



NOTES

Fill Thickness (M)	
	0 - 1m
	1 - 2.5m
	2.5 - 4m
	>4m

REVISION

0	For Information
A	>>
B	>>
C	>>
D	>>

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CLIENT

CEG

SITE

Oughtibridge Mill

DRAWING TITLE

**Made Ground Thickness
Zoning Plan**

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DRAWN BY SM	APPROVED BY NJ	
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Proposal to Control Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*) & Horsetail (*Equisetum* *ssp.*)

Oughtibridge Mill, Sheffield

CLIENT:	Pierre Angulaire
COMMISSIONED BY:	Mark Edge
SPECIALIST:	Ebsford Environmental
DATE PREPARED:	24/07/17
PREPARED BY:	Ray Holderness Senior Consultant M: 07915 620807 E: rayholderness@ebsford.co.uk



Ebsford Summary

After receipt of several site maps, plans and subsequent discussions with the client, Ray Holderness, Senior Consultant at Ebsford Environmental, carried out a walkover survey on 7th July 2017. I was accompanied by Mark edge of Pierre Angulaire who showed me the locations and extent of invasive weeds on site. On completion of the survey and after further discussions with the client, it was decided the best method of invasive weeds control in the short to medium term, would be to proscribe an herbicide treatment programme over a number of years until sufficient control has been achieved. There may be one area on site that requires Knotweed excavation to facilitate the installation of a new bridge across the River Don.

The project brief consists of:

- Establish the location and extent of invasive weeds
- Management and control options
- Timescales and budget analysis
- Excavation options and budget costs

The findings of this survey and subsequent recommendations are detailed in this report.



Site Survey Overview

The site is best described as a mixture of large industrial buildings, extensive areas of hard standing with a mixture of mature woodland trees, semi mature and self seeded sapling trees with other desirable and undesirable vegetation located around the site boundaries and along the river corridor. There are areas where buildings have been demolished several years ago and scrubland vegetation is beginning to dominate. Invasive weeds such as Himalayan Balsam and Japanese Knotweed are present in the riparian areas and the nuisance weed Horsetail is also present, as can be seen on the invasive overview plan below, and accompanying photographs taken during the survey. Himalayan Balsam is well-established and would be best described as carpet coverage in most areas. The main vector of Himalayan Balsam spread, is flowing water, into which the seeds are flung by the explosive seed pods. When the water level drops the seeds, brought from up steam are deposited and the area is very quickly colonised and weed begins to spread profusely.




Japanese Knotweed is present along the river; not all areas were accessible on foot and it cannot be certain that all infestations have been identified but any areas not identified will almost certainly be small and will be incorporated in the treatment programme if that is the preferred eradication option. The River Don flows through the site; permission from the Environment Agency (EA) to use herbicides near water will be required before treatments are applied. It is understood that a new access bridge will be built in a similar location to the existing pipe bridge located to the north of the existing access bridge; Japanese Knotweed and Himalayan Balsam is located in the immediate area of both bridges. Excavation of Knotweed may be required to facilitate this aspect of the development.

Invasive Overview Plan



Project:
Oughtibridge Mill, Sheffield

Legend:

-  Himalayan Balsam
-  Horsetail
-  Japanese Knotweed

Survey Data:

Prepared for: Mark Edge

Prepared by: Ray Holderness
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Drawing Ref:
22023
Date: 24/07/17

Scales: NTC
Drawn: MS
Checked: RH

Infestation Overview

Invasive Weed Type	Growth Type	HB Avg. Height	Visible Area	Previous Treatment
Himalayan Balsam	Sporadic to mature carpet coverage	1m	Along the river corridor	No
Japanese Knotweed	Sporadic to Mature	2m to 3m	Along the river corridor	Yes
Horsetail	Normal	200 to 300mm	In the south western area of site	No



Photographic Evidence



Pictures above (left) show Japanese Knotweed located near the existing bridge over the River Don. The picture to the right shows Himalayan Balsam along the river. Himalayan Balsam is present in most areas of the river that flows through the development site.

Photographic Evidence



Pictures above (left) show Japanese Knotweed located near the existing pipe bridge over the River Don. The picture to the right shows several stands of Knotweed located in the proposed access bridge location. Excavation and disposal of site of Knotweed contaminated may be required to facilitate this.

Photographic Evidence



There are several areas of Japanese Knotweed along the northern river embankment that appear to have been previously treated with herbicides but eradication is or was not complete. Pictures above show sporadic Knotweed growth (left) and dead Knotweed canes and crowns. Himalayan Balsam is also present nearer to the river.



A relatively small area of Horsetail is located in a central area south of the river; there does not appear to be a great deal but it can cause problems with tarmac hardstanding or block paved paths and driveways.



Himalayan Balsam

Introduced to the UK in 1839 from Northern India, Himalayan Balsam is most commonly found on riverbanks and damp areas, though it is capable of thriving in many other habitats.

Due to a lack of natural predators and diseases, once introduced, this invasive plant spreads rapidly forming dense stands which can grow up to three metres tall dominating the area. These stands shade out our native plant species and in late autumn the plants die back leaving the area bare of vegetation and liable to erosion on watercourses. Himalayan Balsam also causes a less obvious problem for native species; Himalayan Balsam produces a sugary nectar to attract insects. However, the flowers produce more nectar than any other native European species making it more attractive to bees and other insects, luring them away from pollinating our native flowers.

The seedlings of this annual plant germinate over a short period, often during April, and grow prodigiously to be able to set seed in approximately six weeks time. The stems are pinkish-red, brittle and hollow with side branches originating from joints in the stem. Once mature, the leaves are dark green, lance shaped, have a dark-red midrib, serrated edges and can grow up to 150mm long. Himalayan Balsam can grow up to three metres tall and have a characteristic slipper shaped purplish-pink or white flowers that begin to appear in June. In late July/August its distinctive 'exploding' seed pods mature which are capable of catapulting its seeds distances of up to seven metres. The seeds which are shed from July until October need winter chill to break dormancy. Each pod can contain up to sixteen seeds and each plant being capable of producing 800 seeds according to the Royal Horticultural Society. Himalayan balsam is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

Horsetail (*Equisetum ssp.*)

Horsetail is non notifiable and is classed as inert if the mother soils are classed as such. If the soils go off site they will go to landfill as inert. Horsetail has the ability to propagate and regenerate from either sections of the rhizome (underground stem) or via the production and dispersal of spores, usually borne in mid spring. The spores produced by *Equisetum* tend to only remain dormant for a few days, with visible germination occurring in approximately seven days. Strictly speaking it is not an invasive weed, there are no laws or government acts controlling its sale, spread or disposal and the landowner has no legal requirement to carry out any remediation. However, it is a plant that has the ability to readily form infestations with the associated damage to tarmac and hard landscape schemes.

Ebsford would recommend the herbicide treatment of Horsetail as per the proscribed Himalayan Balsam programme. Other measures, such as the installation of root barrier membrane under hard surfaces, particularly footpaths and driveways, may be required to protect the surfaces in the immediate vicinity.



Recommendations

Ebsford recommend multi season herbicide treatment of all invasive weeds on the banks of the River Don and within the site red line boundary, including Horsetail. Where mechanical disturbance of Japanese Knotweed will occur when the installation of a new bridge commences, I recommend several measures be put in place to ensure the client and/or appointed contractors carry out the work according to statutory requirements. The services Ebsford would envisage being required are: supervision of bridge removal/demolition, excavation, haulage and disposal of Knotweed contaminated waste material off site.

These aspects of work are outlined on the following pages.



Recommendations

Ebsford's Multi-Season Herbicide Treatment Programme

Japanese Knotweed

I recommend a two year treatment programme and subsequent third year monitoring/spot treatment programme using a non-residual herbicide (Glyphosate) that is safe to use near watercourses, trees, shrubs and bushes. Vegetation clearance may be required to gain access to the Knotweed areas. This will be done when the nesting bird season ends in August; ideally a team will be on site applying herbicides and carrying out clearance with brush cutters. Access to all areas may not be possible without using a boat and waders; it is assumed a suitable location for launching a small boat is available.

Application to the Environment Agency (EA) will be required to use herbicides near water; Ebsford will liaise with them, making the necessary arrangements before herbicides are applied. the process may take up to two weeks to complete.

The programme below is recommended:

August/September 2017 – Vegetation clearance and initial Knotweed herbicide treatment visit

September/October 2017 – A second application visit may be scheduled; this will be dependant on several variables such as weather and success of previous treatment.



Recommendations

1: Ebsford's Multi-Season Herbicide Treatment Programme

Japanese Knotweed

Second year herbicide treatments will re-commence in summer 2018, usually in July and then at approximately four weeks intervals during the season. It is envisaged that three visits will be scheduled but this depends on several variables such as weather conditions, maturity of Knotweed growth etc. Monitoring and spot treatment, if required, will be implemented during 2019; two visits should suffice and the warranty will be issued on completion.

On completion of the treatment programme a ten year, £5,000,000 P.I backed warranty will be issued and monitoring of the site will take place for the duration of the warranty. The warranty covers hard standings, structures and is fully transferable; a sample warranty certificate is provided within this documentation.

It is important that Knotweed is left undisturbed during the treatment programme i.e. is not treated by third party contractors, cut down, burnt or mechanically excavated. Any disturbance can lead to extended eradication and an increase in costs. On completion of eradication and issue of warranty, the Knotweed contaminated area will still be classed as non-hazardous waste, compliance with waste management regulations will be required, if removed from site. Herbicide Treatment alone is not a feasible remediation strategy where the ground in which the knotweed resides is due to be mechanically disturbed (any ground breaking activity). Herbicide application alone can ultimately render the plant unable to produce new growth (deemed as eradication), but it is unlikely to remove viability from 100% of the underground rhizome system.

Recommendations

Japanese Knotweed – Supervision and Excavation Options

In areas where Japanese Knotweed is present and imminent ground breaking activities are to take place, an alternative, immediate eradication option, is to excavate, haulage off site and disposal at suitable landfill site may be required. Several assumptions and estimations will need to be made i.e. volumes for removal off site and the waste being classified as non-hazardous at the receiving landfill site. Any other contaminants may re-classify the waste as hazardous. This option would be complex and may include the removal of Knotweed contaminated material from the river bank.

Ebsford will provide excavation plant, supervision of excavations, haulage and disposal off site; the client will provide, site security and welfare facilities.

A notional volume 300m³ of Knotweed contaminated material will be removed and this is expected to fill approximately thirty four 18 tonne lorry loads. Our supervisor will ensure that all visible Knotweed contaminated material from within the development footprint is removed, no cross contamination occurs and all machinery used during the process will be cleaned on completion of the works.

On completion of excavations and removal from site a ten year, £5,000,000 P.I backed warranty will be issued and monitoring of the site will take place for the duration of the warranty. The warranty covers hard standings, structures and is fully transferable; a sample warranty certificate is contained within this document.

Application to the Environment Agency (EA) may be required for flood defence consents for excavating in the river. Ebsford will liaise with the EA to ensure all consents are received so the work can commence in due course.

Details of these options, with budget costs, can be found on the Budget Analysis pages below.

Recommendations

Ebsford's Multi-Season Herbicide Treatment Programme

Himalayan Balsam

It is too late this season to treat Himalayan Balsam; the seeds are already setting and any further disturbance will exacerbate the situation. I recommend a two year treatment programme, starting in spring 2018, continuing in 2019 and a subsequent third year monitoring/spot treatment programme using a non-residual herbicide (Glyphosate) that is safe to use near watercourses, trees, shrubs and bushes. The initial treatment should be applied in April/May 2018; this application will reduce the Himalayan Balsam coverage and encourage germination of the seed bank. I strongly recommend early treatment; this will give best results in the longer term. Application to the Environment Agency (EA) will be required; the earlier Knotweed application will be covered by the EA agreement.

Further treatments will be applied to any new growth before the end of the season; it is envisaged that three further treatments will be administered before the end of the season as follows:

May/June 2017	2 nd Treatment Visit
July/Aug 2017	3 rd Treatment Visit
Aug/Sept 2017	Final Treatment Visit



Recommendations

Ebsford's Multi-Season Herbicide Treatment Programme

A similar programme, with a start date of April/May will be implemented in 2019; this will give sufficient control although complete eradication will never be achieved. The existing watercourse will bring seeds from upstream; it may be prudent to implement a continual monitoring and maintenance programme (see below).

The above dates are subject to change due to visits being reliant on several variables, most outside our control, such as weather, traffic and location of operatives at a given time.

It is envisaged that our qualified and trained spray operatives with PA1 & PA6AW certificates using an EA approved non residual herbicide for use in or near a watercourse, including all consumables, will take one full day, on each visit, to spray the Himalayan Balsam in the areas identified. Any other areas identified within the site will also be treated with herbicides.

It should also be noted that the herbicide applications will leave the treated areas looking scorched i.e. grass and other plants in the treatment zones will be affected. On completion of the proscribed treatment programme Ebsford would recommend a planting scheme should be implemented to restore and improve the areas. Ebsford can provide a service as described. Please contact me if you would like to discuss.



Ebsford Services

Utilities, Flood Defence & Regeneration Developments

- Public Open Space Regeneration
- Marina & Harbour Developments
- Integrating Removed Silt Onsite
- Efficient Maintenance Solutions
- Civils In/On/Near Water
- Asset De-silting
- Asset Restoration & Improvements
- River Restoration
- Rock Armour
- Soft/Bio Erosion Control
- Drainage Ditch and Culvert Clearance

Watercourses, Rivers and Canals, Lakes and Ponds

- River Restoration and Realignment
- Dredging and De-silting
- Soft Bio Erosion Control
- Lake & Pond Restoration and Development
- Efficient Maintenance Solutions
- Integrating Removed Silt On-site
- Establishing Native Aquatic Plants
- Groynes & Beach Nourishment
- Canal Restoration
- Accelerated Silt Dewatering

Vegetation Management

- Japanese knotweed Herbicidal Eradication
- Japanese knotweed Mechanical Eradication
- Japanese knotweed Screening
- Japanese knotweed
- Enviroscreen 20-20
- Site Clearance and Tree Work
- Other Non-Native Species
- INNSA



What our clients say

“Ebsford have worked exceptionally well on a number of projects giving professional advice not only to give a better outcome but cost effective too.

The service turnaround from initial contact to working on site has been quick and effective. Competitive prices across the range of work has helped to get work completed with one company rather than going to two or three companies on one site. Overall an excellent company to work with”

Andrew Willerton
Landscape Architect
Bovis Homes

“We have used the Ebsford Enviroscreen machine now on a number of projects and must write to say how impressed we are with both the Ebsford approach and the machine itself.

On every occasion we have found that the system has come in cheaper than alternative solutions, in some cases over 50% whilst allowing us to retain material on site for re-use as part of our development. We will continue to specify this solution as our system of choice and have no issue recommending Ebsford to our contacts.”

Alan Finchett
Davis and Davis Properties

“From initial contact to completion of works, Nick Hartley and Ray Holderness of Ebsford have provided a simple, effective and professional solution to a problem which was only identified late in the process.

After some research into Japanese knotweed it was refreshing to have the recommendation of a trustworthy contractor who delivered exactly what they claimed. The warranty was provided immediately upon completion and the health and safety of the site teams was without fault. I would have no hesitation in using Ebsford again or in recommending them to other organisations with Japanese knotweed problems”.

John Lanagan
Impact Housing

