

Invasive Non-Native Species Protocol



Introduction

This document has been prepared to combine various method statements from Licensed Invasive Species Consultant and Contractor, Japanese Knotweed Solutions Ltd (JKSL), in relation to the containment, control and removal of the invasive species Japanese Knotweed and Himalayan Balsam. The individual documents are appended to this document.

Background

Following a survey in November 2019, JKSL identified the presence of both Himalayan Balsam, and Japanese Knotweed which had spread from a neighbouring property. These locations are shown identifiable from Figure 1.

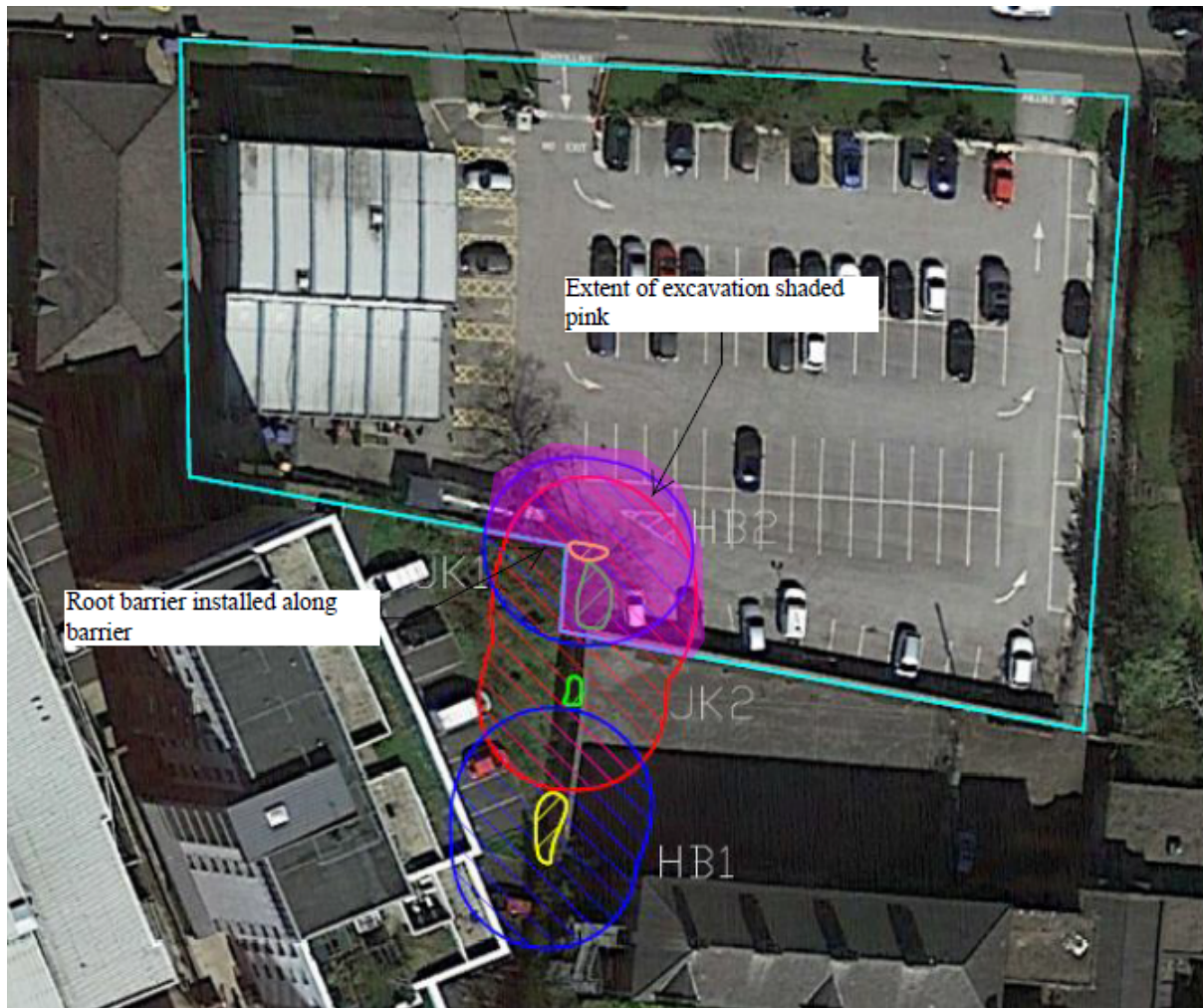


Figure 1

Upon identifying the invasive species the affected areas underwent a chemical treatment. There have been 8 treatments to date, with one more expected before October 2022.

The extent of planned development works brought risk to disturbing the invasive species before the final treatment. This creates the need to excavate the affected areas, remove spoil from site, and install a vertical root barrier along the boundary to block any growth from off-site.

Proposed Works

The works proposed to contain, control and remove the invasive species can be summarised as follows:

- Excavation of contaminated material - excavate to remove viable Japanese Knotweed including crown and rhizome to depth of deepest route. This includes transfer of material to on-site loading area
- Haulage and disposal of materials containing Japanese Knotweed propagules at a suitable facility. Materials will be removed in covered wagons
- Supply and installation of an HSP3 (O) Geo-Textile membrane root barrier as per manufacturer's guidelines. Top of membrane to protrude 50 mm above ground level

Decontamination

In order to prevent cross-contamination, plants, tools, other equipment and personnel (particularly boots) will be decontaminated when working with invasive species. This document covers the activity of decontamination by hand, without the aid of a jet wash.

The following equipment is required for this task:

- Hand tools - usually a stiff brush, spade or shovel and a foot wash

Temporary fencing and signage will be installed and root barrier membrane "decontamination area" will be in place to prevent cross-contamination.

Once contaminated equipment is ready to be removed from the working areas, visually inspect it for soils or viable Japanese Knotweed material visually. Remove all potentially-contaminated materials by hand or using brush shovels and / or spades. Work from top plant to the bottom.

Any potentially-contaminated material will be disposed of as specified in the Clean Site Policy, e.g. left on geotextile membrane or deposited into bucked or ton bags located nearby for this purpose. Bags or buckets will be replaced when they are filled to a level suitable for carrying to avoid spillage.

JAPANESE KNOTWEED SOLUTIONS LTD.

**THE UK'S
MOST
INVASIVE
WEED IS
WAITING...**

Management Plan

FOR

Manchester University NHSFT

CONTACT US (LINKS):

TEL: 0161 723 2000

WEB: <https://www.jksl.com/contact-jksl/>

(CLICK TO OPEN YOUR DEFAULT EMAIL APP)

EMAIL: jk@sltd.co.uk

Client	Manchester University NHSFT		
Site	Diabetes Car Park, Hathersage Road, Manchester		
Survey Date	29.11.19		
Surveyor	Kate Hilton		
Contact	0161 723 2000	jk@sltd.co.uk	https://www.jksl.com/contact-jksl/

Summary

This report gives the results of the survey outlined above, and the invasive species found within the survey extents, as outlined on the survey drawing in the “Drawings” section of this document. A full breakdown of the infestation in each area is provided later in the report.

Japanese knotweed and Himalayan balsam surface growth was recorded within the site boundary.

The site has currently been placed under a 5-year chemical treatment warranty in line with chemical treatments on the adjacent site. JKSL recommended that all areas be treated together.

The chemical treatment dates have been as follows:

- **20.06.19 – Initial treatment**
- **23.08.19 – Visit 1**
- **25.10.19 – Visit 2**
- **05.10.20 – Visit 3**
- **12.06.20 – Visit 4**
- **24.07.20 – Visit 5**
- **30.09.20 – Visit 6**

The site will also receive chemical treatments in:

- **August-October 2021**
- **August-October 2022**

The presence of Japanese knotweed on a site currently impacts on mortgage lending decisions, and can reduce the value of a property as well as resulting in legal duties for the owner of the site. Causing or allowing the plant to spread from your site to another site could potentially result in criminal prosecution (although this is rare), enforcement action by the authorities or civil action.

The growth present on site is included within an existing treatment programme put in place by a neighbouring land-owner.

At present, there are no insurance backed guarantees in place for this site, the costs for this are below.

Insurance Backed Guarantee Costs:

PCA trade body

1. *Knotweed Express Policy (Starts after 2 years no-regrowth)*
 - Policy fee (£45.00) + Admin fee (£35.00) + IPT @ 12% (£9.60) + Sign off survey fee (£275.00) + 10-year contractors guarantee (£260.00) + 2 seasons clear monitoring visits (£360.00) = £984.60+VAT
2. *Knot New Policy (Starts at the beginning of the treatment programme)*
 - Policy fee (£228.31) + Admin fee (£35.00) + IPT @ 12% (£31.60) + Sign off survey fee (£275.00) + 10-year contractors guarantee (£260.00) + 2 seasons clear monitoring visits (£360.00) = £1,189.91+VAT

Contents

Summary	2
Contents	4
Introduction.....	5
About Japanese Knotweed Solutions Limited	6
About Japanese Knotweed	7
Site Information	8
Background	8
Site Development and Other Plans	8
Survey Results	9
Photos	9
Drawings	10
Reference Documents	11
More about us - Invasive Weed Solutions Limited.....	11
Information about treatment methods.....	11
Codes of Practice.....	11
Insurance-backed guarantees	11
Herbicide information	11

Introduction

When reading this report in the original PDF format, you can use the links in the header and footer to navigate the document and contact us (phone numbers active on mobile devices only). Our Survey team will be happy to provide hard copies of the report or edited documents on request (e.g. to remove details of pricing or site planning documentation) although this may incur a charge.

Client	Manchester University NHSFT		
Site	Diabetes Car Park, Hathersage Road, Manchester		
Survey Date	29.11.19	Survey Time	10am
Site Conditions	Good weather conditions / visibility		
Surveyor	Kate Hilton		
Qualifications	BSc Hons, CSCS, CSJK		
Contact	0161 723 2000	jk@sltd.co.uk	www.jksl.com/contact-jksl/

The extents of the survey and the areas of invasive plant species found during the survey are shown on the survey [Drawing](#) and summarised in the [Survey Results](#) section, with photographs.

Disclaimer

The information in this report is up-to-date and accurate to the best knowledge of the Surveyor, based on a reasonable inspection, taking in to account the site conditions at the time of the visit. Japanese Knotweed Solutions Limited provide no warranty or guarantee that Japanese knotweed (or any other plant) is not present, or was not present at the time of the survey – only that there were no visible signs detected by our Surveyor.

It is important to note that Japanese knotweed forms extensive underground rhizome networks, that it does not generally grow from November until around spring time, that it can remain dormant for periods of up to twenty years and that it can re-grow from very small pieces of viable material. In rare instances, knotweed plants can also grow from seed in the UK.

While every effort has been made to identify any and all invasive plants on site, it is possible for the presence of Japanese knotweed to be concealed from even a very experienced surveyor, for new infestations to establish quickly or for knotweed to be overlooked during a survey, particularly where the site is overgrown with other vegetation or otherwise obstructed. Where there were any areas of the site that could not be surveyed or properly inspected, this will be noted in the Survey Results.

Copyright

This report and the information within, including (but not limited to) images and site plans are the intellectual property of Invasive Weed Solutions Limited, and all rights are reserved. The report is licenced to the Client for their exclusive use and must not be used, copied, reproduced or shared by any third party without the express permission of Invasive Weed Solutions Limited.

Where other documents are used to support this report (client's site plans, photographs or any other material), this has been obtained by Invasive Weed Solutions Limited either by the client, in the public domain or under licence (or fair use), and is provided here for reference only. Where possible, this will be attributed to the original source of the content. Invasive Weed Solutions Limited does not warrant the content or accuracy of any third-party information contained within this report.

About Japanese Knotweed Solutions Limited

Japanese Knotweed Solutions Limited is a full member of invasive species trade bodies [INNSA](#) and the [PCA](#). Both organisations implement their own quality standards and provide support to clients, as well as routes to independent redress. Having works completed by a member of one of these organisations is often a precondition of finance in the UK, particularly mortgage lending.

JKSL are committed to best practice, and have been integrally involved in drawing up the [INNSA Standards](#) and the [INNSA Code of Practice](#). These documents provide clear minimum standards that JKSL will always work to – but which other contractors may not commit to (or be able to deliver). These standards are in place to ensure that works are carried out in a way that best protects the client's site from future problems, which can be costly, as well as causing significant delays or even damage to critical projects. JKSL also comply with all local legal requirements.

JKSL offer a variety of insurance-backed guarantees, with five- and ten-year products available as standard and longer guarantees available on request. Insurance-backed guarantees are often a requirement for domestic property sales where Japanese knotweed is recorded – but they also offer our clients cover in the case that JKSL should cease to trade, ensuring that alternative provision can be made for the future of the site.

JKSL's robust safety, environmental and quality management systems are accredited by UK approval bodies, and we are accredited to ISO:9001 and ISO:14001. If you want to know more about JKSL, visit our [website](#), view our other [accreditations](#) and learn why you should choose us.

JKSL use in-house teams, with our three most senior site staff having each worked for the company since its founding in January 2002; we also have numerous other members of site and office-based staff with ten years' experience with the company. This ensures that your works will be carried out by some of the most experienced invasive species specialists in the UK. Our teams work year-round on Japanese knotweed and other invasive weed removal projects, so all works will be completed by a knowledgeable specialist – not a general gardener or agency worker.

JKSL has been at the forefront of invasive weed treatment for over fifteen years, and we continue to offer the most up-to-date and reliable methods available for remediating these problems – but what we recommend to our clients are the most reliable methods we are aware of, and the most suitable method for the development plans for the site in question. There are no “miracle cures” for Japanese knotweed and it's important not to be taken in by claims that one company can do something that no other companies can do – particularly where they are suggesting that they can convert contaminated soils into clean soils.

It is also worth questioning cheaper quotes, with some companies deliberately underestimating excavation volumes for projects and putting them on re-measure, only for the price to increase significantly during works. While lump-sum-fixed-fee is not always appropriate for knotweed removal, particularly where excavation is concerned, you should question any proposal which estimates the spread and depth of rhizomes as anything less than 4m wide and 1m down.

There are no shortcuts with Japanese knotweed – but Japanese Knotweed Solutions have the experience and track record that you can depend on to ensure that your site is managed over the long term.

About Japanese Knotweed

Invasive plant species or “invasive weeds” are problem plants which originated outside the UK but were spread or introduced here. Many non-native species in the UK do not cause significant negative effects; however, species like Japanese knotweed, *Rhododendron ponticum*, *Buddleja davidii*, Himalayan balsam and giant hogweed have all caused significant damage in the UK since their introduction in the 18th and 19th centuries and are therefore described as “invasive”.

Invasive weeds often out-compete native species because the invasive weed has few (or no) natural predators in their new habitat. Invasive weeds and other invasive species cause significant impacts to the economy; the total annual cost of invasive non-native species to the British economy is estimated to be approximately £1.7 billion, with Japanese knotweed costing over £150 million per year based on most recent (2010) official estimates^[1].

Japanese knotweed does not normally spread via seeds in the UK; it spreads through the expansion of its underground rhizome (“root system”) and transportation of fragments of rhizome and surface growth which can easily re-grow; a fragment of rhizome less than 1g can grow into a new plant. These fragments are known as “propagules” and can be carried via any means including flood waters, landslip, soil movement, or on boots, tools and equipment. Spreading Japanese knotweed within a site is common and is a major cause of increased remediation costs. It is important to implement a Clean Site Policy as soon as you become aware of Japanese knotweed on your site to prevent the spread of Japanese knotweed; JKSL can help with this from day one.

Japanese knotweed is known to have significant impacts on development and infrastructure. While damage to structures, particularly existing buildings, is uncommon, it is known to occur and is much more likely when the structures are built on top of areas where Japanese knotweed is already present or where soils containing Japanese knotweed are imported during the development process. Damage to hard surfaces, landscaping and retaining walls is common and growth within buildings and infrastructure damage have all been recorded on sites JKSL have investigated.

In the UK, mortgage lenders currently take a very risk-averse approach to Japanese knotweed and the presence of Japanese knotweed on a site can have significant effects on property value and lending decisions. Most commonly, lenders will only approve funding for domestic properties contaminated with Japanese knotweed if a treatment plan is in place along with an insurance-backed guarantee. JKSL can offer all of the above and we are members of both UK trade bodies who deal with invasive species – INNSA and the PCA. This report should be suitable for the requirements of any UK lender but please contact your surveyor if anything further is required.

Remediation of Japanese knotweed normally involves either treatment with chemical herbicide or mechanical remediation (digging out the plant’s roots). Both options have their advantages and our surveyor will recommend what they feel is the most appropriate treatment for your needs.

Because Japanese knotweed is controlled under UK law^[2], any Japanese knotweed-contaminated materials leaving site must be taken to a licensed landfill site. Implementing our Clean Site Policy as soon as practicably possible may reduce the volume of soils which are eventually removed.

[1] The Economic Cost of Invasive Non-Native Species on Great Britain, F. Williams et al, November 2010, CABI

[2] including the Wildlife and Countryside Act 1981 and Environmental Protection Act 1990

Site Information

The site consists of the NHS Diabetes centre with car park and associated grassed areas. Adjacent land contains newly developed properties, as well as a derelict area of hard standing.

Background

The site is currently part of an existing chemical treatment programme to cover Japanese knotweed and Himalayan balsam. The chemical treatment dates have been as follows:

- **20.06.19 – Initial treatment**
- **23.08.19 – Visit 1**
- **25.10.19 – Visit 2**
- **05.10.20 – Visit 3**
- **12.06.20 – Visit 4**
- **24.07.20 – Visit 5**
- **30.09.20 – Visit 6**

The site will also receive chemical treatments in:

- **August-October 2021**
- **August-October 2022**

Site Development and Other Plans

It is important that Japanese Knotweed Solutions are provided with up-to-date information about site plans, including accurate site drawings and details of any additional planned works, particularly in any contaminated area. Japanese knotweed is easily spread and even tiny fragments can cause new infestations if they are moved out of a contaminated area. It is important to implement a Clean Site Policy and Japanese Knotweed Management Plan as soon as practically possible.

Any activity on site which has the potential to cause cross-contamination can significantly increase the remediation costs for Japanese knotweed, and any warranty or guarantee offered may be invalidated if works are undertaken which cause cross-contamination on site.

Survey Results

Areas of Japanese knotweed were identified, as described in the table below – which corresponds to the [survey drawing](#) JK19-5946-01 which is included in this report.

Growth was identified off-site and is included within this drawing.

Photos

Photos have been arranged into the tables below – with each table corresponding to the lettered area (Area A, Area B, Area C etc.) as identified on the survey drawing.

Area JK1	
	
Japanese knotweed infestation areas	Himalayan balsam infestation area
	
Area to the rear of site – no Japanese knotweed or Himalayan balsam present	Further Japanese knotweed growth

Drawings



Reference Documents

This document is deliberately concise but if you need more information, your Surveyor will be happy to help. JKSL also provide online documents to assist our clients. Below is a selection of links to information on the work we do, our products and services, and what we use to do the job.

More about us - Invasive Weed Solutions Limited

- Website – <https://jksl.com>
- [Contact us](#)
- [Why choose us?](#)
- [Accreditations](#)

Information about treatment methods

- The [INNSA Standards](#) are minimum requirements for the main Japanese knotweed treatment methods. INNSA is the UK trade body dedicated to invasive species remediation.

Codes of Practice

- The [INNSA Code of Practice – Managing Japanese Knotweed](#) (pdf) gives full guidance for landowners, developers, contractors and others with an interest in Japanese knotweed.
- The Property Care Association have their own [Code of Practice](#) (pdf) for Japanese Knotweed
- RICS (formerly the Royal Institute of Chartered Surveyors) released guidance in 2012 – [Japanese Knotweed and Residential Property](#) (pdf). This guidance is no longer current.
- The Environment Agency gives guidance called [RPS 178](#) which explains what you need to do to get rid of Japanese knotweed material from your site.
- The original [Environment Agency's Code of Practice – Managing Japanese Knotweed on Development Sites](#) was used for almost fifteen years, but was withdrawn in 2016.

Insurance-backed guarantees

- [10 Year INNSA Insurance Backed Guarantee](#)
- [GPI – Knotweed New](#)
- [GPI – Knotweed Express](#)

Herbicide information

- [Safety Data Sheet - Roundup Pro Vantage 480](#)
- [Safety Data Sheet - ICADE](#)
- [Safety Data Sheet - Katana](#)
- [Safety Data Sheet - Mixture B NF](#)
- [Use of Roundup near pets](#)
- [Use of Roundup near livestock](#)



SAFE SYSTEM OF WORKS: Decontamination of Plant, Equipment and Personnel

LAST REVIEW / UPDATE: 22/06/2021

REVIEWED BY: Chris Oliver

NEXT REVIEW BEFORE: 01/05/2023

INTRODUCTION

In order to prevent cross-contamination, plant, tools, other equipment and personnel (particularly boots) should be decontaminated when working with invasive plant species. This document covers the activity of decontamination by hand, without the aid of a jet wash. It does not cover any other activities.

HEALTH AND SAFETY

This document covers the task and should be read with JKSL's Health and Safety documents, including the contractor's Risk Assessment and Method Statement (RAMS) where relevant. Separate RAMS must be provided for the other operations on site.

Where these works are to take place on a working site, JKSL personnel will attend a briefing or induction from the Principal Contractor and will follow all site procedures.

JKSL's Site Foreman should report any health and safety concerns on site to the client's Site Manager at the earliest opportunity, as well as reporting concerns to the JKSL office.

Manual handling risk associated with this task are expected to be significant but not severe. This is addressed in JKSL's Manual Handling Risk Assessment and the task-specific RA. Risks of twisting and bending can be minimised by an ergonomic layout of working areas.

Where decontamination works involve plant, it is important to ensure that operatives work safely around plant, and that all plant is switched off and cool, with the keys given to the decontamination team to ensure the plant is not operated accidentally.

The potential to disturb asbestos containing materials during this operation is relatively high, and staff carrying out these works should have asbestos awareness training.

EQUIPMENT

The following equipment is required for the task:

- Hand tools – usually a stiff brush, a spade or shovel and potentially a foot wash

Depending on the job, temporary fencing and signage may be installed and root barrier membrane "decontamination area" may be put in place to prevent cross-contamination. This will be outlined in the Clean Site Policy and additional task-specific RAMS.

The site-specific RAMS will specify what PPE is to be used, but the minimum PPE required for this task is:

- footwear with protective toe and mid-sole [EN ISO:20345],
- high-visibility vest, coat or tabard [EN ISO:20471]
- hard hat [EN397]



- eye protection [EN166]
- knee pads [EN 14404] if works will be done kneeling down
- gloves [EN 388]

PREPARATION

JKSL's Site Foreman will make sure all JKSL staff get an induction or site briefing from the client or contractor before starting works.

Foot wash will be placed at a suitable location and used by any person when leaving the contaminated area. Decontamination team can advise foot wash users on correct use.

Tools and other equipment must be inspected before starting works and all plant and powered tools must be left to cool down before starting works.

All works will be undertaken in line with JKSL's Clean Site Policy, the requirements of which will be specified in that document, including what to do with contaminated materials.

DECONTAMINATION OF TOOLS AND EQUIPMENT

Once contaminated equipment is ready to be removed from working areas (including being switched off and cool), visually inspect it for soils or viable Japanese knotweed material visually. Remove all potentially-contaminated materials hand or using brush shovels and/or spades. Work from the top of plant to the bottom.

Plant may need to be operated to e.g. rotate the wheels or tracks. This must be done by agreement between the team and the plant operator at the end of the decontamination process, using hand signals (e.g. thumbs-up rule).

TRANSFERRING CONTAINERS / REMOVAL OF MATERIALS FROM SITE

Any potentially-contaminated material should be disposed of as specified in the Clean Site Policy, e.g. left on the geotextile membrane or deposited into buckets or ton bags located nearby for the purpose. Bags or buckets will be replaced when they are filled to a level suitable for carrying by the available team.

All transfer of containers must be carried out in a planned way, in line with manual handling best practice, including e.g. transferring these using vehicles or dumpers where this is appropriate and allowed within the Clean Site Policy. Do not over-fill containers, and unload some material into another container if required to make carrying safe.



SAFE SYSTEM OF WORK: Excavation, Transfer and Loading Operations

LAST REVIEW / UPDATE: 06/01/2021

REVIEWED BY: Chris Oliver

NEXT REVIEW BEFORE: 01/05/2023

INTRODUCTION

Mechanical excavation (and hand digging) are used in remediation, relocation or removal of plant species. Where invasive plants (particularly Japanese knotweed) are present in soils, legal restrictions may apply and a Clean Site Policy should be implemented to reduce the risk of cross-contamination.

Heavy plant including excavators from 0.5-21 tonnes and dumpers from 1-10 tonnes may be used to dig and transfer materials including soils and plant material.

This document does not cover the installation of root barriers, any fencing, decontamination, (hand-)screening or any other operations not explicitly outlined in the "OPERATIONS" sections below and does not cover the use of specialised excavator attachments e.g. a pecker (or flail). JKSL do not operate wagons (for delivery or removal of aggregates or soils) or deliver any plant heavier than a micro-digger carried on a trailer, so these operations must be covered by the supplier's RAMS.

HEALTH AND SAFETY

This document covers the task and should be read with JKSL's Health and Safety manual as well as site-specific Method Statement (SSMS) and relevant Risk Assessments (RAs).

Also see separate risk assessments for vibration, noise and manual handling. Manual handling must be carried out in a planned way, and only as approved by the Site Foreman.

COSHH assessments will be provided for any hazardous substance (including diesel). Fuels will be stored in approved containers only. When refuelling plant (or any equipment), the relevant RAMS will be followed, and plant nappy and spill kits in place.

Only competent, qualified (CPCS or NPORS) operators are permitted to operate plant. All plant must be used in line with operator's training and JKSL's vibration risk assessment. All operators using plant and operatives working near to plant must wear hearing protection if this is required by JKSL's noise risk assessment.

Excavations made by JKSL will be made and maintained by JKSL up until the completion of works, at which point they will be handed back to the control of the client. Unless agreed with JKSL's Project Manager, backfilling will not be carried out and fencing (or other safety measures) will not be left in place. Daily inspections of the excavation(s) will be carried out by a competent member of JKSL staff, using the checklist provided.

Excavations will always be made in such a way as to avoid the need for sheeting, propping or shoring – excavations will be wide, open and graded or battered to a suitable angle to prevent the possibility of collapse.



Suitable safety measures must be in place at all times when significant excavations are present on site. JKSL Site Foreman must contact JKSL Project Manager if they feel additional measures (e.g. fencing, stop blocks etc.) are required in order for excavations on site to be safe for all groups identified in the RA.

Any specific safety measures required by the client or site owner (including those highlighted in their RA) will only be implemented by JKSL where agreed with JKSL's Project Manager – otherwise, these will be the responsibility of the client.

EQUIPMENT

The following equipment will be used for this task:

- Excavator(s) – as specified in the SSMS
- Dumper(s) – as specified in the SSMS, if required
- CAT scan and generator
- Fuel bowser, diesel and AdBlue may be required for longer projects
- Line marker spray
- Footwash, brushes, shovels and spades may be required for decontamination
- (Fencing materials, root barrier etc. will be specified in separate RAMS)

The site-specific RAMS (and/or client's site rules) will specify what PPE is to be used, but the minimum PPE required for this task is:

- footwear with protective toe and mid-sole [EN ISO:20345],
- high-visibility vest, coat or tabard [EN ISO:20471]
- hard hat [EN397] is mandatory on sites where plant is present – unless you are in the cab of an excavator with FOPS (falling object protection system)
- eye protection [EN166] is mandatory for dumper drivers

The following PPE may be required for this task:

- hearing protection [EN352] may be required for plant operators or operatives
- gloves [EN388] are recommended but optional unless handling soils
- eye protection [EN166] is recommended but optional for general works on site
- high-visibility trousers [EN ISO:20471] are recommended but optional

SITE TRAFFIC

The site-specific RAMS (and client's site induction, where applicable) should address the access routes and parking locations for road vehicles, the approved routes for site plant and the pedestrian routes on site.

Competent banksmen must be present to guide vehicles in the following circumstances:

- Any vehicle reversing, except road vehicles under 3.5 tonne GTW
- Any vehicle entering site, except road vehicles under 3.5 tonne GTW
- Any plant, 8-wheeler or grab wagon moving around site
- Any plant or vehicle entering or leaving a loading area
- Any vehicle towing on site (including road vehicles)

PREPARATION

Before starting work, implement Clean Site Policy, if the works require one. Implement either the client's or JKSL's Permit to Dig system before breaking ground.



Before starting work, JKSL's Site Foreman will walk and inspect the following areas:

- The excavation area(s)
- any haul routes along which materials will be transferred
- loading area(s)
- areas for burial pits, waste management area (WMA) or temporary WMA.

The foreman will check these areas for obstructions, slip/trip/fall hazards, fall-from-height hazards or anything that would interfere with the work; they will also look for overhead services and signs of underground services (manhole covers, lamp posts etc.). On-site risk assessment will be used and additional control measures (such as goalposts) should be put in place if required, JKSL office informed and the RAMS updated accordingly.

Haul routes, loading and/or storage and WMAs will be marked as appropriate, if required. Loading areas must be physically marked (e.g. using cones) where they are to be used by wagons. Marked loading areas are recommended (but not required) for loading dumpers.

JKSL will check that inspection (and LOLER paperwork for excavators) are provided with all plant delivered to site. Plant will be inspected daily by a competent person, using the checklist provided. Plant will be secured when not in use, with the keys removed and must be left (shuttered, if provided) in a suitable location (as agreed) at the end of each day.

JKSL will CAT scan any area where ground is to be broken before starting works – this will be done by a trained, competent operative only. Service drawing(s) and UXO (unexploded ordnance) survey for the site should be requested from the client and checked before CAT scanning. If these are not available, proceed on the basis that there are active services in all excavation areas.

Before starting works, JKSL will CAT scan any area where ground is to be broken. This will be done by a trained, competent operative only and in line with the separate RAMS for this task. Service drawing(s) and UXO (unexploded ordnance) survey for the site should be requested from the client and checked before CAT scanning. If these are not available, proceed on the basis that there are active services in all excavation areas.

All suspected services will be appropriately marked before digging, and discussed with the machine operator, if this is not the person doing the CAT scanning.

If diesel or petrol are stored on site, an impermeable bund must be in place, measuring at least 110% of the storage capacity of the largest vessel or 25% of the total storage capacity, whichever is the greater. JKSL will put this in place as required.

JKSL's Site Foreman will give a briefing to the team, to include:

- which members of staff will be doing which task(s)
- location of storage area(s) for fuel, plant etc.
- where excavations are to be carried out
- where (temporary) WMA, burial pits and root barriers are to be installed
- routes for moving around site (pedestrian, plant and other vehicles)
- sequence and timings for excavations and loading
- any relevant hazards (asbestos, overhead services, slip/trip/fall and fall-from-height)
- any site-specific information (from RAMS, on-site RA, service drawing etc.)
- areas to avoid, including 500mm radius from any suspected services



OPERATIONS – EXCAVATION

Within 500mm (laterally in any direction) of any suspected underground services, digging will be carried out by hand using shock shovels. In all other areas, use the mechanical excavator. Exposed solid pipes must not be undermined, and cables should not be left hanging – Adequate means of support should be discussed with the client's site engineer before digging under any services found on site.

JKSL will excavate materials as outlined in the SSRA. Normally, excavations for Japanese knotweed chase the root system to any limit laid out by the client's site engineer – or until it is fully removed. For species where seeds are of greater concern than the root system, the specified radius for the seed bank must be agreed in advance and marked on site.

Excavators will be positioned giving consideration first to safety (including prevention of collapse of the excavation) and then to the prevention of cross contamination. The machine operator will determine the most efficient approach to removing the material – including the sequence of digging, if multiple areas are required to be excavated.

Care will be taken not to spill excavated materials, particularly where Clean Site Policy is in place. Spillages will be cleaned up as soon as it is safe to do so (once the machine operator has halted operations). This will be carried out by JKSL Operatives using a combination of spades, shovels and brushes, as appropriate.

The excavation should proceed in roughly 300mm layers, with the edges of the excavation being graded or battered where possible to remove any steep drops. The area should be re-CAT-scanned every 300mm (depth) of excavation. The machine driver must switch off the machine before operative CAT scan within the swing of the machine.

The excavated material will be loaded directly from the contaminated area directly into waiting wagons / into waiting dumpers / into (temporary) WMA, as outlined in the SSMS. Dumper drivers must leave their dumper and switch it off

Once each area has been cleared to the satisfaction of JKSL's Site Foreman, this will be signed off as complete, and the excavation graded (if required) and machines, tools and operatives decontaminated before moving to the next area as per separate RAMS for this process.

OPERATIONS – TRANSFER OF CONTAMINATED MATERIALS

Vehicles will approach the loading area, and stop outside both the swing of the machine and any other exclusion zone (e.g. contaminated area). On flat ground, dumper drivers will drive face-on into the exclusion zone. Wagons will reverse in to the loading area, and must only do this under the guidance of a competent banksman.

Wagons should never enter an excavation. Dumpers will be permitted to enter down a graded slope if the route in to the excavation is in good condition, suitably graded and free from obstructions. When moving down a slope, dumpers should drive directly down the slope (not sideways or at an angle). A forward-tipping dumper should be driven forward down a slope if it is empty, and should be reversed down a slope if it is loaded. When driving up a slope, a forward-tipping dumper should be driven forward if it is loaded, and reversed if it is empty. Once safely on flat ground, the dumper should manoeuvre to face the appropriate direction of travel.



During loading, dumper drivers must switch off the vehicle, remove the keys and walk outside of the swing of the excavator before loading starts. A competent banksman (ideally the dumper driver) should signal the excavator driver when to start and stop loading. Dumpers unloading should unload on flat ground only, and will approach the unloading area slowly, and confirm that the area is clear before emptying the bucket. Stop blocks can be put in place to assist with correct positioning, if required.

During loading, tipper wagon drivers should remain in the cab of their vehicle, with the engine turned off. Grab wagon drivers should be on the grab station at all times during loading and in the cab at all other times. The banksman should signal the excavator driver (or grab operator) when they can start loading and when to stop, and the banksman should indicate to the wagon driver when they can cover the wagon, and when it is safe to re-start the engine and move away from the loading area.

Vehicles and skips may be loaded to capacity unless the Clean Site Policy states that part-loading (usually to 75%) is required to avoid any cross-contamination issues.

OPERATIONS – MAKING AND MANAGING STOCKPILES

Excavators may also be used to move and transfer materials deposited by hauliers, dumpers or other excavators and/or to form them into bunds, stockpiles or other formations or to backfill earlier excavations.

When backfilling or loading materials into a borrow-pit (e.g. for burials) the position of the excavator may be included in the SSRA but will often need to be made on site, because of considerations about protecting the root barrier membrane. A machine driver may track over a backfilled excavation in order to compress the materials, but only when it is safe.

Forming stockpiles is normally done from adjacent to a small stockpile but may be done from adjacent to or on top of the stockpile depending on considerations of stability and avoiding collapse or cross-contamination. For very large stockpiles, driving onto the stockpile be required.

Stockpiles must not be made more than 1m tall unless this is explicitly stated in the SSMS. Stockpiles should have a suitable profile – generally at least as wide as they are tall, with an additional fringe, graded to a ratio of 1:1 or similar (depending on the properties of the soils or material used).



SAFE SYSTEM OF WORK: Prep and installation of root barrier membrane

LAST REVIEW / UPDATE: 19/10/2021

REVIEWED BY: Chris Oliver

NEXT REVIEW BEFORE: 01/05/2023

INTRODUCTION

Geotextile membranes (aka "root barriers") are used in a variety of ways to provide a barrier between two areas, preventing the spread of invasive plant material. This could be on a surface to protect it from materials stockpiled above or buried below, or in a "vertical" orientation to prevent lateral migration from one area into another.

Barriers can occasionally be installed by a single operative but it is generally a two-man job. The works require physical exertion, lifting and carrying and may require the use of hand tools and powered tools, run from a generator.

JKSL recommend that any works in contaminated areas are carried out with a member of JKSL staff on hand in order to maintain a clean site and prevent cross-contamination. For this reason, a Clean Site Policy will most likely be implemented in the associated works.

This safe system of work covers only the activities of JKSL staff while preparing and installing root barriers – it does not include and works that break ground or the preparation of surfaces for the installation of barriers.

HEALTH AND SAFETY

This document covers the task only and should be read with JKSL's Health and Safety Manual, site-specific Method Statement and Risk Assessment(s).

Also see separate Manual Handling Risk Assessment. Manual handling should always be carried out in a planned way, and only as approved by the Site Foreman.

Because installation of vertical root barriers or lining of burial cells are likely to be carried out in excavations, a suitable risk assessment for this element of the works must be included in the safety documents for such works.

Where the site is open access or where vandalism is a known risk, large areas of membrane should, if possible, be covered with a small layer of material to prevent the risk of arson resulting in combustion of sections of the barrier.

EQUIPMENT

The following equipment is required for this task:

- Geotextile – which can be supplied as 6m / 3m / 2m wide rolls or as "off-cuts" of virtually any size. The team should bring the smallest section that will do the job.
- Cutting tools ("Stanley" knife, fixed-blade knife or suitable shears)
- Welding tools – normally a "heat gun" but also a wedge-welder if appropriate.
- Generator (to power the heat gun)
- Mallet, timber pegs, screws, washers and cordless drill / screwdriver

Safe System of Works – Watching Brief on Client's Works and Install Root Barrier (JK)



The site-specific RAMS will specify what PPE is to be used, but the minimum PPE required for this task is:

- footwear with protective toe and mid-sole [EN ISO:20345],
- high-visibility vest, coat or tabard [EN ISO:20471]
- hard hat [EN397]

The following are required when cutting or welding, but optional otherwise:

- gloves [EN388]
- eye protection [EN166]

The following PPE may be required for this task:

- high-visibility trousers [EN ISO:20471]
- hearing protection [EN 352]

PREPARATION

JKSL's Site Foreman will make sure all JKSL staff get an induction or site briefing from the client or contractor before starting works. JKSL will brief anyone working in contaminated area(s) about the Clean Site Policy and any other invasive-species-related issues.

The areas where root barriers are to be installed should be prepared before installation – a relatively flat and even surface is required, with no sharp protuberances or stones etc. A layer of topsoil or sand can be put in place on top of an unsuitable surface, for example. Separate RAMS should be provided for this aspect of works, including preparing borrow pits, taking into account whether this process required breaking ground.

All areas where ground is to be broken (including driving in timber pegs) must be CAT scanned in line with the SSoW_CAT_Scan.pdf and relevant risk assessments.

CLEAN SITE POLICY

Installation of root barriers is likely to form a part of the Clean Site Policy document. In order to minimise the potential for cross-contamination due to the works in contaminated areas, all works must be undertaken in line with JKSL's Clean Site Policy. Decontamination will be carried out in line with the RAMS for the task. Footwashes should be placed in a suitable position away from working areas.

TRANSFERRAL OF GEOTEXTILE

These works will be planned in advance and carried out in line with JKSL's Manual Handling risk assessment. It is preferable for all manoeuvring of geotextile to be done by a team of at least two persons. If using a machine and lifting straps (or other suitable lifting equipment) to put the roll in place, a separate RAMS and lifting plan will be required.

The team should bring to site the smallest piece of root barrier that will safely do the job – whether this is in the form of off-cuts or 2m rolls. Where 6m rolls are required, these will be delivered directly to site. Where numerous 2m rolls are required, delivery to site should also be considered, in order to minimise manual handling.

The geotextile should be removed from the van or trailer by a team of two (unless it is very small off-cuts) in a location as close as safely possible to the installation area. Once on the



ground, rolls should be rolled into the location they will be prepared (while still in the plastic wrapper), and off-cuts carried. If possible, particularly in wet weather, keep the roll in its plastic cover and avoid getting the membrane wet, as this will significantly increase the weight of the material.

PREPARATION OF GEOTEXTILE

If the barrier can be rolled out into place (e.g. if a 2m barrier size is required and you have 2m rolls) then this may be the best option – manoeuvre the barrier into place, making sure that if it is being rolled down a slope, there is no chance of it running out of control or hitting anyone or anything at the bottom. Position the roll standing on its end, remove any plastic cover and roll out the roll, fixing pegs at the top as you go (see below).

Do not attempt to control the movement of a roll of geotextile down a slope by putting people down-slope of the roll. Never stand in the bucket of a machine; this is not a safe or suitable method of accessing areas.

If cutting or welding are required, planning the location of the cutting and/or welding is important. Ideally a flat, level area away from other hazards is ideal – however it's also important to take into account the requirement to minimise manual handling so far as possible and the difficulties of pulling a membrane up a slope or exposed face.

For lining the bottom of a burial pit or waste management area, lining should not begin until the pit is complete or where lining works can take place at a suitable distance from any other works (e.g. 10m). For the bottom of burial pits etc. it is preferable to weld in-situ but for the sides, particularly with stepped or steeply-graded faces, preparing the geotextile in the area at the top of the excavation (away from the edge) may be preferable, with the barrier being manoeuvred into place from the top with assistance from someone in the pit, rather than trying to pull it up from the bottom.

For vertical barriers adjacent to the edge of site (fencing etc.), there is not likely to be any alternative to preparing the barrier at the bottom and putting in place as many suitable measures as possible to make the process of pulling / rolling / unfolding the barrier up the slope as safe as possible. Larger teams are likely to make this process easier.

This decision is to be made on site by JKSL Site Foreman once the excavation has been prepared and assessed.

WELDING OF GEOTEXTILE

Where larger single-piece areas of barrier are required (e.g. burial pits), sections of barrier will be melted ("heat-welded") together using a heat gun or wedge welder.

Using either a 110v generator or a 240V petrol generator and a step-down transformer as a power source, the welding equipment will be manoeuvred to position to heat weld all seams across the specified area to provide a 'one-piece' geotextile cover.

Temperature, distance from the membrane and speed for welding will be specific to the site conditions and test welding will be performed to give optimum seam welds. The test welds will be inspected for integrity to inform temperature and speed settings for the operation.



Glue may be used if heat welding equipment cannot be used on site (e.g. if the Site Manager says that this would violate the conditions for hot works; or if the weather conditions do not allow for safe use). Glue will be used in mastic tubes and will only be used once a separate MS and COSHH assessment has been provided.

Any rips, tears or other damage to the barrier will be repaired using the above method as soon as possible. Normally it is expected that a patch will be required in order to allow both sides to be welded suitably together, and that the tear will need to be cut across in order to weld.

VERTICAL ROOT BARRIER

A suitable geotextile membrane may be installed to provide a "vertical" line of protection around the contaminated edge of an area. This will prevent roots located outside the root barrier from migrating back into the remediated area.

The barrier will generally be installed on the graded face of the excavation, so will not literally be vertical *per se* but will still create a line past which roots cannot migrate. Where a barrier is required to be literally vertical, this will generally be installed against a wall or using boards to provide a stable vertical surface for the barrier, and will generally need to be backfilled immediately. If this approach is required, the RAMS must reflect this.

SURFACE ROOT BARRIER (AKA "LINER", "LOADING AREA")

Geotextile membrane may be installed to provide a barrier on top of contaminated materials which cannot be excavated, or under contaminated materials to protect the materials below – to prevent the plants from travelling vertically.

Where the barrier is to be left exposed, the edges of the barrier should be fixed in to place as below.

A burial cell is formed by joining a a surface barrier on the bottom of the excavation to a vertical barrier which fully covers the edges of the excavation. 500-1500mm of excess ("lap") around the top of the edges should be left about the level of the contaminated fill. This lap can then be folded down once the contaminated materials have been put in the cell, and then welded to another surface barrier installed over the top of the contaminated materials.

FIXING THE BARRIER IN PLACE

Unless this is prevented by site constraints, the edges of the barrier will be fixed in to place using wooden stakes, road pins. Other suitable means (e.g. held down by bricks or stones) may be used if there is a suitable justification. The fixings may be removed in some circumstances but are advised to be left in place unless this causes other safety issues.

Areas where ground is to be broken will be CAT scanned as above, and JKSL will consult service drawing(s) and UXO (unexploded ordnance) survey, where available, and will check for overhead services and signs of underground services (lampposts, grids, manhole covers etc.).



Stakes (or road pins) will then be driven in to the ground either by hand, if the ground is soft enough, or using a mallet. The area must be CAT scanned (as above) before breaking ground. Care will be taken when using the mallet that no other operatives are standing nearby where they might be hit.

A screwdriver (generally an electric drill) will be used to drive a screw through a washer, through the root barrier and into each wooden peg to hold the barrier in place.

BACKFILLING

Backfilling against a root barrier should be carried out within 7 days of installation. If JKSL are to undertake the backfilling, this will require a separate RAMS. The material used to backfill should not contain stones or other objects capable of penetrating or ripping the barrier – or if such material is to be used, a “blinding layer” of sand or soft soil should be used to provide suitable cover on top of the barrier.

Approximately the top 300mm of the barrier should be left protruding from the ground, or the levels brought up to the same level that the pegs are fitted into, so that the top portion of the barrier and the pegs are visible above ground.

If covering the barrier is to be carried out (e.g. to prevent it from being set on fire), this can be done with sand, borrowed soil or any other suitable inert material that will not puncture the barrier and will not be a significant fire risk (so, dry wood chippings would not be a suitable material).