

# Construction Quality Assurance Plan

Prepared on Behalf of

**Robin Chapman Ltd**

**For the site at Copse Quarry, Landshire Lane, Henstridge, BA8 0SD**

**April 2022**



2 Chapel Court

Long Ashton Business Park

Long Ashton

Bristol. BS41 9LB

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<b>Date of issue:</b>	24 April 2022			
<b>Revision:</b>	1			
<b>Project number</b>	001GMAd300			
<b>Document file path:</b>	"S:\Bris2022\Abricon\Projects\Business Improvement Projects\Copse Quarry\CQA Plan.docx"			



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## QUALITY MANAGEMENT

Revision History				
Rev	Date	Status	Reason for revision	Additional comments
1	24/04/2022	Final	-	For Issue

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**EXECUTIVE SUMMARY**

*This document represents the application Construction Quality Assurance Plan submitted as part of an application to the Environment Agency (EA) for an environmental permit (EP). The EP is sought to permit the recovery of waste. This allows the reuse of inert waste materials such as soil, hardcore and construction waste in lieu of virgin stone excavated from a quarry.*

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## 1 INTRODUCTION

- 1.1. Robin Chapman Limited is applying to the Environment Agency for a bespoke Environmental Permit for a waste recovery activity at Copse Quarry, Landshire Lane, Henstridge, BA8 0SD.
- 1.2. Robin Chapman Limited have appointed Abricon Limited (Abricon) to provide the design and independent construction supervision advice and quality assurance services for the restoration of Copse Quarry. A site location plan is included in Appendix A.
- 1.3. The site occupies an a redundant quarry which was originally agricultural land.
- 1.4. This CQA Plan has been prepared by Abricon to detail the installation and material suitability testing quality control procedures that will be followed during the construction works involved with the proposed the recovery of inert construction waste at Copse Quarry.
- 1.5. For the sake of clarification, the following definitions are given:

1.5.1 **Construction Quality Assurance (CQA)** - A planned and systematic pattern of all means and actions designed to provide confidence that items or services meet contractual and regulatory requirements and will perform satisfactorily in service.

Construction Quality Assurance refers to means and actions employed by the Engineer, to assure conformity with this CQA plan. CQA is provided by a party independent from production and installation of the systems, in this case Abricon as the Engineer.

1.5.2 **Construction Quality Control (CQC)** - Those actions that provide a means to measure and regulate the characteristics of an item or service to contractual requirements.

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Construction Quality Control refers to those actions taken by the Installers, Contractors, or the Employer to ensure that the materials and the workmanship meet the requirements of the CQA Plan.

1.5.3 **Employer** - The person or persons, firm, company, or other body who own and have responsibility for the facility. For the works undertaken at Copse Quarry the Employer is Robin Chapman Limited. The Employer is also the Contractor for these works.

1.5.4 **Contractor** – As previously mentioned, the Contractor is also the Employer for these works, and accordingly no contract has been let.

1.5.5 **Engineer** - The person, firm or company appointed by the Employer to act on his behalf for the proper execution of the Works. For this CQA Plan the Engineer is Abricon.

1.6. Within this project, the following Responsibilities are assigned:

1.6.1 **“CQA Project Manager”**, the Engineer who will be based at the offices of Abricon and will be present during the start of construction. The CQA Project Manager will, when required:

- Attend selected progress or liaison meetings and will be the key contact with regulatory officers
- Review all designs, plans and specifications
- Review other site-specific documentation, including proposed layouts, and Contractor’s qualifications
- Administer the construction programme
- Reviews all changes to the design, plans and specifications
- Oversee and reviews the CQA Certification Report.
- Oversee training of personnel involved with construction of the Permanent Works

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1.6.2 **“CQA Engineer”** is a representative of the Engineer and shall make periodic visits to the site during the construction of the lining system. CQA Engineer will:

- Advise and coordinate the construction works on behalf of the client.
- Act as the on-site (resident) representative of the Engineer
- Be familiar with the site, and the CQA requirements for the project
- Attend all CQA-related meetings (e.g. Preconstruction and Progress)
- Prepare, or oversee the ongoing preparation of the Record Drawings
- Assign locations for testing and sampling to show suitability of Permanent Works
- Report to the CQA Project Manager, and logs in his reports any relevant observations
- Report any unresolved deviations from this CQA Plan to the CQA Project Manager
- Provide all logs and relevant data to the CQA Project Manager for the preparation of the final report
- Review all Certifications and Documentation from the Contractor and makes
- appropriate recommendations
- Note and bring to the attention of the Contractor any on-site activities that could result in damage to the liner system.
- Reviews the activities as shown on the daily construction reports completed by the Contractor
- Undertake the relevant training of the site personnel involved with the project.



## **2 SCOPE OF WORKS**

- 2.1 The location of the works is shown on Drawing No. GMA-098-Location Plan, the restoration details of are shown on Drawing No RC\_10420\_05 in Appendix A.

### 3 CONSTRUCTION QUALITY ASSURANCE AND TRAINING

- 3.1 It is considered that the overriding requirement from a construction quality assurance point of view is to demonstrate the suitability of materials that are to be used in the restoration of the quarry. The objective of the third party CQA supervision will therefore be to confirm that appropriate procedures are implemented at the site and to provide independent assessment that only suitable materials are used. Training of site staff on the requirements of the CQA Plan including record keeping and procedures for material selection will be undertaken before construction commences.
- 3.2 In the absence of the CQA engineer during construction works, the contractor shall record the relevant construction activities in a Construction Summary Report.
- 3.3 CQA Supervision Frequencies. Table 3.1 below details the minimum CQA supervision frequency which shall be adopted for the duration of the works. In the absence of the CQA engineer, works activities shall be recorded by the contractor on the daily construction summary included in Appendix F.

Table 3.1: Minimum CQA attendance for an inert site located on a Minor Aquifer.

<b>Works Description</b>	<b>CQA Attendance Minimum Frequency</b>
Pre-start site visit	Required, with CQA Project Manager
Quarry Restoration	1 visit per 2,500m <sup>3</sup> of placed barrier material and at least 1 visit per 2 weeks of engineering works, whichever provides the greatest number of site visits

3.4 Site Operative Training: Due to the CQA Engineer conducting periodic site visits at various stages of the works, operatives involved with the selection and placement of suitable construction waste material shall receive a sufficient level of training. The training shall be provided to operatives involved with the works by Abricon and shall cover the following as a minimum:

- Selection of suitable imported waste material based on the material acceptance procedure. Training shall include examples identified as both suitable and unsuitable material.
- The placement and compaction methodology of the material which forms the permanent works. Operatives shall adhere to the agreed placement and compaction criteria as developed by the CQA engineer at the start of the project
- The identification of defects within the works such as soft/wet areas affected by inclement weather and the actions which are required to remediate such defects.
- Completion of the daily construction reports

3.5 CQA Documentation: Throughout the construction works the CQA Engineer will maintain a site file including the Contract Drawings and CQA Plan. The file will also incorporate the results from all compliance testing and daily records prepared by the CQA Engineer. Standard procedures will include preparation of a daily report, which as a minimum will consist of:

- Field notes;
- Observation logs
- Photographs
- Formation Acceptance Certificates
- Corrective measures Reports

3.6 As a minimum, the observation logs and test data sheets will include:

- Data on weather conditions;
- Plan showing all work and test locations;
- Equipment and personnel;
- Records of thickness and number of passes of compaction equipment; and
- Signature of the CQA personnel.

This documentation shall be used and incorporated, where necessary, in the preparation of the CQA validation Report (see Section 6).

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## 4 PERMANENT WORKS MATERIALS AND CONSTRUCTION

4.1 Material Sources: It is envisaged that material to be utilised for the quarry restoration works will be from imported, free-draining, inert waste. The following general definitions shall apply:

4.1.1 “**Inert material**” - material that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater

4.1.2 “**Suitable fill material**” - shall comprise of all that which is in accordance with this CQA Plan, and deemed by the CQA Engineer to be suitable.

4.1.3 “**Unsuitable material**” shall mean material other than suitable materials and shall include:

- i) Peat, material from marshes and bogs;
- ii) Logs, stumps and perishable material;
- iii) Material in a frozen condition;
- iv) Material susceptible to spontaneous combustion;
- v) Any industrial, commercial or domestic waste; and
- vi) Cobbles and boulders with a minimum dimension greater than 125mm in any dimension.

4.2 Material acceptance: In order to assess the suitability of the material used in the construction of the Permanent Works, the Waste Acceptance Procedure shall be used. This is aimed at providing a determination of the material suitability and moisture condition prior to use in the permanent works and shall be used by both the CQA engineer and site personnel involved with the project. The CQA engineer shall provide sufficient training to the site operatives prior to the works including examples of both acceptable and unacceptable material types. Only material which complies with the Waste Acceptance Procedure shall be incorporated into the works.

4.3 Formation Preparation and Acceptance: The receiving surface for the imported waste material shall be stripped of topsoil (This is set aside for use to provide a planting medium in the areas to be landscaped). This area is to be trimmed and proof rolled to provide a clean, even, firm unyielding foundation sufficient to permit the placement of fill without causing rutting or other deleterious effects.

Proof rolling shall be undertaken using a vibratory tamping roller in dead weight mode. The receiving surface shall be smooth without shrinkage cracks or other surface defects and free from unsuitable material or excessively soft areas. The receiving surface shall also be free from sudden sharp or abrupt changes in grades, undulations, hollows or mounds.

Any soft spots or, areas exhibiting heave during the proof rolling shall be removed to the satisfaction of the CQA Engineer and replaced with suitable imported fill material, placed and compacted in accordance with this the CQA Plan. The excavated surface shall have a minimum in-situ shear strength of 40kPa.

The Contractor shall not place material into the permanent works at any location until the surface at that location has been accepted by the CQA Engineer. The CQA Engineer shall inspect and test the surface in order that a minimum in-situ shear strength of

50kPa has been achieved. Hand shear vane testing shall be undertaken on a 20m linear square grid with the results being record on a formation acceptance certificate.

Areas deemed to be unacceptable will be identified by the CQA Inspector and the Contractor shall discuss and agree any proposed remedial measures which may include re-trimming and re-rolling of the surface. Once the Contractor has carried out any necessary remedial work, the CQA Inspector shall re-inspect the surface for approval.

4.4 Placement Criteria and General Procedures: The material, when suitably engineered to form the restoration fill will be required to conform to the criteria in Table 4.1 below

Table 4.1 Geological Barrier Acceptance Limits

Acceptance Parameter	Minimum Acceptable limits
Undrained Shear Strength	40kPa

Materials will be placed in a series of discrete (loose) horizontal layers not exceeding 275mm in thickness uncompacted and 250mm when compacted. The material shall be placed in accordance with Volume 1 of the Specification for Highway Works, Section 612 Method Compaction, as published by The Department of Transport, December 1991, reprinted August 1993 with amendments.

Haulage of suitable materials to the areas of placement shall only proceed when sufficient spreading and compaction plant is operating at the place of deposition. There shall be minimum delay between placement and compaction. All necessary measures shall be adopted to prevent desiccation, softening and contamination of material to be placed, and that has been already placed and compacted No earthmoving or other plant, which could damage the placed material, shall be allowed onto the surface of the material following satisfactory compliance testing of that section.

The CQA Engineer shall monitor the placement of the material during site visits and ensure personnel involved with the construction of the lining system have received sufficient training.

4.5 Material Conditioning: If material to be placed is in, or attains a condition (e.g. as a result of inclement weather), such that it cannot be placed in compliance with the CQA Plan requirements, then one of the following courses of action shall be undertaken:

- The affected material shall be removed and discarded and/or stored until it attains suitable condition; or
- The material shall be treated, to the satisfaction of the Engineer, by wetting or being allowed to dry, as appropriate.

Once conditioning has been undertaken and prior to placement the materials suitability shall again be assessed.

Any material frozen in stockpiles shall be removed and put to one side until thawed. Previously compacted material that has become frozen shall be removed from the earthworks and stockpiled until suitable for re-use.

4.6 Adverse Weather, Defects and Remediation: No materials shall be placed or compacted in the engineered earthworks during inclement weather conditions if, in the opinion of the CQA Engineer, trafficking over compacted or uncompacted material would prove detrimental to the construction. Any such trafficking damage caused by the Contractor shall be repaired in accordance with the CQA Plan to the satisfaction of the CQA Engineer. Inclement weather conditions may include rain, snow, freezing conditions or excessive heat as determined by the CQA Engineer on site.

Following wet weather conditions, any standing water on the surface of the construction must be removed. If instructed by the CQA Engineer, the Contractor shall remove to spoil heaps any material rendered unsuitable by wetting. Earthworks

placement operations following inclement weather conditions shall not proceed without the prior approval of the CQA Engineer.

Defects such of soft spots or failed areas in as constructed sections of the lining system are to be repaired by the contractor to the satisfaction of the CQA Engineer. Defective placed and compacted materials shall be excavated from the permanent works and replaced with fresh, compliant material. Excavations shall be suitably benched and be of sufficient width to allow for full compaction of the replaced layers. The CQA engineer shall determine the full extent of the remediation area through visual inspections of placed materials and in-situ Shear Vane testing. Any area not achieving the 40kPa minimum requirement shall be subject to remedial works.

4.7 Compliance Monitoring: As part of the Construction Quality Assurance works the CQA Engineer shall undertake reviews, visual inspections and implement field and laboratory testing. The CQA Engineer shall ensure that the:

- Material is placed and compacted in accordance with section 4.4;
- Material layer thickness and the number of plant passes conform to the agreed working method as detailed in section 4.4;
- All placed and compacted material complies with the material acceptance procedure;
- Accepted good practice techniques are employed by the Contractor to obtain bonding between lifts; and
- Should any portion of fill become desiccated, or saturated, it is removed from the works and replaced with fresh material in accordance with section 4.6

The compliance testing regime will be performed on the permanent works under the supervision of the CQA Engineer. Compliance testing shall be carried out at the frequencies shown in table 4.2 below

Table 4.2 Minimum Permanent Works Test Frequencies.

Test Parameter	Minimum Frequency	Minimum Acceptance Criteria
In-Situ Shear Strength	1/25m Grid	40kPa



The locations of all tests and samples will be selected by the CQA Engineer and marked on the as built drawings

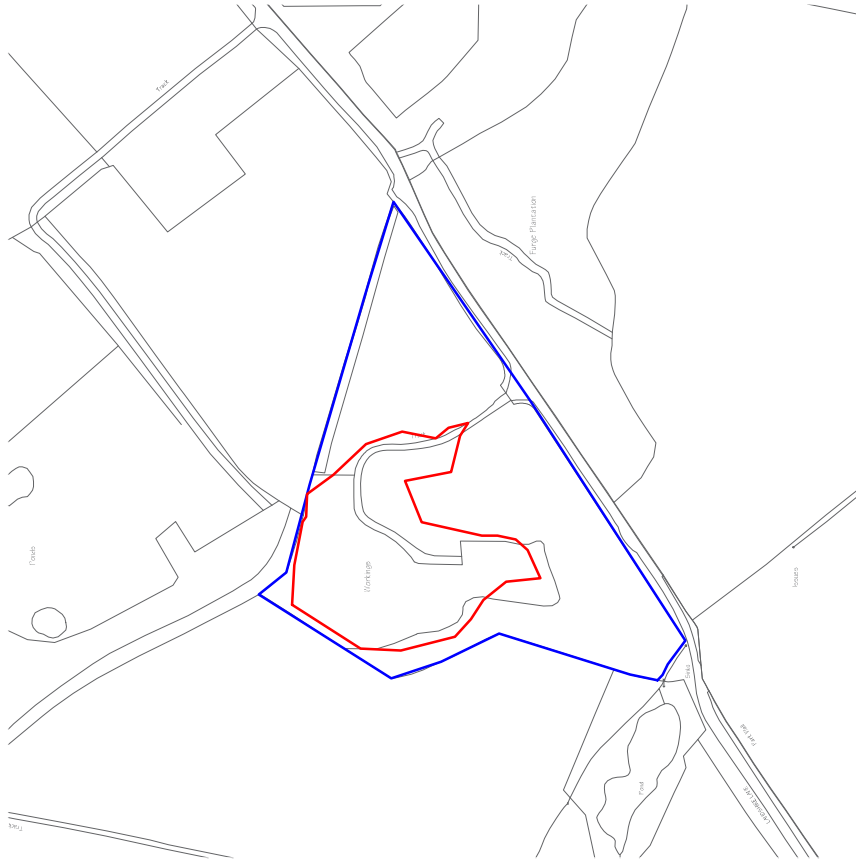
## **5 CQA VALIDATION REPORT**

5.1 Upon completion of the engineering works the CQA Engineer will prepare a Certification Report summarising the works undertaken, including all CQA documentation prepared. As a minimum, this shall include:

- Description of the Works;
- Daily Records and Completed Proformas;
- Photograph Record of Construction Works;
- Test (Laboratory & Field) Reports.
- As built Drawings showing as constructed areas of Permanent Works including sample and test locations

The above report will confirm that the works have been carried out in accordance with the Construction Quality Assurance Plan.

## **Appendix I - Drawings**



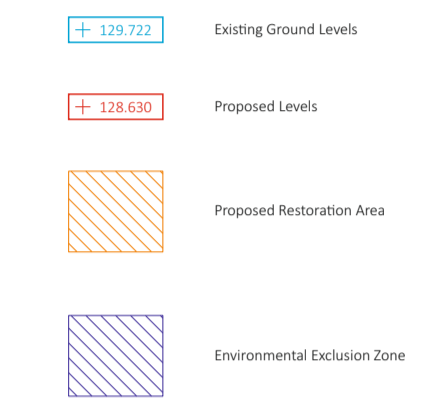
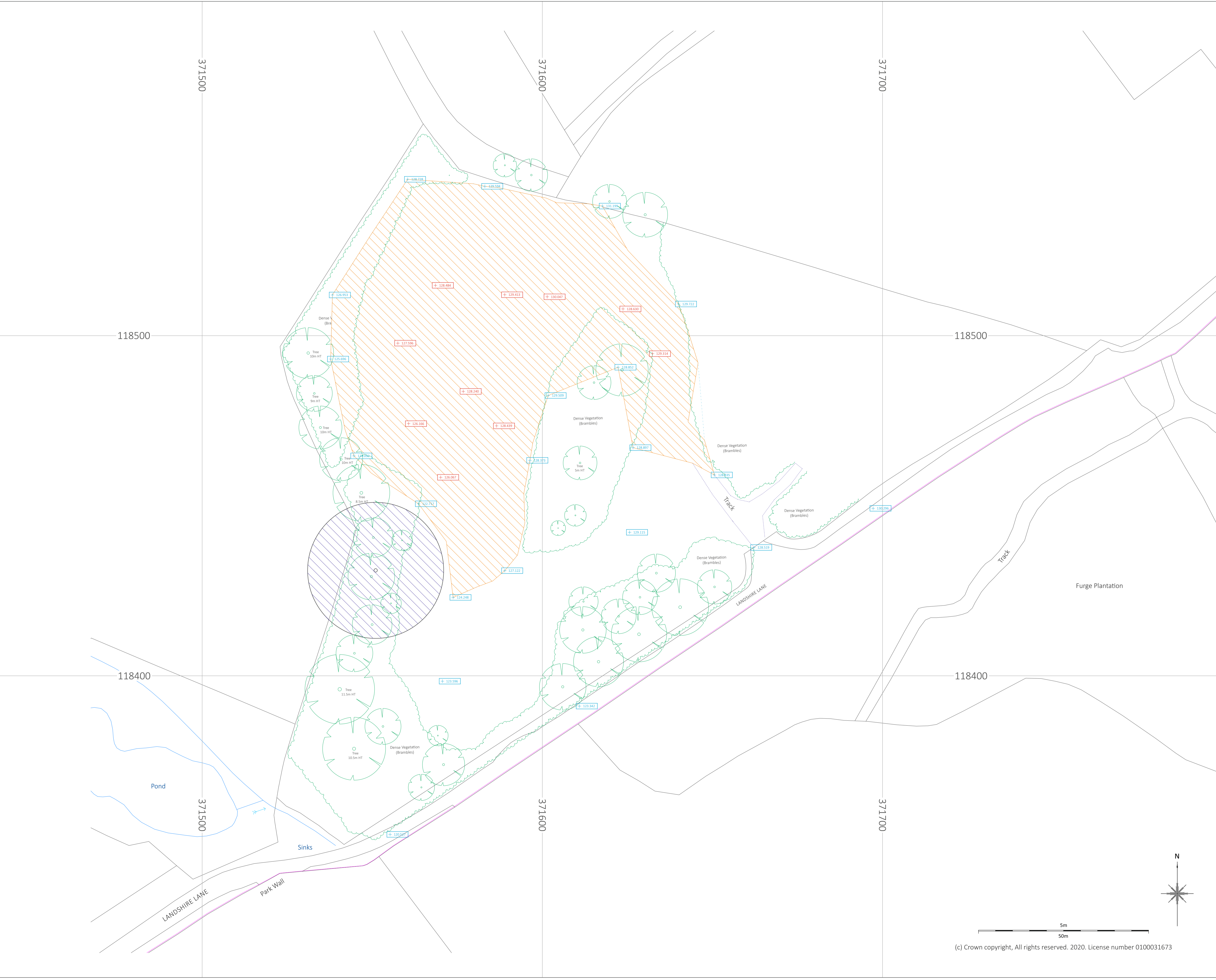
Location Plan - Scale 1:1250

**gma** 2651211  
Landscape Design  
Landscape

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Contractors must verify all dimensions on site before commencing work or preparing stop drawings.

TITLE: Location Plan  
PROJECT: COPSE COUNTRY LANDSHIRE LANE, HEBSTIDGE  
SCALE: 1:1250  
SHEET: 01 OF 1



**Abbreviations**

(A) Approximate	IC Inspection Cover
AF Angle Iron Fence	IL Invert Level
(AK) Assumed Route	IRF Iron Rail Fence
AvG Average	IRWF Inter Woven Fence
BD Bollard	KO Kerb Outlet
Bin Litter Bin	LP Ladder
Bld Building	LP Lamp Post
BW Brick Wall	Me Manhole
BS Bush	MHR Metal Hand Rail
BT British Telecom Inspection Chamber	MK Marker
BW Brick Wall	MPF Metal Post
CB Cabinet	MPRF Metal Post & Rail Fence
CBF Close Boarded Fence	OH Overhead
CDC Concrete Drainage Channel	O/S Outline
CE Concrete Edging	OSM Ordnance Survey Bench Mark
CHP Chestnut Piling	Pav Pavings
CI Cable Into Ground	PI Pipe Into Ground
CIF Corrugated Iron Fence	PL Pavement Light
CL Cover Level	RE Roading Eye
CLF Chain Link Fence	RS Road Sign
CM Cable Marker	RSJ Rolled Steel Joist
Col. Column	RW Retaining Wall
Conc Concrete	SD Silt Drain
CP Concrete Post	SE Stone Edging
CPS Concrete Paving Slabs	SecF Security Fence
CI Cable TV Inspection Chamber	Sho Service
CW Concrete Wall	SL Soffit Level
d Depth	SN Spotlight
dil Dilapidated	SN Sign
DK Drop Kerb	SV Stop Valve
DP Downwater Down Pipe	SWK Storm Valve Marker
DSW Dry Stone Wall	SWC Stone Wall
E Earth	SWC Storm Water Inspection Chamber
EC Electricity Inspection Chamber	SY Slay
EM Electricity Meter	tar Tarmac
EP Electricity Pole	THL Threshold Level
ER Earth Road	TL Traffic Light
ETL Electricity Transmission Lines	TMC Traffic Management IC
F Fence	TPS Tackle Paving Slabs
PH Fire Hydrant	TTL Telephone Transmission Line
PHMK Fire Hydrant Marker	u/g Underground
FL Floor Level	u/L Unable To Lift
Fib Flowerbed	ULF Vegetation
FP Floodlight	VP Vent Pipe
FP Footpath	W Wall
FWC Fault Water Inspection Chamber	WE Wood Edging
GM Gas Meter	WL Water Level
GMK Gas Marker	WMF Wire Mesh Fence
GP Gas Post	WMK Water Meter Marker
Gr Grass	WO Wash Out
GV Gas Valve	WP Wooden Post
Gv Gravel	WPR Wooden Post & Rail Fence
Gy Gully	
h Height	
Hc Harbours	
IB Illuminated Bollard	

**Station Abbreviations**

HN Heli Nail	PKN Parker Kalon Nail
PGM Permanent Ground Marker	WP Wooden Peg

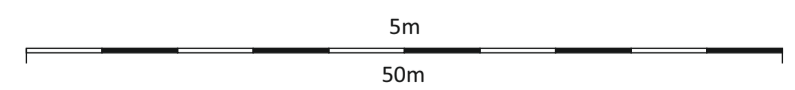
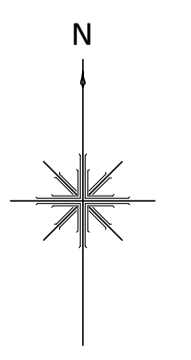
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**SCALE**  
 Information has been gathered for the quoted scale.  
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 Pipe sizes and connections are determined from surface level inspection and service records where available.

**UNDERGROUND SERVICES**  
 Any underground services shown on this survey are from information on service enquiries and tracing with Electrolocation equipment.  
 Some underground services may be undetectable, e.g. non-conductive pipes or cables and therefore NOT SHOWN

**CONTOURS**  
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 The contour line positions have been generated by ground modelling software and are INDICATIVE only.



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Date	Description	REV	
08/05/2020	Environment Exclusion Zone Added - Badger Set at Grid Ref: 571551 18431	B	
SCALE	JOB No.	DWG No.	REV
1:500 A1	RC_010420	RC_010420_05	B
PROJECT	Drawn By	D.M.	DATE
The Quarry, Landshire Lane, Henstridge			19/04/20
TITLE	DATE	DATE	DATE
Proposed Restoration Area			