Bromsberrow North Sandpit: Site Operating Plan – Extraction and Infilling

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Bromsberrow North Sandpit: Site Operating Plan – Extraction and Infilling

Prepared for

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Bromsberrow North Sandpit: Site Operating Plan – Extraction and Infilling

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Updated Quarry Development Plan – Floor at 36mAOD Cross Sections	Drawing No. 7873-005-D-004 Rev 03
Site Restoration Proposals	Drawing No. 21224.101 Rev A
Existing Site Layout Plan	Drawing No. 21-248-D-011 Rev 02
Proposed Site Layout Plan	Drawing No. 21-248-D-012 Rev 02
Services Plan	Drawing No. 21-248-D-013 Rev 01
Typical Cross Section used for SRA	Drawing No. 7873-006-001 Rev P01

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1 Introduction

1.1 Report Overview

Stantec UK Limited (Stantec) has been commissioned by Allstone Sands Gravels Aggregates Trading Co Ltd (Allstone) to prepare a Site Operating Plan (SOP) for operations at Bromsberrow North Sandpit, Bell Lane, Bromsberrow Heath, Ledbury, Gloucestershire HR8 1NX (the Site).

This SOP addresses the operation and management of both the mineral extraction and proposed restoration by inert landfill (i.e. infilling) activities at the Site.

This document is a "live" document and will be updated whenever necessary to ensure that the Site operations are described accurately.

1.2 Current Site Operations

The Site is currently a red sand quarry. The Site is being worked under planning permission as a sand pit by Bromsberrow Sand and Gravel Company Ltd (BSGC), a wholly owned subsidiary of Allstone. There are currently three planning permissions relating to the Site for development consisting of the winning and working of minerals (G1209, G1209/A and G1209/C) (Bromsberrow Sand and Gravel Company Limited, 2022). The Site has been an operating quarry for approximately 70 years.

1.3 Proposed Operations - ROMP and Environmental Permit

In June 2022, BSGC applied to Gloucestershire Country Council (GCC) for an Initial Review of planning conditions relating to the extraction of sand from the Site(Bromsberrow Sand and Gravel Company Limited, 2022). The application Site extends to approximately 5 hectares (ha).

GCC is the determining Minerals Planning Authority (MPA), and it has a statutory duty to review what are commonly referred to as 'old' planning permissions for mineral working. The process of review is referred to by the acronym 'ROMP' – Review of Old Mineral (planning) Permissions.

A total of 27 new planning conditions are proposed by BSGC within the supporting statement included within the ROMP application, which is currently being reviewed by GCC.

The proposed conditions would replace the existing conditions and address the winning and working of minerals, the importation of inert materials for restoration purposes, alongside site access, operations, noise and dust management, material storage, restoration and aftercare, landscaping, ecology, permitted development rights and record keeping.

Further development and restoration of the quarry has been divided into several phases according to the restoration plans, providing a total of 341,000 tonnes of mineral (red sand) to be extracted. Based on current rates of extraction, the end of the sand extraction is expected in 2032.

Restoration at the Site will be worked in conjunction with mineral extraction; worked out areas will be restored in lockstep with extraction over a period of 20 years to the original ground level and the Site will be returned to agricultural or amenity use. It is estimated that a total of 670,000m^3 of inert material will be imported to achieve this restoration, which is estimated to be completed by

2044. The proposed restoration of the Site is shown on Site Restoration Proposals, Drawing No.21224.101 Rev A.

The phasing described above is shown on two drawings:

- Updated Quarry Development Plan – Floor at 36mAOD (Drawing No. 7873-005-D-002 Rev 02).
- Updated Quarry Development Plan – Floor at 36mAOD Cross Sections (Drawing No. 7873-005-D-004 Rev 03).

The Site is proposed to be restored by inert landfilling under the conditions of an Environmental Permit (EP) to achieve the intended restoration profile. Stantec have sought pre-application advice from the Environment Agency (EA) on behalf of the proposed landfill operator to inform further progress on the EP application. The operator of the EP will be Allstone.

The EP being applied for will allow the progressive infilling of the former quarry void with approximately 670,000m^3 of imported waste.

1.4 ROMP Consultee Responses and Enhanced EP Pre-application advice

A number of comments have been made by stakeholder consultees on the ROMP application made by BGSC. The stakeholder consultees ('ROMP consultees') include Atkins, (acting on behalf of GCC), Severn Trent Water Ltd (STW) and the EA. Initially, both STW and the EA's responses objected to Allstone's proposals as set out in the ROMP application, principally due to the Site's close proximity to Bromsberrow public water supply (PWS) located on the northern boundary.

Allstone have been actively engaging with the ROMP consultees since receipt of their comments, with Stantec providing technical support to Allstone, principally on hydrogeological, hydrological and environmental permitting aspects. Allstone is working to address the concerns raised by the above consultees, in terms of progressing with the approval the ROMP application and ultimately the EP application. Although the consultee responses relate to the ROMP application, given the EA involvement to date as a consultee to the ROMP application, as well as the proposals to restore the site by inert landfill in accordance with an EP, Stantec have sought and received both 'basic' and 'enhanced' pre-application advice from the EA to inform the content and approach to the EP application.

The SOP seeks to appropriately detail a strategy for operations at the quarry to be protective (as much as possible) of the nearby PWS. As such, this SOP has been prepared to demonstrate how the Site will be operated for both the mineral extraction and restoration by inert landfill activities. This SOP has undergone a series of revisions as part of the ongoing dialogue between Allstone, Stantec and the ROMP consultees within a working group established by Allstone, as well as from pre-application discussions with the EA for the inert landfill EP.

1.5 Structure of the Site Operating Plan

This SOP is structured as follows:

- **Section 2 Site Location and Setting:** A summary of the Site location and setting.

- **Section 3 Management:** An overview of the management of the Site including details of lead staff, staff training and operating hours.
- **Section 4 Site Infrastructure:** Details of the proposed site infrastructure.
- **Section 5 Material Management and Placement:** summarises how material will be managed on the Site to achieve the intended landform and comply with ROMP conditions.
- **Section 6 Waste acceptance under the EP:** a summary of the waste acceptance controls that will be used at the Site under the EP.
- **Section 7 Pollution Prevention and Control:** summarises control measures to prevent and actions to be taken in the event of pollution incidents that could contaminate land and groundwater.
- **Section 8 Environmental Nuisance Control:** summarises control measures for environmental nuisance such as dust, noise and odour.
- **Section 9 Monitoring:** an overview of the monitoring to be undertaken at the Site.
- **Section 10 Site Records:** details of the records that are to be maintained during the lifetime of the Site.
- **Section 11 Exception Protocol:** an overview of the process to be undertaken for events occurring on the Site that are not covered in this SOP or in other Allstone documentation.

2 Site Location and Setting

The Site is currently an active quarry extracting red sand and is located at Bromsberrow Heath, Ledbury, Gloucestershire, HR8 1NX approximately 4.5 km south of Ledbury and 7 km northeast of Newent, close to the village of Bromsberrow Heath in Gloucestershire. The Site is centred approximately on National Grid Reference (NGR) SO 73896 33065.

The general site location is shown in Figure 2.1.

The southern boundary of the Site is adjacent to the M50 motorway which runs in a southwest-to-northeast direction, beyond which Bromsberrow South Quarry has been restored as an inert landfill. Bromsberrow Heath residential area extends from the western Site boundary. Beyond the northern boundary there is the Bromsberrow Public Water Supply (PWS) pumping station operated by STW. To the east lies agricultural land and a sewage treatment works. The surrounding land is predominantly agricultural and farm dwellings.

The elevation of the perimeter of the Site ranges between 55 and 60 metres above Ordnance Datum (mAOD), with the proposed base of the extraction at no deeper than 36 mAOD. The Site topography is generally consistent with the western surroundings; however, the land rises eastwards to form Bevanhill Coppice, to more than 75 mAOD. To the south the land also rises from the Site, ranging between 70 to 75 mAOD around Russellsend Coppice to the southeast. East and north of the coppices, the land falls to 50 mAOD in the Glynch Brook valley.

According to available mapping, there are no superficial deposits underlying the Site. The bedrock consists of the Permian Bridgnorth Sandstone Formation (sandstone), which is classed as a Principal Aquifer. The aquifer is a highly productive sandstone, with some conglomerates. Geological dip is generally southerly, and natural groundwater flow is expected to follow the dip and the regional topography, south and east towards the River Severn valley. However, more locally groundwater flow is expected to run northwards due to abstraction from the PWS to the north of the Site.

Dewatering is not anticipated to occur at the Site as the extraction of sands will remain above the water level in the base of the quarry.

There is one recorded authorised landfill (landfill sites that are currently authorised by the EA under Environmental Permitting Regulations) within 3 km of the Site. This landfill, is the Bromsberrow South Sandpit (Ryton Road Sand Quarry Landfill, operated by Terra Firma (Gloucestershire) LLP under EP Reference EPR/JP3698VP) issued on 27 January 2011 and is located beyond the M50 to the south of the Site, and is categorised as inert. Allstone is understood to be the parent company of Terra Firma (Gloucestershire) LLP.

A detailed description of the Site, its environmental and local geo-environmental setting is presented in the Environmental Setting and Site Design (ESSD) Report prepared as part of the inert landfill EP application (Stantec, 2024a).

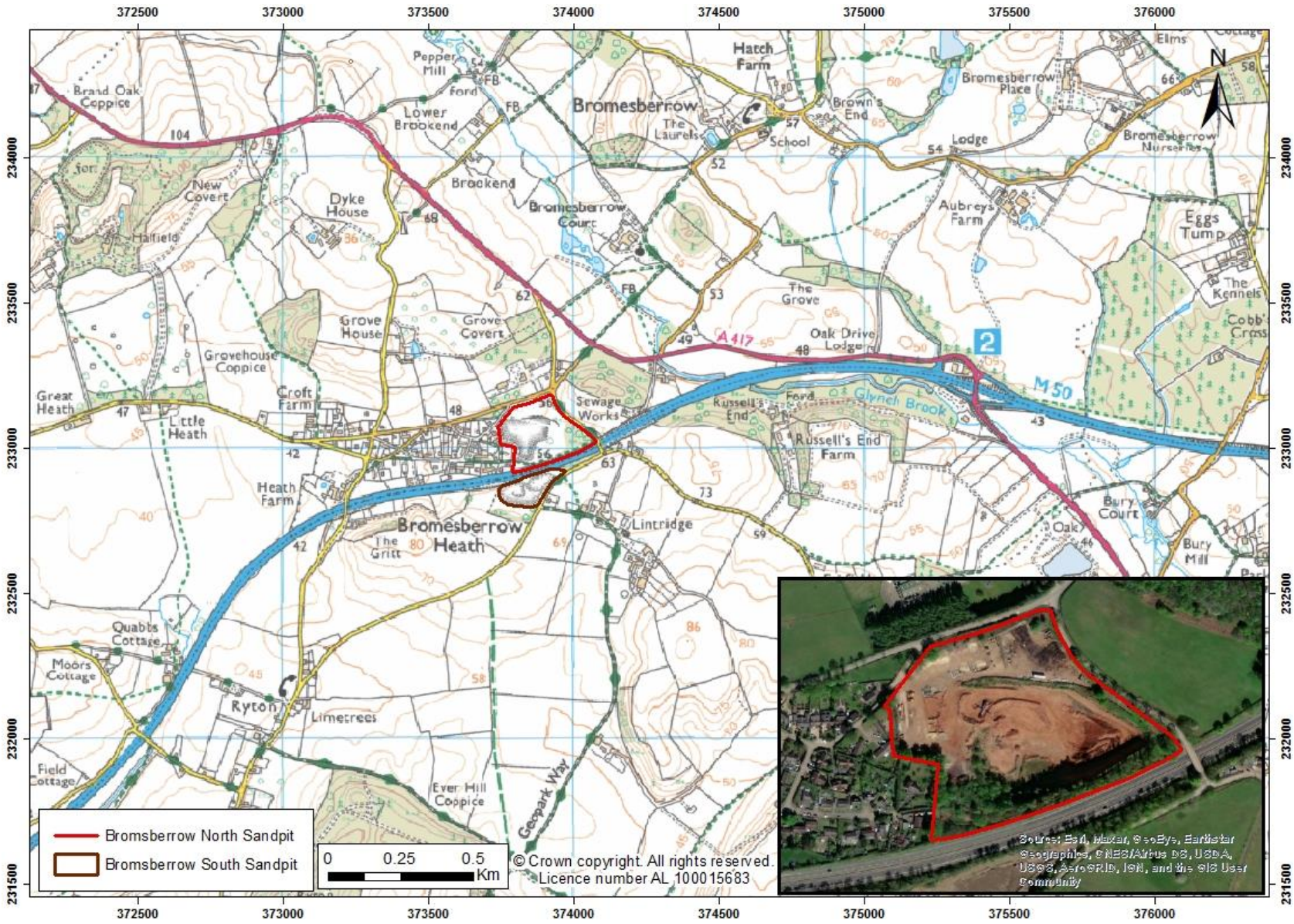


Figure 2.1 Site Location

3 Management

3.1 Management Plans

The operation of the Site is undertaken in accordance with this SOP. The Site has additional management plans and procedures set out in risk assessments to cover specific aspects including, but not limited to:

- Environmental Risk Assessment (Stantec, 2024b);
- Dust and Emissions Management Plan (Stantec, 2024c);
- Water Management Plan as set out in the Environmental Setting and Site Design (ESSD) Report (Stantec 2024a);
- Hydrogeological Risk Assessment (Stantec, 2024d);
- Flood Risk Assessment (Stantec, 2024e);
- Landfill Gas Risk Assessment (Stantec, 2024f); and
- Environmental Monitoring Plan (Stantec, 2024g).

Key information from these documents is included within this SOP, as appropriate.

3.2 Staff and Key Contacts

The Site is operated by competent staff. The Site Manager and the Technically Competent Manager (TCM) for the Site are responsible for the effective operation of the Site.

Contact details for key staff roles are provided in Table 3.1.

Table 3.1 Staff roles and contact details

Role	Key responsibilities	Name	Phone	Email
Site Manager	Overall operation of the Site. Overseeing site staff. Ensuring safety of staff and contractors/visitors	David Ambrose	Office: 01452 522751 Mobile: 07435 989931	david@allstone.co.uk
Technically Competent Manager (TCM) for EP	Responsible for operation of the proposed landfill in accordance with the conditions of the EP.	David Ambrose	Office: 01452 522751 Mobile: 07435 989931	david@allstone.co.uk
Site Supervisor	Responsible for the supervision and management of sand extraction operations and provision of training.	Josh Mitchell	01531 650319	josh.mitchell@allstone.co.uk

Operations are conducted by staff from Allstone and any contractors and visitors to the Site will be overseen by the Site Manager or their nominee on a daily basis. This includes the use of plant and equipment owned by Allstone.

3.3 Staff Training

To ensure the appropriate and successful operation of the Site it is vital for all staff to be trained in accordance with Site procedures and for this training to remain up to date. All staff will undergo induction training to understand operational processes and health and safety matters. Areas of training will be revisited via regular toolbox talks to ensure staff remain up to date with the latest proposed techniques and operations. Tailored training will be provided depending on the nature of the staff member's role on the Site.

3.4 Hours of Operation

The Site will be open between the following hours:

- 07:00 – 18:00 Mondays to Fridays.
- 07:00 – 13:00 Saturdays.

The Site will be closed on Sundays and Bank Holidays unless prior written consent has been obtained from the Local Planning Authority and/or the EA. When the Site operates during the hours of darkness during the winter months the company will provide portable electric lighting to:

- Ensure safe working conditions.
- Enable all materials deposited to be properly identified.

3.5 Health and Safety

Regulation 32 of the Health and Safety at Quarries: Quarries Regulations 1999 states that excavations should be appraised by a suitably qualified Geotechnical Professional to determine if they pose a Significant Hazard.

A minimum stand-off of 15m between the quarry operation and adjacent infrastructure to the Site must be maintained in accordance with the extant planning permissions for the Site. This distance must be maintained so that Site workings do not adversely impact adjacent infrastructure nor put Site operatives at risk.

The Site Manager is responsible for ensuring relevant health and safety regulations are complied with to ensure to safety of all members of staff and visitors to the Site.

4 Site Infrastructure

4.1 Proposed Infrastructure

Under the ROMP, the layout of the Site is proposed to be amended, with Site facilities and access being relocated from the north-west of the Site to the north / north-east of the Site. The relocation of site facilities will involve a new (three phase, 415 volt) electrical connection to the Site and a new connection to foul sewer (which runs along northern site boundary), replacing the existing foul sewer connection. The existing water connection would be retained, near the current site entrance, but storage tank(s) for water would be constructed here to provide adequate volumes of water storage for activities on site including wheel washing and dust suppression by water bowser.

An indication of the proposed layout of the Site is provided on Proposed Site Layout Plan, Drawing No. 21-248-D-012 Rev02.

For the purposes of this SOP, the layout drawings show:

- The general layout of buildings and equipment on the Site
- Access points to the Site
- Roads around the Site
- The routes of pipework
- The routes of known or suspected buried services (including water and gas)
- Fuel store
- Aggregate storage areas
- Boreholes / monitoring locations

The proposed infrastructure at the Site includes but is not limited to:

- Access from/onto Bell Lane/ Wood End Street;
- Wheel wash;
- Site office(s) including welfare facilities, kitchen, and car park;
- Road signing and lighting as required;
- Internal haul roads, principally used by plant and equipment;
- Boreholes for gas and groundwater monitoring
- Reception area; and
- Quarantine area.

The Site will be accessed from a concreted public highway via Wood End Street. A wheel wash will be located at the access/egress point in order to wash the wheels of any outgoing vehicle from the Site. All vehicles are required to use the wheel wash facility.

The weighbridge office will be located in the northeast corner of the Site, adjacent to the proposed access point from Wood End Street.

The northern and eastern boundaries of the Site are defined by 2.5m high palisade fencing along with densely vegetated scrub, native species trees and hedgerows. The southern and western boundaries are also defined with various mature trees and hedgerows. The various boundary definitions, including a 3.5m high bund along the Beach Lane boundary ensure that the majority of the Site is particularly well screened from surrounding receptors.

Aggregate storage bays are located along the northern boundary of the Site and are used for the storage of mineral from the extraction operations. The aggregate storage bays border the 3.5m bund and are constructed of "Lego" type blocks to create walls approximately 2m high. Vehicles are stored in an area to the south of the aggregate storage bays.

4.2 Utilities

Mains electricity and water is supplied to the Site. Mains water is used for the operation of the Site office and for dust suppression measures. The existing water connection, located near the current Site entrance off Bell Lane, will be retained. Mains electricity is used for the operation of the Site office and associated facilities.

The Site has an existing connection to foul sewer. The connection to foul sewer is proposed to change to the northeast of the Site. The current and proposed connections are shown on the Services Plan, Drawing No. 21-248-D-013 Rev 01.

There is no mains gas supply to the Site.

4.3 Provision of Site Identification Board

A notice board summarising the Site rules for visiting drivers will be displayed in a prominent position at the entrance to the waste reception area, and a complete set of rules will be displayed in the Site office. Copies of the site rules will be available for issue to visiting drivers.

The notice board will be constructed from durable materials and will display the following details once the inert landfill EP has been issued by the EA:

- Name and address of the facility.
- Statement that the Site is permitted by the EA and the EP reference number.
- Name, address, and telephone number of permit holder.
- The EA's national numbers for general enquiries and emergencies.
- The emergency contact and telephone number of the permit holder.
- Days and hours that the Site is open to receive waste.

The notice board will be inspected daily and checked for integrity and accuracy of information. Repairs/ alterations will be carried out as soon as possible after any defect is noted.

4.4 Plant and Equipment

The plant and equipment listed in Table 4.1 is proposed to be used at the Site in the extraction and infilling activities.

Table 4.1 Plant and Equipment Used on Site

Description	Make	Model
Terex sand screen	Terrex Finlay	Terrex 693+

Front loading shovel	Volvo	L220
23 t excavator	Hitachi	Zaxis 210LC-5B
Dozer	Cat	D6LPG
Fire engine*	Volvo	FL6 14
Road sweeper*	DAF	LF230
Telehandler	JCB	JCB550-80 WM

**This mobile plant is not kept on the Site on a permanent basis. It is brought onto the Site on an as-needs basis.*

All plant and equipment are maintained in accordance with manufacturer's recommendations and is subject to regular checks. Operation of plant and equipment is undertaken by suitably trained staff.

4.5 Substances Stored on Site

Fuel and oil will be stored on the Site to facilitate Site operations.

Fuel and oil is stored in two 10,000L double-bunded tanks on the Site. The tanks will be located on hardstanding and will be installed as part of the movement of the Site facilities to the north and north-east of the Site. The designated area will be designed so that spills, leaks, drips and contaminated run-off can be captured and properly disposed of. The refuelling area can be located within an enclosed (fenced) compound if necessary, nothing that the wider Site is appropriately secured with fencing, lockable gates and CCTV etc as outlined in Section 4.6.

Any rainwater that accumulates in the bunding will be removed regularly.

Drainage from the impermeable areas will be protected by oil/water separators as appropriate with discharge to public sewer or soakaway under an appropriate consent.

The tanks will be fitted with a 'Merridale' system, as installed to other fuel and oil tanks operated by Allstone. This system measures the fuel level from a sensor probe suspended at the bottom of the tank. The current stock and ullage are displayed on-screen. The gauge links back to a Merridale fuel management system enabling stock data to be automatically recorded and transferred back to a central computer.

Above ground storage containers are to be clearly marked with their contents and kept in good condition, including any pipework and valves, with an inspection and maintenance programme in place.

The location of the fuel and oil storage area is marked on the Proposed Site Layout Plan, Drawing No. 21-248-D-012 Rev 02.

4.6 Site Security

4.6.1 Site Boundaries and Access

The northern and eastern boundaries of the Site are defined by 2.5m high security fencing in addition to native species trees and hedgerows. The southern and western boundaries are also defined with various mature trees and hedgerows. The hedgerows and fencing are designed to restrict access to

the site, to prevent vehicular access and to discourage casual visitors. The entrance is protected by metal gates.

Once per month, all boundary fencing and hedgerows is inspected. Any necessary repairs are made as soon as possible. Any damage that exposes members of the public to significant risk or that allows unauthorised vehicular access to the site will be rectified with a temporary repair until a permanent repair can be made.

A note will be made in the Site Diary of when the inspections are carried out and a record will be made of any damage discovered and the remedial action taken.

The site entrance gates are of sufficient height to prevent easy access. The gates are kept locked at all times outside working hours. At the end of each working day the Site is checked to ensure it is secure (i.e., all gates and buildings are locked).

4.6.2 Use of CCTV

CCTV is utilised on the Site and covers all operational areas. CCTV is monitored during the operational hours by Site staff. Outside of operating hours monitoring of CCTV is provided by Glevum Security. There is also a system in place to access CCTV monitoring remotely via use of mobile phones. If a security issue is detected, then alerts are sent through to the Site Manager. Upon identification of a security issues, the Site Manager or their delegated nominee will arrange for attendance of the Site and notify emergency contacts if required.

4.6.3 Buildings

Doors will be made of substantial material and preferably metal lined. Windows will be fitted with toughened glass and be covered with bars or lockable steel shutters for protection during periods of closure.

4.6.4 Property

Keys giving access to the company's property will only be kept by persons authorised to do so by the Site Manager. A list of all keyholders and their contact details is provided in Section 7.5.

Wherever possible, one person will be made responsible for locking up.

4.6.5 Vehicles and Mobile Plant

All mobile plant will be parked securely at the end of each working day.

All vehicles and mobile plant are to be locked when not in use.

A record of serial numbers should be maintained for all mobile plant. All plant and equipment is maintained in accordance with manufacturer recommendations.

4.6.6 Documents

When not in use, all confidential papers must be kept in a locked location.

There must be no delay in reporting the theft of any confidential documents.

4.6.7 Fuel and Oil

Fuel and oil used by plant is stored on the Site. Fuel and oil is stored in double bunded tanks of 10,000 litres nominal capacity each. The tanks are to be fitted with a Merridale system as set out in Section 4.5 to ensure that overfilling does not occur. The tanks will have bund and overfill alarms fitted.

4.6.8 Visitors

Unauthorised persons are not allowed on company's premises.

Visitors must call at the Site office, identify themselves and state the nature of their business. Unless the caller is known he/she must not be allowed to find their destination unaccompanied.

Individuals will not be allowed to go onto the Site to remove material(s) unless authorised in writing.

Once authorised waste is deposited in the licensed area it becomes the property of the company and unauthorised removal is therefore theft.

4.6.9 Reports of Thefts

The Site Manager must immediately be informed of an occurrence of:

- Breaking and entering of company's premises.
- Vandalism.
- Theft from company's premises.
- Any act or suspected act of dishonesty.
- Stock or cash deficiencies.

Where an outside element is suspected the police will be called without delay.

5 Material Management and Placement

Careful handling and management of material at the Site from both extraction and infilling is key to ensure that the conditions of the ROMP and any gained EP are complied with.

All materials deposited at the Site will be placed in accordance with the Quarry Development Plan (drawing reference below) and Site Restoration Proposals, Drawing No 21224.101 Rev A.

5.1 Mineral Extraction

Aggregate storage bays are located along the northern boundary of the Site and are used for the storage of mineral from the extraction operations prior to their removal off site.

Mineral extraction will progress in accordance with the order shown on the Updated Quarry Development Plan – Floor at 36mAOD, Drawing No. 7873-005-D-002 Rev 02.

5.2 Fracture Discovery Protocol

Allstone have not identified any major fracture zones within the sandstone during their sand extraction operations at the Site to date, and none were evident during Stantec's walkovers of the site in August 2022 and September 2023. However, major fractures in the sandstone will have a permeability that is orders of magnitude greater than intact sandstone. These types of fracture zones can act as faster pathways increasing the risks of turbidity into the aquifer and so the operations at the quarry within these zones could mobilise more sediments towards the PWS.

Staff members will be trained on how to identify major fracture zones as mineral extraction takes place. Should a major fracture zone be uncovered, extraction operations will temporarily cease and the Site Manager will be informed. The Site Manager will decide the appropriate course of action to ensure the ongoing protection of groundwater.

5.3 Stockpile Management

In line with Condition 19 of the proposed planning conditions proposed in the ROMP application, all stockpiles on the Site must not exceed 4m in height in the interests of visual amenity of the locality and to prevent environmental nuisance such as dust emissions. The Site Manager will ensure that stockpiles are managed appropriately and will enforce corrective actions to re-profile stockpiles should an exceedance of 4m in height be recognised.

5.4 Surface Preparation

Before depositing waste in any new area, any vegetation that exists within the former quarry will be stripped and composted. Should it not be possible to compost the vegetation, it will be disposed of offsite at a suitably licensed facility.

Immediately prior to the commencement of construction, the base of the quarry will be graded to a reasonably smooth profile using a dozer. Any accumulations of soft silt will be removed to provide a sound formation upon which to construct the enhanced geological barrier.

5.5 Enhanced Geological Barrier – Non-waste Material

The materials that are to be used for restoration will be inert and are therefore not likely to give rise to contaminated leachate or landfill gas. A Hydrogeological Risk Assessment (HRA) has been

prepared by Stantec for the Site. The HRA has demonstrated that an engineered containment system is not required, as there is no significant source of contamination (Stantec, 2024d). However, in accordance with the requirements of the Landfill Directive, an enhanced geological barrier is required.

It is proposed that a minimum 1m thick geological barrier will be constructed over the base and the sides of the excavation prior to the placement of inert waste, which will be compacted to achieve a maximum permeability of 1 x 10^{-9} m/s. As there is no material available on the Site, imported non-waste material will be used for the barrier. The barrier clay is proposed to come from Bishops Cleeve – Charmouth Mudstone (formerly Lower Lias Clay).

If no geotechnical site investigation data are provided, or if the data are incomplete or inconclusive, the material will be accepted at the site, and will be stockpiled separately from other materials to allow it to be sampled and tested to confirm its suitability or otherwise. At least one bulk sample per 5000 m³ (approximately 1 sample per 500 loads) of incoming barrier clay will be taken and tested to check its suitability. The results from the tests will be reviewed by the Site Manager or other suitably qualified person. If the testing results show that it meets the requirements, the material will be sent to the working face to be incorporated in the enhanced geological barrier. Otherwise, the material will be removed from the storage area and incorporated in the general mass of fill.

Incoming loads will be visually inspected at the working face to confirm that the material matches the description in the site investigation reports for the clay, and any loads that do not appear to satisfy the requirement for fine grained material will be directed to the active tipping area. Acceptable loads will be incorporated in the enhanced geological barrier and laid in accordance with the details shown on Typical Cross Section used for SRA, Drawing No. 7873-006-001 Rev P01. Further detail as to the construction of the geological barrier is included in the ESSD for the inert landfill EP application (Stantec, 2024a).

Construction Quality Assurance (CQA) will be undertaken to ensure that the geological barrier is placed correctly and in accordance with the agreed specification as defined in the CQA Plan.

5.6 Placement of Waste

Detail on the waste to be accepted under the EP and the waste acceptance criteria is provided in Section 6. Acceptable material will be incorporated into the restoration within the current working area.

On arrival at the working face, the load will be deposited as directed by the machine driver. The operative(s) will inspect the load before and during deposition in the working area. If any unacceptable material is discovered it will be dealt with in accordance with the procedure detailed under quarantine, storage and rejection of restoration materials (see Section 6.3.9).

The restoration materials will be spread from the point of deposit using a bulldozer and compacted by roller with repeated passes of the machine.

All large items such as intact masonry or concrete will be placed at the base of the current working face away from the edges or flanks of the face, or the sides of the working area. Such items will not be placed within the final lift to minimise the risk of uneven surface deformation, and to ensure that they do not interfere with restoration and aftercare activities.

Each layer will be laid to a fall at a suitable gradient to ensure that excess rainfall is shed from the surface.

At the end of the working day, the working face and flanks will be compacted to slopes at a gradient less than 1(V):2(H) and the working area will be left in a neat and tidy condition.

5.7 Use of Daily and Intermediate Cover

The materials to be deposited at the Site will be inert and are unlikely to give rise to unacceptable odours, aerial emissions, or wind-blown litter. Nor are they likely to attract vermin, scavengers, corvids, or gulls. Consequently, the use of daily and intermediate cover will not be necessary. However, the working area will be graded and left in a tidy condition at the end of each working day.

5.8 Removal of Residual Material from Site

If the Site operations cease permanently, any residual material on the Site will be removed to a suitably licensed disposal facility following the restoration materials rejection procedures (see Section 6.3.9).

5.9 Site Completion and Final Landform

5.9.1 Design

All materials deposited at the Site will be placed in accordance with the Quarry Development Plan as well as the approved restoration scheme.

Only inert materials will be deposited at the site under the EP, which are unlikely to generate contaminated leachate or landfill gas. An engineered cap is not proposed for the Site; however the final deposits will be covered with a layer of subsoil and topsoil, which will limit the infiltration and provide a suitable ground for vegetation.

The restoration scheme is shown on Drawing No.21224.101 Rev A. The Site will be restored to a landform compatible with the topography of its immediate surroundings. Topographical surveys will be undertaken periodically to ensure that the achieved profile is in accordance with the proposed restoration scheme.

5.9.2 Soils for Completion

No indigenous sub-soil or topsoil is available on the Site. Therefore, suitable material will need to be either imported or manufactured to complete the restoration. Specifications for topsoil is set out in the Management Plan for Restoration and Aftercare (MHP, 2022).

5.9.3 Construction

When infilling in any area is nearing completion, profile boards will be established indicating the final restoration levels. The fill will be brought up to the final levels shown on the profile boards and graded using a bulldozer to achieve smooth contours.

The subsoil and topsoil will be placed by loose tipping using a tracked backhoe excavator to minimise compaction.

Each layer will be:

- Ripped using a winged, tined ripper at 800mm centres; ripped to a depth of approximately 400mm. Ripping will be carried out in transverse directions down slope.
- Stone picked following ripping; stones greater than 100mm will be removed.
- Trimmed to level using a low ground pressure dozer.

5.9.4 Quality Assurance

Samples of the subsoil will be taken by hand auger to verify the thickness, nature, and friability of each layer at a frequency of three per hectare; analyses will be visual to determine thickness and by hand to determine nature of soil and friability.

5.9.5 Maintenance

Restored areas will be inspected in the first spring following restoration for signs of erosion, slippage or cracking. Any defects noted will be made good as soon as practicable. Any areas requiring remediation with additional soils will be undertaken in the appropriate season. Subsoil and topsoil will only be placed when in a dry and friable condition and in periods of dry weather. In unusually dry or windy conditions, soil handling would be suspended if it appears likely that dust may be carried towards any sensitive receptors. As a temporary measure the area will be secured from further access for future repair. The EA will be informed of any action taken.

No pesticides, herbicides, fertilisers are proposed to be applied at the Site as part of the planting process.

6 Waste Acceptance under the EP

6.1 Waste Quantities

6.1.1 Maximum Capacity of Operation

The maximum capacity of the restoration is 670,000 m³.

6.1.2 Annual Waste Deposition

The maximum quantity of imported waste accepted at the Site per year will not exceed 100,000 tonnes.

6.2 Proposed Permitted Wastes

The materials listed in Table 6.1 are proposed to be accepted at the Site under the EP.

Table 6.1 List of Waste Codes

EWC / LoW Code	Description	Restrictions
10 11 03	Waste glass-based fibrous materials	Only without organic binders
15 01 07	Glass packaging Glass	
17 01 01	Concrete	Selected C & D waste only *
17 01 02	Bricks	Selected C & D waste only *
17 01 03	Tiles and ceramics	Selected C & D waste only *
17 01 07	Mixtures of concrete, bricks, tiles and ceramics	Selected C & D waste only *
17 02 02	Glass	
17 05 04	Soil and stones	Excluding topsoil, peat; excluding soil and stones from contaminated sites
19 12 05	Glass	
20 01 02	Glass	Separately collected glass only
20 02 02	Soil and stones	Only from garden and parks waste; Excluding top soil, peat

**Selected construction and demolition waste (C & D waste): with low contents of other types of materials (like metals, plastic, soil, organics, wood, rubber, etc). The origin of the waste must be known.*

- *No C & D waste from constructions, polluted with inorganic or organic dangerous substances, e.g. because of production processes in the construction, soil pollution, storage and usage of pesticides or other dangerous substances, etc., unless it is made clear that the demolished construction was not significantly polluted.*
- *No C & D waste from constructions, treated, covered or painted with materials, containing dangerous substances in significant amounts.*

Strict waste acceptance procedures will be implemented on the Site to ensure that:

- The accepted waste is on the list set out in Table 6.1;
- The waste is from a single source; and
- There is no suspicion that the material may be contaminated.

Potential incoming waste should be classified in accordance with Technical Guidance WM3 to assign the correct European Waste Catalogue (EWC) / List of Waste (LoW) code.

Accepted waste will be inert in nature and will not exceed inert WAC limits.

The waste types set out in Table 6.1 do not require WAC analysis to be provided prior to acceptance at inert landfill (as set out in the Landfill Directive) provided that the wastes:

- come from a single source
- are well characterised and described
- carry no risk of contamination, for example from a site that has not previously been developed.

The waste producer must test waste and provide the results of the analysis if the waste to Allstone if the waste has come from:

- land that has or may have been contaminated by previous use;
- a waste treatment or transfer facility; and
- any site where it is suspected that the waste may have been contaminated.

In case of suspicion of contamination (either from visual inspection or from knowledge of the origin of the waste) testing should be applied or the waste refused.

Materials that are identified as arising from multiple sources will not be accepted; neither will, for example, soils from the site of a former petrol station, since they may be contaminated with hydrocarbons.

Customers attention is drawn to these limitations and a prerequisite of acceptance is the signed declaration by the customer that the materials to be brought to the Site will comply with these requirements.

6.3 Acceptance and Control Procedures

6.3.1 Inquiry Stage

Wastes will only be accepted at the Site if they have been adequately characterised by the waste producer (Level 1, Basic Characterisation).

Allstone's acceptance and control procedures will be explained to all new customers, including the need to carry out the Basic Characterisation requirements of the Landfill Directive.

Both new and existing customers will be required to provide Allstone with the necessary Basic Characterisation information in advance, in the form of a signed declaration. Basic characterisation will include:

- Source and origin of the material;
- Information on the process producing the material (description including Standard Industry Classification (SIC) code and characteristics of raw materials and products);
- Description of any treatment applied in compliance with Article 6(a) of the Landfill Directive or a statement of reasons why such treatment is not considered necessary; data on the composition of the material and, where relevant, the leaching behaviour of the material;
- Appearance of the material (smell, colour, physical form);
- EWC / LoW code – with a waste classification having taken place in accordance with Technical Guidance WM3;
- Information to demonstrate that the material is not prohibited;
- The landfill class at which the material may be accepted; and
- Any additional precautions to be taken at the Site.

The customer will also certify that the material:

- Cannot practically be recycled or received;
- Does not consist of or contain any materials that are described in Article 5 (3) of the Landfill Directive (banned wastes);
- Consists only of material that is in Table 6.1;
- Does not contain components/parameters that exceed the standard inert WAC limits
- Only comes from a single source;
- Does not contain material that is suspected of being contaminated; and
- Does not come from a stockpile where dilution or mixing of other unauthorised waste may have occurred.

If, after consideration of the basic characterisation information, the material is not considered acceptable the customer will be informed so that they can seek an alternative disposal site.

In either case, the Site Clerk will be informed so that they are aware that the material has been approved for acceptance (subject to its on-site verification at the reception area and tipping face) or rejected as being unacceptable for disposal at the site.

6.3.2 Reception at Site

Drivers of all vehicles delivering inert material for the restoration of the site must report to the site office to disclose the nature of the material they are carrying and provide the relevant documentation.

The site office is manned by the Site Clerk who will record the movement of vehicles to and from the site and identify the loads they are carrying. The Clerk will complete Transfer Notes and site dockets and is responsible for their safe storage. Waste Transfer Notes will be made available for inspection by representatives of the EA on request. In line with the proposed ROMP conditions, there will be no more than 60 heavy goods vehicle movements to and from the Site per operational day (30 incoming and 30 outgoing).

The Site Clerk will ensure that a fully completed Waste Transfer Note is received for every load (unless part of a multiple consignment) and includes the appropriate EWC/LoW code.

For each load of material delivered the delivery driver will be issued with a receipt.

Only authorised carriers and exempt authorities will be allowed on site. Any new carrier must provide evidence of registration (registration certificate or official copy certificate) before being allowed to deposit their loads of waste. In addition, occasional checks of carriers who regularly use the Site will be carried out to check that their registration is still current.

6.3.3 On-Site Verification

Reception area

All loads of inert materials delivered to the Site will be visually inspected at the reception area (where practicable) and again when the material is deposited at the tipping face. The objective of this inspection is to detect the presence of unauthorised materials.

Vehicles that arrive sheeted will normally be unsheeted at the reception area for inspection. A notice will be erected to tell drivers where vehicles must be unsheeted.

In windy conditions or where the nature of the load may give rise to wind-blown dust the vehicle will remain sheeted until it reaches the tipping face and the clerk will contact the dozer driver by radio with details of the vehicle, to ensure that the load is properly inspected at the tipping face.

Loads that appear acceptable after inspection at the reception area will be directed to the tipping face. If the Site Clerk's inspection detects any unauthorised material, it will be dealt with in accordance with the restoration material rejection procedures.

The Site Clerk and machine operator will use two-tray radios so that the visual inspection and cross-checking of any load can be carried out. The Site Manager or their nominee will also carry a radio so that they can be made aware of potential problems at the earliest opportunity. This might, for example, be the arrival of a delivery containing unauthorised materials. The Site Manager will then be able to ensure that such materials are handled safely and removed from site as soon as practicable.

After inspection of the load the Site Clerk will sign the Waste Transfer Note to confirm that the details are correct. If inspection is not possible in the reception area, the clerk will only sign the Waste Transfer Note when the vehicle returns to the reception area after the deposit of the material has taken place.

Tipping Face / Deposit Area

On arrival at the working area the load will be deposited as directed by the operative(s) at the face.

The operative will observe every load as the waste is deposited from the delivery vehicle.

If the inspection detects any unacceptable material, it will be dealt with in accordance with the restoration material rejection procedures below.

6.3.4 On-Site Verification Testing (Level 3 Characterisation)

Only wastes that are listed in Table 6.1 will be accepted and do not exceed standard inert WAC limits will be accepted under the inert landfill EP.

Allstone are required to sample and test the incoming waste periodically to ensure that the waste accepted is as described in the accompanying documentation. The frequency of such testing is set out below:

- For **homogeneous** waste (waste containing the same of similar components), each waste stream or waste source will be sampled and tested once a year.
- For **heterogeneous** waste (waste containing a range of different components) and **new** wastes, each waste stream or waste source must be sampled and tested three times a year.

If the gained testing results shows that the waste should not have been accepted under the EP, then Allstone must report this to the producer of the waste so that they can review and refine their basic characterisation. The waste must be removed from the site and the Site's local EA officer most be notified of failed samples. If the waste cannot be removed, then Allstone will provide an explanation to the EA what effect this waste will have to the local environment.

6.3.5 Multiple Consignments

Customers may use a "season ticket" to cover the delivery of multiple loads for a period of up to 12 months providing the material is from the same source and is consistently the same type (i.e. its composition does not change). Allstone requires that the haulier supply some form of documentation for each load of the multiple consignment that records the following information:

- Place of origin
- Description of the material
- Person delivering the material (and Vehicle Registration No.
- Date of the delivery.

This paperwork will be stored and attached to the multiple consignment note when the contract is completed.

6.3.6 Waste Rejection Procedure

If the Site Clerk finds that the material on the vehicle at the reception area does not comply with the conditions of the EP, the material will not be accepted. The driver will be issued with a Rejected Materials Form and asked to leave the site.

If during or after deposit, the operative observes the presence of a significant quantity of unacceptable material they will alert the driver and, if possible, reload the unacceptable material onto the delivery vehicle.

If the vehicle has left the working area, the operative will contact the reception area by portable radio and inform the Site Clerk who will detain the delivery vehicle at the site office if possible.

The Site Clerk will inform the Site Manager or their nominee who will then inspect the load with the delivery driver and, where practicable, ensure that the unacceptable material is a returned to the producer.

Where the delivery vehicle has already left site, the unacceptable material will be isolated or moved to a temporary storage location if safe to do so. Unacceptable material is not to be covered with other material.

The carrier will then be offered the opportunity to remove the material. If the carrier is unable to collect the material, it will be re-loaded into a suitably safe container on their behalf. The material will then be consigned to an alternative disposal facility that is authorised to receive such material, using a registered (and reputable) waste carrier.

Materials that have been deemed unacceptable will be removed from the site within 5 calendar days of receipt.

Each load of material dispatched from the site will be accompanied by a Waste Transfer Note.

The Site Manager or their nominee will record the incident in the Site Diary and inform the producer and carrier with the issue of a Rejected Materials Form. Where unauthorised materials are received for a second time from the same producer a warning letter will be issued to the producer in addition to the Rejected Materials Form. Any further receipt of unauthorised material will result in the issue of a letter prohibiting the producer's use of the site.

Copies of Rejected Materials Forms and letters issued to customers will be stored securely and filed with other relevant contract documentation.

6.3.7 Duty of Care

Section 34(1) of the Environmental Protection Act 1990 imposes a Duty of Care on any person who imports, produces, carries, keeps, treats, or disposes of controlled waste, which includes the restoration materials to be used at the Site. The Duty of Care came into force on 1st April 1992 by way of The Environmental Protection (Duty of Care) Regulations 1991.

The Regulations require an adequate description of the materials to be provided and a Waste Transfer Note to be completed, signed and kept by the parties to a transfer. There are, however, some circumstances where a carrier will not provide a transfer note for each load (e.g. where the load is part of a regular consignment). To ensure that each load received can be accounted for, Allstone will arrange the site receipt docket in a way that it duplicates the information required by the transfer note. The Duty of Care is therefore complied with in all respects providing an adequate description is received from the carrier, a site receipt docket is duly completed, and a copy given to the carrier.

Waste Transfer Notes and waste transfer information will be kept in a safe place for a period of at least two years, to allow inspection by the EA, in accordance with the Duty of Care Regulations.

The duty of care waste transfer note will state the:

- Name and address of the waste holder or producer
- The Standard Industry Code (SIC) of the producer
- Name and address and registration number of the waste carrier
- Name and signature of the person transferring the waste
- The contents/ type of the waste
- The weight of the waste (if appropriate)
- The EWC / LoW code
- A description of the waste
- Date of transfer
- The containment of the waste (e.g. Loose, sacks, drum)

- Duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

The information required on a landfill receipt docket will be the:

- Name of the Site
- EP number
- Name of Licensing Authority
- Customers trading title and address
- Waste description and LoW code.
- Source of the waste by district
- Customers order number if available
- Transfer note number
- Date and time of delivery
- Name and signature of the company's representative (Name: The initials and surname of the person raising the ticket must be entered in block capitals. Signature: signature of the person raising the ticket).
- Vehicle owner (enter the full name of the vehicle owner if different from the customer.
- Vehicle registration number (enter the full vehicle registration number).
- Carrier's registration certificate number and registering authority. (Every haulage company must have their own registration number. Vehicles will not be allowed access to the site if they are found operating with another person's registration number. Care must be taken to ensure that only registered carriers are allowed on site and that genuine registration numbers are recorded).
- Quantity of waste deposited.
- Driver's name and signature – Enter the initials and surname of the driver in BLOCK CAPITALS. Ensure the person in charge of the vehicle signs the ticket.

6.3.8 Documentation Procedure

One receipt docket must be issued for every load deposited.

Only authorised carriers and exempt authorities will be allowed on site. A check must be made against the list of registered carriers where the owner of the vehicle is identifiable. Where the carrier is not listed and where the vehicle is not identifiable the original or authenticated copy of the registration must be seen, and the Site Clerk must satisfy her/himself that everything is in order before allowing the driver and vehicle to proceed.

The third copy of each ticket will be given to customers at the time of deposit. The top copy ticket will be sent to Allstone's head office with a completed daily record sheet leaving the second (carbon) copy on site.

6.3.9 Quarantine, Storage and Rejection of Materials

If the Site Clerk finds that the material on the vehicle does not comply with the conditions of the EP, the material will not be accepted on site. The driver will be asked to leave the Site and advised to deliver the material to a suitably licensed disposal facility.

If, during, or after deposit, the operative observes the presence of unacceptable material they will alert the driver and, if possible, reload the unacceptable material onto the delivery vehicle. Unacceptable material is not to be covered.

If the vehicle has left the working area, the operative will inform the Site Clerk who will detain the delivery vehicle at the Site office if possible.

The Site Clerk will inform the Site Manager or their nominee who will then inspect the load with the delivery driver and, where practicable, ensure that the unacceptable material is returned to the waste producer.

Where the delivery vehicle has already left site, the unacceptable material will be isolated or moved to a temporary storage location if safe to do so. A load holding area for unsuitable loads will be provided on site. The exact location of this area may vary depending upon factors such as current tipping areas and health and safety. The location of the load holding area will be notified to the EA.

The carrier will then be offered the opportunity to remove the material. If the carrier is unable to collect the material, it will be re-loaded into a suitably safe container on his behalf. The material will then be consigned to an alternative disposal facility that is licensed to receive such waste, using a registered (and reputable) waste carrier.

Materials that have been deemed unacceptable must be removed from the Site within five calendar days of receipt.

If a load is rejected, a load rejection record must be issued, and a copy of the record retained on site. The reason for rejection must be given. The rejection certificates shall be made available for inspection by the EA on request. The rejection of a load should also be recorded in the Site Diary.

7 Pollution Prevention and Control

7.1 Pollution Risk Overview

This section of the SOP discusses control measures to prevent and actions to be taken in the event of pollution incidents. Potential causes of pollution incidents from the operations that could have an impact on the local community or the environment (including Bromsberrow PWS) may include:

- Acceptance of unauthorised wastes;
- Arson / vandalism;
- Equipment failure and plant breakdown;
- Failure of geological barrier;
- Failure of services to the Site;
- Fire;
- Flooding and extreme weather;
- Leaks and / or spillages; and,
- Waste slippage and stability issues.

Table 7.1 sets out the following for each potential incident:

- Examples of the type of incident;
- The consequences of that incident occurring;
- Preventative mitigation measures in place to reduce the potential of that incident occurring; and
- Remedial mitigation measures in the event of that incident.

It should be noted that “environmental nuisance” incidents such as emissions of dust, noise and odour are considered separately in Section 8 of this SOP.

Table 7.1 Potential incidents, mitigation measures and actions

Potential incident	Example of potential accident	Consequences of the accident happening	Preventative mitigation	Actions Remedial mitigation
Acceptance of unauthorised wastes under inert landfill EP	Acceptance of unauthorised waste containing combustible material Acceptance of unauthorised waste above the inert WAC limits set in the waste acceptance procedures.	Rogue loads may result in accidental acceptance of hazardous substances or materials. This could lead to fires and the release of smoke and contaminated fire water. Contamination of land and groundwater.	Strict waste acceptance procedures are in place to ensure that only acceptable wastes will be accepted onto the Site. Unauthorised waste may be identified at: - The weighbridge while checking accompanying documentation; - At the weighbridge during visual checks; - During offloading of the waste; and - Post-offloading of the waste. Where possible. Unauthorised material should be loaded back onto the delivery vehicle if safe to do so, or temporarily quarantined until efforts can be made to remove from the Site. Staff will be trained in accordance with procedures within the Environmental Management System (EMS) developed for the Site.	Waste acceptance and rejection procedures within this Operating Plan set out what to do in the event of unauthorised wastes being accepted at the Site. Should unauthorised waste be accidentally accepted and deposited in the void, then the Site Manager should be informed and the EA must be contacted. Where possible and identifiable, the waste should be excavated and removed from the Site. The EA will inform of any other corrective actions that should be taken. If it is considered that the accepted waste could pollute groundwater, then STW at Bromsberrow PWS must be notified at the earliest opportunity with details of the incident and any corrective actions. If caused by staff error, refresher training should be provided or training should be amended.
Arson / Vandalism	Unauthorised entry and tampering of malicious damage to plant and equipment.	There is the potential for arson or vandalism to result in fires and spillage of polluting liquids. Arson and vandalism could also lead to plant and equipment stored on the Site to be damaged and become unsuitable for Site operations. Arson could cause particular concern to sensitive receptors such as residential dwellings, the M50 motorway and Local Wildlife Sites if the fire was to spread / generate significant smoke.	The Site is manned during working hours, and outside of working hours is secure and monitored with CCTV. The Site will be securely locked at the end of each working day. Plant and equipment securely parked / stored at the end of each working day. Vehicles locked when not in use. Boundaries inspected on regular basis for security checks. Damage to fences/boundaries when access could be gained is remedied at the earliest opportunity. Any damage that exposes members of the public to significant risk or that allows unauthorised vehicular access to the site will be rectified with a temporary repair until a permanent repair can be made Staff will be trained in accordance with procedures within the EMS for the Site. It should be noted that extant security measures are deemed effective as the Site has not previously been known to have regularly been the subject of unauthorised entry.	In the event of arson inside working hours, there is fire equipment on site to deal with small fires, however the emergency services should be called in any case. The Site Manager must immediately be informed of an occurrence of: - Breaking and entering of company's premises. - Vandalism. - Theft from company's premises. - Stock or cash deficiencies. Damage caused by unauthorised entry will be rectified at the earliest opportunity. Damage of plant or fuel and oil storage will be checked as soon as possible to confirm whether there are any spillages/leaks (see "Leaks and/or spillage" for additional actions if identified) Collaboration with emergency services (if required) on potential actions to prevent event reoccurring. If caused by staff error, refresher training should be provided or training should be amended.
Equipment failure and plant breakdown	Leakages; due to faulty pipe work, valves, over pressure, blockages, corrosion, severe weather, ground movement and so on. Puncture; of vessels and tanks etc. due to impact – such as forklift trucks. Excessive dust emissions and noise emissions from malfunctioning plant and equipment	Contamination of land and groundwater. Potential for increase in dust emissions from malfunction plant and equipment to nearby sensitive receptors (including residential dwellings within 10m of the Site boundary) Potential for increase in noise emissions from malfunction plant and equipment to nearby sensitive receptors (including residential dwellings within 10m of the Site boundary).	All plant and equipment must be maintained in accordance with manufacturer's recommendations. Mobile screening plant will effectively be 'static' during the next stage of extraction, in its current location several meters above the base of the excavation. This will allow construction of an impermeable surface (concrete slab) upon which the screening plant will be placed, with a low bund around the edge of the concrete to prevent runoff of potentially contaminated surface water. The impermeable surface will prevent leaks or spills of fuels/oils, etc., from the operation and/or refuelling of the screening plant reaching groundwater beneath the site. Any contaminated water that collects in this area will be removed and disposed of appropriately. Regular visual inspections recorded of plant and equipment. Fuel storage tanks and vessels generally located within secondary containment facilities. Movement of materials and vehicles/plant using safe techniques. Staff will be trained in accordance with procedures within the EMS for the Site at EP issue.	Use of spill kits in the event of a fuel spillage. Temporary cessation of related operations. Site Manager must be informed. If plant and equipment must be replaced, then a replacement will be sourced as soon as practicable. If caused by staff error, refresher training should be provided or training should be amended. Any contaminated water that collects on the impermeable surface within the bunding will be removed and disposed of appropriately.

Potential incident	Example of potential accident	Consequences of the accident happening	Preventative mitigation	Actions Remedial mitigation
Failure of geological barrier	Damage to the artificially enhanced geological barrier could occur as a consequence of either mechanical actions (i.e. accidental damage from machinery, vehicle movements etc.) or from land movements, resulting in possible loss of containment	Lateral migration of landfill gases beyond the boundaries of the Site: Direct releases to atmosphere across the restored area have the potential to pose health risks to site occupants, including employees within the site office building and weighbridge plus any plant operatives. Potential for impacts on vegetation within the neighbouring land area due to landfill gas migration.	Construction of geological barrier in line with restoration scheme. Materials that satisfy the acceptance criteria for inert waste will be chemically suitable for use in the enhanced geological barrier. Any geotechnical site investigation data provided by the customer will be reviewed by the Site Manager or other suitably qualified person to determine whether imported material meets the requirements. Landfill gas generation will be controlled through appropriate waste acceptance procedures which will ensure that no fill materials likely to generate landfill gas will be accepted. Monitoring of ground gases (including flow rates) and groundwater. Staff will be trained in accordance with procedures within the EMS for the Site.	Should the monitoring identify a significant gas flow, a quantitative risk assessment will be undertaken. The risk assessment will conclude with an explanation of the potential impact of the gas on the environment and human health, with recommendations for any remedial action if it is considered necessary. A course of action will be agreed with the EA. If caused by staff error, refresher training should be provided or training should be amended.
Failure of utility services	Potential lack of water for dust suppression measures and activities other than those covered by the EP.	Increase in dust emissions from Site operations to nearby sensitive receptors.	No preventative measures to stop the failure of services as this is outside the control of the operator.	Step-by-step procedures in the event of an accident will be set out in the EMS at EP issue. Staff are trained in accordance with procedures within the EMS for the Site. Contact local suppliers in the event of a failure of supply using Emergency Contact details.
Fire	The following potential sources of fire have been identified/: • Arson • Electrical faults • Vehicle engine overheating • Hot exhausts on plant / equipment or malfunction of plant / equipment. • Cross-contamination of material from leaks and spillages of oil /fuel • Discarded cigarettes etc.	Fire on the Site could lead to releases of smoke and contaminated fire water.	Strict waste acceptance procedures are in place to ensure that only acceptable wastes will be accepted onto the Site. No materials will be burned on the Site. All mobile plant will carry a fire extinguisher and will be inspected and maintained in accordance with the plant maintenance schedule to mitigate any potential fires. Procedures included in the EMS ensure that the likelihood of a fire breaking out from an engine overheating remains low. Staff will be trained in accordance with procedures within the EMS for the Site. No smoking policy enforced on the Site.	Fire extinguishers in mobile plant and Site Office can be used on small fires if safe to do so. Staff are trained on the use of fire extinguishers. If appropriate, the fire engines owned by Allstone can be brought to Site to assist with issue. In the unlikely event that a fire does occur that cannot be safely dealt with using the on-site equipment, the local fire service will be called using 999. Fire and rescue services will be informed of key Site contacts to call if they attend the Site and it will be confirmed with them that fire retardant additives are not to be used where these would present risks to groundwater from contaminated runoff. Drainage channels on the Site will be blocked off and/or diverted to prevent contaminated run-off entering the base of the excavation, with any impounded contaminated water being collected and disposed of appropriately offsite by a specialist contractor (see Key Contacts). If caused by staff error, refresher training should be provided or training should be amended.
Flooding and extreme weather	Flooding of the Site from excessive surface water. High winds at the Site Lack of rainfall for substantial periods (in the event of a drought)	Flooding of the Site could lead to contaminated waters being washed off Site. The Site is located within Flood Zone 1, which means it has a low probability of flooding from rivers. There is also low risk of flooding from surface waters in the vast majority of the Site. However it should be noted that the base of the quarry is at high risk of flooding from surface water in some areas.	Monitoring of weather conditions by way of reviewing weather forecast. Dust mitigation measures such as use of water suppression may be utilised in the event of high winders and lack of rainfall.	Should there be a belief that contamination of raw materials, land, groundwater and watercourses with flood water has occurred, then the EA should be contacted to investigate remedial options. Dust remedial mitigation measures such as cessation of activities and use of water suppression can be utilised in cases of dry and/or windy weather.

Potential incident	Example of potential accident	Consequences of the accident happening	Preventative mitigation	Actions Remedial mitigation
		Extreme weather could lead to a loss of containment through freeze-thaw (see Leaks and spillages) and increased dust emissions from drought / high wind conditions. Contamination of raw materials, land, groundwater and watercourses with flood water. Dust emissions are more likely in windy conditions. Therefore there may be higher dust emissions from the Site operations from windwhipping etc. Dust emissions are more likely in dry conditions.		
Leaks and/or spillage	Spillage during delivery of oil or fuel. Spillages during refuelling of plant and equipment. Slow seepage of liquids from imported wastes. Slow seepage can be less noticeable than spills. Failure of fuel / oil containment facilities due to land movement, impact, corrosion and so on. Cross-contamination	Contamination of land and groundwater	All fuels and oils used by Site plant will be brought to the facility by mobile bowser when required. Fuel and oil is stored on the Site in two 10,000 litre double-skinned tanks. Double-skinned tanks will have an outer skin with a capacity of 110% of the inner skin. The tanks are fitted with level gauges to ensure that they are not overfilled. The tank will have a system for checking for leaks in the inner skin and will be protected from vehicle damage by a metal impact bar or concrete bollards of appropriate height. Mobile screening plant will effectively be 'static' during the next stage of extraction, in its current location several meters above the base of the excavation. This will allow construction of an impermeable surface (concrete slab) upon which the screening plant will be placed, with a low bund around the edge of the concrete to prevent runoff of potentially contaminated surface water. The impermeable surface will prevent leaks or spills of fuels/oils, etc., from the operation and/or refuelling of the screening plant reaching groundwater beneath the site. Any contaminated water that collects in this area will be removed and disposed of appropriately. Drip trays are also utilised to prevent spillage of fuel and oil. Plant and equipment are refuelled in designated areas within the Site boundary. Prior to commencing refuelling, the plant operator must check the level of fuel remaining in the tank and determine the amount to be delivered. During refuelling operatives must remain with the plant being refuelled and must not leave the delivery hose running unattended. Inspect and validate all incoming wastes. Ensure no liquid wastes are present. Stringent waste acceptance procedures will ensure no contaminated wastes are accepted on Site. Inspections of fuel and oil storage tanks for loss of integrity. Procedure for contractors to work on Site including induction training and permit to work. Fail-safe filling systems. Staff will be trained in accordance with procedures within the EMS for the Site. Mobile plant deployment is continually reviewed based on the latest technology and effectiveness. This will include the use of electrically powered equipment, which would serve to greatly reduce and in some cases eliminate the risk of leakages and spillages.	For small spillages, spill kits will be used and the affected area may be excavated immediately and removed for disposal at an appropriately licensed facility. The Site Manager will: • Ensure that the floor and walls of the bund are impervious to the contents of the tanks, drums, or containers and that all inlet, outlet and vent pipes are directed downwards and, together with gauges, within the bund; • Ensure that all hosing is kept within the bund walls; • Inspect the bund or outer skin daily and record in the Site Diary any damage and action taken for repair; • Keep the bund empty of liquid and ensure that any liquid removed from the bund is disposed of to a suitably licensed site, or with the approval of the appropriate Statutory Water Undertaker, to foul sewer; • Maintain any storage tanks or containers and bunds in good condition throughout the life of the site. For larger spillages, the remedial measures and actions must be implemented as quickly as possible to prevent potential impact on the groundwater (see Section 8 for Hydrogeological Considerations): • Site operative should inform the Site Manager immediately of the accident and its nature. • Efforts should be made to reduce the impact of the accident wherever possible, via use of spill kits if it is safe to do so. The Site Manager, or his delegated nominee, will provide direction on this. • The contaminated ground will be excavated immediately and temporarily stored in impermeable containers (e.g. skips) retained on the Site for that purpose. • The Site Manager should inform the Relevant Authority and STW at Bromsberrow PWS without delay (see Emergency Contacts). For example, the EA should be informed without delay following the detection of: • Any malfunction, breakdown of failure of equipment or techniques, accident or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution.

Potential incident	Example of potential accident	Consequences of the accident happening	Preventative mitigation	Actions Remedial mitigation
				• The breach of a specified limit in the permit. • Any significant adverse environmental effects • Where appropriate, the Site Manager should inform the police, fire service, or other relevant service. • Where appropriate, the Site Manager will contact or instruct his delegated nominee to contact neighbouring properties. • The Site Manager should inform Allstone head office as soon as possible of all accidents where a Relevant Authority has been notified. • The Site Manager should initiate the appropriate action, with advice from Allstone head office where necessary, and agreement should be sought from the Relevant Authority • The excavated contaminated materials will be sent off-Site to an appropriately licenced facility for treatment and/or disposal with records maintained of the volume of material removed, details of the containment(s) and any laboratory testing carried out and the appropriate 'duty of care' documentation for the off-Site waste transfer. • The excavated area would be reinstated in accordance with Site operational requirements using Site-won uncontaminated materials (e.g. clean sand). The plant and other equipment required to remove and store contaminated excavated materials will be readily accessible on Site at all times. If spillage/leak is a result of tank/plant/equipment issue, then the tank/plant/equipment should be repaired or replaced at the earliest opportunity. Review of spillage procedures and if caused by staff error, training should be provided.
Waste slippage and stability issues	Failure of slopes in the restoration of the Site Failure of geological barrier due to instability. Loss of containment of waste.	Contamination of land and groundwater	The geological barrier and infill waste will be placed in accordance with the details in Section 5 . Construction Quality Assurance will be undertaken on the placement of the geological barrier. The waste materials will be placed in compacted layers of thickness appropriate for the material being deposited; the maximum anticipated layer thickness is 1m with maximum lift heights of 2m and with temporary slopes in the waste no steeper than a 1v in 2h gradient. The regrading works will be surveyed following completion to ensure compliance with proposed design. Monitoring during construction will comprise construction quality assurance to ensure compliance with the construction specification. The working areas of the Site will be graded and left in a tidy condition at the end of each working day. Site personnel to undertake daily inspections of the waste mass to confirm its stability, a written record of all inspections to be maintained. Staff will be training on placement of material in accordance with the Site EMS.	The Site Manager will be informed immediately if stability issues / waste slippage is identified on the Site and operations in the area of the potential issue will be paused while the situation is assessed. The EA should be consulted to identify remedial actions if deemed necessary. If caused by staff error, refresher training should be provided or training should be amended.

7.2 Key Hydrogeological Considerations

A Hydrogeological Risk Assessment (Stantec, 2024d), Flood Risk Assessment (Stantec, 2024e) and Hydrogeological Impact Assessment (Stantec, 2022) has been prepared to consider the potential hydrogeological impacts of the proposed operations at the Site. The entirety of the Site lies within Zone II of the SPZ for Bromsberrow PWS, with the northern boundary lying immediately south of SPZ Zone I. If the source had to be removed from supply, for example due to aquifer contamination, then this would affect over 20,000 properties.

The key sources of contamination that could be released during the operational and restoration phases of the Site have been recognised during extant HRA work as:

- Turbidity arising from site activities during the operational phase. Turbidity in infiltrating water has a direct link with bacterial loading and as such there are strict limits on source water turbidity at the PWS.
- Contamination of infiltrating water due to fuel spills or seepage of infiltrating water from a restored area into the quarry void during the operational phase.
- Infiltration of water through the landfill engineering and unsaturated zone during the post-operational phase.

The conceptual model for the Site indicates that local groundwater flows northwards beneath the Site, towards the nearby Bromsberrow PWS.

There are a number of preventative and remedial mitigation measures proposed to be used at the Site to prevent negative impacts on groundwater as described elsewhere in this SOP.

Groundwater monitoring will be undertaken during and post the operational phase of the Site. The monitoring requirements are set out in the Environmental Monitoring Plan (Stantec, 2024g) and are summarised in Section 9 of this SOP.

7.3 Emergency Response Equipment on Site

Pollution emergency response equipment on the Site consists of firefighting equipment and spill kits comprising absorbent materials and shovels. In addition, Allstone have company-owned fire engines that can attend the Site in the event of a fire.

All emergency equipment will be checked on a regular basis to ensure that it remains in good working order. The equipment should remain clearly marked alongside instructions for its use clearly displayed.

Training will be provided to all staff to ensure its prompt and effective use.

Should additional emergency equipment be installed on the Site or moved to an alternative location, then the relevant site plan denoting its location should be updated.

7.4 General: Pollution Emergency Procedure

If a pollution accident occurs and there is likely, or there is potential because of its size or nature, to be an impact on the local community or the environment, then the general actions listed below will be followed:

- The Site operative should inform the Site Manager immediately of the incident and its nature.

- The Site Manager will assess priorities depending on the nature of the incident.
- Efforts should be made to reduce the impact of the accident wherever possible if it is safe to do so. The Site Manager, or their delegated nominee, will provide direction on this.
- If deemed required, the Site Manager will arrange for and instruct for the evacuation of the Site.
- The Site Manager should inform the Relevant Authority without delay. For example, the EA should be informed without delay following the detection of:
    - Any malfunction, breakdown of failure of equipment or techniques, accident or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution.
    - The breach of a specified limit in the permit.
    - Any significant adverse environmental effects.
- Where appropriate, the Site Manager should inform the police, fire service, or other relevant service.
- Where appropriate, the Site Manager will contact or instruct their delegated nominee to contact neighbouring properties. For example, in the event of a spillage that could impact groundwater, STW would be contacted and the remedial measures identified.
- The Site Manager should inform Allstone head office as soon as possible of all accidents where a Relevant Authority has been notified.
- The Site Manager should initiate the appropriate action, with advice from Allstone head office where necessary, and agreement should be sought from the Relevant Authority.
- Details of the accident will be documented on an Accident Report Form and retained by the person responsible for ensuring the completion of the corrective/preventative actions (usually the Site Manager).
- In the event of a pollution accident and the receipt of an environmental accident report, the Site Manager will conduct the appropriate cause analysis and liaise with Allstone head office as appropriate.
- The details will be copied to any additional personnel with responsibility for carrying out the corrective/preventative action. After the necessary corrective action has been implemented, completed documentation will be sent to Allstone head office.
- Press enquiries should be referred to Allstone head office.
- The accident procedure should be reviewed following the occurrence of an accident/incident to review how to prevent such an accident/incident occurring again.
- Any waste generated from the incidence will be sent to a suitably licenced facility at the earliest opportunity.

For major leakages or spillage to ground from polluting substances, the following additional mitigation measures are applied:

- Following any major leakages or spillages to ground from polluting substances, the contaminated ground would be excavated immediately and temporarily stored in impermeable containers (e.g. skips) retained on Site for that purpose.
- The excavated contaminated materials will be sent off-Site to an appropriately licenced facility for treatment and/or disposal, with records maintained of the volume of material removed, details of the contaminant(s) and any laboratory testing carried out and the appropriate ‘duty of care’ documentation for the off-Site waste transfer.

- The excavated area would be reinstated in accordance with Site operational requirements using Site-won uncontaminated materials (e.g. clean sand).
- The plant and other equipment required to remove and store the contaminated excavated materials will be readily accessible on Site at all times.

All staff and contractors will be made aware of the pollution emergency procedures.

The effectiveness of emergency procedures will be tested regularly to ensure that they remain effective in the event of an emergency.

7.5 Emergency Contacts

Details for relevant parties to contact in an emergency are included in Table 7.2. The Site Manager must ensure that the contact details provided are kept up to date to ensure to ensure that site operatives have the correct information of who to contact in the event of an emergency.

In all incidents, the Site Manager, or their delegated nominee, is responsible for managing any emergency that arises on the Site.

Table 7.2 Emergency contact details

SITE EMERGENCY CONTACTS	**Name**	**Contact No.(s)**
Site Manager:	David Ambrose	(Office) 01452 522751 (Mobile) 07435 989931
Staff Keyholders	David Ambrose	(Office) 01452 522751 (Mobile) 07435 989931
	Tom Ford	01452 522751
	Josh Mitchell	01531 650319
EMERGENCY SERVICES		**Contact No.(s)**
Emergency:		999
Police:		999
Fire:		999
REGULATORS		**Contact No.(s)**
Health and Safety Executive (HSE) Incident Contact Centre:		0345 300 9923
Environment Agency (EA):	Floodline	0800 80 70 60
	24-hour emergency hotline	0345 988 1188
Natural England:		0845 600 3078
Local Authorities		**Contact No.(s)**
Gloucestershire County Council		(Emergency Duty Team) 01452 614194
Utility Providers		**Contact No.(s)**
Water: Severn Trent Water		0800 783 4444
Sewage: Severn Trent Water		0800 783 4444
Electricity: Western Power Distribution / National Grid		0800 096 3080
Specialist Advisors		Contact No.(s)
Glevum Security (CCTV)		(24 Hour Control Centre) 0870 413 5330 (Office Hours) 01452 729713
Clean-up Contractors		Contact No.(s)
William Gilder (for e.g. firewater collection)		01242 509790

8 Environmental Nuisance Control

8.1 Environmental Nuisance

This section of the SOP discusses controls measures to prevent and actions to be taken in the event of “environmental nuisance” incidents rather than “pollution” incidents.

For the purposes of this SOP, environmental nuisance is considered to include the following:

- Dust emissions from site;
- Noise emissions from site;
- Odour;
- Mud and debris;
- Litter; and
- Pests and vermin.

The Site Manager, or their nominee, will always exercise day-to-day control on the Site. They have responsibility for ensuring full compliance with the conditions attached to any acquired EP and planning permission. Specifically, the Site Manager will assume control, either personally or by delegation to suitably trained and responsible staff, of:

- Vehicle movements;
- All loading, tipping, and materials handling operations;
- Operation of preventative and remedial mitigation measures; and
- Inspection, cleaning and maintenance of all plant and equipment.

Staff at all levels receive the necessary training and instruction in their duties relating to the control of all operations and the potential sources of environmental nuisance. Emphasis will be given to dealing with plant malfunctions and abnormal conditions. Site staff will inform the Site Manager whenever unusual conditions such as the release of abnormal dust emissions, noise incidents or excessive mud and debris, as a result of any site operation.

The continuing effectiveness of mitigation measures included in this section to address environmental nuisance will be reviewed regularly.

8.2 Dust

8.2.1 Dust and Emissions Management Plan

A Dust and Emissions Management Plan (DEMP) (Stantec, 2024c) has been produced. The DEMP covers dust emissions and their preventative and remedial mitigation measures in relation to emissions from the restoration activity only. However, and for these purposes of this SOP, a summary has been provided below of the likely sources of dust emissions and preventative remedial mitigation measures of these for both the restoration and extraction activities at the Site.

8.2.2 Prevention and Control of Releases of Dust, Fibres and Particulates

The focus of the dust management strategy is to control dust generation and movement at source. The main sources of dust at the Site are likely to be from the internal haul roads, operation of mineral

extraction plant and from the surface of the already restored areas during periods of dry weather. Deposition of individual loads is considered less significant in terms of potential for dust generation.

Visual inspections of the Site, access road and haul roads are undertaken by the Site Manager or their nominee at least twice during each working day (start of day and mid-day as a minimum). A record of the inspections and their findings, together with the prevailing weather conditions, is kept in a logbook made specifically for this purpose.

Additionally, the extraction of mineral and deposition of dusty wastes will be carefully monitored during periods of high winds.

Dust suppression measures will be required to ensure that no visible dust leaves the facility. The focus of the dust control strategy is to control dust generation and movement at source. Therefore, no receptor-specific dust monitoring will be undertaken. The requirement for receptor-specific dust monitoring will be reviewed at regular intervals.

The following measures will be implemented and maintained throughout the operational life of the Site, the objective of which will be to prevent and minimise the release of airborne dusts, fibres and particulates arising from activities in such quantities or concentrations that are likely to cause pollution of the environment or harm to human health.

8.2.3 Control Measures During Transportation of Materials

All vehicles carrying material will be required to have sheeted loads to avoid the spillage of material or creation of dust outside the Site.

Within the Site, internal haulage will be restricted to clearly delineated routes, generally on a prepared surface and at low level where possible. The haul routes will be compacted, graded, and maintained to provide a smooth surface and will be designed to avoid sharp changes in gradient or alignment.

Temporary haul roads will be maintained in good condition and kept free from mud by regular grading, good drainage, and use of hardcore as necessary.

In dry weather, and when necessary, water will be used to control dust movement. An adequate water supply will be maintained on site for effective dust/particulate matter suppression/ mitigation. The following wet methods can be used on side during periods of dry weather conditions:

- High pressure water hose to the Site;
- A water bowser fitted with a sprinkle bar;
- Water cannon.

All Site vehicles will be maintained in accordance with the manufacturer's instructions and will be fitted with upswept exhausts and radiator cowls.

Site haulage speeds will be controlled to minimise possible dust entrainment. Appropriate instruction will be issued to all vehicle drivers.

8.2.4 Control Measures During Deposition and Placement of Materials

When necessary, the working areas will be sprayed with water to suppress dust by tractor and bowser as necessary.

The progressive approach to the restoration will ensure that the operational area will be confined to limited areas at any one time. This will ensure that the potential for widespread dust arisings will be reduced and that dust management controls can be focussed on specific areas.

The Site will only accept inert material. The nature of much of this material is such that it will not in itself create significant dust arising. However, dust can arise from the physical operations associated with the actual deposition of the materials.

In unusually dry or windy conditions, material extraction, handling and deposit would be suspended if it appears likely that dust may be carried towards any sensitive properties.

8.2.5 Dust, Fibres and Particulates Action Plan

If any dust, fibres or particulates arising from the site are released outside the Site boundary in such quantities or concentrations that they are likely to cause pollution of the environment or harm to human health, the actions specified below will be implemented:

- The Site Manager or his nominee will be informed immediately.
- The source of the dust, fibres or particulates will be identified and damped down.
- If the source of the dust, fibres or particulates is a particular waste stream, consideration will be given to suspending acceptance of that waste until appropriate measures are in place to control the release of dust, fibres, or particulates from the waste.
- If necessary, the Site Manager will instruct the suspension of any operation causing visible dust emissions until such time as the situation has been resolved.

8.3 Noise and Vibration

The following measures will be implemented and maintained throughout the operational life of the Site to minimise the impact of noise and vibrations:

- All plant used on the site will be modern, equipped with silencers in accordance with the manufacturers specifications and will be maintained in good working order - plant found to have defective silencing systems will be stood down until the system is rectified.
- Daily inspections will be carried out on all the plant.
- Vehicles delivering materials must be fit for purpose and in good working order.
- Restrictions on working periods for specific activities will be in force.
- Activities that may cause higher levels of noise or that cannot readily be mitigated will be handled as temporary operations.

8.4 Odour

The current and proposed operations at the Site are not likely to give rise to unacceptable odours. Consequently, odour management, monitoring and action plans are not considered necessary.

Allstone have not previously received any complaints or reports regarding odours during its operation of the Site to date.

8.5 Mud and Debris

8.5.1 Overview

Mud and debris may be carried out of the Site boundary onto public roads by the wheels of vehicles leaving the site. The occurrence of mud and debris is most likely to occur during and after heavy rain. Management and monitoring procedures will be used to control mud and debris.

8.5.2 Road Sweeping

The Site entrance and access road will be inspected daily to check whether it is clean and tidy. A road sweeper will sweep the Site entrance and the access road if the daily inspection indicates it is necessary. As a minimum, a roadsweeper will be brought onto the Site for use at least two times per working week.

Additional inspections will be included as necessary in response to comments from the general public or during and following periods of particularly heavy rainfall.

8.5.3 Wheel Cleaning Facilities

All delivery vehicles will be required to use the wheel wash before leaving the Site. Any driver who refuses to take his vehicle through the wheel cleaner will be recorded within the Site Office and may be refused future access to the Site. Details on the non-compliance will be sent to the driver's employer. Information may additionally be sent to the EA.

The wheel wash will be maintained in good working order. It will be inspected daily to determine whether it is functioning correctly and immediate measures will be taken to return it to full working order should it be found in need of repair.

8.5.4 Internal Haul Roads

Internal roads will be maintained in useable condition, fit for purpose, and kept free from mud by regular grading, good drainage, and the use of hard-core as necessary. Internal haul roads will be inspected on a daily basis to ensure good order. Any issues with haul roads will be reported by staff to the Site Manager at the earliest opportunity.

8.6 Litter

The types of material which will be accepted for the restoration of the Site are unlikely to give rise to significant amounts of litter. Notwithstanding this, the following measures will be implemented and maintained throughout the operational life of the Site, the objective of which will be to prevent any litter escaping from the confines of the Site:

- Vehicles delivering material will remain sheeted until the vehicle reaches the waste reception area, or, if the nature of the material or windy conditions could give rise to wind-blown litter, until the vehicle reaches the discharge point.
- Incoming vehicles will have their loads inspected at both the receptions area and at the point of deposit. Loads found to contain a significant volume of material likely to give rise to litter will be rejected and removed from the Site.
- Loose litter on the access roads or at the Site entrance will be collected daily.
- Inspections of the Site as a whole will be carried out on at least a weekly basis and any litter discovered will be collected and disposed of.

- The restoration materials will be well compacted.

In the event that litter does escape from the Site in windy conditions, it will be collected as soon as practicable.

8.7 Pests and Vermin

8.7.1 Pest Infestations

The types of material to be accepted at the Site present a low risk of attracting pests or vermin. Notwithstanding this, the Site will undergo regular inspections to check for the presence of infestations. A record of the inspections and their findings will be kept in the Site Diary.

A specialist contractor will be employed to control pests if required. If remedial action is required, a note of any treatment supplied will be made in the Site Diary.

8.7.2 Control of Scavenging Birds and Other Scavengers

The types of material to be disposed of at the Site are unlikely to attract birds or other scavengers, consequently, control measures are not considered necessary.

8.8 Complaints Procedure for Environmental Nuisance

The notice board will be displayed prominently by the Site entrance and will contain information to enable direct contact with the Site Manager and the relevant authority. Members of the community will therefore have the ability to contact the operator of the EP in the event of any incident or wish to submit a complaint.

A complaints procedure is established to ensure that any nuisance being caused to local residents is dealt with effectively. A register of complaints will be kept on-site to record all concerns made either directly to the Site Manager or via the regulatory authorities.

All complaints will be recorded in a complaints log, together with any action required/taken, and any procedural changes necessary to prevent a similar recurrence. Information on the complaint including the nature of the complaint, the likely cause, time and date of the complaint and photographs where appropriate will be shared among the wider Allstone team.

The Site Manager will ensure that:

- Any observations recorded at the time of the complaint are analysed by authorised personnel;
- Site activities at the time of the complaint are reviewed and investigated; and
- Additional mitigations are identified and implemented at the earliest opportunity.

Complaints will be acknowledged promptly to the complainant along with an explanation as to what, if any, action is being undertaken as a result and an estimated time in which they will aim to respond. For minor issues, it is expected that responses can be provided within two working days. If further investigation is required beyond this time, this too will be communicated to the complainant together with a revised timescale.

The suspected activity (if applicable) will be ceased until it can be determined what the cause for the complaint is if the complaint is warranted and what action should be taken. If the complaint is a result of something outside the control of Allstone, this will be clearly communicated to the complainant in a timely manner.

9 Monitoring

9.1 Environmental Monitoring Plan

An Environmental Monitoring Plan (EMP) (Stantec, 2024g) has been prepared as part of the EP application for inert landfill, which will set out the proposed monitoring to be undertaken and provides a framework for the management of potential environmental impacts associated with the Site. As such, the plan is designed to offer suitable safeguards for the protection of various potential receptors (including groundwater, local ecologies and human health), as identified by a number of risk assessments performed in relation to the Site.

The aim of the EMP is to provide a summary of the methods, procedures and actions to be implemented at the site for the duration of the EP and up to the point of surrender, in order to meet the following objectives:

- Demonstrate that the landfill is performing as designed and in accordance with the risk assessment predictions;
- Show that management and control systems are preventing pollution;
- Show compliance with the emission and compliance limits set in the EP;
- Identify where further investigation is needed and, where risks are unacceptable, the need for measures to prevent, reduce or remove pollution; and
- Identify when the Site no longer presents a risk of pollution.

The EMP also sets out the:

- Procedures for the design, construction and CQA of additional monitoring infrastructure;
- Procedures for the routine inspection and maintenance of the monitoring infrastructure;
- Quality assurance of the monitoring and sampling; and
- Submission of monitoring records including the reporting of environmental performance.

Monitoring point locations (proposed and existing) are shown in Figure 9.1.

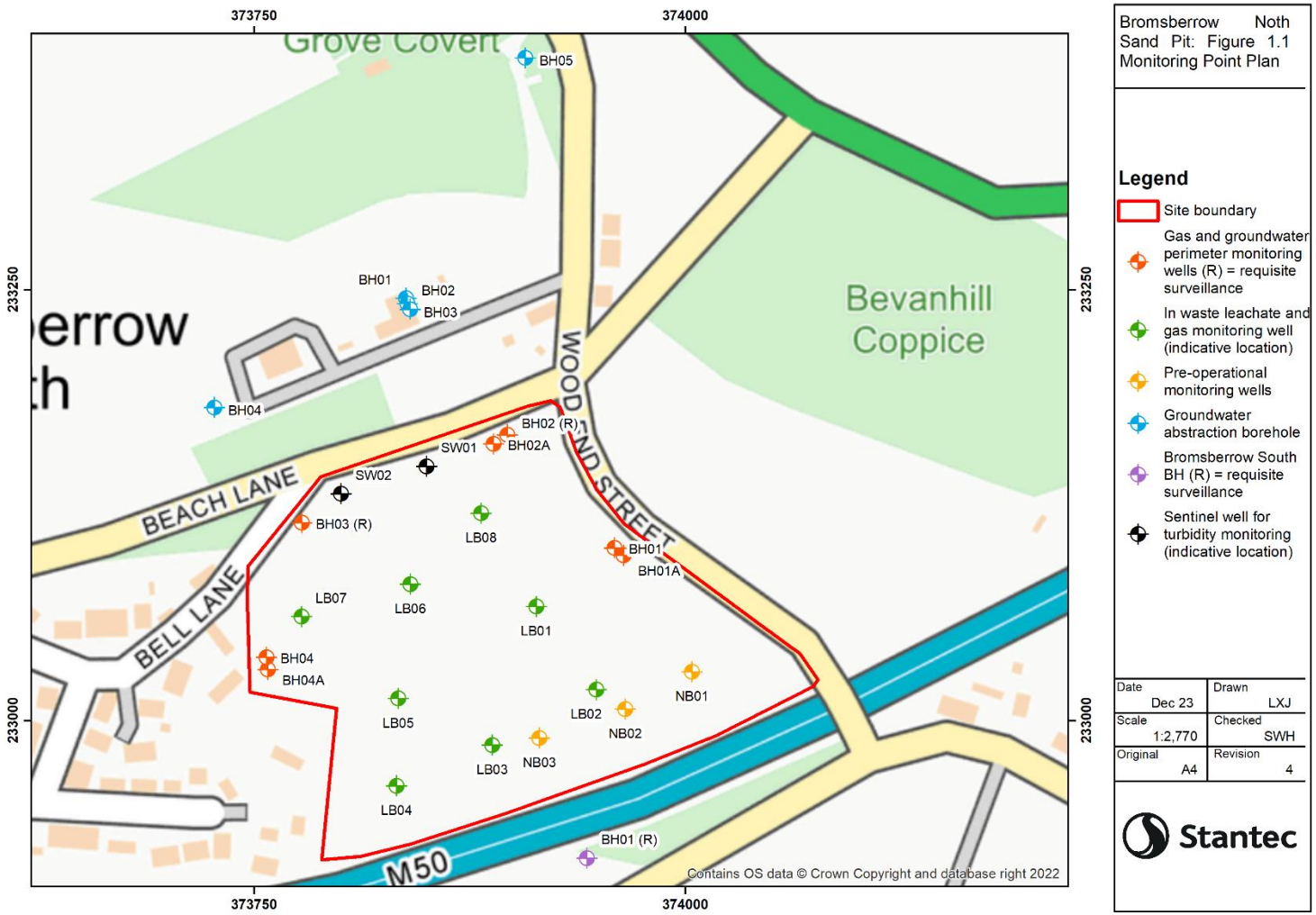


Figure 9.1 Monitoring Point Plan

9.2 Landfill Gas Monitoring

Landfill gas monitoring is ongoing during the pre-operational phase for the landfill and will continue as described in the EMP (Stantec, 2024g) during the operational and post closure phases, including the monitoring of both in-waste and external monitoring boreholes.

9.3 Leachate Monitoring

As the Site will accept only inert waste, no leachate storage, collection, or treatment systems will be installed at the Site. Within the pre-application advice sought for the inert landfill EP application, the EA have recommended the installation of leachate quality and level monitoring within the Site (not leachate drainage) to validate the modelling undertaken, confirm the conceptual model presented, ensure any risks of leachate breakout are detected early and provide data suitable to support the surrender of the permit.

The pre-application advice confirms that in-waste gas monitoring will be required and could be combined with the leachate monitoring. The monitoring locations proposed within the restored areas are, therefore, proposed as dual purpose landfill gas and leachate monitoring wells.

The proposals for leachate monitoring during the operational and post-closure phases is described in the EMP (Stantec, 2024g).

9.4 Groundwater Monitoring

9.4.1 General

Groundwater monitoring (level and quality) is ongoing during the pre-operational phase for the landfill and will continue as described in the EMP (Stantec, 2024g).

9.4.2 Turbidity Monitoring

Turbidity is a key indicator of water quality and is continuously monitored at the PWS. The Bromsberrow Pumping Station (BPS, e.g., the PWS) will automatically shut down if the turbidity measurement exceeds 1 Nephelometric Turbidity Units (NTU), or if the rate of increase in the turbidity measurements exceeds a certain threshold.

STW have noted that there have been only two incidences of the BPS shutting down over the past two decades due to turbidity spikes, the most recent being in December 2022 when the turbidity rose too quickly and the plant ‘tripped’ (the turbidity threshold of 1NTU was not exceeded) but the borehole pumping was quickly restarted.

There is no evidence of impact to the Bromsberrow BPS from Site activities over the past 20 years, based on the turbidity measurements. However, Allstone recognise that it is critical that the groundwater turbidity is not affected by Site activities going forward. To that end, there is ongoing discussion in the working group around STW sharing turbidity monitoring data with Allstone (turbidity being something that can only be demonstrated in pumped water) and the procedures that would need to be agreed around activities on Site should the turbidity results start to rise or spike, or if significant factures are identified in the bedrock (refer to Fracture Discovery Protocol, Section 5.2).

Turbidity monitoring during the operational phase is yet to be agreed with the EA (and STW as operators of the adjacent PWS). The following, however, summarises Allstone’s proposals for turbidity monitoring at the Site during the operational phase at this stage:

1. Two new monitoring wells ('sentinel wells' SW01 and SW02) will be drilled and installed along the northern boundary of the Site in the indicative locations shown in Figure 9.1 (see Section 9.4.3 below for further details of these);
2. Each sentinel well will have an 'AquaTROLL 500' (or similar) multiparameter sonde installed, capable of in-situ turbidity monitoring, linked to a 'VuLink' (or similar) telemetry module that will allow real-time monitoring of turbidity in groundwater in these locations and send out an alarm to the Site Manager should an agreed turbidity value be exceeded.
3. The above system would permit the sharing of data with a third party (e.g. STW) if required.
4. An action plan will be developed and agreed with EA/STW, with a course of action to follow by the Site Manager, should the turbidity value be exceeded.

It is understood that the EA must agree with the Operator's proposal before continuous monitoring is started.

The above proposals are seen as the initial approach to turbidity monitoring during the Site operational phase, recognising that sand extraction (and subsequently landfilling activities) is currently progressing to the west, i.e., no closer to the PWS than at present, and this will likely be the case into the early 2030s. Based on the data collected in the coming years, it may be agreed that in future as the Site operations progress towards the northern Site boundary that it would be proportionate to the potential risks to the PWS to install additional sentinel wells with turbidity monitoring capability off-site to the north, e.g. two additional sentinel wells on land owned by STW in locations halfway between the proposed sentinel wells on Allstone land and the PWS extraction boreholes. This would all of course need approval by STW and the EA and would be subject to access agreements with STW.

9.4.3 Sentinel Wells

In their letter of 11 October 2022, STW sets out their response to the ROMP application. Within the letter, STW request that: *"telemetered sentinel boreholes between the quarry and Bromsberrow BPS installed with continuously logging water quality probes, and associated controls to cease extraction if they are triggered"* are made as a condition of the ROMP review.

There are already monitoring boreholes located between the quarry and Bromsberrow PWS, as described in the Environmental Monitoring Plan.

As set out above, Allstone propose to install two new sentinel wells (SW01 and SW02) in the approximate locations shown on Figure 9.1. These boreholes would have short (3m) screened (slotted) sections at an appropriate depth to intercept the groundwater body that is to be targeted by the groundwater monitoring.

General details of the design and construction of any additional groundwater monitoring boreholes agreed are presented in the EMP (Stantec, 2024g). This includes the approach to CQA.

Although it is intended that the sentinel wells are used exclusively for turbidity monitoring during the site operational phase, Allstone intend to use the wells more generally as part of the borehole network for groundwater level and quality monitoring during the post-operational phase.

9.5 Surface Water Quality Monitoring

The proposals for surface water management are included in the ESSD report (Stantec, 2024a) Monthly checks of the SuDS infiltration trenches and basin, once established after completion of the landfill, to ensure that there is no visible oil or other pollutant entering the feature.

As there will be no point source discharge of surface water from the landfill, no other surface water monitoring is proposed.

9.6 Dust Monitoring

The Dust and Emissions Management Plan (DEMP) (Stantec, 2024c) sets out the details of the Site dust monitoring and reporting proposed.

9.7 Noise Monitoring

A Noise Impact Assessment (NIA) dated August 2022 (24 Acoustics, 2022)) was undertaken to support the ROMP application. Noise measurements were made in accordance with BS 7445: 1991 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use'. The NIA concludes that the level of noise impact for the Site at the nearest sensitive receptors (residential properties) will be "*within the levels suggested for surface mineral workings within the technical guidance of the Planning Practice Guidance and is therefore acceptable*".

The ROMP application and NIA make no suggestion of noise monitoring via equipment being required at the Site and as such noise monitoring is not proposed to be undertaken. The EA confirmed as part of enhanced pre-application advice for the EP that a noise management plan would not be required for the inert landfill EP application.

9.8 Restoration Fill Materials Monitoring

The EMP (Stantec, 2024g) sets out the details of the monitoring of restoration fill materials proposed.

In accordance with the EMP, topographic surveys of the Site will be carried out annually, including:

- During the development phase;
- Before waste is placed in the landfill;
- During the operational phase;
- On completion of the restoration; and
- Until surrender of the permit.

Written agreement will be sought from the EA before topographic surveys of the Site are stopped.

10 Site Records

10.1 Security of Records

All records which are required to be made under the conditions of the planning permissions, Site procedures and any issued EP will be maintained and kept secure from loss, damage or deterioration.

The following records and documents will be available for inspection at the Site office:

- Visitors Book;
- Site Diary;
- Daily Inspection Reports;
- EMS (which will include a copy of the issued EP, SOP, Environmental Monitoring Plans, risk assessments and management plans).
- Maintenance Records;
- Copies of all the EA visit or inspection reports;
- Company Safety Policy;
- Emergency Procedures;
- Waste Transfer and Acceptance documentation; and,
- Health and Safety documentation.

The following records, in addition to the above, will be maintained in electronic format by in the site office and at Allstone's head office:

- Landfill gas monitoring records;
- Groundwater monitoring records; and
- Leachate monitoring records.

10.2 Availability of Records

All records which are required to be made under the conditions of any issued EP will be made available for immediate inspection when required by an authorised officer of the EA.

A notice board will be maintained in the office with up-to-date versions of the following prominently displayed:

- Plan of method and direction of working signed and dated by the Site Manager;
- Certificate of employer's liability insurance;
- Emergency telephone numbers;
- The conditions of acceptance of material for the restoration. (Printed copies will be available for issue should these be required); and,
- The site safety rules for customers/visitors. (Printed copies will be available for issue should they be required).

Records of materials that are accepted at the site, records of materials that are rejected and despatched from site and Site Diary records will be kept for a minimum of two years. Environmental monitoring records will be kept until the Site has been successfully restored and the EP surrendered.

10.3 Records of Material Movements

A record will be kept of each load of waste accepted and each load of waste removed from the Site. This record will include the following details:

- The nature of the waste, i.e. solid;
- Associated testing/acceptance/removal documentation.
- EWC / List of Waste (LoW) code;
- Quantity in tonnes;
- Date received;
- Date accepted, if different from received;
- Origin of waste, in terms of place;
- Destination of the waste (off-site); and
- The number of heavy good vehicle movements to and from the Site during the restoration.

A summary record of the waste types accepted and removed from the site will be made for each quarter of the financial year and will be submitted to the EA within one month following the end of the quarter.

10.4 Site Diary

A Site Diary will be maintained by the Site Manager and will be available for inspection when required by an authorised officer of the EA.

The diary will include a record of the following:

- Weather conditions (including wind speed and direction observations);
- Unacceptable waste details;
- Complaints received;
- Operations functions (visits for gas monitoring, groundwater monitoring, plant services, etc);
- Observations made during daily site inspections;
- Any unusual circumstances; and
- Changes to procedures.

10.4.1 Daily Inspection Checklist

To assist in the completion of the diary, the Site Manager refers to the “daily inspection check list”. The daily inspection may comprise of the following checks:

- That radios are working properly;
- All site plant is operating and maintained according to schedules;
- That the day’s routine monitoring has been done;
- On any high environmental monitoring readings reported;
- That the spray system and water bowser are in use if dust suppression is necessary;
- If litter is a problem;
- Fuel store levels;
- Signs of leakage or spillage from fuel store;
- If any unacceptable material has been delivered. If so, ensure segregation, removal and reporting in Site Diary;
- The standard of haul roads and whether any repairs are required;

- Potential pests, birds, weeds etc;
- Cleanliness of access road (between entrance and office);
- Cleanliness of site entrance – mud on road, etc;
- Cleanliness of site office and surrounds;
- Condition of grass and vegetation both inside and outside the Site;
- Condition of signs and notice boards;
- Covering of areas awaiting restoration;
- Covering of current working area;
- Damage to fences and gates;
- Any fly tipping;
- Odours at various points of the Site, note to wind direction;
- Presence of bubbles in standing water;
- Signs of discoloration of surface water;
- Signs of standing water;
- Standard of operation;
- Vandalism of on-site equipment; and
- Completion of the Site Diary.

10.5 Reporting Environmental Performance

10.5.1 Waste Reporting

It is expected that the EP will require reporting to the EA of how much waste has been accepted for disposal (and/or removed from site) at the end of each quarter, using a waste return form made available for the purpose (RATS2E or similar). This will include details of the types of wastes.

Waste reporting requirements will be set out within the EP.

10.5.2 Annual Report

It is expected that the EP will require the preparation of an annual report, to include:

- A summary of the previous year's progress against improvement targets (where appropriate);
- Improvement targets plan for the coming year;
- An assessment of the monitoring data, including a description of any trends, assessment level or compliance limit breaches and problems with individual monitoring points;
- A summary of the results of any waste validation (level 3) testing carried out; and
- A topographic survey to show the structure and composition of the landfill body, using this survey and the previous survey to calculate the void space taken up, the remaining void space and the settlement behaviour of the waste.

Once the Site is in 'definite closure' it is expected that a report will be required once every 3 years.

The annual reports will be submitted to the EA by 31st January each year unless the EA has agreed to accept it on another date.

Annual reporting requirements will be set out within the EP.

10.5.3 HRA Review

The Operator will undertake a review of the HRA every six years. Reviews will be due on the sixth anniversary of the original issue date of the EP and every subsequent 6 years. HRA review

requirements will be set out within the EP.

10.5.4 Completion Report

A completion report will be prepared at the end of the site completion phase. The report will include the following information:

- An analysis and review of the environmental monitoring results recorded for the site, with an interpretation of the results against background and trigger levels; and
- A review of the risk management systems provided for the site.

11 Exception Protocol

If a situation occurs that is not covered by information in this SOP or in other Allstone documentation, the following protocol will be adopted:

- The Site operative that has identified or been informed of the situation will inform the Site Manager immediately of the event, providing details (as much as possible) of its nature and potential impact.
- The Site Manager will assess the situation to determine whether Site operations need to change, halt or can carry on as normal. Where appropriate,
    - the Site Manager will contact Allstone Head Office to discuss the nature of the event and confirm actions;
    - the Site Manager will inform police, fire service, or other relevant service;
    - the Site Manager will inform the Relevant Authority without delay; and / or
    - the Site Manager will contact or instruct their delegated nominee to contact neighbouring properties.
- The Site Manager should initiate the appropriate action, with advice from Allstone head office where necessary, and agreement should be sought from the Relevant Authority.
- Where appropriate, the situation will be investigated and the Site Manager will inform for Allstone documentation to be updated if the situation is perceived to potentially happen again.
- Details of the event will be documented and retained by the person responsible for ensuring the completion of any amendments/corrective/preventative actions (usually the Site Manager).
- Press enquiries should be referred to Allstone Head Office.

Should the Site Manager not be available in the above scenario, then Site Operatives should refer to the Site Manager's delegated nominee where possible or confer with Head Office.

All staff and contractors will be made aware of the exception protocol.

REFERENCES

24 Acoustics, 2022. Bromsberrow Quarry- Review of Old Mineral Permissions: Noise Impact Assessment, August 2022. Report Ref. R9694-1 Rev 0

Bromsberrow Sand and Gravel Company Limited, 2022. Initial periodic mineral review of planning consents G1209, G1209/A & G1209/C at Bromsberrow Sand & Gravel Company Bell Lane Bromsberrow Heath Gloucestershire HR8 1NX. The application, reference 22/0031/FDROMP, can be viewed on Gloucestershire County Council Planning Portal, here: https://planning.gloucestershire.gov.uk/publicaccess/applicationDetails.do?activeTab=summary&keyVal=RDX8X5HN01600

MHP, 2022. Management Plan for Restoration and Aftercare, Version 1: July 2022

Stantec, 2022. Bromsberrow North Sandpit, Hydrogeological Impact Assessment, May 2022. Report reference 331201146R1 Rev1.

Stantec, 2024a. Bromsberrow North Sandpit, Environmental Setting and Site Design Report, January 2024. Report reference 331201261R2

Stantec, 2024b. Bromsberrow North Sandpit, Environmental Risk Assessment, January 2024. Report reference 331201261R3

Stantec, 2024c. Bromsberrow North Sandpit: Dust and Emissions Management Plan, January 2024. Report Ref. 331201261R8.

Stantec, 2024d. Bromsberrow North Sandpit, Hydrogeological Risk Assessment, January 2024. Report reference 331201147R3 Rev1.

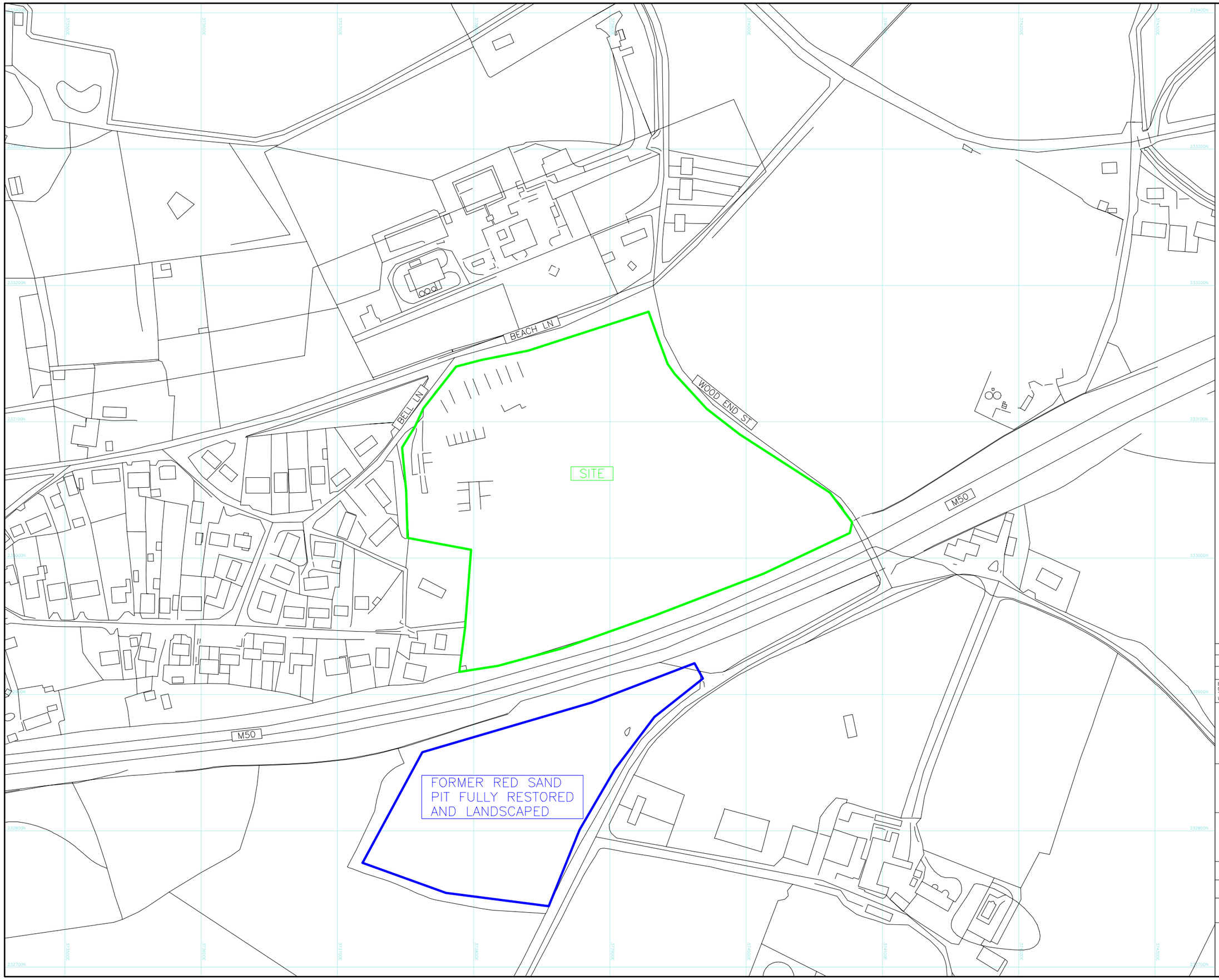
Stantec, 2024e. Bromsberrow North Sandpit, Flood Risk Assessment, January 2024. Report reference 331201147R2 Rev1

Stantec, 2024f. Bromsberrow North Sandpit, Landfill Gas Risk Assessment, January 2024. Report reference 331201261R6

Stantec, 2024g. Bromsberrow North Sandpit, Environmental Monitoring Plan, January 2024. Report reference 331201261R7

DRAWINGS

Site Location Plan	Drawing No. 21-248-D-010 Rev 02
Updated Quarry Development Plan – Floor at 36mAOD	Drawing No. 7873-005-D-002 Rev 02
Updated Quarry Development Plan – Floor at 36mAOD Cross Sections	Drawing No. 7873-005-D-004 Rev 03
Site Restoration Proposals	Drawing No. 21224.101 Rev A
Existing Site Layout Plan	Drawing No. 21-248-D-011 Rev 02
Proposed Site Layout Plan	Drawing No. 21-248-D-012 Rev 02
Services Plan	Drawing No. 21-248-D-013 Rev 01
Typical Cross Section used for SRA	Drawing No. 7873-006-001 Rev P01



Rev.	Revision Detail	Drawn	Date
02	Former red sandpit update	RB	07/11/23
01	First Issue	RB	28/04/22

CLIENT:
ALLSTONE SANDS GRAVELS AGGREGATES TRADING CO. LTD

PROJECT:
BROMSBERROW QUARRY

TITLE:
SITE LOCATION PLAN

DRAWN:	CHECKED:	DATE:
RB	BD	NOV '23
SCALE: 1:2500	ORIGINAL SHEET SIZE: A3	STATUS: FINAL

DRAWING NO. 21-248-D-010 REVISION: 02

KEY GEOSOLUTIONS LTD
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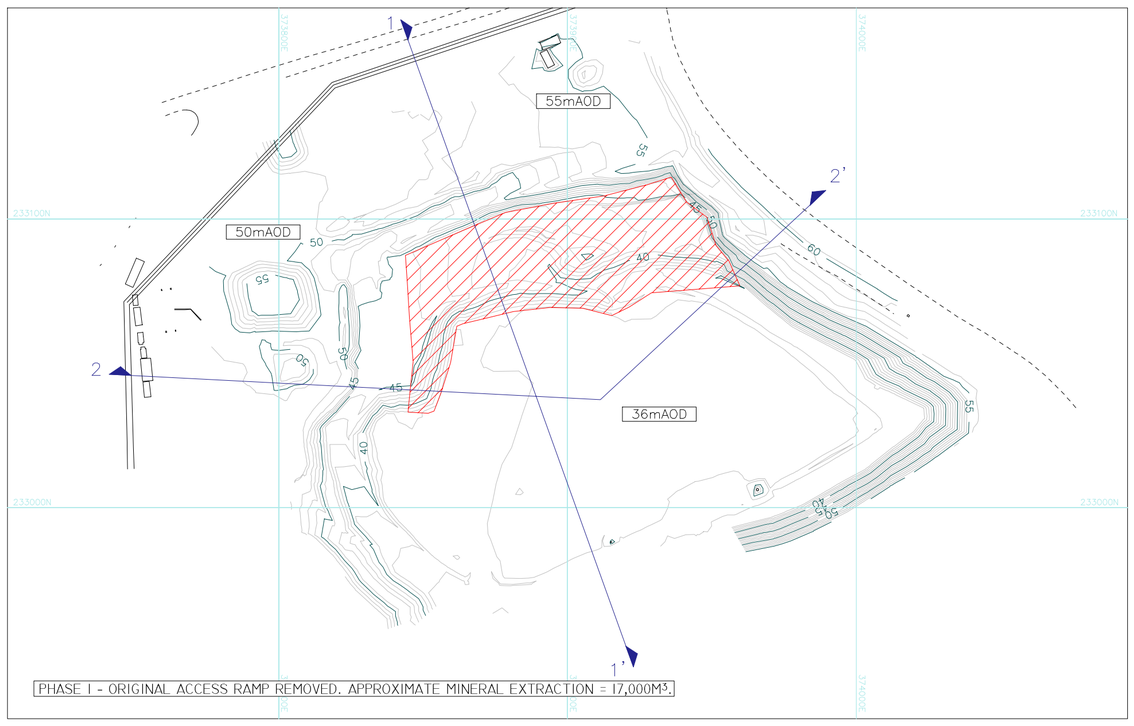
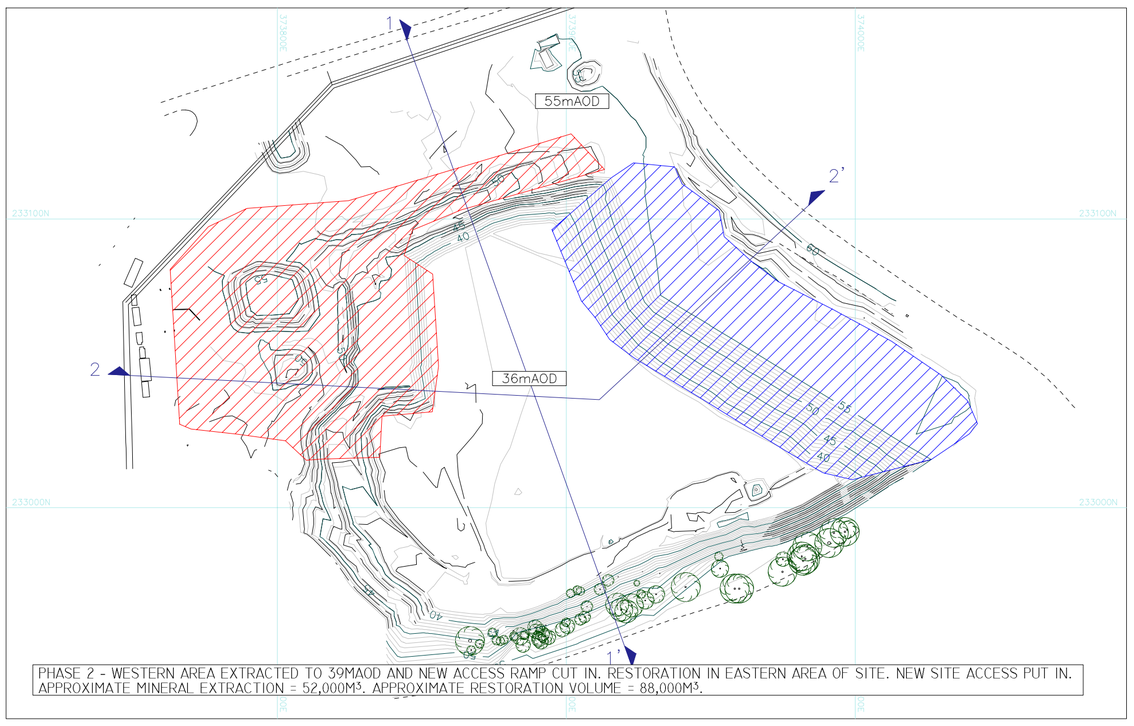
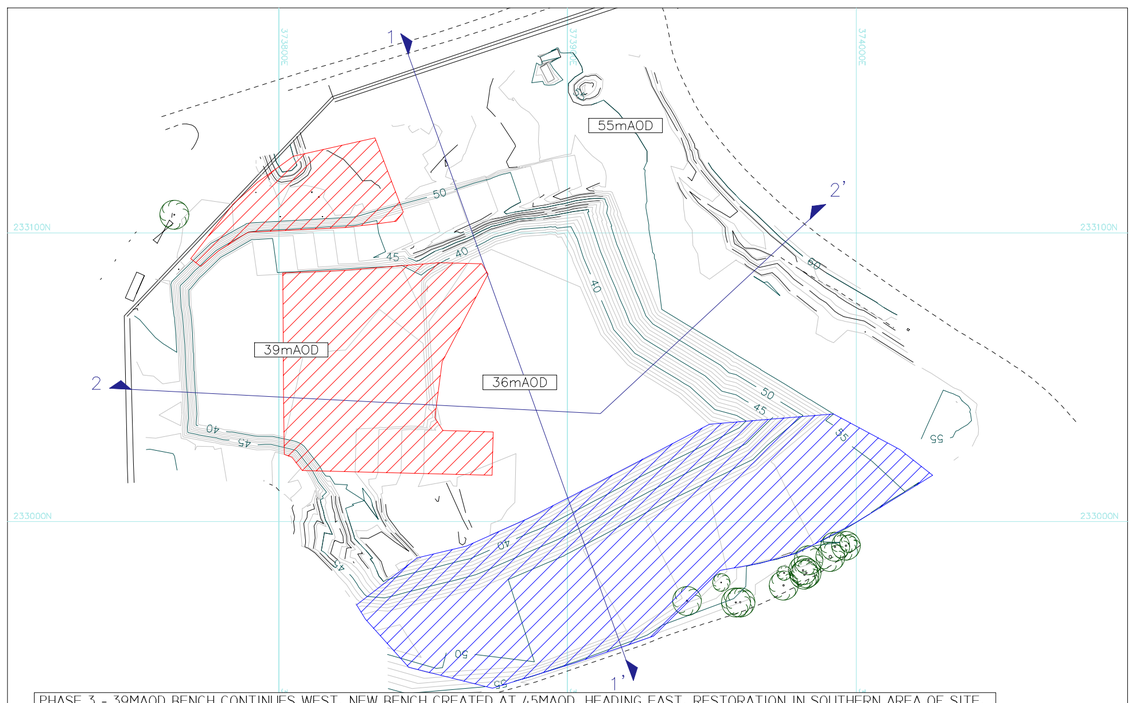


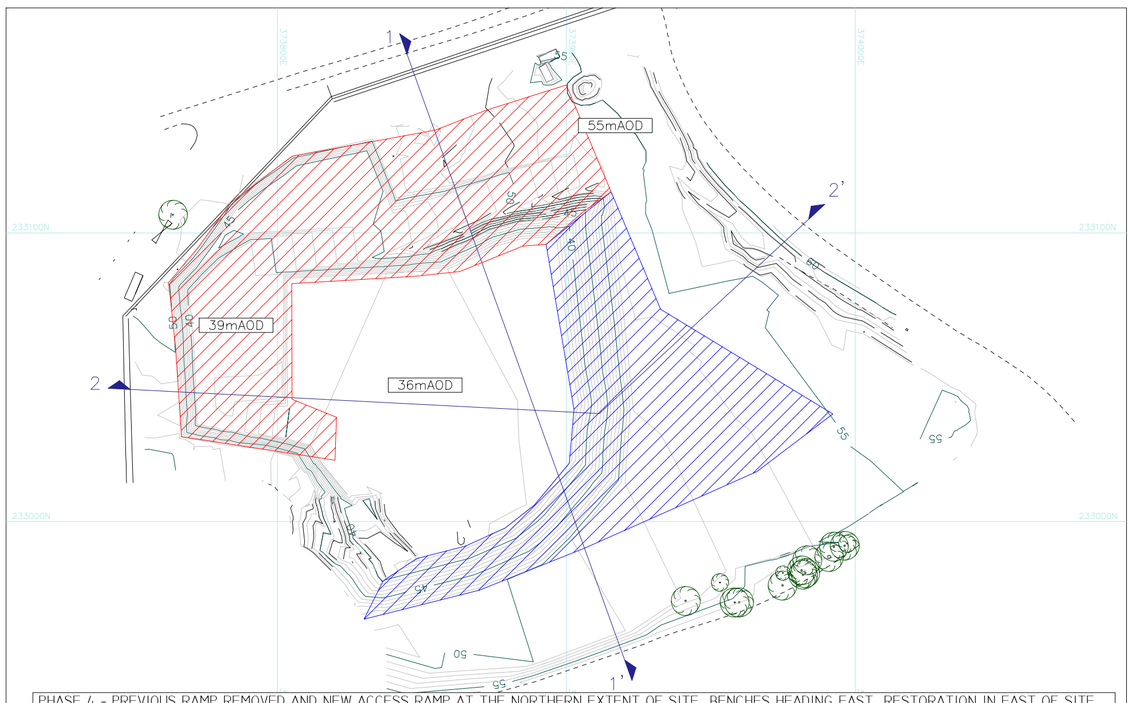
PHASE 1 - ORIGINAL ACCESS RAMP REMOVED. APPROXIMATE MINERAL EXTRACTION = 17,000M³.



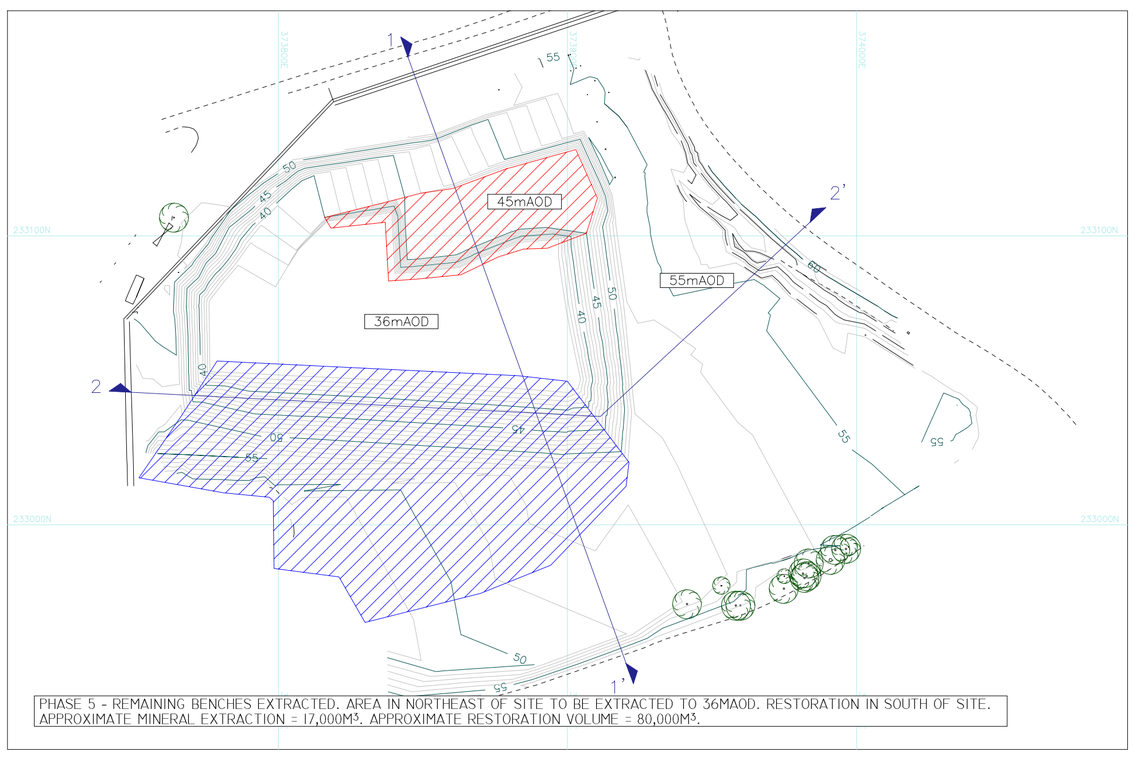
PHASE 2 - WESTERN AREA EXTRACTED TO 39MAOD AND NEW ACCESS RAMP CUT IN. RESTORATION IN EASTERN AREA OF SITE. NEW SITE ACCESS PUT IN. APPROXIMATE MINERAL EXTRACTION = 52,000M³. APPROXIMATE RESTORATION VOLUME = 88,000M³.



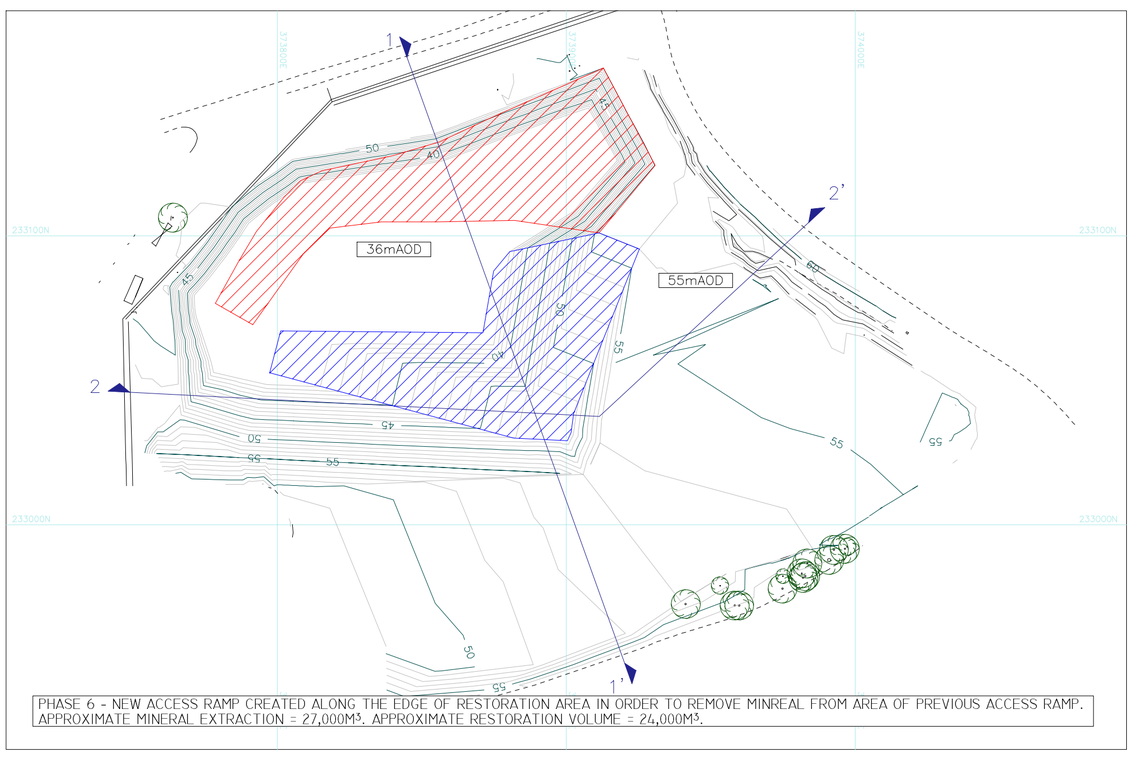
PHASE 3 - 39MAOD BENCH CONTINUES WEST. NEW BENCH CREATED AT 45MAOD, HEADING EAST. RESTORATION IN SOUTHERN AREA OF SITE. APPROXIMATE MINERAL EXTRACTION = 18,000M³. APPROXIMATE RESTORATION VOLUME = 76,000M³.



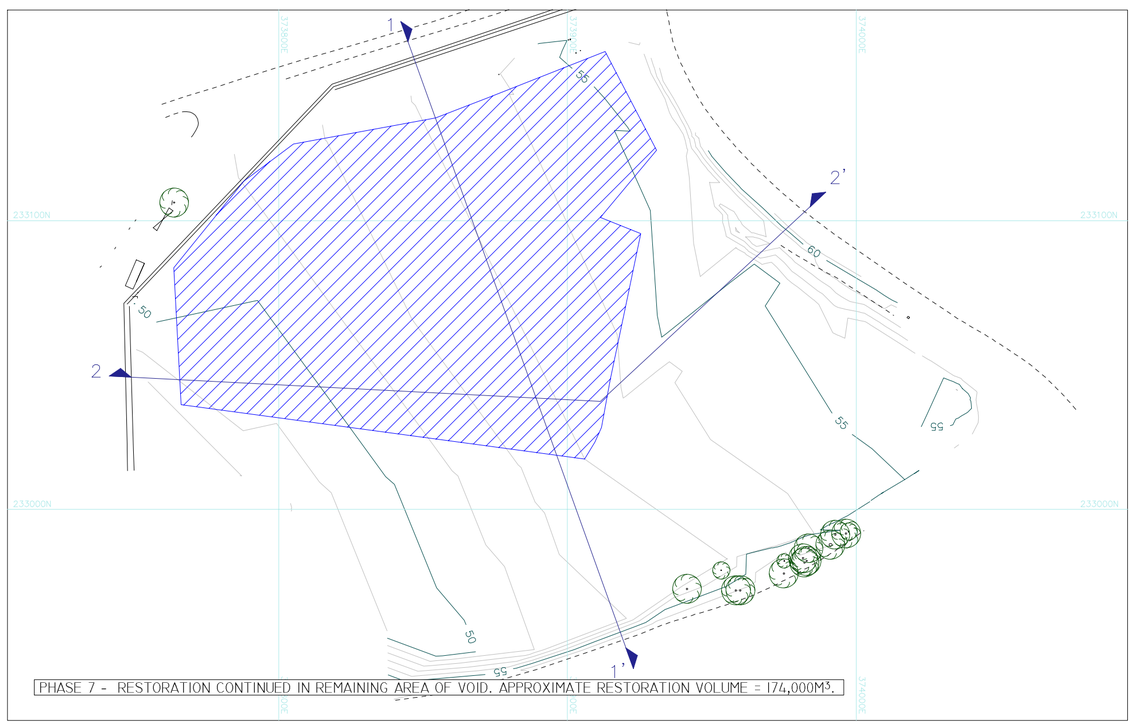
PHASE 4 - PREVIOUS RAMP REMOVED AND NEW ACCESS RAMP AT THE NORTHERN EXTENT OF SITE. BENCHES HEADING EAST. RESTORATION IN EAST OF SITE. APPROXIMATE MINERAL EXTRACTION = 24,000M³. APPROXIMATE RESTORATION VOLUME = 43,000M³.



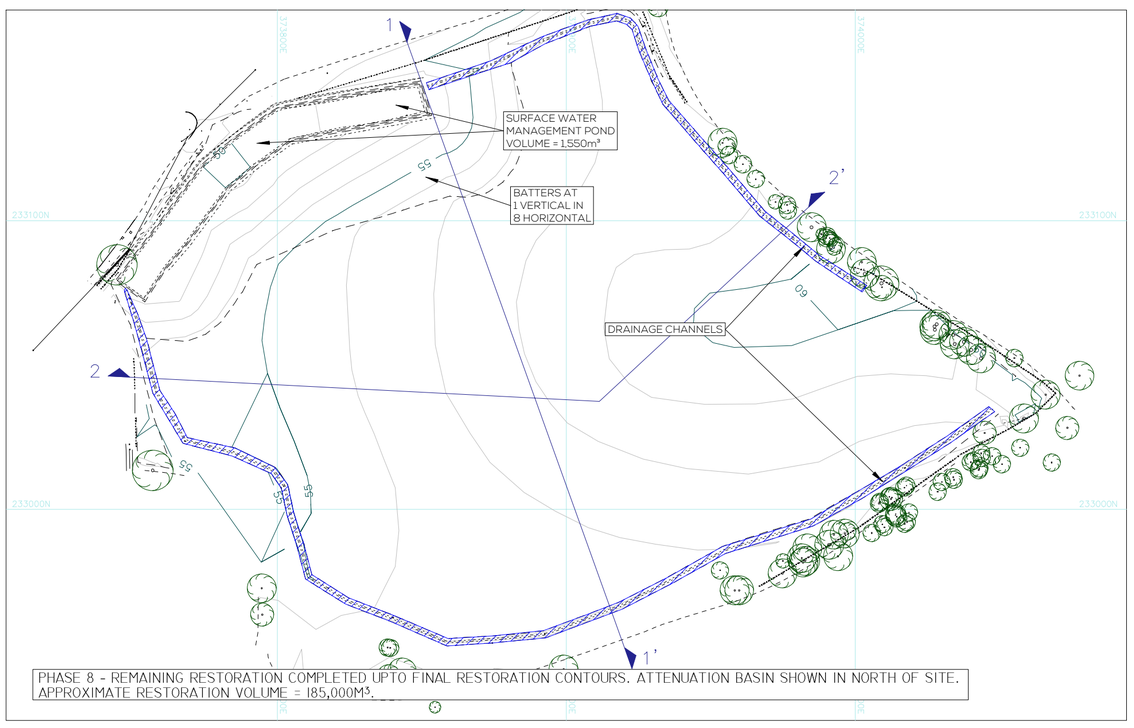
PHASE 5 - REMAINING BENCHES EXTRACTED. AREA IN NORTHEAST OF SITE TO BE EXTRACTED TO 36MAOD. RESTORATION IN SOUTH OF SITE. APPROXIMATE MINERAL EXTRACTION = 17,000M³. APPROXIMATE RESTORATION VOLUME = 80,000M³.



PHASE 6 - NEW ACCESS RAMP CREATED ALONG THE EDGE OF RESTORATION AREA IN ORDER TO REMOVE MINREAL FROM AREA OF PREVIOUS ACCESS RAMP. APPROXIMATE MINERAL EXTRACTION = 27,000M³. APPROXIMATE RESTORATION VOLUME = 24,000M³.



PHASE 7 - RESTORATION CONTINUED IN REMAINING AREA OF VOID. APPROXIMATE RESTORATION VOLUME = 174,000M³.



PHASE 8 - REMAINING RESTORATION COMPLETED UPTO FINAL RESTORATION CONTOURS. ATTENUATION BASIN SHOWN IN NORTH OF SITE. APPROXIMATE RESTORATION VOLUME = 185,000M³.

NOTES

AREAS OF MINERAL TO BE EXTRACTED ON A PHASED BASIS

AREAS OF RESTORATION TO BE PROGRESSED ON A PHASED BASIS

REV.	REVISION DETAIL	DRAWN	DATE
02	SURFACE WATER POND UPDATE	RB	30/11/23
01	FIRST ISSUE	RB	08/08/23

CLIENT:

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E-MAIL: INFO@KEYGS.COM
WEB: WWW.KEYGS.COM

PROJECT:

BROMSBERROW QUARRY

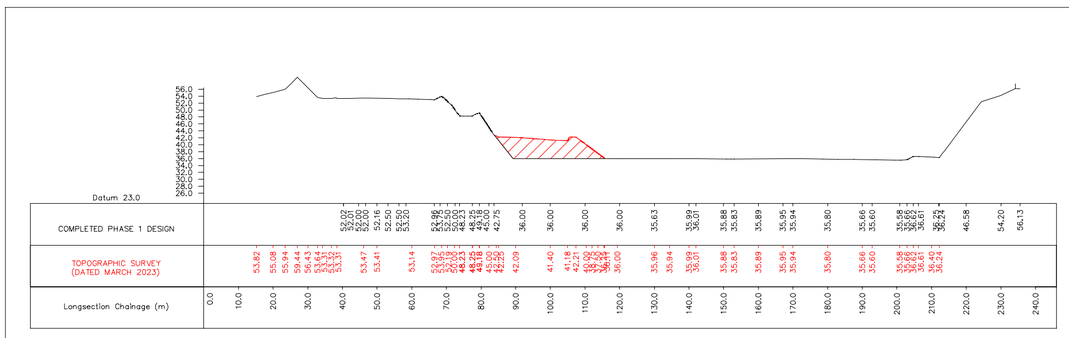
TITLE:

UPDATED QUARRY DEVELOPMENT PLAN - FLOOR AT 36MAOD

DRAWN:	CHECKED:	DATE:
RB	BD	AUG '23
SCALE:	ORIGINAL SHEET SIZE:	STATUS:
1:1500	A1	FINAL

DRAWING NO. 7873-005-D-002

REVISION: 02



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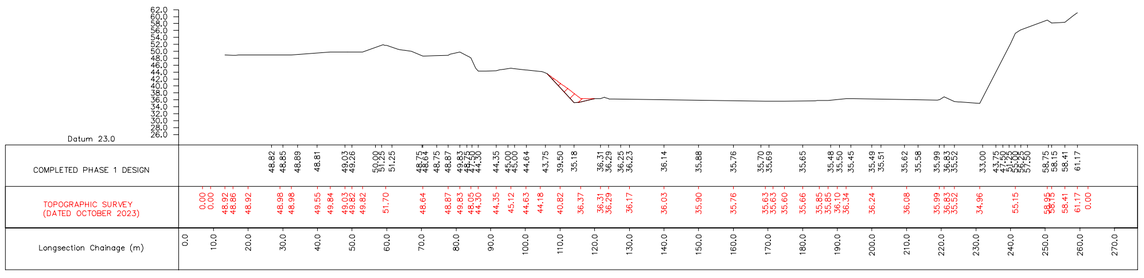

SECTION 2 – 2'

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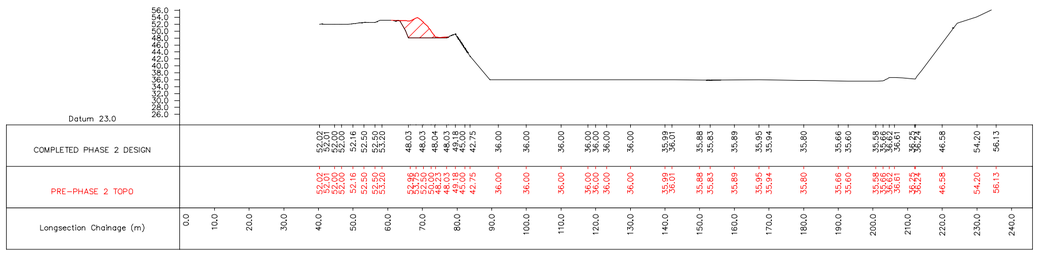

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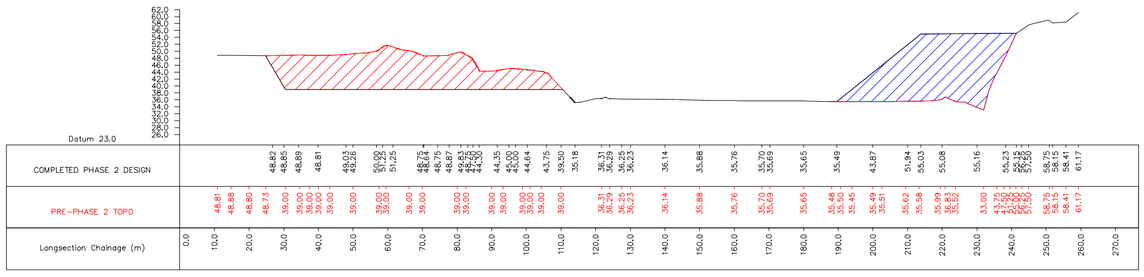

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PHASE 2 CROSS SECTIONS

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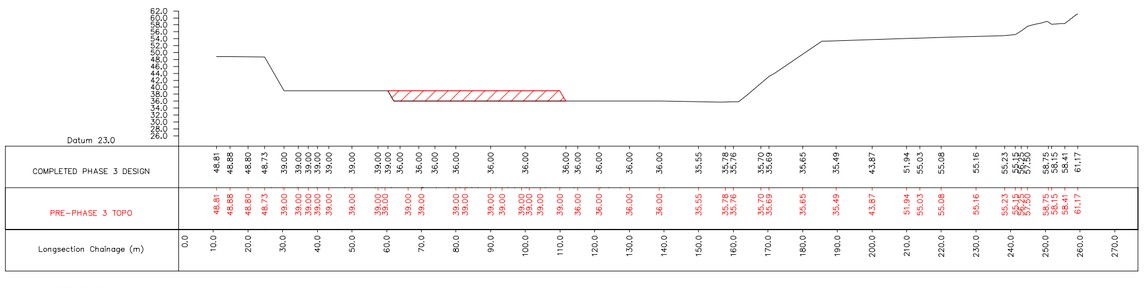

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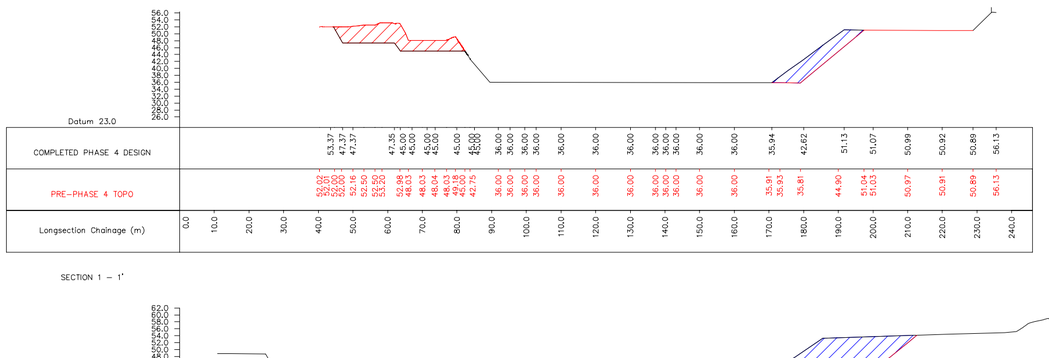

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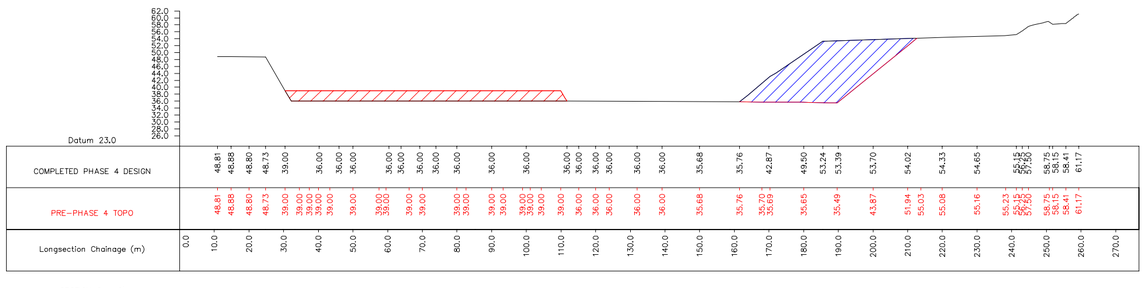

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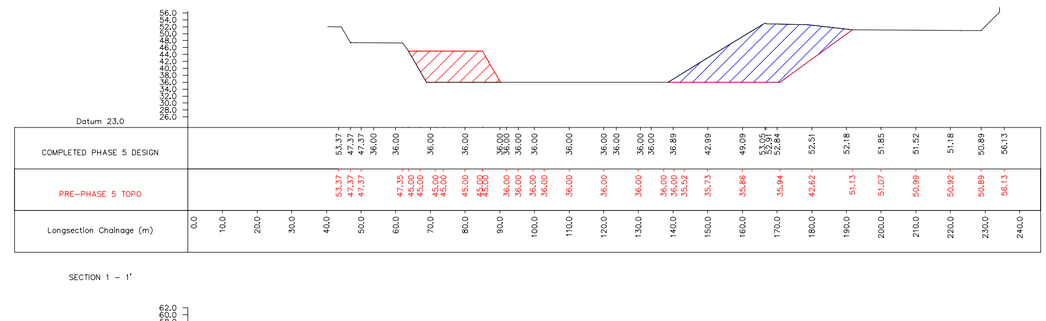
PHASE 4 CROSS SECTIONS



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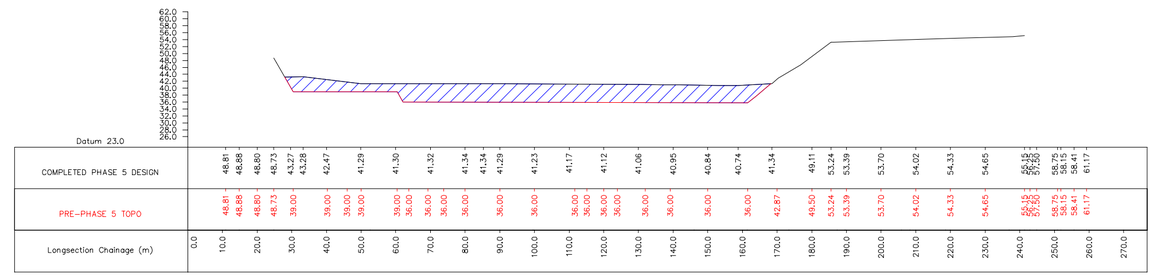
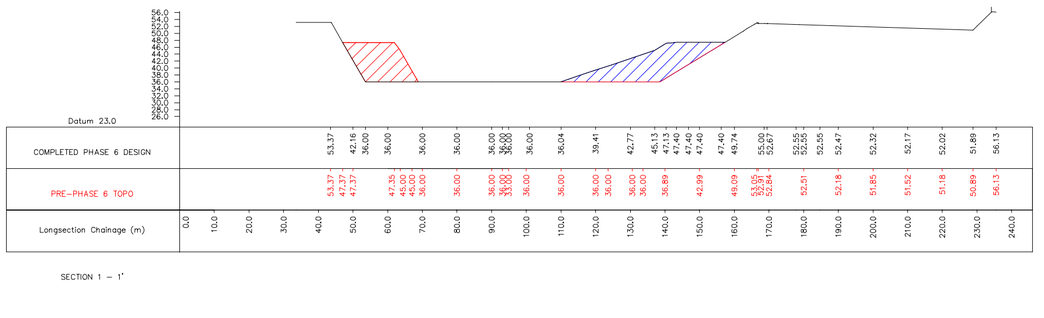
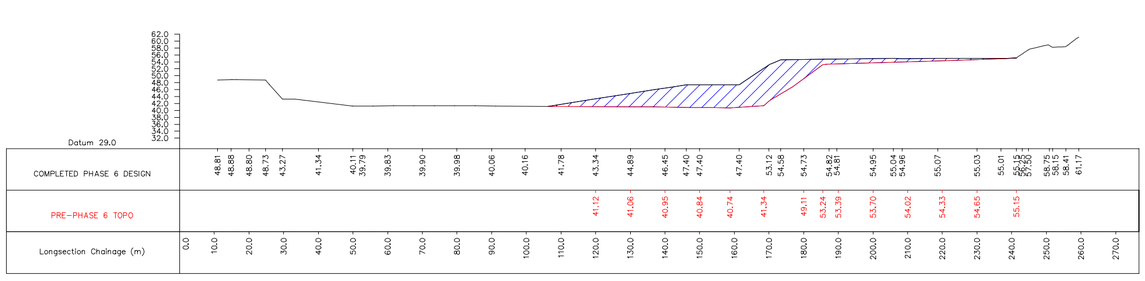


SECTION 2 – 2'

PHASE 5 CROSS SECTIONS

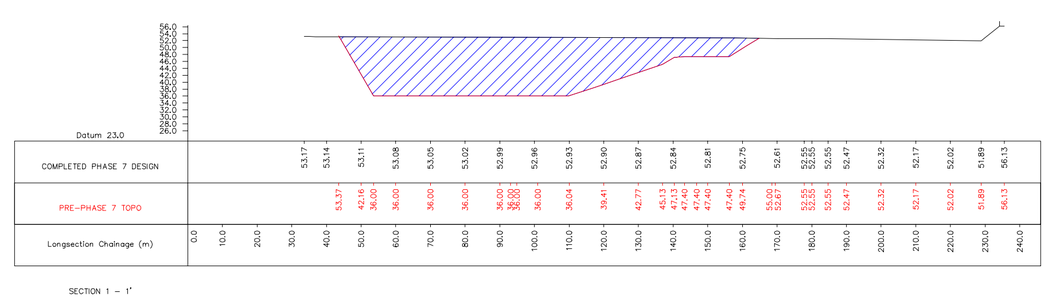


SECTION 1 – 1'



SECTION 2 – 2'

PHASE 6 CROSS SECTIONS



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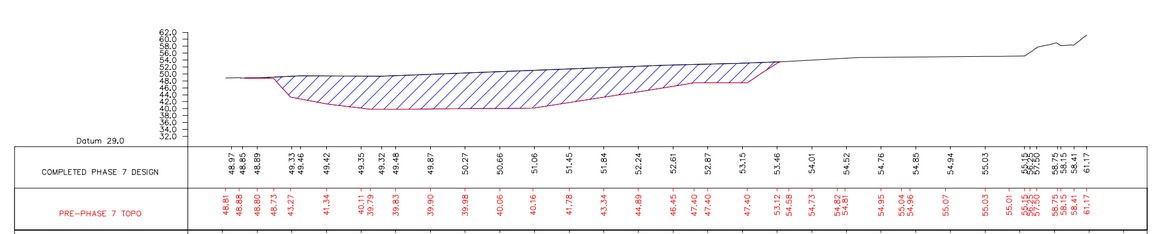
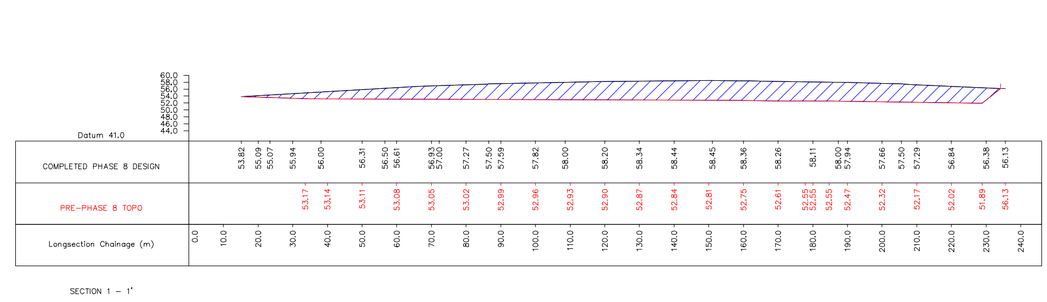
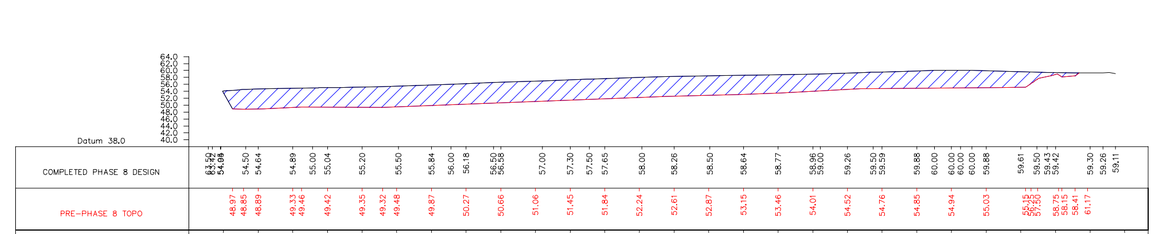


SECTION 2 – 2'

PHASE 7 CROSS SECTIONS



SECTION 1 – 1'



SECTION 2 – 2'

PHASE 8 CROSS SECTIONS

NOTES

AREAS OF MINERAL TO BE EXTRACTED ON A PHASED BASIS

AREAS OF RESTORATION TO BE PROGRESSED ON A PHASED BASIS

REV.	REVISION DETAIL	DRAWN	DATE
03	SURFACE WATER POND UPDATE	RB	30/11/23
02	TOPOGRAPHIC SURVEYS UPDATED	RB	07/11/23
01	FIRST ISSUE	RB	09/08/23

CLIENT:

ALLSTONE SANDS GRAVELS AGGREGATES TRADING CO. LTD

KEY GEOSOLUTIONS LTD
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SHROPSHIRE TF10 7DW
TEL: 01952 822960
E-MAIL: INFO@KEYGS.COM
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PROJECT:

BROMSBERROW QUARRY

TITLE:

UPDATED QUARRY DEVELOPMENT PLAN - FLOOR AT 36MAOD CROSS SECTIONS

DRAWN:	CHECKED:	DATE:
RB	BD	NOV '23
SCALE:	ORIGINAL SHEET SIZE:	STATUS:
1:1250	A1	FINAL

DRAWING NO.: 7873-005-D-004

REVISION: 03

Key

- Proposed tree planting
- Existing tree and vegetation planting to be removed
- Existing trees and vegetation to be retained
- Proposed woodland planting matrix
- Proposed bund hedgerow planting mix
- Proposed new grassland
- Proposed field ditch
- Existing levels (58.50)
- Proposed levels (Existing in brackets0) 54.60 (49.03)

Plant Schedule

All stock to be supplied in accordance with the National Plant Specification from an HTA approved nursery.

MAIN STRUCTURE TREE PLANTING SCHEDULE
(All stock to be supplied bare root unless stated)

Ref	Species	Quality	Lifecycle Carbon Capture
AC	Acer campestre	90-120 cm height, feathered	2572 Kg
BP	Betula pubescens	90-120 cm height, feathered	3224 Kg
FS	Fagus sylvatica	90-120 cm height, feathered	4216 Kg
QR	Quercus robur	90-120 cm height, feathered	7500 Kg
TC	Tilia cordata	90-120 cm height, feathered	5019 Kg

All stock to be root dipped in Mychorirral Inoculant prior to planting.
Trees to be supplied from Oak Processionary Moth (OPM) free countries, from designated pest free areas including protected zones. Plant passports will be required.

WOODLAND PLANTING MIX MATRIX SPECIES MIX planting)
(All stock to be supplied bare root unless stated)

Ref	%	Species	Quality
Ac	20%	Acer campestre	1+1 transplant, 60-80 cm, min. 3 breaks
Cm	15%	Crataegus monogyna	1+1 transplant, 60-80 cm, min. 3 breaks
Ca	25%	Corylus avellana	1+2 transplant, 60-80 cm, min. 3 branches
Fs	5%	Fagus sylvatica	1+1 transplant, 60-80 cm, branched
Ia	10%	Ilex aquifolium	2L, 40-60cm, leader and laterals
Ms	5%	Malus sylvestris	1+1 transplant, 60-80 cm, branched
Qr	5%	Quercus robur	1+1 transplant, 60-80 cm
Rc	5%	Rosa canina	1+0 transplant, 40-50 cm
Vo	10%	Viburnum opulus	1+2 transplant, 60-80 cm, min. 3 branches

Species to be planted on a 3.0 m grid system. Protect with spiral rabbit guards 60cm in height supported by cane.

BUND HEDGEROW PLANTING MIX
(All stock to be supplied bare root unless stated)

%	Species	Quality
10%	Acer campestre	1+1 bareroot transplant, 60-80cm height
40%	Crataegus monogyna	1+1 bareroot transplant, 60-80cm height
10%	Corylus avellana	1+1 bareroot transplant, 60-80cm height
10%	Cornus sanguinea	1+1 bareroot transplant, 60-80cmcm height
5%	Ilex aquifolium	3L container, 40-60cm height
5%	Ligustrum vulgare	1+1 bareroot transplant, 60-80cm height
5%	Malus sylvestris	1+1 bareroot transplant, 60-80cm height
5%	Prunus spinosa	1+1 bareroot transplant, 60-80cm height
10%	Viburnum opulus	1+1 bareroot transplant, 960-80cm height

Planting shall be carried out at 800mm centres ensuring around 2 plants per sq m. Protect with spiral rabbit guards 60cm in height supported by cane.

MEADOW GRASS SPECIFICATION MIX
(Seed supplied shall be British seed Houses WFG2 Flowering Meadow containing 20% Wild flora and 80% grasses to provide year round cover. Seed to be sown at a rate of 5 g/m2).

Species	
Agrostema githago	(Corn Cokle)
Anthemis arvensis	(Corn Chamomile)
Centaurea cyanus	(Cornflower)
Centaurea nigra	(Common Knapweed)
Chrysanthemum segetum	(Corn Marigolg)
Digitalis purpurea	(Foxglove)
Hypericum perforatum	(Perforate St John's Wort)
Leucanthemum vulgare	(Ox-Eye Daisy)
Papaver rhoas	(Poppy)
Silene alba	(White Campion)
Vicia sativa	(Common Vetch)
Agrostis castellana	(Common Bent)
Anthoxanthum odoratum	(Sweet Vernal Grass)
Festuca longifolia	(Hard Fescue)
Festuca ovina	(Sheeps Fescue)
Lotus corniculatus	(Common Birdsfoot Trefoil)
Plantago lanceolata	(Ribworth Plantain)
Prunella vulgaris	(Selfheal)

All areas to be seeded unless shown as matrix understory planting.

Topsoiling

All top soiling to general planting and grass areas to be in accordance with BS3882. All topsoil supplied to site shall be free or pernicious weeds and roots, clay lumps, non-soil materials or other building materials. Topsoil shall be spread evenly over areas and settlement accounted for in depth calculations. Topsoil is to be spread in layers and firmed when the material is reasonably dry. All soil finishes should be married in with existing adjacent levels to form a consistent join.

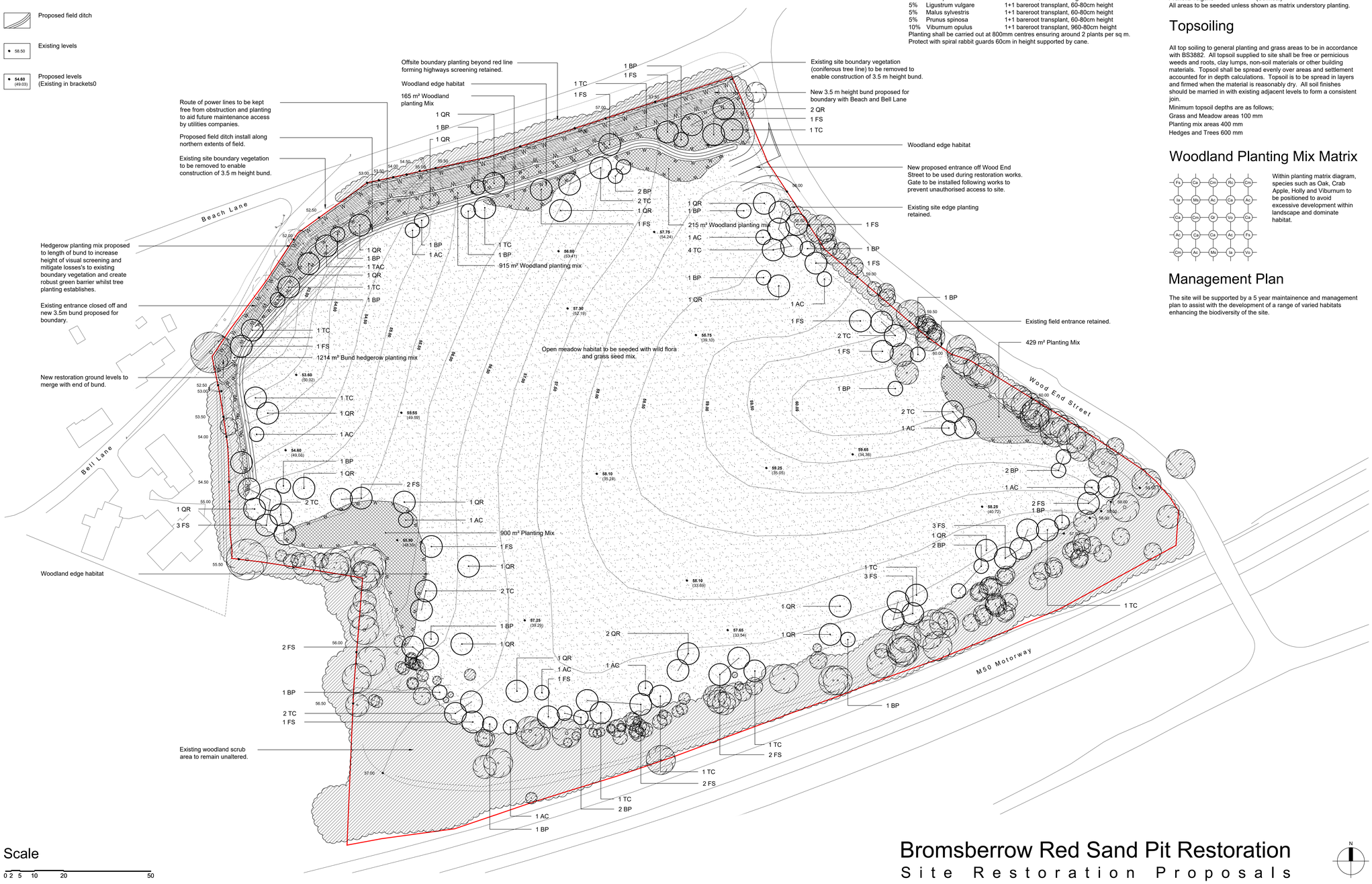
Minimum topsoil depths are as follows;
Grass and Meadow areas 100 mm
Planting mix areas 400 mm
Hedges and Trees 600 mm

Woodland Planting Mix Matrix

Within planting matrix diagram, species such as Oak, Crab Apple, Holly and Viburnum to be positioned to avoid excessive development within landscape and dominate habitat.

Management Plan

The site will be supported by a 5 year maintainence and management plan to assist with the development of a range of varied habitats enhancing the biodiversity of the site.



Notes

1) Do not scale directly from this drawing.

2) This drawing is to be read in conjunction with all other relevant MHP drawings and information supplied by other consultants.

3) Hatch patterns displayed on this drawing are indicative only and do not represent actual paving units or material sizes.

4) All tree planting in proximity to buildings to be checked by engineers to ensure foundation detailing is appropriate.

Rev	Description	Date	Drawn	Checked
A	New entrance to Wood End Street included, bund proposed to Beach / Bell Lane. Planting amended to accomodate.	13/05/22	DAL	PSH

Revisions:

Project: Bromsberrow Red Sand Pit Restoration

Client: P J Duncliffe

Title: Site Restoration Proposals

Drawing number: 21224.101 Rev: A

Status: FOR INFORMATION

Drawn By:	Checked By:	Date:	Scale @ A0:
DAL	PSH	23-11-21	1:500

Scale
0 2 5 10 20 50

Bromsberrow Red Sand Pit Restoration

Site Restoration Proposals

N

CHARTERED LANDSCAPE ARCHITECTS mhp
MHP DESIGN LTD 79 THE PROMENADE CHELTENHAM GL50 1PJ
T 01242 250 622 E info@mhpdesign.com www.mhpdesign.com

Rev.	Revision Detail	Drawn	Date
02	Updated drawing with March'23 topo	RB	07/11/23
01	First Issue	RB	28/04/22

CLIENT:

ALLSTONE SANDS
GRAVELS AGGREGATES
TRADING CO. LTD

PROJECT:

BROMSBERROW QUARRY

TITLE:

EXISTING SITE
LAYOUT PLAN

DRAWN:	CHECKED:	DATE:
RB	BD	NOV '23
SCALE: 1:500	ORIGINAL SHEET SIZE: A1	STATUS: FINAL

DRAWING NO. 21-248-D-011 | REVISION: 02

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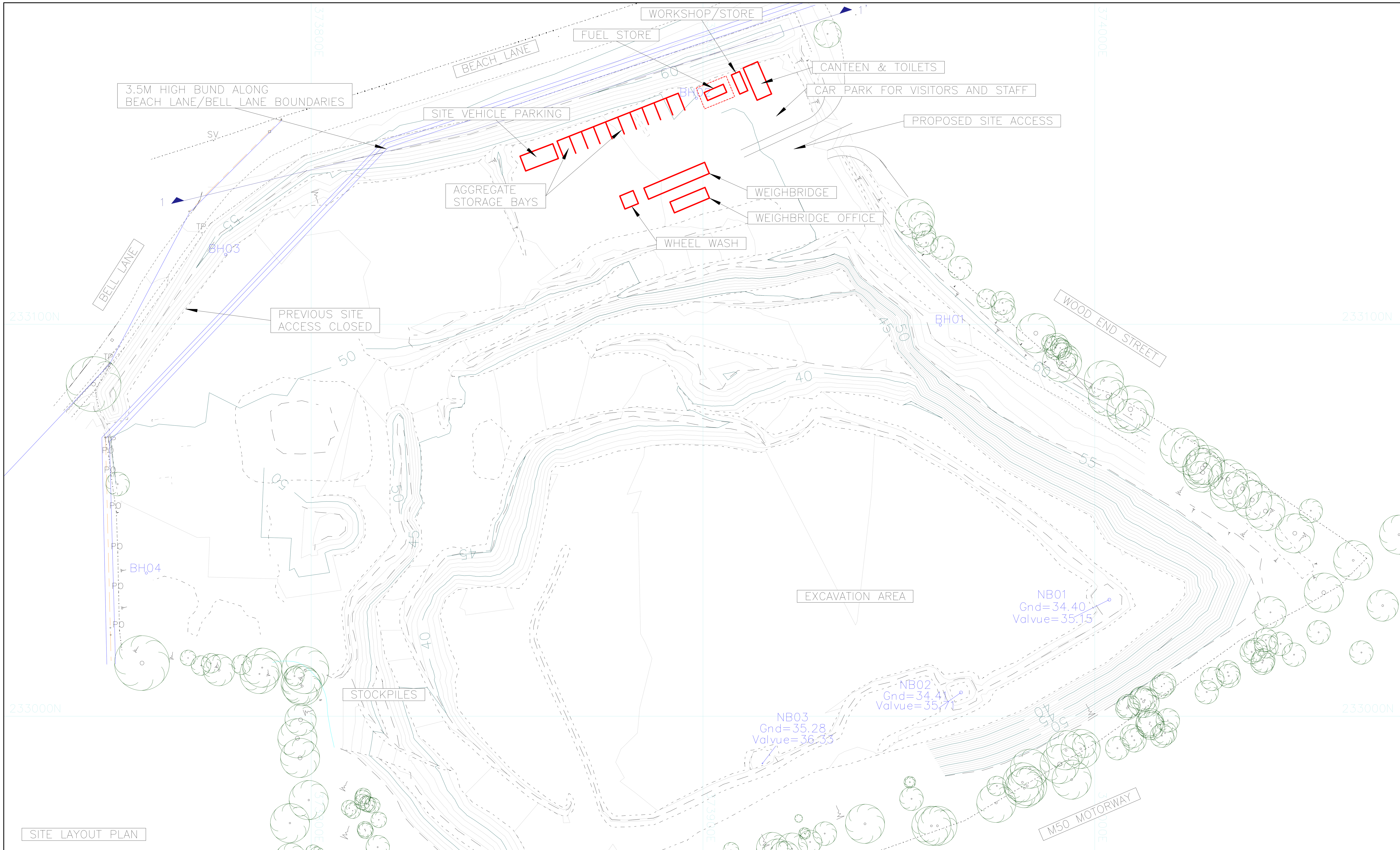

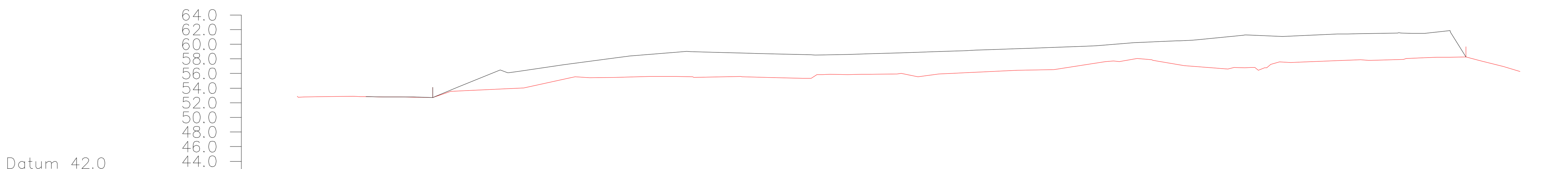

PROPOSED SITE LAYOUT PLAN WITH 3.5M BUND DESIGN	52.89 [illegible] 52.74 52.85 52.78 52.71 54.31 56.50 56.60 57.99 58.38 59.01 58.73 58.50 58.81 59.18 59.55 60.08 60.57 61.26 61.05 61.38 61.55 61.50 57.48 56.27
TOPOGRAPHIC SURVEY	52.89 [illegible] 52.74 52.85 52.80 52.71 53.62 60.65 54.35 60.65 55.55 55.41 55.46 63.55 63.54 63.43 [illegible] 55.60 55.48 55.59 55.86 55.86 56.04 55.57 56.16 56.52 57.71 58.05 60.65 56.94 56.59 [illegible] 57.58 57.78 [illegible] 57.87 58.05 60.65 58.24 58.26 57.48 56.27
Longsection Chainage (m)	0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0 110.0 120.0 130.0 140.0 150.0 160.0 170.0 180.0

SECTION THROUGH PROPOSED EARTH BUND ALONG 'BELL LANE' AND 'BEACH LANE' BOUNDARIES

Rev.	Revision Detail	Drawn	Date
02	Updated drawing with March'23 topo	RB	07/11/23
01	First Issue	RB	28/04/22

CLIENT:
ALLSTONE SANDS GRAVELS AGGREGATES TRADING CO. LTD

PROJECT:
BROMSBERROW QUARRY

TITLE:
PROPOSED SITE LAYOUT PLAN

DRAWN:	CHECKED:	DATE:
RB	BD	NOV '23
SCALE: 1:500	ORIGINAL SHEET SIZE: A1	STATUS: FINAL

DRAWING NO. 21-248-D-012 — REVISION: 02

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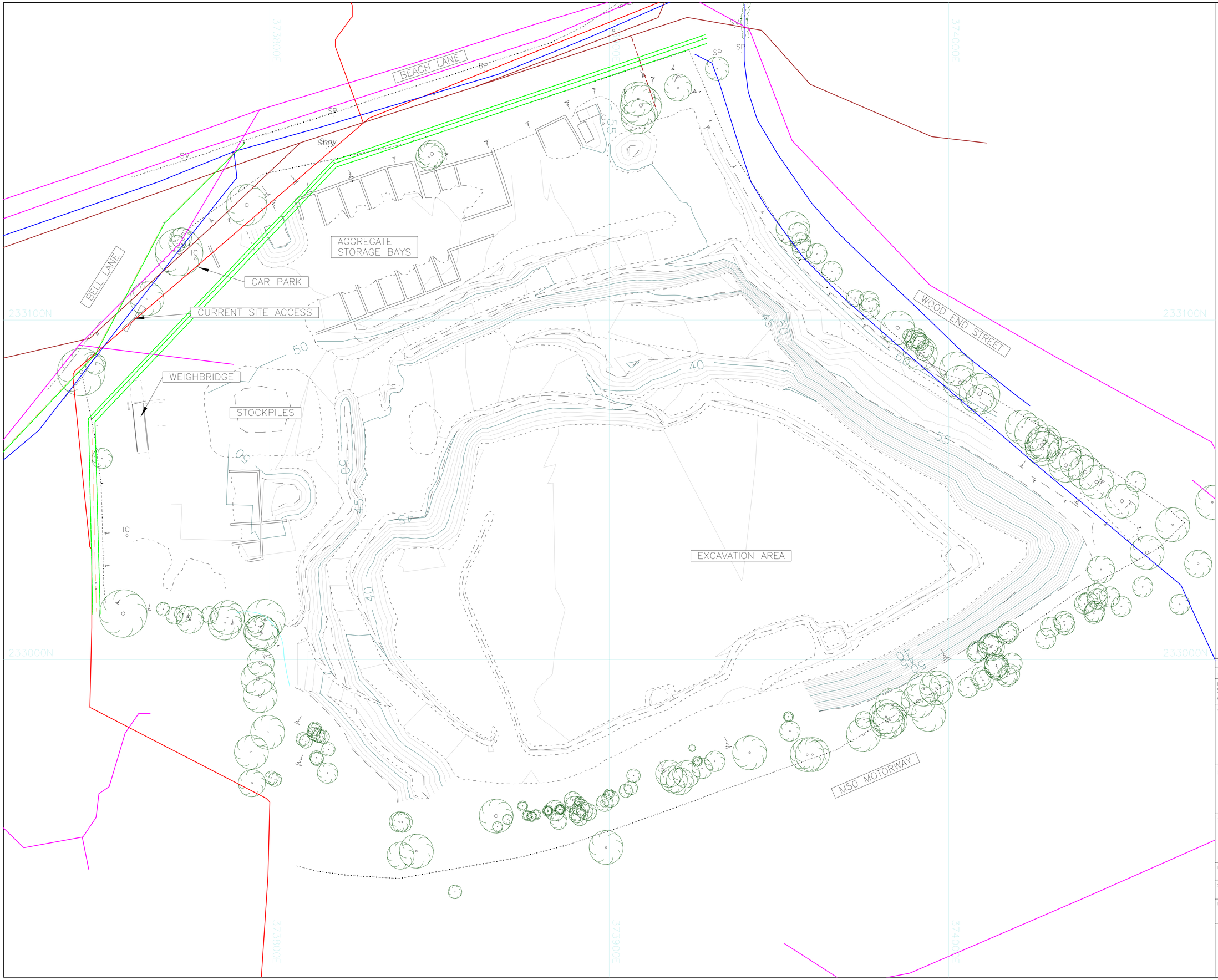

KEY

- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC
- WATER – MAINS
- WATER – FOUL
- WATER – FOUL (PROPOSED)
- OPENREACH (BT)

Rev.	Revision Detail	Drawn	Date
01	First Issue	RB	09/11/23

CLIENT:

ALLSTONE SANDS
GRAVELS AGGREGATES
TRADING CO. LTD

PROJECT:

BROMSBERROW QUARRY

TITLE:

SERVICES PLAN

DRAWN:	CHECKED:	DATE:
RB	BD	NOV '23
SCALE:	ORIGINAL SHEET SIZE:	STATUS:
1:500	A1	FINAL

DRAWING NO. 21-248-D-013

REVISION: 01

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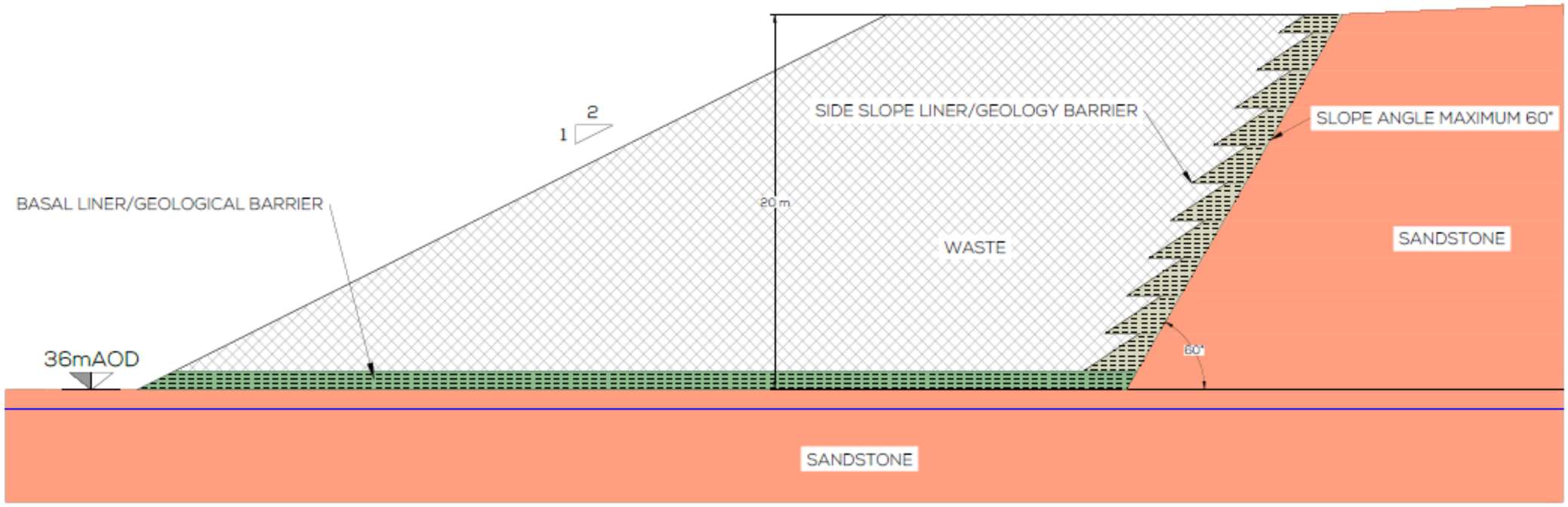

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) & ALL LEVELS ARE IN METRES (m) UNLESS NOTED OTHERWISE.
2. GEOLOGICAL BARRIER MINIMUM 1m THICK WITH A MAXIMUM PERMEABILITY COEFFICIENT OF $1x10^{-9}$m/s.
3. TEMPORARY SLOPE MAXIMUM 1V:2H AND SLOPE HEIGHT MAXIMUM 20m
4. THE SIDE SLOPE LINER WILL BE PLACED IN LIFTS OF MAXIMUM 2m PER LIFT.

KEY

- WASTE
- SANDSTONE
- BASAL LINER
- SLOPE LINER
- WATER LINE

P01	FIRST ISSUE	ZG	ZL	23.11.23
REV.	AMENDMENTS	DRW	CHK	DATE

CLIENT

Bromsberrow Sand & Gravel Ltd

PROJECT

BROMSBERROW QUARRY

TITLE

TYPICAL CROSS SECTION USED FOR SRA

DRAWN:	ZG	DESIGN:	---
CHECKED:	ZL	APPROVED:	BD
DATE:	NOV '23	SCALE:	1:250

KEY | GS PART OF RICHTER

STATUS: PRELIMINARY	SHEET SIZE: A3
DRAWING NO.: 7873-006-001	REV.: P01