



Japanese Knotweed Solutions Ltd

Low Wood Commercial Warehouse, Suites 3, 4 & 5,
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SAFE SYSTEM OF WORK: **Prep and installation of root barrier membrane**

LAST REVIEW: **28/02/2023** **REVIEWED BY: Simon Prato-Scarlett**

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CLIENT: Middleton Sheet Metal Co Ltd

SITE: 1 Hanson Close, Middleton, M24 2HD

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



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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

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.



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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.



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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.

LINING BURIAL CELLS

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.



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It is important to ensure that burial cells are installed at a suitable depth to comply with RPS178 and other guidance – including to ensure that sufficient material can be backfilled on top of the cell once it is complete.

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).