Harron Homes Limited

Bleachcroft Way, Barnsley

Japanese Knotweed Management Plan

Revision 1

Monday 13th March 2023

Contaminated Land, Brownfield & Environmental Contracting

Vertase FLI

REPORT TITLE: **Japanese Knotweed Management Plan**

REPORT NUMBER: **1975HAR_Japanese Knotweed Management Plan_Revision 1**

CLIENT NAME: **Harron Homes Limited**

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1.0 Introduction

1.1 General

1.1.1 Vertase F.L.I. Limited (VertaseFLI) have been appointed by Harron Homes Limited (the Client) to produce a Japanese Knotweed Management Plan (JKMP) to support remediation and earthworks for their site at Bleachcroft Way, Barnsley, S70 3PD (the Site).

1.1.2 A site location plan is presented on drawing SK1975_01 in Appendix A.

1.1.3 This JKMP has been prepared in accordance with industry guidance as detailed in the Invasive Non-Native Specialists Association (INNSA) Code of Practice for Managing Japanese Knotweed (included in Appendix D):

- 'Code of Practice, Managing Japanese Knotweed', by the Invasive Non-Native Specialists Association (INNSA), dated April 2017.

1.2 Proposed Development

1.2.1 It is understood that the client intends to develop the site for residential use.

1.2.2 The proposed residential development is presented on drawing 498-PL-001-Rev-V, presented in Appendix A.

1.3 Scope of Works

1.3.1 The scope of VertaseFLI works is summarised below:

- Stripping / stockpiling of vegetation and topsoil.
- Cut / fill earthworks within the footprint of proposed housing plots and areas of public open space to meet final formation levels.
- Cut / fill earthworks within the footprint of proposed estate roads to meet final formation levels.
- Excavation and processing of any made ground to produce suitable materials for reinstatement.
- Management / remediation of made ground exhibiting elevated levels of contamination when compared to the site reuse criteria.

- Segregation and remediation of areas of Japanese Knotweed infestation.
- Export of surplus materials.

1.4 Scope of this Report

1.4.1 This report details the strategy for management of Japanese Knotweed infested soils identified at the site only.

2.0 Environmental Setting

2.1 The Site

2.1.1 The site is located off Bleachcroft Way, Barnsley, S70 3PD. The site is located approximately 3km to the southeast of Barnsley town centre.

2.1.2 A site location plan is presented on drawing SK1975_01 in Appendix A.

2.1.3 The site is irregular in shape, covering approximately 10.5 hectares. The approximate centre of site is located on National Grid Reference (NGR) 437237, 405016.

2.1.4 Historically the site has never been fully developed. The historic canal and railway were built on the eastern and western boundaries respectively and are now disused. A small sandstone quarry was located in the west of site and has since been infilled. A small reservoir located in the south of site was developed and then backfilled.

2.1.5 The site slopes, steeply in places, from west to east. Low points onsite include a former canal that runs along and forms the eastern site boundary, a stream (Dob Sike) that forms the south-eastern boundary and the area of a former reservoir, located to the south of site.

2.1.6 The site is undulating with large areas of the site overgrown with brambles. The area of the former railway located through the western boundary of the site is entirely overgrown. There are a number of self-seeded trees throughout the site, as well as a number of mature trees on the southern, western and eastern boundaries of the site.

2.1.7 The site appears to be well used by locals with well-trodden tracks and

2.1.8 footpaths clearly cut through the vegetation.

2.1.9 An electrical substation is present near to the northern boundary of site.

2.1.10 The site is bound to the south by the Dob Sike, followed by agricultural land. To the west, the site is directly bound by a railway, followed by Ardsley Cemetery and then residential properties. The site is directly bound to the north by a mixture of allotments, residential and commercial / industrial properties. To the east, the site is directly bound by a historic canal, a Tesco Extra and commercial units.

2.2 Japanese Knotweed

2.2.1 VertaseFLI carried out a Japanese Knotweed Survey during growing season. Japanese Knotweed was observed in the Eastern area of site only.

2.2.2 VertaseFLI subsequently returned to carry out a supplementary survey outside of the growing season to provide greater delineation of the impacted area. This survey was based on evidence of desiccated cane material and large woody crowns from the previous season's growth. As with the original survey, evidence of Japanese Knotweed was only observed in the east of site.

2.2.3 The location of Japanese Knotweed on site is presented on drawing D1885HHL_05b, included in Appendix A. This drawing shows that the approximate area impacted with Japanese Knotweed is 3,246m^2.

2.2.4 Whilst evidence obtained from two surveys of the site suggests that Japanese Knotweed is located in the east of site only, a watching brief shall be maintained throughout the works to ensure any infestations not previously identified are incorporated into the management process detailed within this document.

2.2.5 It is noted that whilst there is a Japanese Knotweed stand present outside of the site on the southern boundary, this is outside of the works area and is not covered by the management strategy detailed in this plan.

3.0 Management Plan

3.1 Strategy

3.1.1 The overarching strategy is to manage Japanese Knotweed infested soils on site through a process of careful excavation and subsequent burial at a depth of no less than 2mbgl in a fully lined cell, as detailed below.

3.2 Scope of Management Plan

3.2.1 The works required to satisfy the overarching strategy and covered by this management plan includes the following:

- Clerk of Works.
- Toolbox talks.
- Plant & Equipment.
- Excavation of Japanese Knotweed and infested soils.
- Movement of infested soils.
- Temporary stockpiling of infested soils (if required).
- Placement of infested soils within lined reinstatement cell.
- Decontamination procedures.
- Offsite disposal (if required).
- Universal Control Measures (those applying to more than one of the work activities described above).
- Validation Reporting.

3.2.2 Risk assessments presented in Appendix B and Safe Systems of Work (SSoW) titled SSoW 006- Excavation – Groundworks and SSoW 010 – Safe Plant and Vehicles on Site, which are presented in Appendix C, are to be read in conjunction with this method statement.

3.3 Clerk of Works

3.3.1 In accordance with best practice, VertaseFLI have appointed a Japanese Knotweed Clerk of Works. The Clerk of Works is suitably trained and experienced in the identification of Japanese Knotweed and

appropriate management techniques, including those described in this document.

3.3.2 The Japanese Knotweed Clerk of Works will be present on-site full time during the works described in this document and is responsible for ensuring compliance with this management plan.

3.4 Toolbox Talk

3.4.1 Prior to the commencement of works on site The VertaseFLI Clerk of Works will provide a comprehensive toolbox talk on the subject of Japanese Knotweed to all site operatives. This will include as a minimum:

- Japanese Knotweed identification throughout it's growth stages. Photographs will be provided showing different parts of knotweed plants throughout the various growth stages.
- Discussion of the hazards caused by Japanese Knotweed.
- Briefing on the relevant sections of this Japanese Knotweed Management Plan and associated risk assessments, including the approved method of works and the controls.
- The location of Japanese Knotweed on site. A site plan detailing the locations of Japanese Knotweed will be presented.

3.4.2 Photographs of Japanese Knotweed and the location plan described above, will be displayed in the site canteen.

3.4.3 All personnel arriving on site after the toolbox talk will be briefed on the above in their site induction. Depending on the length of the works, the toolbox talk may be presented to all site personnel again.

3.5 Plant and Equipment

3.5.1 The plant and equipment utilised in the Japanese Knotweed works will include (but may not be limited to):

- 360-degree mechanical excavators.
- Forward Tipping Dump Trucks.
- Articulated Dump Trucks.
- Hand tools.

3.6 Excavation of Japanese Knotweed and Infested Soils

3.6.1 Any knotweed identified will be removed as per the below methodology.

3.6.2 Areas of Japanese Knotweed infestation will be identified, marked out and isolated by fencing, as directed by the Clerk of Works.

3.6.3 At the start of each shift, the Clerk of Works will brief the excavator operator on the days plan, including which areas are to be cleared and the applicable control measures.

3.6.4 The Clerk of Works will supervise all works involving Japanese Knotweed, including excavation.

3.6.5 Infested soils and plant material will be excavated using a 20-tonne 360 excavator or similar. Arisings will be placed into a forward tipping or articulated dump truck for transit, either to temporary stockpile or direct to the reinstatement cell.

3.6.6 Initial excavation works will target areas of desiccated canes and woody crowns. The excavation will continue vertically and horizontally until the Clerk of Works is satisfied that the bulk of the Japanese Knotweed infestation has been removed.

3.6.7 Following this initial excavation phase, the Clerk of Works will carry out a detailed inspection of the excavation, marking out any locations where rhizomes are present in the face and base of the excavation. Under the supervision of the Clerk of Works, these rhizomes and associated soils will then be excavated.

3.6.8 The process detailed in the paragraph above will be repeated until the Clerk of Works is satisfied that all rhizomes have been removed.

3.6.9 Once the Clerk of Works is satisfied that all rhizomes have been removed, a further 300mm will be removed from the base and sides of the excavation to ensure all knotweed impacted soils have been removed.

3.6.10 Upon completion of Japanese Knotweed excavation works, the Clerk of Works will validate the sides and base to ensure no knotweed material remains. Validation will include a detailed photographic record of the excavation. The excavation shall be surveyed by an engineer. An

approved NPTC spraying operative will apply herbicide spray to the entire formation and sides of excavation. Selection of herbicide is subject to an environmental survey including future use of the area.

3.7 Movement of Infested Soils

3.7.1 It is imperative that Japanese Knotweed Soils are not spilled during transit.

3.7.2 Japanese Knotweed and infested soils shall be transited by forward tipping dump trucks or articulated dump trucks.

3.7.3 The skip of dump trucks must not be overfilled and should carry no more than two-thirds their capacity. Skips shall be inspected prior to movement to ensure that no materials are overhanging the skip or could be accidentally ejected during movement.

3.7.4 Dump trucks shall be prohibited from transiting over areas of infestation to prevent rhizomes from adhering to tyres. Dump trucks may only transit on clean areas adjacent to the excavation, or on areas of previous infestation that have subsequently been remediated and validated by the Clerk of Works.

3.7.5 Dump trucks must not exceed the site speed limit of 10mph.

3.7.6 Haul routes for transit of Japanese Knotweed shall be civilised, removing significant bumps and depressions that could cause involuntary movements and accidental ejection of the skip. Any soft spots shall be removed prior to use of the haul road to mitigate the risk of dump trucks overturning.

3.8 Temporary Stockpiling

3.8.1 The preference is that Japanese Knotweed and infested soils, once excavated, be transited directly to the reinstatement cell.

3.8.2 Notwithstanding the above, it is possible that some materials may have to be temporarily stockpiled during this process, due to site constraints associated with the excavation of the reinstatement location.

3.8.3 Where soils are temporarily stockpiled, the stockpile area must be bunded and lined with suitable root barrier liner. Suitable bunds shall present loose material from rolling down the stockpile and escaping

onto the surrounding ground. The root barrier liner shall protect underlying materials from cross contamination.

3.8.4 Materials in stockpile must be compacted and sealed with an excavator bucket to reduce the likelihood of loose materials separating and rolling down the stockpile, or materials drying and becoming wind born.

3.8.5 The stockpile shall be inspected regularly to ensure that soils are not likely to dry and become wind born. Where drying presents a significant risk, the stockpile should be damped down with a jetwash bowser or similar. Alternatively, the stockpile could be covered with a liner. It is noted that the cover liner need not be root barrier, the purpose of the cover is to prevent wind blown dust and debris only.

3.8.6 Once materials have been relocated to the reinstatement cell, the root barrier liner shall be carefully folded and placed in the reinstatement cell. The Japanese Knotweed Clerk of Works shall carry out a detailed visual inspection of the ground that was beneath and adjacent to the cell to confirm that no rhizomes are present.

3.8.7 If deemed necessary by the Clerk of Works, the surface will be scraped to a maximum of 0.3mbgl to ensure that the risk of cross contamination is entirely mitigated.

3.9 Japanese Knotweed Reinstatement Cell

3.9.1 A suitable area for reinstatement of Japanese Knotweed in a lined cell has been identified on site on is shown on drawing SK1975_06, in Appendix A.

3.9.2 The position of the Japanese Knotweed Reinstatement Cell is in an area where no penetrating infrastructure is planned such as beneath buildings or in areas where drainage is proposed, to ensure the encapsulated cell is not damaged or punctured during subsequent works.

3.9.3 The area of the reinstatement cell shall be excavated to a minimum of 4mbgl. Based on the dimensions of the area, it is calculated that approximately 21,605m^3 of clean natural strata shall be recovered from the area, with a maximum volume of up to circa 6,492m^3 Japanese Knotweed infested material anticipated to reinstated.

3.9.4 Based on the above calculations, the top of the encapsulated cell will be at a greater depth than the minimum of 2m below final ground level, specified in section **4.6** of the Invasive Non-Native Specialist Association (INNSA) code of practice 2017.

3.9.5 The knotweed infested material will be placed within a cell that will be lined with a plastic root barrier. The root barrier will be used to completely encapsulate the infested material.

3.9.6 The root barrier will be laid to minimise the number of required joints and seams providing encapsulation. Where joints and seams are unavoidable a minimum of 2m overlap of the plastic barrier will be maintained.

3.9.7 Prior to placement of impacted material, a non-persistent herbicide will be applied to the infested areas if the plant is in leaf. Burial of the material will not take place until the herbicide prescribed active period is over.

3.9.8 Once all infested materials have been placed and the root barrier secured over the top of the cell, the area of the cell shall be raised to final finish levels using Japanese Knotweed free site won materials.

3.9.9 The location and construction details of the buried cell will be recorded and included within the validation reporting of these works.

3.10 Decontamination Procedures

3.10.1 The preference is that tracked plant should not track of infested soils. Where this is not possible, due to site constraints and the size of the infested area, thorough decontamination shall be required prior to the affected machine leaving the area, or the site.

3.10.2 To de-contaminate tracked plant the following steps should be undertaken:

a) Operator to lift track off ground. Plastic liner or similar will be placed on the ground below.

b) The operator is to then spin tracks to remove loose soil.

c) Soil will still remain between the teeth of the tracks. If dry this can be removed by striking the tracks with a sledgehammer. This

will be repeated until all soil is removed. If wet then each groove in the tracks is to be cleaned using hand tools and a wire brush.

d) Following striking the tracks the tracks are then to be brushed using a wire brush or similar.

e) Repeat the above process for the other track.

f) Clean all around the machine under the cab and counterweight and inside the cab.

g) Throughout the above process, the soil on the membrane is to be cleared periodically so it does not build up. Soil arising from the cleaning process to be placed in the reinstatement cell or shall be stockpiled temporarily prior to disposal.

h) Excavator to then be inspected by the Clerk of Works and approved if clean. Inspection and verification to include photographs.

3.10.3 As noted in section **3.7**, wheeled plant shall be prevented from running on infested soils.

3.10.4 Notwithstanding this, the skip of the dump trucks shall require decontamination and tyres may become impacted in emergency situations. To de-contaminate wheeled plant such as dumpers the following steps should be undertaken:

a) If forward tipping dumper is used, place a plastic sheet or similar under the skip. The dumper operator will tip the skip over the plastic to remove all loose soil within.

b) Any residual soil will then be removed by an operative with a shovel. Once this is complete the skip will be brushed using a stiff wire brush.

c) If an ADT is used an excavator will be used to remove loose soil within allowing any residual soil to fall onto the plastic.

d) The wheels of the dumper will be cleaned with hand tools and completed using a stiff brush.

e) All other surfaces will be cleaned using hand tools and brushes.

f) Throughout the above process, the soil on the membrane is to be cleared periodically so it does not build up. Soil arising from the cleaning process to be placed in the reinstatement cell or shall be stockpiled temporarily prior to disposal.

g) Dump truck to then be inspected by the Clerk of Works and approved if clean. Inspection and verification to include photographs.

3.10.5 Hand tools must be thoroughly decontaminated following completion of the works using water and a wire brush.

3.11 Disposal of Japanese Knotweed Soils

3.11.1 As described in section **3.9**, there is sufficient space within the reinstatement cell, that offsite disposal of infested soils should not be required.

3.11.2 Notwithstanding this, if it is deemed necessary to dispose of any infested soils off-site it will be moved by a registered waste carrier to a suitably licenced landfill that is permitted to accept such waste.

3.11.3 Road wagons carrying infested materials are subject to the applicable controls stated in section **3.7** and must additionally be fully covered to prevent loss of material during transit on public roads.

3.11.4 The waste will be consigned as Japanese Knotweed impacted soils. All knotweed soils removed from site will be recorded and reported in the validation report.

3.12 Universal Control Measures

3.12.1 Access and egress to the work area will be controlled by demarcation and fencing. Following a site briefing, operatives will make their way through a pedestrian walkway into the knotweed working area of the site. Upon exit of the knotweed working area, they shall wash their boots in the boot wash provided.

3.12.2 Once plant enters an infested area it will stay there until the works are complete or the plant is off hired, when it shall be decontaminated in accordance with section **3.10**.

3.12.3 On completion and prior to the excavator moving away from the work area the bucket will be cleaned over a suitable membrane and inspected by the knotweed clerk of works. Should the tracks become contaminated, decontamination shall be required in accordance with section **3.10**.

3.12.4 All arising's from decontamination will be added to the reinstatement cell.

3.12.5 Soil suspected to contain rhizomes is to be excavated in such a way to reduce occurrence of overspill from the excavator's bucket and the dumpers skip. Any accidental overspill is to be immediately cleared and placed in to the dumper. Any overspill from the excavators bucket, the dumpers skip, or the tippers body during loading will immediately be cleared.

3.13 Cross Boundary and Inaccessible Materials

3.13.1 At time of writing it is anticipated that all Japanese Knotweed will be accessible to be managed on site in accordance with this plan.

3.13.2 Notwithstanding this, Japanese Knotweed may be discovered to cross the site boundary, or be present in areas on site where the excavation procedure detailed in this document are not practical (such as directly bounding, or underneath the Dob Sike).

3.13.3 Such materials shall be reported to the client and a plan for the long term management of these materials shall be produced. Such a plan is likely to comprise a long-term spraying strategy.

3.13.4 Such areas shall be fenced off and signage erected. The areas shall be surveyed and reported in the validation report.

3.14 Validation Reporting

3.14.1 On completion of the works, a validation document shall be produced by VertaseFLI. This document should be added to the site health and safety plan.

3.14.2 The validation report shall include the following information as a minimum:

- Description of the works including confirmation of compliance with this management plan.
- Site location Plan.
- Site plan showing areas of Japanese Knotweed infestation that have been managed through the works, including any areas not originally identified and described in this document.
- As-built survey showing the location and depth of the Japanese Knotweed Reinstatement Cell.
- Technical specification of the Root Barrier liner.
- Photographic record of the works, including the validation photographs described in this document.
- Waste consignment notes of any material disposed of offsite.
- As-built plan showing location of residual cross boundary and / or inaccessible areas of Japanese Knotweed (if present).

4.0 Health, Safety and Environmental

4.1 Hazard – Risk Analysis

4.1.1 Specific risk assessments and method statements are presented in Appendix B of this management plan. Working with Japanese Knotweed does not pose any additional risks in respect of personnel health and safety.

4.2 Personnel / Labour PPE requirements

4.2.1 All personnel will be required to wear appropriate PPE, including but not limited to, safety boots, hi-vis vests and hard-hats.

4.3 Welfare

4.3.1 Suitable welfare shall be provided by VertaseFLI in accordance with the CDM Regulations (2015).

4.4 Emergency Procedures

4.4.1 Emergency procedures for the site are included in the Construction Phase Plan and shall be displayed on the site notice board.

4.5 Pre-start Briefing Procedures

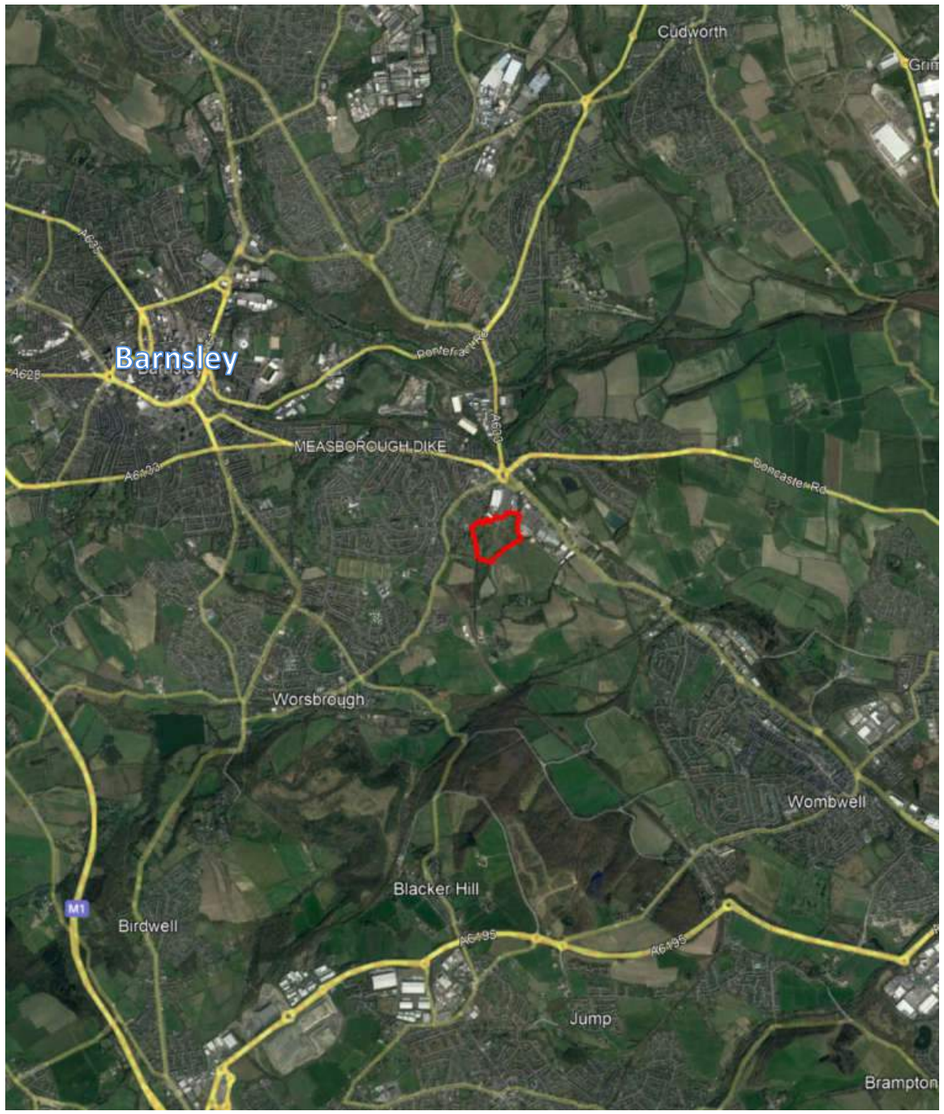
4.5.1 Operatives will be briefed on this management plan and associated risk assessments. A toolbox talk on knotweed will also be provided. Staff will be given the opportunity to discuss the works and ask any questions.

4.6 Environmental Considerations

4.6.1 Care must be taken with to avoid spreading Japanese Knotweed infested soils, as described in detail in section **3**.

Appendix A

Drawings





A3

Legend

- Site Boundary
- VertaseFLI Works / Phase 1 Area

Rev.	Description	Revised By	Date
	FIRST ISSUE		16-12-22

Vertase FLI

Contaminated Land, Brownfield & Environmental Contracting Specialists

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Site Address:
Bleachcroft Way,
Barnsley,
S70 3PD

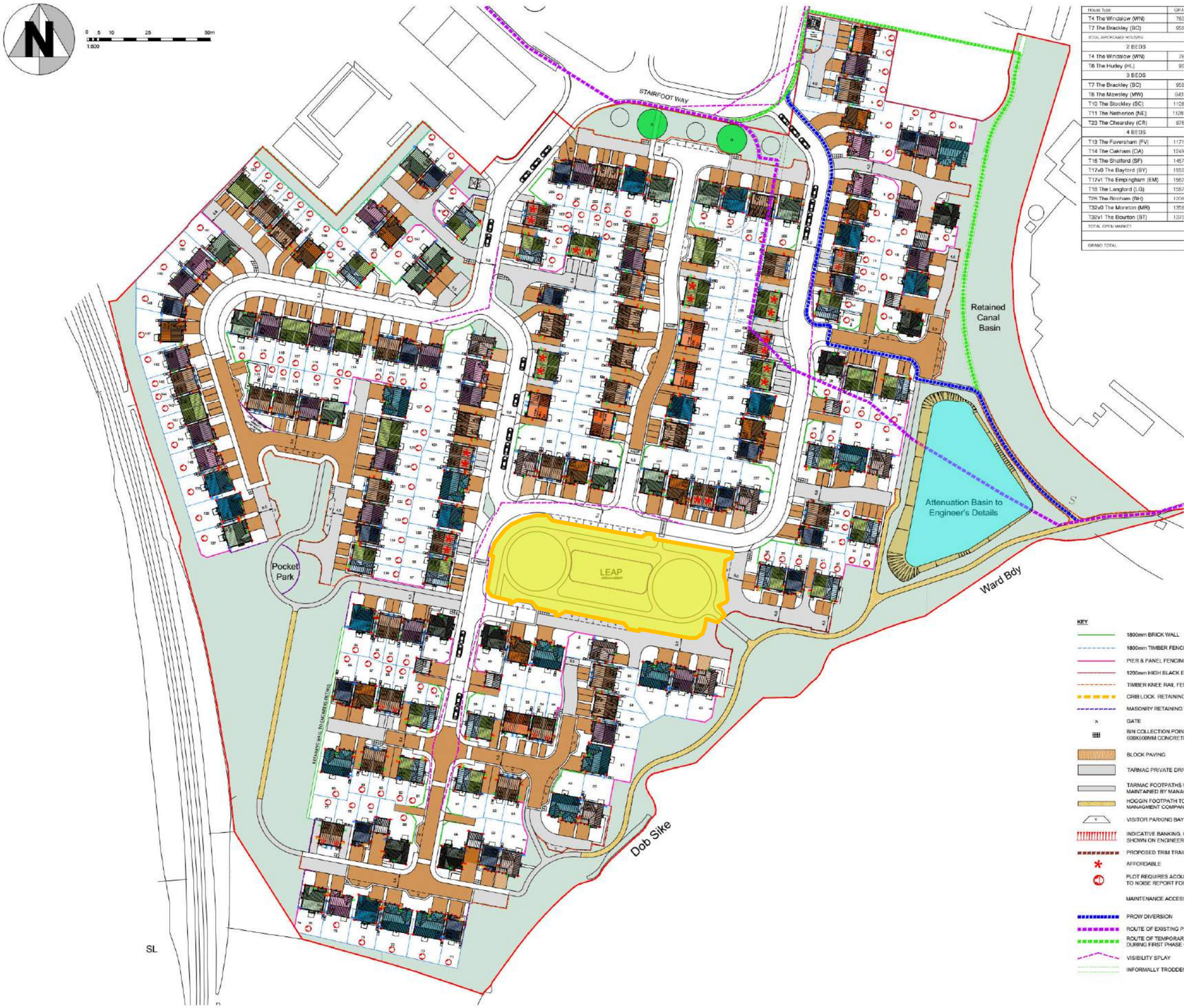
Rev: A

Title: Site Location Plan

Client: Harron Homes Limited

Drawn: IS	Checked: CL	Approved: CL
Dwg: SK1975_01	Contract: 1975HAR	Scale: NTS

A3



Legend

Proposed reinstatement area for JKW

Rev.	Description	Revised By	Date
	FIRST ISSUE		20-02-2023

Vertase FLI

Contaminated Land, Brownfield & Environmental Contracting Specialists

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Site Address:
BLEACHCROFT WAY
BARNSLEY
S70 3PD

Rev: A

Title: Proposed Japanese Knotweed Reinstatement Area

Client: Harron Homes Limited

Drawn:	Checked:	Approved:
IS	RS	RS

Dwg:	Contract:	Scale:
SK1975_06	1975HAR	NTS

0 5 10 25 50m

1:500

House Type	GIFA	#	SQFT
T4 The Windslow (WN)	760	12	9120
T7 The Brackley (BC)	958	12	11496
TOTAL AFFORDABLE HOUSING		24	20616
2 BEDS			
T4 The Windslow (WN)	760	40	30400
T6 The Hurley (HL)	902	12	10824
3 BEDS			
T7 The Brackley (BC)	958	27	25866
T8 The Mawsley (MW)	943	16	15088
T10 The Stockley (SC)	1108	18	19944
T11 The Netherton (NE)	1128	19	21432
T23 The Chearsley (CR)	976	15	14640
4 BEDS			
T13 The Faversham (FV)	1171	7	8197
T14 The Oakham (OA)	1249	10	12490
T16 The Shelford (SF)	1457	11	16027
T17v0 The Bayford (BY)	1550	3	4650
T17v1 The Empingham (EM)	1562	4	6248
T18 The Langford (LG)	1587	11	17457
T25 The Bircham (BH)	1208	8	9664
T32v0 The Moreton (MR)	1358	5	6790
T32v1 The Bourton (BT)	1370	8	10960
TOTAL OPEN MARKET		214	230677
GRAND TOTAL		238	251293

Notes

1. Do not scale from this drawing. All dimensions must be checked on site prior to the commencement of any fabrication or building works. Where applicable, dimensions and details are to be read in conjunction with specialist consultants' drawings and/or other specifications; any disparity is to be brought to the attention of the office & clarification sought before proceeding.

2. Any dimensions shown on this drawing are in (millimetres/metres)

STAIRFOOT WAY

Retained Canal Basin

Attenuation Basin to Engineer's Details

Path (

Ward Bdy

Pocket Park

LEAP
AREA=400M²

RETAINING WALL TO ENGINEERS DETAILS

Dob Sike

SL

KEY

- 1800mm BRICK WALL
- 1800mm TIMBER FENCE
- PIER & PANEL FENCING
- 1200mm HIGH BLACK ESTATE RAILING
- TIMBER KNEE RAIL FENCE
- CRIB LOCK RETAINING WALL AND FENCE
- MASONRY RETAINING WALL AND FENCE
- GATE
- BIN COLLECTION POINT CONSISTING OF 1NO. 600X600MM CONCRETE PAVING SLAB PER BIN
- BLOCK PAVING
- TARMAC PRIVATE DRIVE
- TARMAC FOOTPATHS WITHIN POS TO BE MAINTAINED BY MANAGEMENT COMPANY
- HOGGIN FOOTPATH TO BE MAINTAINED BY MANAGMENT COMPANY
- VISITOR PARKING BAY
- INDICATIVE BANKING, GRADIENT SHOWN ON ENGINEERING LAYOUT
- PROPOSED TRIM TRAIL
- AFFORDABLE
- PLOT REQUIRES ACOUSTIC TREATMENT, REFER TO NOISE REPORT FOR DETAILS.
- MAINTENANCE ACCESS STRIP FOR DOB SIKE
- PROW DIVERSION
- ROUTE OF EXISTING PROW
- ROUTE OF TEMPORARY PROW DIVERSION DURING FIRST PHASE OF CONSTRUCTION
- VISIBILITY SPLAY
- INFORMALLY TRODDEN FOOTPATH

Revisions

REV:V DATE: 09/01/2023 DRAWN:JFE CHECKED:##
Plots 6-18 reconfigured to allow for adequate rear to rear separation further to comments from planning.

REV:U DATE: 16/12/2022 DRAWN:JFE CHECKED:##
Private drive serving plots 38-42 reconfigured further to comments from highways.

REV:T DATE: 08/12/2022 DRAWN:JFE CHECKED:##
Layout updated to suit vehicle tracking.

REV:S DATE: 07/12/2022 DRAWN:JFE CHECKED:##
Plots 14-23 reconfigured to remove adopted highway alongside the retained canal basin. This means that the canal basin can remain intact throughout the construction process.

REV:R DATE: 30/11/2022 DRAWN:JFE CHECKED:##
Layout amended to reflect comments from highways. Road to front of plot 15 amended to allow for forward visibility. Audit of visitor parking spaces undertaken to ensure they're 6m in length. Additional visitor parking spaces added.

REV:Q DATE: 02/11/2022 DRAWN:JFE CHECKED:##
Footpath widened adjacent to plot 227 to accommodate forward visibility. Area of land to the front of plot 121 to be within adopted highway to accommodate visibility splay.

REV:P DATE: 31/10/2022 DRAWN:JFE CHECKED:##
Plots 110-120 reconfigured to allow space for drainage easement. Knee rail fence shown around attenuation basin. Review undertaken based on highways comments received on 22/10/2022. Plots 61 & 62 reoriented to face out to Dob Syke.

REV:O DATE: 23/09/2022 DRAWN:JFE CHECKED:##
PROW diversion route amended further to comments from planning. Rumble strips shown on key.

REV:N DATE: 19/08/2022 DRAWN:JFE CHECKED:##
Layout updated further to comments raised by highways and the urban designer. Frontage parking reduced, turning facilities amended to suit vehicle tracking. House type mix adjusted due to reconfiguration of the layout.

REV:M DATE: 06/07/2022 DRAWN:GY CHECKED:##
Footpath link adjacent Plot 206 added to link private drive and footpath for services. Services entry points added to CH, EM & SC house types

REV:L DATE: 09/06/2022 DRAWN:JFE CHECKED:##
Notation added to LEAP further to comments from planning. Frontage parking reduced to plots 16 & 17.

REV:K DATE: 30/05/2022 DRAWN:GY CHECKED:##
Frontage parking spaces reduced in number further to comments from planning. Footpath along Plots 26, 33, 34 & Basin omitted. Plots 16/17 swapped with Plots 99/100. Knee rail to pos replaced with 1200mm black estate railing. Line of footpath around basin adjusted.

REV:J DATE: 25/03/2022 DRAWN:JFE CHECKED:##
Frontage parking spaces reduced in number further to comments from planning.

REV:I DATE: 10/03/2022 DRAWN:JFE CHECKED:##
Layout and mix updated in response to comments from planning.

REV:H DATE: 06/01/2022 DRAWN:GY CHECKED:##
Mix downsized in favour of more 2 & 3 bed house types. HL & RO house types added.

REV:G DATE: 17/11/2021 DRAWN:JFE CHECKED:##
Mix downsized in favour of more 3 bed house types. BC house type added. Footpath link adjacent to plot 134 removed and replaced with adopted highway creating a loop. Plots 182-198 reconfigured to create additional green space and reduce affordable clustering.

REV:F DATE: 18/10/2021 DRAWN:JFE CHECKED:##
Footpath adjacent to LEAP repositioned, parking court serving 175-176 reconfigured for turning, private drive serving plots 65-67 reconfigured for turning.

REV:E DATE: 21/09/2021 DRAWN:JFE CHECKED:##
Layout reconfigured to reflect comments received at meeting with planners on 17/09/2021.LAP and trim trail removed and replaced by a LEAP. Footpath link added adjacent to plot 131 to create north/south connectivity. Parking courts to northwest of site reconfigured to create additional green space. Total number of units now stands at 237.

REV:D DATE: 27/08/2021 DRAWN:JFE CHECKED:##
Plots 146-167 & 185-193 reconfigured further to comments from planning. Total number of units now stands at 236.

REV:C DATE: 29/07/2021 DRAWN:JFE CHECKED:##
Layout updated further to comments from planning, plots pulled away from the canal. Mix adjusted, total number of units now stands at 235.

REV:B DATE: 24/06/2021 DRAWN:JFE CHECKED:##
Plots 1-3 reconfigured further to discussions with sales. Substation repositioned to rear of plot 188.

REV:A DATE: 13/04/2021 DRAWN:JFE CHECKED:##
Layout updated to reflect comments from group. Plots 180-188 reconfigured. 1No. Tonbridge removed 1No. Nidderdale added. Extra Bamburgh added taking the total number of units to 231.

Harron Homes Limited
Unit 1 Cliffe Park
Bruntcliffe Road
Morley
Leeds
LS27 ORY

Tel: 0113 204 4670
Fax: 0113 204 4677
Web: www.harronhomes.co.uk

Status:PLANNING

Project: BLEACHCROFT WAY, BARNSLEY

Title: PROPOSED SITE LAYOUT

Drawn:JFE Date:11/12/2020

Checked:/ Scale @ A0:1:500

Job no:498 Drg No:PL-001 Rev:V

All Levels and Grid are correlated to OSNG and mAOD by using the national GNSS network

Contours are at 0.5 metre intervals

Key :

- Site Boundary
- (1) Japanese Knotweed Surveyed 9th Sep 2021 Plan Area 583m2
- Proposed Extent of Rhizomes Plan Area = 3246m2

A2

Rev	Description	Rev' By	Date
b	Knotweed aded 27/9/2021	LF	27/9/2021
	Issue		10/9/2021

Vertase FLI

Contaminated Land, Brownfield & Environmental Contracting Specialists

email: info@vertasefli.co.uk
www.vertasefli.com

■ Bristol Head Office — Tel: 01275 397600 Fax: 01275 397601

□ Sheffield Office — Tel: 01246 813289 Fax: 01246 812963

Site Address:

Bleachcroft Way
Barnsley

Rev: B

Title: Survey September 2021 showing Japanese Knotweed Locations

Client: Harron Homes

Drawn By: LF	Checked By: CL	Approved By: CL
Drawing No: D1885HHL_05_b	Contract No: 1885HHL	Scale: A2 @ 1:1000

Appendix B

Task Based Risk Assessment & Method Statement

Appendix C

Safe Systems of Work

EXCAVATIONS / GROUNDWORKS

THESE NOTES ARE FOR YOUR GUIDANCE, IF IN DOUBT; CONTACT YOUR SUPERVISOR / MANAGER

All excavation work will be carried out in accordance with Regulation 22 of CDM 2015

Hazards

The main hazards created by excavations and groundworks are:

- Collapse of the sides
- Materials falling onto people working in the excavation.
- People and vehicles falling into the excavation.
- The undermining of nearby structures.
- Contact with underground services.
- Water inflow.

Planning Procedures

When planning to carry out excavations or groundwork's, the manager must:

- Carry out a risk assessment to establish the risks from the hazards mentioned above.
- Avoid the need for personnel to enter any excavation; If it is deemed necessary then this must be done under a permit to work and where there is insufficient room to batter back the sides, suitable supports will be needed. If supports are installed, then these must be approved by the TWC (Temporary Works Co-ordinator)
- Arrange for suitable and sufficient edge protection to ensure that people, vehicle and materials cannot fall into the excavation.
- Carry out an investigation to determine whether any underground services are present. Service plans should be reviewed and a CAT & Genny used to trace and identify where services are located. If services are present, then they must be identified and a safe stand-off put in place. Hand digging to locate the services may be required to confirm the exact location. CAT & Genny only to be used by trained and competent person.
- Ensure that a suitable distance is left when excavating near to structures or pylons. If this is not practical, then competent advice must be sought to ensure continued stability of the structure and the excavation.
- Where personnel are required under a RA / TBRA to work in an excavation; then ensure that a suitable means of access and egress is available at all times. Should there be a risk of the excavation falling into a confined space categorisation then all entries must be controlled under a separate confined space risk assessment and permit to work.
- Develop a method statement for the work.
- **All excavation works must be controlled under a 'permit to dig'**.

Training

When carrying out excavations or groundwork's, competent persons may be required for the following:

- Use of cable avoidance tools.
- Reading of service diagrams.
- Use of permit to works systems
- The use of gas monitoring equipment

EXCAVATIONS / GROUNDWORKS

Monitoring

Regular monitoring of the excavation needs to be carried out by the manager or supervisor to ensure that continued stability is maintained. Excavations must be checked:

- before the start of every shift and must be recorded on *H&S.013-Excavation Inspection*
- after any occurrence likely to affect the stability
- after any collapse
- If a gas monitor is used, it is to be monitored in accordance with the manufacturer's instructions.

Control Measures

- Before digging ensure you are aware of the location of all services and protect them as necessary as excavating operations progress. All excavations to be controlled under a 'permit to dig'.
- Keep soil heaps a suitable distance away from the edge of excavations to prevent collapse due to overload or the materials falling back in.
- No-one is to enter an excavation unless authorised by the site manager / supervisor.
- Suitable PPE must be worn, at all times, in accordance with the risk assessment.
- Ensure that suitable access and egress points are used at all times. Never use suspended services to climb in and out of the excavation.
- An excavation must not be entered unless there is a sufficient stepped batter of the sides of the excavation to prevent collapse of the sides or the excavation has shuttering (shuttering must be approved by the TWC). Entry may need to be controlled under a confined space permit if there is a risk of gas or a toxic atmosphere building up.
- All persons are to be aware of the sound and meaning of the alarm from gas detection equipment and the action to be taken if an alarm sounds.

Emergency action:

If damage or leakage is caused or an escape of gas is smelt or suspected:

- Remove all personnel from vicinity.
- Prohibit smoking.
- Extinguish all naked flames or source of ignition (hot works, engines, electrical power) within 25 metres.
- Inform site manager.
- Inform local gas authority.
- Inform client.
- Prevent approach of public or personnel.
- Assist gas personnel, police and fire service as required.
- Inform company H&S Manager.

If in doubt, seek advice from local gas authority, whose telephone number for emergencies and enquiries can be found on the site notice board.

References

H&S.013 – Excavation Inspection
Permit to Dig
Confined Space Permit
HS(G) 185 Health & Safety in Excavations
Construction (Design & Management) Regulations 2015
HS(G) 47 Avoiding Danger from Underground Excavations
CIS 64 Excavation: What you need to know as a busy builder

SAFE PLANT & VEHICLES ON SITE

THESE NOTES ARE FOR YOUR GUIDANCE, IF IN DOUBT; CONTACT YOUR SUPERVISOR / MANAGER

In order to comply with our legal duties, we have introduced this further guidance for employees / plant operators and all visitors to VertaseFLI sites. All site personnel including visitors **MUST** carry out their duties with regards to the safe operation and work around plant, equipment and vehicles on Vertase FLI sites in accordance with the guidance given below:

Competence

All persons required to drive or operate any form of transport owned by or hired by the company to carry out its undertakings, must be suitably competent and as a minimum, hold a valid CPCS card for the plant to be operated and a full UK driving license for 4x4's or other light vehicles.

The Plant operator / driver **MUST** produce his/her CPCS / Licence before being permitted to operate any plant / vehicle. Only originals will be accepted, and a photocopy will be taken and held with the induction records.

The Site Manager may carry out a practical assessment of an operator's competence before being permitted to operate plant / vehicle on site.

Risk Assessment

All plant / vehicle operators must be briefed on the site-specific risk assessments.

Site Safety Operating Near Plant / Vehicles

There will be a site-specific Traffic Management Plan (TMP) displayed on site, which will clearly indicate the route plant and vehicles must adhere too as well as showing pedestrian routes. Wherever practicable a one-way system will be set for all sites.

Under NO circumstances must pedestrians approach working plant.

Should there be a need to speak to an operator during normal working operations to relay new work instructions and this cannot be done during a normal break period then:

1. Gain the machine operators attention from a safe distance (outside the working radius of excavators); once the machine operator has seen you then the operator must stop the machine on level and stable ground.

    - Excavators – Must curl the bucket on the ground to ensure that no material can leave the bucket. Switch off the engine and operators' hands are clear of the controls.
    - Dump truck – Must be completely stopped. The handbrake applied and the engine switched off.
    - Any other plant and vehicles - Must be completely stopped. The handbrake applied and the engine switched off.
    - Engage all plant safety devices i.e. dead man switch.

- Only once the operator has indicated that it is safe to approach, (the "thumbs-up" exchange is commonly used) can you proceed to the machine, being mindful of all other traffic on site.

- **DO NOT APPROACH THE MACHINE UNLESS THE OPERATOR HAS SHUT DOWN THE MACHINE AND HAS INDICATED TO YOU THAT IS SAFE TO APPROACH.**

2. Once new instructions have been relayed to the machine operator; retreat to a safe distance from the machine and then indicate to the machine operator that you and all other personnel are now clear. The machine operator **must only restart** the plant when the person or persons are a safe distance away and confirmation that it is safe to restart has been indicated by that person.

Where reversing on site cannot be avoided and where there is a risk to personnel and/or other plant, then a request must be made to the site manager to assess if it is safe to put a banksman in place. Banksman must only be utilised where it is absolutely deemed necessary to do so as it is VertaseFLI policy not to have personnel on the ground where plant is operating. Only if deploying a banksman is deemed absolutely necessary and it is safe, then the banksman must follow steps 1 & 2 above at all times before any banking operation is carried out and must remain a safe distance from the plant during the banking operation, ensuring that they have eye contact with the driver at all times. Under no circumstances must banksman stand directly behind reversing vehicles or plant.

Safety Devices

All plant and vehicle operators are to ensure that they use safety devices provided on the plant, e.g. seat belts, reversing mirrors, cameras, lights, horns, amber flashing lights, body props, anti-slew bars, etc. Safety devices are never to be intentionally damaged disconnected or abused and must be maintained in good order. These devices should be checked regularly at the start of each shift and such checks recorded in the daily plant check sheet *H&S 056*.

Reporting Defects

All operators of mobile plant and vehicles must ensure that they report all defects to their manager / supervisor. If the defect presents a significant hazard the plant must be switched off, parked in a safe position and locked, and the manager supervisor must be informed immediately.

A daily plant inspection sheet H&S. 056 must be completed on a daily basis i.e. at the start of a shift, the pre-use and operational checks must be carried out; any defects must be reported as above. A final check must be completed at the end of your shift, before the machine is parked up for the night in the designated plant parking area.

Security

All drivers are responsible for the safety of their own vehicles. They must ensure that they leave their vehicles / machines in a safe condition whereby unauthorised start-up is prevented. Each vehicle / machine must be parked in a sensible area where it does not present a hazard to other people. **Keys must be removed and the vehicle / machine locked**. Any other safety devices or immobilisers that are installed must be enabled. If the vehicle or machine is left in the yard over a non-working period, the keys must be placed in the office.

Mobile Phones

The use of mobile phones, personnel stereos and other electronic devices is **strictly prohibited** while operating a vehicle / plant on site. Anyone caught using these while operating plant will be subject to the company disciplinary procedure.

SAFE PLANT & VEHICLES ON SITE

Site Name:…… Project Number:……

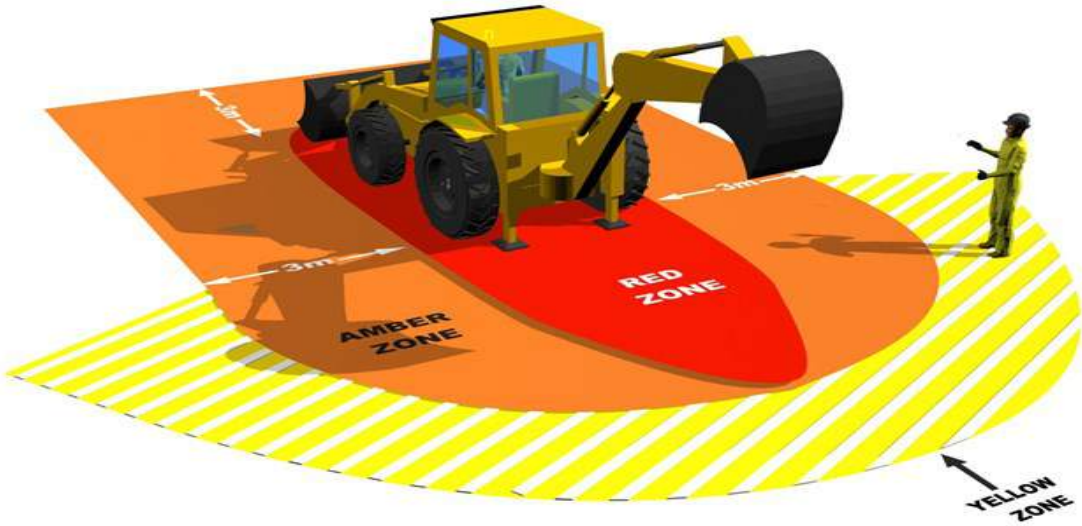
All site personnel and visitors must be briefed on this safe system of work and must sign below as evidence that they have read and understood the procedures and have been afforded the opportunity to ask any questions:

Date	Print Name	Signature

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?

180 Excavator



Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

Amber Zone: Entry prohibited until positive visual contact is made with the plant operator, the slew arm/hydraulics grounded and the machine is immobilised using the safety lever.

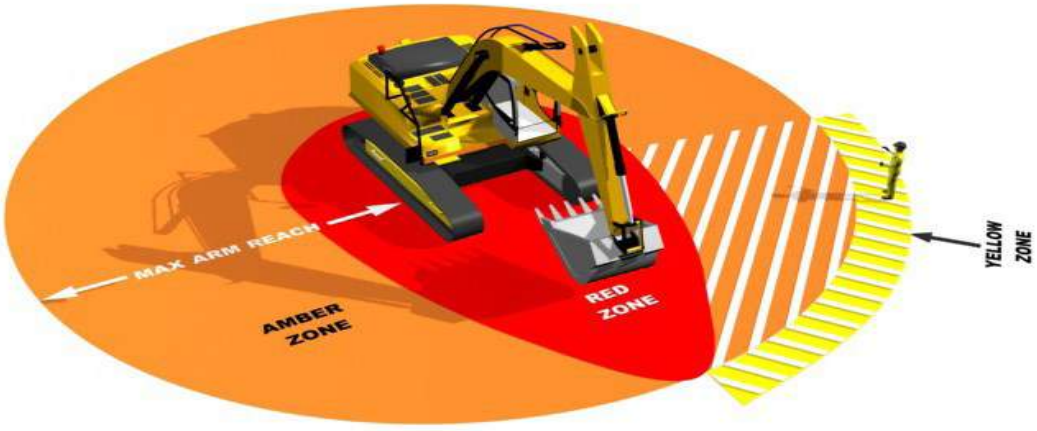
Red Zone: Entry prohibited unless the machine is completely isolated with the slew arm/attachment/bucket grounded, the machine immobilised using the safety lever and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?

360 Tracked Excavator



Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

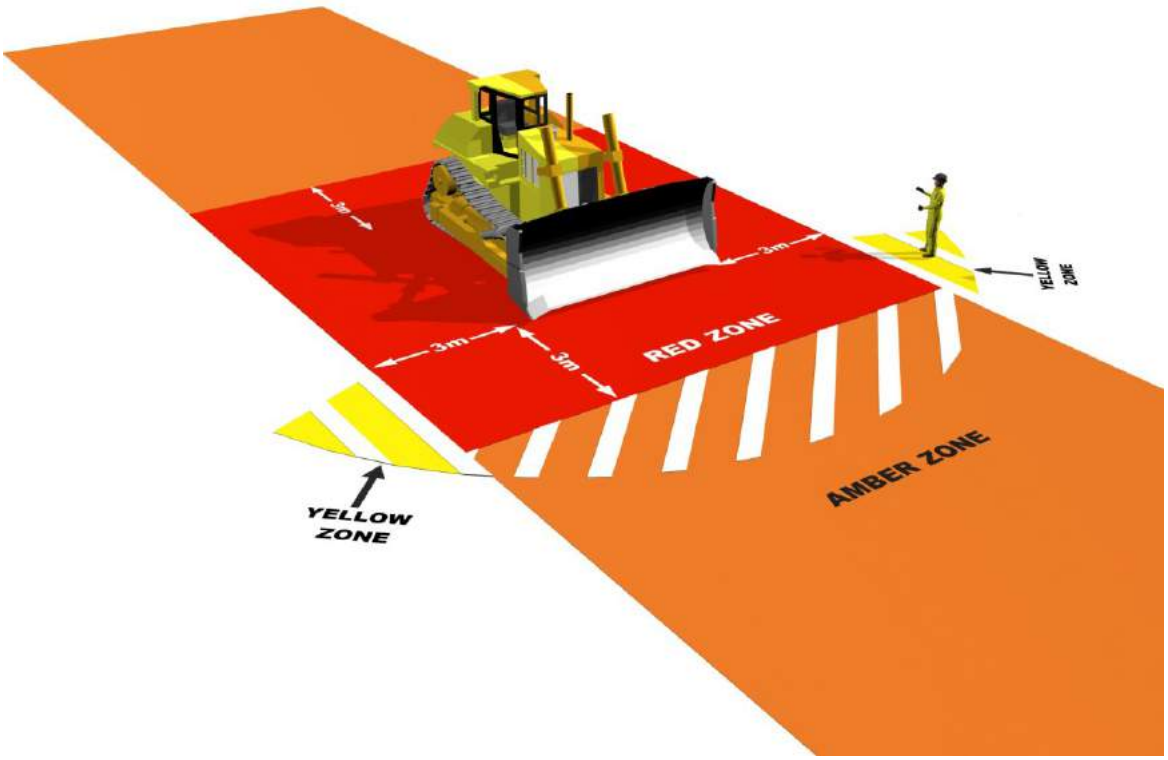
Amber Zone: Entry prohibited until positive visual contact is made with the plant operator, the slew arm/hydraulics grounded and the machine is immobilised using the safety lever.

Red Zone: Entry prohibited unless the machine is completely isolated with the slew arm/attachment/bucket grounded, the machine immobilised using the safety lever and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



Dozer

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

Amber Zone: Entry prohibited until positive visual contact is made with the plant operator, the blade is grounded and the machine is immobilised.

Red Zone: Entry prohibited unless the machine is completely isolated with the blade grounded, the machine immobilised and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



Forward / Swivel Tipping Dumper

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

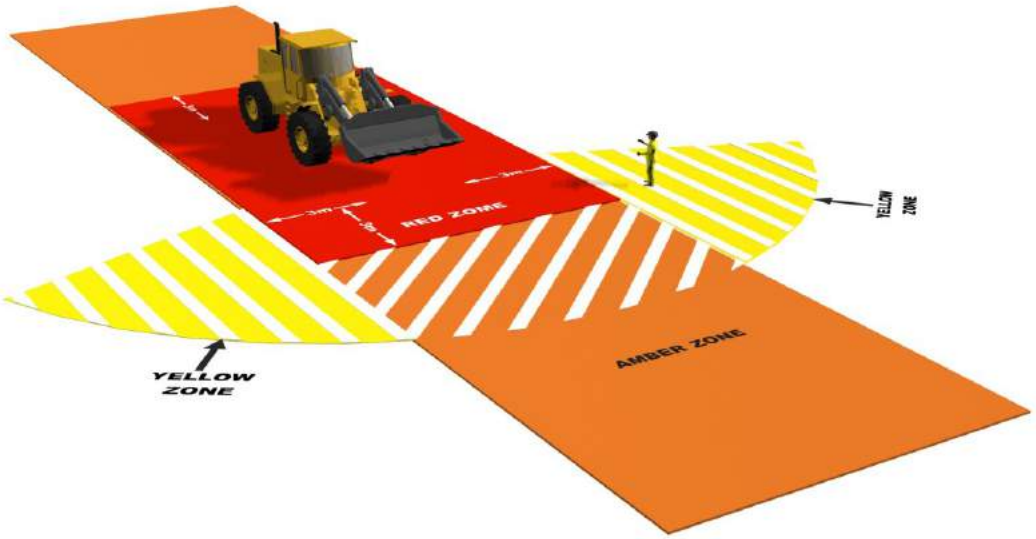
Amber Zone: Entry prohibited until positive visual contact is made with the plant operator and the hand break applied and machine is immobilised.

Red Zone: Entry prohibited unless the machine is completely isolated with the machine immobilised / hand break applied and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



FRONT LOADING SHOVEL

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

Amber Zone: Entry prohibited until positive visual contact is made with the plant operator, the Bucket is grounded and the hand break applied and machine is immobilised.

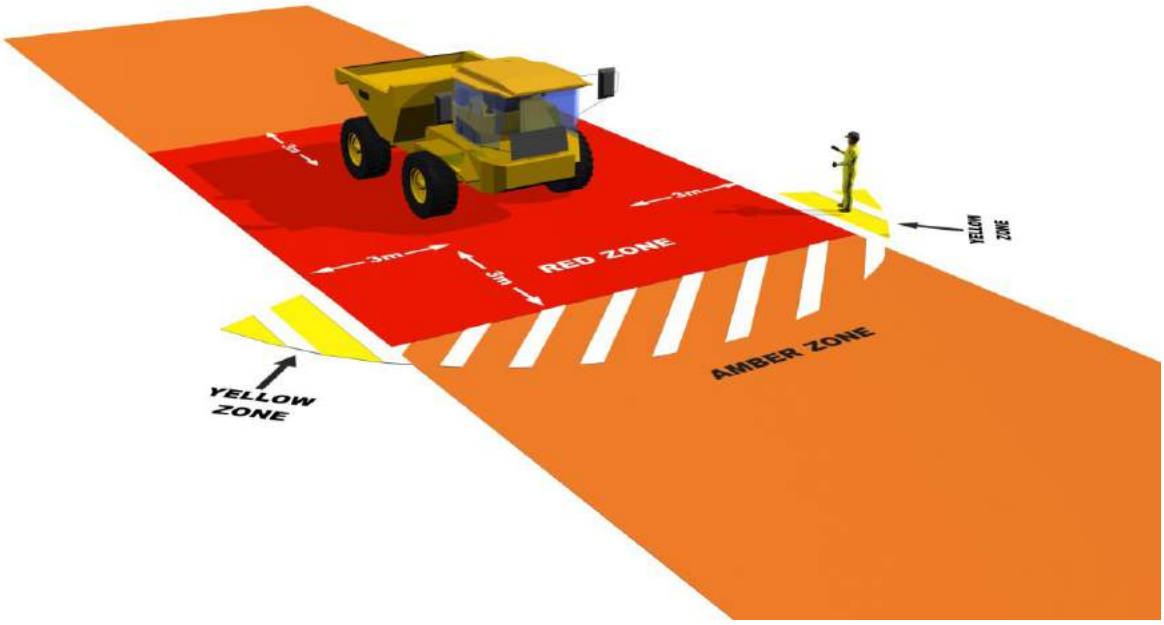
Red Zone: Entry prohibited unless the machine is completely isolated with the bucket grounded, the machine immobilised, hand break applied and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?

Hydrema Dump Truck



Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

Amber Zone: Entry prohibited until positive visual contact is made with the plant operator, the machine is immobilised and hand break applied.

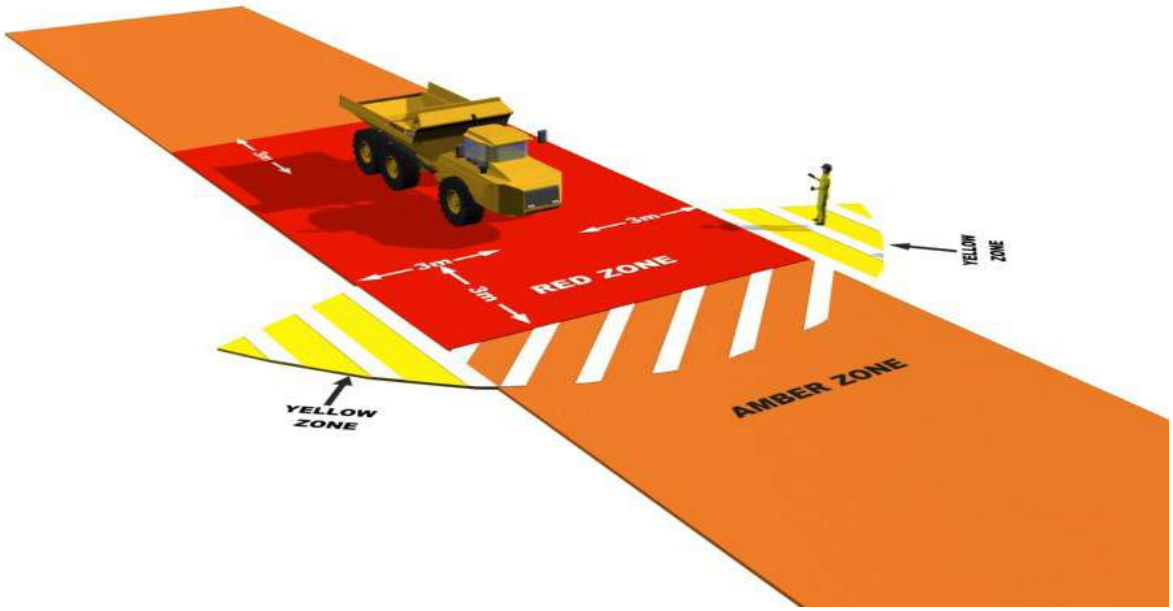
Red Zone: Entry prohibited unless the machine is completely isolated with the machine immobilised / hand break applied and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?

Articulated/Rigid Dump Truck



Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

Amber Zone: Entry prohibited until positive visual contact is made with the plant operator and the machine is immobilised and the hand break applied.

Red Zone: Entry prohibited unless the machine is completely isolated with the machine immobilised / hand break applied and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

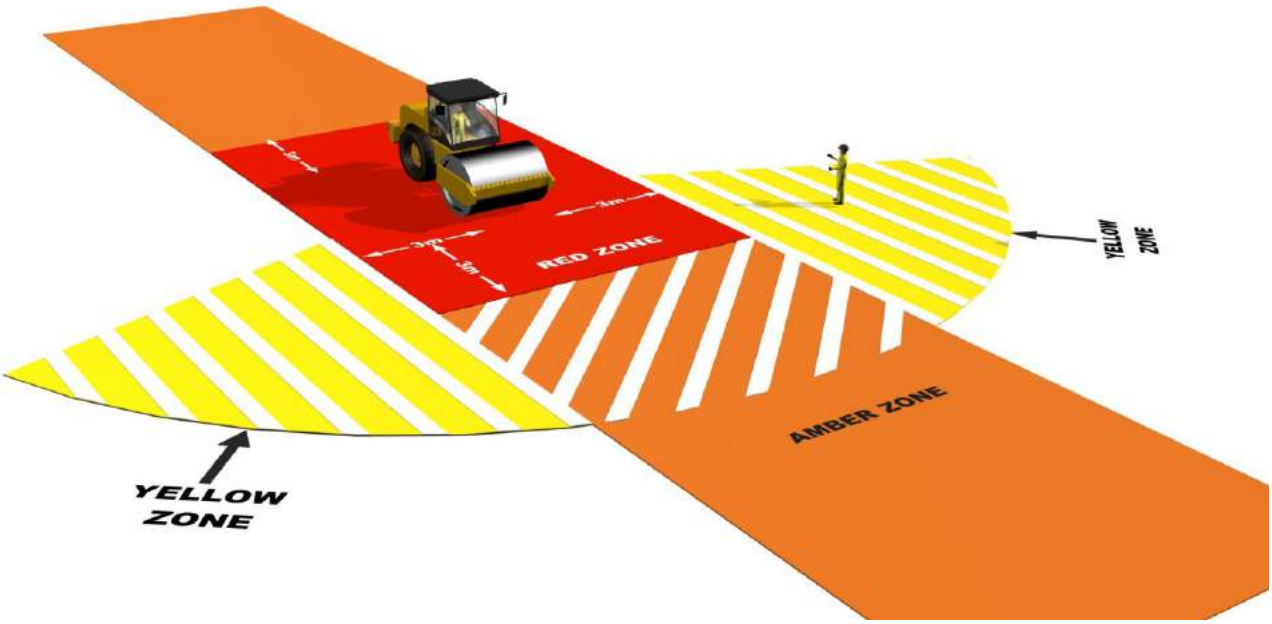
DO YOU KNOW YOUR SAFE ZONES?

Articulated/Rigid Dump Truck – **Tip Position**



People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



Roller

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

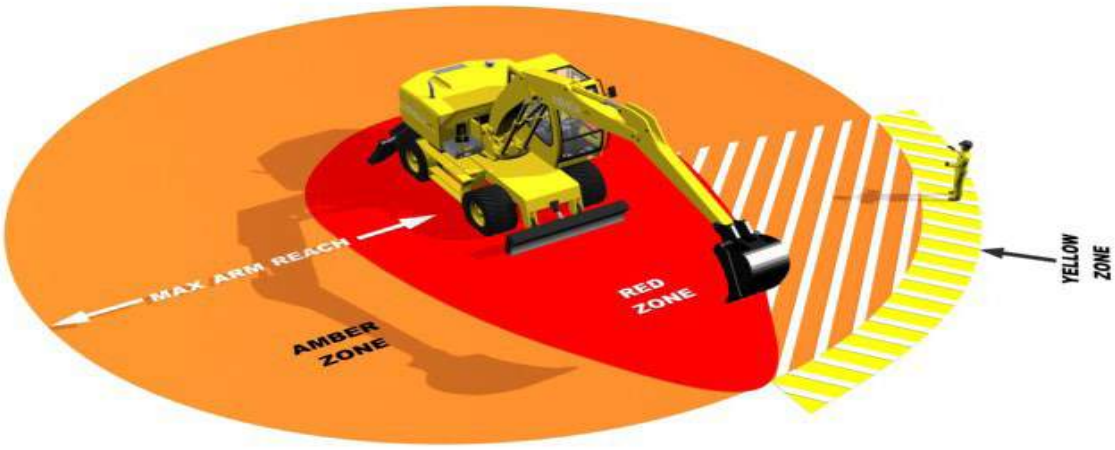
Amber Zone: Entry prohibited until positive visual contact is made with the plant operator and the machine is immobilised and the hand break applied.

Red Zone: Entry prohibited unless the machine is completely isolated with the machine immobilised / hand break applied and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



360 Wheeled Excavator

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

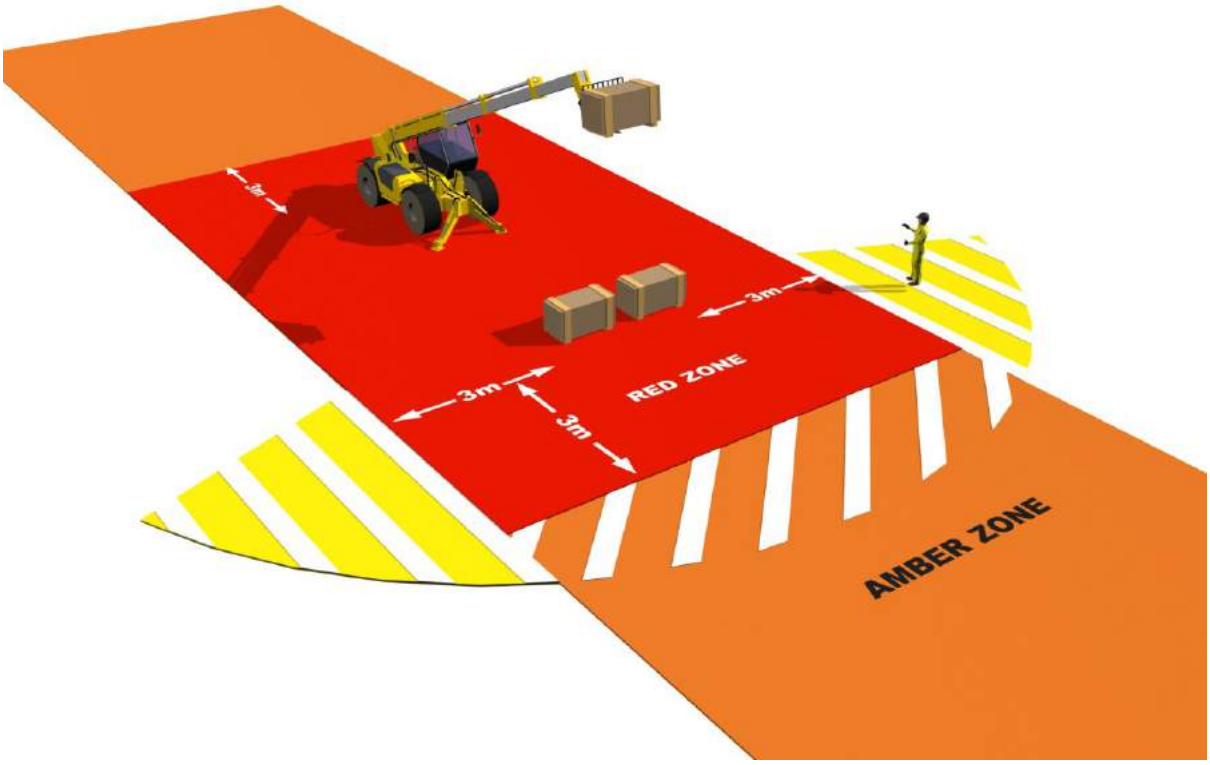
Amber Zone: Entry prohibited until positive visual contact is made with the plant operator, the slew arm/hydraulics grounded and the hand break applied / machine is immobilised using the safety lever.

Red Zone: Entry prohibited unless the machine is completely isolated with the slew arm/attachment/bucket grounded, the hand break applied / machine immobilised using the safety lever and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



Telehandler

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

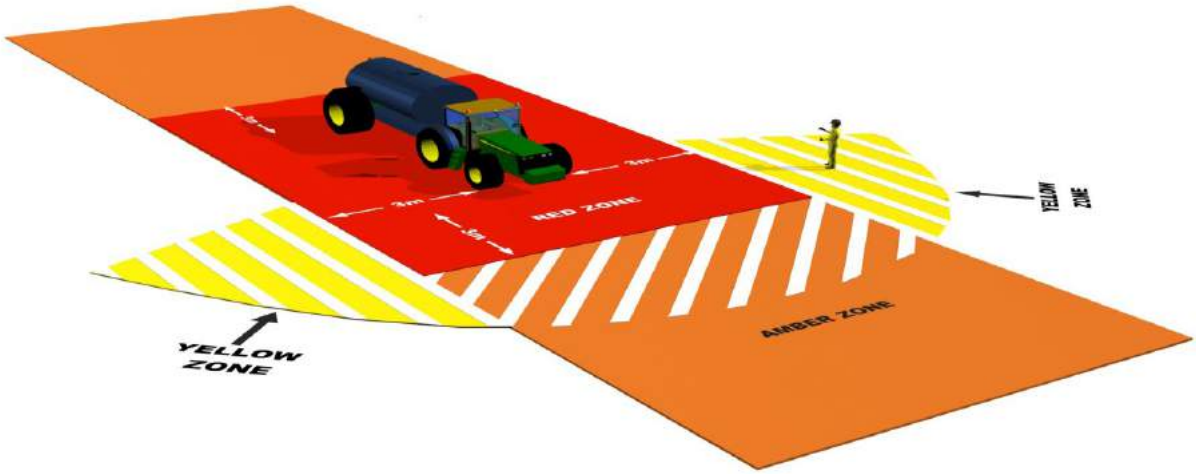
Amber Zone: Entry prohibited until positive visual contact is made with the plant operator, the hydraulic boom and forks are grounded and the hand break applied / machine is immobilised using the safety lever.

Red Zone: Entry prohibited unless the machine is completely isolated with the hydraulic boom and forks are grounded, the hand break applied / machine immobilised using the safety lever and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



Tractor

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

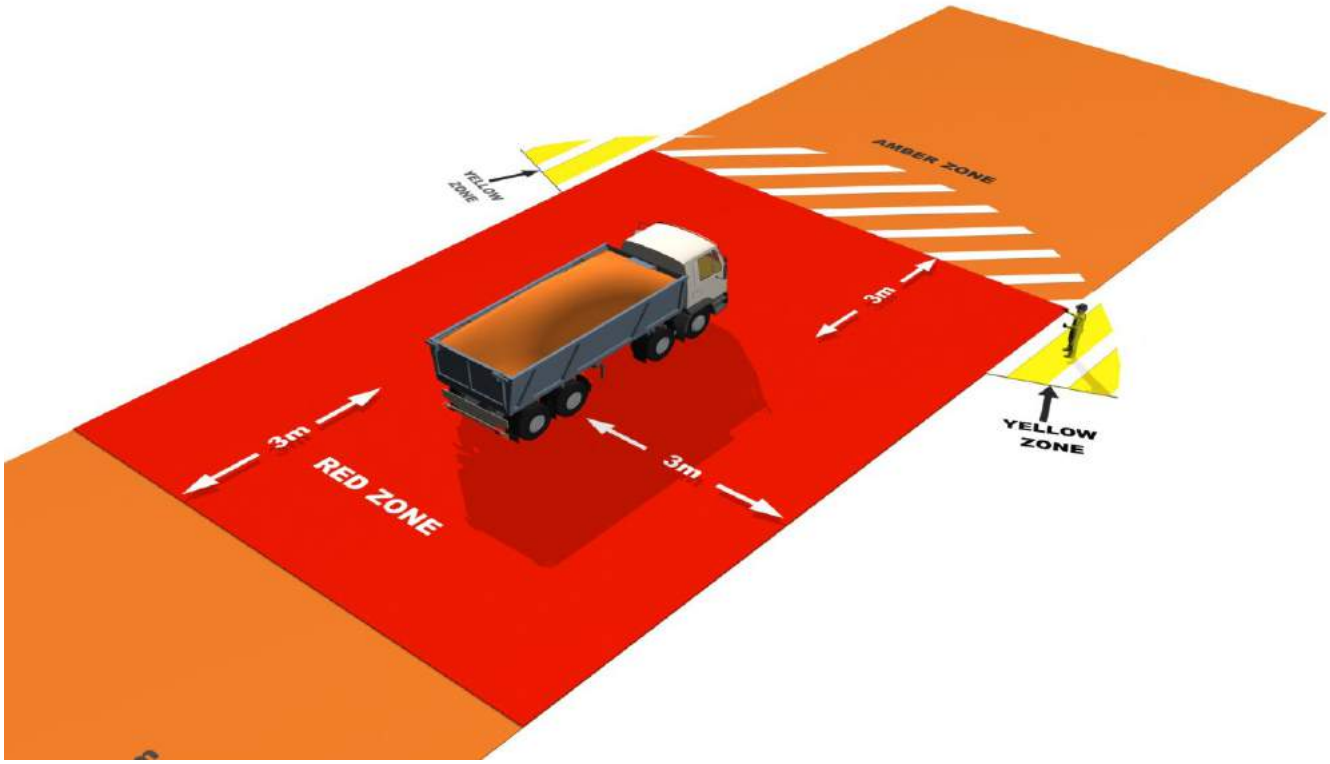
Amber Zone: Entry prohibited until positive visual contact is made with the plant operator and the hand break applied / machine is immobilised.

Red Zone: Entry prohibited unless the machine is completely isolated with the hand break applied / machine immobilised and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?



Vehicles, Vans & Lorries

Plant Interface Zones

Yellow Zone: All personnel involved with the plant operation must remain within this zone to maintain visual contact with the plant operator.

Amber Zone: Entry prohibited until positive visual contact is made with the plant operator and the hand break applied / machine is immobilised.

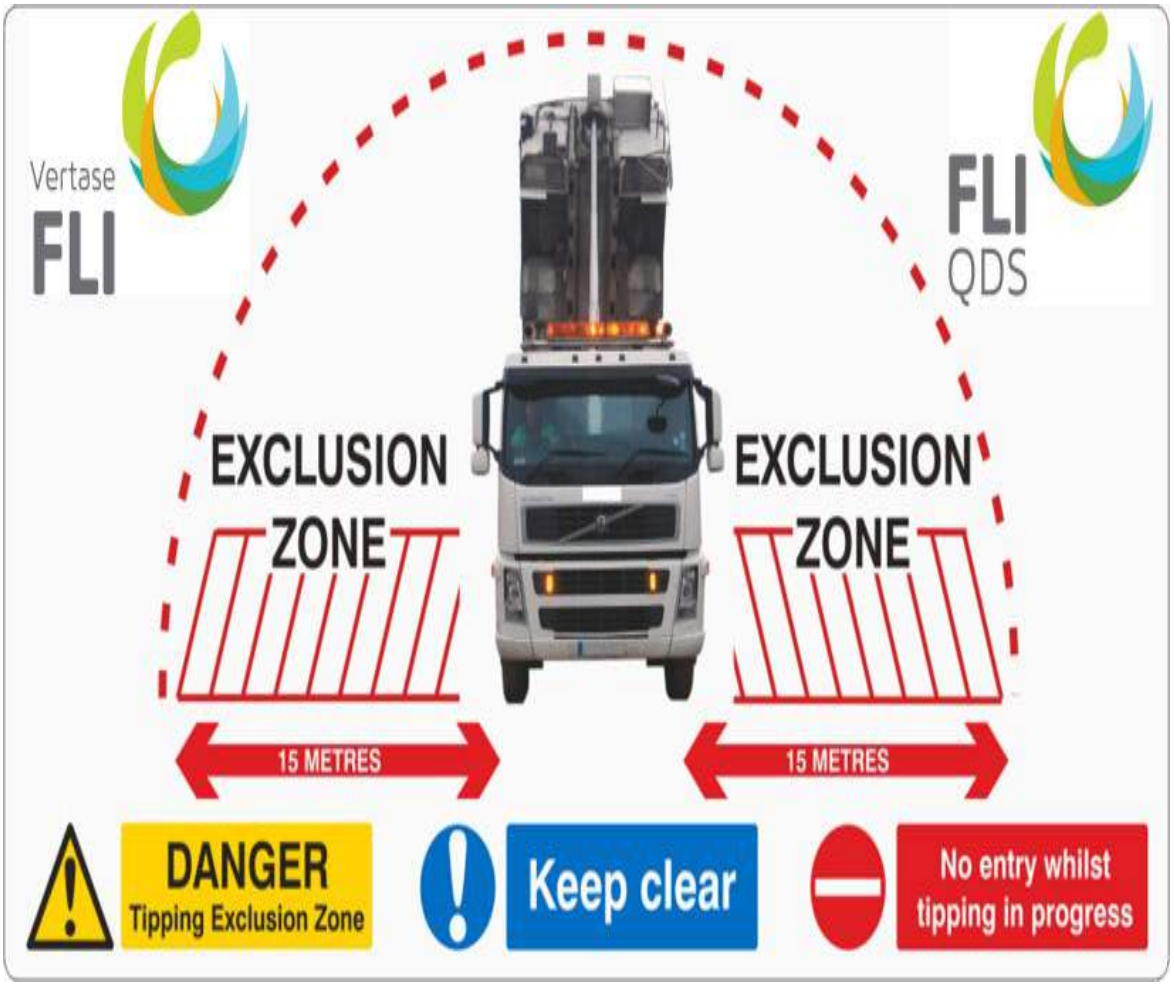
Red Zone: Entry prohibited unless the machine is completely isolated with the hand break applied / machine immobilised and the engine switched off.

Hatched Zone: Denotes the typical line of site of the plant operator

People & Plant Interface

DO YOU KNOW YOUR SAFE ZONES?

Vehicles, Vans & Lorries – **Tip Position**



Appendix D

INNSA Code of Practice

INNSA

INVASIVE NON-NATIVE SPECIALISTS ASSOCIATION

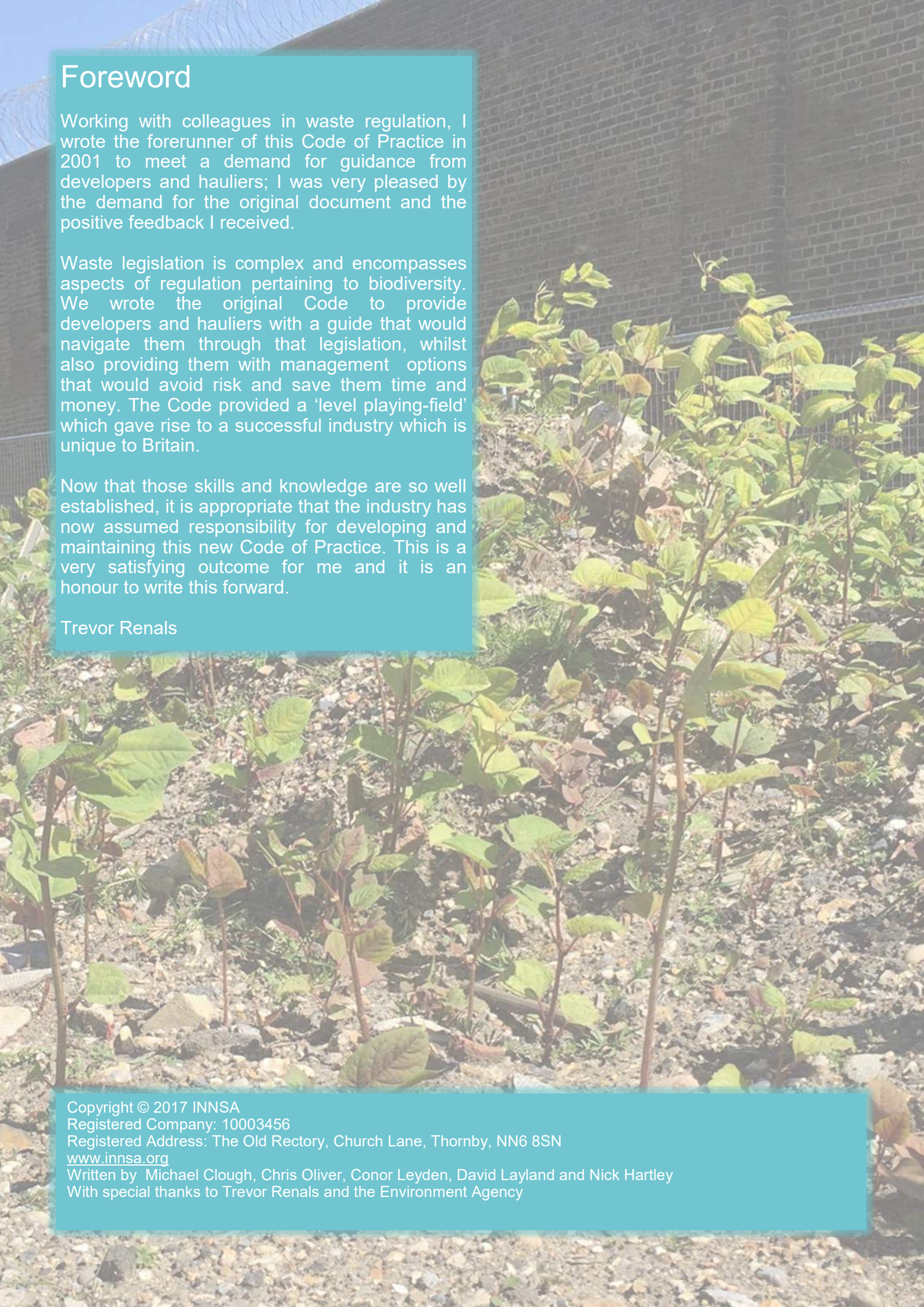
Code of Practice

Managing Japanese Knotweed

April 2017



INVASIVES CODE



Foreword

Working with colleagues in waste regulation, I wrote the forerunner of this Code of Practice in 2001 to meet a demand for guidance from developers and hauliers; I was very pleased by the demand for the original document and the positive feedback I received.

Waste legislation is complex and encompasses aspects of regulation pertaining to biodiversity. We wrote the original Code to provide developers and hauliers with a guide that would navigate them through that legislation, whilst also providing them with management options that would avoid risk and save them time and money. The Code provided a 'level playing-field' which gave rise to a successful industry which is unique to Britain.

Now that those skills and knowledge are so well established, it is appropriate that the industry has now assumed responsibility for developing and maintaining this new Code of Practice. This is a very satisfying outcome for me and it is an honour to write this forward.

Trevor Renals

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Registered Company: 10003456
Registered Address: The Old Rectory, Church Lane, Thornby, NN6 8SN
www.innsa.org
Written by Michael Clough, Chris Oliver, Conor Leyden, David Layland and Nick Hartley
With special thanks to Trevor Renals and the Environment Agency

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Executive Summary

This Code has been produced by the UK trade body INNSA and is based on the Environment Agency Code of Practice – Managing Japanese Knotweed on development sites.

The Code provides best practice advice and guidance aimed at contractors carrying out Japanese knotweed remediation works and will be useful for developers, planners and contractors who may encounter Japanese knotweed in the course of their work.

Japanese knotweed is an invasive plant which causes significant damage to the amenity, built and natural environments in the UK. The costs of managing Japanese knotweed on your site can be significant.

Managing land infested by Japanese knotweed in a timely and appropriate way can avoid:

- excessive cost
- potential prosecution and/or compensation claims
- physical damage to buildings and hard surfaces
- harm to the environment.

Identifying Japanese knotweed on a site early enables developers to assess and prepare cost options for eradicating, disposing of and managing it, as well as negotiating an appropriate change in the purchase price of the land.

You should keep the amount of Japanese knotweed-infested soil excavated to a minimum.

Making sure your staff can identify Japanese knotweed rhizome and vegetation can reduce waste costs and improve how you manage Japanese knotweed on site.

Do not accept topsoil until it has been inspected for Japanese knotweed rhizome.

Depending on site constraints and after consultation with a competent specialist, Japanese knotweed-infested soil that has been treated may be reused for landscaping the site, but should not be taken off site, unless it is taken to a licensed landfill site.

Designating a clerk of works to oversee the Japanese knotweed management on your site is a good way of ensuring that contractors treat Japanese knotweed in an appropriate manner.

You have a choice of herbicides that are effective against Japanese knotweed, depending on your situation.

It is an offence to plant or cause Japanese knotweed to spread in the wild under the Wildlife and Countryside Act 1981 and all waste containing Japanese knotweed is subject to Part II of the Environmental Protection Act 1990.

Introduction

INNSA Invasive Non-Native Specialists Association) is a UK trade body dedicated to the UK invasive species industry. Japanese knotweed remediation forms a significant part of this industry and the costs associated with Japanese knotweed are estimated at £166 million per year in the UK alone (Williams et al. 2010).

This Code of Practice is intended to replace the third edition of the Environment Agency document “Managing Japanese knotweed on development sites”, also known as “the knotweed Code of Practice”, which was withdrawn in 2016, and which forms the basis of this document.

The original knotweed Code of Practice was written in 2001 by Trevor Renals of the Environment Agency, who continued to manage and amend the code until it was passed over to INNSA in 2016 to ensure that this information and guidance remains in the public domain. INNSA has committed to continue to build upon, enhance and refine over a decade’s work by one of the industry’s most well-respected figures.

Further updates have been made to this version of the Code, including the INNSA Standards for managing Japanese knotweed, which represent the highest shared standards of best practice within the industry.

The Code has been written for anyone involved in the invasive species industry and anyone who may encounter sites with Japanese knotweed, or soil containing it and is intended to provide invasive non-native specialists and clients alike with an agreed framework for projects involving Japanese knotweed.

The Code of Practice will help developers manage Japanese knotweed legally. It also gives options for cost-effectively managing Japanese knotweed on site. Local authorities, architects, planners, designers, contractors, consultants and landscape gardeners can also use this Code.

The Code is managed by the trade body INNSA, and is available to purchase through the website, www.innsa.org

INNSA

The primary aims of INNSA are to raise standards in the invasive species industry and to protect consumers, land owners and property professionals as well as supporting its members. In addition to sharing best practice, INNSA sets and upholds robust standards which all of its members must maintain and adhere to when providing services for their clients.

INNSA is the only body that has brought together demanding technical standards and membership criteria with an outward facing Code of Conduct for clients to refer to called the Invasives Code. The Invasives Code clearly articulates how subscribers will treat their customers and ties in with BASIS-Registration Ltd (BASIS) in respect of the Amenity Assured scheme, which ensures that members are delivering to the highest technical standards. The Invasives Code is regulated independently by the Property Codes Compliance Board (PCCB) www.propertycodes.org.uk with an independent dispute resolution service provided by The Property Ombudsman (TPO) www.tpos.co.uk.

Furthermore, all INNSA Contractor Members and Consultant Members work to the INNSA Standards for all invasive species works, as outlined in Section 4 of this document.

INNSA strives to maintain a level playing-field where clients have a clear understanding of what is required and what is recommended. The services offered by INNSA Members will be comparable and transparent, with no 'grey areas' and will meet the INNSA standards at all times.

INNSA's Membership also includes manufacturers, educational establishments and independent experts with a common interest in non-native species, whose willingness to share best practice, proven ideas and concepts of continually improving the industry.

INNSA is a not-for-profit organisation limited by guarantee. It has an independent chairman, a Board of Directors and a Steering Group, made up of INNSA Members. The Board of Directors consists of;

David Layland
Mike Clough
Conor Leyden
Nick Hartley
James Sherwood-Rogers – Independent Chairman

Japanese Knotweed

Japanese knotweed (*Fallopia japonica* var. *japonica*) is a non-native invasive species of plant. Other relatives and hybrids of the plant are also present in the UK. Since it was introduced into the UK as an ornamental garden plant in the mid-nineteenth century Japanese knotweed has spread across the UK, particularly along watercourses, transport routes and brownfield sites.

Plants within their native range are usually controlled by a variety of natural pests and diseases. When these plants are introduced into new areas that are free from these pests and diseases, they can become larger and more vigorous. The spread of Japanese knotweed is a serious threat to our countryside, and the native plants and animals that rely upon it. Rivers, hedges, roadsides and railways form important corridors for native plants and animals to migrate, and large infestations of non-native weeds can block these routes for wildlife.



Japanese knotweed in flower (generally July-October)

Japanese knotweed is not just a problem for our native wildlife. The vigorous growth can damage buildings and hard surfaces. Once established underneath or around a built environment, it can be particularly hard to control. Riverside Japanese knotweed can damage flood defence structures and reduces the capacity of channels to carry floodwater.

Footpaths may become crowded with tall canes, making access difficult for pedestrians and making them feel less safe. In winter, the tall dead canes show where litter has become caught up and can become a nesting place for rats. Lawns and gardens become infested and the cost of maintaining buildings increase significantly.

There are a number of ways in which the impact of Japanese knotweed can be managed. It is important to understand how Japanese knotweed has spread and try to tackle these sources. Disposing of impacted soils from development sites is one way Japanese knotweed can spread.

Brownfield development is an important aspect of urban and rural regeneration and protecting green belt land. Many brownfield sites support infestations of Japanese knotweed, which can thrive in the poor soil quality and contamination which are common in such areas. These sites are rarely maintained prior to development and are often used unlawfully for fly-tipping or storage, all of which can cause Japanese knotweed to flourish, or re-infest wider areas.

Legislation

Legislation covering the handling and disposal of Japanese knotweed includes the following:

The Control of Pesticides Regulations 1986 require any person who uses a pesticide to take all reasonable precautions to protect the health of human beings, creatures and plants, safeguard the environment and in particular avoid the pollution of water. For application of pesticides in or near water, approval from the Environment Agency should be sought before use.

The Plant Protection Products (Sustainable Use) Regulations 2012 introduced new requirements regarding the sale, storage and use of plant protection products (pesticides), the approval of training and certification, and the inspection and testing of certain types of equipment.

Since November 2015, professional plant protection products (herbicides) may legally only be purchased where the end user holds an approved pesticide application qualification. All herbicide operations (including mixing) must be carried out by a competent person who holds an approved pesticide application qualification which covers the equipment used.

Section 14(2) of the **Wildlife and Countryside Act 1981 (WCA 1981)** states that "if any person plants or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9, he shall be guilty of an offence". Japanese knotweed is one of the plants listed in Schedule 9. Anyone convicted of an offence under Section 14 of the WCA 1981 may face a fine of £5,000 and/or 6 months' imprisonment, or 2 years and/or an unlimited fine on indictment.

The Environmental Protection Act 1990 (EPA) contains a number of legal provisions concerning "controlled waste", which are set out in Part II. Any soil or plant material contaminated with Japanese knotweed that you discard, intend to discard or are required to discard is likely to be classified as controlled waste. The most relevant provisions in the EPA is section 33 (1a) and (1b). These create offences to do with the deposit, treating, keeping or disposing of controlled waste without a permit. Section 33 (1c) makes it an offence to keep, treat, or dispose of controlled waste in a manner likely to cause pollution of the environment or harm to human health. Section 34 places duties on any person who imports, produces, carries, keeps, treats or disposes of controlled waste. Waste must be handled responsibly and in accordance with the law at all stages between its production and final recovery or disposal.

Waste must be transferred to an authorised person, in other words, a person who is either a registered carrier or exempted from registration by the **Waste (England and Wales) Regulations 2011 (Waste Regulations)**. A waste transfer note must be completed and signed giving a written description of the waste as per regulation 35 of the Waste Regulations.

This must be sufficient to enable the receiver of the waste to handle it in accordance with their own duty of care. Failure to comply with these provisions is an offence

The Hazardous Waste Regulations 2005 (HWR 2005) contain provisions about the handling and movement of hazardous waste. Hazardous wastes are defined by reference to regulation 6 of the HWR 2005. A waste is defined as hazardous if it is listed as a hazardous waste in the List of Wastes Decision as well as the **List of Waste (England) Regulations 2005**. The Secretary of State is also able to decide if a particular batch of waste is to be determined as hazardous. Schedule 3 of the HWR 2005 includes a list of properties that render hazardous waste. Annexes I, II and III of the Hazardous Waste Directive also provide further guidance on what constitutes hazardous waste.

Consignment notes must be completed when any hazardous waste is transferred. They must include details about the hazardous properties and any special handling requirements. If a consignment note is completed, a waste transfer note is not necessary. Untreated Japanese knotweed is not classed as hazardous waste, but material containing Japanese knotweed which has been treated with certain herbicides may be classified as hazardous waste.

As of November 2014, **Community Protection Notices**, which replaced (and are often incorrectly referred to as) "ABSOs", can now be issued to the owners of land with Japanese knotweed by the relevant local authority, by a person or body authorised by the local authority, or by a constable.

Under the **Anti-social Behaviour, Crime and Policing Act 2014**, such a notice can be used for various purposes, including to require someone to control or prevent the growth of Japanese knotweed or other plants capable of causing serious problems to communities. The test is that the conduct of the individual or body is having a detrimental effect of a persistent or continuing nature on the quality of life of those in the locality, and that the conduct is unreasonable. Under section 57 of the Act, "conduct" includes "a failure to act".

The Infrastructure Act 2015, contains powers to compel landowners to control or eradicate invasive non-native species and permits authorised persons to enter land to carry out species control operations at the landowner's expense.

The Environmental Permitting (England and Wales) Regulations 2010 (EPR) includes reference to the 'Exercise of relevant functions' in Schedule 9, paragraph 4. These objectives are derived from Article 13 of the European Waste Framework Directive. These objectives state that necessary measure shall be taken to ensure that "waste management is carried out without endangering human health, without harming the environment and, in particular, without risk to water, air, soil, plants or animals; without causing a nuisance through noise or odours; and without adversely affecting the countryside or places of special interest".

Exemptions are available in some circumstances, and are set out in Schedule 2 and 3 of the EPR. Exempt waste operations must comply with the general rules governing operations and must register with the relevant authority.

The above legal provisions have consequences for a range of people, including anybody involved in the management or disposal of Japanese knotweed. For example, Japanese knotweed which is cut down or excavated and removed from a development site must be transferred to an authorised person and correctly described. It should be disposed of appropriately, as set out below in this Code.

If Japanese knotweed is going to be buried on site, the **Environment Agency (EA)** will need to be consulted. Furthermore advice should be sought form an appropriately qualified professional (contaminated land consultant or similar) to determine if any existing contamination or contaminants within the material being buried will affect human health or groundwater.

Anyone who pollutes the environment or causes harm to human health may be prosecuted. Anyone who uses a herbicide must ensure that they do not pollute the water environment and the use of herbicides in or near water requires approval from the relevant local agency. If any waste soil or knotweed is sent for landfill either before or after any treatment, it must go to a landfill that is authorised to receive it. It is not an offence to have Japanese knotweed, but to allow it to grow onto other people's property may be regarded as a private nuisance under common law; however, this would be a civil matter.

Where you rely on the methods of on-site Japanese knotweed management in this document, you would normally require an environmental permit of a pollution prevention and control permit. However, if you follow the conditions of the Environment Agency's Regulatory Position Statement 178 (RPS 178), you don't need to apply for an environmental permit to treat or bury invasive non-native plant material. INNSA also understands that the Environment Agency won't normally take enforcement action against you provided: your activity meets the description in RPS 178; you comply with the conditions set out in RPS 178; and your activity doesn't (and isn't likely to) cause environmental pollution or harm human health.

The role of the Environment Agency

The Environment Agency is responsible for regulating waste. They grant waste management permits, register exemptions and can take enforcement action including prosecution if the law is not complied with. They give approvals under the Control of Pesticides Regulations 1986 for the use of pesticides in or near water.

The EA may take enforcement action under WCA 1981, but there are also a number of other organisations that can also do so. They would not normally use this legislation unless a waste offence had also been committed.

The EA are not responsible for controlling Japanese knotweed, other than where it is growing on their land.

Managing Japanese knotweed is the responsibility of the owner/occupier of a site. The EA do not endorse Japanese knotweed management plans, or endorse companies that provide them.

The Status and Use of this Code

Although they may not be suitable for use on all sites or in all circumstances, this Code describes ways of managing Japanese knotweed that developers may wish to consider in order to potentially avoid creating a waste disposal problem. INNSA encourages alternatives that allow developers to treat Japanese knotweed on site, so there is no need to use landfill which is very expensive for the development industry; it reduces valuable landfill capacity and needs haulage, which damages the environment and increases the risk of Japanese knotweed spreading. Sometimes, due to shortage of time and location, landfill is the only reliable option, but developers and INNSA Members should treat this as a last resort.

There are a number of ways of managing Japanese knotweed within a development site. Site managers need to be careful of claims made about products and methods on offer for controlling Japanese knotweed, particularly those that claim it can quickly eradicate the problem completely.

Since the publication of the 2006 Code by the EA, various soil screening and sieving methods have become a popular method for rhizome removal. Where conditions are appropriate for this method, screening can provide a cost-effective means of rhizome removal. Screened soil must still be regarded as potentially containing viable knotweed rhizome and must not be reused off-site or sold for re-use. If soil is taken off site, it should be disposed of at an approved landfill, in accordance with the relevant sections of this Code. If soil has been efficiently screened, it can be re-used on site in accordance with the relevant section of the Code.

Although INNSA cannot guarantee that any of the methods described in this Code will be successful, we believe the methods within this document are among the best that are currently available.

Before treatment, the INNSA Contractor Member and their client need to agree a contract for effectively treating the problem. Generally, some form of long-term site monitoring should be recommended. Remember that Japanese knotweed can stay dormant for many years and can regenerate from extremely small fragments of rhizome material.

You may wish to use this Code of Practice to assist you in carrying out your legal duties concerning Japanese knotweed. The information in the Code concerning on-site treatment options is aimed at suggesting best practice rather than setting out legal obligations.

Note, this Code does not constitute legal advice and it does not aim to give a detailed or comprehensive account of the legislation that could apply to you. You should be aware that it is your responsibility to make sure that the law is complied with. Waste legislation is especially complex.

For advice, call the INNSA team on 0800 1300 485.

If you see anyone illegally moving or disposing of waste, call the EA incident hotline on **0800 80 70 60**.

Development in Areas Contaminated with Japanese Knotweed

By developing this Code, INNSA hopes to protect the environment and increase the use of natural resources in a sustainable way. Developers should be aware that following the guidance in this Code may significantly reduce the costs associated with remediating sites contaminated with Japanese knotweed.

We would encourage developers to consider the following particular points:

Check for Japanese knotweed before buying a site

- The information and internet links within this Code should be sufficient for you to identify Japanese knotweed in its various forms. If there is Japanese knotweed on a site, this should not stop you from buying it, but you will need to consider this when working out how profitable a development is likely to be.
- If a site has been skimmed or treated, look for evidence of Japanese knotweed material. Consider some form of legal protection from the potential subsequent cost of managing Japanese knotweed within the purchase agreement.
- If there is Japanese knotweed, consider whether you will be able to treat the material on-site. Have you bought enough space to relocate soil and create a bund, for instance?
- If you think there is no Japanese knotweed on the site, consider getting legal guarantee that confirms this before you purchase the site.
- A survey by a specialist consultant can provide significantly more information about potential invasive plant problems on your site – including species other than Japanese knotweed, which may present their own specific hazards. An INNSA Consultant Member can provide such a survey. INNSA Consultant Members work to agreed standards when carrying out site surveys and reports will be presented in a suitable, easy-to-understand format.

Timetable for treatment and development

- Plan to minimise the amount of Japanese knotweed that you have to excavate, and to minimise the amount of materials taken off site to landfill.
- Make sure you have allocated enough time within the project timescale to develop and apply a Japanese knotweed management plan.
- Treating Japanese knotweed early and effectively, can significantly reduce the chance of it growing again. You should agree and implement a treatment plan as soon as possible.
- Consider phasing the development, to allow more time to treat the problem.
- Use best methods, including the most effective herbicides for the site in question. This will be determined by factors such as how close the site is to controlled waters, desirable trees and other vegetation.

Managing treated material

Just because soil has been treated, Japanese knotweed can still remain viable and start to regrow. However, if soil is treated effectively, it may be clean enough to be used for landscaping within the development.

You should only use treated soil in localised areas, where Japanese knotweed control methods could easily be used if material starts to grow again. Use of treated soils under buildings or other structures is generally advised against due to the potential for re-growth to cause damage.

We advise that you should not relocate treated soil within 50m of a watercourse without the recommendation of a suitably competent contaminated land consultant..

Long-term management

You need to consider the possibility that Japanese knotweed could grow back when you are managing the site long-term.

Current owners of the site need to accurately record within the deeds of the property where any material is buried or bunded and make this available to all subsequent owners so the material is not disturbed.

A summary of the treatment should be included within the vendor statement declaration.

Section 1

The Ecology of Japanese Knotweed

1.1 What is Japanese Knotweed?

Japanese knotweed is a tall, vigorous ornamental plant that escaped from cultivation in the late nineteenth century to become an aggressive invasive species in urban and rural environments.

1.2 What Does Japanese Knotweed Look Like?

Japanese knotweed, scientific names *Fallopia japonica* [Houtt. Ronse Decraene], *Reynoutria japonica* [Houtt.] or *Polygonum cuspidatum* [Siebold & Zuccarini], is a member of the dock family (*Polygonaceae*). It is a rhizomatous [i.e. it produces underground stems] perennial plant with distinctive, branching, hollow, bamboo-like stems, covered in red or purple speckles, which often reaches 2-3m in height.

Further similar plants and hybrids are found in the UK which may be referred to as "knotweed", including:

- Dwarf Japanese knotweed ***Fallopia japonica var. compacta***
- Giant knotweed ***Fallopia sachalinensis***
- Bohemian knotweed ***Fallopia x bohemica***
- Himalayan knotweed ***Polygonum polystachyum*** **(also *Polygonum polystachum*)**
- Railway yard knotweed ***Fallopia x conollyana***

The leaves of mature *Fallopia japonica* are up to 120mm in length with a flattened base and pointed tip and are arranged on arching stems in a zig zag pattern. The plant flowers late in the season, generally from July or August through to October, with small creamy-white flowers hanging in clusters from the leaf axils (the points at which the leaf joins with the stem). The underground rhizomes are thick and woody with a knotty appearance and, when broken, reveal a bright orange coloured centre. The rhizome system may extend to a depth of 2m or more and extend 7m laterally from a parent plant.

During winter, the leaves die back to reveal orange/ brown coloured woody stems which may stay erect for several years. Stem and leaf material decomposes slowly, leaving a deep layer of plant litter. During March to April, the plant sends up new shoots, red/purple in colour with rolled-back leaves. These shoots grow rapidly due to stored nutrients in the extensive rhizome system. Growth rates of up to 40mm a day have been recorded.

1.3 Regeneration

Only female Japanese knotweed (*F. japonica* var. *japonica*) plants have been recorded to date in the UK. Although seeds are produced, they are not true Japanese knotweed seeds but hybrids, and rarely survive.

The two species in the UK most closely related to Japanese knotweed are giant knotweed (*Fallopia sachalinensis*), a much taller plant which can reach a height of 5m; and a smaller compact variety (*Fallopia japonica* var. *compacta*), which grows to a height of only 1m. The hybrid *Fallopia* x *bohemica* (a cross between *Fallopia japonica* and *Fallopia sachalinensis*) is also found throughout the UK but is not as common as Japanese knotweed. Both giant knotweed and the hybrid should be managed in the same way as Japanese knotweed.

Japanese knotweed rarely produces viable seed. In the UK, the plant is mainly spread through rhizome fragments or cut stems. Greenhouse trials have shown that as little as 0.7 gram of rhizome material (10mm in length) can produce a new plant within 10 days. Cut, fresh stems have also been shown to produce shoots and roots from nodes when buried in soil or immersed in water. Once cut stem material has been allowed to dry out thoroughly and has reached the orange/brown 'woody' stage, there is no further regeneration. Rhizome material may take much longer to die and may remain dormant for long periods, possibly as long as 20 years, given suitable conditions.

1.4 Dispersal

The spread and high regeneration rates of the plant have serious implications for dispersal by both natural and human means. In river catchments, fragments of rhizomes or cut stems that are washed into watercourses under high water flows can form new plants downstream. Surface-water floods can cause similar problems. Fly-tipping garden waste that contains stem or rhizome fragments, using contaminated topsoil and transporting soil from infested sites during construction works are the main ways that people spread the plant. Small fragments of stem and rhizome may also be transferred from an infested site to other sites on machinery used for e.g. building works or maintaining road verges.

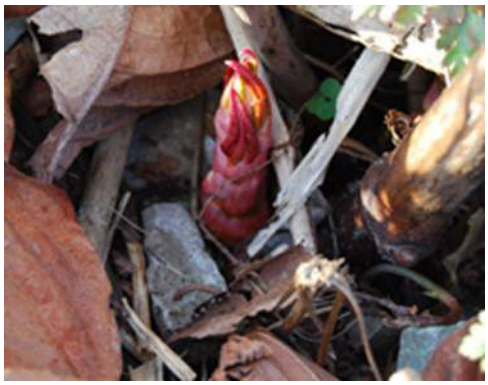
1.5 Managing Japanese Knotweed on a Development Site

Habitats affected by Japanese knotweed include those in both urban and rural areas. In an urban environment, sites such as road verges, railway land and watercourse corridors may be affected. Waste ground, cemeteries and heavily disturbed land is particularly vulnerable. In rural areas, the problems caused by Japanese knotweed include disruption of sight lines on roads and railways and disruption of flood defence structures and the flow of watercourses in the riparian (riverside) environment. The plant damages the urban environment by pushing up through tarmac and paving and disturbing retaining walls, and also by out-competing other species in planting programmes as part of landscaping schemes and causing aesthetic problems as litter accumulates in the dense thickets formed by the plant. This also encourages vermin.

Japanese knotweed is also invading continental Europe, particularly in the East. It is also causing problems on the Western Seaboard of the United States. Within its native range, Japanese knotweed rarely causes problems.

Japanese knotweed has been removed from the natural enemies that control it in its native range in Japan. It out -competes our native plants and animals. The spread of Japanese knotweed is a serious threat to our countryside, and the native plants and animals that rely upon it.

Very early spring growth





Spring growth with hollow stems, purple speckles

A node with distinctive branching pattern





Dense summer growth

Creamy white flowers





Large Japanese knotweed rhizomes



Dead Winter Canes

Section 2

Preventing the Spread of Japanese Knotweed

It is important to make sure that sites are not contaminated by Japanese knotweed, or that parts of a site previously unaffected by Japanese knotweed do not become contaminated. INNSA recommends that:

- you have a Japanese knotweed management plan in place;
- all staff are aware how to identify Japanese knotweed and what their responsibilities are;
- You have a clerk of works responsible for the management of Japanese knotweed.

2.1 Avoiding Contamination Around the Site

It is essential that you establish where Japanese knotweed infestations exist on site, that you document it, and everyone working there clearly understands the implications. Contractors should be fully briefed on the situation. You should record any areas that are contaminated with Japanese knotweed and isolate with fencing and erect restricted access signs.

2.2 Good Site Hygiene

To maintain good site hygiene, we suggest that for all Japanese knotweed identified, you need to determine exactly how far the rhizomes have spread. This can be done by digging a series of trial pits and examining them carefully:

- a fence that can clearly be seen should mark out the area(s) of infestation, including the underground rhizome network. Signs should warn people that there is Japanese knotweed contamination;
- you should indicate stockpiles of soil contaminated with Japanese knotweed with appropriate signs and isolate them using fencing, hording or other suitable means;
- you should try and avoid the use of vehicles with caterpillar tracks within the infested area;
- vehicles leaving a contaminated area should either be confined to haulage routes protected by root barrier membranes, or be decontaminated on each occasion before they leave the contaminated area;
- vehicles used to transport infested soils must be thoroughly brushed down or pressure-washed in a designated decontamination area before being used for other work;
- any decontamination area must be selected to prevent possible cross-contamination by plant fragments that are cleaned off the vehicle;
- areas infested by Japanese knotweed that are not going to be excavated should be protected by a root barrier membrane if they are likely to be disturbed by vehicles. Root barrier membranes may need to be protected from damage by vehicles with a layer of sand above and below the root barrier membrane, topped with a layer of hardcore or other suitable material as specified by an architect or engineer;
- all material remaining after the vehicles have been decontaminated must be contained, collected and disposed of along with other Japanese knotweed material;
- a clerk of works should oversee the Japanese knotweed management plan, including the provisions for avoiding contamination. Everyone working on site must clearly understand the role and authority of the clerk of works.

2.3 Avoiding Contamination on Site

This advice is particularly relevant to sites fortunate enough not to be infested by Japanese knotweed.

The three most common ways a site can become infected are:

Infested topsoil: There have been numerous instances where site owners have paid to remove Japanese knotweed-infested soil from their site, only to introduce it again with topsoil they have imported and not inspected.

BS 3882:2007 'The British Standard Specification for topsoil and requirements for use' states that the supplier shall exercise diligence to avoid the spread of Japanese knotweed and other pernicious or injurious weeds. You should always inspect topsoil brought into site. You can often get topsoil from different sources. Ideally, you should inspect these sources before you receive material on site. You should use topsoil from different sources within distinct areas of the site and keep a record of this. This may help you with compensation claims against the supplier, should Japanese knotweed subsequently grow. If you have any evidence that sub-standard topsoil is being sold, you should inform the local Trading Standards Office.

Contamination on vehicles: You should inspect vehicles before using them on site. You need to pay particular attention to caterpillar tracks and areas where trucks and dumpers are stowed.

Fly-tipping: Most Japanese knotweed infestations on development sites are as a result of fly-tipped waste and this often continues after the development has started.

You should report any fly-tipping to the Environment Agency on the 24-hour Freephone number, **0800 80 70 60**.



Stockpile area



Decontamination of a dumper truck

Section 3

Management of Japanese Knotweed

3.1 Japanese Knotweed Management Plans

Once you find Japanese knotweed on a site, it is essential that you set up some form of Japanese Knotweed Management Plan ('KMP' or 'JKMP'). You need to identify a clerk of works to oversee the plan and you need to let all relevant contractors on the site know how important the plan is, for example through the site induction and/or briefings or 'toolbox talks' to staff operation checks on the site.

The KMP is an important document and provides a valuable record of the treatment of the site for future owners. It may also provide evidence that the site has been appropriately managed if subsequent Japanese knotweed regrowth results in litigation against the contractor.

Unless an area of Japanese knotweed is likely to have a direct impact on the development, you should control it in its original location with herbicide over a suitable period of time, usually two to five years.

3.2 Herbicide Treatment

It is important to avoid disturbing or spreading Japanese knotweed materials around site as far as possible. Your approach to herbicide application should take this into account. The cleaning of equipment and footwear, as well as other measures, may be necessary to prevent cross-contamination.

Before application of any pesticide product, you must ensure that you comply with all relevant legislation. INNSA recommends that you consult a qualified pesticides advisor. Further information on legislation can be found on the HSE website www.hse.gov.uk and BASIS www.basis-reg.co.uk operates a register of qualified pesticides advisors.

By law, all herbicide treatment must use only products which are currently approved for use in the UK and must be carried out in accordance with the statutory instructions on the product label. There is a duty, both on the person applying herbicides and on the company they work for to keep the application of herbicides to a minimum, and to keep records of all herbicide application.

Applications near to water may only be carried out by a holder of a specific qualification for this activity. Application near to a watercourse, water abstraction or protected site (e.g. Site of Special Scientific Interest, Area of Special Scientific Interest, Special Area of Conservation, Special Protection Area or RAMSAR site) are likely to be subject to the approval of the relevant local regulator:

- England: Environment Agency (EA), Natural England
- Wales: Natural Resources Wales (NRW)
- Scotland: Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage
- N. Ireland: Northern Ireland Environment Agency (NIEA).

Application of herbicide near water is likely to require permission in writing from the local Environment Agency and the requirements and conditions for approval vary between different local bodies. Conditions of approval will be specific to the site in question.

Even after herbicide treatment, Japanese knotweed rhizome can remain dormant for a considerable period after regrowth has apparently stopped, so you need to check whether rhizomes are still living before disturbing the site. Unconfirmed observations suggest rhizome can stay alive for more than 20 years. However, treating Japanese knotweed with an appropriate herbicide can reduce its growth, even if it is only treated a few weeks before it is disturbed. If the timescale of the development does not give you enough time to effectively eradicate Japanese knotweed using chemicals, you should still treat the plant, if it is in leaf, as soon as possible.

Due to the high potential of regrowth from disturbance of soil containing Japanese knotweed, only a competent person should be appointed to assess the effectiveness of herbicidal treatment. Unless the treatment was completed a significant number of seasons prior to disturbance it is likely that further remedial works will be required.

Equipment

Generally, herbicide application for Japanese knotweed is carried out using a knapsack sprayer with a long (or extending) lance and/or a stem injection gun designed for Japanese knotweed treatment. Use of vehicle-mounted sprayers is generally not recommended because of the difficulty of navigating through and applying herbicide to the tall, dense growth, as well as the potential to cause cross-contamination by spreading plant propagules via the wheels or tracks of the vehicle.

Many contractors will spray both the tops and the undersides of the leaves to improve absorption of the herbicide, but this technique is very likely to increase the amount of run-off which occurs. You should pay careful attention to the dose and application rates when using this approach.

Nozzle choice for knapsack sprayers is generally indicated by the product label but common choices include “deflector” or “air inclusion” type nozzles. Selection of colour (which indicates flow rate) should be based on the application rate specified by the product label and the calibration of equipment.

A medium-quality spray tends to be used for most Japanese knotweed applications, but a coarse spray can be used in more windy conditions to prevent spray drift and a finer spray can be used in showery conditions to encourage evaporation of the water in the pesticide solution.

The healthier the Japanese knotweed is, the more susceptible it is likely be to herbicide application either by stem injection or by spraying. The optimum time for herbicide application is after flowering, when the plant is naturally translocating nutrients to the rhizome, and prior to the first frost.

Glyphosate

Glyphosate-based herbicide has a long track record of use for Japanese knotweed treatment. Glyphosate as an active ingredient is approved for use near water in the UK but not all products containing glyphosate are approved for use near water; usage restrictions will apply.

Glyphosate is a foliar-acting translocating herbicide, meaning that spray treatment is not effective unless it is applied to living leaves. The leaves absorb the herbicide, which is then moved to the rhizome by the plant’s vascular system. Spraying glyphosate onto soils or on growth without live leaves is likely to have no effect whatsoever on the target plant. Glyphosate is not generally residual in soils after around 48 hours, which makes it a good option for spraying in areas where mechanical remediation is planned.

Treatment regimes for glyphosate-based herbicides are generally recommended to last a minimum of three years but are commonly implemented over a five year period.

Application by spraying may be undertaken twice per year: normally once in spring, after the plant reaches around a metre in height and has fully-unfurled leaves, and then once between July and September/October (after flowering, but before the leaves start to discolour and fall). In treatments where only one application is made in a given growing season, this should be carried out after flowering. This should achieve the maximum effect, as this is the time when the plant is taking nutrients back into its rhizome system.

Applications of overdose of herbicide, or repeated applications too early in the growing season can result in very small “bonsai” growth, which can have a detrimental effect on the treatment plan. “Bonsai” growth has minimal leaf area, and does not absorb or translocate chemical as well as plants showing ordinary growth, making it very difficult to achieve good results using further chemical treatment.

Glyphosate is a non-selective herbicide, and will harm or kill other broadleaf species and grasses that it is applied to. Because Japanese knotweed is tall and bushy, it often overhangs other species or areas of grass which may be affected by herbicide which drips or drifts on to them. This should be taken in to account when planning the application methods.



‘Bonsai’ growth of Japanese knotweed

Chemical injection (“stem injection”) or direct application using leaf wiping or a brush (or “weed wiper”) can be used with some glyphosate-based herbicides (as specified on the label). Application is generally carried out once per year, after flowering.

The stem injection method has been in use by specialist Japanese knotweed contractors for over ten years and nowadays it is normally carried out using specially-designed equipment commonly known as an “injection gun”. The equipment is suitable for use on Japanese knotweed canes where the stem exceeds a certain diameter. Ideally, the stems should not be damaged during the injection treatment as this can potentially send the plant into shock. (Dr Ron Crockett, Monsanto 2004)

Recommendations vary, but herbicide is generally injected neat or diluted to up to 5:1. However, some contractors report success with injection of more dilute solutions.

Stem injection has previously been carried out using syringes or by cutting the stems of the plant and pouring dilute herbicide solution down the hollow stem (also known as “stem filling”).

Programmes of treatment which start with stem injection will often need to be completed using either spraying or leaf wiping to treat any subsequent growth which is too small to be treated using an injection gun.

Research by Ford S. 2004, has shown that stem filling achieves a reduced kill rate versus spraying; however, chemical injection and/or weed wiping have the advantage that they reduce the likelihood of damage to other plant species and the potential contamination of adjacent watercourses.

Aminopyralid

Aminopyralid-based herbicides are suitable for use in amenity grassland and areas not intended to bear vegetation, but as they are able to persist in both soils and grass species and retain their herbicidal properties even at very low concentrations, aminopyralid-based herbicides are not authorised for use on grassland which is used for pasture, compost or fodder. They are therefore generally not appropriate for use in private gardens, where grass cuttings may end up in local council green or garden waste bins.

Aminopyralid-based products are generally suitable for a single application per year at the full dose rate. Some products state that they are suitable for use at any time during active growth but a more common recommendation is for application when the plant is "1m high with good foliage cover", which is normally around June under normal growing conditions.

Aminopyralid-based products are often co-formulated with another active (e.g. triclopyr or fluroxypyr). Most aminopyralid- based herbicides on the UK market are not currently approved for use with stem injection equipment.

2, 4-D

At the time of writing, 2, 4-Dichlorophenoxyacetic acid ("2, 4-D") is still an approved active ingredient in various forms, including 2, 4-D amine. There is one product containing 2, 4-D which is approved for use near water. However, this product is not currently available on the UK market, meaning that glyphosate-based products are, in practice, the only herbicides suitable for use near water in the UK.

2, 4-D can effectively be used as a selective herbicide, as it normally has minimal effect on grass species at concentrations suitable for control of broadleaf species including Japanese knotweed. 2, 4-D can be used throughout the growing season, but must be applied to live leaf in order to be effective. Early season application is preferable and the flowering period should be avoided to protect bees.

2, 4-D is residual (active) for approximately one month after spraying – this should be taken in to account when carrying out spraying of areas which are to be mechanically remediated.

2, 4-D is not recommended for use with the stem injection method and products containing this active ingredient are not generally approved for stem injection use.

Due to potential endocrine disrupting properties, 2, 4-D appears on a list of active ingredients shortlisted for potential withdrawal by the EU. However, the active ingredient remains approved at the time of publishing; no decision has been made to approve the proposed withdrawal and there is no final date scheduled for the withdrawal of 2, 4-D or products which contain it, other than the expiry dates of the current approvals under normal pesticides approval procedures.

3.3 Mechanical Remediation

It is important to ensure any disturbance of Japanese knotweed is kept to an absolute minimum. It is vital that you keep contaminated material separate from other waste and surplus soil within the site. Soil free from Japanese knotweed and other waste may be disposed of relatively cheaply under exemptions from waste licence requirements.

The treatment and disposal of invasive non-native plants is covered by the Environmental Permitting Regime. A permit would normally be required for the disposal of invasive plant material and the substrate in which it is rooted.

The Environment Agency issued the Regulatory Position Statement (RPS) 178 in November 2016. This document highlights activities related to invasive plant species remediation which can be carried out without a permit as well as the conditions to comply with to avoid enforcement action. RPS 178 will be reviewed in June 2018. A copy of the document is available on the UK government website:

https://www.gov.uk/government/publications/treatment-and-disposal-of-invasive-non-native-plants-rps-178

INNSA recommends the use of the INNSA Standards – specific methods which are outlined in section 4 – for the treatment and disposal of Japanese knotweed. INNSA believes that these standards represent current best practice within the industry.

Different methods will be suitable to different sites, depending on the nature of the planned development, the timescale for development, the space available and other site conditions. An INNSA Consultant Member will be able to provide site inspections and recommendations for the remediation methods suitable for any given site.

The INNSA standards are best practice guidelines for specific works which are regularly carried out within the invasive species industry. These guidelines form part of the requirements for INNSA Contractor Membership; all INNSA Members should follow these guidelines while carrying out the works described.

The INNSA Standards include a some legal requirements and conditions set out in RPS 178 but they are intended as guidance only. It is your legal duty to ensure that they comply fully with your responsibilities when carrying out any works.

Compliance with all regulations and legal responsibilities including cooperation with all relevant authorities is an underlying principle of the INNSA Standards. At times, this will mean that works need to be carried out differently to the specifications set out in the following sections but where this is the case, the INNSA Standards should be followed as closely as possible to ensure best practice.

Section 4

The INNSA Standards

4.1 Invasive Species Identification

Invasive species identification should be undertaken by an appropriately qualified and experienced person. The identification survey should aim to determine the following with regards to invasive species:

- The type of invasive species present, and the extent of their presence;
- The extent of any habitat suitable to support invasive species;
- Any constraints to treatment, including the client's expectations with respect to timescale and development plans, and the presence of potentially sensitive receptors.

The key aim of the identification survey is to provide sufficient information from which a specialist can design and propose a treatment programme.

Pre-site walkover desk-top review

Before undertaking a walkover of a site, it is useful to review aerial photographs of the site and surrounding area, and available information on the local area, in order to identify likely features warranting specific consideration, including:

- Linear features such as railway lines, rivers or canals which may act as a route for invasive species transfer;
- The presence of watercourses or other habitats which may support invasive species;
- The proximity of the site to residential gardens or allotments;
- Former land use.

Preparation for the walkover

All available desk-top information should be utilised to develop a site specific health and safety plan with appropriate risk assessments.

Performing the walkover

During the walkover, the surveyor will identify and map the habitats on the site and on adjoining land, where access permits, and check them for the presence of invasive non-native species.

During the survey, the occurrence of any terrestrial invasive weeds on the site must be identified and recorded in terms of species present and stand size, including growth stage of the weeds. In addition, any notable features that may impact upon treatment methodology should be recorded, for example the proximity of a water body to the invasive weeds.

Any signs of other invasive species must also be recorded, and photographed where possible. This includes invasive aquatic weeds where a water body is present at or adjacent to the site and terrestrial and aquatic fauna.

Reporting

The findings of the identification survey should be reported in an invasive species identification report, and should include as a minimum the following information:

- Plans and photographs illustrating the habitats on the site and the location and extent of any suspected or confirmed invasive species.
- Any constraints which limited the extent or performance of the survey.
- The location of any sensitive receptors which may impact treatment methodologies.
- Recommendations for any further species specific surveys, if required.



Cross-section of Japanese knotweed rhizome



Japanese knotweed breaking through a hard surface

4.2 Herbicide Spraying of Japanese Knotweed

Spraying of chemical herbicide is a commonly-used and cost- effective means of Japanese knotweed control.

- All operatives carrying out spraying works must hold (or be directly supervised by someone holding) a valid certificate of competence (e.g. NPTC PA1*), as well as the relevant Award relating to the equipment being used (e.g. NPTC PA6A*)
- INNSA Contractor Members offering invasive weed treatment should provide additional continued training to all site operatives. This training should provide specific information and techniques regarding all non-native invasive species which the site operatives will be required to treat.
- Where chemical application works are carried out in or near to water, a relevant award (e.g. PA6INJ or PA6AW*) must be held by a supervising member of the site team.
- Operations being carried out near water should apply for permission from and comply with Environment Agency (or the relevant local agency's) water quality management requirements.
- Herbicide mixing and application works should always be carried out using appropriate PPE, specific to the task in hand.
- Chemical application works should be carried out with a relevant policy in place to minimise the risks of cross-contamination, protect the environment and minimise any risk to water.
- Companies should be forthcoming with customers about the risks and limitations of herbicide treatments and the timescales for treatment.
- Contractors should always provide a written method statement, risk-assessment and COSHH assessment for all herbicide application works that are undertaken.
- Contractors should follow all statutory instructions, including the recommended dosage rates as specified on the product label and any relevant manufacturers' guidelines.
- Contractors should implement measures to avoid applying chemical to non-target species, taking account of spray drift, weather conditions and the variety of application methods available.
- Contractors should, where possible and where appropriate, obtain written permission from neighbouring landowners, where treatment may pose a risk to non-target species on their land.
- When offering chemical eradication of Japanese knotweed, companies should recommend treatment plans as standard, which include a minimum number of sprays over a minimum period of time.
- Companies should at all times maintain an awareness of current pesticide regulations and laws appropriate to their area(s) of operation and ensure all employees and sub-contractors are regularly updated, preferably through CPD accreditation.
- Customers should be made aware that irrespective of the herbicide application method (foliar/stem injection/leaf wipe), treatment areas should be treated as contaminated even after herbicide application.
- Ground disturbance or excavation work within the contaminated areas and buffer zones will need the contractor's consent prior to works commencing and may require additional remediation.
- Single applications of chemical may be offered, but should not be recommended as a long-term solution.

* Further details available at:
https://www.nptc.org.uk/qualificationdefault.aspx

4.3 Stem Injection of Japanese Knotweed

Stem injection of Japanese knotweed is an established and cost-effective means of Japanese knotweed treatment which can be used in most weather conditions and can minimise damage to other plants.

- All operatives carrying out stem injection works must hold (or be directly supervised by someone holding) a valid certificate of competence (e.g. NPTC PA1*), as well as the relevant Award relating to the equipment being used (e.g. NPTC PA6INJ*).
- INNSA Contractor Members offering invasive weed treatment should provide additional continued training to all site operatives. This training should provide specific information and techniques regarding all non-native invasive species which the site operatives will be required to treat.
- Where chemical application works are carried out in or near to water, a relevant award (e.g. PA6INJ or PA6W*) must be held by a supervising member of the site team.
- Operations being carried out near water should apply for and comply with Environment Agency (or the relevant local agency) water quality management requirements.
- Herbicide mixing and application works should always be carried out using appropriate PPE specific to the task in hand.

- Chemical application works should be carried out with a relevant policy in place to minimise the risks of cross-contamination, protect the environment and minimise any risk to water.

- Companies should be forthcoming with customers about the risks and limitations of herbicide treatments.

- Contractors should always provide a written method statement, risk-assessment and COSHH assessment for all herbicide application works that are undertaken.

- Contractors should follow all statutory instructions, including the recommended dosage rates as specified on the herbicide manufacturers' guidelines (the product label).

- Contractors should ensure that equipment is correctly calibrated prior to work commencing and maintained throughout the procedures.

- A management plan should be in place to ensure all works have been completed successfully.

- Surveying of the plants must be completed by the contractor prior to starting the contract to establish the potential success of the stem injection in the first season.

- Previously treated Japanese knotweed, damaged or cut canes or small growth may take more than one season to treat and/or may need alternative remediation methods. All customers should be informed of this.



Direct stem injection

- Companies should at all times maintain an awareness of current pesticide regulations and laws appropriate to their area(s) of operation and ensure all employees and sub- contractors are regularly updated, preferably through CPD accreditation.

- Customers should be made aware that irrespective of the herbicide application method (foliar/stem injection/leaf wipe), treatment areas should be treated as contaminated even after herbicide application.

- Ground disturbance or excavation work within the contaminated areas and buffer zones will need the contractor's consent prior to works commencing and may require additional remediation.

* Further details available at:
https://www.nptc.org.uk/qualificationdefault.aspx

4.4 Installation of Root Barrier for Japanese Knotweed

There are several instances where installation of a suitable root barrier may be required as part of a Japanese knotweed management plan, for example;

- Where Japanese knotweed infestations are near existing structures, it may not be possible to excavate the Japanese knotweed in its entirety due to the potential to undermine foundations etc.

- Where Japanese knotweed infestations cross land ownership boundaries, it is not usually possible to excavate beyond the party wall / fence line, therefore a suitable root barrier should be used to reduce the risk of re-infestation from the contaminated site.

- Where proposed development will allow, a reduced-level partial excavation may be feasible to reduce disposal costs. However, a suitable root barrier must be installed to prevent future damage to the proposed development.

In all scenarios, it is essential that root barriers are installed correctly, as a root barrier is only effective if it has been installed in the correct way, with the correct overlay and joints. Supervision by a suitably qualified person is essential during root barrier installation.

Consideration should be given to the type of root barrier used. Some root barriers are more cost effective than others but there may be limitations to cheaper alternatives, such as diminished static puncture resistance or impermeability. This is especially relevant when installing root barriers to large areas because water-retention is generally undesirable. Japanese knotweed rhizome material can remain dormant for upwards of twenty years, therefore the root barrier's material integrity should be guaranteed by the supplier for a minimum of 50 years.

Prior to installation, faces of excavation should be uniform and free from sharp objects such as bricks and roots. Where removal of all sharp objects is not possible, a blinding layer of sand should be laid on the exposed surface to protect the installed root barrier. If the material used for backfilling contains sharp material, sand blinding should also be applied to the face of the installed root barrier depending on the type of material. Plant and machinery should also be prevented from travelling directly across root barriers, as this activity can compromise the integrity of the barrier.

When installing vertical root barriers, the root barrier should be installed on timber sheeting to prevent creasing and ensure uniform installation. This will also help the root barrier to retain its profile during backfilling.

It is essential that no Japanese knotweed material migrates to the clean side of the installed root barrier during backfilling. It is therefore important that you check any imported soils for contamination.

Root barriers should be installed using the minimum number of joints possible to maintain the integrity of the root barrier. Where jointing is unavoidable, seams should be welded. If this is not possible due to the type of root barrier used, root barrier should be installed with sufficient overlap of not less than two metres. Where root barriers are penetrated by services, root barrier should be sealed to ducting using appropriate jointing tape or similar.

Following installation, the area of installed root barrier should be recorded so subsequent works within the area do not compromise the barrier.



Root barrier capping



Root barrier geotextile

4.5 Creating a Waste Management Area for Japanese Knotweed

On sites where Japanese knotweed is present in development areas, it is sometimes possible to avoid removing materials to landfill and to facilitate herbicide treatment by relocating contaminated materials to a waste management area (WMA). A WMA is a bund – a mound of soils – where the Japanese knotweed can be chemically treated over a period of years without interfering with the development.

Where there will be a delay before the relocation is carried out, you should apply a non-persistent herbicide such as glyphosate to reduce the growth of the viable material, if the plant is in leaf.

You should choose a suitable location for the WMA in an area not earmarked for future development, landscaping or the installation of roads, public open space or services. Ensure the chosen area is not likely to be disturbed, at risk of significant erosion or used as a path for vehicles, people or animals – all of which could result in cross-contamination.

The location of the WMA should be accurately recorded on the relevant documentation (deeds, site plans and the KMP) to ensure that it is properly managed in the long term. You should advise the local environment agency office of the location of the WMA.

If the whole of the area designated for the WMA is not already contaminated with Japanese knotweed, then a suitable root barrier membrane should be installed on the surface underneath the WMA to prevent cross-contamination. The membrane should extend significantly beyond the base of the bund on each side.

It is vital the integrity of the membrane is maintained at all times, that there are no holes in the membrane and that the welds between different sections of the membrane are perfectly sealed along their full length. INNSA recommend to all clients that this operation is undertaken by an experienced specialist contractor.

Many root barrier membranes are available which claim to prevent Japanese knotweed penetrating. Given that the rhizomes may remain dormant for 20 years, it is important that the supplier of the membrane gives a guarantee exceeding this, with a minimum specification of 50 years or greater.

The WMA should be built up in layers, with more viable sections of rhizome being placed towards the top of the WMA to encourage their growth, in order to facilitate effective herbicide treatment.

The WMA should be "weathered" (the sides packed, graded and made smooth) so that it retains its shape and structure over the years.

Suitable fencing and signage should be installed around the WMA to prevent unauthorised access and alert contractors to the presence of contaminated material, therefore reducing the likelihood of cross-contamination.

The materials in the WMA should be treated as contaminated during and after herbicide treatment, even if no growth has been recorded.

Chemical herbicide treatment should then be carried out as normal on the growth which emerges from the WMA.



WMA—Lining before waste is stockpiled



WMA—Protecting the root barrier membrane

4.6 Burial of Japanese Knotweed

Soil containing Japanese knotweed material may be buried on the site where it is produced. You must comply with local laws. In England, you must inform the Environment Agency at least one week prior to the burial; please refer to the EA's Regulatory Position Statement 178 for further guidance.

Prior to burial of the Japanese knotweed, you should apply a non-persistent herbicide such as glyphosate if the plant is in leaf; this should reduce the growth of the viable material. You should check the product label, which will inform you of the 'active' period of the herbicide; material may not be buried during this period.

The materials to be buried should consist of soil and stones containing Japanese knotweed only; do not bury rubble or other contaminants (including household waste).

You have two options when burying Japanese knotweed:

- Cover the material with at least 5m (depth) of clean soils (preferably separated by a geotextile root barrier membrane on the surface of the contaminated material)

- Encapsulate the material completely within a geotextile membrane and cover the capsule with at least 2m (depth) of clean soils

It is therefore likely that you will be making and working in deep excavations, and you must accordingly take appropriate safety precautions.

You should choose a suitable location for the burial pit which is not likely to be disturbed, not earmarked for future development, landscaping or the installation of roads, public open space or services.

The location of the burial cell should be accurately recorded on the relevant documentation (deeds, site plans and the KMP) to ensure that it is properly managed in the long term. You should advise the local environment agency office of the location of the burial cell.

Consideration and or consultation with the Contaminated Land Consultant should also take place is there is any risk of pollutant linkages occurring or pre -existing contamination being affected by the formation of a burial chamber.

Many root barrier membranes are available which claim to prevent Japanese knotweed penetrating. A root barrier membrane is only as good as the way in which it has been laid, expert supervision is essential when the root barrier membrane is installed.

Where the encapsulation method is used, your excavation should be lined along the bottom and the sides before any contaminated materials are imported. It is vital that the integrity of the membrane is maintained at all times. It is important to have a minimum amount of seams; if any Japanese knotweed does have the strength to regenerate, it may break through any holes or poorly-welded joints.

Given that the rhizomes may remain dormant for 20 years, it is important that the supplier of the membrane gives a guarantee exceeding this, with a minimum specification of 50 years or greater.



Compaction of a burial chamber



Capping of a burial chamber

4.7 Dig and Dump for Japanese Knotweed

Where no other methods of on-site management of Japanese knotweed are suitable for a particular site, a controlled excavation and removal off site to a licensed facility ("dig and dump") may be the only viable option. Prior to works, the area of Japanese knotweed infestation should be suitably demarcated to prevent access and disturbance by site traffic and operatives. Disturbance may lead to further cross-contamination.

Furthermore, it is essential that the waste is classified by the landfill operator prior to the material being exported from site. This can be done by providing a chemical analysis of the soil, which should be carried out by a UKAS accredited lab and transported under controlled conditions. This information may be available from the site investigation report for the site.

Where possible, excavation should take place from outside the area of infestation to prevent plant tracks or tyres coming into contact with Japanese knotweed contaminated soil. When working on large infestations or tight sites, this may not be possible. In this scenario, consideration should be given to laying a temporary blinding layer of suitable material or sacrificial root barrier to prevent contact between Japanese knotweed material and plant. As a last resort, plant and machinery coming into contact with Japanese knotweed contaminated material should be thoroughly inspected and decontaminated by a suitably-qualified person before each time they leave the contaminated area.

Consideration should be given when moving the excavated material from excavator to proposed receptacle so that material is not lost during transport. Equipment (such as dumper trucks) should be under-filled to prevent this scenario.

Excavation should proceed to the extent of rhizome network. When supervised by a suitably-qualified person, the volume of excavated material can be significantly reduced compared to previous Environment Agency recommendation of 7m of soils in all directions. On completion of each stage of the excavation, further material should be loosened and inspected for the presence of Japanese knotweed material.

When no further Japanese knotweed material is encountered, the excavation may be prepared for backfilling or subsequent works. The final depth of rhizome penetration is likely to vary, depending on ground conditions and porosity. It is essential that all material is removed unless a suitable root barrier is to be subsequently installed.

It is recommended that a herbicide monitoring regime is implemented following any excavation works in case any small fragments of Japanese knotweed rhizome remain in the soil. Suitable herbicides applied by qualified persons can prevent the growth from small rhizome fragments from becoming re-established.

Japanese knotweed material to be transported off-site is considered to be controlled waste. It is essential that a full set of duty of care and waste transfer paperwork is in place to confirm material has been managed in an appropriate manner. Any persons transporting Japanese knotweed soils must be a registered waste carrier and a copy of their license should be presented to the waste producer prior to works commencing.

Any landfill operator must be licensed to accept Japanese knotweed and it is the waste producer's responsibility to ensure that the contaminated material is transported and disposed of correctly. Records of how the material was transported must be kept in case any appointed representative of the relevant local agencies wishes to verify the waste's final location.

Further information on your responsibilities in relation to waste can be found at https://www.gov.uk/managing-your-waste-an-overview



Dig and dump method



Dig and dump method

4.8 Removal of Japanese Knotweed from Soil or Contaminated Material ("Sifting" or "Soil Screening")

The physical removal of Japanese knotweed rhizome refers to the manual or mechanical separation of Japanese knotweed rhizome from the growing medium for disposal off-site.
This method aims to significantly reduce the amount of material taken off site. This system may be suitable for sites which do not have time for longer-term solutions and/or where space is at a premium. This system often utilises bespoke machinery specifically designed for the processing of materials into two or more fractions.

Prior to any works being undertaken, a full Japanese knotweed management plan should be prepared and authorised by a suitably-qualified and experienced professional. The area of Japanese knotweed infestation should be suitably demarcated to prevent access and disturbance by site traffic and operatives. Disturbance, especially during inclement conditions, may lead to further cross-contamination. At this time, a suitable static "screening zone" should be identified, this area should ideally be fenced from the main site and located on a solid area within close proximity to the Japanese knotweed infestation.

Where possible, excavation should take place from outside of the area of infestation to prevent plant tracks or tyres coming into contact with Japanese knotweed contaminated soil. When working on large infestations or tight sites, this may not be possible. In this scenario, consideration should be given to laying a temporary blinding layer of suitable material or sacrificial root barrier to prevent contact between Japanese knotweed material and plant. As a last resort, plant and machinery coming into contact with Japanese knotweed contaminated material should be thoroughly inspected and decontaminated by a suitable qualified person prior to further movement on site.

Excavation should proceed to the extent of the rhizome network. When supervised by a suitably-qualified person, the volume of excavated material can be significantly reduced compared to the previous Environment Agency recommendation of 7m of soils in all directions. On completion of each stage of the excavation, further material should be loosened and inspected for the presence of Japanese knotweed material.

During the excavation process, removed material should be transported to the screening zone in manageable quantities, as stockpiling contaminated material in inclement weather may lead to delays or may even render the material unsuitable for screening. Where all the contaminated material needs to be excavated before screening can commence, stockpiles should be protected with a waterproof covering.

Material passed through the screening machinery will be split into multiple fractions of material, typically oversize, midsize and fines. The material will then pass through a secondary system (e.g. conveyor belt) which will enable mechanical or manual removal of rhizome material.

Contaminated material should be segregated into containers and sealed where possible, before removal from site.

When no further Japanese knotweed material is encountered and after the screening process is complete, the excavation may be prepared for backfilling or subsequent works. It is essential that any screened material (soil) is suitably managed because it may still contain small fragments of rhizome. Consideration should be given to relevant waste management licences, permits and the CL:AIRE Code of Practice before any re-use and / or burial of soils on site.

This can be managed by either the specification of a capping layer at, or storage in a waste management area which can then be monitored and treated with herbicide if necessary (as per the INNSA Standard – Creating a Waste Management Area for Japanese Knotweed).



Soil screening

The final depth of rhizome penetration and amount of material processed may vary dependent on ground conditions and porosity. It is essential that all material is removed and screened unless it is proposed that a suitable root barrier is to be subsequently installed.

It is recommended that a herbicide monitoring regime is implemented following any excavation works in case any small fragments of Japanese knotweed rhizome remain in the soil. Suitable herbicides applied by qualified persons can prevent the growth from small rhizome fragments from becoming re-established.

Japanese knotweed material to be transported off-site is considered a controlled waste. It is essential that a full set of duty of care and waste transfer paperwork is in place to confirm material has been managed in an appropriate manner. Any persons transporting Japanese knotweed soils must be a registered waste carrier and a copy of their license should be presented to the waste producer prior to works commencing.

The chosen landfill operator must be licensed to accept Japanese knotweed and it is the waste producer's responsibility to ensure that the contaminated material is transported and disposed of correctly. Records of how the material was transported must be kept in case any appointed representative of the relevant local agencies wishes to verify the waste's final location.

Further information on your responsibilities in relation to waste can be found at https://www.gov.uk/managing-your-waste-an-overview



Soil screening

Section 5

INNSA Membership

INNSA (Invasive Non-Native Specialists Association www.innsa.org) is the industry body for companies involved in controlling and eradicating invasive non-native species in the UK.

INNSA aims to improve standards within the industry and offer peace of mind to clients.

All INNSA Members must subscribe to the Invasives Code which is regulated by the independent body, the Property Codes Compliance Board (PCCB). For more details, go to www.pccb.org.uk.

We believe that together, we are the most powerful voice in the industry. Our aims are to encourage the highest standards within the industry and improve the business climate in which the industry operates, as well as to promote and protect the interests of our members through contact with government, other industry and non-industry organisations, the media and the general public.

We also believe that membership of INNSA represents the highest available standards within the industry, and that by joining INNSA or insisting that your supply chain use only INNSA Members for invasive species works, you can demonstrate your own commitment to those standards.

5.1 Membership Categories

There are several categories available for membership, depending on your role in the industry:

- Contractor – for companies who offer invasive species remediation services
- Consultant – for companies who offer surveys and advice on invasive species
- Associate – for companies working towards full Contractor or Consultant Membership
- Affiliate – for service users, bodies with an interest in the industry

INNSA Membership has a variety of benefits, which are tailored to members in each different category.

5.2 Benefits of Membership

Membership of INNSA is a badge that should be worn with pride, but it also opens doors within the industry and comes with a number of additional benefits.

INNSA Contractor Membership benefits

- Benefit from the INNSA 5-year or 10-year Insurance Backed Guarantee, recognised by mortgage lenders and RICS
- Access sales opportunities available only to INNSA members
- Benefit from preferential rates from a list of suppliers including herbicide suppliers
- Demonstrate that you follow the highest standards within the industry
- Support through gaining professional accreditations
- Discounted training courses and events
- Access to clear and concise advice on treatment methods and best practice
- Advertising on www.innsa.org where your case studies and biographies will be visible to all users and customers
- Access to details of current and proposed changes in legislation
- INNSA provides Contractor Members with a voice in the industry

INNSA Consultant Membership benefits

- Build relationships with specialist contractors to affirm your standing in the industry
- Access to INNSA's wide knowledge base
- Access to details of current industry standards, best practice and details of current and proposed changes in legislation
- Access to a broad range of clients for a wider sales perspective
- Offer your services to INNSA Contractors and Associates and build partnerships to raise standards and offer the complete package to your clients
- INNSA provides Consultant Members with a voice within the industry

INNSA Associate Membership benefits

- Benefit from the INNSA 5-year or 10-year Insurance Backed Guarantee, recognised by mortgage lenders and RICS
- Benefit from preferential rates from a list of suppliers including herbicide suppliers
- Demonstrate that you are working towards the highest standards within the industry
- Discounted training courses and events
- Support through gaining professional accreditations

- Advertising on www.innsa.org where your case studies and biographies will be visible to all users and customers
- Access to clear and concise advice on treatment methods and industry best practice
- Access to current and proposed future changes in legislation

INNSA Affiliate Membership benefits

- Directly market to a number of the largest invasive species contractors across the UK
- Access to regularly updated information on current legislation, treatment methods and best practice within the industry

5.3 Membership Criteria

Contractors and consultants must meet stringent criteria in order to become members of INNSA. Where companies are not able to meet all of the criteria on application, they will be offered an Associate membership, and given guidance and assistance with meeting the full membership criteria.

Membership will not be approved where serious non-conformances are noted.

INNSA Contractor Membership

- ISO 9001 and ISO 14001– Members must be accredited to both standards.
- BASIS Qualification – member of staff qualified with BASIS Certificate in Invasive and Injurious Weeds or have a written agreement in place with an external company to provide advice and guidance.
- INNSA Standards – Contractor Members must adhere to the 'INNSA Standards' in all invasive species works that they carry out
- Insurance – all members must hold a minimum of £2m Professional Indemnity, £5m Employer's Liability and £10m Public Liability insurances. All insurances must specifically cover works with invasive species
- Health and Safety – members must hold current accreditation from at least one SSIP scheme e.g. CHAS, SMAS Safe Contractor (see www.ssip.org.uk for further details)
- Amenity Assured – INNSA Contractor Members must be members of the Amenity Assured scheme, run by BASIS-Registration Ltd
- Invasives Code – all INNSA Members must subscribe to and comply with the Invasives Code
- All members will be audited regularly by the Property Codes Compliance Board and agree to abide by any decision made by the Property Ombudsman.

INNSA Consultant Membership

- ISO 9001 and ISO 14001 – Members should be accredited to both standards
- Professional Standing – Members should have at least one specialist with membership at an appropriate level in IEEM or IEMA
- Insurance – All members to have a minimum of £2m Professional Indemnity, £5m Employers Liability and £10m Public Liability. PII is to reference working with Invasive species

INNSA Associate Membership

If a prospective member is able to demonstrate good standards, but does not meet all of the relevant membership criteria above, then they will normally be offered an INNSA Associate Membership until such time as they achieve the required standards for full membership.

INNSA offers support and guidance to all Associate Members to ensure that they have a road map to membership and to help them to achieve full membership status within an appropriate timescale. In addition, discounts and preferential rates are available for INNSA Associate Members on a number of relevant training schemes and products (including insurance) which form part of the membership criteria.

Notes

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