


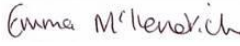
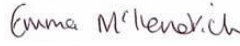

# Outline Construction & Environmental Management Plan

Glounthaune SHD

Bluescape Limited

Project number: 60592432  
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## Quality information

Prepared by	Checked by	Verified by	Approved by
			
Aileen Prendergast Principal Engineer	Emma McKendrick Regional Director	Emma McKendrick Regional Director	Aileen Prendergast Principal Engineer

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Prepared for:  
Bluescape Limited

Prepared by:

AECOM Ireland Limited  
1st floor, Montrose House  
Carrigaline Road  
Douglas, Cork T12 P088  
Ireland

T: +353 21 436 5006  
F: +353 21 436 5156  
aecom.com

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# 1. Introduction

## 1.1 Background

AECOM were appointed by Bluescape Limited to prepare an outline Construction and Environmental Management Plan (CEMP) in support of a Strategic Housing Development (SHD) planning application to An Bord Pleanála for a proposed residential development at Glounthaune, Co. Cork.

This CEMP has been prepared to accompany the planning application for the proposed development. The proposed layout of the development is detailed in the planning drawings prepared by Deady Gahan Architects.

The purpose of this report is to ensure that best construction management practices are applied to the site by the main contractor and that measures are in place during construction to reduce as much as possible the impact of the works on people, property, and the environment. The contractor will be required to develop this outline report further in line with his/her detailed requirements.

The proposed activities include site preparation, excavation, building and construction, services installation, materials delivery, materials and waste removal and any other associated engineering works. A Construction and Demolition Waste Management Plan has also been prepared to accompany this application.

## 1.2 Site Location

The current site comprises of a greenfield site. The site measures approximately 13.87 ha in total. The majority of the site is located to the north of The Terrace Road ('the Terrace') with a small part of the site located to the south of 'the Terrace'. There is a considerable variation in ground levels across the site which has been considered in developing the proposed layout. The site slopes from north to south from approximate +110 m OD Malin to +34.5 m OD Malin on The Terrace to approximately +3.30 m OD Malin.

The northern part of the site is bounded by existing residential developments to the north, west and south. Agricultural land bounds the site to the east. The southern part of the site is bounded by the L-2970, known locally as 'the Terrace' to the north, existing dwellings to the east and west and Johnstown Close to the south. The public road network surrounding the site is defined by the L-2969 to the north, the L-2968 to the west, and the L-2970, known locally as 'the Terrace' to the south.

## 1.3 Proposed Development

The proposed development consists of the construction of a mixed-use residential development of 289 no. residential units consisting of 201 no. dwelling houses and 88 no. apartment/duplex units, a two storey creche, 4 no. ESB substations and all ancillary site development works at Lackenroe and Johnstown (townlands), Glounthaune, Co. Cork. The proposed development will be constructed on lands to the north and south of the public road, L-2970, known locally as 'the Terrace'. A portion of the site to the south of 'the Terrace' was formerly within Ashbourne Garden and is considered to be within the curtilage and attendant grounds of Ashbourne House, which is a Protected Structure (Ref 00498).

The proposed development to the north of 'the Terrace' provides for 260 no. residential units comprising of 196 no. dwelling houses, 64 no. apartment/duplex units and a two storey creche. The 196 no. dwelling houses includes 5 no. 4 bedroom detached dwellings, 44 no. 4 bedroom semi-detached dwellings, 12 no. 4 bedroom townhouses, 2 no. 3 bedroom detached dwellings, 22 no. 3 bedroom semi-detached dwellings, 47 no. 3 bedroom townhouses and 64 no. 2 bedroom townhouses.

The 64 no. apartment/duplex units contains 5 no. 3 bedroom units, 32 no. 2 bedroom units and 27 no. 1 bedroom units contained in 6 no. three storey apartment buildings, with ancillary bicycle parking and bins stores.

The proposed development to the south of 'the Terrace' provides for 29 no. residential units comprising of 5 no. dwelling houses and 24 no. apartments. The 5 no. dwellings include 1 no. 3 bedroom detached dwelling, 2 no. 3 bedroom townhouses and 2 no. 2 bedroom townhouses. The proposed apartments are provided in a four-storey mixed-use building containing a ground floor community unit and a commercial unit with apartments at ground and upper floor levels comprising 3 no. 3 bedroom units, 7 no. 2 bedroom units and 14 no. 1 bedroom units with ancillary rooftop terrace, car parking, bicycle parking and bin stores.

Vehicular access to 2 no. dwellings in the lands to the north of 'the Terrace' will be provided via an upgraded entrance from 'the Terrace' with vehicular access to the remainder of dwellings in the lands to the north of 'the Terrace' via the signalised junction from the L-2968 and internal road network permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17. A separate secondary emergency access is also proposed from the L-2969 to the north.

Vehicular access to the 5 no. dwellings to the south of the 'the Terrace' will be via a new entrance from 'the Terrace' and the proposed apartment building will be accessed from Johnstown Close. The proposed development also makes provision for a pedestrian link from the proposed development north of 'the Terrace' to Johnstown Close via 'the Terrace' which will include a signalised pedestrian crossing and associated traffic calming measures on 'the Terrace'.

Ancillary site works include the demolition of 1 no. existing derelict dwelling house and associated outbuildings, landscaping and servicing proposals including the realignment of the existing pedestrian/cycle route on Johnstown Close, the undergrounding of existing overhead lines, upgrade of the storm and foul sewer network to the south and east of the subject lands along 'the Terrace' and Johnstown Close (L-3004).

Figure 1 illustrates the extent and layout of the proposed development.



Figure 1 – Site Location and Layout

## 1.4 Legislative Basis for the CEMP

This Construction and Environmental Management Plan is to be read in conjunction with the EIAR prepared for the project. This Construction and Environmental Management Plan is a 'live' document and must be managed and updated throughout the construction phase as required by the main contractor and it is intended that any such revisions to this Construction and Environmental Management Plan will be agreed with the local authority. In particular, the CEMP will be updated to ensure the requirements of all relevant planning conditions are incorporated.

## 1.5 Construction Programme and Phasing

Access to the proposed development site will be from the existing public road adjacent to the northern end of the site. The estimated duration of the construction phase of this project is 48 months. Vehicular access to the lands to the north of 'the Terrace' will be via the signalised junction from the L-2968 and internal road network permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17 with a separate secondary emergency access proposed to the L-2969 to the north. Vehicular access to the 5 No. Units located to the south of the Terrace will be provided from the Terrace.

As per the Phasing strategy included in Figure 2, it is proposed to construct 97 Units, including the creche, community facility & commercial unit (shown in blue) in Phase 1. This phase also includes the construction of the development access road through the site along with the pedestrian paths traversing from north to south through the site and proposed drainage networks.

As part of Phase 2 it is proposed to construct 93 Units along the western boundary of the site (shown in green in Figure 2). As part of Phase 3 it is proposed to construct 99 Units along the eastern boundary (shown in yellow in Figure 2).

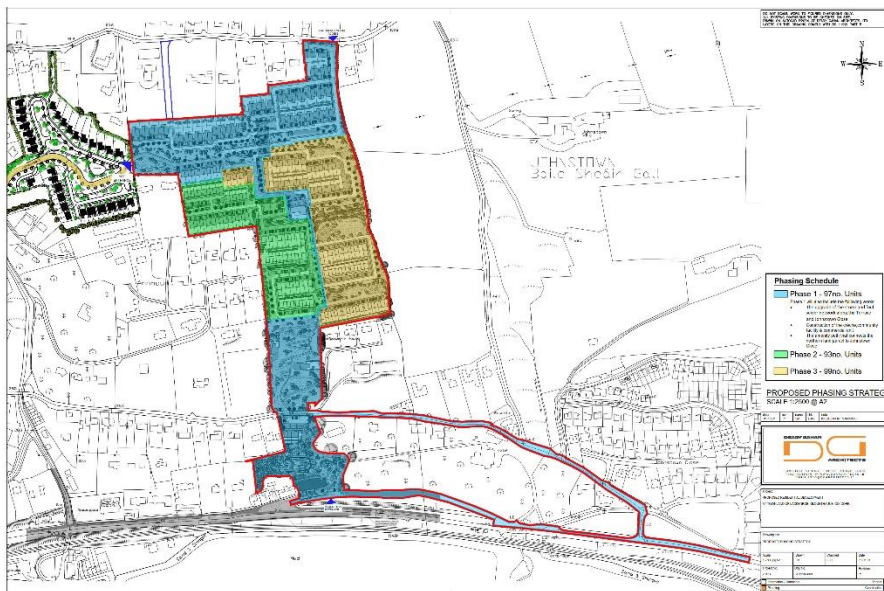


Figure 2 – Proposed Phasing Plan



## 2. Ground Conditions

Ground investigation has been carried out by Priority Geotechnical Limited (PGL). The typical sequence of stratigraphy is given below.

1. Stratigraphy: 300 mm to 400 mm thick topsoil. Superficial glacial deposits were described as firm to stiff, slightly sandy (slightly) gravelly CLAY/ SILT with varying Cobble content 0.7m to 2.1m thick and granular deposits of (very) silty (very) sandy GRAVEL and (very) sandy (very) clayey GRAVEL with varying cobble content 0.3m to 3.0m thick persisted to depths 1.0m bgl to 4.0m bgl. Typically, the CLAY / SILT deposit transitioned to the GRAVEL overlying the bedrock. No groundwater was encountered. The weathered rock mass was 1.0m to 4.0m below existing ground level (bgl).

2. Bearing capacities: The following was noted by PGL in relation to bearing capacities:

*“A presumed bearing pressure of 75kN/m<sup>2</sup> to 150 kN/m<sup>2</sup> (kPa) is expected of the ‘firm to stiff’ Clay/ Silt deposits (BS8004, Code of practice for foundations, 1986). A characteristic undrained shear strength of 90kPa is recommended at a depth below 1.0m bgl, describing the stiff deposits. Taking a partial factor of safety, 1.4 a bearing capacity factor  $N_c = 5.14$  yielded an ultimate bearing pressure of 330kPa in the glacial deposits (Skempton, 1951). A characteristic  $N_{spt} = 15$  was indicative of an allowable bearing pressure 150kPa, (Terzaghi and Peck, 1967) for settlements up to 25mm within the Clay/ Silt deposits. Foundations shall be within the ‘firm to stiff’ glacial deposits below a depth of 1.0m bgl. Shallow strip and pad foundations are an acceptable foundation form. Services and utilities will be adequately supported within the glacial deposits.*

*Some over excavation can be expected where undrained shear strength of 40kPa to 61kPa were identified (BH02 and BH08), noting further similar locations may be present. An allowable bearing pressure of 75kPa to 100kPa is expected in such locations.*

*Foundations within SILTSTONE bedrock BS8004 (1986) identified a presumed bearing value of 2,000 kN/m<sup>2</sup> (kPa) for non-weathered strong sedimentary rock mass. In accordance with Figure 1 — Allowable bearing pressures for square pad foundations bearing on rock (for settlement not exceeding 0.5 % of foundation width) this should be reduced to a value of 250MPa for an assumed Group 4, weak, un-cemented and fractured rock mass.”*

3. Groundwater: No groundwater was encountered in the trial pits or boreholes.
4. Contamination: contamination testing indicates that the material on site is suitable for disposal at an inert waste facility.
5. Sulphates & Ph values for concrete: Based on the pH (7.2 and 7.9) and sulphate (<0.010g/l – 1.2g/l <0.010% to 0.3%) data indicate design sulphate class DS-1 in accordance with BRE Digest for concrete in aggressive ground for static groundwater conditions. In general, there are no special requirements with regard to concrete mix design. Note BH01 at 1.0m indicated a DS-2 classification and with an acid soluble sulphate >0.2% (I.S.398 Pt. 1).

### 3. Earthworks

The draft bulk earthworks are associated with the site strip and levelling & re-grading of the site to accommodate the proposed residential units, road/footpath gradients as necessary. Additional information is provided in the Constraints Reports accompanying this application.

Pedestrian footpaths provide connectivity between all parts of the development. Universally accessible footpaths link from Killahora Road to Johnstone Close and also to Knockraha Road ensuring full pedestrian permeability. Non-disabled routes are also provided.

The levels of the path to the north of the Terrace typically results in cut and fill not exceeding 1.5m, the exception being the path between chainages 180m and 290m where the overall depth of excavation is 2.3m and at chainage 410m to 470m where approximately 2.0m of fill material is required to tie in with the road level of 64.950 m OD Malin.

Side slopes at a gradient no steeper than 1 in 2 are proposed. Generally, the distance required to tie back into the natural ground level is circa 2m, with one exception occurring at chainage 200m where the distance is circa 7.5m.

Short lengths of retaining walls will be required, particularly where the path turns back on itself as it meanders up the slope. It is proposed that these retaining structures be generally formed with timber permicrib gravity retaining wall system with small sections formed with Gabion baskets filled with rock excavated and crushed on site. The retained height throughout is typically 2m.

The levels of the path to the south of the Terrace typically results in cut not exceeding 3.0 m. The extent of this 3m excavation is limited to chainage 390m. The level of the path typically results in fill not exceeding fill 3.5 m. The extent of this fill is limited to the area around chainage 250 m.

Short lengths of retaining walls will be required, particularly where the path turns back on itself as it meanders up the slope. It is proposed that these retaining structures be generally formed with timber permicrib gravity retaining wall system with small sections formed with Gabion baskets filled with rock excavated and crushed on site. The retained height throughout is typically 2m.

The 3m wide footpath will have 1m wide verges with pedestrian guard rail protection at embankment edges. The guardrail protection will also prevent people taking shortcuts between the meandering path.

The choice of introducing embankments or retaining structures was influenced by minimising excavation of rock and also to retain existing trees where possible.

The development as proposed has been designed to work with the natural constraints of the site and successfully overcome them to achieve an accessible, integrated, permeable site layout and design.

The site has been modelled in the Civil 3D software package. Excavated overburden and rock will be used as fill on the site. The estimated earthworks quantities are set out in Table 3-1 below.

Existing topsoil will be retained on site to be used for the proposed development. Topsoil will be stored in an appropriate manner on site for the duration of the construction works and protected for re-use on completion of the main site works.

During the demolition and construction phase, all excavations and exposed sub-soils in open cuts will be blinded and protected with clean broken stone as soon as possible after exposing the subsoil in order to prevent erosion.

**Table 3-1. Estimated Excavation Quantities**

<b>Material</b>	<b>Cut Volume (m<sup>3</sup>)</b>	<b>Fill Volume (m<sup>3</sup>)</b>	<b>Net Volume (m<sup>3</sup>)</b>
Top Soil (400 mm depth)	41,772	13,925	27,798
Overburden	53,964	53,964	0
Rock	18,565	12,602 (crushed rock as fill)	5,963

Soil stripping, earthworks and stockpiling of soil and rock on site will be carried out during the works. Rock will be crushed and re-used on site. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the excavation and there will be no direct link or pathway from this area to any surface water body. It is anticipated that only local/low level of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off site or will be reused in other areas of the site as fill. Any excavated material to be disposed off-site will go to a licensed facility. The maximum number of HGV movements during the construction phase will be 15 HGV's per day.

## 4. Site Logistics

### 4.1 Sequence of Works

It is estimated that the overall duration of the Construction Phase will be approximately 48 months. The main stages of construction will be progressed based on the following:

- Complete any necessary pre-construction surveys. Please refer to the EIAR accompanying this application for specified surveys.
- Implement all recommended environmental mitigation measures arising from the preconstruction surveys,
- Confirm utility locations and divert utilities,
- Establish contractor's site compound and erection of site hoarding,
- Site clearance and top soil stripping,
- Cut and fill to level and re-grading works within site to formation level,
- Installation of services (drainage networks, water supply, electricity, etc.),
- Construction of roads, footpaths & hard/ soft landscaping,
- Installation of foundations/ footings for buildings and retaining walls,
- Construction of new buildings (houses, duplex units and creche),
- Connection to public services,
- Installation of substations,
- Provision of proposed road finishes,
- Provision of landscaping finishes,
- Complete all site finishes,
- Completion of any required testing and commission services within the development.

The above will be undertaken for each of the phases set out in Section 1.5.

### 4.2 Excavation

The proposed development will involve excavation, stripping of topsoil and removal of material from site for platform installations and regrading of the site profile.

### 4.3 Removal of Mature Trees

Removal of vegetation will include removal of several hedgerows and there are approximately 133 no. trees to be felled.

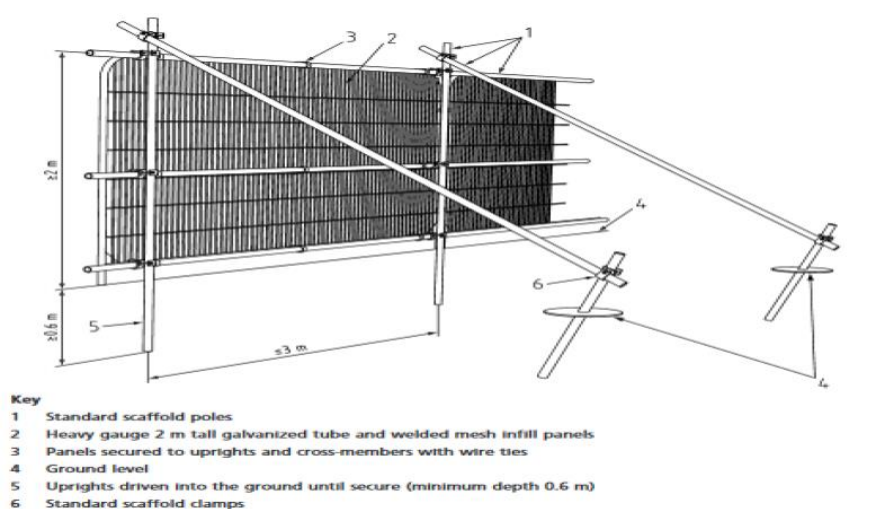
- A category: 4 No. trees,
- B category: 56 No. trees,
- C category: 57 No. trees,
- U category: 16 No. trees. These are trees which are not considered to be of value and some which are dead.

For details of each category please refer to the Arborist Report prepared for the subject development. For further information relating to the landscape proposals, please refer to Chapter 4 of the EIAR and the Landscape Report prepared by CSR.

### 4.4 Protection of Existing Trees

Protective barriers must be installed by the Contractor around trees to be retained prior to the commencement of works on site. The locations of all tree protection barriers will be as shown on the Tree Protection Plan (TPP) prepared by CSR and as per BS5837. These barriers will remain in place for the duration of the works. Section 4 of the Arboricultural Survey Report

provides additional detail on the protective barriers to be provided. Figure 3 illustrates a typical detail of the protective barriers required.



**Figure 3 – Typical Detail of Protective Barrier**

## 4.5 Protection of Existing Grotto

There is an existing Grotto Structure within the portion of the site to the south of 'the Terrace' (E:577287, N:573397), to the east of the existing apartment block. For further details of the existing grotto structure please refer to Chapter 11 of the EIAR (Cultural Heritage).

An inspection of the existing grotto structure was undertaken by John Cronin & Associates and the following was noted:

*"An inspection of the accessible interior of the random rubble structure did demonstrate that it is constructed with poorly sorted, unhewn limestone blocks, perhaps sourced from quarry rubble. The inspection also revealed that sections of the stonework are roughly bonded with a concrete-rich aggregate mortar, but it was unclear if this material represented later repair works or was an original element of the structure. Overall, the walls of the structure have a "dry stone" appearance."*

A method statement describing the steps to be taken in advance of commencing construction has been prepared by John Cronin & Associates. The following measures are to be undertaken in advance of commencing construction.

- The principal requirement will be the demarcation and protection of the structure prior to commencement of any site development works. Given the overgrown nature of the structure, it is easily overlooked and consequently vulnerable to inadvertent damage through tree-felling and machine/plant movements. Prior to site clearance works commencing, the existing grotto must be clearly identified on site with a barrier provided to prevent machinery/ vehicles impacting the structure. The existing grotto structure must remain clearly identified for the duration of the contract.
- Tree felling activities in the area must be carefully undertaken to avoid impact on the existing structure. The methodology for tree felling must ensure measures are incorporated to prevent trees being dropped from height and hitting the existing grotto structure and the ground adjacent to it.
- Prior to commencing works, the Contractor must hold 'toolbox talks' with all staff and sub-contractors to ensure all are aware of the location and sensitivity of the existing grotto structure. This must include any relevant conditions of the planning permission.
- A masonry conservation specialist shall be appointed to oversee the demarcation and vegetation clearance for the creation of a buffer/protection zone. The conservation specialist may require the assistance of a tree surgeon to undertake targeted tree-felling. At later stages of the works, the protection/buffer zone will provide protection from

construction activity/traffic associated with the wider site. The fencing will also control access mortar mixing area and storage of materials.

- The structure will be demarcated by buffer zone consisting of a temporary demountable fence (i.e., “Heras” fence or similar) that provides a minimum of 2.7 metres clearance around the structure. To achieve the clearance to erect the fence line, trees and shrubbery within the buffer zone should cut back, taking due care to prevent damage to the structure. No removal of embedded roots (or grubbing up of the ground surface) should be undertaken without the express consent/approval from the masonry conservation specialist. The contractor must regularly inspect the fencing and buffer zone throughout the duration of the contract.
- On the careful removal of the vegetation to expose the structure and prior to works commencing, a full appraisal of the structure, including the compilation of detailed drawn and photographic records, will be undertaken by the masonry conservation specialist. If necessary, scaffolding can be erected to provide safe access to the upper portions of the structure. At this juncture, the masonry specialist may specify additional conservation measures.
- The Contractor must adhere to the vibration limits set out in Section 6.8 of this document. In order to ensure that the site activities are conducted to minimise the vibration impacts on the existing grotto, vibration monitoring shall be conducted during the course of the works associated with the proposed apartment block and path through the site to the south of ‘the Terrace’. It is proposed that vibration monitoring will be conducted using calibrated vibration monitors and geophones and that audible and visual alarm units are installed to ensure if vibration levels approach or exceed the specified limits, site personnel will be alerted to cease at the earliest instance and appropriate mitigation measure may then be implemented to minimise the vibrational impact on the existing grotto structure.
- To provide protection and support during construction, the contractor is to place sandbags within the grotto structure, up to a height of 1m below the existing roof level. This will provide a dampening effect on vibrations while also providing internal support to the grotto for the duration of the works on site. The sand bags are only to be removed as part of the conservation works to be undertaken following substantial completion of the works in this area.
- In the event of damage occurring during construction repairs can be made as part of the conservation works based on the recording of the structure undertaken prior to construction.

Following substantial completion of the proposed development works in this part of the overall site, the conservation works set out in Chapter 11 of the EIAR (prepared by John Cronin & Associates) are to be undertaken on the grotto structure.

## 4.6 Invasive Plants

An Invasive Alien Plant Species (IAPS) Survey has been undertaken of the subject site (May 2021). A number of non-native invasive plant species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (*i.e.* species of which it is an offense to disperse, spread or otherwise cause to grow in any place) are present at the study site as follows (see IPS 2021);

- Bohemian Knotweed (*Fallopia Bohemica*),
- Himalayan Knotweed (*Persicaria wallichii*),
- Three-cornered Garlic (*Allium triquetrum*),
- Spanish Bluebell (*Hyacinthoides hispanica*),
- Rhododendron (*Rhododendron ponticum*), and

- American Skunk Cabbage (*Lysichiton americanus*).

A dedicated Invasive Plants Survey and Management Plan has been developed in relation to these Third Schedule species (IPS 2021).

The locations of each of these IAPS are presented in the IAPS Site Assessment Report and Management Plan. This report also details the treatment programme recommended for each IAPS and is to be implemented on the subject site.

As requested by Cork County Council, the provisions of the Invasive Alien Species Management Plan are included in this CEMP.

Prior to and following commencement of the proposed development the recommended treatment plan must be implemented on site. The appropriate treatment plans recommended by Invasive Plant Solutions for each of the IAPS are included in Appendix A. The recommended treatment plans are to be implemented by the Contractor as part of the works.

Other non-native plant species are also present at the study site (that are not listed on the Third Schedule) that will also need to be managed in accordance with best practice guidelines;

- Buddleia (*Buddleia davidii*),
- Winter Heliotrope (*Petasites fragrans*),
- Snowberry (*Symphoricarpos albus*),
- Cotoneaster (*Cotoneaster sp.*),
- Fuchsia (*Fuchsia magellanica*),
- Lawson Cypress (*Chamaecyparis lawsoniana*), and
- Cypress Leyland (*Cupressus x leylandii species*).

A site assessment by a suitably qualified/experienced Ecologist or Invasive Plant Specialist prior to enabling/construction activities will be required to assess the most up-to-date status of all non-native invasive plants at the site relative to the works area.

#### 4.7 Site Security Fencing and Hoarding

Site hoarding and barriers will prevent unauthorised access to each works area. A minimum 2.4 m high plywood painted timber hoarding is to be provided around working areas. Heras type fencing will be used on short term site boundaries where appropriate to suit the works. The site compounds will each be fenced to deter unauthorised access. The contractor must regularly inspect and maintain the condition of the hoarding throughout the duration of the contract.

Controlled access points to the site, in the form of gates or doors/turnstiles, will be kept locked for any time that these areas are not monitored (e.g., outside working hours). During working hours, a gateman will control traffic movements and deliveries at any active site access to ensure safe access and egress to & from site onto the public roads. All personnel working on site must have a valid Safe Pass card and be inducted by the Main Contractor with regard to site specific information.

The external hoarding and walkways must be maintained in good condition during the construction period. The external hoardings and walkways must not obstruct any drainage, surface water channels or traffic signals, signs, or lights.

The external hoarding and walkways are to be painted with two coats of an approved synthetic paint. Any logo and lettering as shown on drawings/details are to be provided by competent graphics painters and calligraphers.

No fences or hoarding is to be used for advertising purposes and the Contractor must keep the fences or hoarding clear from advertisements.

## 4.8 Site Facilities during Construction

### 4.8.1 Site Facilities

It is estimated that 50 staff will be required on site. Site facilities will be provided at three locations within the extent of the proposed development. The on-site accommodation will consist of:

- Contractor's office space,
- Meeting room/ H&S Room, first aid room,
- Separate male and female toilet facilities with a minimum ratio of 1 to 20,
- Drying room,
- Site canteen with drinking water, hot water, seating, plus facilities to heat and refrigerate food,
- Storage containers and bicycle storage,
- Materials storage areas and drop off.

All facilities shall have adequate heat and lighting and shall be cleaned regularly.

Temporary water supply, electricity supply and foul drainage will be required for the new facilities. Connections to electricity & water are available close to the site boundary. A temporary potable water supply will be provided from the adjoining development to the west. Foul drainage will need to be taken to a vented holding tank for regular removal by suction tanker.

It is intended to limit construction staff parking and to encourage the use of public transport (e.g., Cork Middleton rail line) for the journey to and from the subject site. A number of car parking spaces will be provided on a temporary basis for use by the contractor adjacent to the site compound. Construction parking will be managed/ controlled by the contractor subject to the requirements of any planning conditions.

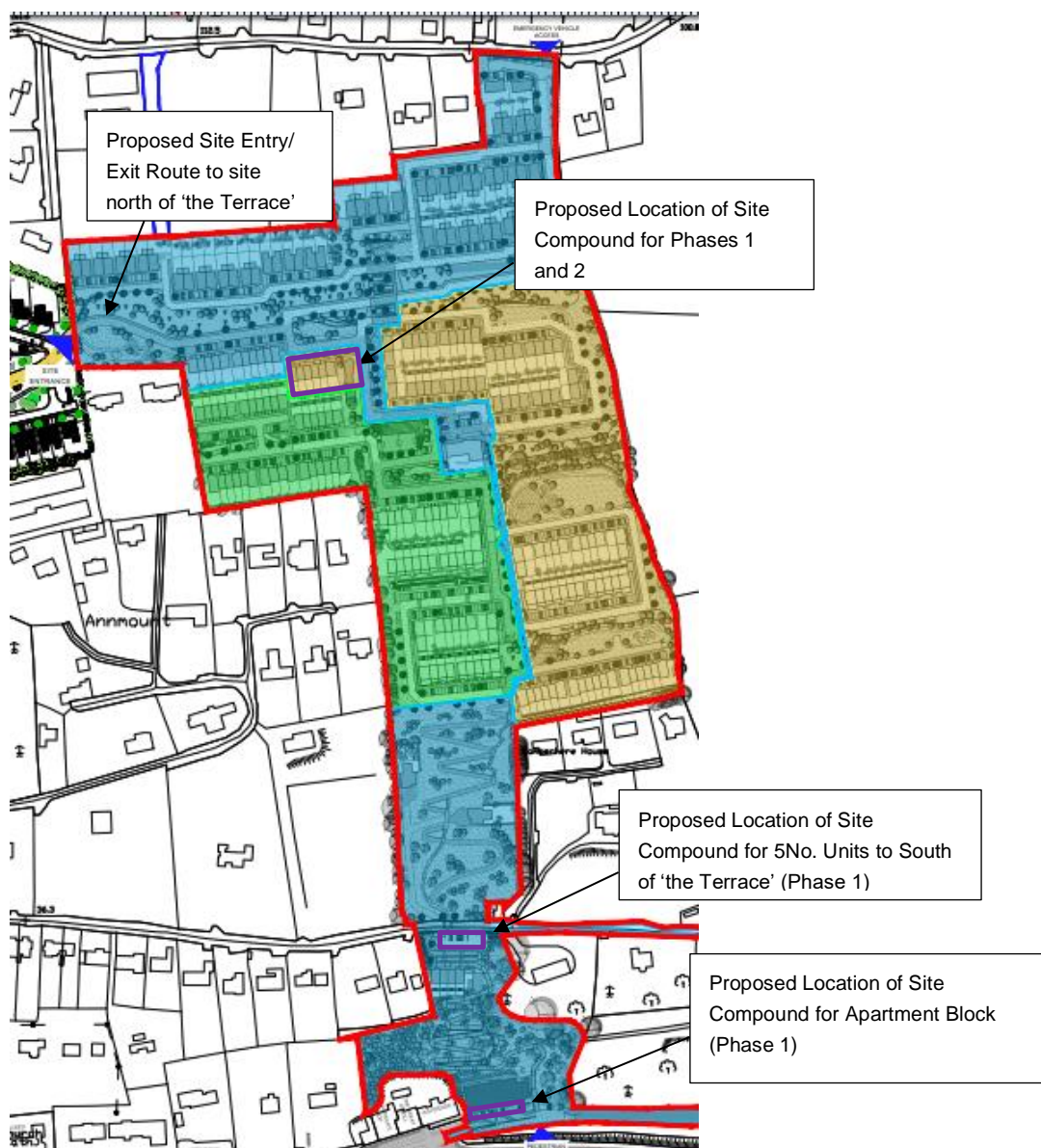
Adequate fire protection and means of escape will be in place. It will be the responsibility of the contractor to provide and maintain the required standard throughout the project and the contractor will inform all operatives of the welfare arrangements for the contract during site inductions.

### 4.8.2 Facility Locations

It is proposed to provide the facilities described in Section 4.8.1 at a number of locations within the overall proposed development. A temporary hardstanding area, located as shown in Figure 4 will be provided for the portions of Phase 1 located to the north of 'the Terrace' and Phase 2.

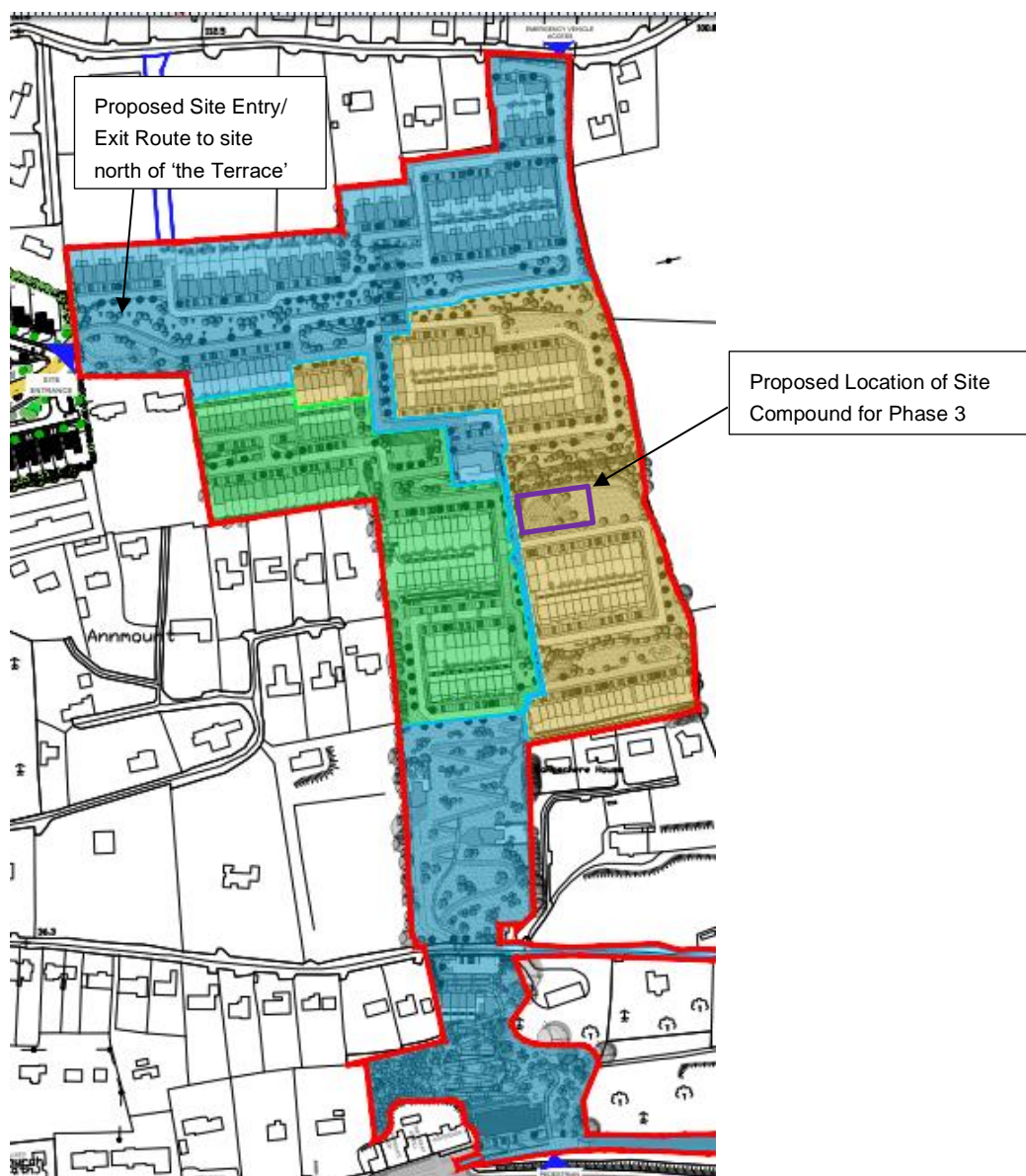
As part of the development of the lands to the south of 'the Terrace' during Phase 1, (includes a section of the proposed path, the 5 no. dwelling houses and 24 no. apartments) it is proposed to provide a temporary hardstanding area within the proposed car park adjacent to 'the Terrace' and within the proposed parking spaces adjacent to the apartment block. This will provide limited material storage, site facilities and car parking for the works associated with the path, the 5 no. dwelling houses and 24 no. apartments to the south of 'the Terrace'.





**Figure 4 – Proposed Site Facilities – Phases 1 & 2**

Following completion of Phases 1 and 2, it is proposed to relocate the site facilities for the duration of Phase 3. A temporary hardstanding area, located as shown in Figure 5 will be provided for Phase 3 of the proposed development.



**Figure 5 - Proposed Site Facilities – Phase 3**

## 4.9 Site Working Hours

Unless otherwise required by the requirements of the planning permission, it is proposed that standard construction working hours will apply, i.e.:

- 7am to 6pm Monday to Friday,
- 8am to 2pm on Saturdays.

Any works proposed outside of these periods shall be strictly by agreement with the Local Authority in advance.

In order to mitigate any impact of construction activities, the following measures are proposed:

- Coordination of deliveries to site within working hours,
- Scheduling of noisier activities early in the working day,
- Noise and vibration mitigation measures as per Section 6.8 of this plan.
- The delivery of materials to the site during the construction phase shall be organised so that deliveries are minimised and do not cause traffic hazard, deliveries not permitted at peak times of traffic 8.00am to 9.00am and 5.00pm to 6.00pm and that all construction vehicles are parked within the site.

## 4.10 Site Security

The Contractor will be responsible for the security of the site. The Contractor will be required to:

- Operate a site induction process for all site staff.
- Ensure all site staff shall have current 'safe pass' cards.
- Install adequate site hoarding to the site boundary.
- Maintain site security staff at all times.
- Ensure restricted access is maintained to the works.

## 4.11 Health and Safety

All construction works will be carried out under appropriate supervision. Works will be carried out by experienced contractors using appropriate and established safe methods of construction. All requirements arising from statutory obligations including the Safety, Health and Welfare at Work Act and associated regulations will be met in full. The Contractor must also comply with all guidelines and procedures in accordance with IÉ specification documents.

All site works to be completed as per the Safety, Health and Welfare at Work (Construction) Regulations 2013. All personnel working on site must have a valid Safe Pass card and have completed PTS training.

## 4.12 COVID-19

The Contractor is to follow the latest CIF safety protocols for COVID-19 in relation to all activities on site, in relation to travel to & from home to site for all staff, in relation to site visitors and in relation to any other relevant activities connected with the construction of the development.

## 5. Traffic Management

The Contractor is to inform and educate all regular suppliers and all sub-contractors and delivery drivers of the basic protocols. All deliveries will be controlled at the identified compound location. The designated storage area will be identified prior to taking delivery of the materials and the driver will be directed to the compound. Site access, and the delivery of construction materials, will be carefully planned and managed throughout the construction works. Site access to the Contractor compound area will be via the existing public road to the north of the site (refer to Figure 2).

No works associated with the proposed development are to commence until the signalised junction permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17 is operational.

The Contractor will ensure that deliveries are coordinated on site so that trucks do not block the road outside the site. Delivery drivers will wear full PPE as per the site rules and sign the delivery rules at the controlled entrance gate. The site will be fenced and sealed with access gates secured at all times to prevent unauthorised access.

The Contractor must provide wheel washing and road sweeping facilities to ensure that the roads are kept mud and debris free.

### 5.1 Construction Route

#### 5.1.1 Vehicle Movements

All construction access to the lands to the north of 'the Terrace' will be via the signalised junction from the L-2968 and internal road network permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17. This will provide access to the area of the proposed development known as 'The Green'. As noted above, no works associated with the proposed development are to commence until this signalised junction is operational. This is illustrated in Figure 4 for Phases 1 and 2 and Figure 5 for Phase 3.

Construction access to the portion of the site where the 5 no. dwellings to the south of 'the Terrace' are proposed will be via a new entrance from 'the Terrace' while the works area for the proposed apartments will be accessed from Johnstown Close. In order to ensure that vehicles entering/ exiting the site associated with the proposed Apartment Block a banks man/ flag man will be stationed at the entrance to the site to safely direct traffic.

Materials will be delivered to the proposed site storage areas, offloaded within the site compound using a teleporter and there will be a temporary lay down area used for the duration of the offload. When delivery trucks leave the compound, the material can be delivered to the correct location within the site compound.

Following unloading at the site compounds to the north of 'the Terrace', the vehicle can then leave the site via the signalised junction from the L-2968 and internal road network permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17 at a safe speed ensuring there is no risk of incidents involving pedestrians or other road users. Vehicles leaving the site compound associated with the 5 no. dwelling houses to the south of 'the Terrace' using 'the Terrace' road (L-2970-38). Vehicular access to and from the proposed apartments will be provided from Johnstown Close (L-3004-31).

Similar practices shall be put in place for trucks removing excavated material / demolition waste from site. Provision for parking cars / vans etc. will be within a designated area within the site compounds.

## 5.2 Contractor's Traffic Management Plan

A Traffic Management Plan will be prepared by the contractor and agreed with Cork County Council's Transportation Department & An Garda Siochana, to mitigate any impact of construction on the surrounding road network. The Contractor must propose a Construction Stage Traffic Management Plan in accordance with the following guidance documents for the temporary control of traffic at road works:

- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign Roadworks (2019);
- Traffic Management Guidelines, Department of Transport (2003);
- Requirements of Cork County Council.

The Traffic Management Plan will provide for the following:

1. The contractor will be responsible for and make good any damage to existing roads or footpaths caused by his own contractor's or suppliers transport to and from the site.
2. The contractor must at all times keep all public and private roads, footpaths entirely free of excavated materials, debris, rubbish, provide vehicle wheel wash and thoroughly clean all wheels and arches of all vehicles as they leave the site.
3. The contractor must confine his activities to the area of the site occupied by the works and the builders' compound during any particular phase of the development.
4. Haul routes to and from the site will be defined and agreed with the Local Authority.
5. Properly designed and designated entrance and egress points to the construction site for construction traffic will be used to minimize impact on external traffic.
6. Where traffic signals are not in place, flagmen must be used to control the exit of construction vehicles from the site onto the public road.
7. Existing fire hydrants are to remain accessible for the duration of the works.

Due regard will be paid to minimising any impacts by construction vehicles on the surrounding area. Particular emphasis will be on the following:

- Construction and delivery vehicles must be instructed to use only the approved and agreed means of access; and movement of construction vehicles must be restricted to these designated routes;
- Warning signs / Advanced warning signs are to be installed at appropriate locations in advance of the construction access locations;
- Speed limits of construction vehicles are to be managed by appropriate signage, to promote low vehicular speeds within the site;
- Appropriate vehicles are to be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;
- Parking of site vehicles must be managed by the Contractor and must not be permitted on public road;
- A road sweeper is to be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public roads leading away from the construction works;
- On site wheel washing will be undertaken for construction trucks and vehicles to prevent any debris prior to leaving the site, to remove any potential debris on the local roads;

- All vehicles are to be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol, or diesel. Spill kits must be available on site. All scheduled maintenance carried out off-site must not be carried out on the public highway; and
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities must be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities must cater for vulnerable users including mobility impaired persons.

### **5.3 Measures to Minimise Construction Vehicle Movements**

Construction vehicle movements are to be minimised through:

- Consolidation of delivery loads to/from the site and scheduling of large deliveries to site to occur outside of peak periods;
- Use of precast/prefabricated materials where possible;
- 'Cut' material generated by the construction works is to be re-used on site where possible, through various accommodation works;
- Adequate storage space on site will be provided;
- Construction staff vehicle movements will also be minimised by promoting the use of public transport.
- Car sharing among the construction staff following Covid-19 safety guidelines may be used to reduce traffic numbers.
- Public Transport: An information leaflet to all staff as part of their induction on site highlighting the location of the public transport services in the vicinity of the construction site.

## 6. Environmental Management

The Contractor will be required to be accredited with ISO14001 Environmental Management Systems. The Contractor will be required to mitigate the impact of the construction works on the environment.

### 6.1 Environmental Impact Assessment Report

An Environmental Impact Assessment Report (EIAR) has been prepared as part of the planning application package. In addition to the various measures noted in this report, a series of impact mitigation measures have been set out in the EIAR. The Contractor must implement these measures. These measures are summarised in Chapter 15 of the EIAR.

A Natura Impact Statement (NIS) has been prepared as part of the planning application package. Potential Impact-receptor pathways are set out in Section 3 of the NIS. The mitigation measures set out in this document have been developed based on the potential Impact-receptor pathways identified.

### 6.2 Site Control Measures

The designated and operational on-site control measures, which will be established and maintained at this site, will include:

- Designated hard routes through the site,
- Each departing vehicles to be checked by banksman,
- Wheel wash facility at egress point,
- Provision and facilities to cover lorry contents as necessary,
- Controlled loading of excavated material to minimise risk of spillage of contents,
- Spraying/ damping down of excavated material on site,
- Facility to clean roads if mud or spillage occurs.

### 6.3 Material Handling and Storage

Within the site compounds, a section within the area will be identified for material storage only. It is proposed that unloading bays are provided for deliveries to the site within the hoarding perimeter. They are to be accessible by forklifts. Appropriately demarcated storage zones will be used to separate and segregate materials.

Means to ensure that surface water run-off is controlled such that no silt or other pollutants enter local surface water sewers or drains are to be provided.

### 6.4 Spill Control Measures

It is not proposed to store any oils/fuels for the purpose of refuelling on the site.

Onsite plant will be refuelled by an external contractor who will call to site as required. Road vehicles are not be refuelled at the site. Minor spills and leaks may occur from road vehicles and the onsite excavator. Any oils or fuels onsite will be removed by an experienced and authorised contractor.

The following steps provide the procedure to be followed in the event of any significant spill or leak.

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- Eliminate any sources of ignition in the immediate vicinity of the incident

- Contain the spill using the spill control materials, track mats or other suitable material. Do not spread or flush away the spill.
- Cover or bund off any vulnerable areas where appropriate such as drains or watercourses.
- Clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Contractor immediately giving information on the location, type, and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately.
- The Employers Representative will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.

## 6.5 Foul Drainage

Contractor welfare facilities will be provided within the Contractor's compound. As noted in Section 6.5 foul drainage will need to be taken to a vented holding tank for regular removal by suction tanker. A temporary potable water supply will be provided from Phase 1 of the wider development.

## 6.6 Surface Water Drainage

All watercourses must be protected from sedimentation and erosion throughout the duration of the Works.

Surface water management on site will comply with the following guidelines from CIRIA:

- C532 Control of Water Pollution from construction Sites, Guidance for Consultants and Contractors,
- C741 Environmental Good Practice on Site - 4<sup>th</sup> Edition.

Refer to Chapter 8 of the EIAR for additional measures which must be implemented for the duration of the works.

Run-off control measures to include the following:

- Dewatering measures will only be employed where there are no other alternatives.
- For groundwater encountered during construction phase, mitigation measures will include;
  - Dewatering by pumping to a soakaway.
  - Excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e., highly vulnerable groundwater areas.
- If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface.
- Existing surface drainage channels within the site that serve adjacent lands will be retained where possible to prevent causing increased flooding impacts.
- Any surface water sewer connections will be made under the supervision of the Local Authority/Irish Water and checked prior to commissioning.
- New onsite surface water drains will be tested and surveyed prior to commissioning to prevent any possibility of ingress of ground water.
- All surface water manholes and drains will be inspected and sealed to ensure that uncontrolled ground water inflow does not occur.



- Filters and silt traps will be used to prevent rain washing silts and other materials into the surface water network and creating blockages.
- Areas surrounding the site are to be protected as necessary from sedimentation and erosion due to direct surface water runoff generated onsite during construction phase. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works, as noted in the points above, until the permanent surface water drainage system of the proposed site is complete.
- Regular inspections of de-watering settlement tanks, if used, are to be carried out and additional treatment used if settlement is not adequate.
- Bunded areas will be created for the storage or use of any fuels, oils, greases, cement, etc.
- Emergency spill kits will be kept close to the works.

## 6.7 Water Supply

A water supply will be required for various activities on site. The Contractor will require a water source for the duration of the works. Water will be required for:

- Main contractor's welfare facilities.
- Wheel wash and vehicle wash-down (use recycled water where feasible).
- Dust suppression (as applicable).
- Curing of concrete in warm weather.
- General construction cleaning materials/equipment etc.

A temporary potable water supply will be provided from Phase 1 of the wider development. There are existing public water mains to the north and south of the site, which could be used during the construction subject to Irish Water approval.

## 6.8 Noise & Vibration

The Contractor will comply with the Local Authority requirements with regard to the control of noise. Refer to Chapter 10 of the EIAR for additional measures which must be implemented for the duration of the works.

The Contractor will select and utilise methods of working and items of plant so that the maximum measured ground vibrations do not exceed the limits set out in Chapter 10 of the EIAR.

The Contractor will monitor ground vibrations at selected locations to the approval of the Employer's Representative during the progress of the works. The selected locations are to include the existing grotto structure at the southern end of the site.

Each vibrograph shall be certified as being in proper working order and shall unless otherwise approved, record vibrations in three directions simultaneously with print-out showing the amplitude and frequency of the vibrations.

The noise will comply with the following:

- BS 5228-1: 2009+A1:2014 Code of Practice for Noise Vibration Control on Construction and Open Sites: Noise;
- BS 5228-2: 2009 Code of Practice for Noise and Vibration control on Construction and Open Sites: Vibration;

- Environmental Protection Agency Act 1992 Sections 106-108, Local Authority's specific requirements depending on the location of the site, and
- Safety, Health and Welfare at Work (Control of Noise at Work) Regulations 2006 SI 371 (2006).

As per Chapter 10 of the EIAR, Table 6-1 sets out the maximum permissible noise levels at the facade of dwellings during construction.

**Table 6-1. Maximum permissible noise levels at the facade of dwellings during construction**

Assessment category and threshold value period ( $L_{Aeq}$ )	Threshold value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (11.00pm to 7.00am)	45	50	55
Evenings (7.00pm to 11.00pm weekdays). Weekends (1.00pm to 11.00pm Saturdays and 7.00am to 11.00pm Sundays)	55	60	65
Daytime (7.00am to 7.00pm) and Saturdays (7.00am to 1.00pm)	65	70	75

Any contradiction between this table and the planning application documents, the contractor is to work to the most onerous time/noise limits.

The limits outlined in above table may only be modified with the express written agreement of the Employer's Representative and the Local Authority.

Noise will be minimised, as far as practicable, by the selection of appropriate methods and equipment, and by the use of silencing devices wherever necessary. All compressors, percussion tools and vehicles will be fitted with effective silencers of a type recommended by their manufacturers. Measures shall be taken to minimise noise such turning off any machinery not in use.

Employees will not be permitted to use radios or other audio equipment in ways or at times which may cause nuisance and cause a Health and Safety risk.

The Contractor will carry out their works such that the effect of vibration on the surroundings is minimised and does not cause any damage. The Contractor is to refer to Section 10.3.2 (Assessment Criteria), 10.6.1 (Potential Impacts) and 10.7.1 (Mitigation Measures) of Chapter 10 of the EIAR, this CEMP or tender / Contract documentation for further details of limits on vibration.

In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

BS 5228 and BS 7385 define the following thresholds for cosmetic damage to residential or light commercial buildings: PPV should be below 15 mm/s at 4 Hz to avoid cosmetic damage. This increases to 20 mm/s at 15 Hz and to 50 mm/s at 40 Hz and above. At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded. This is summarised in Table 6-2.

**Table 6-2 Vibration Limits (PPV)**

Type of building	Transient Vibration	Continuous Vibration
Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s	25 mm/s
Unreinforced or light framed structures. Residential or light commercial-type buildings	15 mm/s	7.5 mm/s
Protected and Historic Buildings <sup>Note 1</sup>	6 mm/s – 15 mm/s	3 mm/s – 7 mm/s
Identified Potentially Vulnerable Structures and Buildings with Low Vibration Threshold		3 mm/s

Note 1: The relevant threshold value to be determined on a case by case basis. Where sufficient structural information is unavailable at the time of assessment, the lower values within the range will be used, depending on the specific vibration frequency.

Furthermore, BS 5228-2 and BS 7385 state that minor structural damage can occur at vibration magnitudes greater than twice those in Table 6-2 and major structural damage can occur at vibration magnitudes greater than four times those in Table 6-2.

BS 5228-2 also provides guidance relating to the human response to vibration. Guidance is again provided in terms of PPV in mm/s since this parameter is routinely measured when monitoring the structural effects of vibration. The potential human response at different vibration levels, as set out in BS 5228-2, is summarised in Table 10.3.

**Table 6-3 Guidance on human response to vibration levels**

Vibration Level <sup>Note A) B) C)</sup> (mm/s)	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

- A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
- B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
- C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

In the absence of more onerous values, the limits set out in Table 6-2 will apply. These values will only be modified with the express written agreement of the Employer's Representative.

## 6.9 Dust & Air Quality

The Contractor's proposals must include dust control measures in accordance with best practice and with reference to the following:

- The EIAR, in particular Chapter 12 of the EIAR, accompanying this application,

- Air Pollution Act 1987,
- BS 6187: Code of Practice for Demolition.

In order to ensure that adverse air quality impacts are minimised during the construction phase and that the potential for soiling of property and amenity and local public roads is minimised, the following mitigation measures shall be implemented during the course of all construction activities:

- Avoid unnecessary vehicle movements and manoeuvring, and limit speeds on site so as to minimise the generation of airborne dust.
- Use of rubble chutes and receptor skips during construction activities.
- During dry periods, dust emissions from heavily trafficked locations (on and off site) will be controlled by spraying surfaces with water and wetting agents.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only.
- Re-suspension in the air of spillages material from trucks entering or leaving the site will be prevented by limiting the speed of vehicles within the site to 10kmh and by use of a mechanical road sweeper.
- The overloading of tipper trucks exiting the site shall not be permitted.
- Aggregates will be transported to and from the site in covered trucks.
- Where the likelihood of windblown fugitive dust emissions is high and during dry weather conditions, dusty site surfaces will be sprayed by a mobile tanker bowser.
- Wetting agents shall be utilised to provide a more effective surface wetting procedure.
- Exhaust emissions from vehicles operating within the construction site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor by ensuring that emissions from vehicles are minimised by routine servicing of vehicles and plant, rather than just following breakdowns; the positioning of exhausts at a height to ensure adequate local dispersal of emissions, the avoidance of engines running unnecessarily and the use of low emission fuels.
- All plant not in operation shall be turned off and idling engines shall not be permitted for excessive periods.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Material stockpiles containing fine or dusty elements including top soils shall be covered with tarpaulins.
- Where drilling or pavement cutting, grinding or similar types of stone finishing operations are taking place, measures to control dust emissions will be used to prevent unnecessary dust emissions by the erection of wind breaks or barriers. All concrete cutting equipment shall be fitted with a water dampening system.
- A programme of air quality monitoring shall be implemented at the site boundaries for the duration of construction phase activities to ensure that the air quality standards relating to dust deposition and PM10 are not exceeded. Where levels exceed specified air quality limit values, dust generating activities shall immediately cease and alternative working methods shall be implemented.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.
- Dust netting and site hoarding shall be installed along the north, south, east, and western site boundaries to minimise fugitive windblown dust emissions falling on third party lands and existing residential areas.

The Contactor will put in place a Dust Management Plan as set out in Chapter 12 (Appendix 12.2) of the EIAR.

The key aspects of controlling dust are listed below.

- Drop heights from conveyors, loading shovels, hoppers and other loading equipment will be minimised, if necessary fine water sprays will be employed.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- When conditions are such that there is a risk of trackout of dust (i.e., very dry, or muddy), vehicles exiting the site shall make use of a wheel wash facility prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted through speed limit implementation, and this speed restriction will be enforced rigidly. On any site roads, this will be 20 kmph.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust and other dust generating activities will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Full details of the dust management plan can be found in Appendix 12.3 (Volume III) of Chapter 12 of the EIAR.

The dust management plan will include a regime for monitoring dust levels in the vicinity of the site during the works using the Bergerhoff Method. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. Then minimum criteria to be maintained shall be the limit specified by the Environmental Protection Agency (EPA) for licensed facilities in Ireland which is 350mg/m<sup>2</sup>/day as a 30- day average.

## 6.10 Fire and Explosion

The Contractor will take precautions to prevent the risk of fire or explosion caused by gas or vapour. Suitable portable fire extinguishers shall be kept at all times in working areas and areas not protected by other fire services.

Containers of flammable liquids or gases shall be handled in accordance with the recommendations of the Fire Services Department, Local Authority and Statutory Regulations.

## 6.11 Disposal of Materials

Where material is to be stockpiled on site prior to disposal, the contractor will control all run-off to prevent contamination of surrounding watercourses. Any surplus material will be removed off site to a licenced facility. Contaminated soil will be assessed to determine its constituents and disposed of offsite in accordance with Irish Waste Management Legislation.

Where site won topsoil is to be reused on site for planting / landscaping it will be appropriately stored and approved for use by the Employer's Representative prior to spreading in the required locations. Stockpiles must be no higher than 2m and the exposed surface must be seeded out.

## 6.12 Communication

The types of relevant communication and training required to ensure that the Contractor will take responsible steps to ensure waste and environmental duty of care is complied with and that materials are handled efficiently, and waste is managed appropriately:

- Construction Management Plan,
- Site Waste and Environmental Management Plan,
- Roles and responsibilities,
- Toolbox talks,
- Waste procedures on site,
- Duty of care / responsibilities,
- Material storage.

Waste and environmental management will be included on the Agenda for all site meetings and monitoring statistics will be provided for review.

## 6.13 Sustainability

The Contractor shall undertake an embodied carbon footprint assessment of the Works in accordance with international best practice / standards. The scope of the assessment shall as a minimum include cradle / source to site and construction activity related emissions. Product type-specific Environmental Product Declarations (in accordance with I.S. EN15804), where these are available, can be consulted to assist in developing embodied carbon footprints of construction products.

## 7. Monitoring & Protection of Neighbouring Properties

A monitoring regime will be put in place to protect neighbours & neighbouring properties with a full and detailed vibration, noise, dust, and groundwater monitoring regime put in place for the duration of the works.



Flowchart for the Instrumentation and Monitoring Subcontractor (MSC)

### 7.1 Monitoring Works Specialist

The Contractor will appoint a competent person to be referred to as the Surveying, Instrumentation and Monitoring Subcontractor (MSC) and together with them will prepare and maintain the vibration, noise, dust, and groundwater monitoring plan, for the agreement/approval of the Client, Employers Representative, and the Technical Advisors.

### 7.2 Condition Schedules

The MSC will be responsible for preparing or organising the preparation of condition surveys of surrounding buildings, walls, hardstanding area etc. prior to the carrying out of any works on site. Extent of surveys to be agreed. The condition surveys shall be carried out to a level of detail, suitable to the nature and extent of conditions encountered in order to obtain an understanding of the general structural condition of the property/structure and/or external environments.

### 7.3 Movement & Vibration

Monitoring Movement & vibration monitoring of adjoining areas are not deemed to be required given the nature of the works and the site location.

### 7.4 Noise & Dust Monitoring / Control

Refer to Sections 6.8 and 6.9 of this report, and Chapters 10 and 12 of the EIAR for details.

### 7.5 Recording

The MSC will monitor, collate, and report on noise & dust in report format, on a monthly basis, increased to weekly during critical activities.

# Appendix A IAPS Management Plans





invasiveplantsolutions

## **INVASIVE ALIEN PLANT SPECIES : SITE ASSESSMENT REPORT & MANAGEMENT PLAN**

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RESIDENTIAL DEVELOPMENT LANDS AT LACKENROE, GLOUNTHAUNE, CO. CORK

FOR

BLUESCAPE LIMITED

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## I.A.P.S. SITE ASSESSMENT REPORT & MANAGEMENT PLAN

RESIDENTIAL DEVELOPMENT LANDS, GLOUNTHAUNE, CO. CORK								
PROJECT NO.	CO-03-21	GPS POSITION : ITM	X	577195	Y	573892	AUTHOR	MR. KYRAN COLGAN

### EXECUTIVE SUMMARY

Invasive Plant Solutions have been retained by Bluescape Limited, to provide IAPS (invasive alien plant species) consultancy services in relation to a land holding in the townland of Lackenroe, Glounthaune, Co. Cork. The majority of the land holding is currently in agricultural use, but with the most southerly part of the holding comprising of a mix of woodland habitat and unoccupied residential use.

Proposals are being considered in relation to the future development of the lands, which currently envisage an integrated mixed residential scheme occupying the main body of the lands, with secondary development and pedestrian connections to Glounthaune village provided via routes through the woodland zone occupying the southern sector of the land holding. These proposals have been developed to a stage whereby Statutory Consents can be sought in the near future, but the outcome of such a process, and specific timelines for any future development, are currently unknown.


This IAPS Site Assessment Report and Management Plan represents the first stage of an ongoing programme of IAPS consultancy services, the scope of which is designed and intended to deliver the safe, bio-secure and comprehensive management of all identified invasive alien plant species. The evolving Management Plan will include any necessary remediation measures that may be required to satisfy this purpose, in circumstances where the land is approved for development.

An initial I.A.P.S. survey was carried out on the 24<sup>th</sup>. May 2021, which falls within the optimum window in 2021 for surveying for the presence of IAPS. The data and information contained in this document is therefore as up to date as is reasonably possible, and therefore forms a reliable basis for the implementation of a realistic and deliverable IAPS management programme.

The management plan has been developed with reference to *The Management of Noxious Weeds and non-native Invasive Species on National Roads* by NRA (2010), *Best Practice Management Guidelines* by Invasive Species Ireland (2008) and the UK Environment Agency's *The Knotweed Code of Practice : Managing Japanese Knotweed on Development Sites*. In applying the latter's planning matrix, as well as the "precautionary principle", we can conclude that the IAPS management will initially consist of a combination of three specific measures, as follows :

- Deployment of initial bio-security measures, including fencing of certain infested zones and the fitting of warning / advisory signage
- Multi Annual in-situ herbicide control of certain IAPS infestations, particularly Knotweeds, Three Cornered Garlic and Spanish Bluebell
- On-site physical remediation of certain other IAPS infestations, particularly Rhododendron and American Skunk Cabbage

Based on the outcome of the project development process, including the planning approval and detailed design stages, assessed in conjunction with the overall phasing and timing of any construction works, and with ongoing site monitoring and treatment in the interim, this IAPS Management Plan will be developed and expanded upon. A "construction stage" document will further refine the IAPS management process and will set out the detailed bio-security requirements and individual remediation measures to be deployed at each IAPS location, during the delivery phase of any proposed development.



**KYRAN COLGAN**  
Director

16 SEPTEMBER 2021



INVASIVE PLANT SOLUTIONS LIMITED  
The Stationhouse  
Station Road  
Dundrum  
Co. Tipperary  
E34 EK83

## I.A.P.S. SITE ASSESSMENT REPORT

### SECTION 1 : GENERAL INTRODUCTION

The Site Assessment Report has been prepared for the client / agency referenced in Section 2 below, and is for their sole and exclusive use. The report reflects the particular site circumstances and conditions, as they presented on the days of inspection. Depending on the time of year of the site assessment, particularly if carried out in advance of the annual IAPS growing season, the evidence of invasive plant species on site may be limited. In these circumstances follow up site inspections, later in the growing season, may be recommended. This will be included in Conclusions and Recommendations at Section 13 of the report.

By their nature, IAPS are aggressive interlopers in our native habitat, are capable of aggressive and rapid dominance, and if left untreated generally result in extensive habitat impairment. It is therefore reasonable to conclude that, where IAPS are identified, but control measures are not applied, these plant species will spread beyond their observed extents.

In addressing invasive alien plant species the precautionary principle should always be applied to their assessment, management and control. All recommended management and control measures should be carried out strictly in accordance with a Site Specific Management Plan, and follow “best practice” principles, as set out in technical reference documents such as the UK Environment Agency’s *The Knotweed Code of Practice, The Management of Noxious Weeds and non-native Invasive Species on National Roads* by NRA (2010), and *Best Practice Management Guidelines by Invasive Species Ireland* (2008)

Control measures should be implemented using a recognised professional service with expertise in this field of work, and take into account any and all sensitivities highlighted in the site assessment report. Particular care should be taken in circumstances where the invasive plant species are located within a designated site of ecological importance, such as an SAC, SPA or NHA, or are set within the context of known ecological sensitivities. Where the use of herbicides are proposed, these should be applied strictly in accordance with the manufacturers recommendations, by a registered Professional Pesticides User, and fully in compliance with the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. 155 of 2012).

Under no circumstances should any IAPS be cut or dug out without the advice, direction and supervision of an invasive species specialist. Many plant species have extensive root / rhizome systems which spread beyond the footprint of the above ground plant, and some can regenerate themselves from very small fragments of root or stem. Some plants produce very substantial quantities of seeds, which remain viable for many years, while others produce a sap which causes severe skin damage & burns.

The off-site removal of Japanese knotweed, its variants, soil infested with knotweed material, and other IAPS, are all strictly controlled by legislation and require a licence from the National Parks and Wildlife Service in advance of their removal, in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477).

### SECTION 2 : LEGISLATIVE CONTEXT

Japanese Knotweed, *Fallopia japonica*, and other invasive plant species, are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477 of 2011, as amended). In addition, soils and other material containing Knotweeds are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls. Failure to comply with the legal requirements set down can result in either civil or criminal prosecution, with very severe penalties accruing. A person who commits an offence under Regulations 49 & 50 is liable (a) on summary conviction, to a Class A fine or imprisonment for a term not exceeding six months, or both, or (b) on conviction on indictment, to a fine not exceeding €500,000, or imprisonment for a term not exceeding three years, or both. A person who knowingly incites, directs, procures, permits or assists another person to carry out an action that is an offence under these Regulations shall also be guilty of an offence. The relevant sections of the regulations are reproduced below.

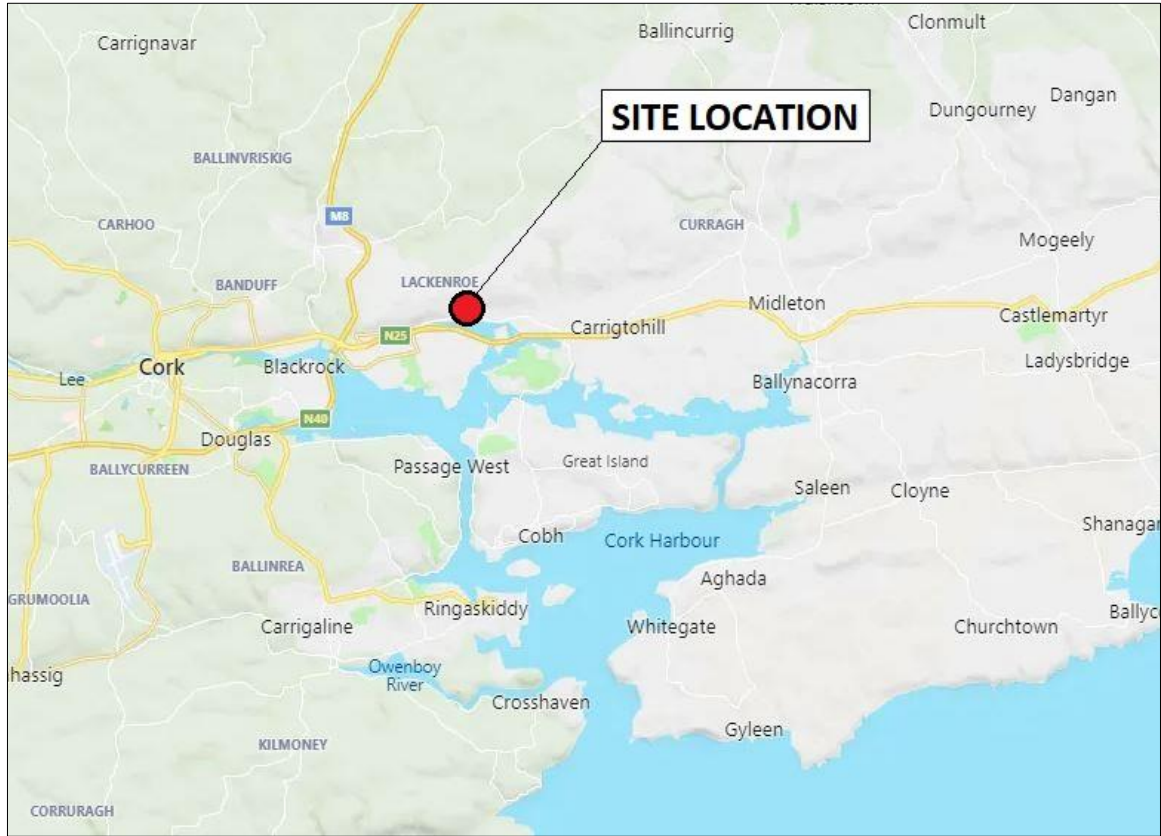
- 49(2) *Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht], any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place [a restricted non-native plant], shall be guilty of an offence.*
- 49(3) *... it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.*
- 50(1) *Save in accordance with a licence, a person shall be guilty of an offence if he or she [...] offers or exposes for sale, transportation, distribution, introduction or release—*
- (a) [any restricted non-native animal or plant species],
  - (b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or
  - (c) a vector material listed in the Third Schedule, [which includes] soil or spoil taken from places infested with Japanese Knotweed....and its hybrids...

It is an offence under regulations 49(2) and 50(1) to spread, or cause to spread, Japanese Knotweed and other IAPS. An offence may only be avoided if the relevant party can prove that they took all reasonable steps to avoid causing an offence under the legislation. To comply with these regulations, therefore, this management plan relies solely on methodologies necessary to ensure strict compliance with the legislation.

**SECTION 3 : CLIENT & SITE DETAILS**

<b>GENERAL DETAILS</b>										
<b>SITE ADDRESS</b>		LACKENROE, GLOUNTHAUNE, CO. CORK								
<b>CLIENT DETAILS</b>		<b>BLUESCAPE LIMITED</b> 12 MERRION SQUARE DUBLIN 2 IRELAND				<b>OWNERSHIP</b>		PUBLIC	PRIVATE	X
						<b>CLIENT REP.</b>		MR. PAUL Mc. CARTHY		
						<b>TEL / EMAIL</b>		087 233 8991 / paul@westhilluk.com		
<b>STATE AGENCIES INVOLVED</b>		CO. COUNCIL		NPWS		IFI		IRISH WATER	BORD NA MONA	
		ESB		IRISH RAIL		GNI		OTHER		
<b>CONSULTANTS / AGENTS</b>		<b>ARCHITECTS – DEADY GAHAN ARCHITECTS</b> EASTGATE VILLAGE RETAIL PARK LITTLE ISLAND CO. CORK  <b>ECOLOGICAL CONSULTANTS – KELLEHER ECOLOGY SERVICES</b> CASTLELYONS CO. CORK								
<b>SITE USAGE</b>		AGRICULTURAL	X	FORESTRY		RESIDENTIAL	X	COMMERCIAL	INDUSTRIAL	
		PUBLIC SPACE		GREENFIELD	X	BROWNFIELD		OTHER		
<b>SITE AREA</b>		Lands outlined in Red : 12.69 Ha. + Lands outlined in Blue : 0.13 Ha. = Total Site Area : 12.82 Ha.								
<b>SITE DESCRIPTION</b>		<p>THE SUBJECT SITE COMPRISES A LARGE, PRIMARILY GREENFIELD, SOUTH FACING AGRICULTURAL LAND HOLDING, EXTENDING FROM THE L3004 OLD YOUGHAL ROAD, ON THE EAST SIDE OF GLOUNTHAUNE VILLAGE, IN THE SOUTH, AND RUNNING UPHILL TO THE NORTH AND WEST. THE BULK OF THE LANDS ARE LAID OUT IN WELL ESTABLISHED FIELD DIVISIONS, ACCESSED VIA EXISTING AND PROPOSED ROADWAYS TO THE NORTH AND WEST. THE WESTERN ACCESS PIONT IS A FUTURE ROADWAY, TO BE BUILT AND ROUTED ACROSS EXISTING AGRICULTURAL LANDS, AND DELINIATED IN YELLOW ON THE MAP REPRODUCED BELOW.</p> <p>THE SOUTHERN PORTION OF THE LAND HOLDING CONSISTS OF TWO DISUSED RESIDENTIAL PROPERTIES ON INDIVIDUAL SITES, LOCATED ON THE NORTH SIDE OF “THE TERRACE” PUBLIC ROADWAY, AND A TRANCH OF MIXED NATIVE WOODLAND, EXTENDING FROM THE SOUTHERN SIDE OF “THE TERRACE” PUBLIC ROAD DOWNHILL TO THE SOUTHERN LIMITS OF THE OVERALL LAND HOLDING, ON THE PEDESTRIAN WALKWAY JUST NORTH OF THE L3004. A SMALL SECTION OF FORMER GARDENS PROVED TO BE INACCESSIBLE FOR THE PURPOSE OF THIS ASSESSMENT, AND IS ILLUSTRATED ON THE MAP BELOW.</p> <p>THE LAND HOLDING IS BOUNDED BY PRIVATE RESIDENTIAL AND COMMERCIAL PROPERTIES TO THE SOUTH, WEST, AND NORTH, AND BY A MIX OF AGRICULTURAL FIELDS AND PRIVATE RESIDENTIAL PROPERTIES TO THE EAST</p> <p>SITE BOUNDARIES ARE GENERALLY WELL DEFINED AND DEMARCATED, IN A COMBINATION OF STONE AND MASONRY WALLS, NATIVE HEDGES AND FENCING.</p> <p>THE LANDS ARE CURRENTLY BEING ASSESSED AND CONSIDERED FOR A POTENTIAL RESIDENTIAL DEVELOPMENT</p>								
		<p>The map shows a large agricultural land holding outlined in red. A portion of the northern boundary is outlined in blue, labeled 'LANDS IN THE OWNERSHIP OF THE APPLICANT'. A yellow line indicates a 'RIGHT OF WAY TO THE DEVELOPMENT LANDS'. A small green area is labeled 'PORTION OF LANDS INACCESSIBLE FOR I.A.P.S. SURVEY'. The map also shows surrounding residential areas and a road labeled 'JOHNSTOWN Baile Sheair'. A north arrow is present in the top right corner.</p>								
		LAND HOLDING MAP REPRODUCED COURTESY OF DEADY GAHAN ARCHITECTS								

### SECTION 4 : SITE LOCATION MAP & AERIAL SITE LAYOUT



SITE LOCATION MAP  
SITE LOCATION MAP REPRODUCED COURTESY OF BING MAPS



AERIAL SITE LAYOUT  
AERIAL SITE LAYOUT REPRODUCED COURTESY OF BING MAPS

## SECTION 5 : SCOPE OF I.A.P.S. SURVEY

The scope and purpose of the I.A.P.S. Survey was to:

- Confirm presence, or otherwise, and extent of Japanese Knotweed and its hybrids within, or in close proximity to, the site forming the study area
- Confirm the presence, or otherwise, of any other I.A.P.S. within or in close proximity to, the site forming the study area
- Use the survey results to inform the preparation of an I.A.P.S. Site Assessment Report
- Use the survey results to inform the preparation of an I.A.P.S. Management Plan, particularly in relation to any necessary bio-security and control measures that may be required

## SECTION 6 : BACKGROUND RESEARCH

A desktop study was carried out in May 2021, to identify any formal records that may exist for the presence of land based I.A.P.S., as set out in Part 1, Schedule 3, of S.I. 477 of 2011, within for the study area.

The National Biodiversity Data Centre (NBDC) invasive species database and mapping system were reviewed, covering the study area, the immediately surrounding lands, and the broader hinterland.

The search of the NBDC invasive alien plant species database yielded no records of the presence of land based I.A.P.S. within the survey area itself. However there are a number of IAPS records located in the broader hinterland, generally relating to the railway line which runs parallel, and to the south, of the L3004 Old Youghal Road, itself just south of the subject site. These records relate primarily for the presence of Japanese Knotweed, but also include a small number of records for Bohemian and Giant Knotweed plants. For reference, we have reproduced below the NBDC map record for the nearest Japanese Knotweed sites, as recorded between 2000 and 2021.

In addition we also referred to various open source mapping, satellite imaging, and data sets, including Land Direct, Geohive, NPWS Map Viewer, Google Maps and Bing Maps



MAPPING RECORDS OF JAPANESE KNOTWEED IN THE VICINITY OF THE SURVEY AREA, 2001- 2021

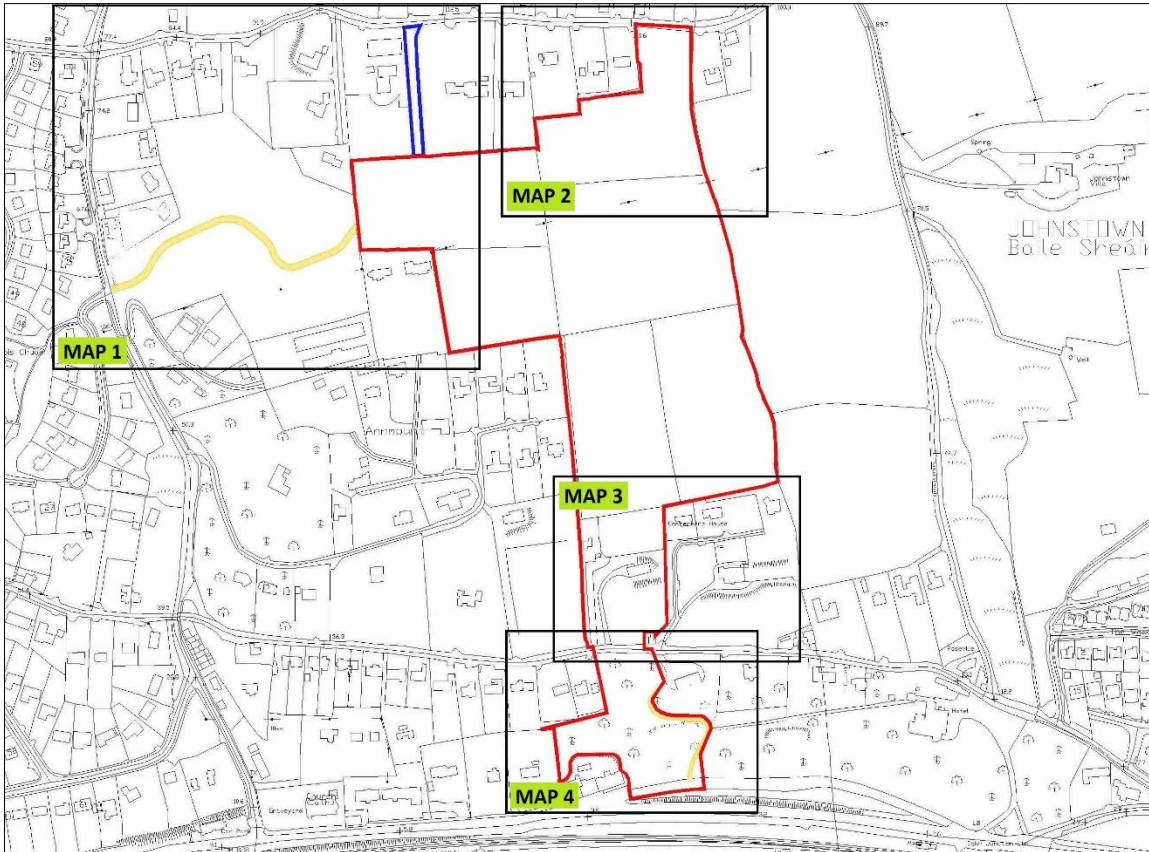
MAP REPRODUCED COURTESY OF NATIONAL BIODIVERSITY DATA CENTRE

**SECTION 7 : I.A.P.S. OVERALL INFESTATION DETAILS**

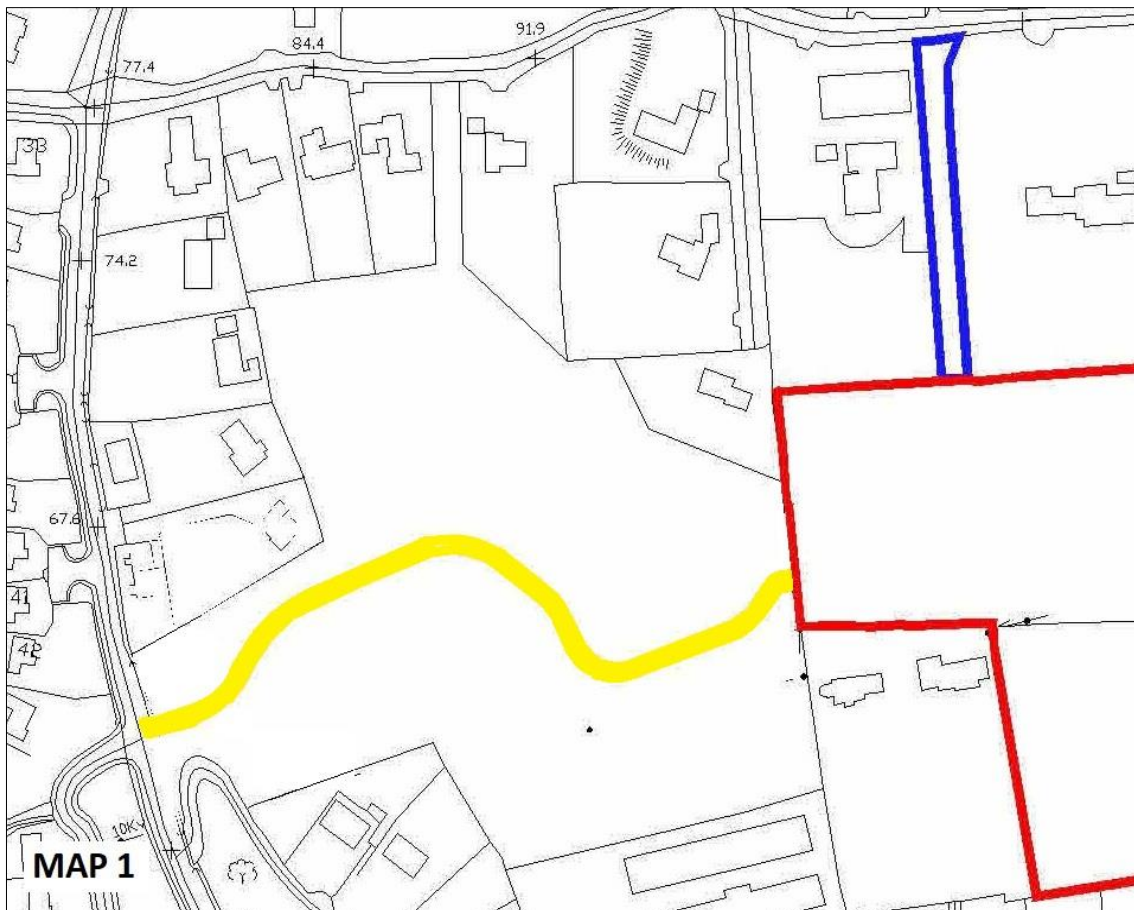
INVASIVE ALIEN SPECIES									
JAPANESE KNOTWEED		GIANT KNOTWEED		BOHEMIAN KNOTWEED	X	HIMALAYAN KNOTWEED	X		
GUNNERA		HIMALAYAN BALSAM		GIANT HOGWEED		RHODODENDRON	X		
AMERICAN SKUNK CABBAGE	X	THREE CORNERED GARLIC	X	SPANISH BLUEBELL	X	HOTTENTOT FIG			
<b>DESCRIPTION &amp; EXTENT OF KNOTWEED COLONISATIONS</b>									
<u>BOHEMIAN KNOTWEED – BK 1</u>									
<p><b>BK 1</b> IS A STAND OF HEALTHY, EMERGING, BOHEMIAN KNOTWEED WITHIN THE WOODLAND ZONE FORMING THE SOUTHERN SECTOR OF THE LANDS. THE STAND IS LOCATED JUST NORTH AND WEST OF SUNKEN STONE STRUCTURE, CLOSE TO A RECENTLY FORMED ACCESS ROUTE THROUGH THE WOODLAND TO THE LOWEST SECTION OF THE SITE. THE BOHEMIAN KNOTWEED IS ALMOST FULLY EMERGED FOR THIS GROWING SEASON, WITH STEMS UP TO 1.5M – 2M IN HEIGHT, AND WITH SMALLER STEMS PRESENTING AROUND THE PERIPHERY OF THE STAND. THERE IS NO EVIDENCE OF DEAD CANES FROM PREVIOUS SEASONS GROWTH, SUGGESTING THAT THE STAND COULD BE PART OF A PREVIOUSLY DORMANT INFESTATION, OR POSSIBLY GROWTH FROM RHIZOME THAT WAS PREVIOUSLY INTRODUCED ONTO THE SITE IN SPOIL MATERIAL, AND WHICH WAS ACTIVATED BY THE RECENT SITE CLEARANCE ACTIVITIES</p>									
<u>BOHEMIAN KNOTWEED – BK 2</u>									
<p><b>BK 2</b> IS A STAND OF BOHEMIAN KNOTWEED LOCATED APPROX. 12M TO THE EAST OF <b>BK 1</b>, AND IS EXHIBITING SIMILAR CONDITIONS AND CHARACTERISTICS. IT IS POSSIBLE THAT THE TWO STANDS ARE CONNECTED GROWTH ORIGINATING FROM THE SAME REPOSITORY OF RHIZOME MATERIAL CONTAINED WITHIN THE GROUND IN THIS GENERAL AREA. FURTHER INVESTIGATION IS REQUIRED TO DETERMINE THE PRECISE CIRCUMSTANCES OF THE TWO STANDS</p>									
<u>HIMALAYAN KNOTWEED – HK 1</u>									
<p><b>HK 1</b> IS A LARGE MONOLITHIC STAND OF RECENTLY EMERGENT HIMALAYAN KNOTWEED LOCATED IN THE SAME SOUTHERN SECTOR, NORTH OF <b>BK 1</b>. THE STAND IS PARTIALLY ON THE RECENTLY FORMED ACCESS TRACK, BUT WITH THE MAIN BODY OF THE STAND EXTENDING TO THE WEST, UP THE SLOPING BANK IN OPEN GROUND. AS WITH THE OTHER STANDS, THERE IS NO EVIDENCE OF DEAD STEMS FROM PREVIOUS SEASONS GROWTH.</p>									
<u>HIMALAYAN KNOTWEED – HK 2</u>									
<p><b>HK 2</b> COMPRISES A SERIES OF JUVENILE AND IMMATURE HIMALAYAN KNOTWEED SHOOTS, IMMEDIATELY NORTH, AND TO THE WEST, OF <b>BK 2</b>, SCATTERED ACROSS THE RECENTLY DISTURBED OPEN GROUND. IT IS EARLY IN THE GROWING SEASON, SO ITS FULL EXTENT MAY NOT YET BE FULLY REPRESENTED.</p>									
<b>DESCRIPTION &amp; EXTENT OF OTHER I.A.P.S. COLONISATIONS</b>									
<u>THREE CORNERED GARLIC – TCG 1 &amp; TCG 3</u>									
<p><b>TCG 1 &amp; TCG 3</b> ARE LINEAR STANDS OF WELL ESTABLISHED THREE CORNERED GARLIC, SPREADING WITHIN AND ALONG ROADSIDE VERGES</p>									
<u>THREE CORNERED GARLIC – TCG 2</u>									
<p><b>TCG 2</b> IS A SMALL STAND OF THREE CORNERED GARLIC, LOCATED WITHIN THE NATIVE HEDGEROW SEPARATING FIELDS IN THE NORTHERN SITE SECTOR</p>									
<u>THREE CORNERED GARLIC – TCG 4, TCG 5, TCG 6 &amp; TCG 7</u>									
<p><b>TCG 4 - TCG 7</b> ARE A SERIES OF STANDS OF WELL ESTABLISHED THREE CORNERED GARLIC, SPREADING WITHIN THE NORTHERN PART OF THE WOODLAND THAT FORMS THE SOUTHERN SITE SECTOR, AND ALONG BOTH SIDES OF THE PEDESTRIAN RIGHT OF WAY ON THE WOODLAND’S EASTERN FRINGE</p>									
<u>SPANISH BLUEBELL – SB 1</u>									
<p><b>SB 1</b> IS A SMALL GROUP OF SPANISH BLUEBELL PLANTS SCATTERED THROUGH NATIVE VEGETATION. LOCATED IN THE RECENTLY FORMED CLEARANCE IN THE NORTHERN SECTOR OF THE WOODLAND, WHICH FORMS THE SOUTHERN SECTOR OF THE LAND HOLDING</p>									
<u>THREE CORNERED GARLIC &amp; SPANISH BLUEBELL – TCG/SB 1, TCG/SB 2 &amp; TCG/SB 3</u>									
<p><b>TCG/SB 1, TCG/SB 2 &amp; TCG/SB 3</b> ARE EXTENSIVE ZONES OF MIXED INFESTATIONS OF BOTH THREE CORNERED GARLIC AND SPANISH BLUEBELL, LOCATED ON THE GROUNDS OF THE TWO RESIDENTIAL PROPERTIES ON THE NORTH SIDE OF “THE TERRACE” PUBLIC ROAD. THE STANDS ARE TYPICALLY WELL ESTABLISHED AND ARE MIXED AND SPREADING AMONGST NATIVE VEGETATION. THERE IS EVIDENCE OF SOME SPERAD INTO THE FIELDS TO THE NORTH</p>									
<u>THREE CORNERED GARLIC &amp; SPANISH BLUEBELL – TCG/SB 4, TCG/SB 5 &amp; TCG/SB 6</u>									
<p><b>TCG/SB 4, TCG/SB 5 &amp; TCG/SB 6</b> ARE A SERIES OF MIXED STANDS OF WELL ESTABLISHED THREE CORNERED GARLIC AND SPANISH BLUEBELL, SPREADING WITHIN THE WOODLAND THAT FORMS THE SOUTHERN SITE SECTOR, PARTICULARLY ALONG THE ROADSIDE MARGIN ON ITS NORTHERN FRINGE AND ALONG BOTH SIDES OF THE PEDESTRIAN RIGHT OF WAY ON THE WOODLAND’S SOUTH EASTERN MARGINS</p>									
<u>RHODODENDRON – RHO 1 &amp; RHO 2</u>									
<p><b>RHO 1 &amp; RHO 2</b> ARE TWO HEALTH AND MATURE RHODODENDRON TREES, LOCATED IN THE GROUNDS OF THE LARGE DISUSED RESIDENTIAL PROPERTY, ON THE NORTH SIDE OF “THE TERRACE” PUBLIC ROAD. <b>RHO 1</b> IS LOCATED CLOSE TO SOUTHERN END OF THE PROPERTY’S EASTERN BOUNDARY, WHILE <b>RHO 2</b> IS IN THE WESTERN SECTOR OF THE PROPERTY, IN LINE WITH THE ENTRANCE POINT TO THE SITE. THE TWO TREES ARE CURRENTLY IN FLOWER.</p>									
<u>AMERICAN SKUNK CABBAGE – ASC 1</u>									
<p><b>ASC 1</b> REPRESENTS AN AREA OF AMERICAN SKUNK CABBAGE, COMPRISING APPROX 10 PLANTS, AT VARYING STAGES OF PLANT GROWTH. THEY ARE LOCATED IN A LOW LYING WET GROUND, WITHIN THE SOUTHERN SITE SECTOR, APPROX 20M NORTH OF THE BOEMENIAN KNOTWEED STANDS</p>									
<b>CONDITION OF INFESTATIONS</b>									
<b>GROWTH STAGE</b>	EMERGENT	X	REGROWTH		JUVENILE / SEMI MATURE	X	MATURE	X	
<b>CONDITION</b>	HEALTHY	X	DISTRESSED		STUNTED		BONSAI		
<b>RISKS FROM PLANTS</b>									
<b>BOUNDARIES</b>	X	SOFT LANDSCAPE	X	HARD SURFACES		SITE DISPERSAL	X	SENSITIVE HABITATS	X



**SECTION 8 : I.A.P.S. DISTRIBUTION MAPS**

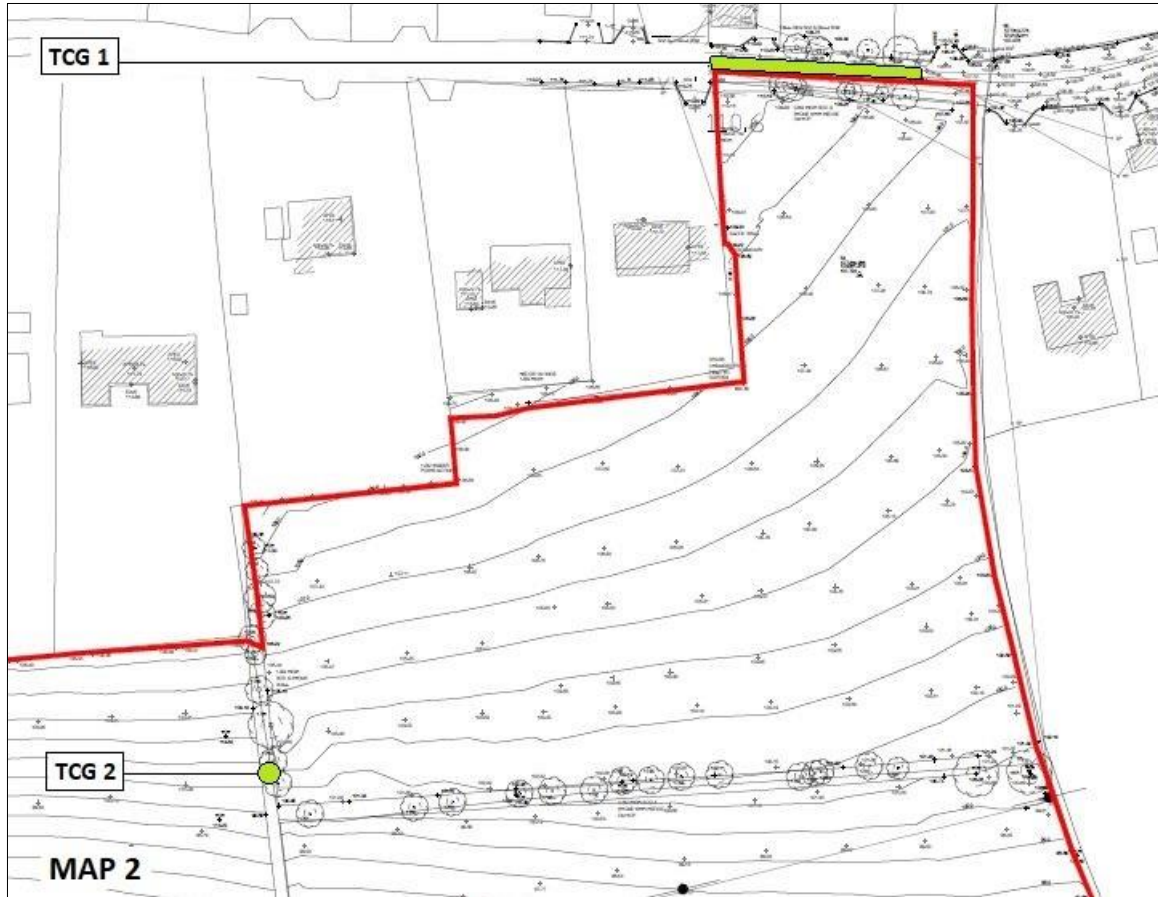


**OVERALL SITE LAYOUT WITH KEY TO I.A.P.S. DISTRIBUTION MAPS**

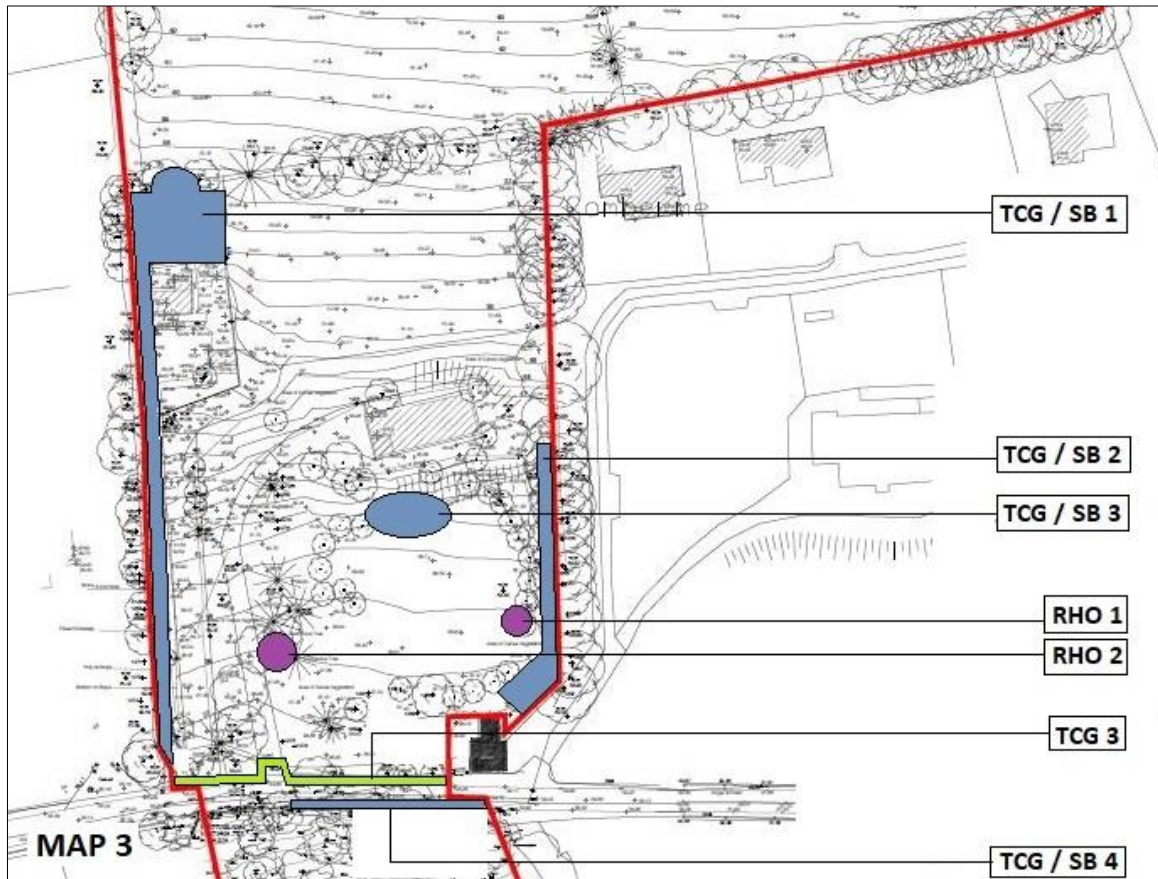


**I.A.P.S. DISTRIBUTION MAP 1**

SECTION 8 : I.A.P.S. DISTRIBUTION MAPS – CONTD.



I.A.P.S. DISTRIBUTION MAP 2



I.A.P.S. DISTRIBUTION MAP 3



**SECTION 9 : I.A.P.S. INDIVIDUAL INFESTATION DETAILS**

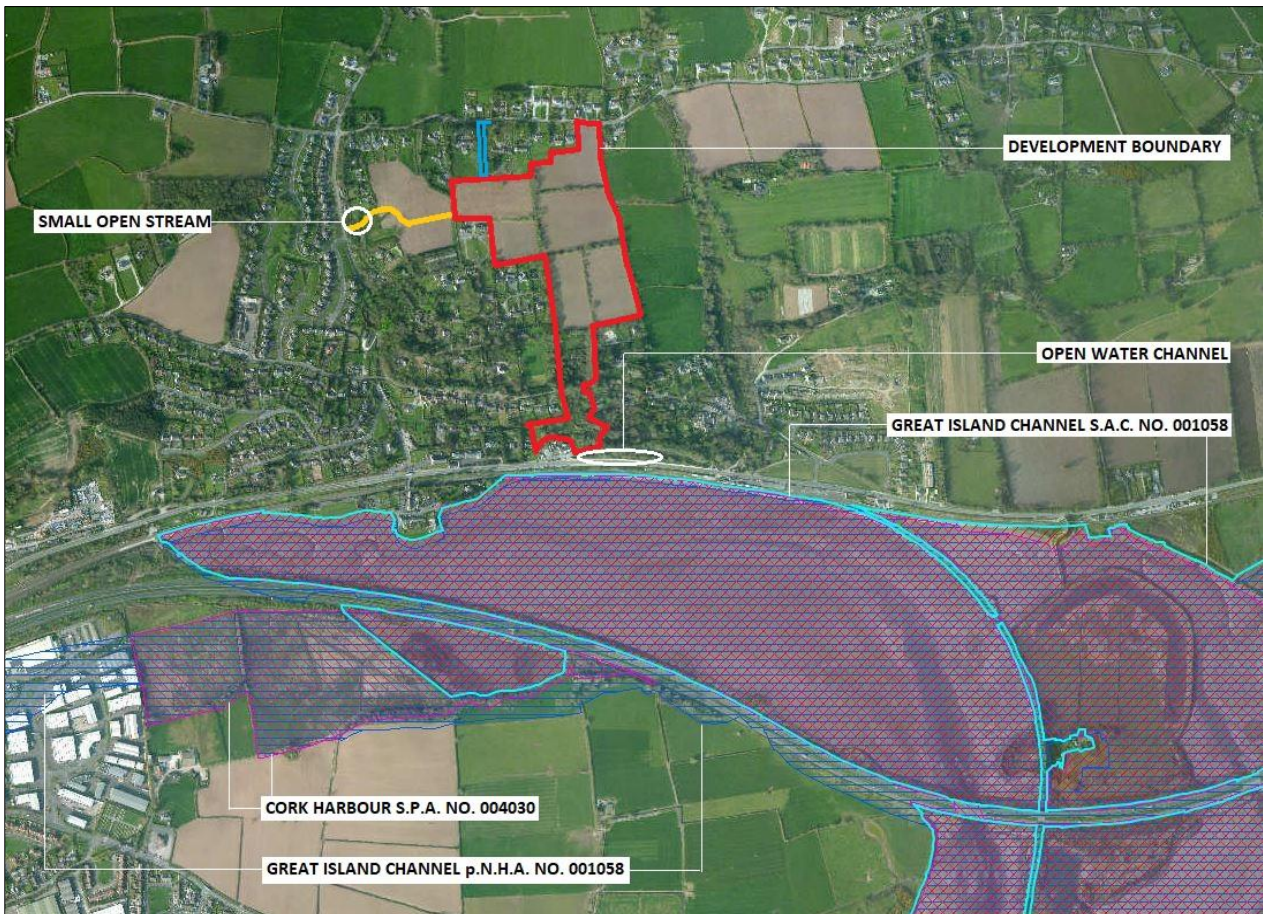
DETAILS	NO.	ITM – X *	ITM – Y *	SIZE (M X M)	COMMENTS
INFESTATION 1	BK 1	577279	573379	+/- 5m dia.	Emergent, distressed stems on periphery
INFESTATION 2	BK 2	577290	573375	+/- 4m x 3m	Emergent, distressed stems on periphery
INFESTATION 3	HK 1	577279	573397	+/- 10m x 6m	Emergent, section on trackway disturbed
INFESTATION 4	HK 2	577286	573380	+/- 4m x 3m	Just emerging, in disturbed ground
INFESTATION 5	TCG 1	577253 to 577302	574098 to 574102	+/- 50m x 1m	On roadside margin, on south side of public Road
INFESTATION 6	TCG 2	577155	573962	+/- 2m dia.	Within hedgerow at crossing point between fields
INFESTATION 7	TCG 3	577209 to 577263	573500 to 573503	+/- 55m x 5m	On roadside margin and spreading into the main property entrance, on north side of public road
INFESTATION 8	TCG 4	577259	573475	+/- 5m x 12m	In woodland clearing, spreading south
INFESTATION 9	TCG 5	577277	573467	+/- 7m x 5m	Under large tree in woodland, spreading south
INFESTATION 10	TCG 6	577276 to 577283	573412 to 573431	+/- 18m x 1m x 2	Both side of pathway, around right hand bend
INFESTATION 11	TCG 7	577236	573439	+/- 2m x 1m	In woodland clearing
INFESTATION 12	SB 1	577256	573456	+/- 3m dia.	In woodland clearing
INFESTATION 13	TCG/SB 1	577205 to 577209	573503 to 573625	+/- 100m x 1m x 2 + +/- 16m x 20m	Both sides of driveway and in open ground behind house, spreading into the field to the north
INFESTATION 14	TCG/SB 2	577274 to 577281	573512 to 573569	+/- 60m x 5 - 10m	
INFESTATION 15	TCG/SB 3	577254	573556	+/- 6m x 3m	Spreading through vegetation at woodland fringe
INFESTATION 16	TCG/SB 4	577232 to 577270	573490 to 573491		On roadside margin, on south side of public Road
INFESTATION 17	TCG/SB 5	577324	573426	+/- 15m x 2m	Both side of pathway, around left hand bend
INFESTATION 18	TCG/SB 6	577313 to 577315	573369 to 583396	+/- 8m x 20m	
INFESTATION 19	RHO 1	577275	573533	+/- 4m dia.	Currently in full flower
INFESTATION 20	RHO 2	577222	573531	+/- 6m dia.	Currently in full flower
INFESTATION 21	ASC 1	577301	573402	+/- 3m x 2m	

\* Many of the invasive alien plant species recorded are located within woodland or close to dense canopy cover. Therefore some of the GIS co-ordinates could have a significant margin of error, which should be taken consideration when implementing IAPS management measures. Their exact location and extent should be validated on the ground, and clearly demarcated, using an invasive alien plant species specialist.

**SECTION 10 : I.A.P.S. - ENVIRONMENTAL IMPACT AND LOCAL SENSITIVITIES**

ENVIRONMENTAL CONTEXT								
VISUAL IMPACT	MINIMAL		MODERATE	X	SIGNIFICANT		SEVERE	
ENVIRONMENTAL IMPACT	LIMITED		MODERATE		SIGNIFICANT	X	SEVERE	
TRANSLOCATION RISK	LOW		MEDIUM		HIGH	X	ACUTE	
PROXIMITY TO WATER BODY	DISTANT		VICINITY	X	ADJOINING		WITHIN	
NATURE OF WATER BODY	RIVER		SEA	X	LAKE		CHANNEL	X
DESIGNATED STATUS								
IS SITE IN A DESIGNATED AREA	SAC	NO	SPA	NO	NHA / pNHA	NO	NO.	N/A
DESIGNATED AREA NEARBY	SAC	YES	SPA	YES	NHA / pNHA	YES	NO.	001058 / 004030
OTHER SENSITIVITIES								
COMMENTS / NOTES	<p><b>DESIGNATED SITES</b></p> <p>THE NEAREST DESIGNATED SITES ARE <b>THE GREAT ISLAND CHANNEL S.A.C. NO.001058</b> AND <b>THE CORK HARBOUR S.P.A. NO.004030</b>, BOTH OF WHICH ARE A SHORT DISTANCE TO THE SOUTH OF THE SOUTHERN SITE BOUNDARY, WITH THEIR NORTHERN LIMITS LOCATED JUST SOUTH OF THE CORK TO MIDDLETON RAILWAY LINE, ITSELF SOUTH OF THE L3004 OLD YOUGHAL ROAD.</p> <p><b>OTHER SENSITIVITIES</b></p> <p>AS WELL AS THE PRESENCE OF THE ABOVE DESIGNATED SITES THERE IS AN ASSOCIATED STREAM / DRAINAGE DYKE LOCATED BETWEEN THE SOUTHERN SITE BOUNDARY AND THE NORTH SIDE OF THE OLD YOUGHAL ROAD. IN ADDITION, THERE IS THE FORMATION OF A SMALL STREAM WHICH PRESENTS ABOVE GROUND AND FOLLOWS THE GENERAL LINE OF THE WESTERNMOST SECTION OF THE PROPOSED WESTERN ACCESS ROAD.</p> <p>GIVEN THE PROXIMITY OF THE OPEN WATER BODIES CLOSE TO, OR ON, THE LAND HOLDING, AS WELL AS THE DESIGNATED SITES IMMEDIATELY TO THE SOUTH OF THE PROPERTY, THERE MAY BE POTENTIAL PATHWAYS FOR HERBICIDES, WHICH COULD HAVE AN IMPACT ON KNOWN ECOLOGICAL SENSITIVITIES OR RECEPTORS WITHIN THE DESIGNATED SITES</p>							

**MAPS / ILLUSTRATIONS**



RELATIONSHIP BETWEEN THE SITE & THE CLOSEST DESIGNATED SITES

MAPS REPRODUCED COURTESY OF THE N.P.W.S. MAPVIEWER FACILITY

SECTION 11 : SITE PHOTOGRAPHS

BOHEMIAN KNOTWEED – BK 1



VIEW OF STAND – LOOKING WEST



VIEW OF STAND – LOOKING NORTH

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

BOHEMIAN KNOTWEED – BK 2



VIEW OF STAND – LOOKING SOUTH



VIEW OF STAND – LOOKING NORTH

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

BOHEMIAN KNOTWEED – BK 1 & BK 2



DETAIL OF HEALTHY PLANT STEMS AND LEAVES



DETAIL OF DELAYED OR DISTRESSED GROWTH



SECTION 11 : SITE PHOTOGRAPHS – CONTD.

HIMILAYAN KNOTWEED – HK 1



VIEW OF STAND – LOOKING NORTH EAST



VIEW OF STAND – LOOKING NORTH WEST

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

HIMILAYAN KNOTWEED – HK 1



VIEW OF EASTERN END OF THE STAND ON, AND CROSSED BY, A VEHICLE TRACK – LOOKING NORTH



CLOSE UP OF EMERGING NEW SEASON GROWTH

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

HIMILAYAN KNOTWEED – HK 2



HEALTHY EMERGENT NEW SEASON GROWTH IN DISTURBED GROUND – LOOKING NORTH



DELAYED OR DISTRESSED NEW SEASON GROWTH IN DISTURBED GROUND – LOOKING WEST

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 1



ROADSIDE MARGIN – LOOKING WEST



THREE CORNERED GARLIC MIXED AMONGST NATIVE VEGETATION IN ROADSIDE MARGIN

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 2 & TCG 3



THREE CORNERED GARLIC MIXED AMONGST NATIVE VEGETATION IN HEDGEROW AT TCG 2



ROADSIDE MARGIN AT TCG 3 CONTAINING THREE CORNERED GARLIC – LOOKING WEST

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 4 & TCG 5



THREE CORNERED GARLIC MIXED AMONGST NATIVE VEGETATION IN WOODLAND CLEARING AT TCG 4



THREE CORNERED GARLIC AROUND THE BASE OF A TREE IN THE SOUTHERN WOODLAND AT TCG 5

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 6 & TCG 7



THREE CORNERED GARLIC ON THE SIDE OF THE PATH ALONG THE EASTERN WOODLAND FRINGE AT TCG 6



THREE CORNERED GARLIC ON THE SIDE OF THE VEHICLE TRACK THROUGH THE SOUTHERN WOODLANDS AT TCG 7

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

SPANISH BLUEBELL – SB 1



TYPICAL SPANISH BLUEBELL PLANTS IN THE WODLAND CLEARING AT SB 2



SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 1



THREE CORNERED GARLIC AND SPANISH BLUEBELL INTERMITTENTLY ON BOTH SIDES OF DRIVEWAY AT TCG/SB 1



GROUND TO THE REAR (NORTH) OF THE HOUSE HEAVILY COLONISED BY THREE CORNERED GARLIC AT TCG/SB 1

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 2 & TCG/SB 3



THREE CORNERED GARLIC AND SPANISH BLUEBELL SPREADING THROUGH NATIVE VEGETATION AT TCG/SB 2



SPANISH BLUEBELL SPREADING THROUGH NATIVE VEGETATION AT TCG/SB 3

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 4 & TCG/SB 5



ROADSIDE MARGIN AT TCG/SB 4 CONTAINING THREE CORNERED GARLIC & SPANISH BLUEBELL – LOOKING WEST



THREE CORNERED GARLIC & SPANISH BLUEBELL BESIDE THE PATH ALONG THE EASTERN WOODLAND FRINGE AT TCG/SB 5

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 6



THREE CORNERED GARLIC & SPANISH BLUEBELL IN OPEN GROUND AT TCG/SB 6 LOOKING NORTH WEST



THREE CORNERED GARLIC & SPANISH BLUEBELL BOTH SIDES OF THE PATH ON THE EASTERN WOODLAND FRINGE AT TCG/SB 6

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

RHODODENDRON – RHO 1



RHODODENDRON TREE IN THE EASTERN SECTOR OF THE PROPERTY NORTH OF "THE TERRACE" PUBLIC ROAD



SPREAD OF THE RHODODENDRON TREE IN THE EASTERN SECTOR OF THE PROPERTY NORTH OF "THE TERRACE" PUBLIC ROAD

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

RHODODENDRON – RHO 2



RHODODENDRON TREE IN THE WESTERN SECTOR OF THE PROPERTY NORTH OF "THE TERRACE" PUBLIC ROAD



DETAIL OF THE RHODODENDRON TREE IN FLOWER

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

AMERICAN SKUNK CABBAGE – ASC 1



SMALL AMERICAN SKUNK CABBAGE PLANT IN WET GROUND – LOOKING NORTH



LARGER AMERICAN SKUNK CABBAGE PLANT BEYOND – LOOKING NORTH

## SECTION 12 : CONCLUSIONS & RECOMMENDATIONS

1. BASED ON THE TIME OF YEAR THAT THE 2021 SITE INSPECTION WAS CARRIED OUT, AND CONSIDERING THE GROUND DISTURBANCE WITHIN THE SOUTHERN WOODLAND SECTION OF THE LAND HOLDING, IT IS POSSIBLE THAT I.A.P.S. PLANTS ARE PRESENT BEYOND THE LIMITS RECORDED. IN APPLYING THE "PRECAUTIONARY PRINCIPLE", ON-GOING SITE MONITORING SHOULD BE MAINTAINED DURING THE 2021 GROWING SEASON
2. FURTHER FORMAL SITE SURVEYS SHOULD BE SCHEDULED ACROSS THE SUMMER GROWING PERIOD, TO INSPECT FOR NEWLY EMERGENT I.A.P.S., INCLUDING KNOTWEEDS, AMERICAN SKUNK CABBAGE AND RHODODENDRON, AS WELL FOR FURTHER NEW SEASON GROWTH OF KNOTWEEDS RELATED TO THE IDENTIFIED STANDS. THE SURVEYS SHOULD INSPECT FOR VIABLE KNOTWEED PLANT/RHIZOME MATERIAL THAT MAY HAVE BEEN DISPERSED INTO OTHER AREAS OF THE PROPERTY. THIS REPORT AND MANAGEMENT PLAN SHOULD BE UPDATED ACCORDINGLY, TO TAKE ACCOUNT OF THE RESULTS OF THE SURVEYS
3. AREAS OF INFESTATION SHOULD BE SECURELY FENCED OFF WITHOUT DELAY, INCLUDING A 5 – 7m BUFFER ZONE AROUND KNOTWEED STANDS. FENCING SHOULD BE STURDY AND SHOULD INCORPORATE APPROPRIATE WARNING / ADVISORY SIGNAGE. WHERE STANDS ARE SMALL, OR JUST INDIVIDUAL STEMS, OR HAVE BEEN PREVIOUSLY TREATED AND COMPRISE OF PRIMARILY OF DEAD STEMS, THEN ADVISORY SIGNAGE ON STURDY TIMBER POSTS MAY SUFFICE
4. THIS REPORT SHOULD BE CIRCULATED TO ALL MEMBERS OF THE DESIGN TEAM FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, AS WELL AS PRESCRIBED AUTHORITIES AND ANY ADJOINING LAND OWNERS AFFECTED BY THE I.A.P.S. PRESENCE, WHERE EITHER RELEVANT OR NECESSARY TO DO SO. IN PARTICULAR THE LOCAL AUTHORITY SHOULD BE FORMALLY NOTIFIED OF THE SIGNIFICANT EXTENT OF THREE CORNERED GARLIC AND SPANISH BLUEBELL POPULATING THE MARGINS OF THE PUBLIC ROADWAYS IN THE VICINITY OF THE SUBJECT LANDS
5. THIS MANAGEMENT PLAN AND TREATMENT METHODOLOGY SHOULD BE SCREENED FOR POTENTIAL IMPACTS ON ECOLOGICAL RECEPTORS AND SENSITIVITIES, WHERE THEY EXIST, TO FULLY CONSIDER THE REQUIREMENTS OF S.I. 477 OF 2011 – THE EUROPEAN COMMUNITIES (BIRDS AND NATURAL HABITATS) REGULATIONS 2011 AND S.I. 155 OF 2012 – THE EUROPEAN COMMUNITIES (SUSTAINABLE USE OF PESTICIDES) REGULATIONS 2012
6. IN GENERAL THE I.A.P.S. INFESTATIONS ARE HEALTHY AND SUITABLE FOR THE COMMENCEMENT OF A HERBICIDE CONTROL PROGRAMME DURING THE EARLY SUMMER OF 2021, ALTHOUGH THE THREE CORENERD GARLIC AND SPANISH BLUEBELL PLANTS MAY HAVE ALREADY SET SEED AND BE ENTERING SENESCENCE. A MULTI-ANNUAL TREATMENT PROGRAMME SHOULD BE AGREED AND IMPLEMENTED AT THE EARLIEST APPROPRIATE OPPORTUNITY, TO ARREST THE RISK OF FURTHER SPREAD OF KNOTWEEDS AND OTHER I.A.P.S., AND TO COMMENCE THE PROCESS OF CONTROL AND ERADICATION. SEE SECTIONS 13 TO 19 FOR FURTHER DETAILS
7. NO GROUND MAINTENANCE, OPENING UP OR ANY FURTHER GROUND DISTURBANCE SHOULD TAKE PLACE WITHIN THE FENCED AND SIGNED AREAS, WITHOUT PRIOR CONSULTATION WITH, AND THE DIRECTION OF, AN INVASIVE PLANT SPECIES SPECIALIST, AND THEN ONLY UNDER STRICT SUPERVISION
8. ALL RELEVANT STAFF AND SITE VISITORS SHOULD BE BRIEFED ON THE IDENTIFICATION, RISKS AND DANGERS OF KNOTWEEDS AND OTHER I.A.P.S., AND ON THE SPECIFIC MEASURES, RESTRICTIONS AND PROTOCOLS TO BE DEPLOYED ON THE ESTATE IN GENERAL, AND THE HOTEL DEVELOPMENT SITE IN PARTICULAR
9. IF ACCESS TO THE INFESTED AREAS IS NECESSARY, AND PARTICULARLY IF ANY ESSENTIAL WORK HAS TO BE CARRIED OUT WITHIN THE FENCED LOCATIONS, THEN THIS MUST ONLY BE DONE FOLLOWING FORMAL APPROVAL IN ADVANCE, AND AFTER THE PREPARATION AND AGREEMENT OF A "TASK SPECIFIC" METHOD STATEMENT. NO VIABLE PLANT MATERIAL OR RHIZOME SHOULD BE DISTURBED IN, OR REMOVED FROM, THE ZONES OF INFESTATION
10. WHEN AND IF DEVELOPMENT PROPOSALS ARE APPROVED, AND DETAILED DESIGNS FINALISED, AND WHERE THESE WILL RESULT IN ENCROACHMENT INTO I.A.P.S. INFESTED AREAS, THEN A SITE SPECIFIC SOIL REMEDIATION PROGRAMME SHOULD BE DEVELOPED AND DEPLOYED, TO PROVIDE FOR MANAGEMENT OF I.A.P.S. INFESTED SOILS, AND ENSURE THEIR BIO-SECURE DISPOSAL. THE PLAN SHOULD INCLUDE FOR THE PROVISION OF VERTICAL AND HORIZONTAL ROOT BARRIER MEMBRANES WHERE REQUIRED, AND ALL OTHER MEASURES NECESSARY TO ENSURE STRICT BIO-SECURITY COMPLIANCE ACROSS THE CONSTRUCTION STAGE OF THE PROPOSED DEVELOPMENT. SECTION 19 OF THIS DOCUMENT ALSO PROVIDES SOME GUIDANCE ON MEASURES THAT SHOULD BE DEPLOYED, TO PREVENT THE EXTERNAL INTRODUCTION OF I.A.P.S., DURING CONSTRUCTION WORKS
11. DETAILED GROUND REMEDIATION PROPOSALS SHOULD BE DEVELOPED IN THE POST PLANNING STAGE OF THE DEVELOPMENT PROCESS, IN CLOSE CO-ORDINATION WITH THE RELEVANT DESIGN TEAM CONSULTANTS AND, TO THE GREATEST EXTENT POSSIBLE, SHOULD BE CARRIED OUT AS A SEPERATE ENABLING WORKS CONTRACT IN ADVANCE OF THE COMMENCEMENT OF A PRIMARY CONSTRUCTION CONTRACT

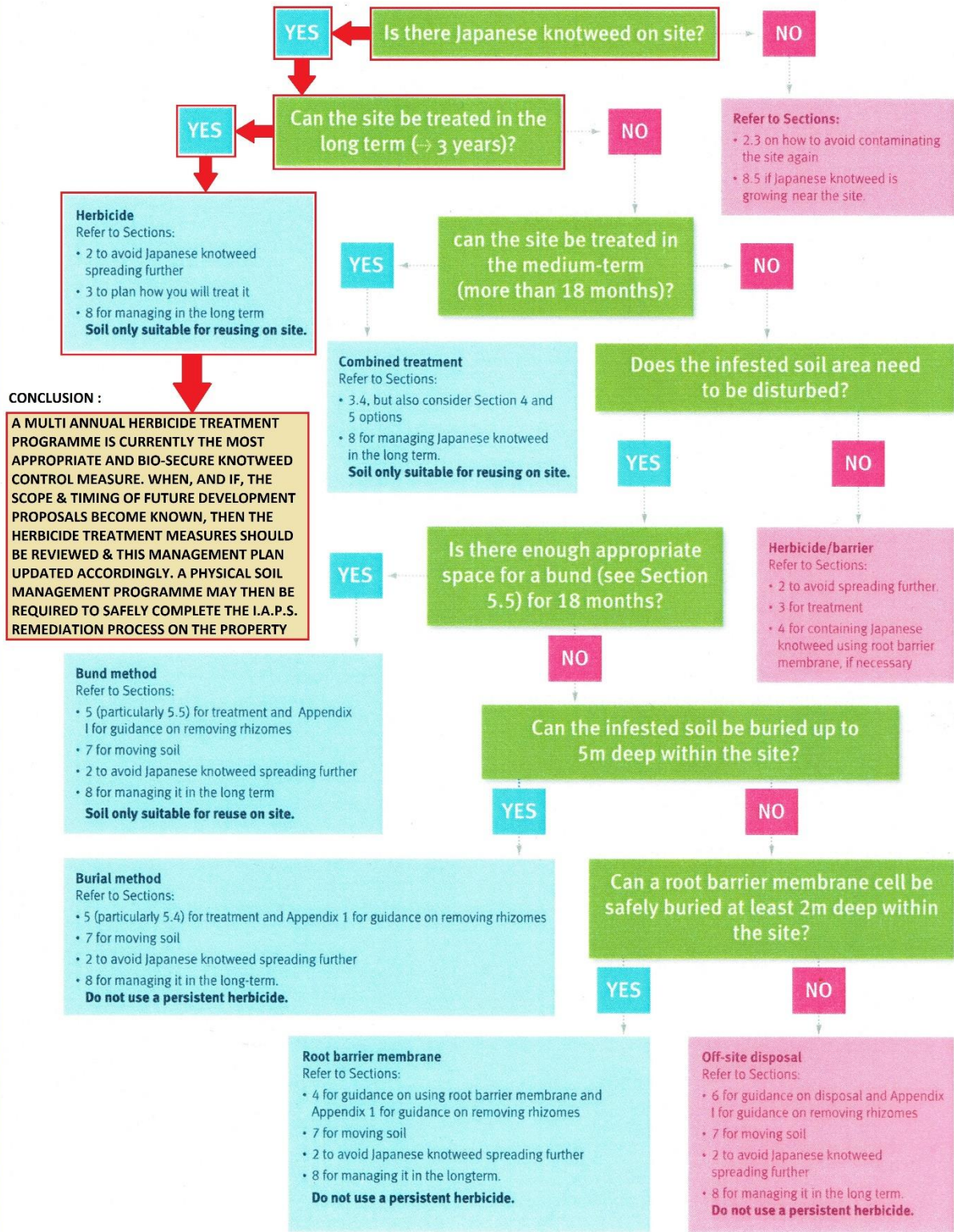


**SECTION 13 : KNOTWEEDS - PROCESS OF TREATMENT SELECTION**

<b>INVASIVE ALIEN SPECIES</b>				
JAPANESE KNOTWEED	GIANT KNOTWEED	BOHEMIAN KNOTWEED	X	HIMALAYAN KNOTWEED
<b>SELECTION OF TREATMENT</b>				

THE MATRIX BELOW HAS BEEN DEVELOPED BY THE U.K. ENVIRONMENT AGENCY, BASED ON BEST PRACTICE AND THE APPLICATION OF "THE PRECAUTIONARY PRINCIPLE". THIS PROCESS IS INTENDED TO ARRIVE AT THE OPTIMUM JAPANESE KNOTWEED MANAGEMENT SOLUTION, WHICH POSES THE LEAST BIO-SECURITY RISK, AND WHICH MANAGES THE PLANT REMEDIATION PROCESS AS CLOSE AS PRACTICABLE TO IT'S EXISTING LOCATION

# Flowchart for treating Japanese knotweed



**SECTION 14 : KNOTWEEDS - MANAGEMENT & REMEDIATION PLAN**

TREATMENT PLAN			
TREATMENT METHODOLOGY	<p>BASED ON THE OUTCOME OF THE ANALYSIS CARRIED OUT USING THE FLOWCHART AT SECTION 13 ABOVE, IN CONJUNCTION WITH THE CURRENT PREVAILING SITE CONDITIONS, AND THE INTENTIONS FOR THE FURTHER COMPREHENSIVE RE-DEVELOPMENT OF PARTS OF THE LANDS IN THE SHORT TO MEDIUM TERM, THE PRINCIPLES OF THE PREFERRED MANAGEMENT SOLUTION ARE AS FOLLOWS :</p> <ol style="list-style-type: none"> <li>1. FENCE OFF IDENTIFIED BOHEMIAN AND HIMALAYAN KNOTWEED LOCATIONS, USING SECURE FENCING, INCORPORATING APPROPRIATE ADVISORY/WARNING SIGNAGE, AND INCLUDING RECOMMENDED SAFE BUFFER ZONE – SEE APPENDIX 7 AND 8 FOR TYPICAL EXAMPLES</li> <li>2. CARRY OUT ON-GOING INSPECTIONS OF THE PROPERTY ACROSS THE 2021 SUMMER GROWING PERIOD, TO VALIDATE THE RESULTS OF THE CURRENT SITE SURVEY, AND TO SCREEN THE SITE FOR ADDITIONAL INVASIVE ALIEN PLANT SPECIES WHICH MAY NOT HAVE FULLY EMERGED AT THE TIME OF THE MAY 2021 SITE INSPECTION, OR WHICH MAY HAVE BEEN DISTURBED DURING LAND MANAGEMENT ACTIVITIES, AND MAY HAVE BEEN INADVERTENTLY MOVED IN SOIL SPOIL MATERIAL TO PREVIOUSLY UNINFESTED LOCATIONS</li> <li>3. UPDATE THIS I.A.P.S. ASSESSMENT REPORT &amp; MANAGEMENT PLAN, AS NECESSARY, FOLLOWING EACH FOLLOW UP SITE SURVEY</li> <li>4. INSTITUTE A MULTI-ANNUAL HERBICIDE TREATMENT PROGRAMME IN EARLY SUMMER 2021, TO COMMENCE THE MANAGEMENT OF KNOTWEED STANDS BK 1, BK 2, HK 1 AND HK2</li> <li>5. FOR THE KNOTWEED LOCATIONS, WHEN THE DEVELOPMENT PROGRAMME BECOMES CLEAR, AN UPDATED MANAGEMENT PLAN SHOULD BE PREPARED TO PHASE OUT THE HERBICIDE TREATMENT PROCESS, AND TO REPLACE IT WITH THE PHYSICAL REMEDIATION OF INFESTED SOILS. THE PRECISE DETAILS AND TIMING OF THIS PLAN IS TO BE BASED ON UP TO DATE SURVEY INFORMATION AND DEVELOPED IN PARALLEL TO THE FINALISATION OF DETAILED PROJECT DESIGN.</li> <li>6. THE CURRENT PREFERRED LONG TERM REMEDIATION SOLUTION WOULD BE FOR THE CONTROLLED REMOVAL OF INFESTED SOILS, FOR OFF-SITE DISPOSAL TO A SUITABLE LICENCED WASTE FACILITY, IN CONJUNCTION WITH THE USE OF VERTICAL ROOT BARRIER MEMBRANES INSTALLED TO PROTECT ANY RETAINED UNDERGROUND WALLS AND STRUCTURES THAT COULD CONTAIN VIABLE KNOTWEED RHIZOME MATERIAL.</li> </ol>		
MANAGEMENT ELEMENTS	INITIAL / MULTI-ANNUAL HERBICIDE CONTROL	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE
	EXCAVATE AND TREAT IN ON-SITE TEMPORARY BUND		CERTIFIED ROOT BARRIER MEMBRANE SYSTEMS
HERBICIDE TREATMENT TECHNIQUE	FOLIAR SPRAY		STEM INJECTION
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB
	<p><b>STEM INJECTION</b> TO CONSIST OF A 2ml DOSE OF UNDILUTED ROUNDUP BIACTIVE XL, OR ALTERNATIVE LICENCED GLYPHOSATE BASED AND AQUATIC APPROVED HERBICIDE, APPLIED FULLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.</p> <p>INJECTION TO BE APPLIED TO ALL SUITABLE HEALTHY KNOTWEED STEMS, AS CLOSE AS POSSIBLE TO THE BASE OF EACH HOLLOW STEM, USING A PROPRIETARY CALLIBRATED INJECTION UNIT AND NARROW GUAGE NEEDLE, WITH HERBICIDE SUPPLIED VIA A PRE-FILLED DISPENSING UNIT. ON-SITE HANDLING OF HERBICIDE TO BE AVOIDED</p> <p><b>SPOT SPRAY</b> TO CONSIST OF A TARGETED DOSE OF ROUNDUP BIACTIVE XL IN SOLUTION, AT A DILUTION RATE OF 1:40, OR ALTERNATIVE GLYPHOSATE BASED AND AQUATIC APPROVED HERBICIDE, APPLIED FULLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.</p> <p>SPRAY TO BE APPLIED ONLY TO SUITABLE HEALTHY KNOTWEED LEAVES, AND APPLIED USING A PROPRIETRY SPRAY UNIT FITTED WITH AN ANTI DRIFT SHIELD. SPRAY ONLY TO BE APPLIED UNDER SUITABLE PREVAILING WEATHER CONDITIONS AND APPLIED AT A RATE AND PRESSURE WHICH MINIMISES RUN OFF FROM THE KNOTWEED LEAVES.</p> <p>SITE HANDLING AND MIXING OF HERBICIDE TO BE AVOIDED TO THE GREATEST EXTENT POSSIBLE</p>		
ADDITIONAL WORKS	CUT AND BAG PLANT MATERIAL		SHRED & DISPOSE OF VIABLE PLANT MATERIAL
HERBICIDE TYPE	APPROVED FOR USE WITH KNOTWEEDS	X	APPROVED FOR USE IN AQUATIC ENVIRONMENTS
BIO-SECURITY MEASURES	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET 5 – 7m SAFETY ZONE AROUND INFESTATIONS
	ADVISE AFFECTED PARTIES / NOTIFY NEIGHBOURS		BRIEF WORKERS AND VISITORS TO PROPERTY
	IF MORE THAN 1 PARTY, AGREE WORKS IN ADVANCE		ONGOING MONITORING AND RECORDING

**SECTION 15 : THREE CORNERED GARLIC & SPANISH BLUEBELL – MANAGEMENT PLAN**

TREATMENT PLAN			
TREATMENT METHODOLOGY	THE PREFERRED SOLUTION FOR MANAGING THREE CORNERED GARLIC & SPANISH BLUEBELL IS :		
<ol style="list-style-type: none"> <li>1. FIT FENCING AND/OR APPROPRIATE SIGNAGE AT THE IDENTIFIED THREE CORNERED GARLIC AND SPANISH BLUEBELL LOCATIONS – SEE APPENDIX 7 AND 8 FOR TYPICAL EXAMPLES</li> <li>7. CARRY OUT ON-GOING INSPECTIONS ACROSS THE 2021 SUMMER GROWING PERIOD, TO VALIDATE THE RESULTS OF THE CURRENT SITE SURVEY, AND TO SCREEN THE SITE FOR ADDITIONAL INVASIVE ALIEN PLANT SPECIES WHICH MAY NOT HAVE FULLY PRESENTED AT THE TIME OF THE MAY 2021 SITE INSPECTION, OR WHICH MAY HAVE BEEN DISTURBED DURING LAND MANAGEMENT ACTIVITIES, AND MAY HAVE BEEN INADVERTENTLY MOVED IN SOIL SPOIL MATERIAL TO PREVIOUSLY UNINFESTED LOCATIONS</li> <li>2. UPDATE THIS I.A.P.S. ASSESSMENT REPORT &amp; MANAGEMENT PLAN, AS NECESSARY, FOLLOWING EACH SITE SURVEY</li> <li>3. INSTITUTE A MULTI-ANNUAL HERBICIDE TREATMENT PROGRAMME, COMMENCING IN SUMMER 2021, CONSISTING OF TWO TREATMENT VISITS PER YEAR, ALL TO BE CARRIED OUT IN ADVANCE OF THE FLOWERING OF PLANTS</li> <li>4. FOR PART OR ALL OF ANY OF THE THREE CORNERED GARLIC AND SPANISH BLUEBELL SITES THAT COULD BE DISTURBED BY ELEMENTS OF ANY PROPOSED DEVELOPMENT, WHEN THE DEVELOPMENT PROGRAMME BECOMES CLEAR, AND WHERE ERADICATION HAS NOT BEEN VALIDATED, A DETAILED MANAGEMENT PLAN SHOULD BE PREPARED TO PHASE OUT THE HERBICIDE TREATMENT PROCESS, AND TO REPLACE IT WITH THE PHYSICAL REMEDIATION OF INFESTED SOILS</li> </ol>			
MANAGEMENT ELEMENTS	MULTI ANNUAL HERBICIDE CONTROL PROGRAMME	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE
	EXCAVATE AND TREAT IN ON-SITE TEMPORARY BUND		CERTIFIED ROOT BARRIER MEMBRANE SYSTEMS
HERBICIDE TREATMENT TECHNIQUE	FOLIAR SPRAY		STEM INJECTION
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB
	<p><b>SPOT SPRAY</b>                      TO CONSIST OF A TARGETED DOSE OF ROUNDUP BIACTIVE XL IN SOLUTION, AT A DILUTION RATE OF 1:40, OR EQUIVALENT GLYPHOSATE BASED AND AQUATIC APPROVED HERBICIDE, APPLIED FULLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.                       HERBICIDE TO BE APPLIED USING A PROPRIETARY UNIT FITTED WITH AN ANTI DRIFT SHIELD, AND THEN ONLY UNDER SUITABLE WEATHER CONDITIONS. THE RATE AND PRESSURE OF THE SPRAY MUST MINIMISE THE RUN-OFF FROM TARGET PLANT LEAVES.</p>		
ADDITIONAL WORKS	CUT AND BAG PLANT MATERIAL		SHRED & DISPOSE OF VIABLE PLANT MATERIAL
HERBICIDE	APPROVED FOR 3 CORNERED GARLIC/SPANISH BLUEBELL	X	APPROVED FOR USE IN AQUATIC ENVIRONMENTS
BIO-SECURITY MEASURES	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET SAFETY ZONE AROUND INFESTATIONS
	MONITOR AND RECORD	X	BRIEF WORKERS AND VISITORS TO PROPERTY

**SECTION 16 : RHODODENDRON – MANAGEMENT PLAN**

TREATMENT PLAN			
TREATMENT METHODOLOGY	THE PREFERRED SOLUTION FOR MANAGING RHODODENDRON IS :		
<ol style="list-style-type: none"> <li>1. FENCE OFF THE IDENTIFIED RHODODENDRON LOCATIONS USING SECURE FENCING AND APPROPRIATE SIGNAGE</li> <li>2. CARRY OUT ON-GOING INSPECTIONS ACROSS THE 2021 SUMMER GROWING PERIODS, TO SCREEN THE SITE FOR ADDITIONAL RHODODENDRON SEEDLINGS, AND UPDATE THIS I.A.P.S. ASSESSMENT REPORT &amp; MANAGEMENT PLAN ACCORDINGLY</li> <li>3. INSTITUTE A MULTI-ANNUAL PHYSICAL &amp; HERBICIDE TREATMENT PROGRAMME, COMMENCING IN SUMMER 2021, CONSISTING OF THE CUTTING AND IN-SITU CHIPPING OF THE ABOVE GROUND RHODODENDRON PLANT MATERIAL, AND THE DIGGING OUT OF THE PLANTS' ROOT SYSTEM TO THE GREATEST EXTENT POSSIBLE. IF THE ROOT, OR PART OF IT, HAS TO REMAIN IN THE GROUND THEN THE RESIDUAL PLANT STUMP SHOULD BE SWAB TREATED WITH APPROVED HERBICIDE. WORKS TO BE CARRIED OUT IN ADVANCE OF THE PLANT FLOWERING PERIOD WHEREVER POSSIBLE</li> <li>4. CONTINUE THE TREATMENT METHODOLOGY IN THE FOLLOWING YEARS AS REQUIRED, INCLUDING THE PULLING OF ALL NEW SEEDLINGS THAT PRESENT THEMSELVES, UNTIL THE REPOSITORY OF VIABLE SEEDS HAS BEEN EXHAUSTED</li> </ol>			
MANAGEMENT ELEMENTS	PHYSICAL & HERBICIDE CONTROL PROGRAMME	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE
HERBICIDE TECHNIQUE	FOLIAR SPRAY		STEM INJECTION
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB
HERBICIDE	APPROVED FOR RHODODENDRON	X	APPROVED FOR USE IN AQUATIC ENVIRONMENTS
BIO-SECURITY MEASURES	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET SAFETY ZONE AROUND INFESTATIONS
	MONITOR AND RECORD	X	BRIEF WORKERS AND VISITORS TO PROPERTY

## SECTION 17 : AMERICAN SKUNK CABBAGE – MANAGEMENT PLAN

TREATMENT PLAN			
<b>TREATMENT METHODOLOGY</b>	THE PREFERRED SOLUTION FOR MANAGING AMERICAN SKUNK CABBAGE IS : 1. FENCE OFF THE IDENTIFIED AMERICAN SKUNK CABBAGE LOCATIONS USING SECURE FENCING AND APPROPRIATE SIGNAGE 2. CARRY OUT ON-GOING INSPECTIONS ACROSS THE 2021 SUMMER GROWING PERIODS, TO SCREEN THE SITE FOR ADDITIONAL EMERGING AMERICAN SKUNK CABBAGE PLANTS, AND UPDATE THIS I.A.P.S. ASSESSMENT REPORT & MANAGEMENT PLAN ACCORDINGLY 3. INSTITUTE A MULTI-ANNUAL PHYSICAL CONTROL PROGRAMME, COMMENCING IN SUMMER 2021, CONSISTING OF DIGGING OUT OF THE PLANT AND ASSOCIATED ROOT SYSTEM, AND DOUBLE BAGGING ALL EVIDENT PLANT GROWTH. PLANT MATERIAL TO BE LEFT ON SITE IN A SEALED HOLDING UNIT, LOCATED IN A SAFE AND CLEARLY DESIGNATED LOCATION, TO ROT DOWN NATURALLY. REMOVAL TO BE IN ADVANCE OF THE FLOWERING AND SEEDING OF PLANTS 4. CONTINUE THE TREATMENT METHODOLOGY IN THE FOLLOWING YEARS, UNTIL THE SEED REPOSITORY IS EXHAUSTED		
<b>MANAGEMENT ELEMENTS</b>	PHYSICAL CONTROL PROGRAMME	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE
<b>HERBICIDE TECHNIQUE</b>	FOLIAR SPRAY		STEM INJECTION
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB
<b>HERBICIDE</b>	APPROVED FOR AMERICAN SKUNK CABBAGE		APPROVED FOR USE IN AQUATIC ENVIRONMENTS
<b>BIO-SECURITY MEASURES</b>	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET SAFETY ZONE AROUND INFESTATIONS
	MONITOR AND RECORD	X	BRIEF WORKERS AND VISITORS TO PROPERTY

## SECTION 18 : TREATMENT PROGRAMME

PROGRAMME	
<b>STAGE 1</b> SPRING/SUMMER 2021	<ul style="list-style-type: none"> <li>DEPLOY BIOSECURITY MEASURES, COMPRISING SECURE FENCING AND ADVISORY / WARNING SIGNAGE</li> <li>CARRY OUT FOLLOW UP SITE SURVEYS, TO INSPECT FOR NEW, EMERGING AND SPREADING I.A.P.S.</li> <li>UPDATE ASSESSMENT REPORT AND MANAGEMENT PLAN, BASED ON OUTCOME OF SURVEYS</li> </ul>
<b>STAGE 2</b> SUMMER 2021	<ul style="list-style-type: none"> <li>CARRY OUT THE FIRST HERBICIDE TREATMENT AT KNOTWEED STANDS , CONSISTING OF STEM INJECTION AND SPOT SPRAYING, AS REQUIRED</li> <li>CARRY OUT TWO HERBICIDE TREATMENTS AT THREE CORNERED GARLIC AND SPANISH BLUEBELL STANDS , CONSISTING OF SPOT SPRAYING,AS REQUIRED</li> <li>CARRY OUT PHYSICAL AND HERBICIDE CONTROL TREATMENTS AT RHODODENDRON STANDS, CONSISTING OF THE CUTTING AND IN-SITU CHIPPING OF THE ABOVE GROUND RHODODENDRON PLANT MATERIAL, AND THE DIGGING OUT OF THE PLANTS ROOT SYSTEM. SWAB THE FRESH CUT STUMP OF ANY RESIDUAL PLANT MATERIAL WITH APPROVED HERBICIDE, APPLIED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS DIRECTIONS. INSPECT FOR, AND PULL, ANY EMERGING RHODODENDRON SEEDLINGS</li> <li>CARRY OUT PHYSICAL CONTROL TREATMENTS AT THE AMERICAN SKUNK CABBAGE STAND, CONSISTING OF DIGGING OUT AND DOUBLE BAGGING OF PLANT MATERIAL, AND ITS PLACEMENT IN A SECURE BULK CONTAINER, LOCATED IN A SAFE AND CLEARLY DESIGNATED LOCATION, AND LEFT TO ROT DOWN ON SITE</li> <li>INSPECT FENCING AND SIGNAGE. CARRY OUR ANY NECESSARY REPAIRS / REPLACEMENT / RE-CONFIGURATION</li> <li>CARRY OUT FOLLOW UP SITE SURVEYS, TO INSPECT FOR NEW, EMERGING AND SPREADING I.A.P.S.</li> <li>UPDATE ASSESSMENT REPORT AND MANAGEMENT PLAN, BASED ON OUTCOME OF SURVEYS</li> <li>IF PLANNING PERMISSION IS GRANTED AND DEVELOPMENT OF THE LANDS IS SCHEDULED, IN ADVANCE OF FULL ERADICATION HAVING BEEN ACHIEVED, PREPARE AND IMPLEMENT A CONSTRUCTION STAGE INVASIVE ALIEN PLANT SPECIES REMEDIATION PLAN, TO FULLY REMEDIATE THE INFESTED SOILS AT THE AFFECTED I.A.P.S. LOCATIONS, IN ADVANCE OF THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES</li> </ul>
<b>STAGE 3</b> SUMMER/AUTUMN 2021	<ul style="list-style-type: none"> <li>RECORD RESULTS OF SUMMER HERBICIDE TREATMENTS AND PHYSICAL CONTROL MEASURES</li> <li>CARRY OUT THE SECOND HERBICIDE TREATMENT AT KNOTWEED STANDS , CONSISTING OF STEM INJECTION AND SPOT SPRAYING, AS REQUIRED</li> <li>INSPECT FENCING AND SIGNAGE. CARRY OUR ANY NECESSARY REPAIRS / REPLACEMENT / RE-CONFIGURATION</li> <li>CARRY OUT FOLLOW UP SITE SURVEYS, TO INSPECT FOR NEW, EMERGING AND SPREADING I.A.P.S.</li> <li>UPDATE ASSESSMENT REPORT AND MANAGEMENT PLAN, BASED ON OUTCOME OF SURVEYS</li> </ul>
<b>STAGE 4</b> SPRING 2022 ONWARDS	<ul style="list-style-type: none"> <li>CONTINUE IMPLEMENTATION OF THE MULTI-ANNUAL HERBICIDE TREATMENT PROGRAMME AND PHYSICAL CONTROL MEASURES, WITH SUFFICIENT TREATMENT, CONTROL AND INSPECTION VISITS, SCHEDULED TO SUIT THE EVOLVING SITE CONDITIONS AND PARTICULAR I.A.P.S. GROWTH CYCLES, AND AS NECESSARY TO ACHIEVE AND VALIDATE FULL ERADICATION OF ALL I.A.P.S. STANDS</li> </ul>

**SECTION 19 : I.A.P.S. – ADDITIONAL CONSTRUCTION STAGE I.A.P.S. MANAGEMENT MEASURES**

REMEDIATION PLAN	
<b>OVERVIEW</b>	<p>NOTWITHSTANDING THE FACT THAT THE I.A.P.S. PRESENT ON THE PROPERTY MAY BE EITHER ERADICATED OR REMEDIATED BY THE TIME CONSTRUCTION ACTIVITIES ARE SCHEDULED TO COMMENCE, THERE IS ALWAYS A RISK TO PROPERTIES FROM THE INTRODUCTION OF I.A.P.S. FROM THE OUTSIDE. THE PRIMARY PATHS OF INTRODUCTION ARE VIA :</p> <ol style="list-style-type: none"> <li>1. PHYSICAL SPREAD OF I.A.P.S. PLANTS FROM ADJACENT / ADJOINING LANDS</li> <li>2. AIRBORNE DISPERSAL OF SEEDS OR OTHER VIABLE I.A.P.S. MATERIAL</li> <li>3. IMPORTED SOILS AND OTHER FILL/LANDSCAPING MATERIALS CONTAINING VIABLE SEED OR OTHER I.A.P.S. MATERIAL</li> <li>4. SOIL ON MACHINERY AND VEHICLES CONTAMINATED WITH VIABLE SEEDS OR OTHER I.A.P.S. MATERIAL</li> <li>5. TOOLS AND FOOTWEAR CONTAINING VIABLE SEED OR OTHER I.A.P.S. MATERIAL</li> </ol> <p>CONSTRUCTION WORKS, BY THEIR NATURE, POSE A HEIGHTENED RISK OF THE INTRODUCTION OF I.A.P.S. ONTO DEVELOPMENT SITES, PARTICULARLY VIA ITEMS 3. – 5. ABOVE. THEREFORE IT IS ADVISED THAT ALL CONTRACTORS, AND SUB-CUNTRACTORS, SHOULD EMPLOY I.A.P.S. MANAGEMENT PROCEDURES AS AN INTEGRAL PART OF THEIR CONSTRUCTION ACTIVITIES, INCLUDING DEVELOPMENT ON THIS PROPERTY</p> <p>FOR INFORMATION PURPOSES, THE SCHEMATIC OF THE DEVELOPMENT PROPOSAL IS INCLUDED BELOW</p>
<b>PRIMARY MANAGEMENT MEASURES</b>	<p>THE CONTRACTOR SHOULD CONSIDER PREPARING A PROJECT SPECIFIC I.A.P.S. STANDARD OPERATING PROCEDURE DOCUMENT, IN ADVANCE OF WORK COMMENCEMENT. THE DOCUMENT SHOULD BE PREPARED BY AN I.A.P.S. SPECIALIST, AND SHOULD COVER THE BIO-SECURITY MEASURES TO BE TAKEN, INCLUDING THE MAINTENANCE OF RECORDS, TO SCREEN FOR THE INTRODUCTION OF I.A.P.S. AND TO ENABLE THEIR TRACING, IF SUCH AN INTRODUCTION OCCURS, INCLUDING :</p> <ul style="list-style-type: none"> <li>• VALIDATION THAT ALL MACHINERY / VEHICLES ARE FREE OF I.A.P.S., PRIOR TO THEIR FIRST INTRODUCTION TO SITE</li> <li>• CERTIFICATION FROM THE SUPPLIERS THAT ALL IMPORTED SOILS AND OTHER FILL/LANDSCAPING MATERIALS ARE FREE OF I.A.P.S.</li> <li>• A REGULAR SCHEDULE OF SITE INSPECTIONS ACROSS THE I.A.P.S. GROWING SEASONS, FOR THE DURATION OF THE CONSTRUCTION WORKS PROGRAMME</li> </ul>



**KYRAN COLGAN**  
Director

16 SEPTEMBER 2021



INVASIVE PLANT SOLUTIONS LIMITED  
The Stationhouse  
Station Road  
Dundrum  
Co. Tipperary  
E34 EK83

T : 086-2621443 / 062-71589  
W : [www.knotweed.ie](http://www.knotweed.ie)  
E : [info@knotweed.ie](mailto:info@knotweed.ie)

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**APPENDIX 1**

Bohemian Knotweed I.D. Sheet

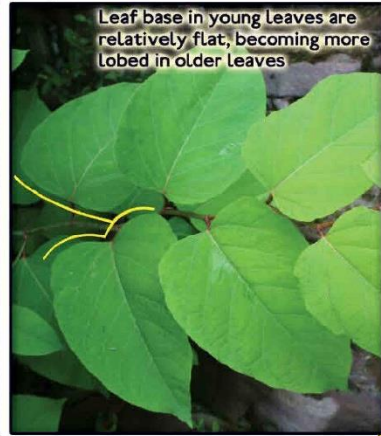


# Bohemian Knotweed

Iascach Intire Éireann  
Inland Fisheries Ireland



Leaves up to 25 cm long, smooth, bright green and with pointed tips



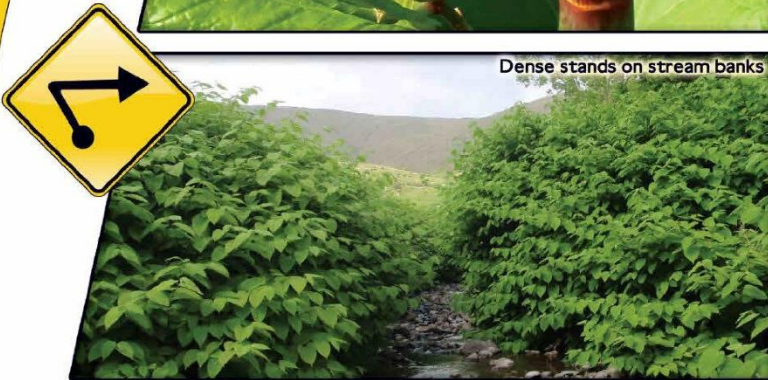
Leaf base in young leaves are relatively flat, becoming more lobed in older leaves



Red / Purple mottled stems



Stems hollow in cross section



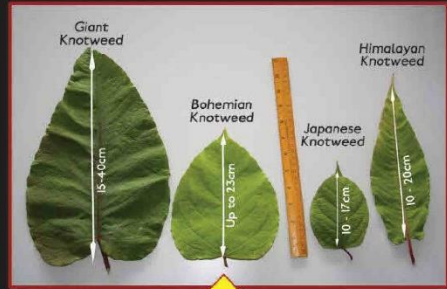
Dense stands on stream banks

Photos: Joe Caffrey (IFI)



Be biosecurity aware! To avoid the risk of introducing and / or spreading harmful aquatic invasive species or pathogens, please clean and disinfect any equipment that has been used or come into contact with water. For best practice guidelines refer to:  
<http://www.fisheriesireland.ie/Invasive-Species/invasive-species.html>

For reporting incidences of invasive species  
**FREEPHONE 1890 34 74 24**



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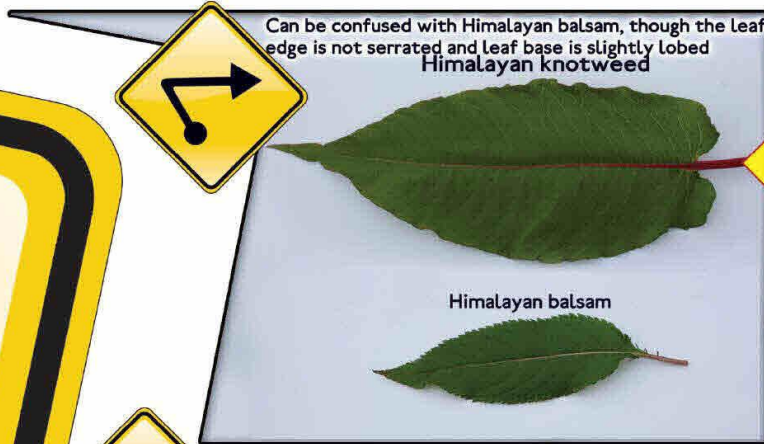
**APPENDIX 2**

Himalayan Knotweed I.D. Sheet





# Himalayan Knotweed

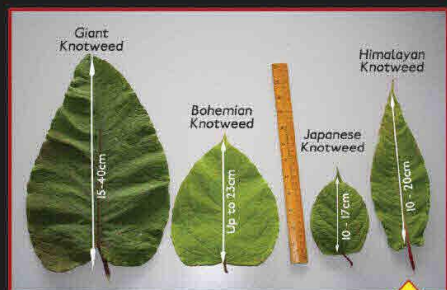


Photos: Joe Caffrey (IFI)



Be biosecurity aware! To avoid the risk of introducing and / or spreading harmful aquatic invasive species or pathogens, please clean and disinfect any equipment that has been used or come into contact with water. For best practice guidelines refer to:  
<http://www.fisheriesireland.ie/Invasive-Species/Invasive-species.html>

For reporting incidences of invasive species  
**FREEPHONE 1890 34 74 24**



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**APPENDIX 3**  
Three Cornered Garlic I.D. Sheet

# Non-Native Garlics

## Species Description

**Scientific names:** *Allium* species

**AKA:** Gerllyg (Welsh)

**Native to:** Mediterranean, Caucasus and Iran

**Habitat:** Roadsides, hedge banks, riverbanks, field margins, rough and waste ground and in woodland

Garlics are perennial herbs with bulbs and grass-like leaves, usually smelling of garlic when fresh and crushed. The most widespread invasive garlics in the UK are Three-cornered Garlic *Allium triquetrum* and Few-flowered Garlic *Allium paradoxum*. Other invasive species include Rosy Garlic *Allium roseum* and Keeled Garlic *Allium carinatum*.

The seeds of Three-cornered Garlic are spread naturally by ants. It was established initially in Guernsey in 1849 and is now naturalised and increasingly abundant and widespread in milder areas of the UK, especially in the south and west, with scattered, sometimes short-lived, populations elsewhere.

Few-flowered Garlic spreads by means of bulbils (small bulbs produced above ground). It was first recorded in the wild near Edinburgh in 1863 and can be very invasive in disturbed habitats. It is increasingly abundant throughout its range, especially in southern Scotland and is most common in the east of Britain.

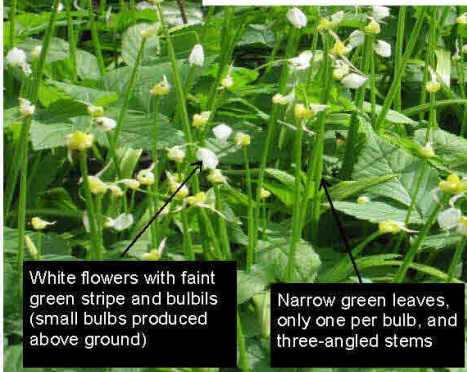
Rosy Garlic was first recorded in the wild in 1837 and is spreading, especially in south-west England. Keeled Garlic has been naturalised since at least 1806, but there is little evidence of a significant increase in range over the last 50 years.



## Key ID Features

### Few-flowered Garlic

Bulbils (small yellow bulbs produced above ground)



White flowers with faint green stripe and bulbils (small bulbs produced above ground)

Narrow green leaves, only one per bulb, and three-angled stems

### Three-cornered and few-flowered garlic

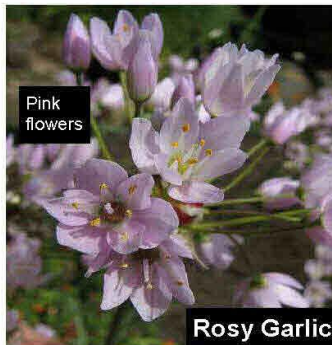


Stem cross section is strongly angled

### Rosy garlic



Stem cross section is round



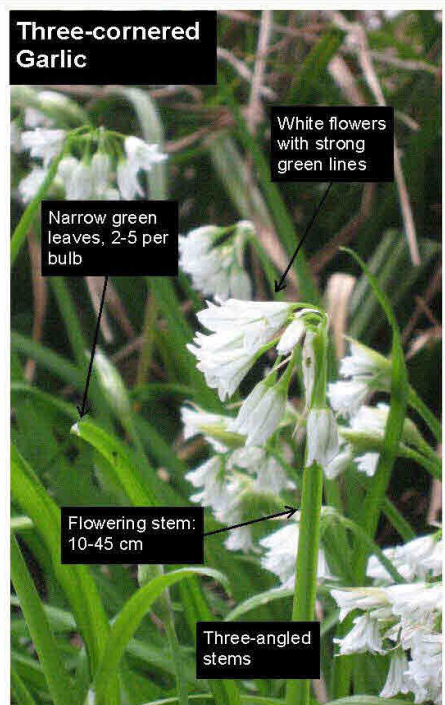
Pink flowers

Rosy Garlic

### Three-cornered Garlic

White flowers with strong green lines

Narrow green leaves, 2-5 per bulb



Flowering stem: 10-45 cm

Three-angled stems

## Identification throughout the year

Three-cornered garlic flowers April to June.

Few-flowered garlic flowers April to May.

Rosy garlic flowers May to June.

Keeled garlic flowers in August.

Leaves are not present over winter as these species die back in cold winters and come up from bulbs in the spring.

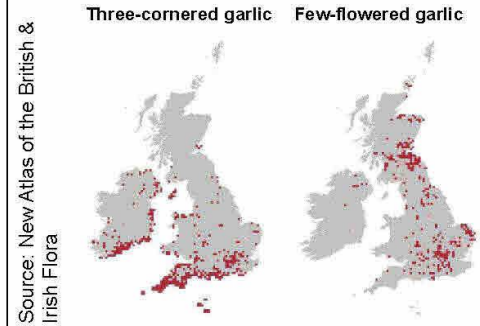
## Distribution

Three-cornered garlic is widespread in milder areas, especially the south-west, and has increased in numbers and range.

Few-flowered garlic has a mainly eastern distribution and is increasing throughout its range.

Rosy garlic is scattered in the south and west and is spreading.

Keeled garlic is scattered throughout the lowlands but does not seem to be increasing.



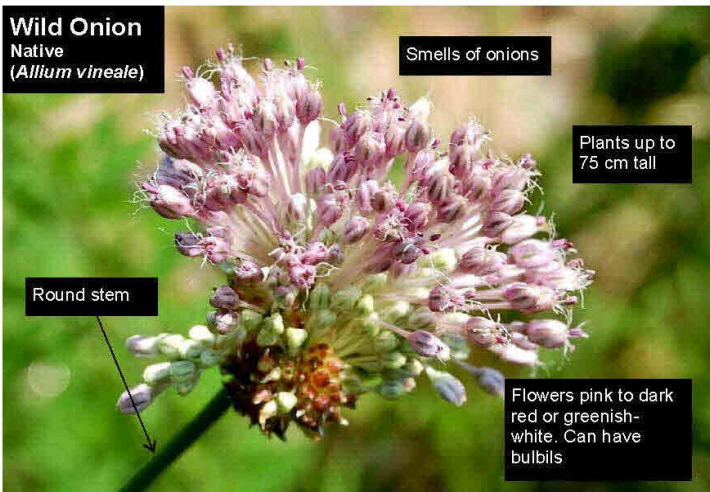
## Similar Species

There are a number of native onion and garlic species in the UK with ramsons and wild onion being the most common. There are many species with leaves which are similar to the non-native garlics but the onion/garlic smell is distinctive.

**Ramsons**  
Native  
(*Allium ursinum*)



**Wild Onion**  
Native  
(*Allium vineale*)



### References and further reading:

Preston *et al.* (2002) "New Atlas of the British & Irish Flora". Oxford University Press

Sell, P & Murrell, G (1996) "Flora of Great Britain and Ireland. Volume 5: *Butomaceae-Orchidaceae*". Cambridge University Press

Stace, C (1997) "New Flora of the British Isles". Cambridge University Press

Photos from: Becky Dewdney-York, Nhu Nguyen, William Vann, Max Wade

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**APPENDIX 4**

Spanish Bluebell I.D. Sheet

WIKIPEDIA

# Hyacinthoides hispanica

***Hyacinthoides hispanica*** (syn. *Endymion hispanicus* or *Scilla hispanica*), the **Spanish bluebell**, is a spring-flowering bulbous perennial native to the Iberian Peninsula. It is one of around 11 species in the genus *Hyacinthoides*, others including the common bluebell (*Hyacinthoides non-scripta*) in northwestern Europe, and the Italian bluebell (*Hyacinthoides italica*) further east in the Mediterranean region.<sup>[1]</sup>

It is distinguished from the common bluebell by its paler and larger blue flowers, which are less pendulous and not all drooping to one side like the common bluebell; plus a more erect flower stem (raceme), broader leaves, blue anthers (where the common bluebell has creamy-white ones) and little or no scent compared to the strong fragrant scent of the northern species. Like *Hyacinthoides non-scripta*, both pink- and white-flowered forms occur.

The Spanish bluebell was introduced in the United Kingdom. Since then, it has hybridised frequently with the native common bluebell and the resulting hybrids are regarded as invasive. The resulting hybrid *Hyacinthoides × massartiana* and the Spanish bluebell both produce highly fertile seed but it is generally the hybrid that invades areas of the native common bluebell. This has caused the common bluebell to be viewed as a threatened species.

The Spanish bluebell is also cultivated as a garden plant, and several named cultivars exist with flowers in various shades of white, pink and blue.


## References

1. *World Checklist of Selected Plant Families* (<http://apps.kew.org/wcsp/home.do>), The Board of Trustees of the Royal Botanic Gardens, Kew, retrieved 2011-07-05, search for "Hyacinthoides"

### General

- The-Tree.org: Bluebell (<https://web.archive.org/web/20060427035443/http://www.the-tree.org.uk/EnchantedForest/WoodlandFlowers/bluebell.htm>) (includes key to identification of hybrids)
- Huxley, A. (1992). *New RHS Dictionary of Gardening* vol. 2: 604. Macmillan.

## External links

-  Media related to *Hyacinthoides hispanica* at Wikimedia Commons

Retrieved from "[https://en.wikipedia.org/w/index.php?title=Hyacinthoides\\_hispanica&oldid=889188975](https://en.wikipedia.org/w/index.php?title=Hyacinthoides_hispanica&oldid=889188975)"

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*Hyacinthoides hispanica*



### Scientific classification

Kingdom:	Plantae
Clade:	Angiosperms
Clade:	Monocots
Order:	Asparagales
Family:	Asparagaceae
Subfamily:	Scilloideae
Genus:	<i>Hyacinthoides</i>
Species:	<i><b>H. hispanica</b></i>

### Binomial name

***Hyacinthoides hispanica***  
(Mill.) Chouard ex Rothm.



**Native bluebells (*Hyacinthoides non-scripta*)**

- Distinctive 'droop' like the top of a shepherd's crook
- Sweet, cool perfume
- Narrow bell-shaped flowers with rolled back tips
- Creamy white pollen

If your bluebells have all of these characteristics then they're native bluebells.



**Spanish bluebells (*Hyacinthoides hispanica*) and hybrids**

- Upright stems
- No scent
- Conical bell-shaped flowers with open tips
- Blue pollen

If the bluebells you see have some or all of these characteristics then they're not a pure native bluebell.

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**APPENDIX 5**

Rhododendron I.D. Sheet



# Rhododendron

## Species Description

**Scientific name:** *Rhododendron ponticum*

**AKA:** Rhododendron

**Native to:** South-west Europe and south-west Asia. UK's stock is believed to come from Spain.

**Habitat:** Common on acid, peaty or sandy soils in woodland, heathland, rocky hill-sides, river banks, gardens and parks

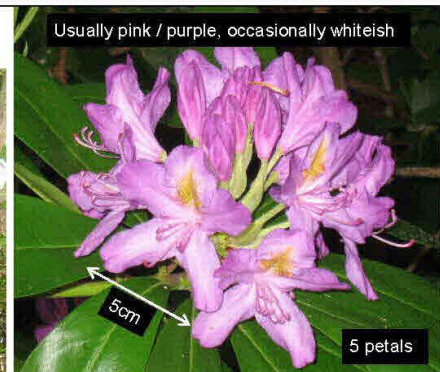
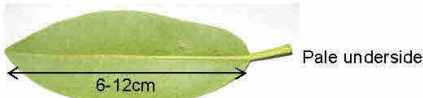
A large evergreen shrub with leathery leaves, attractive purple to pink flowers and solid stems forming into a trunk when mature. Relatively easy to identify, but can be confused with cherry laurel or horticultural varieties of rhododendron. However, horticultural varieties of rhododendron are relatively rarely found in the wild. Spreads by suckers and seed, which are small and carried long distances by wind.

Introduced by gardeners in the late 18<sup>th</sup> century into parks and woodlands, where it was also used for game cover. Still widely planted, particularly by gardeners. Often grows in ecologically sensitive habitats, such as heath, broad-leaved woodland and dunes, where dense growth can considerably alter the structure of the habitat.

For details of legislation go to [www.nonnativespecies.org/legislation](http://www.nonnativespecies.org/legislation).



## Key ID Features



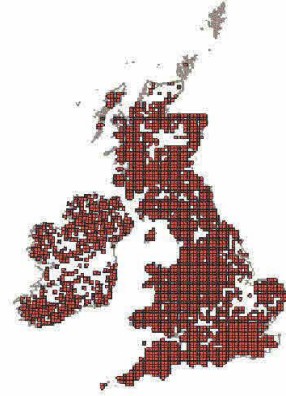
## Identification throughout the year

Varies little throughout the year as leaves are evergreen and woody stems remain the same. Flowers appear May to June followed by seed pods.

## Distribution

Widespread across the whole of the UK, most common in the south and west.

Source: NBN Gateway. Check website for current distribution

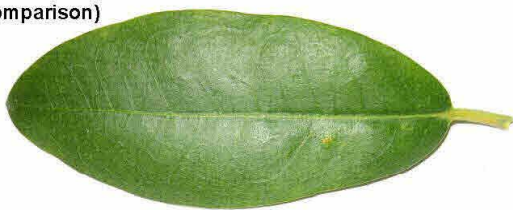


## Similar Species

**Cherry laurel**  
Non-native  
(*Prunus laurocerasus*)



*Rhododendron* leaf  
(for comparison)



Cherry laurel leaf

Toothed edge →



Glossy surface

## Varieties of Rhododendron

There are a large number of highly sought after species and varieties of rhododendron, of which the invasive *Rhododendron ponticum* is just one. It is unusual to encounter other varieties or species outside of planted habitats.

Examples of rhododendron varieties:



References in the further reading list can be used to distinguish between the different varieties if necessary.

### References and further reading:

- Cullen, J (2005) "*Hardy rhododendron species: a guide to identification*". Collins
- Preston, C D and Croft, J M (1997) "*Aquatic plants in Britain and Ireland*". Harley Books
- Preston, C D, Pearman, D A and Dines, T A (editors) (2002) "*New Atlas of the British and Irish Flora*". Oxford University Press
- Stace, C (1999) "*Field Flora of the British Isles*". Cambridge University Press

Photos from: Olaf Booy, David Fenwick, Mike McCabe, Helen Parish

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**APPENDIX 6**

American Skunk Cabbage I.D. Sheet

# American Skunk-cabbage

## Species Description

**Scientific name:** *Lysichiton americanus*

**AKA:** Western Skunk-cabbage

**Native to:** Western North America

**Habitat:** Wet woodland, streamsides, muddy pond margins

Yellow flowers are produced in spring (late March to May) that resemble those of wild arum (lords-and-ladies). They emit a strong odour like that of a skunk. The plant has a basal rosette of stemmed leathery leaves, usually up to about 70cm long. It is a tall herb growing up to 1.5m in height. Green berries are produced in the summer.

American skunk-cabbage needs a wet site but has no specific soil requirements - it can occur in soils from light sand to heavy clay that are acid, neutral or alkaline. It is a hardy perennial lowland plant, but can grow at altitudes of up to 1400m.

Seeds may be dispersed via waterways but also probably by birds and mammals, as occurs in the native range.

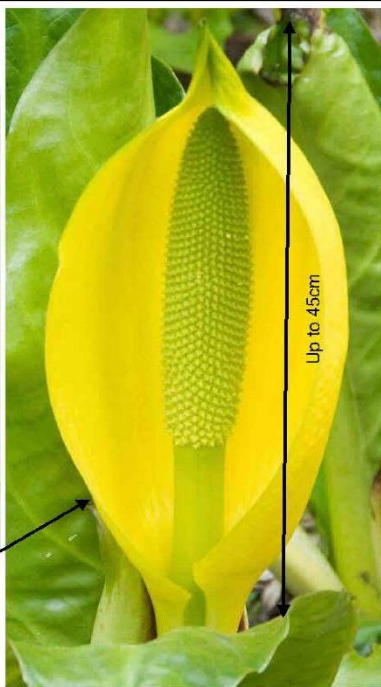
American skunk-cabbage is able to form dense stands and may negatively impact on some native plants, out-competing them by shadowing.



## Key ID Features



1 or 2 (sometimes up to 4) bright yellow spathes (look like large petals)



Up to 45cm



Bright green leathery leaves with light sheen

Rosette of leaves at base of plant

Leaves 40-70cm long (sometimes up to 1.5m)

## Identification throughout the year

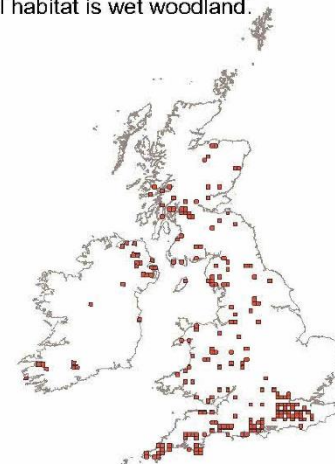
Most easily identified when in flower (late March to May). When not in flower large cabbage-like leaves, often on swamp mud, may be used for identification.



## Distribution

Widespread but not generally common. Its normal habitat is wet woodland.

Source: NBN Gateway. Check website for current distribution



## Similar Species

**Asian Skunk-cabbage**  
Non-native  
(*Lysichiton camtschatcensis*)



White spathe

Very similar plant but slightly smaller. Occurs in similar habitats. Hybrids between American and Asian skunk-cabbages can occur.

Flowers more or less scentless



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**Lords-and-ladies**  
Native  
(*Arum maculatum*)

Green spathe

Purple spadix

Up to 25cm

Arrow-shaped leaves often with dark spots

Smaller than American skunk cabbage

### References and further reading:

Blamey, M, Fitter, R and Fitter, A (2003) "The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora" A & C Black, London

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) "New Atlas of the British and Irish Flora". Oxford University Press

Stace, C (1999) "Field Flora of the British Isles". Cambridge University Press

Photos from: Sannse, RPS and GBNNSS

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**RESIDENTIAL DEVELOPMENT LANDS**

LACKENROE  
GLOUNTHAUNE  
CO. CORK

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**APPENDIX 7**

Sample Site Signage



# Restricted Access

The soil in this area  
contains Japanese Knotweed  
and is being treated.

Do not enter unless authorised.  
Do not remove soil from this  
area without authorisation.

SAMPLE SIGN 1



# Restricted Access

The soil in this area  
contains invasive plant material  
and is being treated.

Do not enter unless authorised.  
Do not remove soil from this  
area without authorisation.

SAMPLE SIGN 2



SAMPLE SIGN 3



SAMPLE SIGN 4



**INVASIVE PLANT SPECIES**  
**DO NOT CUT**  
**DO NOT TOUCH**



**THREE CORNERED GARLIC**



**SPANISH BLUEBELL**



**GIANT RHUBARB**



**HIMALAYAN BALSAM**



invasiveplantsolutions  
www.knotweed.ie

Sureprint

SAMPLE SIGN 5

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**APPENDIX 8**

Sample Site Fencing



**SAMPLE FENCING 1 – POST AND WOVEN MESH FENCING**



**SAMPLE FENCING 2 – HEAVY DUTY HERRAS FENCING**

