contaminated brownfield site and new residential development with associated parking.

2.1.3 The site’s potential to support protected species and habitats has been assessed and appropriate recommendations have been provided. Trees and buildings likely to be affected have been assessed for their potential to support roosting bats. Ecological features of interest are depicted in Figure 1.

2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736. The location of the site is depicted in Image 1.

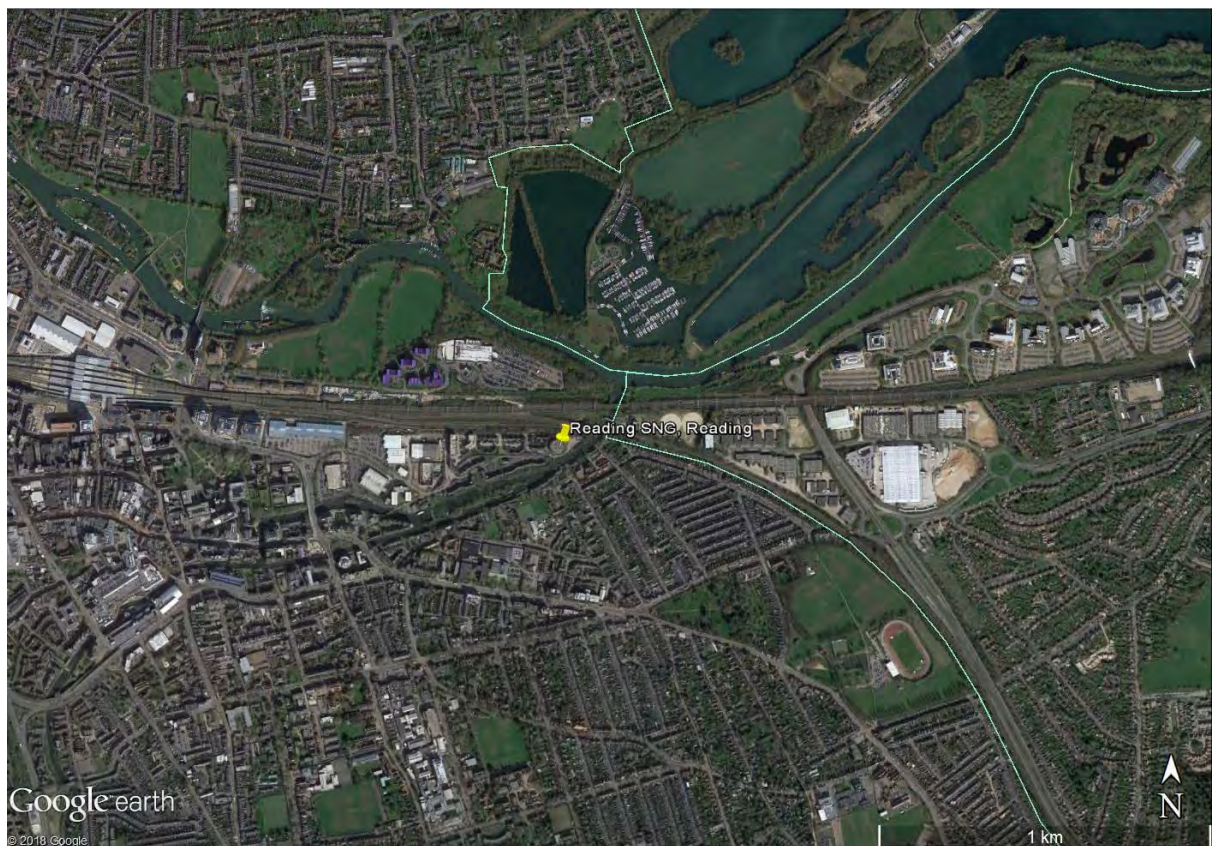


Image 1 – Site Location of Gas Holder Site at Alexander Turner Close, Reading

2.3 Site Description

- 2.3.1 The site occupies approximately 0.71ha and comprises of areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder can be found within the site.
- 2.3.2 The site is bound by residential dwellings to the east; the River Kennett to the south and east; and the National railway to the north. The wider landscape is one of industrial units to the east and west and pockets of scrubland to the north, beyond the railway.

2.4 Legislation and Policies

National Planning Policy Framework

- 2.4.1 The main legislation that applies to ecological issues within England and Wales are:
- The Conservation of Habitat and Species Regulations 2010 transposes European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. These regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' and the adaptation of planning controls for the protection of such sites and species. Under the regulations, public bodies have a duty in exercising their functions to have regard to the EC Habitats Directive.
 - The Wildlife and Countryside Act 1981 (as amended) provides detail on a range of protection and offences relating to wild birds, other animals, and plants. The level of protection depends on which Schedule of the Act the species is listed on. Licences are available for specific purposes to permit actions that would otherwise constitute an offence in relation to species.
 - The Natural Environment and Rural Communities (NERC) Act 2006 imposes an obligation on all public bodies, including local authorities, to consider whether their activities can contribute to the protection of wildlife. The duty is created by section 40(1) of the Act, which states that: "Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."
 - Hedgerows Regulations Act 1997 serves to; enforce under the Environment Act 1995, restrict the removal of hedgerows, or parts of hedgerows which are over 20m in length. In this case, removal includes digging up and replanting elsewhere, as well as removing

from the land completely or destroying in the course of other actions. This includes developments or activities which destroy the roots, causing the vegetation to die.

- The Protection of Badgers Act 1992 exists for welfare reasons, to protect badgers (*Meles meles*) from cruelty. Under the act it is a criminal offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so, or to intentionally or recklessly interfere with a sett.

2.4.2 The above summary serves as guidance only – the reader is referred to the original legislation for definitive interpretation.

UK Planning Policy

2.4.3 The recommendations of this report are in line with the key principles of the National Planning Policy Framework (ref. 1) and Government Circular 06/05 (ref. 2).

2.4.4 Local planning policies relating to ecology are invariably based on the conservation of species protected under the above legislation, including species and habitats of principal importance listed under Section 41 of the NERC Act 2006; and the protection of designated sites. All of these features are considered within the scope of this preliminary ecological appraisal and therefore any recommendations made herein are likely to be in line with this policy.

2.5 Objectives of the Survey

2.5.1 The objectives of the survey were to:

- Classify the main habitats present within the site;
- Evaluate the ecological importance of these habitats;
- Assess buildings and trees for their potential to support roosting bats;
- Evaluate the potential for other protected species to occur within the site; and
- Provide appropriate recommendations for further surveys and mitigation where required.

2.6 Survey Constraints

2.6.1 Access to the interior of buildings B1 and B2 was not possible and these structures were assessed from the exterior only.

2.6.2 All measurements and indications of area given within this report are approximate.

3 SURVEY METHODOLOGY

3.1 Desk Study

3.1.1 A desk study was undertaken to determine the presence of sites and habitats of conservation importance together with historical records of protected and notable species within a 2km radius of the site.

3.1.2 The following bodies were consulted for the desk study:

- Magic.gov.org
- Thames Valley Environmental Records Centre (TVERC)

3.2 Preliminary Ecological Appraisal

Habitats

3.2.1 The site was surveyed using the methodology outlined in 'The Handbook for Phase I Habitat Survey: A Technique for Environmental Audit' (JNCC, 2010). This involves identifying the main plant communities present on the site and classifying the habitat types following the JNCC methodology. This technique provides an inventory of the basic habitat types present and enables areas of greater botanical interest which may require further, more detailed, surveys to be identified. Any occurrences of recognised invasive species as listed on Schedule 9 of the Wildlife and Countryside Act (as amended) were also noted.

3.2.2 A map of the habitats and areas of interest (using a variation of the JNCC 2010 protocol for Phase I Habitat plans) is provided in Figure 1. Photographs of features of interest are presented in Appendix A.

Protected Species

3.2.3 The Phase I Habitat Survey was extended to include an assessment of the site's potential to support protected and notable species. This involved assessing the suitability of the habitats present on the site for these species as well as connectivity to the site from other areas of potentially suitable habitat nearby.

Badger

3.2.4 Evidence of badger activity on site (and where possible within the distance generally considered to be the zone of disturbance) was assessed by searching for signs such as:

- Presence of setts, indicated by suitably sized holes or burrows
- Evidence of badger latrines, badger hair and/or footprints
- Evidence of well-used runs supported by secondary evidence such as foraging signs

Bats

- 3.2.5 Specific survey work was undertaken on the buildings and trees to assess their suitability to support roosting bats. In this instance, a high-powered torch was used to search for any bat roosting features.
- 3.2.6 The results of a scoping survey enable the buildings and trees to be categorised as having Confirmed, High, Moderate, Low or Negligible potential to support roosting bats. An outline of categorisation procedure for classifying bat potential is presented in Appendix B.
- 3.2.7 In accordance with current best practice guidance (Collins, 2016), the level of potential determines the need or not for further summer emergence surveys. Although left to the discretion of the appointed ecologist, in most instances High potential requires three, Moderate potential requires two and Low potential requires one evening emergence or pre-dawn re-entry survey/s (although trees with Low potential do not require further emergence or pre-dawn re-entry surveys). Greater detail on the minimum number of surveys recommended in most instances is presented in Appendix C.

Birds

- 3.2.8 The site was assessed for its potential to support nesting and breeding birds. Factors considered include suitable cover and feeding habitat, the presence of used and disused nests and birds displaying nesting characteristics.

Dormouse

- 3.2.9 The site was surveyed for suitable dormouse habitat, such as the presence of a well-connected understorey broadleaf habitat, hedgerows and suitable food sources such as oak, hazel and other nut-bearing trees, fruiting trees and shrubs, flowers and invertebrates.

Great Crested Newt

- 3.2.10 No waterbodies were identified within 250m of the site during the desk study. Therefore, no further reference to great crested newts is included within this report.

Reptiles

- 3.2.11 The site was assessed for its potential to support reptile populations. Suitable habitat for reptiles includes long grass, scrub, woodland and hedgerow borders and wood/rubble piles that act as hibernacula.

Other species

- 3.2.12 Consideration was given to the site's suitability to support other protected and notable species.

4 SURVEY RESULTS

4.1 Desk Study

Designated Sites

- 4.1.1 There are no statutory designated sites within 2km of the site.

Non-statutory Designated Sites

- 4.1.2 Non-statutory designated sites within 2km of the site are provided below in Table 1.

Table 1 – Non-Statutory Designated Sites

Site Name	Distance from site
The Coal, Kennetmouth and Kings Meadow East	0.2km N
Henley Road Gravel Pit	0.3km NE
Reading Cemetery	0.6km SE
Whiteknights Park	1.6km SE
Thames Valley Park	1.7km NE
River Kennet/ Kennet and Avon Canal	1.8km SW
Whitley Park Farm/St Patricks Hall Pond	2km S
Holy Brook	2km SW

Ancient Woodland

- 4.1.3 There are 2 areas of Ancient Semi-Natural Woodland (ASNW) within 2km of the site. The nearest ancient woodland is located approximately 1.2km north-east of the site.

UK BAP Priority Habitats

- 4.1.4 UK BAP Priority Habitats within 2km of the site are listed below in Table 2.

Table 2 – UK BAP Priority Habitats

Site Name	Distance from site
Deciduous Woodland	0.1km N
Good quality semi-improved grassland	0.9km NW
Wood-pasture and Parkland	1.3km SE
Lowland ferns	1.9km NE

*Protected or Notable Species**Bats*

4.1.5 Table 3 provides details of the species records closest to the site.

Table 3 – Bat Species Recorded within 2km of the site

Species	Scientific Name	Legal Protection / Conservation Priority Status
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	HabDir:A4; Berne:A3; Bonn:A2; WCA5
Soprano pipistrelle	<i>P. pygmaeus</i>	HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5
Brown long-eared bat	<i>Plecotus auritus</i>	HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5; KRDB2
Long-eared bat	<i>Plecotus</i>	HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b
Noctule	<i>Nyctalus noctula</i>	HabDir:A4; Berne:A2; Bonn:A2; BAP; S41; WCA5; KRDB2
Lesser bat	<i>N. leisleri</i>	HabDir:A4; Berne:A2; Bonn:A2; WCA5; KRDB1
Daubenton's bat	<i>Myotis daubentonii</i>	HabDir:A4; Berne:A2; Bonn:A2; WCA5
Serotine	<i>Eptesicus serotinus</i>	HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b
Nathusius pipistrelle	<i>Pipistrellus nathusii</i>	HabDir-A4; HabReg-Sch2; WACA-Sch5-s9.4b/s9.4c/s9.5a/s9.5b

Other Mammals

4.1.6 Table 4 below provides details of those records closest to the site.

Table 4 – Relevant other mammals Records within 2km of the Site

Common Name	Scientific Name	Legal Protection / Conservation Priority Status	Closest record	Date
Eurasian Badger	<i>Meles meles</i>	Bern_III, Badger Act	0.94km NE	2009
European Otter	<i>Lutra lutra</i>	HabDir-A2np; HabDir-A4	0.3km S	2016
European Hedgehog	<i>Erinaceus europaeus</i>	Bern_III	1km E	2006
European Water Vole	<i>Arvicola amphibius</i>	WACA-Sch5-s9.4a/s9.4b/s9.4c	1.3km NE	2012

Birds

- 4.1.7 Recorded species of conservation concern of potential relevance to the site are presented in Table 5.

Table 5 – Relevant Bird Records within 2km of the Site

Common Name	Scientific Name	Legal Protection / Conservation Priority Status
Yellow Wagtail	<i>Motacilla flava</i>	BAP; Berne:A2; BoCC4:Red; S41; KRDB2
Grey Wagtail	<i>Motacilla cinerea</i>	Berne:A2; BoCC4:Red
Dunnock	<i>Prunella modularis</i>	BAP; Berne:A2; BoCC4:Amber; S41
Tawny Owl	<i>Strix aluco</i>	Berne:A2; BoCC4:Amber; Bonn:A2; KRDB3
Mistle Thrush	<i>Turdus viscivorus</i>	Berne:A3; BoCC4:Red; BirdsDir:A2.2
Song Thrush	<i>Turdus philomelos</i>	BAP; Berne:A3; BoCC4:Red; BirdsDir:A2.2; KRDB2; S41
Redwing	<i>Turdus iliacus</i>	Berne:A3; BoCC4:Red; BirdsDir:A2.2; WCA1
Starling	<i>Sturnus vulgaris</i>	BAP; BoCC4:Red; BirdsDir:A2.2; S41; KRDB2
House Sparrow	<i>Passer domesticus</i>	BAP; BoCC4:Red; KRDB2; S41
Tree Sparrow	<i>Passer montanus</i>	BAP; Berne:A3; BoCC4:Red; KRDB2; S41
Kestrel	<i>Falco tinnunculus</i>	BirdsDir-A1; WACA-Sch1-p1
Linnet	<i>Carduelis cannabina</i>	BAP; Berne:A2; BoCC4:Red; KRDB2; S41
Bullfinch	<i>Pyrrhula pyrrhula</i>	BAP; Berne:A3; BoCC4:Amber; S41
Red Kite	<i>Milvus milvus</i>	BirdsDir-A1; WACA-Sch1-p1
House Martin	<i>Delichon urbica</i>	Berne:A2; BoCC4:Amber

Amphibians

- 4.1.8 Amphibian species of conservation concern that are likely to utilise the site are presented in Table 6.

Table 6 – Relevant Amphibian Records within 2km of the Site

Species	Scientific Name	Legal Protection / Conservation Priority Status	Closest Record	Date
Grass snake	<i>Natrix natrix</i>	Bern_III, WCA5(p)	0.41km NW	2008
Slow-worm	<i>Anguis fragilis</i>	Bern_III, WCA5(p)	0.89km W	1982
Great crested newt	<i>Triturus cristatus</i>	ECH_II, Bern_II, WCA5, CRoW	0.94km NW	2017
Smooth Newt	<i>Lissotriton vulgaris</i>	Bern_III, WCA5(p)	1.3km N	1988

Reptiles

4.1.9 Reptile records closest to the site are presented in Table 7.

Table 7 – Relevant Reptile Records within 2km of the Site

Species	Scientific Name	Legal Protection / Conservation Priority Status	Closest record	Date
Adder	<i>Vipera berus</i>	Bern_III, WCA5(p)	1.7km N	2008
Common Lizard	<i>Zootoca vivipara</i>	Bern_III, WCA5(p)	1.78km NE	2013

Invertebrates -

4.1.10 BAP priority species of potential relevance to the site that were highlighted within the desk study area are presented in Table 8.

Table 8 – Invertebrates within 2km of the Site

Common Name	Scientific Name	Legal Protection / Conservation Priority Status
Stag Beetle	<i>Lucanus cervus</i>	Notable-B, UKBAP_P, NERC_S.41

4.2 Phase I Habitat Survey

4.2.1 The following habitat types were recorded within the site:

- Hardstanding
- Dense scrub
- Trees
- Buildings

Hardstanding

4.2.2 The majority of the site is covered by hardstanding. Totalling an area of approximately 6,700m², this habitat is in reasonable condition and is subject to regular use by SGN workers. An access track leads to the area of hardstanding and buildings currently used by SGN. The hardstanding has become vegetated in places and species identified include buddleia *Buddleja davidii*. These areas are, however, trimmed regularly.

Dense scrub

4.2.3 An area of approximately 340m² of dense scrub is present along the southern boundary of the site. This area is dominated by bramble *Rubus fruticosus*, ivy *Hedera helix*, dogwood *Cornus*

sp., buddleia and herb Robert *Geranium robertianum*. A small area of scrub (50m²) comprising buddleia is present in the north-western corner of the site.

Trees

- 4.2.4 Mature trees are present on the sites southern boundary. Species recorded include sycamore maple *Acer pseudoplatanus*, rowan *Sorbus aucuparia*, elm *Ulmus sp.*, common alder *Alnus glutinosa*, silver birch *Betula pendula* and Norway maple *Acer platanooides*. There is an area of bare ground beneath the trees.

Buildings

- 4.2.5 Five buildings are present on site. These are described in more detail in section 4.3 below.

4.3 Protected Species

Badgers

- 4.3.1 No evidence of badgers was noted during the survey.

Bats Roosting Habitat - Buildings

Building 1

- 4.3.2 B1 is a single storey building measuring approximately 7.5m x 4.8m in size. The walls are of brick construction to a height of 3.8m and the roof has a covering of concrete tiles. Overall the walls, fascia's and roof are in good condition. However, Potential Roosting Features (PRF) and access points for bats are present within the building's exterior in the form of raised tiles and gaps under the soffits.

- 4.3.3 Access to the interior of the building was not available during the survey.

Building 2

- 4.3.4 B2 is a single storey building measuring approximately 7.5m x 4.8m in size. The walls are of brick construction to the height of 4m with a concrete tiled flat roof. The walls, soffits, fascia's and roof are in good condition. PRF's and access points for bats are limited to a single hole in the brick work.

- 4.3.5 Access to the interior of the building was not available during the survey.

Building 3-5

- 4.3.6 B3-B5 are single storey buildings. B3 is a sub station and B4-B5 are used by SGN staff as an office. None offer any PRF for bats.

Bats Roosting Habitat - Trees

- 4.3.7 Trees with potential to support roosting bats are described in Table 10 below. Tree locations are provided in Figure 1. For clarity tree numbers are matched to those in the associated

arboricultural report (J20563_Arb). All other trees present within the site are healthy and in good condition and show no potential bat roosting features.

Table 9 – Tree Survey Results

Tree No.	Species	DBH / mm	Description of features	Level of Potential
T2	Sycamore	600	Old pollard. WPH on eastern aspect at 5 metres - may extend.	Moderate

Foraging and Commuting Habitat

- 4.3.8 The site offers limited habitat for foraging. However, its immediate surroundings offer suitable foraging habitat and commuting routes in the form of the tree/vegetation lines on the northern and southern boundaries. The site is well connected to suitable foraging areas in the wider landscape including the River Kennett to the south and the railway line to the north.

Birds

- 4.3.9 Suitable nesting habitat is limited to the area of scrub and the vegetated boundaries. No evidence of nesting birds was recorded during the survey.

Dormouse

- 4.3.10 No suitable dormouse habitat is present within the site. The scrub and boundary vegetation are too fragmented to offer suitable habitat and the wider landscape is also unsuitable.

Great Crested Newt

- 4.3.11 No waterbodies are mapped within 250m and so no assessment of the terrestrial habitat was required.

Reptiles

- 4.3.12 The site offers a limited area of suitable reptile habitat. The adjacent railway which runs along the sites northern boundary provides suitable reptile habitat and connectivity to areas of reptile habitat in the wider landscape.

Other species

- 4.3.13 No evidence of other protected species was recorded.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Designated Areas

- 5.1.1 No statutory designated sites are located within 2km of the site and none will be affected by the proposed development.
- 5.1.2 The closest non-statutory site is 0.2km north of the site and lies beyond the railway line. The small-scale and localised nature of development is not considered likely to adversely impact this site or any other designated site.

5.2 Ancient Woodland

- 5.2.1 The nearest ancient woodland site is located 1.2km from the site, which is well beyond the 15m buffer recommended by Natural England the Forestry Commission when working near ancient woodland sites. The development of this site will have no detrimental impact on any area of ancient woodland.

5.3 Habitats and Botanical Species of Interest

- 5.3.1 The closest UK BAP priority habitat is 0.1km from the site and beyond the railway line. As a result, it will not be affected by the development.
- 5.3.2 The habitats within the site are common and widespread and no further botanically specific surveys are required in this instance.
- 5.3.3 Should any boundary trees require removal, it is recommended that they are compensated by like-for-like replacement within the site. Should any non-native trees require removal, compensatory planting using UK native tree species is recommended. Some suitable tree species are provided in Section 6 below.
- 5.3.4 Protection of retained trees is discussed in the associated arboricultural report (J20563_Arb).

5.4 Protected Species

Badger

- 5.4.1 No evidence of badger was recorded, and no historical evidence of badgers has been reported within or in close proximity to the site. No further surveys for badgers are required.

Bats

Roosting Habitat- Buildings

- 5.4.2 PRF recorded on the building denoted B1 were limited and in isolation the structure would be considered Negligible for its suitability to support roosting bats. However, historical records of nine species of bat exist within the desk study area and the foraging and commuting habitat

in the form of the river and railway which lies adjacent to the site, offer excellent habitat for bats. Consequently, the building denoted B1 has **'Negligible/Low'** suitability. As a precautionary measure, to determine its use by roosting bats, should this building be affected by the development, it should be subject to a single evening emergence survey.

5.4.3 As development of the site will likely result in the loss and/or disturbance of any bat roost present in B1, no works to B1 should take place until further survey for bats has been undertaken.

5.4.4 No further surveys are required for buildings B2-B5, which have been classified as having **'Negligible'** potential.

Roosting Habitat- Trees

5.4.5 Potential roosting features for bats have been identified in the tree T2 and should this tree require removal and/or works that are likely to impact on the woodpecker hole of interest, it should be subject to an elevated inspection, prior to the start of works. Note: tree roosts for bats are highly dynamic and application of climb and inspect would ideally be conducted <6 months prior to commencement of works that will impact the tree. Consequently, application of this survey should not be considered restrictive to approval of the planning application.

5.4.6 Should evidence of bats or features suitable to support bats be identified during the elevated inspection, then further surveys and/or a European Protected Species Mitigation Licence may be required prior to the start of works.

Bats – Foraging and Commuting Habitat

5.4.7 Foraging and commuting habitat is present in the form of tree/vegetation lines on the northern and southern boundaries. Should any boundary tree or vegetation require removal, it is recommended that additional boundary planting is undertaken to maintain the continuity of this habitat.

5.4.8 Although best set out upon completion of the above-mentioned bat survey, lighting can be detrimental to how bats use a site for foraging and commuting and consideration to a sensitive lighting strategy should be implemented within the design.

Birds

5.4.9 Suitable nesting habitat is present on site in the form of trees, scrub and buildings.

5.4.10 As all breeding birds are protected under the Wildlife and Countryside Act 1981 (as amended) it is recommended that works to these areas and any other areas deemed suitable for nesting

birds, such as trees, are conducted outside the core breeding period for birds of Late February – August inclusive.

5.4.11 Should this timeframe be unobtainable, a thorough search for the presence of breeding birds should be conducted by a suitably experienced ecologist prior to the start of works. Should evidence of breeding birds be recorded, works within 5m of the nest, or works that have potential to destroy the nest, should stop until the eggs have hatched and the chicks fledged, or the nest is deemed by a suitably experienced ecologist to have been abandoned.

5.4.12 Although no evidence to suggest historic or current use by the species was recorded, it is understood that a peregrine falcon *Falco peregrinus* is known to use the gas holder for the purposes of roosting (*Pers comms*). Having identified the sites suitability to support the species, inclusion of a peregrine nest ledge has been included within the design.

Dormouse

5.4.13 No suitable dormouse habitat is present, and no historical records of dormice were identified within the desk study area. No further dormouse surveys are required.

Great Crested Newt

5.4.14 Although a restricted area of suitable terrestrial habitat exists within the site, the site and wider area lack the network of waterbodies that great crested newts require to breed. Great crested newts are therefore considered unlikely to be present on the site. No further surveys for the species are required.

Reptiles

5.4.15 A small area of scrub in the south of the site provides suitable reptile habitat and historical records of reptiles exists within the wider area. However, the suitable habitats lack connectivity with the railway and or alternate suitable habitats and reptiles are considered likely to be absent. No further surveys for reptiles are required.

Other species

5.4.16 There are no obvious and immediate issues regarding other protected species on the site and no further surveys to determine the presence of other protected species is required in this instance.

5.4.17 However, should at any point during the development a protected or notable species be identified within the site, then all works should **stop** and the appointed ecologist consulted on the appropriate manner in which to proceed.

6 ECOLOGICAL ENHANCEMENTS

6.1 Opportunities to include biodiversity enhancements within the proposed development exist and in accordance with the requirements of the NPPF the following recommendations are considered appropriate for this site:

- To benefit a diversity of bird species 5 x integrated bird boxes, such as those provided by <http://www.habibat.co.uk/category/bird-boxes> should be erected into the elevations of the proposed buildings. To maximise suitability the boxes should be installed on sheltered aspects close to vegetation at a height of 2-3m, preferably on north, north-east or north-west facing elevations.
- To benefit a diversity of bat species 5 x integrated bat boxes, such as those provided by <http://www.habibat.co.uk/category/bat-boxes> should be erected into the elevations of the proposed buildings. To maximise suitability the boxes should be installed on sheltered aspects close to vegetation at a height of 3 - 8m, preferably on north, east or west facing elevations.
- The incorporation of a native wildlife-friendly planting scheme within the grounds post-development would be of benefit to invertebrates, and subsequently species such as amphibians, birds and bats.
- The boundary vegetation should be enhanced through the planting of native species rich hedgerows and trees.
- All tree planting should be undertaken using native species such as pedunculate oak, small leaved lime *Tilia cordata*, black poplar *Poplar nigra*, wild service tree *Sorbus torminalis* or similar.
- To account for the nearby historical record of hedgehog, the incorporation of hedgehog boxes at suitable locations within vegetated areas of the site would provide an enhancement for this species. Boxes should ideally be located within the northern or southern boundary vegetation. The design of the houses should loosely follow those available at the following link; <https://www.britishhedgehogs.org.uk/hedgehog-homes/>

7 SUMMARY

- 7.1 In response to proposed redevelopment of the Gas Holder Site at Alexander Turner Close, Reading, the site has been subject to a Preliminary Ecological Appraisal.
- 7.2 The site's potential to support protected species and habitats has been assessed and appropriate recommendations provided.
- 7.3 The small-scale, localised development is considered unlikely to result in a negative impact to designated sites, ancient woodland or priority habitats.
- 7.4 Like-for-like replacement planting is recommended for any trees lost to the development. Should any non-native trees require removal, compensatory planting using UK native tree species is recommended
- 7.5 B1 and T2 has potential to support roosting bats and to determine their suitability for the species further surveys / inspections have been recommended. B1 requires 1 x emergence survey as a precaution. Should it be affected by the proposed, T2 requires an elevated inspection ideally no more than 6 months prior to commencement of associated works.
- 7.6 Suitable nesting habitat for birds will be affected. Consequently, recommendations in regard to timings and methods of best practice for breeding birds have been provided. To offset the loss of the peregrine falcon nesting habitat, a suitable ledge has been provided in the final design.
- 7.7 The likelihood of other protected and notable species to occur within the site is considered negligible and no further surveys for other protected species are required. However, should at any point during the development a protected or notable species be identified within the site then all works should stop and the appointed ecologist consulted on the appropriate manner in which to proceed.
- 7.8 In accordance with the requirement of the NPPF, recommendations to enhance the site's suitability for wildlife have been provided.

8 REFERENCES

Collins, J. (ed.) 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). Bat Conservation Trust, London.

JNCC (2010). Handbook for Phase I Habitat Survey; A Technique for Environmental Audit. Peterborough.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf

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<http://www.legislation.gov.uk/ukpga/2006/16/contents>

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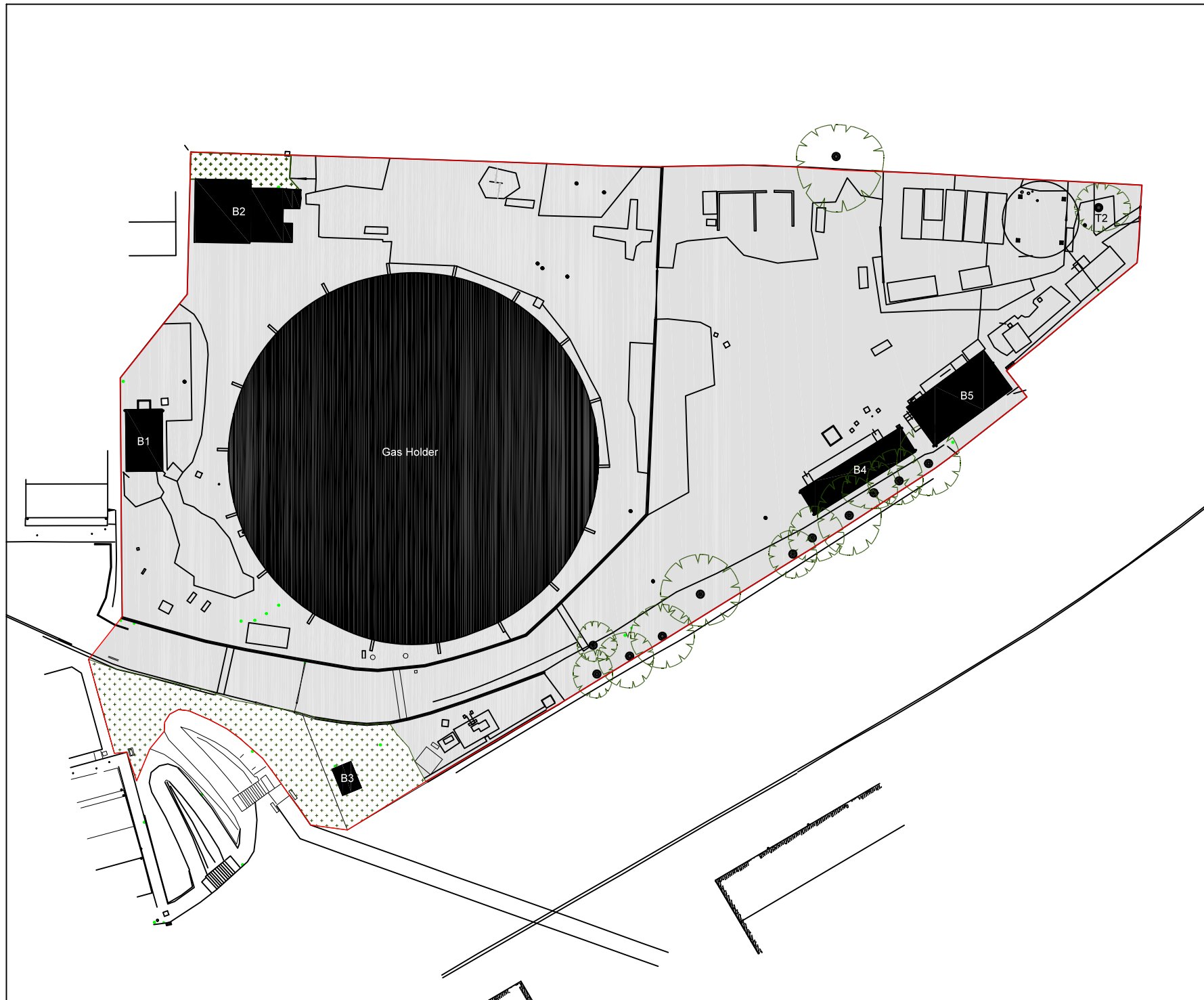
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The Conservation of Habitats and Species Regulations (Habitats Regulations) 2017.

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Wildlife and Countryside Act (as amended) 1981. <http://jncc.defra.gov.uk/page-1377>

Figures



Legend

-  Site Boundary
-  Hardstanding
-  Building
-  Scrub
-  Tree



Job Reference : J20563

Project Title
Reading SGN Site

Drawing Title
Figure 1: Site Boundary

Date : 21-09-18 Checked : GN

Drawn : JJ Approved : N/A

Status : Final Scale : NTS

Copyright - Greenspace Ecological Solutions

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site. All measurements are for indicative purposes only.



Appendices

APPENDIX A – PHOTOGRAPHS



Plate 1. Areas of vegetated hard standing



Plate 2. Gasholder located within the site



Plate 3: Building 2



Plate 4. Building 2



Plate 5. Area of dense scrub

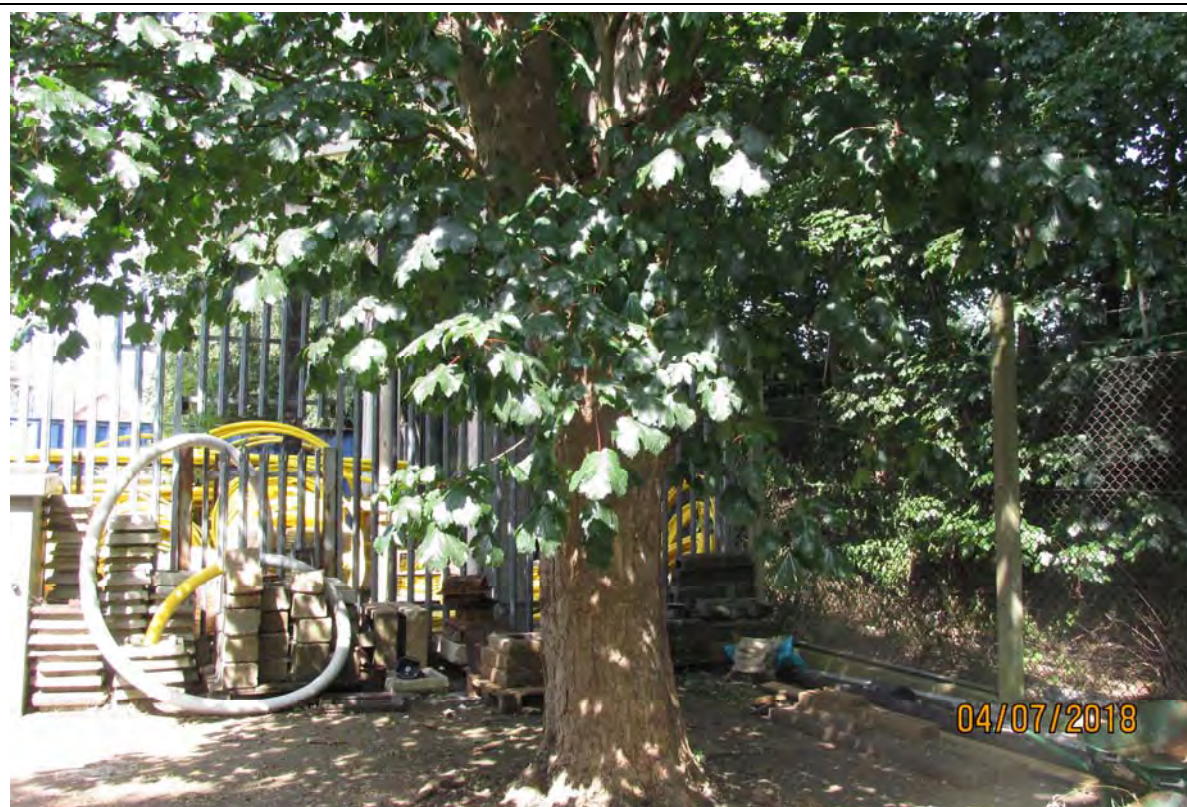


Plate 6. T2

APPENDIX B

Categories of Bat Roost Potential

Roost type Level of potential	Summer Roost used by Non- Breeding Bats	Maternity Roost	Hibernation Roost
Confirmed roost	Presence of bats or evidence of bats identified. Confirmation of a roost will likely require further surveys.		
High	Building/Structure or tree with multiple opportunities for one or more species of roosting bat. Optimal orientation. Good connectivity to optimal foraging habitats.	Building/Structure or tree with multiple roosting opportunities for pregnant female bats and young pups. Optimal orientation. Good connectivity to optimal foraging habitats.	Building/Structure or tree that has suitable thermal stability and levels of humidity to support torpid bats throughout the winter months.
Moderate	Building/Structure for tree with some opportunities for roosting bats. Preferable orientation. Connectivity to moderate to high quality foraging habitat available.	Building/Structure or tree with some roosting opportunities for pregnant female bats and young pups. Good orientation. Good connectivity to moderate to high quality foraging habitats.	Building/Structure or tree that has suitable thermal stability and levels of humidity to support torpid bats for some of the winter months. Moderate connectivity to suitable foraging areas.
Low	Building/Structure or tree with limited opportunities for roosting bats. Poor connectivity to foraging habitat.	Building/Structure or tree with limited opportunities for breeding bats. Poor connectivity to foraging habitat.	Building/Structure or tree with limited potential to support hibernating bats due to instable environmental conditions.
Negligible	Building/Structure or tree with no or very limited opportunities for roosting bats. Little to no connectivity to foraging habitat	Building/Structure or tree with no or very limited opportunities for breeding bats. Little to no connectivity to foraging habitat.	No suitable roosting opportunities for hibernating bats.

APPENDIX C

Minimum Number of Bat Surveys Required in Most Instances

Negligible	Low roost potential	Moderate roost potential	High roost potential*
Dusk emergence and/or pre-dawn re-entry surveys unlikely to be required.	Structures: 1 survey visit. 1 dusk emergence or pre-dawn re-entry survey^a. To be conducted during May – August. Trees: Dusk emergence and/or pre-dawn re-entry surveys unlikely to be required.	2 separate survey visits. 1 dusk emergence survey and 1 pre-dawn re-entry survey^b. To be conducted during May-September with at least one of the surveys May – August.	3 separate survey visits. At least 1 dusk emergence survey and a separate pre-dawn re-entry survey. The third visit could be either a dusk or dawn survey^b. To be undertaken during May-September with at least two of the surveys between May and August.
^a Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case by case basis. If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category. ^b Multiple survey visits should be spread out to sample as much of the recommended survey period as possible; It is recommended that surveys are spaced out at least two weeks apart, preferably more. A dawn survey immediately after a dusk survey is considered one visit. If there is potential for a maternity colony, then consideration should be given to seasonal detectability and the ecologist should use their professional judgement to design the most appropriate survey regime. *For the purpose of this exercise a confirmed roost is considered under the criteria of 'High roost potential'			

Appendix C

SGN Gas Holder No. 4 Reading

Bat Roost & Interim Activity Survey Report

A Report for Danescroft (Kenavon Drive
Project Management) LLP

August 2019



www.greenspace-ecology.co.uk

info@greenspace-ecology.co.uk

SGN Gas Holder No. 4, Reading

Bat Roost & Interim Activity Survey Report

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

Report Contributors: Gemma Abela and James Johnston ACIEEM

Proofread: Guy Newman MCIEEM

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.*

Report Number J20563_P4

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1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: SGN Gas Holder No. 4, Kenavon Drive, Reading, RG1 3DH

Attending Ecologists: James Johnston (NE Bat Class 2 Licence)
Joseph Dyson (NE Bat Class 1 Licence)
Martin Rann
Tanya Rowlinson
Gemma Abela
Mike Marriott

Survey Period: 26th September 2018 – 13th August 2019

Site Proposals: Redevelopment of an existing brownfield site to facilitate a new residential development with associated parking.

Associated Planning Reference Number: Not yet submitted.

Source of Relevant Documents:

Document:	Source:
Previous Reports:	Preliminary Ecological Appraisal, Greenspace Ecological Solutions, October, 2018

2 INTRODUCTION

2.1 Context

2.1.1 In response to the redevelopment of the SGN Gas Holder No.4 Kenavon Drive, Reading, a Preliminary Ecological Appraisal (PEA) was undertaken by Greenspace Ecological Solutions Ltd (GES) in October 2018. Recommendations made within that report identified the need for further considerations to bats and GES was subsequently commissioned to undertake an elevated tree roost assessment of a tree, bat roost presence/likely absence surveys of the building denoted B1 and bat activity surveys of the area surrounding the site.

2.1.2 The results of the surveys, as described in this report, serve to ensure that the Favourable Conservation Status (FCS) of bats is maintained throughout the development and that the proposals remain compliant with existing legislation and planning policies which serve to protect bats and their roosts. Where appropriate, proportionate mitigation to be incorporated within the design of the building, has been provided within this report.

2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736.

2.3 Site Description

2.3.1 The site occupies approximately 0.71ha and comprises areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder is also present within the site.

2.3.2 The site is bound by residential dwellings to the west; the River Kennett to the south and east; and the National Rail link to the north. The wider landscape is typical of an urban area.

2.4 Policies and Legislation

2.4.1 The National Planning Policy Framework 2019 (NPPF) aims to protect species of significant conservation importance in England (in this case bats), as covered by wildlife legislation (see below), NPPF, national and local Biodiversity Action Plans (BAP's) and Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Local planning authorities have an obligation to protect such species and are also required to seek opportunities to promote and enhance biodiversity in accordance with the above legislation, policies and plans.

2.4.2 All British bat species and their places of rest and shelter receive UK and European protection under the Conservation of Habitats and Species Regulation 2018 (Habitats Regulations 2018)

and the Wildlife and Countryside Act (WCA) 1981 (as amended). This protection means that bats and their places of rest and shelter are a material consideration in the planning process.

2.4.3 Taken together, unless under licence, these make it an offence to:

- Deliberately capture or intentionally take a bat;
- Deliberately or intentionally kill or injure a bat;
- To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
- Damage or destroy a breeding site or resting place of a bat;
- Intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection;
- Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection;
- Deliberately disturb any bat, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
- A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to use the same roost sites at different times of year, current legal opinion is that a bat roost is protected whether bats are present at the time.

2.4.4 In addition to the above, certain species of bat are listed on Annex II of the Habitat Regulations 2018. Annex II species include greater and lesser horseshoe bats, barbastelle and Bechstein's bat. Where present, consideration to the requirement of a Special Areas of Conservation (SAC) should be given.

2.5 Objectives of the Survey

2.5.1 The objectives of the surveys were to:

- Determine the presence of bats within the building to be affected by the proposal,
- Gather baseline information on the species of bat using the site and adjacent habitats;
- Determine favoured foraging habitats and commuting routes that are likely to be affected by the proposed;
- Identify species, number and frequency of use of the site by bats should they be present;

- Evaluate the potential for bats to be affected by proposals;
- Identify legal or policy constraints related to bats that may affect the development; and
- Suggest mitigation/compensation measures that may be required.

2.6 Survey Constraints

- 2.6.1 To ensure reasonable effort to determine the bat activity within the site is applied, activity surveys are to be continued until October 2019. This report therefore serves as an interim to support the associated application and the outstanding data will be added as it becomes available.
- 2.6.2 The results taken from bat detector recordings are biased towards bats that use louder echolocation calls. Therefore, quiet species such as long-eared bats may be under recorded due to the limited recording range of the equipment. To compensate for this, the surveyors remained vigilant to ensure that any visual cues identifying the presence of this species were accurately recorded.
- 2.6.3 It is difficult to confidently relate calls registered to numbers of bats present therefore, the number of bat passes does not provide any indication of bat abundance; it is intended only to indicate the level of activity at a particular point.
- 2.6.4 During the walked transect on 18th July 2019, a kit failure resulted in a lack of recordings for the duration of the survey. The results for this section are therefore based on the field observations noted by the surveyor at the time of the survey.
- 2.6.5 Where identification is difficult to distinguish at an individual species level, bat passes are described to genus level such as *Myotis* sp., *Nyctalus* sp., *Pipistrellus* sp.

3 SURVEY METHODOLOGY

3.1 Elevated Tree Roost Assessment

3.1.1 An elevated tree roost assessment was undertaken of T2 on the 17th July 2019 by licenced bat ecologist James Johnston.

3.1.2 The survey was completed in accordance with the guidelines set out by the Bat Conservation Trust (BCT) (Collins, 2016) and equipment used included a ladder and an endoscope. Suitable features identified during the ground level assessment were inspected for any evidence of bats and to determine their suitability for roosting bats.

3.2 Bat Emergence Surveys

3.2.1 A dusk emergence survey was undertaken of the on-site building denoted B1 on the 26th September 2018 and 17th July 2019. The survey was completed in accordance with current best practice guidance (Collins, 2016) and to adequately observe all aspects of the buildings, two surveyors were deployed during each survey. The location of the surveyors is depicted in Figure 1.

3.2.2 The survey was completed in favourable weather conditions with night-time temperatures of $\geq 10^{\circ}\text{C}$ and little or no rain.

3.2.3 To account for the varying times in which differing bat species emerge, evening emergence surveys commenced 15 minutes before sunset and continued for 1 hour and 15 minutes after sunset, or until light levels deemed the survey no longer valid.

3.2.4 A summary of the weather conditions, surveyors and survey times recorded during the survey is provided in Table 1.

Table 1 – Survey Times and Conditions

Date	Sunset time	Start Time	End Time	Surveyors	Start Weather Conditions	End Weather Conditions
26/09/18	18:52	18:37	20:07	James Johnston Gemma Abela	17.0°C, 0% CC, no rain, wind 0BF	15.0°C, 0% CC, no rain, wind 0BF
17/07/19	21:12	20:57	22:27	James Johnston Mike Marriott	18.0 °C, 98% CC, no rain, wind 2BF	17.0 °C, 100% CC, no rain, wind 2BF

3.2.5 To aid audible detection, surveyors were equipped with Elekon Batlogger M bat detectors. These detectors convert the inaudible echolocation of bats into a frequency audible to the

human ear. All calls were digitally recorded, and the sonograms later analysed through the application of the computer programme Elekon BatExplorer.

3.3 Bat Transect Surveys

- 3.3.1 The methodology for bat transect surveys follows the guidance set out by the Bat Conservation Trust (Collins, 2016). The primary objective of the transects were to identify foraging areas, commuting routes and species utilisation of the site.
- 3.3.2 To ensure coverage of the site, the transect routes were determined prior to the survey. To identify activity levels around the features of potential value to bats that are to be most affected by the proposals (i.e. hedgerows/tree lines/scrub habitats etc.) point count stops were included in strategic locations along the route. Each point count was 3 minutes long, during which time all bat activity was recorded.
- 3.3.3 The dusk transects commenced at and ran for a period of approximately 2hrs after sunset.
- 3.3.4 Each transect was walked at a steady pace with the species, time and behaviour of all bat passes recorded on a Site plan. The information gathered provides a general view of the bat activity present on Site and identifies the key foraging area and commuting routes. Elekon Batlogger M detectors were utilised, with the location of each call logged using the GPS facility provided within the unit.
- 3.3.5 Post-survey the peak frequency, inter-pulse interval, call duration and end frequency of the recorded bat calls were analysed using Bat Explorer. Analysis was undertaken by suitably experienced bat ecologists, with the level of bat species and activity across the site, in relation to the abundance of individual species foraging and commuting along the associated habitats, assessed accordingly.
- 3.3.6 All transects were undertaken in suitable weather conditions. A summary of the survey times, surveyors and weather conditions recorded during the surveys is provided in Table 2.

Table 2 – Bat Transect Survey Conditions

Date	Survey Start	Survey End	Sunset/Sunrise Time	Start Weather Conditions	End Weather Conditions	Surveyors
29/04/19	20:23	22:23	20:23	13.0°C, 78% CC, dry, wind OBF	12.0°C, 90% CC, dry, wind OBF	Joseph Dyson Tanya Rowlinson
21/05/18	20:57	22:47	20:57	17.0°C, 5% CC, dry, wind OBF	14.5°C, 0% CC, dry, wind OBF	James Johnston Tabitha Plummer

26/06/18	21:25	22:54	21:25	15.2°C, 100% CC, dry, wind 0BF	14.8°C, 0% CC, dry, wind 0BF	Martin Rann Mike Marriott
18/07/19	03:07	05:00	05:07	14.0°C, 100% CC, dry, wind 1BF	13.5°C, 100% CC, light rain, wind 1BF	James Johnston Mike Marriott
13/08/19	20:31	22:00	21:20	20.5°C, 60% CC, dry, wind 0BF	17.0°C, 80% CC, dry, wind 0BF	Martin Rann Mike Marriott

Bat Static Activity Survey

- 3.3.7 In conjunction with the transect surveys, two Anabat Express static bat detectors were deployed to gather data on bat activity within the site. The static detectors were deployed in strategic places within the site. In this instance, the detectors were deployed on the northern railway and southern river corridor boundaries. The location of the detectors was chosen to maximise coverage of the suitable habitats likely to be affected, directly or indirectly, by the proposed. These locations are depicted in Figure 2.
- 3.3.8 To account for the periods in which the lighting impacts are most likely to occur within the site, each static detector was programmed to record bat activity from ½ hr before sunset until ½ hr after sunrise during the periods 15th May – 19th May 2019, 21st June – 25th June 2019, 17th July – 21st July 2019 and 8th August – 12th August 2019. The sunset times during these periods were from 20:48hrs – 20h:54hrs, 21:24hrs – 21:24hrs, 21:12hrs – 21:08hrs and 20:40hrs – 20:32hrs, respectively. The sunrise times during these periods were from 05:12hrs – 05:07hrs, 04:46hrs – 04:47hrs, 05:06hrs – 05:11hrs and 05:37hrs – 05:44hrs, respectively.
- 3.3.9 Upon completion of the data collection period, the static detectors were collected, and the data subsequently analysed using Analook.

4 SURVEY RESULTS

4.1 Elevated Tree Roost Inspection

- 4.1.1 The elevated inspection of the tree denoted T2 identified no evidence of use by bats and none of the features identified at ground level were considered suitable to support roosting bats.

4.2 Emergence Surveys

26th September 2018

- 4.2.1 No bats emerged from the building.
- 4.2.2 The first bat recorded during the survey was a common pipistrelle *Pipistrellus pipistrellus*, which was recorded foraging within the site at 19:37hrs, some 45 minutes after sunset.
- 4.2.3 This species, as well as soprano pipistrelle *P. pygmaeus* and noctule *Nyctalus noctula* were recorded in low numbers foraging within and commuting through the site during the survey.
- 4.2.4 Overall bat activity within the site was considered **Low**.

17th July 2019

- 4.2.5 No bats emerged from the building.
- 4.2.6 The first bat recorded was a common pipistrelle, which was recorded within the site at 21:27, some 17 minutes after sunset.
- 4.2.7 Common pipistrelle and soprano pipistrelle were recorded in low numbers foraging and commuting through the site during the survey.
- 4.2.8 Bat activity within the site was considered **Low**.

Summary of Emergence Results

- 4.2.9 Table 3 shows a summary of the survey results.

Table 3. Emergence survey results summary

Date	Bats emerging or returning from/to the building	Bat species recorded commuting / foraging within the site
26/09/18	None	Common pipistrelle Soprano pipistrelle Noctule
17/07/19	None	Common pipistrelle Soprano pipistrelle

4.3 Walked Transect Surveys

29th April 2019

- 4.3.1 The April transect recorded a total of 306 passes throughout the survey. As depicted in Figure 3a, the survey identified that 49% of bat passes were of common pipistrelle and 40% of bat passes were soprano pipistrelle. The remaining passes were of noctule (<6% of passes), Myotis sp. (<4% of passes) and long-eared bat (<2% of passes). Activity in April was recorded along the length of the transect route. However, a marked increase in activity was recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

21st May 2019

- 4.3.2 The May transect recorded a total of 215 passes throughout the survey. As depicted in Figure 3b, the survey identified that 36% of bat passes were of soprano pipistrelle and 27% of bat passes were common pipistrelle. The remaining passes were of myotis sp. (25% of passes) and noctule (11% of passes). Activity in May was recorded along the length of the transect route. A marked increase in activity was again recorded at the bridge to the south of the site and along the river toward the confluence of the River Kennet and the River Thames.

26th June 2019

- 4.3.3 The June transect recorded a total of 100 passes throughout the survey. As depicted in Figure 3c, the survey identified that 57% of bat passes were of common pipistrelle and 24% of bat passes were soprano pipistrelle. The remaining passes were of Myotis sp. (12% of passes), noctule (6% of passes) and serotine (1% of passes). Activity during the June survey was low with peak activity again focussed around the bridge to the south of the site and the confluence of the River Kennet and the River Thames and Network Rail link.

18th July 2019

- 4.3.4 Constrained due to equipment failure, the surveyor identified that most of the bat passes were common and soprano pipistrelle with some intermittent noctule passes. The July transect recorded a low/moderate level of bat activity during the survey. Several bats were recorded foraging and commuting along the length of transect route with peaks of activity recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

13th August 2019

- 4.3.5 The August transect recorded a total of 141 passes throughout the survey. As depicted in Figure 3d, the survey identified that 52% of bat passes were of soprano pipistrelle and 34% of bat passes were common pipistrelle. The remaining passes were of Myotis sp. (11% of passes)

and noctule (4% of passes). Activity during the August survey was recorded along the length of the transect route. However, there was a marked increase in activity recorded at the bridge to the south of the site and at the National Rail link.

4.4 Static Surveys

4.4.1 Static detector surveys have been carried out (to date) during the months of May – August 2019.

15th May – 19th May 2019

4.4.2 As detailed in Figure 4a, six species of bat (long-eared bat, common pipistrelle, myotis sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the May survey.

4.4.3 The most frequently recorded species was soprano pipistrelle with a total of 2630 passes; 53% of all bat passes recorded across the site. The second most frequently recorded species was common pipistrelle with a total of 2267 passes, equating to 46% of all bat passes. The third most frequently recorded species were bats from the genus *Myotis* sp. with a total of 57 passes, equating to 1% of all bat passes.

4.4.4 Long-eared bats and noctule were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.

4.4.5 Accounting for 83% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed on the northern railway boundary of the site (Ref: Figure 4a).

4.4.6 During the 30 minutes period after sunset 117 bat passes were recorded. The earliest recording was a soprano pipistrelle at 20:16hrs (32 minutes before sunset) in the south of the site.

4.4.7 During the 30 minutes period prior to sunrise 12 bat passes were recorded. The latest recording was a common pipistrelle at 04:51hrs (18 minutes before sunrise) in the north of the site.

21st June – 25th June 2019

4.4.8 As detailed in Figure 4b, five species of bat (common pipistrelle, myotis sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the June survey.

4.4.9 The most frequently recorded species was common pipistrelle with a total of 396 passes; 65% of all bat passes recorded across the site. The second most frequently recorded species was

soprano pipistrelle with a total of 175 passes, equating to 29% of all bat passes. The third most frequently recorded species were bats were noctule with a total of 22 passes, equating to 4% of all bat passes.

4.4.10 Myotis sp. were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.

4.4.11 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4b).

4.4.12 During the 30 minutes period after sunset 8 bat passes were recorded. The earliest recording was a common pipistrelle at 21:14hrs (10 minutes before sunset) in the south of the site.

4.4.13 During the 30 minutes period prior to sunrise no bat passes were recorded. The latest recording was a soprano pipistrelle at 04:15hrs (31minutes before sunrise) in the north of the site.

17th July – 21st July 2019

4.4.14 As detailed in Figure 4c, four species of bat (common pipistrelle, myotis sp., noctule and soprano pipistrelle) were recorded on the static detectors during the July survey.

4.4.15 The most frequently recorded species was common pipistrelle with a total of 126 passes; 56% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 81 passes, equating to 36% of all bat passes. The third most frequently recorded species were noctule with a total of 10 passes, equating to 4% of all bat passes.

4.4.16 Myotis sp. were recorded in low numbers in both locations within the site.

4.4.17 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4c).

4.4.18 During the 30 minutes period after sunset 1 bat pass was recorded. This recording was a Myotis sp. at 21.27hrs (15 minutes after sunset) in the north of the site.

4.4.19 During the 30 minutes period prior to sunrise 5 bat passes were recorded. The latest recording was a common pipistrelle at 04:45hrs (26 minutes before sunrise) in the north of the site.

8th August – 13th August 2019

- 4.4.20 As detailed in Figure 4d, six species of bat (long-eared bat, common pipistrelle, myotis sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the August survey.
- 4.4.21 The most frequently recorded species was common pipistrelle with a total of 258 passes; 57% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 138 passes, equating to 30% of all bat passes. The third most frequently recorded species were noctules with a total of 39 passes, equating to 9% of all bat passes.
- 4.4.22 Serotine bats were recorded in low numbers in the north of the site. Long-eared bats and Myotis sp. were recorded in low numbers across the site.
- 4.4.23 Accounting for 54% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the south of the site (Ref: Figure 4d).
- 4.4.24 During the 30 minutes period after sunset 17 bat pass was recorded. The earliest recording was common pipistrelle at 20.08hrs (30 minutes prior to sunset) in the south of the site.
- 4.4.25 During the 30 minutes period prior to sunrise 36 bat passes were recorded. The latest recording was a common pipistrelle at 05:29hrs (8 minutes before sunrise) in the north of the site.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Elevated Tree Roost Inspection

- 5.1.1 The PEA identified the tree T2 as having features with potential to support roosting bats. The elevated tree roost inspection identified no polishing, droppings, staining or suitability to support bats and no further consideration to the presence of roosting bats within trees is required.

5.2 Bat Emergence

- 5.2.1 The structure B1 was identified as having 'Low' suitability for bats and two bat emergence surveys have been conducted over the 2018 and 2019 survey period.
- 5.2.2 As reasonable effort to determine the presence or likely absence of roosting bats within B1 has been applied and no bats or their roosts were recorded, no further consideration to the presence of bats within this structure is required.
- 5.2.3 In the unlikely event that bats, or their roosts are identified during the demolition process, all works should stop and the appointed ecologist or Natural England, be consulted on the appropriate manner in which to proceed.

5.3 Bat Activity

- 5.3.1 Bat transect surveys conducted to date conclude that although bat activity in the more built environs to the south is lowest, at least six species of bat are using the sites surrounding habitats for the purpose of foraging and commuting. With peak areas of activity being the bridge to the south of the site and the confluence of the Kennet and Thames, in order of frequency recorded across all surveys, the species recorded include common pipistrelle (41.08%), soprano pipistrelle (38.85%), Myotis sp. (12.20%), noctule (6.82%), long-eared bat (0.92%) and serotine (0.13%).
- 5.3.2 The surveys identified no rare or Annex II species and although difficult to quantify, the level of bat activity and bat species diversity identified throughout the surveys are considered 'Moderate'.
- 5.3.3 A marked spike in the number of bat passes recorded for common and soprano pipistrelle bats in May suggests a maternity roost for these species exists within proximity to the site.
- 5.3.4 Furthermore, the passes by soprano pipistrelle some 32 minutes before sunset in May, common pipistrelle some 30 minutes prior to sunset in June and August and a bat from the

genus *Myotis* some 15 minutes after sunset in July, indicates the presence of roosts for these species in close proximity to the site.

5.3.5 Although the majority of the static detector results were recorded along the northern railway boundary (no access for a walked transect were available along this boundary), the results from the walked transects identified bats using the river to the south for the purposes of both foraging and commuting. With key areas identified as that of the footbridge immediately to the south of the site and the confluence of the Kennet and Thames <200m east of the site, although analysis of the calls could not be conclusive; the habitat type, visual observation of bat morphology and the call parameters suggest at least some of the *Myotis* bats recorded along the Kennet were that of Daubenton's *M. daubentonii*. Comprising up to 25% of the total bat passes recorded, the number of passes by bats of the genus *Myotis* is notable and requires consideration. Although low in number, the presence of long-eared bats during both the static and walked transects confirm the use of the rail and river corridor by this species.

5.3.6 Although bats from the genus *Pipistrellus* and *Nyctalus* (noctule) are known to exhibit a low degree tolerance to artificial lights, many of the 18 species of bat identified within the UK are light sensitive and artificial lighting of bat roosts, access points and foraging pathways can be extremely disturbing to bats and should be avoided. Artificial light falling on or close to a bat roost can cause many problems for bats, by;

- delaying or preventing emergence from roosts, resulting in reduced foraging time and missing the peak time of insect abundance (just after dusk). As all bats in the UK feed on insects, this missed opportunity can have a serious impact on their survival and the growth rates of their young. In some cases leading to bats abandoning or becoming entombed in the roost when the entrance is lit up as bats will be less inclined to leave their roosts in these conditions. This is likely to be considered a breach of legislation as both bats and their roosts are protected by law.
- affecting the feeding behaviour of bats away from the roost. Slower flying species (long-eared bats and *Myotis* bats) avoid illuminated areas and therefore lose foraging grounds if they are lit. This results in slower flying species having to use poorer quality foraging sites and losing out on prey, which are attracted to the surrounding lit areas, a so called 'vacuum effect'.
- affecting commuting and foraging routes, which have been shown to be avoided if there is artificial light spill onto these areas.

- 5.3.7 Having identified light sensitive species present along both the river and rail corridor, to ensure the site remains suitable for use by bats, consideration to the potential impacts of the proposed development and its associated lighting strategy will be required.
- 5.3.8 Garland & Markham (2007) highlighted examples of brightly lit developments, as having potential to impact on bats as the lighting often comes on during the early evening when many bat species are becoming active. Furthermore, should the movement of bats along a commuting routes or foraging corridors be significantly inhibited by lighting, this would be considered a direct impact and would therefore constitute a disturbance offence under the Habitat Regulations 2018.
- 5.3.9 Although the schemes lighting plans have yet been finalised, in broad terms, without a lighting scheme that caters to the requirements of foraging and commuting bats, the development may result in the following impacts on bats:
- Severance of commuting routes;
 - Disruption of foraging areas;
 - Disturbance of potential roost sites.
- 5.3.10 To ensure the sites integrity for bats is maintained, any proposed lighting design should be considerate to the requirements set out by the Bat Conservation Trust in their 2018 document 'Bats and Artificial Lighting in the UK' (Bat Conservation Trust and the Institute of Lighting Professionals, 2018) and should implement the Dark Skies principal to lighting.
- 5.3.11 In accordance with this guidance, application of the following methods should be considerate to the reduction of the lighting impacts to a level suitable for use by bats:
- By forming a dark buffer zone to separate the site from the surrounding rail line and river corridor from lighting. This will include strategic planting of the associated boundaries with native tree and shrub species.
 - The omission of lighting unless required should be implemented across the site.
 - A lighting design that achieves 0.5lux or equals the existing lux levels (whichever is the greatest), at both ground and elevated levels, should be achieved along the northern and southern boundaries.
 - The inclusion of features such as hoods, cowls, louvres and shields on any lighting columns will direct light to the intended area, whilst avoiding unrequired light spillage.

- Luminaires should lack UV elements when manufactured and metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Internal residential lighting should be achieved using LED downlighters (oppose pendants) which are to be set back from windows and balconies to prevent light spillage.
- Balconies should be positioned to maximise the 'shielding' effect of lighting from within living / communal spaces.
- The use of low transmittance glass should be considered where required.
- The use of specialist bollard or low-level downward directional luminaires should be utilised for external lighting.
- Column heights should be carefully considered to minimise light spill.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used.
- Any external security lighting should be set on motion-sensors and short (1min) timers.
- Restricted timings (curfews) for the use of lights will ensure that even at reduced levels any detrimental effects of the required lighting are restricted to shortened periods during the active season for bats of April – November.
- Part night lighting of the site should be considered.
- Potential lighting impacts resulting from glazed windows within the proposed residential units should also be considered.
- The application of planning conditions / written agreements to ensure that no additional lighting is installed at a later date, will further secure the sites on-going use by bats.

5.3.12 When considering the above, should the remaining surveys confirm the presence of swarming/mating activity, the potential to include proportionate mitigation is high and this presence if unlikely to be prohibitive to development.

5.3.13 Its is suggested that so long as the above mitigation strategy is implemented in full, then the nearby roosts, flight lines and foraging areas identified within and around the site will be maintained and the development will be conducted in accordance with planning policies and legislation which serve to protect bats and their roosts.

6 SUMMARY

- 6.1 In response to the proposed redevelopment of the site at SGN Gas Holder No.4, Reading, trees were subject to an elevated inspection, the building B1 was subject to a series of two evening emergence surveys and the site and surrounds were subject to bat activity surveys.
- 6.2 The tree T1 supports no features suitable for use by bats and no bats or their roosts were recorded within B1. No further consideration to the presence of roosting bats within the trees or structures is required.
- 6.3 Although yet to be complete, the bat activity surveys have identified activity indicative of common pipistrelle, soprano pipistrelle and bats of the Genus *Myotis* roosting in close proximity to the site. Furthermore, the northern rail and southern river corridor were both identified as important for foraging and commuting bats.
- 6.4 Without mitigation, lighting from the development has potential to impact on the suitability of these areas for bats. To be finalised upon completion of the surveys, methods to reduce lighting to suitable levels have been included within this report.
- 6.5 It is suggested that so long as the above recommendations are implemented in full, it is suggested that the works proposed at Reading SGN, will be conducted in accordance with current legislation and planning policies which serve to protect the sites, habitats and species likely to be impacted by the development.

7 REFERENCES

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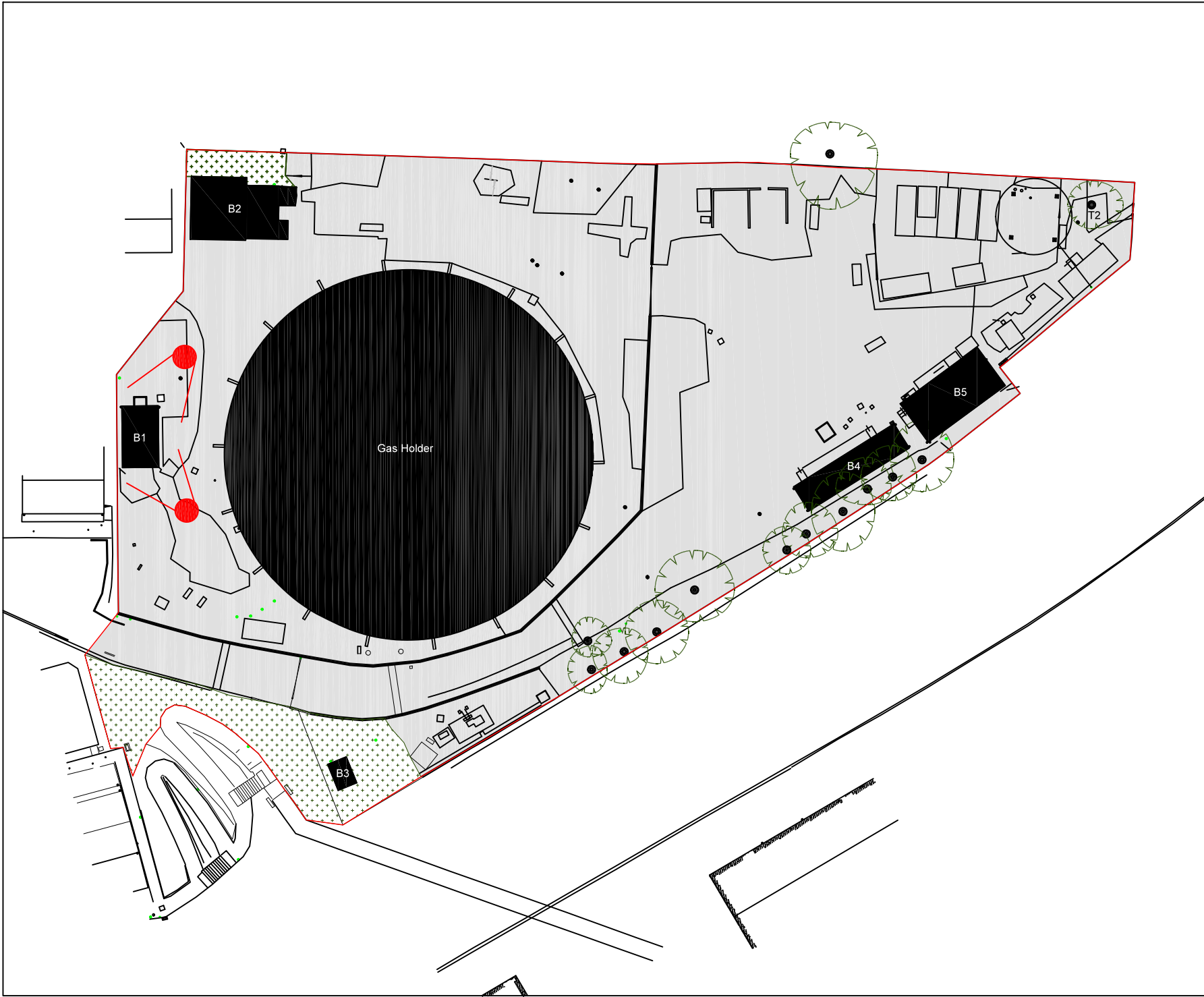
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Figures



Legend

-  Site Boundary
-  Surveyor Locations



Job Reference : J20563_P4

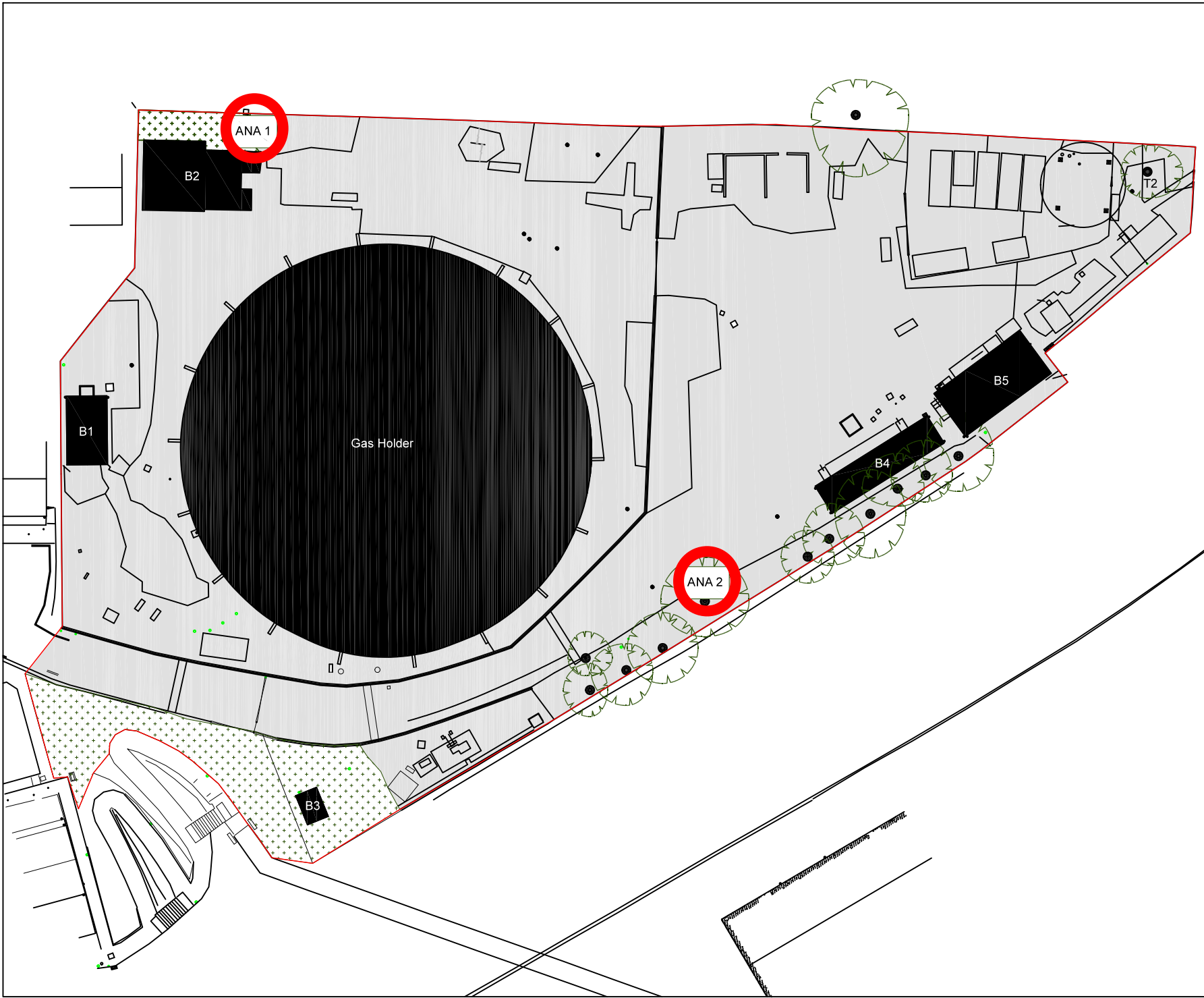
Project Title
Reading SGN Site

Drawing Title
Figure 1: Surveyor Locations

Date : 16-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Legend

-  Site Boundary
-  Anabat Locations



Job Reference : J20563_P4

Project Title
Reading SGN Site

Drawing Title
Figure 2: Anabat Locations

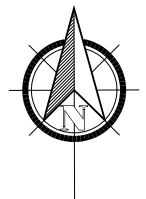
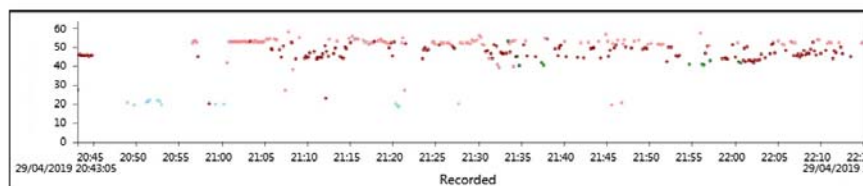
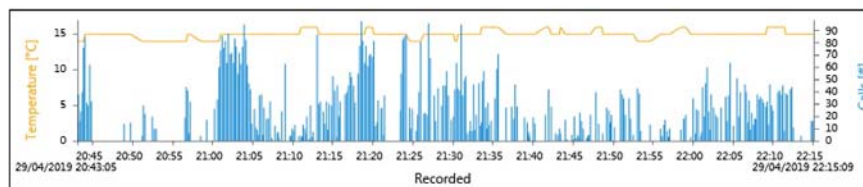
Date : 16-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Species	#	# Calls
● Pipistrellus pipistrellus	149	4245
● Nyctalus noctula	17	414
● Pipistrellus pygmaeus	121	4332
● Plecotus auritus	7	207
● Myotis spec.	12	206



Job Reference : J20563_P4

Project Title: Reading SGN

Drawing Title
Figure 3a - Transect Results (April 2019)

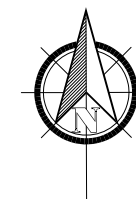
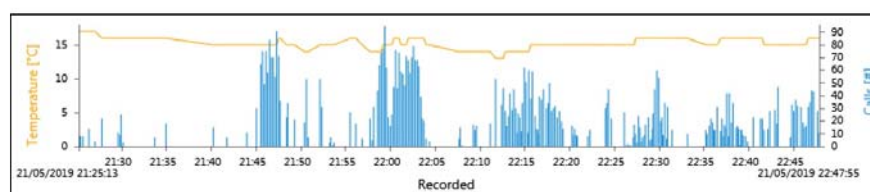
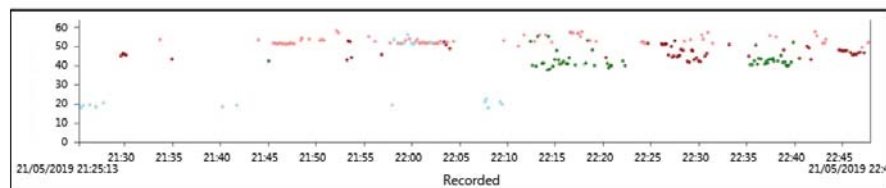
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



● <i>Nyctalus noctula</i>	24	636
● <i>Myotis spec.</i>	54	1253
● <i>Pipistrellus pipistrellus</i>	59	1050
● <i>Pipistrellus pygmaeus</i>	78	3046



Job Reference : J20563_P4

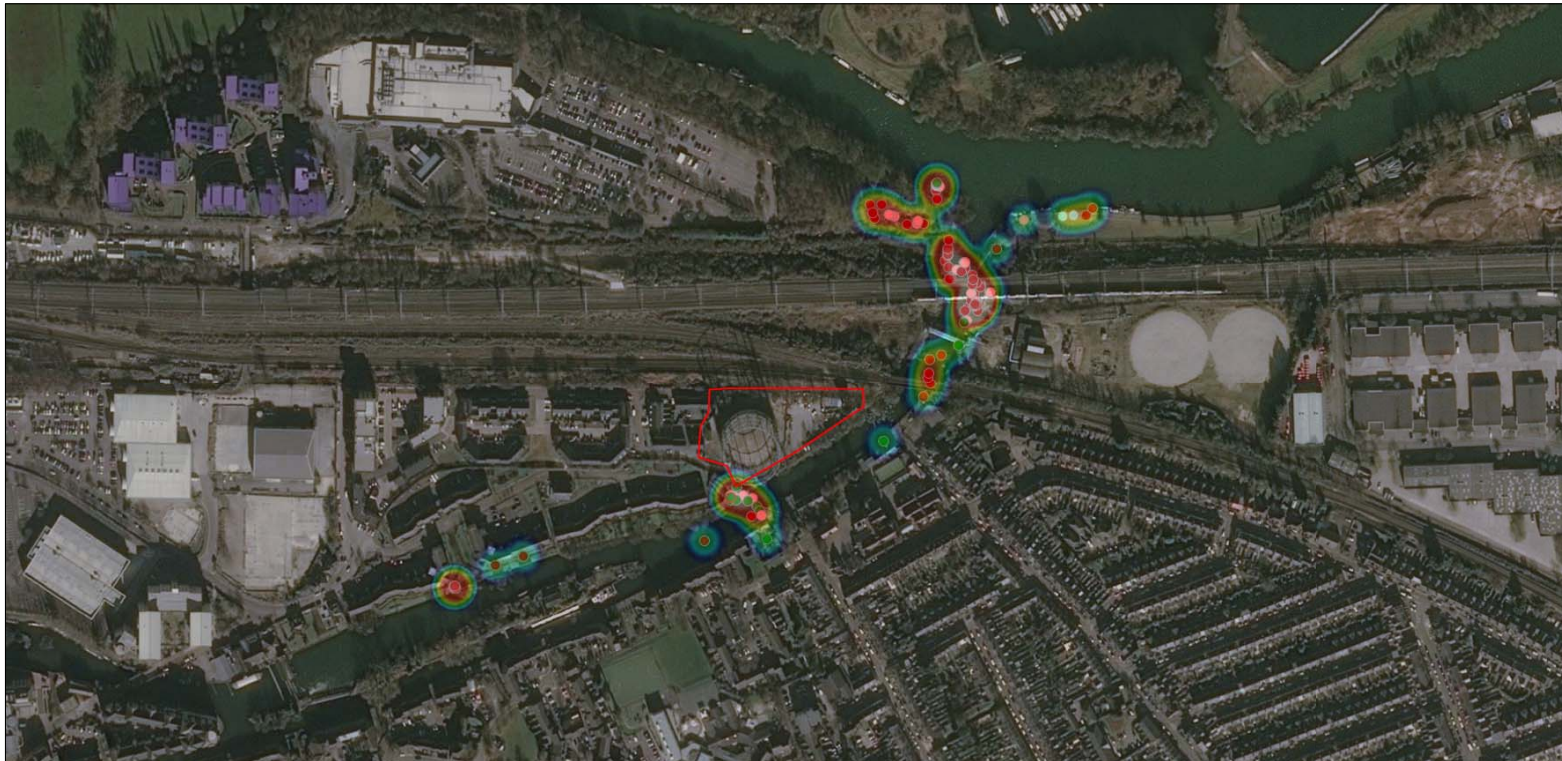
Project Title: Reading SGN

Drawing Title
Figure 3b - Transect Results (May 2019)

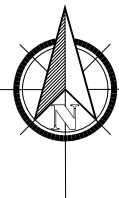
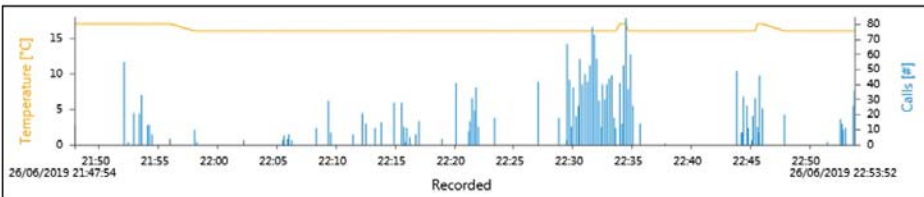
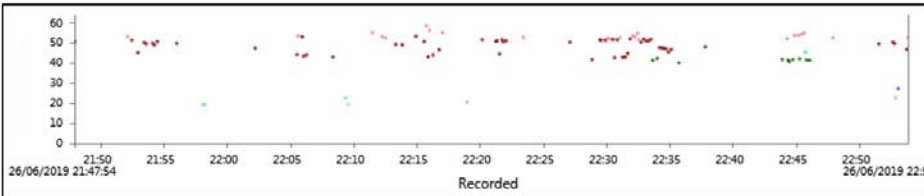
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



● <i>Eptesicus serotinus</i>	1	11
● <i>Nyctalus noctula</i>	6	63
● <i>Myotis spec.</i>	12	289
● <i>Pipistrellus pygmaeus</i>	24	566
● <i>Pipistrellus pipistrellus</i>	57	1436



Job Reference : J20563_P4

Project Title: Reading SGN

Drawing Title
Figure 3c - Transect Results (June 2019)

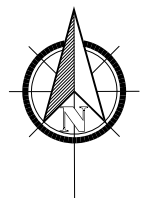
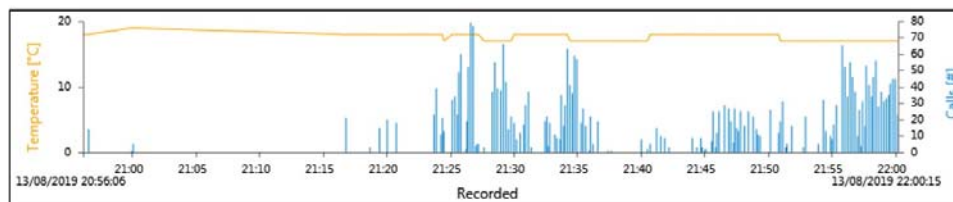
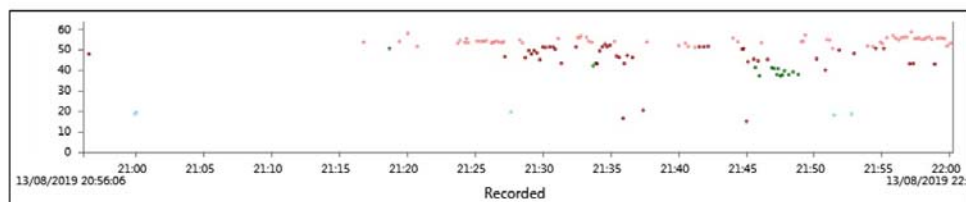
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



● <i>Nyctalus noctula</i>	5	17
● <i>Myotis spec.</i>	15	286
● <i>Pipistrellus pipistrellus</i>	48	957
● <i>Pipistrellus pygmaeus</i>	73	1950



Job Reference : J20563_P4

Project Title: Reading SGN

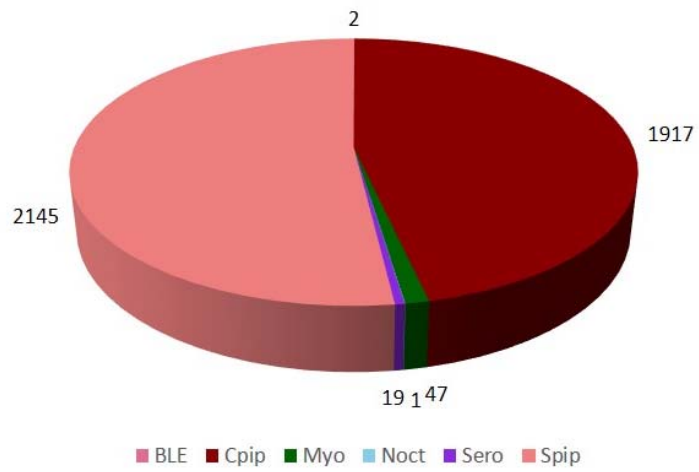
Drawing Title
Figure 3d - Transect Results (August 2019)

Date : 15-08-19 Checked : JJ

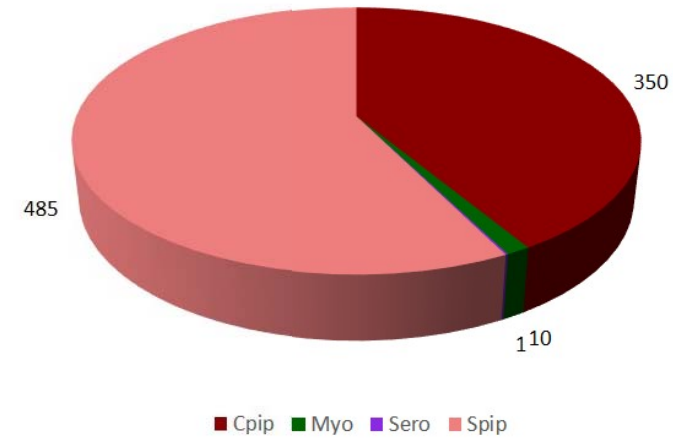
Drawn : GA Approved : N/A

Status : Final Scale : NTS

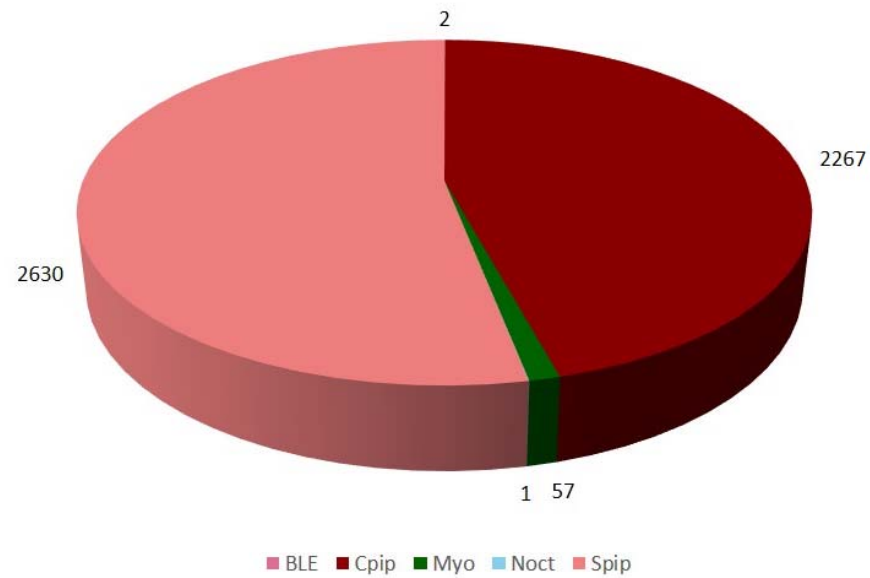
May 2019_Anabat 1_North



May 2019_Anabat 2_South



May 2019_Combined Anabat Results



Job Reference : J20563_P4

Project Title: Reading SGN

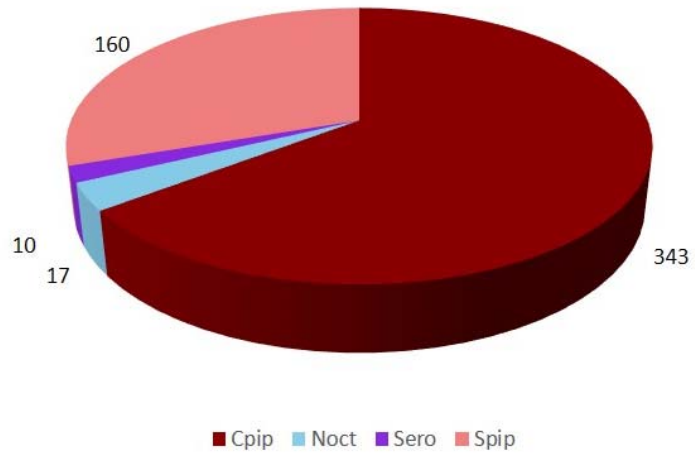
Drawing Title
Figure 4a - Static Detector Results (May 2019)

Date : 12-08-19 Checked : JJ

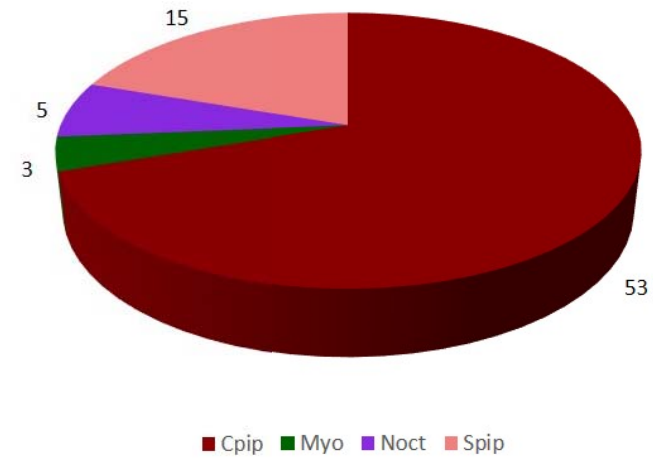
Drawn : GA Approved : N/A

Status : Final Scale : NTS

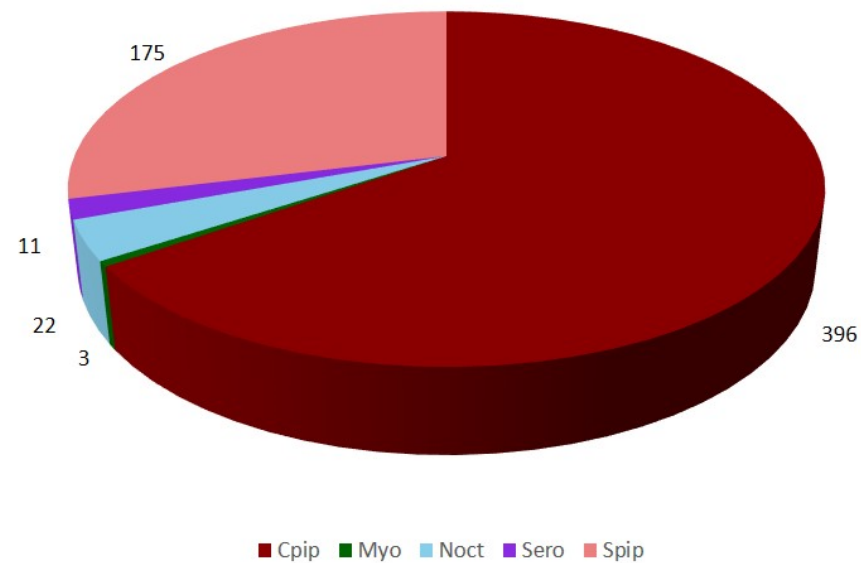
June 2019_Anabat 1_North



June 2019_Anabat 2_South



June 2019_Combined Anabat Results



Job Reference : J20563_P4

Project Title: Reading SGN

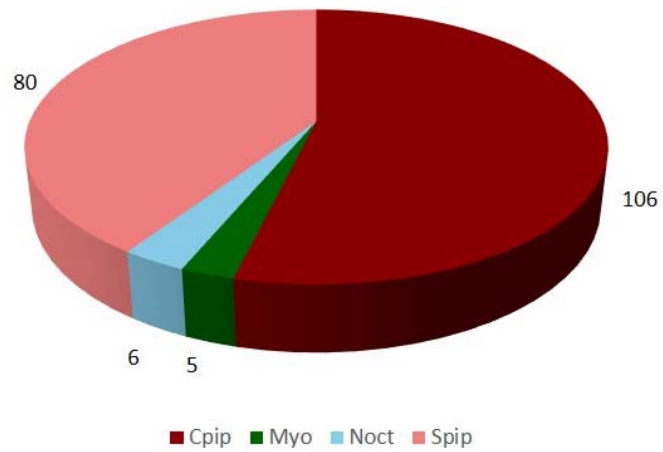
Drawing Title
Figure 4b - Static Detector Results (June 2019)

Date : 12-08-19 Checked : JJ

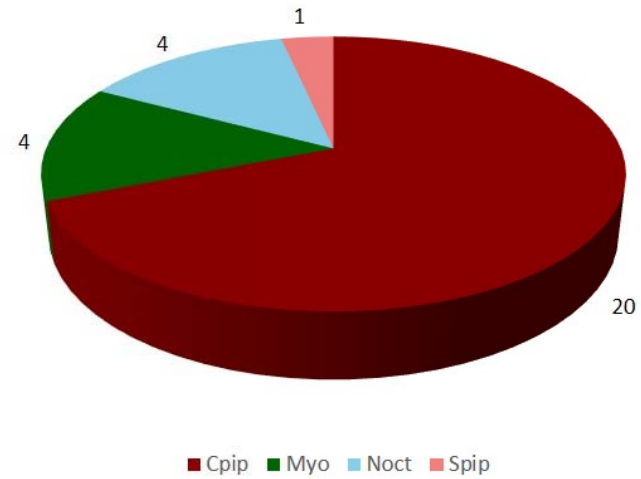
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Status : Final Scale : NTS

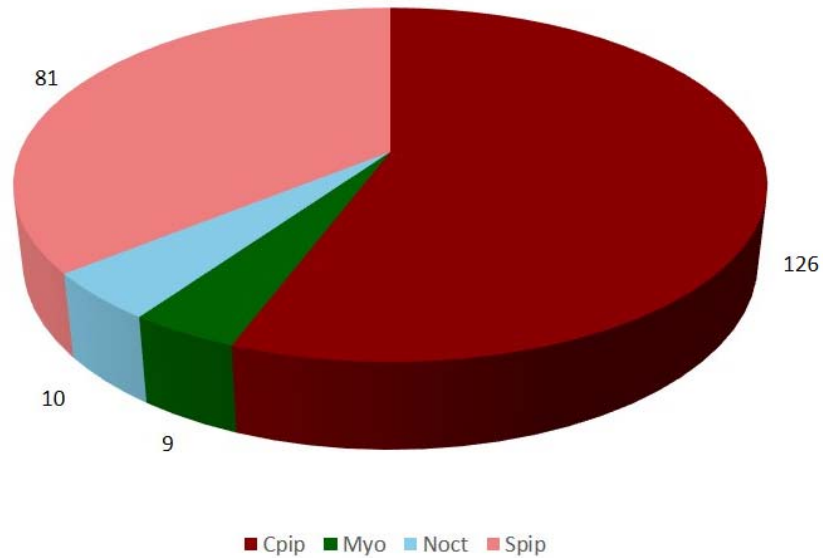
July 2019_Anabat 1_North



July 2019_Anabat 2_South



July 2019_Combined Anabat Results



Job Reference : J20563_P4

Project Title: Reading SGN

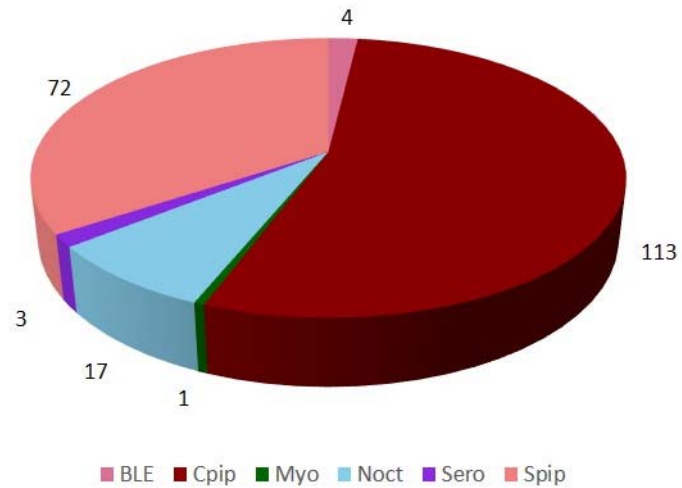
Drawing Title
Figure 4c - Static Detector Results (July 2019)

Date : 12-08-19 Checked : JJ

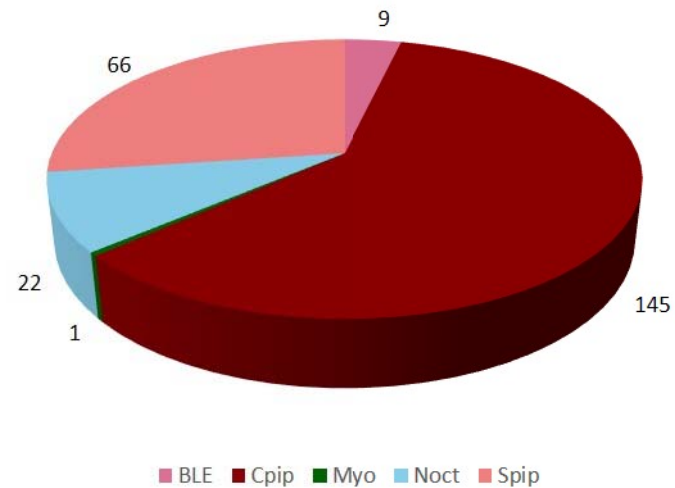
Drawn : GA Approved : N/A

Status : Final Scale : NTS

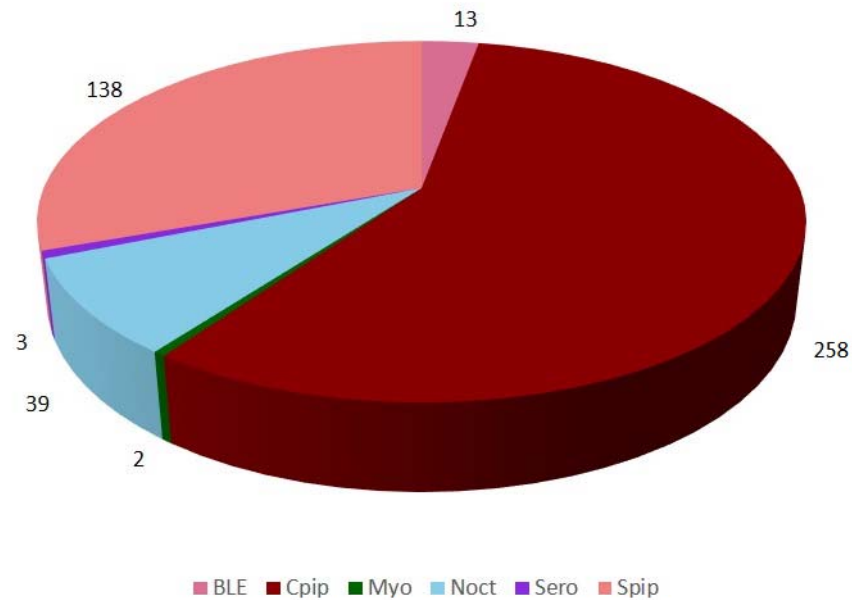
August 2019_Anabat 1_North



August 2019_Anabat 2_South

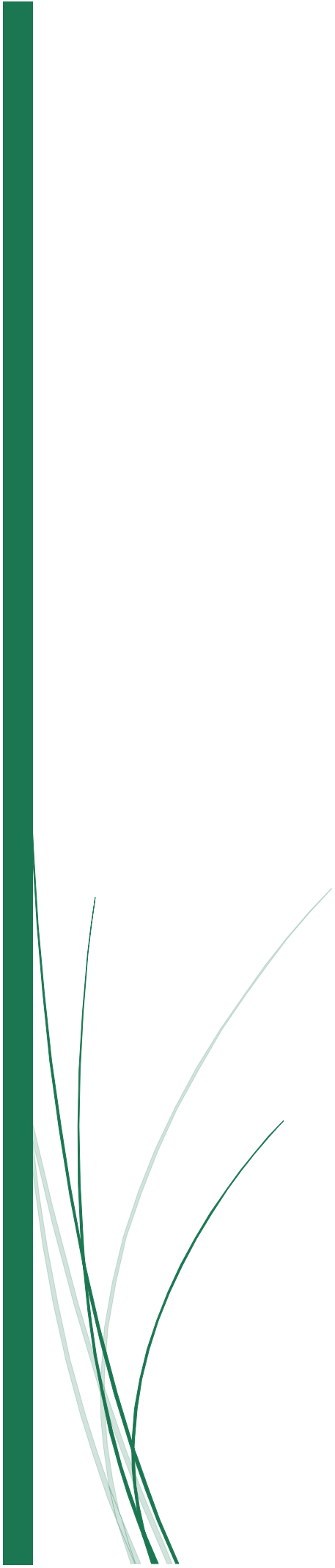


August 2019_Combined Anabat Results



Job Reference : J20563_P4
 Project Title: Reading SGN
 Drawing Title
 Figure 4d - Static Detector Results (August 2019)
 Date : 12-08-19 Checked : JJ
 Drawn : GA Approved : N/A
 Status : Final Scale : NTS

Appendix D



SGN Gas Holder No. 4 Reading

Bat Roost & Bat Activity Survey Report

A Report for Danescroft (Kenavon Drive
Project Management) LLP

October 2019



www.greenspace-ecology.co.uk

info@greenspace-ecology.co.uk

SGN Gas Holder No. 4, Reading

Bat Roost & Bat Activity Survey Report

Controlled Copy

01 of 02

01 Danescroft (Kenavon Drive Project Management) LLP

02 Greenspace Ecological Solutions Ltd

Report Contributors: Gemma Abela and James Johnston ACIEEM

Proofread: Guy Newman MCIEEM

*The content of this report is the responsibility of Greenspace Ecological Solutions Ltd.
It should be noted that whilst every effort has been made to meet the client's requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.*

Report Number J20563_P4

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Suite H3, Blackham Court,
Withyham, East Sussex,
TN7 4DB

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info@greenspace-ecology.co.uk

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1 PROJECT OVERVIEW

Client: Danescroft (Kenavon Drive Project Management) LLP

Site Address: SGN Gas Holder No. 4, Kenavon Drive, Reading, Berkshire. RG1 3DH

Attending Ecologists: James Johnston (NE Bat Class 2 Licence)
Joseph Dyson (NE Bat Class 1 Licence)
Martin Rann Qualifying CIEEM
Tanya Rowlinson Qualifying CIEEM
Gemma Abela Qualifying CIEEM
Mike Marriott

Survey Period: September 2018 – October 2019

Site Proposals: Redevelopment of an existing brownfield site to facilitate a new residential development with associated parking.

Associated Planning Reference Number: Not yet submitted.

Source of Relevant Documents:

Document:	Source:
Previous Reports:	Preliminary Ecological Appraisal, Greenspace Ecological Solutions, October, 2018

2 INTRODUCTION

2.1 Context

2.1.1 In response to the redevelopment of the SGN Gas Holder No.4 Kenavon Drive, Reading, a Preliminary Ecological Appraisal (PEA) was undertaken by Greenspace Ecological Solutions Ltd (GES) in October 2018. Recommendations made within that report identified the need for further considerations in regard to bats. GES were subsequently commissioned to undertake an elevated tree roost assessment of a tree, bat roost presence/likely absence surveys of the building denoted B1 and bat activity surveys of the area surrounding the site.

2.1.2 The results of the surveys, as described in this report, serve to ensure that the Favourable Conservation Status (FCS) of bats is maintained throughout the development and that the proposals remain compliant with existing legislation and planning policies which serve to protect bats and their roosts. Where appropriate, proportionate mitigation to be incorporated within the design of the building, has been provided within this report.

2.2 Site Location

2.2.1 The site is located on the eastern edge of the town of Reading, Berkshire, at National Grid Reference SU 728 736.

2.3 Site Description

2.3.1 The site occupies approximately 0.71ha and comprises areas of scrub, scattered trees and buildings within areas of hard standing. A prominent gas holder is also present within the site.

2.3.2 The site is bound by residential dwellings to the west; the River Kennett to the south and east; and the National Rail link to the north. The wider landscape is typical of an urban area.

2.4 Policies and Legislation

2.4.1 The National Planning Policy Framework 2019 (NPPF) aims to protect species of significant conservation importance in England (in this case bats), as covered by wildlife legislation (see below), NPPF, national and local Biodiversity Action Plans (BAP's) and Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Local planning authorities have an obligation to protect such species and are also required to seek opportunities to promote and enhance biodiversity in accordance with the above legislation, policies and plans.

2.4.2 All British bat species and their places of rest and shelter receive UK and European protection under the Conservation of Habitats and Species Regulation 2018 (Habitats Regulations 2018)

and the Wildlife and Countryside Act (WCA) 1981 (as amended). This protection means that bats and their places of rest and shelter are a material consideration in the planning process.

2.4.3 Taken together, unless under licence, these make it an offence to:

- Deliberately capture or intentionally take a bat;
- Deliberately or intentionally kill or injure a bat;
- To be in possession or control of any live or dead bat or any part of, or anything derived from a bat;
- Damage or destroy a breeding site or resting place of a bat;
- Intentionally or recklessly obstruct access to any place that a bat uses for shelter or protection;
- Intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection;
- Deliberately disturb any bat, in particular any disturbance which is likely to (i) impair their ability to survive, breed, reproduce or to rear or nurture their young; or in the case of hibernating or migratory species, to hibernate or migrate; or (ii) to affect significantly the local distribution or abundance of the species to which they belong.
- A bat roost may be any structure a bat uses for breeding, resting, shelter or protection. It is important to note that since bats tend to use the same roost sites at different times of year, current legal opinion is that a bat roost is protected whether bats are present at the time.

2.4.4 In addition to the above, certain species of bat are listed on Annex II of the Habitat Regulations 2018. Annex II species include greater and lesser horseshoe bats, barbastelle and Bechstein's bat. Where present, consideration to the requirement of a Special Areas of Conservation (SAC) should be given.

2.5 Objectives of the Survey

2.5.1 The objectives of the surveys were to:

- Determine the presence of bats within the building and tree to be affected by the proposal,
- Gather baseline information on the species of bat using the site and adjacent habitats;
- Determine favoured foraging habitats and commuting routes that are likely to be affected by the proposed;

- Identify species, number and frequency of use of the site by bats should they be present;
- Evaluate the potential for bats to be affected by proposals;
- Identify legal or policy constraints related to bats that may affect the development; and
- Suggest mitigation/compensation measures that may be required.

2.6 Survey Constraints

- 2.6.1 The results taken from bat detector recordings are biased towards bats that use louder echolocation calls. Therefore, quiet species such as long-eared bats may be under recorded due to the limited recording range of the equipment. To compensate for this, the surveyors remained vigilant to ensure that any visual cues identifying the presence of this species were accurately recorded.
- 2.6.2 It is difficult to confidently relate calls registered, to numbers of bats present. Therefore, the number of bat passes does not provide any indication of bat abundance; it is intended only to indicate the level of activity at a particular point.
- 2.6.3 During the walked transect on 18th July 2019, a kit failure resulted in a lack of recordings for the duration of the survey. The results for this section are therefore based on the field observations noted by the surveyor at the time of the survey.
- 2.6.4 Where identification is difficult to distinguish at an individual species level, bat passes are described to genus level such as *Myotis* sp., *Nyctalus* sp., *Pipistrellus* sp.

3 SURVEY METHODOLOGY

3.1 Elevated Tree Roost Assessment

3.1.1 An elevated tree roost assessment was undertaken of T2 on the 17th July 2019 by licenced bat ecologist James Johnston.

3.1.2 The survey was completed in accordance with the guidelines set out by the Bat Conservation Trust (BCT) (Collins, 2016). Equipment used included a ladder and an endoscope. Suitable features identified during the ground level assessment were inspected for any evidence of bats and to determine their suitability for roosting bats.

3.2 Bat Emergence Surveys

3.2.1 Dusk emergence surveys were undertaken of the on-site building denoted B1 on the 26th September 2018 and 17th July 2019. The survey was completed in accordance with current best practice guidance (Collins, 2016) and to adequately observe all aspects of the building, two surveyors were deployed during each survey. The location of the surveyors is depicted in Figure 1.

3.2.2 The survey was completed in favourable weather conditions with night-time temperatures of $\geq 10^{\circ}\text{C}$ and little or no rain.

3.2.3 To account for the varying times in which differing bat species emerge, evening emergence surveys commenced 15 minutes before sunset and continued for 1 hour and 15 minutes after sunset, or until light levels deemed the survey no longer valid.

3.2.4 A summary of the weather conditions, surveyors and survey times recorded during the survey is provided in Table 1.

Table 1 – Survey Times and Conditions

Date	Sunset time	Start Time	End Time	Surveyors	Start Weather Conditions	End Weather Conditions
26/09/18	18:52	18:37	20:07	James Johnston Gemma Abela	17.0°C, 0% CC, no rain, wind 0BF	15.0°C, 0% CC, no rain, wind 0BF
17/07/19	21:12	20:57	22:27	James Johnston Mike Marriott	18.0 °C, 98% CC, no rain, wind 2BF	17.0 °C, 100% CC, no rain, wind 2BF

3.2.5 To aid audible detection, surveyors were equipped with Elekon Batlogger M bat detectors. These detectors convert the inaudible echolocation of bats into a frequency audible to the

human ear. All calls were digitally recorded, and the sonograms later analysed through the application of the computer programme Elekon BatExplorer.

3.3 Bat Transect Surveys

- 3.3.1 The methodology for bat transects surveys follows the guidance set out by the Bat Conservation Trust (Collins, 2016). The primary objective of the transects were to identify foraging areas, commuting routes and species utilisation of the site.
- 3.3.2 To ensure coverage of the site, the transect routes were determined prior to the survey. To identify activity levels around the features of potential value to bats that are to be most affected by the proposals (i.e. hedgerows/tree lines/scrub habitats etc.) point count stops were included in strategic locations along the route. Each point count was 3 minutes long, during which time all bat activity was recorded. The Transect Route is depicted in Figure 3a.
- 3.3.3 The dusk transects commenced at and ran for a period of approximately 2hrs after sunset.
- 3.3.4 Each transect was walked at a steady pace with the species, time and behaviour of all bat passes recorded on a Site plan. The information gathered provides a general view of the bat activity present on Site and identifies the key foraging area and commuting routes. Elekon Batlogger M detectors were utilised, with the location of each call logged using the GPS facility provided within the unit.
- 3.3.5 Post-survey the peak frequency, inter-pulse interval, call duration and end frequency of the recorded bat calls were analysed using Bat Explorer. Analysis was undertaken by suitably experienced bat ecologists, with the level of bat species and activity across the site, in relation to the abundance of individual species foraging and commuting along the associated habitats, assessed accordingly.
- 3.3.6 All transects were undertaken in suitable weather conditions. A summary of the survey times, surveyors and weather conditions recorded during the surveys is provided in Table 2.

Table 2 – Bat Transect Survey Conditions

Date	Survey Start	Survey End	Sunset/Sunrise Time	Start Weather Conditions	End Weather Conditions	Surveyors
29/04/19	20:23	22:23	20:23	13.0°C, 78% CC, dry, wind OBF	12.0°C, 90% CC, dry, wind OBF	Joseph Dyson Tanya Rowlinson
21/05/18	20:57	22:47	20:57	17.0°C, 5% CC, dry, wind OBF	14.5°C, 0% CC, dry, wind OBF	James Johnston Tabitha Plummer

26/06/18	21:25	22:54	21:25	15.2°C, 100% CC, dry, wind OBF	14.8°C, 0% CC, dry, wind OBF	Martin Rann Mike Marriott
18/07/19	03:07	05:00	05:07	14.0°C, 100% CC, dry, wind 1BF	13.5°C, 100% CC, light rain, wind 1BF	James Johnston Mike Marriott
13/08/19	20:31	22:00	21:20	20.5°C, 60% CC, dry, wind OBF	17.0°C, 80% CC, dry, wind OBF	Martin Rann Mike Marriott
11/09/19	19:28	21:28	19:28	20.4°C, 50% CC, dry, wind OBF	18.0°C, 50% CC, dry, wind OBF	Tanya Rowlinson Mike Marriott
08/10/19	18:27	20:27	18:27	19.4°C, 20% CC, dry, wind OBF	11.7°C, 40% CC, dry, wind OBF	Martin Rann Mike Marriott

Bat Static Activity Survey

- 3.3.7 In conjunction with the transect surveys, two Anabat Express static bat detectors were deployed to gather data on bat activity within the site. The static detectors were deployed in strategic places within the site. In this instance, the detectors were deployed on the northern railway and southern river corridor boundaries. The location of the detectors was chosen to maximise coverage of the suitable habitats likely to be affected, directly or indirectly, by the proposed. These locations are depicted in Figure 2.
- 3.3.8 To account for the periods in which the lighting impacts are most likely to occur within the site, each static detector was programmed to record bat activity from ½ hr before sunset until ½ hr after sunrise during the periods 15th May – 19th May 2019, 21st June – 25th June 2019, 17th July – 21st July 2019, 8th August – 12th August 2019, 11th September – 15th September 2019 and 9th October – 13th October 2019. The sunset times during these periods were from 20:48hrs – 20h:54hrs, 21:24hrs – 21:24hrs, 21:12hrs – 21:08hrs, 20:40hrs – 20:32hrs, 19:28hrs – 19:19hrs and 18:24hrs – 18:15hrs, respectively. The sunrise times during these periods were from 05:12hrs – 05:07hrs, 04:46hrs – 04:47hrs, 05:06hrs – 05:11hrs, 05:37hrs – 05:44hrs, 06:31hrs – 06:38hrs and 07:17hrs – 07:23hrs respectively.
- 3.3.9 Upon completion of the data collection period, the static detectors were collected, and the data subsequently analysed using Analook.

4 SURVEY RESULTS

4.1 Elevated Tree Roost Inspection

- 4.1.1 The elevated inspection of the tree denoted T2 identified no evidence of use by bats and none of the features identified at ground level were considered suitable to support roosting bats.

4.2 Emergence Surveys

26th September 2018

- 4.2.1 No bats emerged from the building.
- 4.2.2 The first bat recorded during the survey was a common pipistrelle *Pipistrellus pipistrellus*, which was recorded foraging within the site at 19:37hrs, some 45 minutes after sunset.
- 4.2.3 This species, as well as soprano pipistrelle *P. pygmaeus* and noctule *Nyctalus noctula* were recorded in low numbers foraging within and commuting through the site during the survey.
- 4.2.4 Overall bat activity within the site was considered **Low**.

17th July 2019

- 4.2.5 No bats emerged from the building.
- 4.2.6 The first bat recorded was a common pipistrelle, which was recorded within the site at 21:27, some 17 minutes after sunset.
- 4.2.7 Common pipistrelle and soprano pipistrelle were recorded in low numbers foraging and commuting through the site during the survey.
- 4.2.8 Bat activity within the site was considered **Low**.

Summary of Emergence Results

- 4.2.9 Table 3 shows a summary of the survey results.

Table 3. Emergence survey results summary

Date	Bats emerging or returning from/to the building	Bat species recorded commuting / foraging within the site
26/09/18	None	Common pipistrelle Soprano pipistrelle Noctule
17/07/19	None	Common pipistrelle Soprano pipistrelle

4.3 Walked Transect Surveys

29th April 2019

- 4.3.1 The April transect recorded a total of 306 passes throughout the survey. As depicted in Figure 3a, the survey identified that 49% of bat passes were of common pipistrelle and 40% of bat passes were soprano pipistrelle. The remaining passes were of noctule (<6% of passes), *Myotis* sp. (<4% of passes) and long-eared bat (<2% of passes). Activity in April was considered high with peak activity recorded at the bridge to the south of the site and the confluence of the River Kennet and the River Thames.

21st May 2019

- 4.3.2 The May transect recorded a total of 215 passes throughout the survey. As depicted in Figure 3b, the survey identified that 36% of bat passes were of soprano pipistrelle and 27% of bat passes were common pipistrelle. The remaining passes were of *Myotis* sp. (25% of passes) and noctule (11% of passes). Activity in May was considered moderate with peak activity recorded at the bridge to the south of the site and the confluence of the River Kennet and the River Thames.

26th June 2019

- 4.3.3 The June transect recorded a total of 100 passes throughout the survey. As depicted in Figure 3c, the survey identified that 57% of bat passes were of common pipistrelle and 24% of bat passes were soprano pipistrelle. The remaining passes were of *Myotis* sp. (12% of passes), noctule (6% of passes) and serotine (1% of passes). Activity in June was considered low with peak activity recorded at the bridge to the south of the site, at the Network Rail link and the confluence of the River Kennet and the River Thames.

18th July 2019

- 4.3.4 Constrained due to equipment failure, the surveyor identified that most of the bat passes were common and soprano pipistrelle with some intermittent noctule passes. The July transect recorded a low/moderate level of bat activity during the survey. Several bats were recorded foraging and commuting along the length of transect route with peaks of activity recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

13th August 2019

- 4.3.5 The August transect recorded a total of 141 passes throughout the survey. As depicted in Figure 3d, the survey identified that 52% of bat passes were of soprano pipistrelle and 34% of bat passes were common pipistrelle. The remaining passes were of *Myotis* sp. (11% of passes)

and noctule (4% of passes). Activity in August was considered moderate with peak activity recorded at the bridge to the south of the site and at Network Rail link.

11th September 2019

- 4.3.6 The September transect recorded a total of 268 passes throughout the survey. As depicted in Figure 3e, the survey identified that 45% of bat passes were of common pipistrelle and 38% of bat passes were soprano pipistrelle. The remaining passes were of noctule (14% of passes) and *Myotis* sp. (2% of passes). Activity in September was considered high with peak activity recorded at the bridge to the south of the site and at the confluence of the River Kennet and the River Thames.

8th October 2019

- 4.3.7 The October transect recorded a total of 76 passes throughout the survey. As depicted in Figure 3f, the survey identified that 58% of bat passes were of common pipistrelle and 38% of bat passes were soprano pipistrelle. The remaining passes were of *Plecotus* sp. (4% of passes). Activity in October was considered low with peak activity recorded at the confluence of the River Kennet and the River Thames.

4.4 Static Surveys

- 4.4.1 Static detector surveys have been carried out during the months of May – October 2019.

15th May – 19th May 2019

- 4.4.2 As detailed in Figure 4a, six species of bat (long-eared bat, common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the May survey.
- 4.4.3 The most frequently recorded species was soprano pipistrelle with a total of 2630 passes; 53% of all bat passes recorded across the site. The second most frequently recorded species was common pipistrelle with a total of 2267 passes, equating to 46% of all bat passes. The third most frequently recorded species were bats from the genus *Myotis* sp. with a total of 57 passes, equating to 1% of all bat passes.
- 4.4.4 Long-eared bats and noctule were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.
- 4.4.5 Accounting for 83% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed on the northern railway boundary of the site (Ref: Figure 4a).

4.4.6 During the 30 minutes period after sunset, 117 bat passes were recorded. The earliest recording was a soprano pipistrelle at 20:16hrs (32 minutes before sunset) in the south of the site.

4.4.7 During the 30 minutes period prior to sunrise, 12 bat passes were recorded. The latest recording was a common pipistrelle at 04:51hrs (18 minutes before sunrise) in the north of the site.

21st June – 25th June 2019

4.4.8 As detailed in Figure 4b, five species of bat (common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the June survey.

4.4.9 The most frequently recorded species was common pipistrelle with a total of 396 passes; 65% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 175 passes, equating to 29% of all bat passes. The third most frequently recorded species were bats were noctule with a total of 22 passes, equating to 4% of all bat passes.

4.4.10 *Myotis* sp. were recorded in low numbers in the south of the site only. Serotine bats were recorded in low numbers in both locations.

4.4.11 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4b).

4.4.12 During the 30 minutes period after sunset, 8 bat passes were recorded. The earliest recording was a common pipistrelle at 21:14hrs (10 minutes before sunset) in the south of the site.

4.4.13 During the 30 minutes period prior to sunrise, no bat passes were recorded. The latest recording was a soprano pipistrelle at 04:15hrs (31minutes before sunrise) in the north of the site.

17th July – 21st July 2019

4.4.14 As detailed in Figure 4c, four species of bat (common pipistrelle, *Myotis* sp., noctule and soprano pipistrelle) were recorded on the static detectors during the July survey.

4.4.15 The most frequently recorded species was common pipistrelle with a total of 126 passes; 56% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 81 passes, equating to 36% of all bat passes. The third most

frequently recorded species were noctule with a total of 10 passes, equating to 4% of all bat passes.

4.4.16 *Myotis* sp. were recorded in low numbers in both locations within the site.

4.4.17 Accounting for 87% of all bat passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4c).

4.4.18 During the 30 minutes period after sunset, 1 bat pass was recorded. This recording was a *Myotis* sp. at 21.27hrs (15 minutes after sunset) in the north of the site.

4.4.19 During the 30 minutes period prior to sunrise, 5 bat passes were recorded. The latest recording was a common pipistrelle at 04:45hrs (26 minutes before sunrise) in the north of the site.

8th August – 13th August 2019

4.4.20 As detailed in Figure 4d, six species of bat (long-eared bat, common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the August survey.

4.4.21 The most frequently recorded species was common pipistrelle with a total of 258 passes; 57% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 138 passes, equating to 30% of all bat passes. The third most frequently recorded species were noctules with a total of 39 passes, equating to 9% of all bat passes.

4.4.22 Serotine bats were recorded in low numbers in the north of the site. Long-eared bats and *Myotis* sp. were recorded in low numbers across the site.

4.4.23 Accounting for 54% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the south of the site (Ref: Figure 4d).

4.4.24 During the 30 minutes period after sunset, 17 bat pass was recorded. The earliest recording was common pipistrelle at 20.08hrs (30 minutes prior to sunset) in the south of the site.

4.4.25 During the 30 minutes period prior to sunrise, 36 bat passes were recorded. The latest recording was a common pipistrelle at 05:29hrs (8 minutes before sunrise) in the north of the site.

11th September – 15th September 2019

- 4.4.26 As detailed in Figure 4e, five species of bat (common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the September survey.
- 4.4.27 The most frequently recorded species was common pipistrelle with a total of 598 passes; 61% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 361 passes, equating to 37% of all bat passes. The third most frequently recorded species were noctules with a total of 20 passes, equating to 2% of all bat passes.
- 4.4.28 Serotine bats and *Myotis* sp. were recorded in low numbers in the north of the site, each equating to <1% of bat passes.
- 4.4.29 Accounting for 90% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the north of the site (Ref: Figure 4e).
- 4.4.30 During the 30 minutes period after sunset, 42 bat passes was recorded. The earliest recording was common pipistrelle at 19.40hrs (30 minutes prior to sunset) in the north of the site.
- 4.4.31 During the 30 minutes period prior to sunrise, 102 bat passes were recorded. The latest recording was a common pipistrelle at 06:24hrs (14 minutes before sunrise) in the south of the site.

9th October – 13th October 2019

- 4.4.32 As detailed in Figure 4f, five species of bat (common pipistrelle, *Myotis* sp., noctule, serotine and soprano pipistrelle) were recorded on the static detectors during the October survey.
- 4.4.33 The most frequently recorded species was common pipistrelle with a total of 46 passes; 48% of all bat passes recorded across the site. The second most frequently recorded species was soprano pipistrelle with a total of 43 passes, equating to 45% of all bat passes.
- 4.4.34 *Myotis* sp., noctule and serotine bats were recorded in low numbers, each equating to 2% of all bat passes. *Myotis* sp. was recorded in the north of the site, noctule was recorded in the south and serotine was detected across the site during the October survey.
- 4.4.35 Accounting for 76% of all bats passes recorded, the highest levels of bat activity was recorded by the detector placed in the south of the site (Ref: Figure 4f).
- 4.4.36 During the 30 minutes period after sunset, 12 bat passes was recorded. The earliest recording was common pipistrelle at 18.38hrs (16 minutes prior to sunset) in the south of the site.

- 4.4.37 During the 30 minutes period prior to sunrise, no bat passes were recorded. The latest recording was a common pipistrelle at 05:59hrs (42 minutes before sunrise) in the north of the site.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Elevated Tree Roost Inspection

- 5.1.1 The PEA identified the tree T2 as having features with potential to support roosting bats. The elevated tree roost inspection identified no polishing, droppings, staining or suitability to support bats and no further consideration to the presence of roosting bats within trees is required.

5.2 Bat Emergence

- 5.2.1 The structure B1 was identified as having 'Low' suitability for bats and two bat emergence surveys have been conducted over the 2018 and 2019 survey period.
- 5.2.2 As reasonable effort to determine the presence or likely absence of roosting bats within B1 has been applied and no bats or their roosts were recorded, no further consideration to the presence of bats within this structure is required.
- 5.2.3 In the unlikely event that bats, or their roosts are identified during the demolition process, all works should stop and the appointed ecologist or Natural England, be consulted on the appropriate manner in which to proceed.

5.3 Bat Activity

- 5.3.1 Bat transect surveys conducted conclude that although bat activity in the more built environs to the west is lowest, at least six species of bat are using the sites surrounding habitats for the purpose of foraging and commuting. With peak areas of activity being the bridge on the south west corner of the site and the confluence of the Kennet and Thames, in order of frequency across all surveys, the species recorded include common pipistrelle (50.19%), soprano pipistrelle (47.08%), noctule (1.08%), *Myotis* sp. (1.02%), long-eared bat (0.15%) and serotine (0.48%).
- 5.3.2 The surveys identified no rare or Annex II species and although difficult to quantify, the level of bat activity and bat species diversity identified throughout the surveys is considered 'Moderate'.
- 5.3.3 A marked spike in the number of bat passes recorded for common and soprano pipistrelle bats during the May surveys suggests a maternity roost for these species exists within close proximity to the site.

- 5.3.4 Furthermore, the passes by soprano pipistrelle some 32 minutes before sunset in May, common pipistrelle some 30 minutes prior to sunset in June and August and a bat from the genus *Myotis* some 15 minutes after sunset in July, indicates the presence of roosts for these species in close proximity to the site.
- 5.3.5 The results from the walked transects identified bats using the river to the south for the purposes of both foraging and commuting. With key areas identified being the stretch of river between the footbridge immediately to the south of the site and the railway bridge to the east; and the confluence of the Kennet and Thames <200m east of the site, although analysis of the calls could not be conclusive; the habitat type, visual observation of bat morphology and the call parameters suggest at least some of the *Myotis* bats recorded along the Kennet were that of Daubenton's *M. daubentonii*. Comprising up to 1% of the total bat passes recorded, the number of passes by bats of the genus *Myotis* is notable and requires consideration. Although low in number, the presence of long-eared bats during both the static and walked transects confirm the use of the rail and river corridor by this species.
- 5.3.6 Although bats from the genus *Pipistrellus* and *Nyctalus* (noctule) are known to exhibit a low degree of tolerance to artificial lights, many of the 18 species of bat identified within the UK are light sensitive and artificial lighting of bat roosts, access points and foraging pathways can be extremely disturbing to bats and should be avoided. Artificial light falling on or close to a bat roost can cause many problems for bats, by;
- delaying or preventing emergence from roosts, resulting in reduced foraging time and missing the peak time of insect abundance (just after dusk). As all bats in the UK feed on insects, this missed opportunity can have a serious impact on their survival and the growth rates of their young. In some cases, leading to bats abandoning or becoming entombed in the roost when the entrance is lit up as bats will be less inclined to leave their roosts in these conditions. This is likely to be considered a breach of legislation as both bats and their roosts are protected by law.
 - affecting the feeding behaviour of bats away from the roost. Slower flying species (long-eared bats and *Myotis* bats) avoid illuminated areas and therefore lose foraging grounds if they are lit. This results in slower flying species having to use poorer quality foraging sites and losing out on prey, which are attracted to the surrounding lit areas, a so called 'vacuum effect'.

- affecting commuting and foraging routes, which have been shown to be avoided if there is artificial light spill onto these areas.
- 5.3.7 Garland & Markham (2007) highlighted examples of brightly lit developments, as having potential to impact on bats as the lighting often comes on during the early evening when many bat species are becoming active. Furthermore, should the movement of bats along commuting routes or foraging corridors be significantly inhibited by lighting, this would be considered a direct impact and would therefore constitute a disturbance offence under the Habitat Regulations 2018.
- 5.3.8 Therefore, without a lighting scheme that caters to the requirements of foraging and commuting bats, the development may result in the following impacts on bats:
- Severance of commuting routes;
 - Disruption of foraging areas;
 - Disturbance of potential roost sites.
- 5.3.9 Having identified light sensitive species present along both the river and rail corridor, to ensure the site remains suitable for use by bats, consideration to the potential impacts of the proposed development and its associated lighting strategy has been given.

During Construction

- 5.3.10 To maintain the integrity of the surrounding bat habitats, a sensitive lighting scheme is to be implemented during the construction phase.
- 5.3.11 To limit potential lighting disturbance, lighting to facilitate the works will be directional and light spill onto vegetated habitats off-site will be avoided.
- 5.3.12 Where practical, works will be limited to standard daytime hours and where works are required outside of this period, suitable screening will be installed to avoid light spill onto the retained habitats. Installation of the screening will be conducted by the on-site contractors.
- 5.3.13 The appointed ecologist will assess the lighting units, the positioning of the lighting and the light spill resulting from the lighting units prior to the commencement of construction works or at the time of installation should work have commenced.

Post Construction

- 5.3.14 To ensure the sites integrity for bats has been maintained post construction, the lighting design strategy set out within Nick Smith Associates report (2019); has been designed

specifically to minimise lighting impacts on the associated river and rail corridor and has been compiled in accordance with the requirements set out by the Bat Conservation Trust (BCT) and the Institute of Lighting Professionals (ILP) [Guidance Note 08/18 Bats and artificial lighting in the UK](#). (2018).

5.3.15 In accordance with the guidance, application of the following methods has ensured the reduction of the lighting impacts has been reduced to a level suitable for use by bats:

- By forming a dark buffer zone to separate the site from the surrounding rail line and river corridor from lighting. This includes the strategic planting of a 2m high x 8m wide buffer of native tree and shrub species along the river bank.
- The omission of lighting unless required has been implemented across the site.
- The lighting scheme has been designed to achieve 1 lux at both ground and elevated levels, along at least half of the river corridor. (Nick Smith Associates (NSA) - *Drawings 2569-D_02 and 03 rev A*).
- Internal residential lighting is to be achieved using LED downlighters (oppose pendants) which are to be set back from windows and balconies to prevent light spillage.
- Balconies have been positioned to maximise the 'shielding' effect of lighting from within living / communal spaces.
- External column heights restricted to 5m in car parking area.
- The use of specialist bollard and handle rail lighting used in the other public areas of the site.

5.3.16 As long as the above mitigation strategy is implemented in full, the nearby roosts, flight lines and foraging areas identified within and around the site will be maintained and the development will be conducted in accordance with planning policies and legislation which serve to protect bats and their roosts.

5.3.17 The lighting impacts demonstrated within the NSA report are given as a worst-case scenario and in isolation, development of the site results in little increase to the existing light levels. However, to achieve further enhancement for bats the following points have been identified, modelled and demonstrated as viable within the design:

- A significant reduction in the existing lighting impacts on the Kennet River Corridor from roadside lighting on the opposite southern side of the river, could be achieved through revision / replacement of the existing off-site lighting units. In the location of the proposed development, replacement of these units would lower the lux levels to <0.4 lux across the

entirety of the water course. Further details of this strategy are set out within the NSA report (2019). For clarity; the existing and proposed lux level lighting plans are depicted in Figure 5 and 6 respectively.

- Allowing the vegetation within the on-site green buffer along the river corridor to grow to a height of 5m+ would provide a robust flight-line for bats and further reduce the lux levels on the river.
- The installation of floating ecosystem riverbanks such as those provided by [Biomatrix Water](#) along the site side bank of the River Kennet would provide a source of flowering plants for invertebrates (bat prey items) and also provide extra vegetation lines for commuting bats.

5.3.18 It should also be noted, that these recommendations are provided in addition to the wildlife friendly planting strategies, integrated bat boxes to be included within the proposed buildings and alternate measures to achieve biodiversity net gain, as set out within the alternate ecology reports.

5.3.19 It is, there, suggested that through application of the above and alternately proposed mitigation strategies, development of the site will serve to significantly increase the Site and adjacent River Kennet Corridor in its suitability to support even the more light sensitive species of bat.

6 SUMMARY

- 6.1 In response to the proposed redevelopment of the site at SGN Gas Holder No.4, Reading; the tree T2 was subject to an elevated inspection, the building B1 was subject to a series of two evening emergence surveys and the site and surrounds were subject to bat activity surveys.
- 6.2 The tree T2 supports no features suitable for use by bats and no bats or their roosts were recorded within B1. No further consideration to the presence of roosting bats within the trees or structures is required.
- 6.3 The bat activity surveys identified common pipistrelle, soprano pipistrelle and bats of the genus *Myotis* roosting in close proximity to the site. Furthermore, the northern rail and southern river corridor were both identified as important for foraging and commuting bats.
- 6.4 Without mitigation, lighting from the development had the potential to impact on the suitability of these areas for bats. Working collaboratively with the appointed lighting engineer, the lighting scheme proposed serves to result in minimal and acceptable levels of increased lighting through on-site mitigation, and opportunity to significantly reduce lighting impacts on the river corridor through off-site lighting alterations.
- 6.5 In addition to wildlife friendly landscaping, integrated bat boxes and wider measures to achieve biodiversity net gain within the proposed development, measures inclusive of floating eco systems and an increase in the height of on-site vegetation will further enhance the areas use for wildlife.
- 6.6 It is suggested that so long as the above recommendations are implemented in full, the proposed development will not only be conducted in accordance with current legislation and planning policies which serve to protect habitats and species of conservation importance, but will serve to provide significant enhancements for not only bats, but also the adjacent river Kennet corridor and the species which depend upon it.

7 REFERENCES

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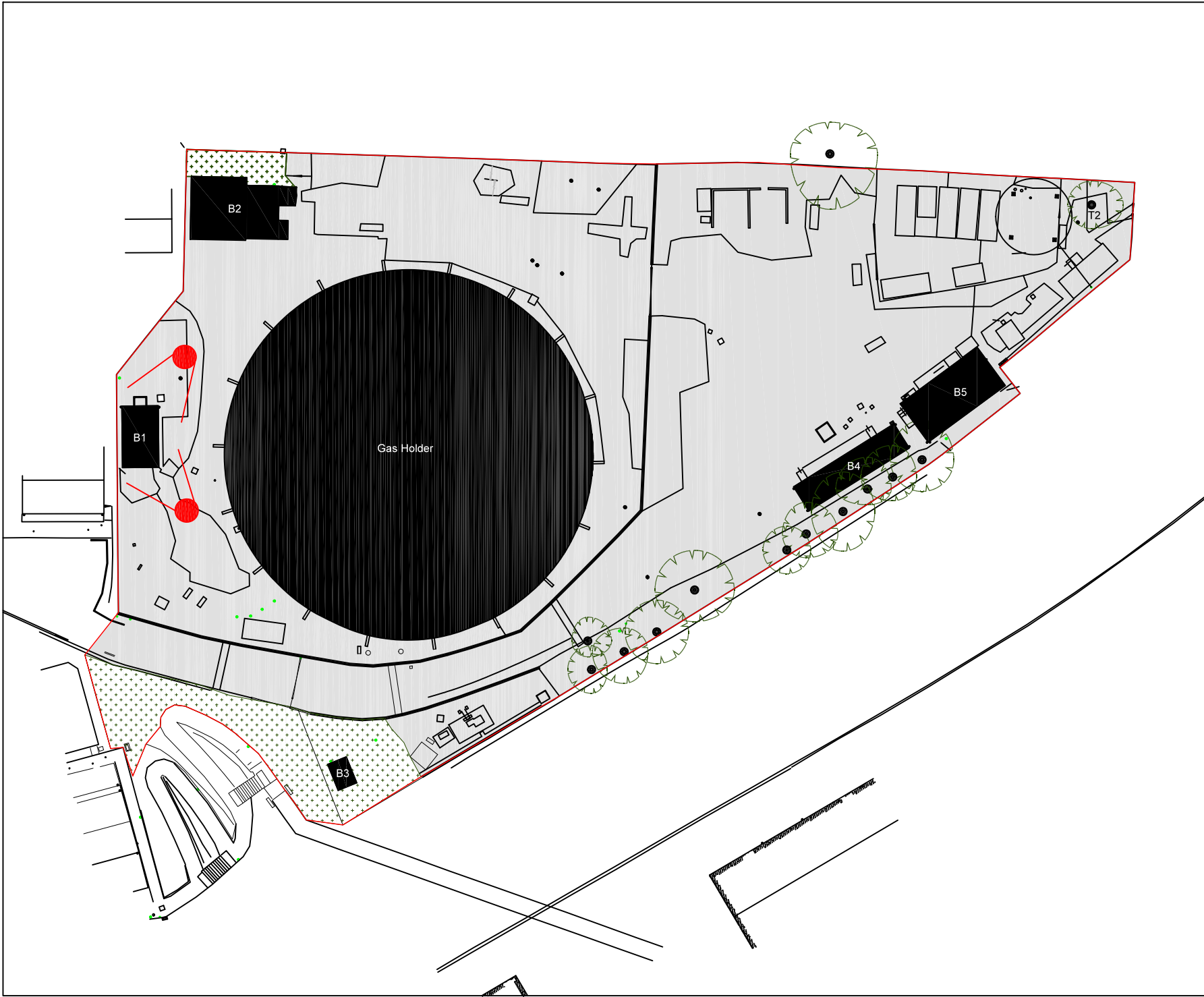
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Figures



Legend

- Site Boundary
- Surveyor Locations



Job Reference : J20563_P4

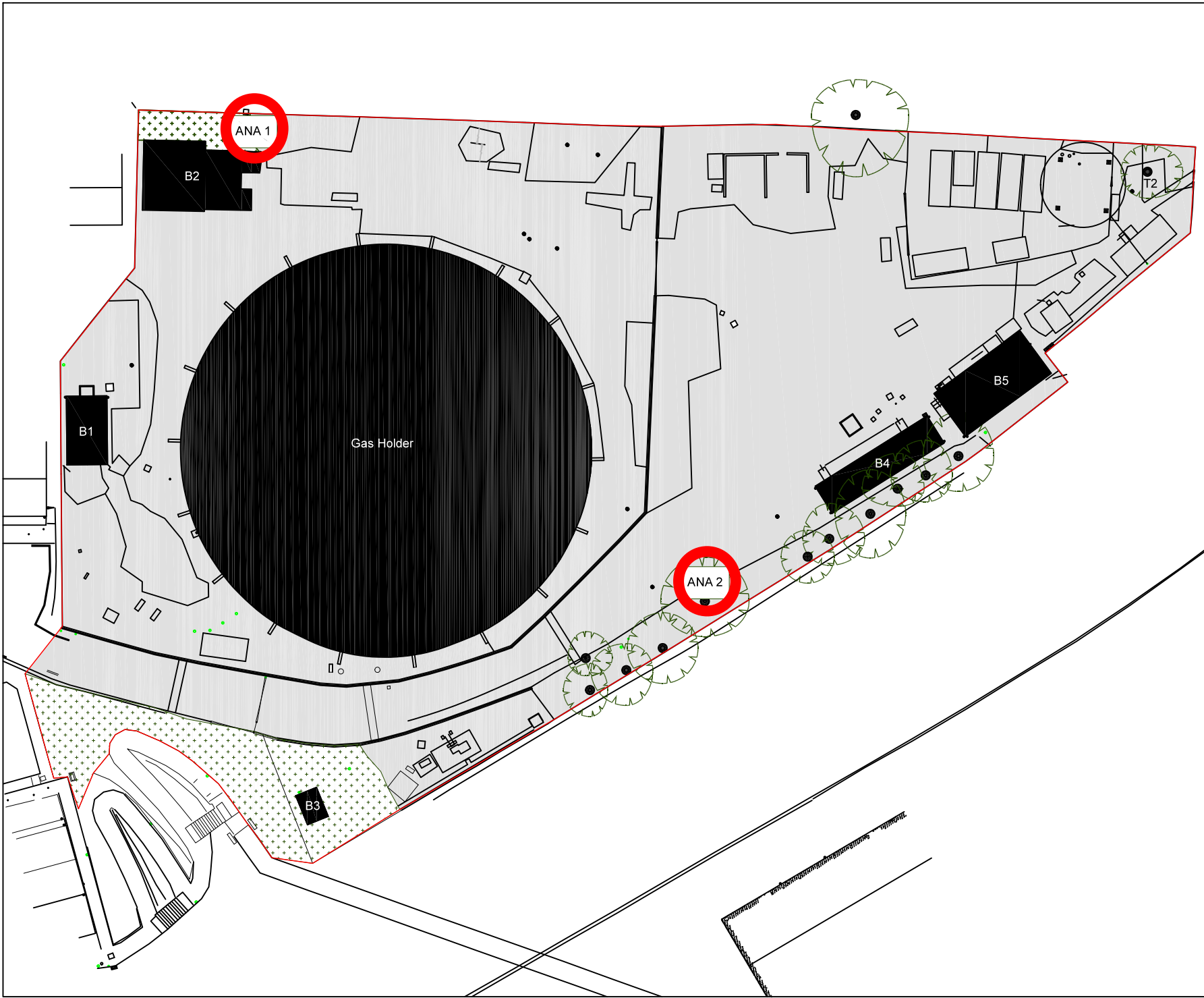
Project Title
Reading SGN Site

Drawing Title
Figure 1: Surveyor Locations

Date : 16-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Legend

- Site Boundary
- Anabat Locations



Job Reference : J20563_P4

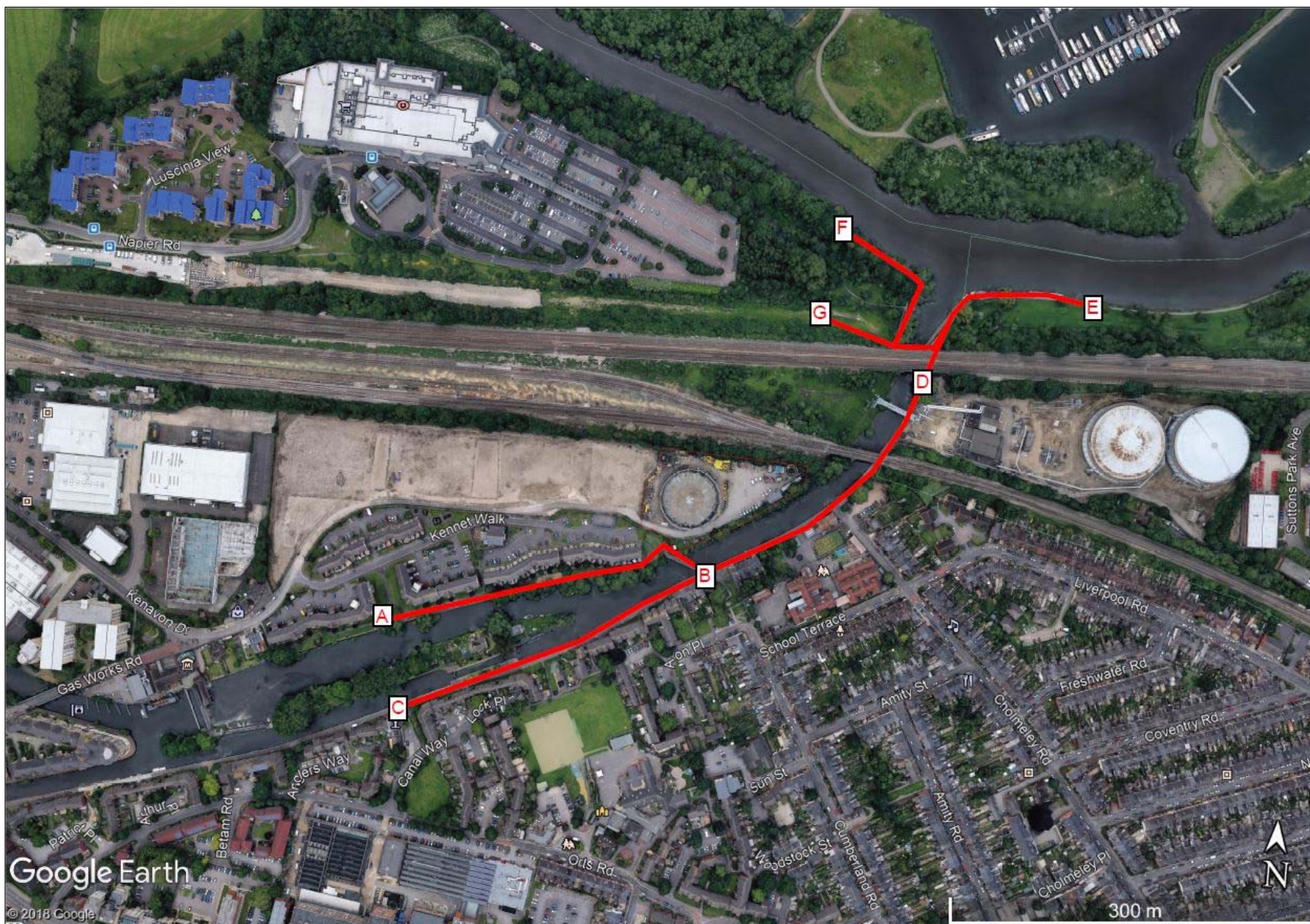
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Reading SGN Site

Drawing Title
Figure 2: Anabat Locations

Date : 16-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Legend

- Transect Route
- Point Count Stop



Job Reference : J20563_P4

Project Title: Reading SGN

Drawing Title
Figure 3a - Transect Route

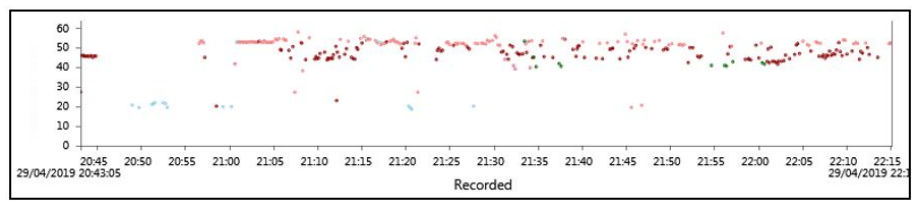
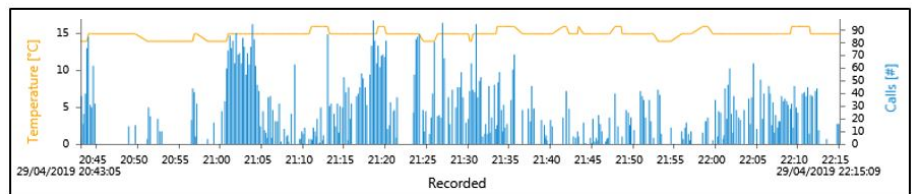
Date : 09-09-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Species	#	# Calls
● Pipistrellus pipistrellus	149	4245
● Nyctalus noctula	17	414
● Pipistrellus pygmaeus	121	4332
● Plecotus auritus	7	207
● Myotis spec.	12	206



Job Reference : J20563_P4

Project Title: Reading SGN

Drawing Title
Figure 3b - Transect Results (April 2019)

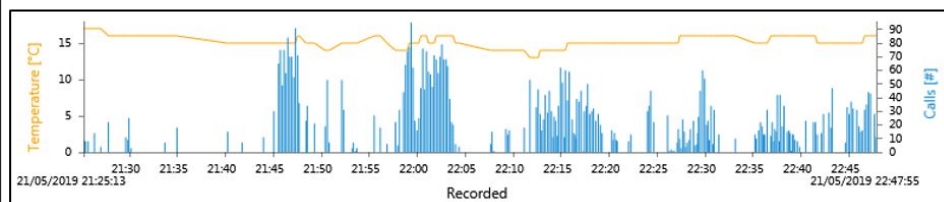
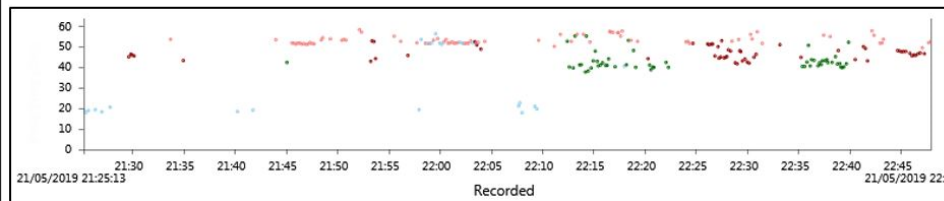
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Species	#	Calls
Nyctalus noctula	24	636
Myotis spec.	54	1253
Pipistrellus pipistrellus	59	1050
Pipistrellus pygmaeus	78	3046



Job Reference : J20563_P4

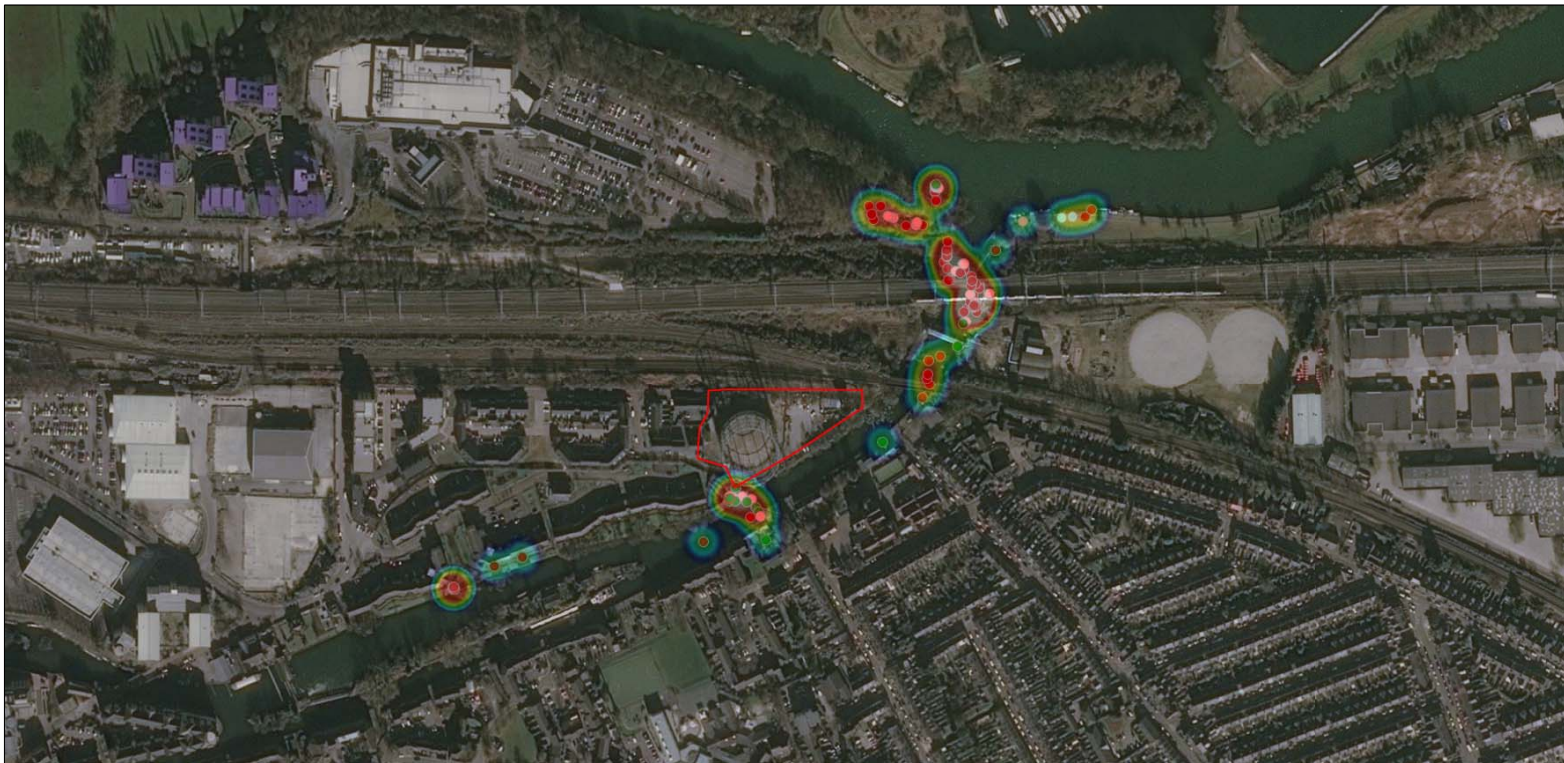
Project Title: Reading SGN

Drawing Title
Figure 3c - Transect Results (May 2019)

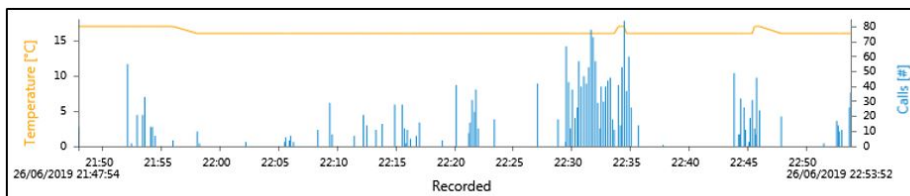
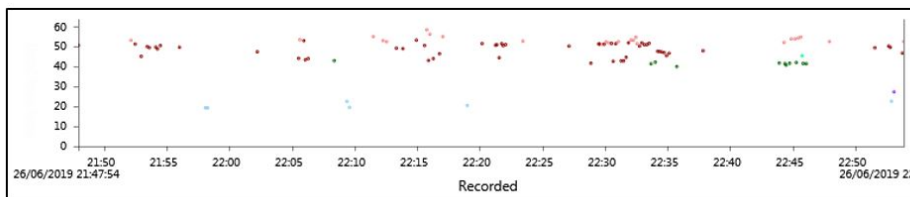
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Species	#	Calls
● <i>Eptesicus serotinus</i>	1	11
● <i>Nyctalus noctula</i>	6	63
● <i>Myotis spec.</i>	12	289
● <i>Pipistrellus pygmaeus</i>	24	566
● <i>Pipistrellus pipistrellus</i>	57	1436



Job Reference : J20563_P4

Project Title: Reading SGN

Drawing Title
Figure 3d - Transect Results (June 2019)

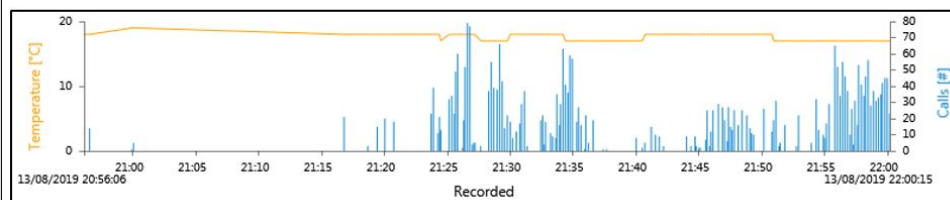
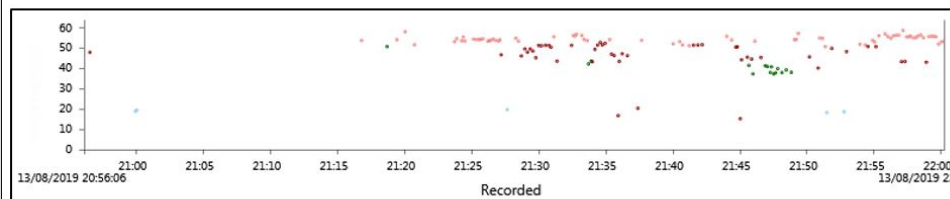
Date : 13-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Species	#	Calls
● <i>Nyctalus noctula</i>	5	17
● <i>Myotis spec.</i>	15	286
● <i>Pipistrellus pipistrellus</i>	48	957
● <i>Pipistrellus pygmaeus</i>	73	1950



Job Reference : J20563_P4

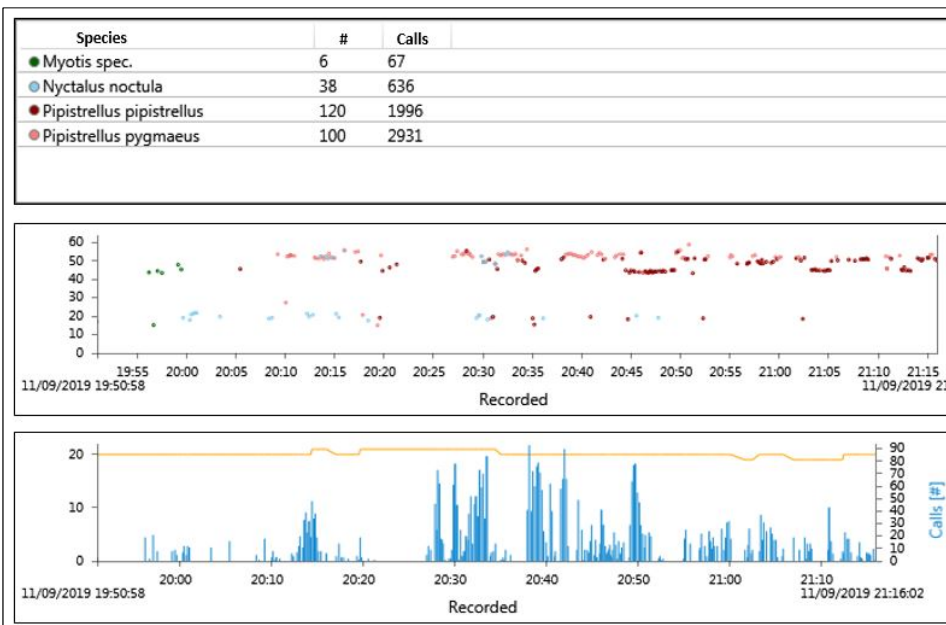
Project Title: Reading SGN

Drawing Title
Figure 3e - Transect Results (August 2019)

Date : 15-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Job Reference : J20563_P4

Project Title: Reading SGN

Drawing Title
Figure 3f - Transect Results (September 2019)

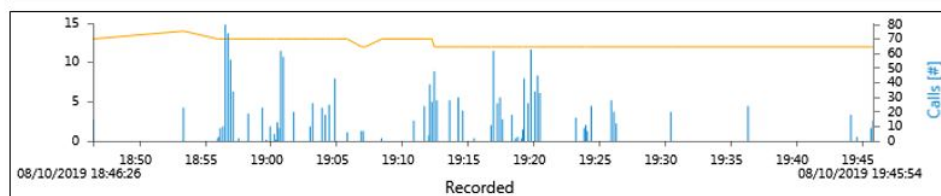
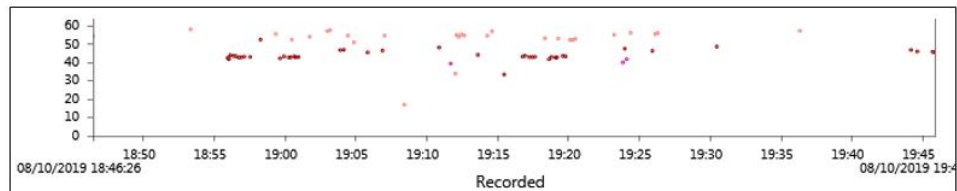
Date : 15-08-19 Checked : JJ

Drawn : GA Approved : N/A

Status : Final Scale : NTS



Species	#	Calls
● Pipistrellus pipistrellus	44	884
● Pipistrellus pygmaeus	29	673
● Plecotus spec.	3	40



Job Reference : J20563_P4

Project Title: Reading SGN

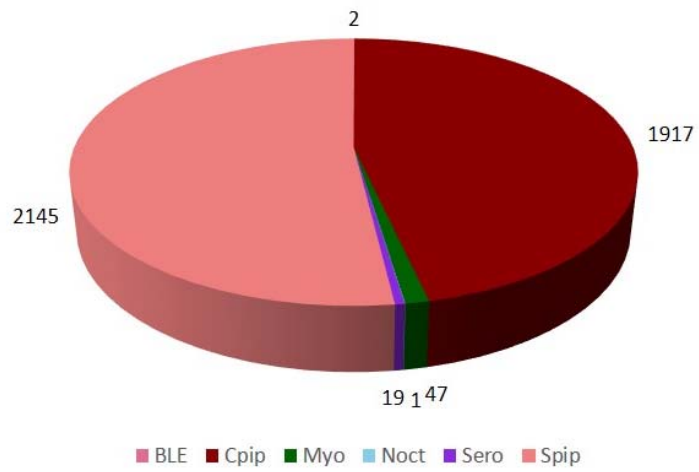
Drawing Title
Figure 3g - Transect Results (October 2019)

Date : 14-10-19 Checked : JJ

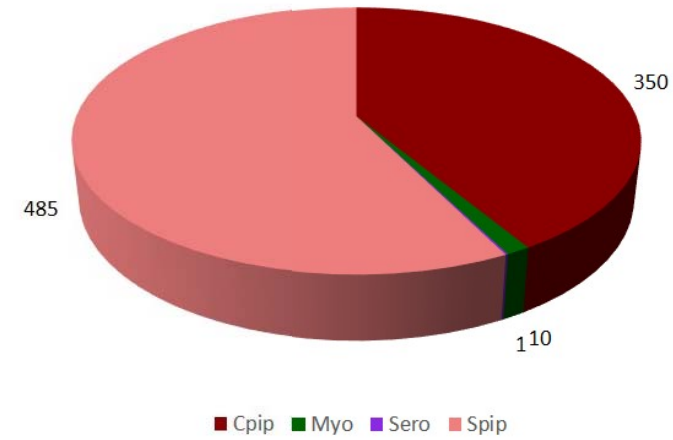
Drawn : GA Approved : N/A

Status : Final Scale : NTS

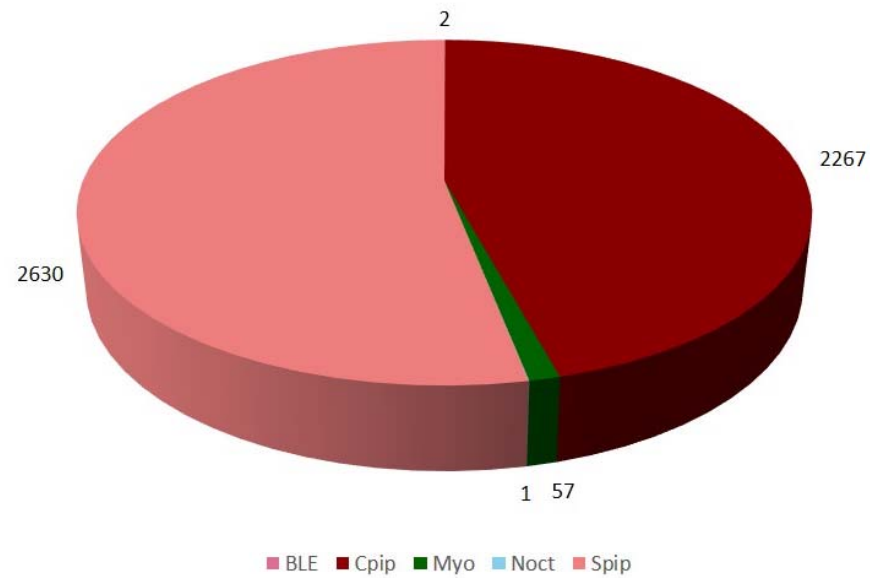
May 2019_Anabat 1_North



May 2019_Anabat 2_South



May 2019_Combined Anabat Results



Job Reference : J20563_P4

Project Title: Reading SGN

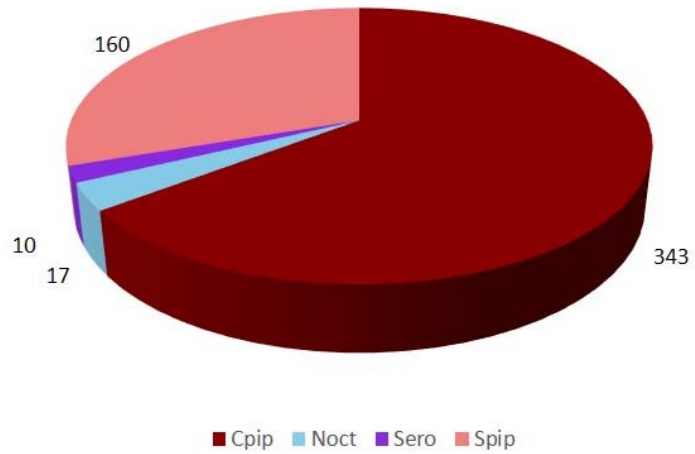
Drawing Title
Figure 4a - Static Detector Results (May 2019)

Date : 12-08-19 Checked : JJ

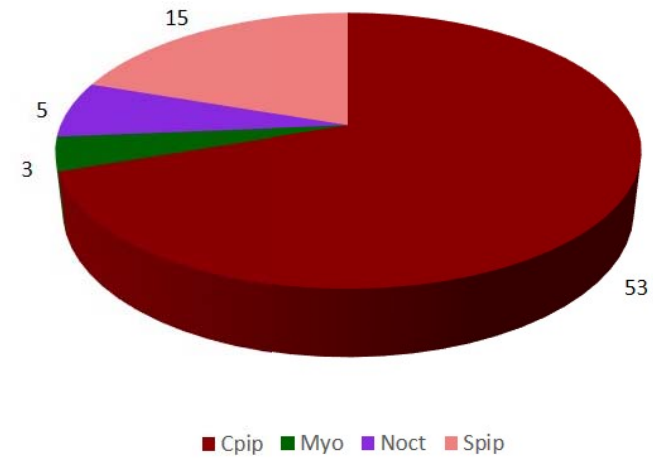
Drawn : GA Approved : N/A

Status : Final Scale : NTS

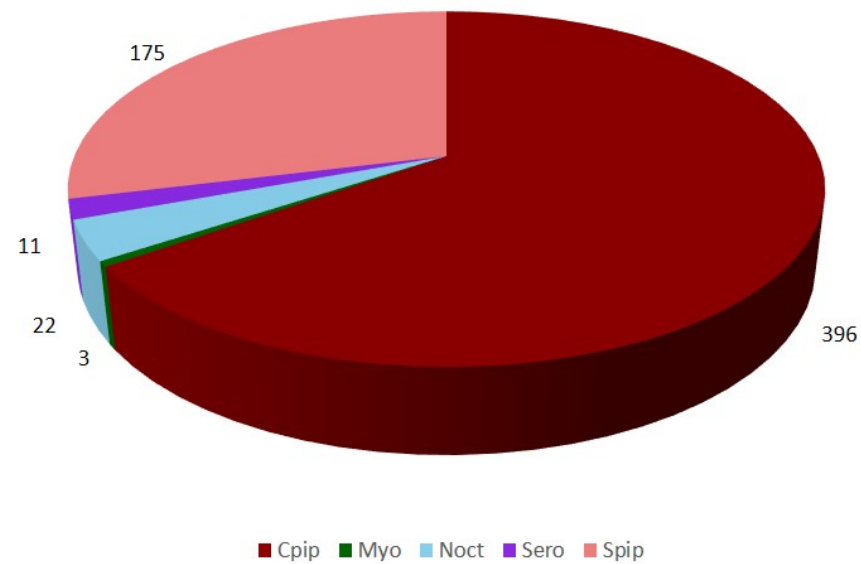
June 2019_Anabat 1_North



June 2019_Anabat 2_South



June 2019_Combined Anabat Results



Job Reference : J20563_P4

Project Title: Reading SGN

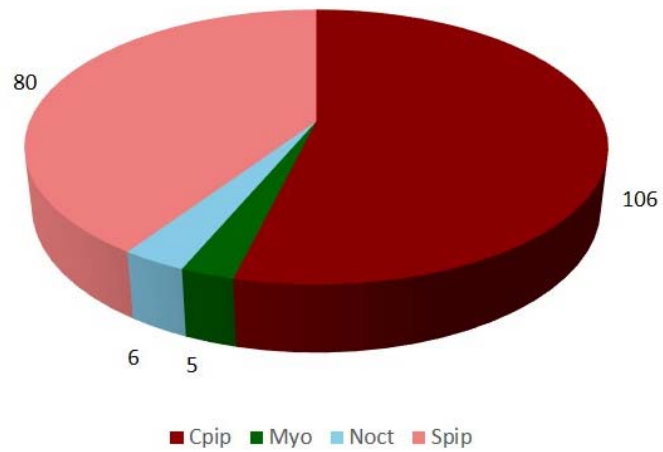
Drawing Title
Figure 4b - Static Detector Results (June 2019)

Date : 12-08-19 Checked : JJ

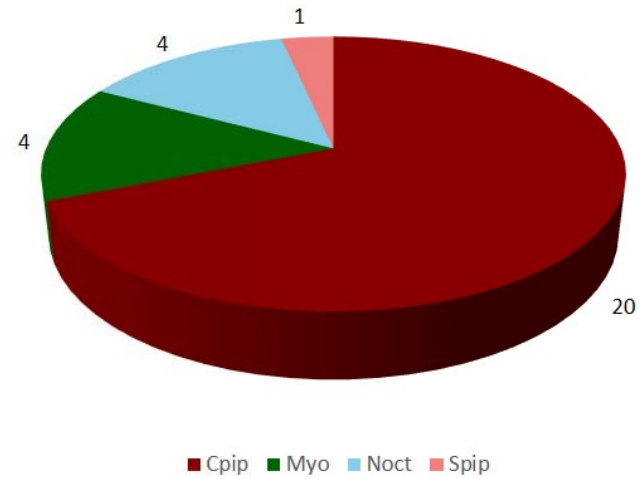
Drawn : GA Approved : N/A

Status : Final Scale : NTS

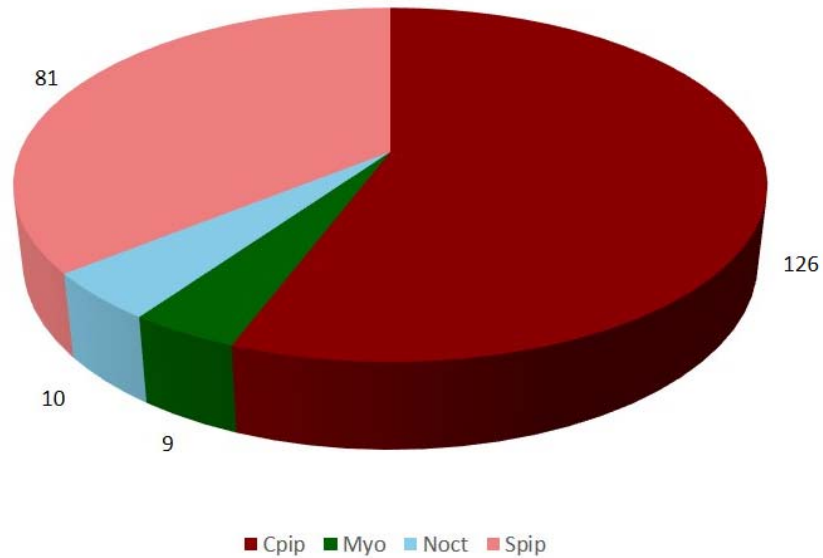
July 2019_Anabat 1_North



July 2019_Anabat 2_South



July 2019_Combined Anabat Results



Job Reference : J20563_P4

Project Title: Reading SGN

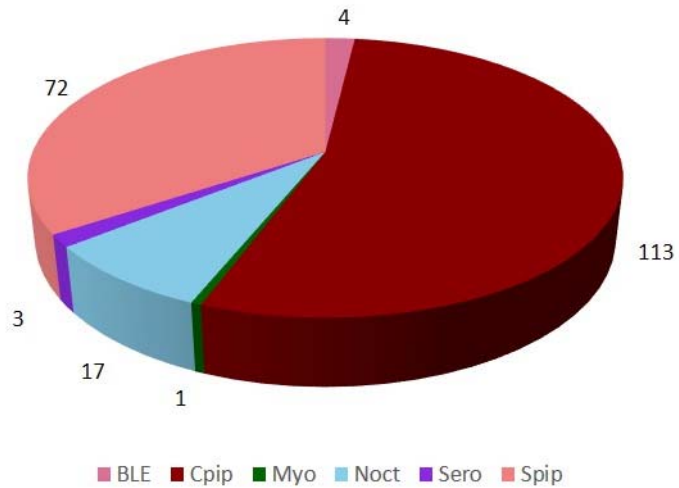
Drawing Title
Figure 4c - Static Detector Results (July 2019)

Date : 12-08-19 Checked : JJ

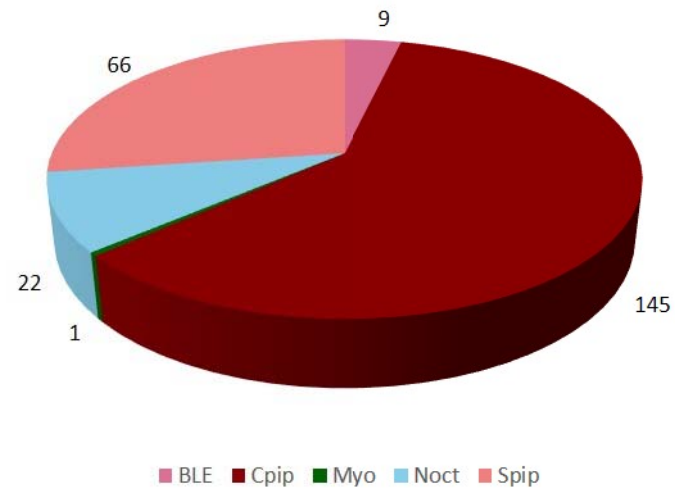
Drawn : GA Approved : N/A

Status : Final Scale : NTS

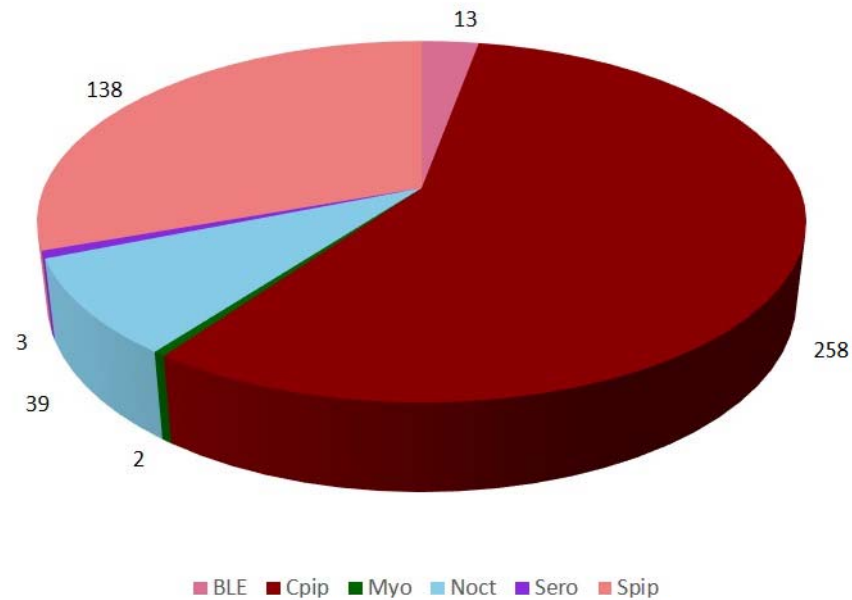
August 2019_Anabat 1_North



August 2019_Anabat 2_South

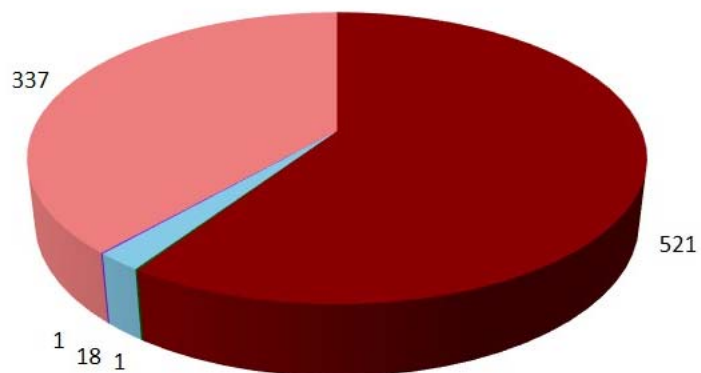


August 2019_Combined Anabat Results



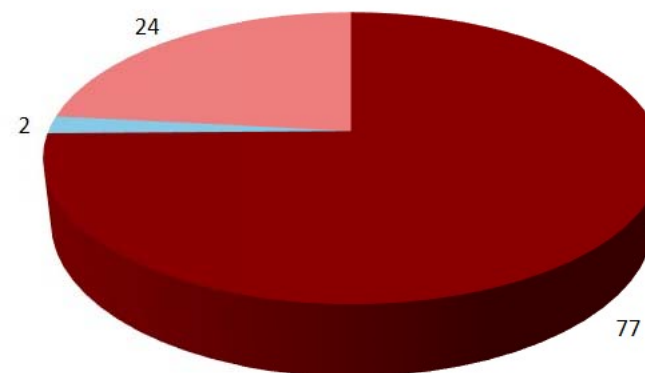
Job Reference : J20563_P4
 Project Title: Reading SGN
 Drawing Title
 Figure 4d - Static Detector Results (August 2019)
 Date : 12-08-19 Checked : JJ
 Drawn : GA Approved : N/A
 Status : Final Scale : NTS

September 2019_Anabat 1_North



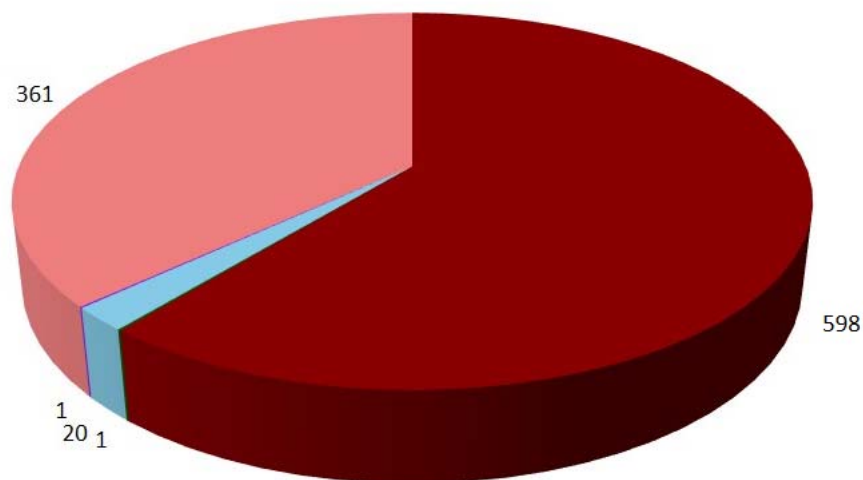
■ Cpip ■ Myo ■ Noct ■ Sero ■ Spip

September 2019_Anabat 2_South



■ Cpip ■ Noct ■ Spip

September 2019_Combined Anabat Results



■ Cpip ■ Myo ■ Noct ■ Sero ■ Spip

Job Reference : J20563_P4

Project Title: Reading SGN

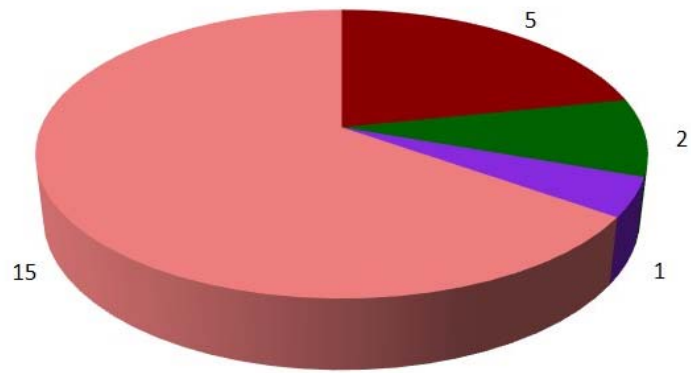
Drawing Title
Figure 4e - Static Detector Results (Sept 2019)

Date : 17-10-19 Checked : JJ

Drawn : GA Approved : N/A

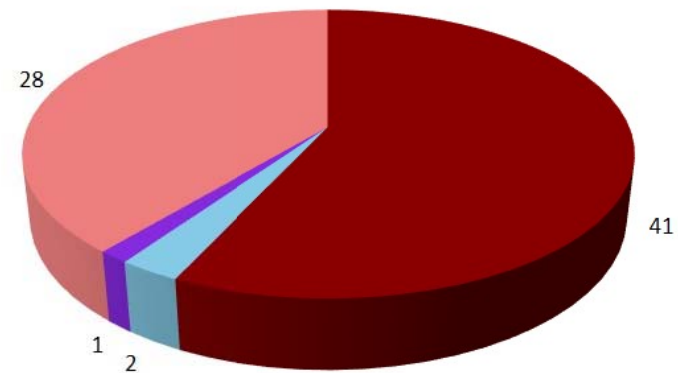
Status : Final Scale : NTS

October 2019_Anabat 1_North



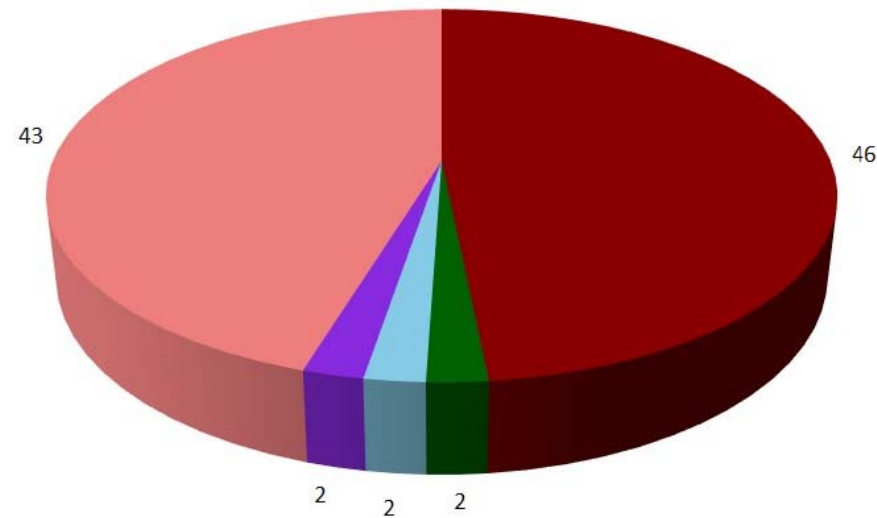
■ Cpip ■ Myo ■ Sero ■ Spip

October 2019_Anabat 2_South



■ Cpip ■ Noct ■ Sero ■ Spip

October 2019_Combined Anabat Results



■ Cpip ■ Myo ■ Noct ■ Sero ■ Spip

Job Reference : J20563_P4

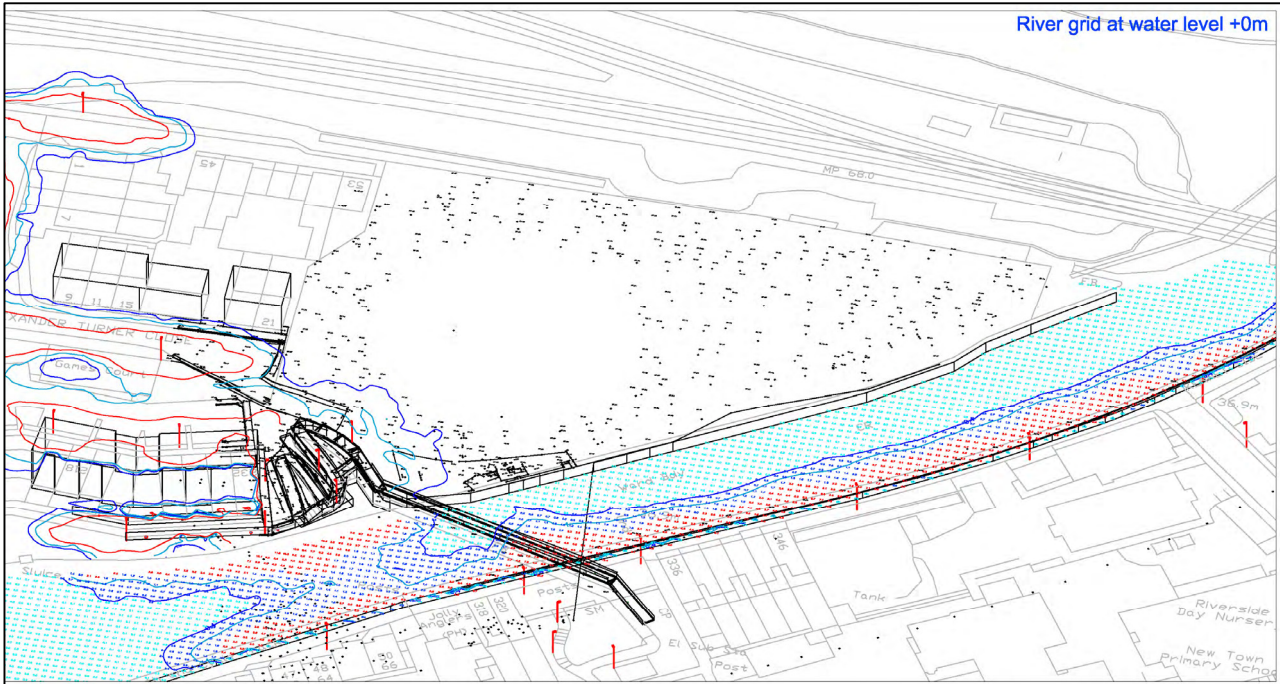
Project Title: Reading SGN

Drawing Title
Figure 4f - Static Detector Results (Oct 2019)

Date : 17-10-19 Checked : JJ

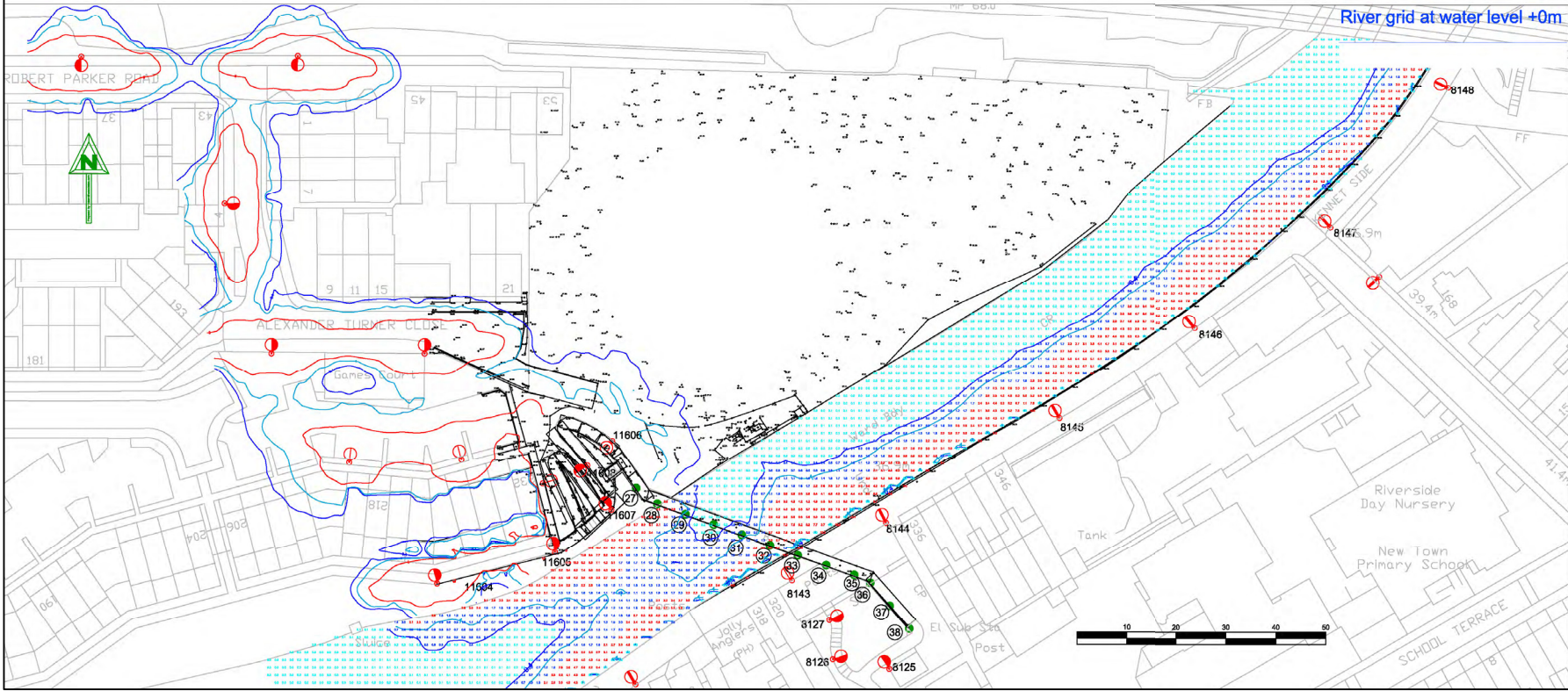
Drawn : GA Approved : N/A

Status : Final Scale : NTS



River grid at water level +0m

This drawing includes the light from the existing street lighting around the development.
It does not take account of lumen depreciation of any light sources.



River grid at water level +0m

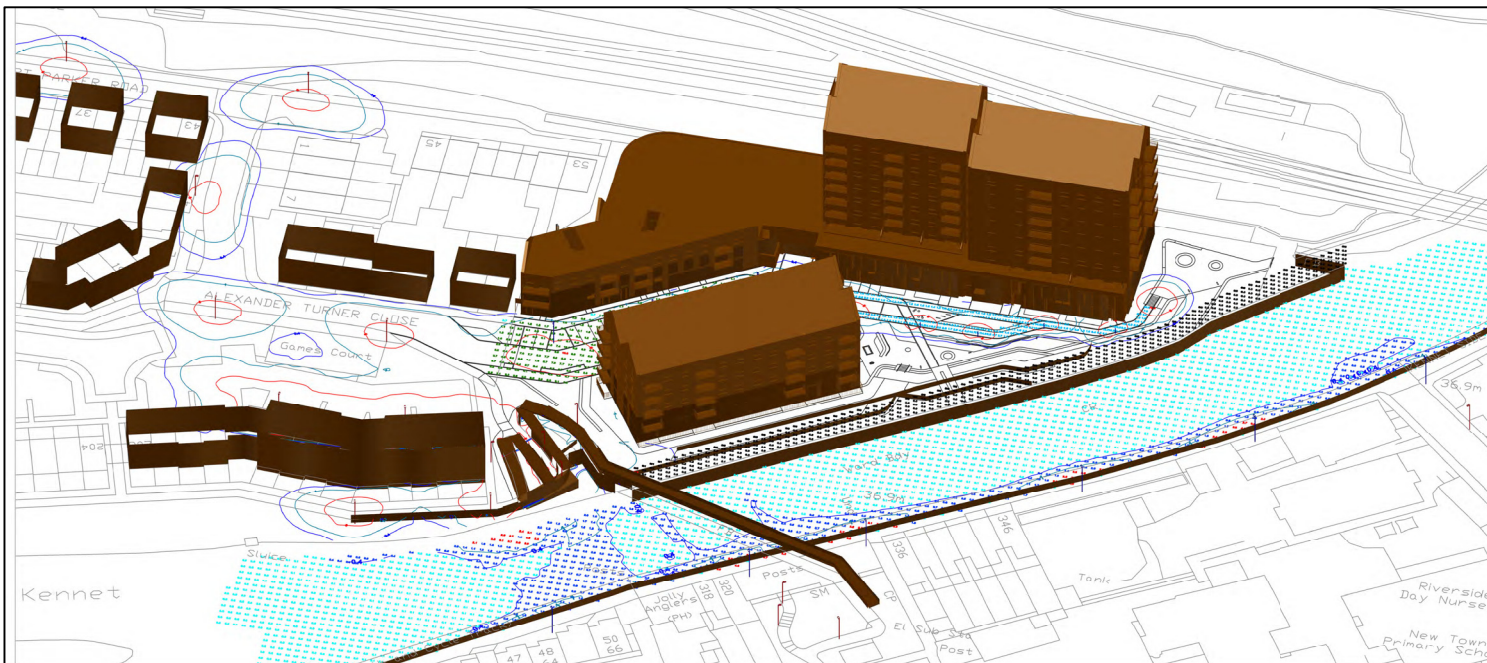
Notes

1. In this instance the use of 3 dimensional masking has been used to take into consideration the actual position of high sided objects such as buildings and the like. Trees and shrubs etc have not been considered as their masking ability will vary with seasonal conditions.
2. Iso contours produced in this drawing have been created using a conventional symmetrical grid. This does not take into account the spacing or weightings as detailed in BS5489 or BS EN 13201-3:2003.
3. The water level in the river has been modelled at 35.31m above OS zero level. This data was gathered from the topographical survey.
4. The ground level for the north side of the site has been modelled 38.45m above OS zero level.
5. The ramps and footbridge have been models using data from the 3D survey, the height of the ramp and footbridge varies

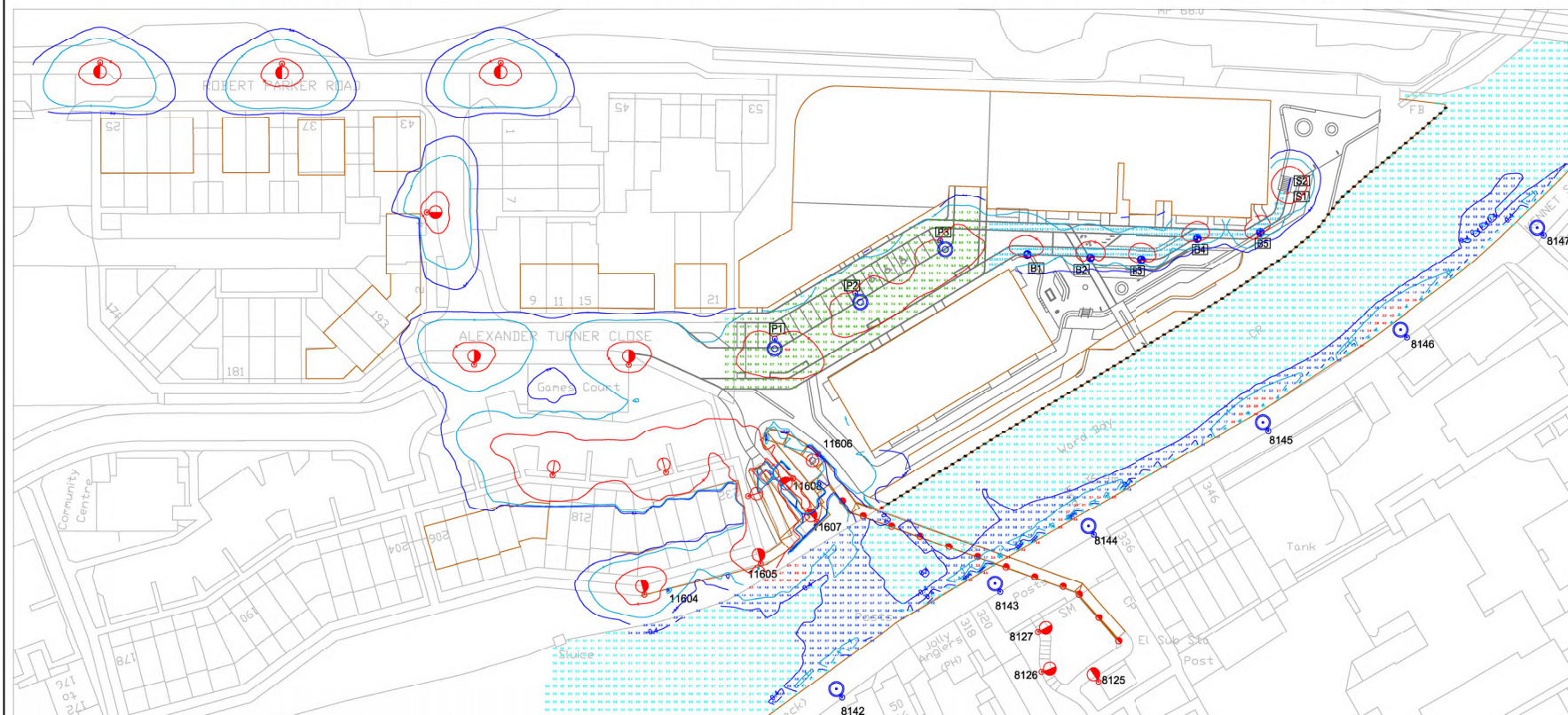
Key

- Existing 6m column with post mounted Urbis Axia with 24 cool white LED
- Existing 6m column with post mounted WRTL Stela wide with 18 no cool white LED
- Existing 5m column with post mounted Holophane VMX lantern with 16 no warm white LED
- Existing 5m column with post mounted Philips ME lantern and 70w SONT lamp
- Existing 5m column with post mounted Urbis Axia with 24 cool white LED
- Existing wall mounted wall packet lantern 70w SONT assumed
- Proposed column number
- Existing column number
- 5.0 lux iso-contour line
- 1.0 lux iso-contour line
- 0.40 lux iso-contour line

Job Reference : J20563_P4
Project Title
Reading SGN Site
Drawing Title
Figure 5 - Existing Lux level Impact Plan
Date : 23-10-19 Checked : JJ
Drawn : GN Approved : N/A
Status : Final Scale : NTS



River Bank Vertical grid @39m	
93 points	
LUX perpendicular to surface	
Average	0.0
Maximum	1.0
Minimum	0.0
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	3.417
River Bank Vertical grid @40m	
93 points	
LUX perpendicular to surface	
Average	0.0
Maximum	1.0
Minimum	0.0
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	3.753
River Bank Vertical grid @41m	
93 points	
LUX perpendicular to surface	
Average	0.0
Maximum	0.9
Minimum	0.0
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	3.868
River Bank Vertical grid @42m	
93 points	
LUX perpendicular to surface	
Average	0.0
Maximum	0.7
Minimum	0.0
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	4.560
River Bank Vertical grid @43m	
93 points	
LUX perpendicular to surface	
Average	0.3
Maximum	0.3
Minimum	0.000
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	3.726
Footpaths	
107 points at p=36.45, sp 1m by 1m	
HORIZONTAL LUX	
Average	4.7
Maximum	79.4
Minimum	0.7
Min/Avg(Uo)	0.147
Min/Max	0.010
Coef Var	1.367
UnifGrad	6.97
Car Park	
380 points at p=36.45, sp 1.5m by 1.5m	
HORIZONTAL LUX	
Average	4.7
Maximum	10.8
Minimum	0.7
Min/Avg(Uo)	0.148
Min/Max	0.065
Coef Var	0.517
UnifGrad	2.13



Notes

- In this instance the use of 3 dimensional masking has been used to take into consideration the actual position of high sided objects such as buildings and the like. Trees and shrubs etc have not been considered as their masking ability will vary with seasonal conditions.
- Iso contours produced in this drawing have been created using a conventional symmetrical grid. This does not take into account the spacing or weightings as detailed in BS5489 or BS EN 13201-3:2003.
- The water level in the river has been modelled at 35.31m above OS zero level. This data was gathered from the topographical survey.
- The ground level for the north side of the site has been modelled 38.45m above OS zero level.
- The ramps and footbridge have been models using data from the 3D survey, the height of the ramp and footbridge varies.

Key

- Existing 6m column with post mounted Urbis Axia with 24 cool white LED
- Existing 6m column with post mounted WRTL Stela wide with 18 no cool white LED
- Existing 5m column with post mounted Holophone VMX lantern with 16 no warm white LED
- Existing 5m column with post mounted Philips ME lantern and 70w SONT lamp
- Existing 5m column with post mounted Urbis Axia with 24 cool white LED
- Existing wall mounted wall packet lantern 70w SONT assumed
- DW Windsor Garda Hand rail.
- 2 no 1.2m section on free standing posts with 2700K LED to deliver 1400 lumens
- TRT Lighting VIA steel bollard with ASY distribution CLO 2700K LED
- Proposed 5m steel column with TRT aspect Eco with 12 no 2700K LED- GA1 lens- internal driver to deliver L90 CLO at 2290 lumens and photocell set to switch on at 35 lux
- Existing 6m column fitted with Philips Luma Micro (BGP615_DN10_1000_6LED_5.1S_CLO_L90_WW) at zero degree tit

11 Project column number

11606 Existing column number

- 5.0 lux iso-contour line
- 1.0 lux iso-contour line
- 0.40 lux iso-contour line

Job Reference : J20563_P4

Project Title
Reading SGN Site

Drawing Title
Figure 6 - Proposed Lux Levels Impacts Plan
(Street Lamp Alteration Strategy)

Date : 23-10-19

Checked : JJ

Drawn : GN

Approved : N/A

Status : Final

Scale : NTS