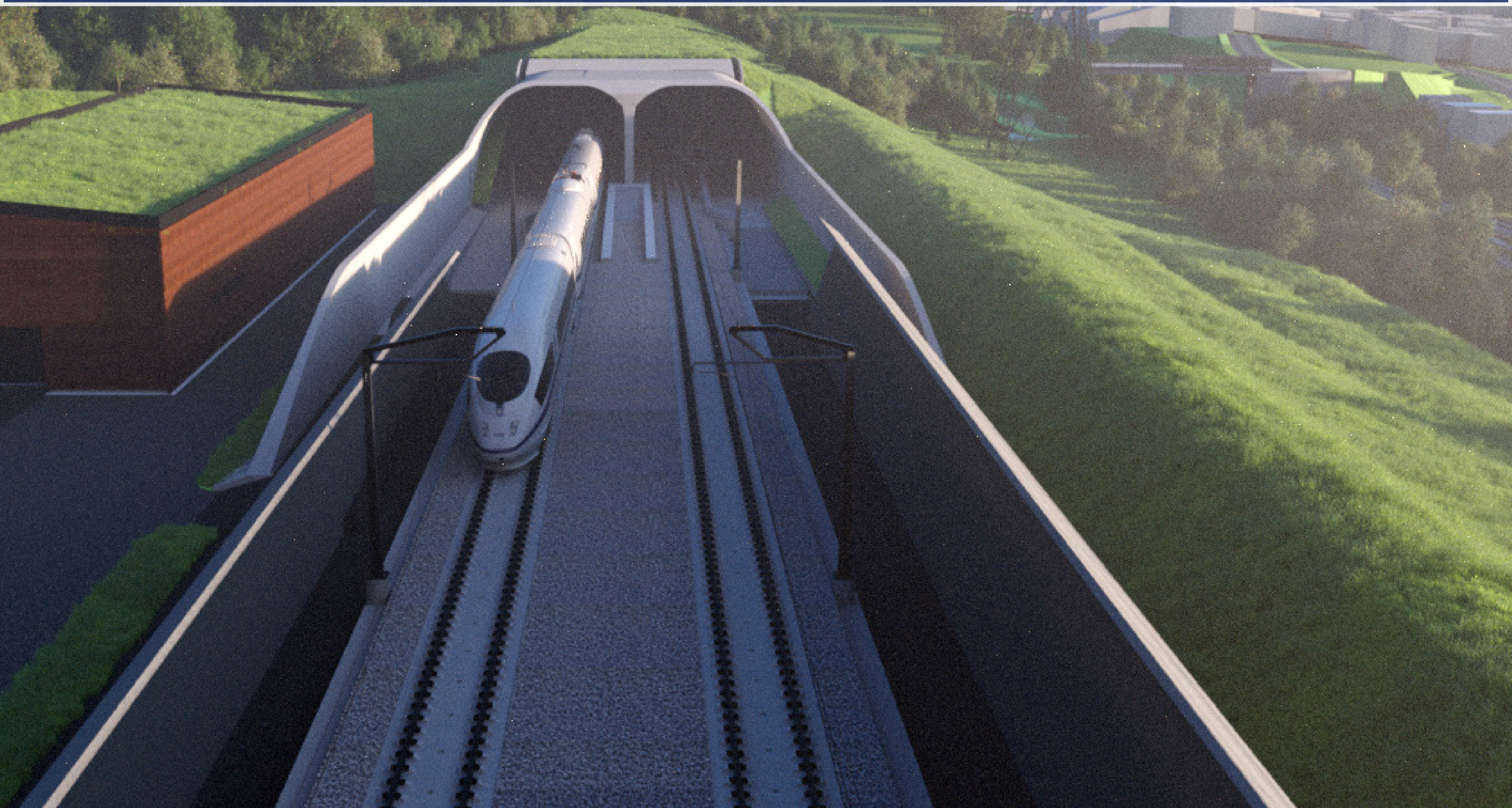
Landscape Elements Strategy

Document no.: 1MC06-CEK-TP-DSH-C002-000001

Rev	Date	Author	Checked by	Approved by	Reason for Issue:	EK Reviewer
P01	16/10/2020	D Stebbings/R Bassindale	R Kitch	A Barbour	For Information	
P02	25/02/2021	C Samdani	D Eustance	A Barbour	For Information	

HS2 SCHEDULE 17 LANDSCAPE DESIGN ELEMENTS STRATEGY DOCUMENT



asc
A High-Speed Design Partnership
ARCADIS SETEC COWI

EKFB

HS2



View at Coombe Hill

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INTRODUCTION

This document sets out key information to support the detailed landscape design vision for HS2 as part of the Schedule 17 application.

This document should be read in conjunction with the relevant Written Statements and drawings which set out the Landscape Design approaches and outline the main landscape design themes in relation to planting design and species selection, landscape earthworks, the landscape response to structures and heritage assets and ecology and the key baseline landscape characteristics of each local character area.

Landscape Design Vision

The landscape vision has taken forward the three core design principles of People, Place and Time as set out in the HS2 Design Vision:

- People - to engage with communities and stakeholders and work collaboratively with other project design disciplines
- Place - to implement good design which responds to the scale and extent of HS2 infrastructure and its components with the local landscape context along the line of route.
- Time - to create a positive lasting legacy and select, where practical to do so materials which stand the test of time.

Approach

The approach has been developed in two parts. Firstly, there are four common route wide principles which have been adopted and then further refined so that the principles respond to the specific requirements of the landscape at the local level. The four common C2 route wide principles are set out below with location specific principles are set out in the relevant Landscape Design Reports.

Design Vision Principles and their design response

Conserve - Through responding to the changing landscape and views along the route and adopt a landscape design approach that creates screening and integration of HS2.

Enhance - The landscape where HS2 is highly visible and adopt a good landscape design approach to create effective integration and screening and provides the opportunity for enhancement of the local clay vale landscape character.

Transform - The landscape where it is in poor landscape condition and through good design bring about positive change and broad environmental benefits.

Collaborative Design - Create a landscape which respects the locally valued distinctiveness of this place, its historic landscape and biodiversity links, and helps set HS2 into the landscape and which fits with the local amenity. Locally, through the implementation of wider good design and negotiation respond to the potential for greater biodiversity links and habitat creation, public access and education

Landscape Planting

The aim of the landscape planting strategy is to reinforce and enhance the existing local landscape features and biodiversity connectivity, and by doing so enable the scheme to integrate with its landscape context. Where possible the landscape planting seeks to reinstate the existing field boundary and lane side hedgerow pattern.

The construction of HS2 will result in severance of the existing hedgerow pattern and the loss of landscape features. Landscape planting scheme will help to knit back the severed landscape, integrate the new large-scale landscape earthworks landforms, the land and track drainage assets This will be achieved through modification of the local hedgerow pattern, introduction of key woodland copses, areas of wildflower grassland and the reinstatement of agricultural fields. The resultant new and retained landscape features will form the basis of the biodiversity connections.

The retention of existing landscape features and the design of new or replacement landscape features will be developed at detail design.

Existing and Retained Vegetation

Where possible existing vegetation is to be retained to provide continuity in amenity value for features associated with important heritage assets e.g. Public Right of Way, for visual screening from important receptors e.g. residential properties and for biodiversity connectivity. Underplanting to the retained vegetation will form part of detail design in order to enhance their species mix, age range and

biodiversity value. The extent of the existing vegetation to be retained is subject to agreement with the Main Works Contractor construction team. The reason for this is the land required for construction such as access, compounds and temporary working areas as well as the footprint of the construction area will conflict with the existing vegetation. Whilst it is important and desirable to retain as much vegetation within the LLAU as possible, the vegetation that can be retained needs to be healthy i.e. is not a health and safety risk to people either working on the site or members of the public on adjacent land, and that adequate space is provided to protect the vegetation and its root system. All retained existing vegetation will be subject to an arboricultural survey and in the event of their unforeseen removal they shall be replaced by new planting which provides the same environmental function and appearance

Proposed Woodland and Hedgerows

The proposed species to be used will be defined by their function and context (including the surrounding soil types and locally prevalent species). Some of the native species plants, particularly where they are associated with key habitat creation sites or adjacent to ancient woodland or other sites of habitat value will be sourced from the seed bank of the locality. Elsewhere native species plant stock will be sourced from commercially available nursery plants. The woodland and hedgerow planting comprise eight elements and have been designed to perform environmental functions for visual screening, biodiversity connectivity and landscape and heritage integration:

• Woodland (quick effect). Native species for visual screening within 15 years and landscape integration.

• Woodland (medium term effect). Native species for biodiversity connectivity within 5 to 7 years and landscape integration.

• Woodland (long term effect). Native species for landscape integration)

• Bushes / Shrubs. Native species for biodiversity connectivity and landscape integration

• Hedgerow habitat planting (quick effect). Native shrub species for visual screening, biodiversity connectivity and landscape integration managed to < 2m height

• Hedgerow habitat planting (high). Native shrub species managed / unmanaged to > 2m height

• Hedgerow habitat planting (regular low). Native shrub species for biodiversity connectivity and landscape integration managed to <1.5m heightLandscape Planting

The aim of the landscape planting strategy is to reinforce and enhance the existing local landscape features and biodiversity connectivity, and by doing so enable the scheme to integrate with its landscape context.

Landscape planting seeks to reinstate the existing field boundary and lane side hedgerow pattern.

The construction of HS2 will result in severance of the existing hedgerow pattern and the loss of landscape features. landscape planting scheme will help to knit back the severed landscape, integrate the new large-scale landscape earthworks landforms, the land and track drainage assets This will be achieved through modification of the local hedgerow pattern, introduction of key woodland copses, areas of wildflower grassland and the reinstatement of agricultural fields. The resultant new and retained landscape features will form the basis of the biodiversity connections.

Proposed Grassland and Wildflower Swards

The proposed grass and wildflower species associated with key habitat creation sites or adjacent to ancient woodland or other sites of habitat value would be sourced locally. Elsewhere the seed mixes will be sourced from commercially available seed mixes which reflect the required species composition.

The grassland and wildflower sward proposals have been designed to perform environmental functions for visual amenity, biodiversity connectivity and integration.

• Aquatic / wetland – Chalk grass and wildflower mix for land drain and track drainage filtration ponds for biodiversity connectivity. Species mix to tolerate a range of conditions as these ponds will be dry for long periods

• Amenity – Chalk grass and wildflower mix for inward slopes of false cuttings to provide visual interest for rail uses and biodiversity connectivity. Species mix to tolerate dry conditions

• Wildflower meadow – Chalk grass and wildflower mix to perimeter of land drain and track drainage filtration ponds for biodiversity benefit

• Infrastructure – Chalk grassland mix for quick establishment on engineered slopes within security fence. Mix to minimise maintenance requirements.

• Scrub – Chalk scrub – Managed natural colonisation of chalk grassland areas with native shrub species.

Drawings- submitted for information and approvals

The Written Statments for each individual section are supported by drawings which illustrate the proposal as the design develops during the Schedule 17 application process. The drawings are submitted for ‘FOR APPROVAL’ in respect of HS2 earthworks, structure, noise barriers, fencing and, also ‘FOR INFORMATION’ in respect of landscape elements such as earthworks, planting and drainage. The drawings will be updated and the landscape elements submitted ‘FOR APPROVAL’ during the Bringing into Use application.

LEGEND

General

- Schedule 17 Application Boundary
- LOD (Limits of Deviation)
- LLAU (Limits of Land to be Acquired or Used
- HS2 Tracks
- PRoW (Public Rights of Way)
- Local Authority Boundary
- Town and Country Planning Application (TCPA) Boundary

Existing Landform Plan

- Major Contour Lines (5m)
- Minor Contour Lines

Proposed Landform Plan

- Existing Major Contour Lines (5m)
- Existing Minor Contour Lines
- Proposed Major Contour Lines (5m)
- Proposed Minor Contour Lines

Earthworks

- Earthworks
- Access Tracks

Drainage

- Drainage Pond Locations
- Drainage Swale Locations
- Drainage Ditch
- CDR — Carrier Drain
- CHD — Rectangular Drainage Channel
- FDR — Filter Drain

Fencing Types (Approval Drawings)

- Proposed Noise Barrier

Demolished Building (Info only)

- Demolished Building

Fencing Types (Information Drawings)

- Stock Proof Fence
- Security Fence Type 2
- Security Fence Type 3
- Security Fence Type 4
- Environmental Barrier
- VRS Barrier

For Information Drawings

- Construction Compound Area
- Site Access Road (Within Application Boundary)
- Site Access Road (Outside Application Boundary)
- Pedestrian Access
- Maintenance Access
- Maintenance Access Parking Bay
- Proposed Realignment & Existing PRoWs routes

Proposed Features

- Viaduct
- Culvert
- Bridge
- Proposed Highway
- Diverted Overhead Pylon
- Retaining Walls

Ecology Ponds

- Ecology Ponds
- Mitigation Areas

HS2 LANDSCAPE KEY PAGE 1 OF 2

Earthworks Cross Sections Details

- Existing Ground Level
- Existing Ground
- Earthworks above Existing Ground Level
- Existing Slope Profile
- Proposed Slope Profile
- Retaining Wall
- Proposed Noise Barrier
- Filtration/ Land Drainage/ Balancing Pond
- Existing Vegetation (Indicative only)

Existing Planting Plan

- Existing Woodland retained/ Protected
- Existing Hedgerows to be retained where possible

Landscape Cross Sections Details

- Existing Ground Level
- Existing Ground
- Earthworks above Existing Ground Level
- Existing Slope Profile
- Proposed Slope Profile
- Retaining Wall
- Proposed Noise Barrier
- Filtration/ Land Drainage/ Balancing Pond
- Existing Vegetation (Indicative only)

Existing Vegetation

- Existing Vegetation

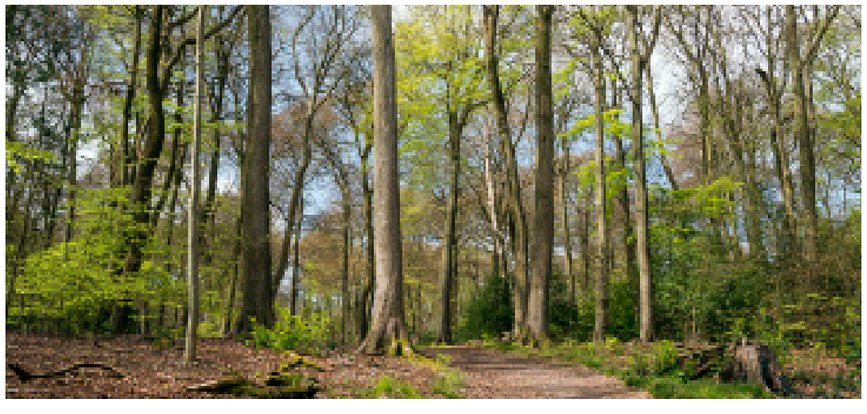
Proposed Retained and Removed Vegetation Plan

- Existing Vegetation retained within LLAU
- Existing Vegetation removed within LLAU

Proposed Planting Plan

- Proposed Woodland
- Proposed Hedgerows
- Proposed Shrubs
- Proposed Scrub
- Proposed Grassland
- Proposed Pond (Land Drainage)
- Proposed Pond (Track Drainage)







HS2 LANDSCAPE KEY PAGE 2 OF 2

HS2 Key - Proposed Planting Types

WQ: Generic Woodland - Quick Effect & Planting

Ecological woodland habitat to compensate for loss of existing woodland habitat, to be planned as early as reasonably practicable within the project programme

WM: Generic Woodland - Medium Term Effect

Landscape mitigation planting for the purposes of integrating the Proposed Scheme into the landscape, generally to commence on completion of civil engineering works

WL: Generic Woodland - Long Term Effect

Landscape mitigation planting for the purposes of integrating the Proposed Scheme into the surrounding landscape

WC: Commercial Woodland

Follows the same principles of the woodland habitat planting type but the details will be seen with the owners

WW: Carr & Woodland proposal

Must align with the wider management approach of the Canal and River Trust and details of planting must be approved on a site by site basis

EW: Edges Woodland

Planting to outer edges of proposed woodland zones or forest edge to act as the transition from an area of woodland/ forest to fields or other open spaces

BS: Bushes/Shrubs - Edges Woodland

Perennial & native woody plants, that have persistent woody stems above ground. Multiple heights and sizes. Evergreen and Deciduous species

SP: Screen Planting - Quick Effect

Landscape mitigation planting for the purposes of screening the Proposed Scheme, to be planted as early as reasonable practicable within the project programme. Is always associated to U&A or EM

SW: Scrub with Wildflower - Landscape Planting

Perennial & native woody plants, that have persistent woody stems above ground. Multiple heights and sizes. Evergreen and Deciduous species

LS: Line Side Vegetation

Specific scrubs or bushes used on track side, within the security fence. Planting to be undertaken under current HS2 Line Side standards. Min 15m from Tracks

FPR Feature Planting - Rural Areas

New coniferous / deciduous parkland and/or scattered tree planting may be used in historic landscapes and parks to reinforce the historic character

FPU Feature Planting - Urban Areas

New coniferous / deciduous parkland and/or scattered tree planting in urban context. Planting Design in urban areas will depend upon the specific landscape design developed for the area

CE: Engineered waterbody / Watercourse planting

Engineered waterbody / Watercourse seeding will, in most instances, be required to have the primary function of stabilizing soils and preventing erosion in wet conditions

Existing Vegetation proposed to be retained





NATIVE WOODLAND PLANTING SPECIES

HS2 Key - Proposed Planting (Hedgerow and Grassland)

HS: Hedgerow Habitat Wooded High Screen Effect

Hedgerow with diverse species without any trimming, is composed of a mix between a shrub layer and tree layer planting for a quick/screen effect we will use bigger plants

HH: Hedgerow Habitat Wooded High - Medium and Long Term Effect

Hedgerow with diverse species without any trimming, is composed of mix between a shrubs layer and tree layer

HQ: Hedgerow Habitat Planting - Quick/ Screen Effect

Hedgerow with diverse species without any trimming, only shrubs layer of medium and low height

HM: Hedgerow Habitat Planting - Medium and Long Term Effect

Hedgerow with diverse species without any trimming, only shrubs layer of medium and low height

HL: Hedgerow Habitat Planting - Regular Low

Hedgerow of one main species trimmed at 1-3m high in a circular shape mainly Elderberry, Hawthorn and Field Maple

HT: Hedgerow Habitat Planting - Regular Low Inc. Trees

Hedgerow of one main species trimmed at 1-3m high in a circular shape plus some feathered hedgerow trees placed informally

RL: Restored Land

Land reinstated to requirements of Land owner or third party requirements

GA: Grassland - Amenity

Grassland area created for public use such as public open space, sport pitches and recreation grounds, it also includes grass for reinstatement of highway verges. Particular care should be taken with the development of sport seed mixes. Grassland/meadow creation which does not have habitat creation as its primary aim but still may reflect local grassland/ meadow communities. This planting type also considers the reinstatement of the wider landscape within the extent of temporary land take required during construction

GW: Grassland - Wildflower Meadow/Ecologist Interest

Wildflower meadows are an alternative to grass seeding area, and can provide a display for Annual meadows that provide a one-off show or perennial meadows that persist from year to year and increase Biodiversity

ME: Grassland - HS2 Infrastructure Grass Planting

Seeding of embankments and cuttings within the security fences

TH: Turf Translocation + Locally Harvested seeds Grassland

Grassland/ meadow habitat creation, including heathland, wet grassland habitat and ecological mitigation pond margins, to compensate for loss of existing grassland/meadow and pond habitats

Listed Buildings

Advanced Planting Area undertaken by Early Works Contractor (EWC)





NATIVE WOODLAND UNDERSTOREY PLANTING SPECIES

HS2 Key - Aquatic Planting Types

AN: Wetland Natural Colonisation

Wetland/Humid zone habitat creation, including heathland, wet grassland habitat and ecological mitigation pond margins, to compensate for loss of existing grassland/meadow and pond habitats

AH: Wetland/ Aquatic plants locally harvested/salvaged

Wetland/Humid zone habitat creation, including heathland, wet grassland habitat and ecological mitigation pond margins, to compensate for loss of existing grassland/meadow and pond habitats

AS: Aquatic / wetland - Standard Commercial Mixes

Wetland/Humid zone habitat creation which does not have habitat creation as its primary aim but still may reflect local grassland/meadow communities. This planting type also considers the reinstatement of the wider landscape within the extent of temporary land the required during construction

SW: Aquatic/ Swale - Standard Commercial Mixes

Swales are part natural landscaping drainage approach, or they can be created to help ensure proper drainage, minimize runoff or capture storm water. In simpler terms, they are generally shallow ditches that have gently sloping sides



Conceptual Infiltration Pond

Standard Slope Treatment



Conceptual Balancing Pond

Standard Slope Treatment



Wetland Plants Marginal Emergent Plants

AQUATIC PLANTING













EXISTING PANORAMIC VIEWS



Beech (*Fagus sylvatica*)

Autumn Winter Spring Summer



Beech Forest

Autumn Winter Spring Summer



Hornbeam (*Carpinus betulus*)

Autumn Winter Spring Summer



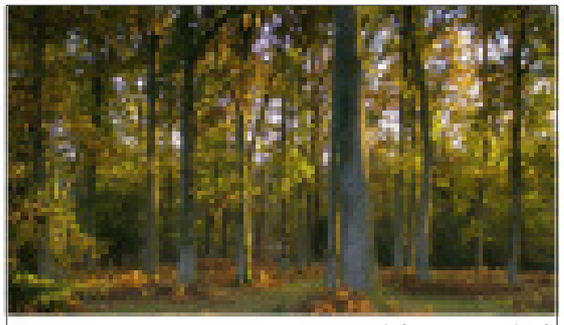
Hornbeam (*Carpinus betulus*)

Autumn Winter Spring Summer



Oak (*Quercus robur*)

Autumn Spring Summer



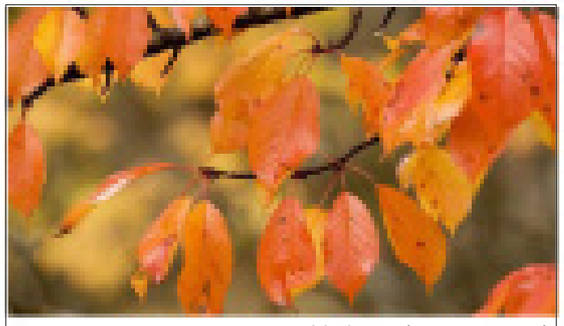
Oak (*Quercus robur*)

Autumn Spring Summer



Wild Cherry (*Prunus avium*)

Autumn Spring Summer



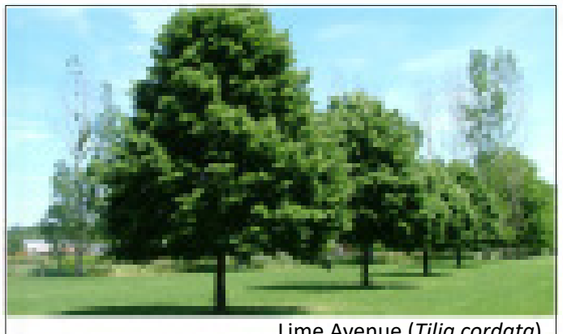
Wild Cherry (*Prunus avium*)

Autumn Spring Summer



Lime Tree (*Tilia cordata*)

Autumn Winter Spring Summer



Lime Avenue (*Tilia cordata*)

Autumn Winter Spring Summer



Holly *(Ilex aquifolium)*

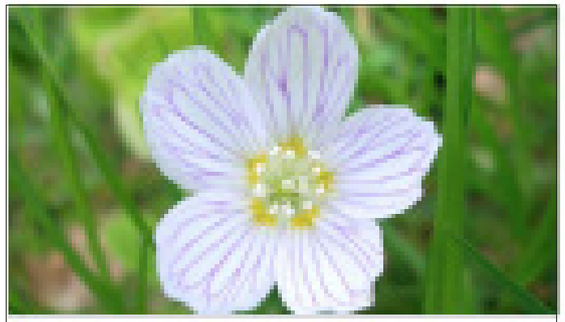
Autumn Winter Spring Summer



Holly *(Ilex aquifolium)*

Autumn Winter Spring Summer

NATIVE WOODLAND PLANTING SPECIES



Wood Sorel (*Oxalis acetosella*)

Autumn | Spring | Summer



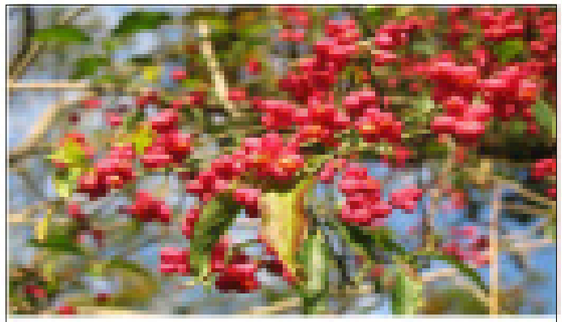
Wood Sorel (*Oxalis acetosella*)

Autumn | Spring | Summer



Spindle Tree *(Euonymus europaeus)* Flower

Autumn | Spring | Summer



Spindle Tree *(Euonymus europaeus)* Fruit

Autumn | Spring | Summer



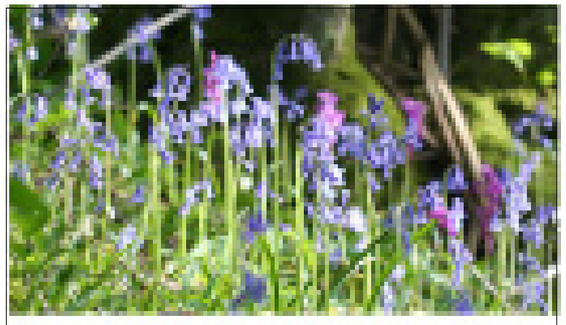
Hellebore (*Helleborus odorus*)

Autumn | Spring | Summer



Hellebore (*Helleborus odorus*)

Autumn | Spring | Summer



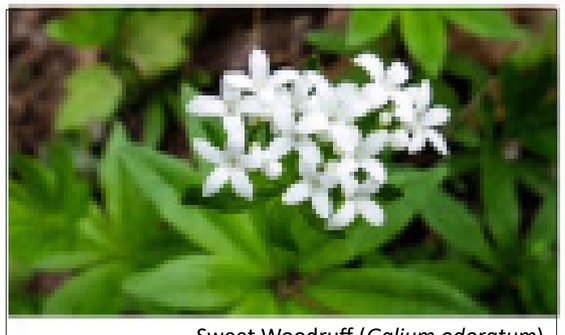
Bluebell (*Hyacinthoides non-scripta*)

Autumn | Winter | Spring | Summer



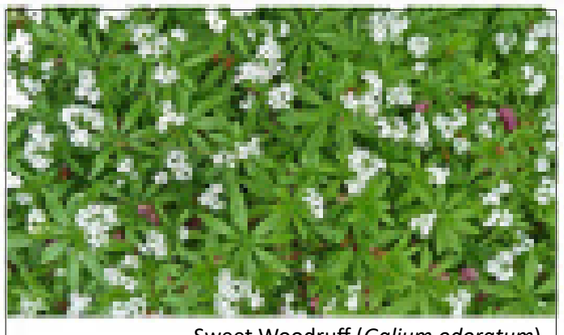
English Bluebell Blue Carpet

Autumn | Winter | Spring | Summer



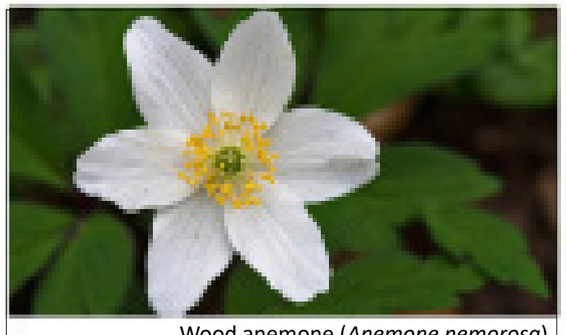
Sweet Woodruff (*Galium odoratum*)

Autumn | Spring | Summer



Sweet Woodruff (*Galium odoratum*)

Autumn | Spring | Summer



Wood anemone (*Anemone nemorosa*)

Autumn | Winter | Spring | Summer



Wood anemone (*Anemone nemorosa*)

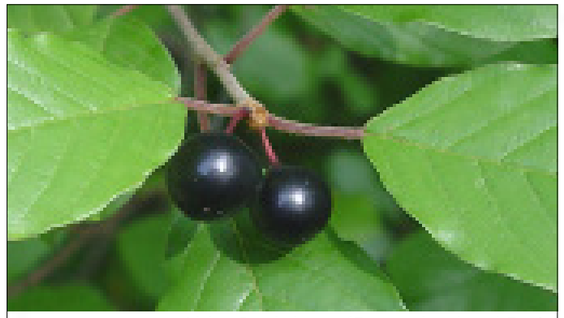
Autumn | Winter | Spring | Summer

NATIVE WOODLAND UNDERSTOREY PLANTING SPECIES



Alder Buckthorn *(Frangula alnus)* Flower

Autumn Spring Summer



Alder Buckthorn *(Frangula alnus)* Fruit

Autumn Spring Summer



Compact Guelder Rose (*Viburnum opulus)* Flower

Autumn Spring Summer



Compact Guelder Rose (*Viburnum opulus)* Fruit

Autumn Spring Summer



Blackthorn *(Prunus spinosa)* Flower

Autumn Spring Summer



Blackthorn *(Prunus spinosa)* Fruit

Autumn Spring Summer



Golden elder *(Sambucus nigra)* Flower

Autumn Spring Summer



Golden elder *(Sambucus nigra)* Fruit

Autumn Spring Summer



Dog Rose *(Rosa Canina)* Flower

Autumn Spring Summer



Dog Rose *(Rosa Canina)* Fruit

Autumn Spring Summer



Blackberry 'Fantasia' *(Rubus fruitocsus)* Flower

Autumn Spring Summer



Blackberry 'Fantasia' *(Rubus fruitocsus)* Fruit

Autumn Spring Summer

NATIVE SHRUB PLANTING SPECIES



Goat willow *(Salix caprea)* Flower

Autumn Winter Spring Summer



Goat willow *(Salix caprea)* Fruit

Autumn Winter Spring Summer



Holly *(Ilex aquifolium)* Flower

Autumn Winter Spring Summer



Holly *(Ilex aquifolium)* Fruit

Autumn Winter Spring Summer



Common gorse *(Ulex europaeus)* Flower

Autumn Winter Spring Summer



Common gorse *(Ulex europaeus)* Fruit

Autumn Winter Spring Summer



Spindle Tree *(Euonymus europaeus)* Flower

Autumn Spring Summer



Spindle Tree *(Euonymus europaeus)* Fruit

Autumn Spring Summer



Common Buckthorn *(Rhamnus catharticus)* Flower

Autumn Spring Summer



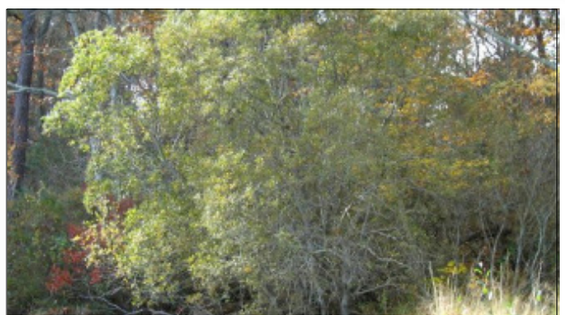
Common Buckthorn *(Rhamnus catharticus)* Fruit

Autumn Spring Summer



Rusty sallow *(Salix cinerea)* Flower

Autumn Winter Spring Summer



Rusty sallow (*Salix cinerea*) shrub

Autumn Winter Spring Summer

NATIVE SHRUB PLANTING SPECIES



HS2 Typical Details

Landscape Earthworks

Maintenance Access Details

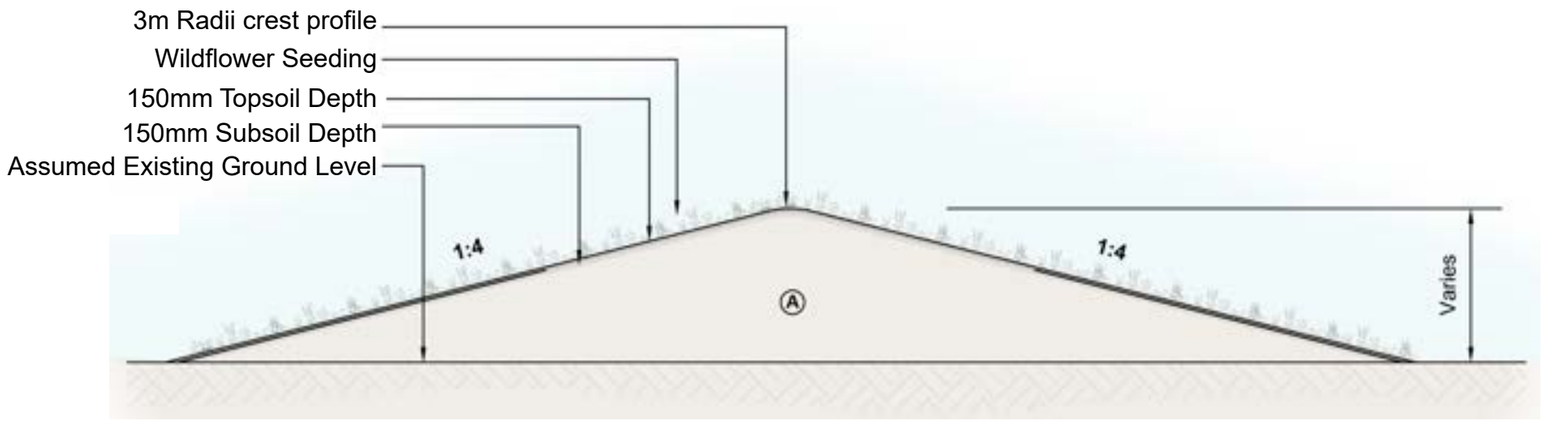
Drainage Details

Fencing Details

Planting Details

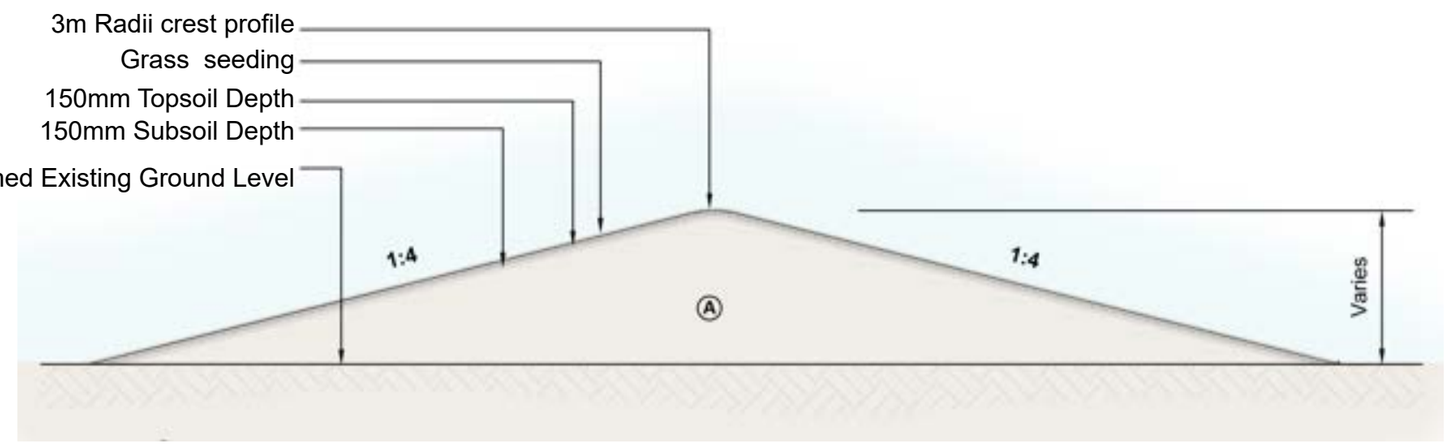
250mm Wildflower Embankment

HS2 Track side



300mm Grass Embankment

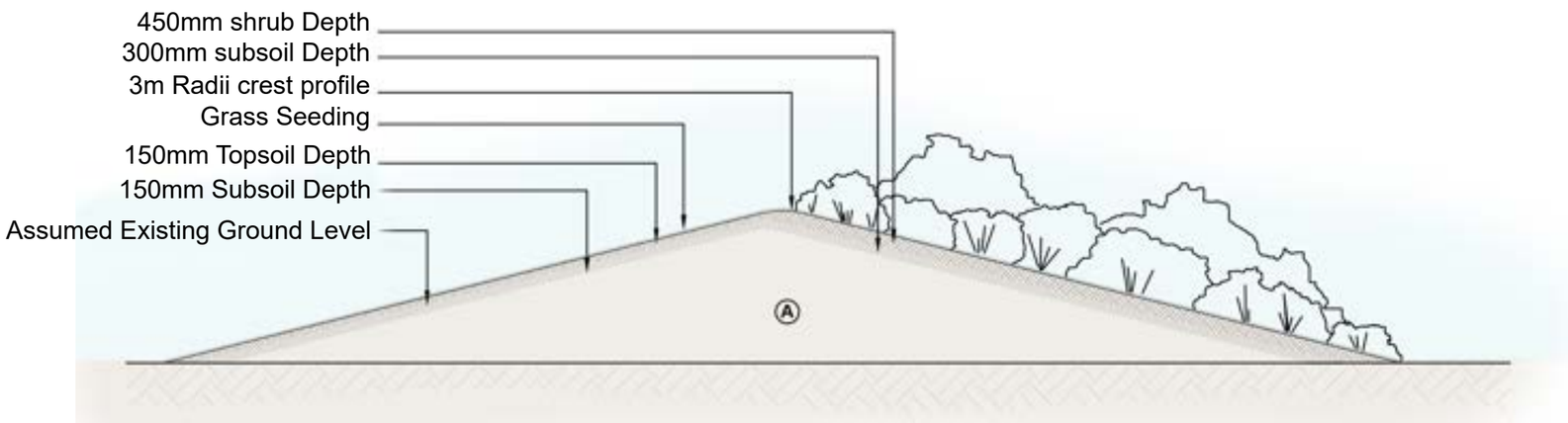
HS2 Track side



LANDSCAPE EARTHWORKS PROFILES

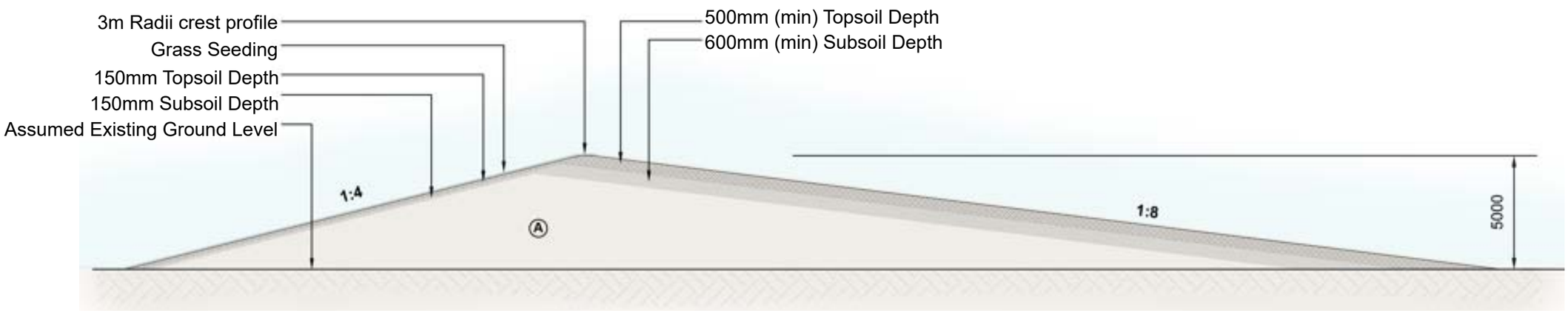
750mm Shrub Planting Embankment

HS2 Track side



1.1m Restored Land Embankment

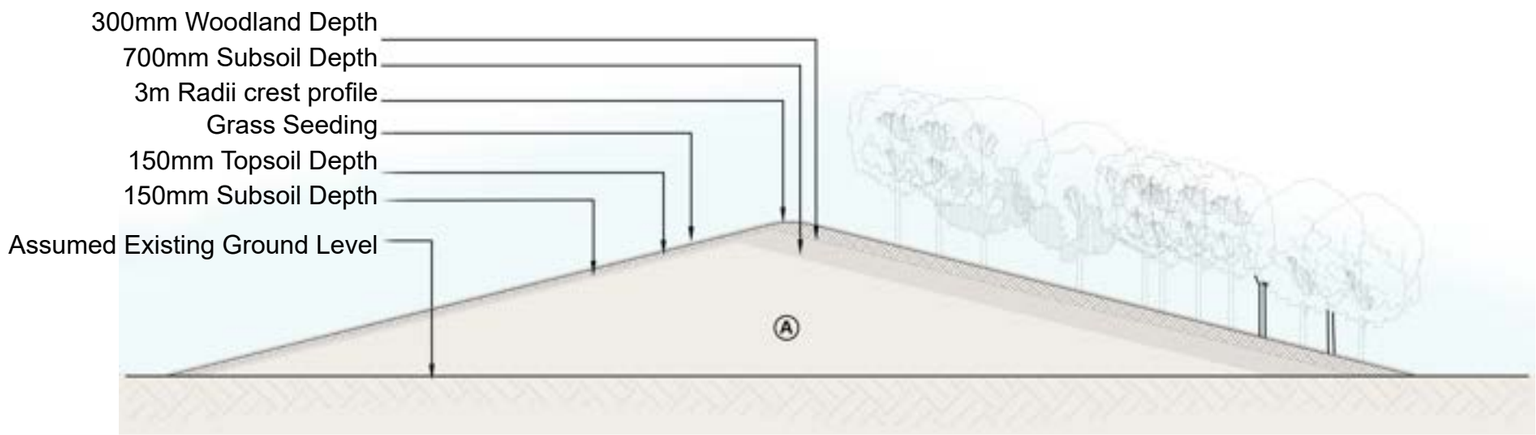
HS2 Track side



LANDSCAPE EARTHWORKS PROFILE

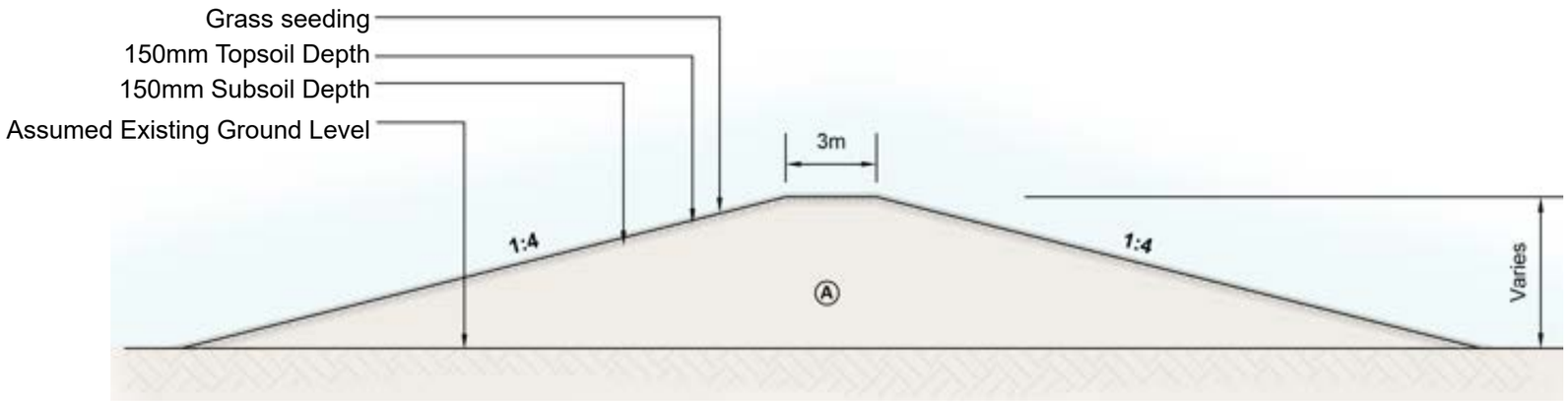
1.0m Woodland Planting Embankment

HS2 Track side

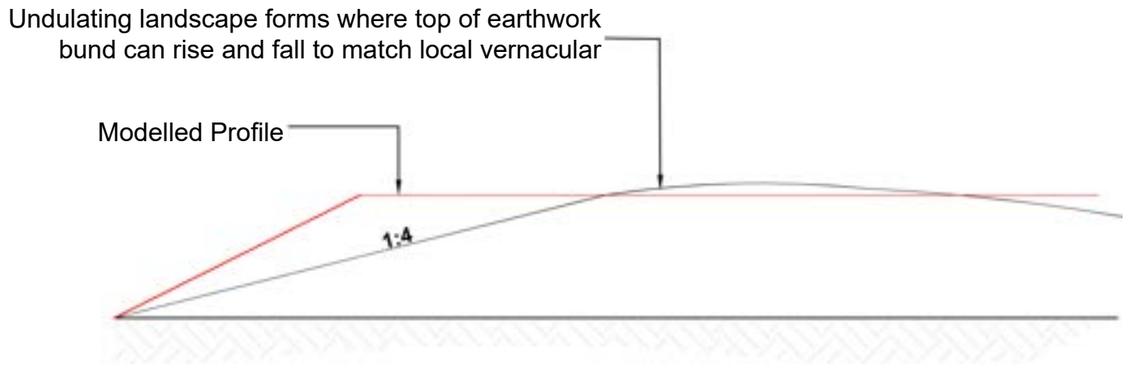


Bridle Path Access Embankment

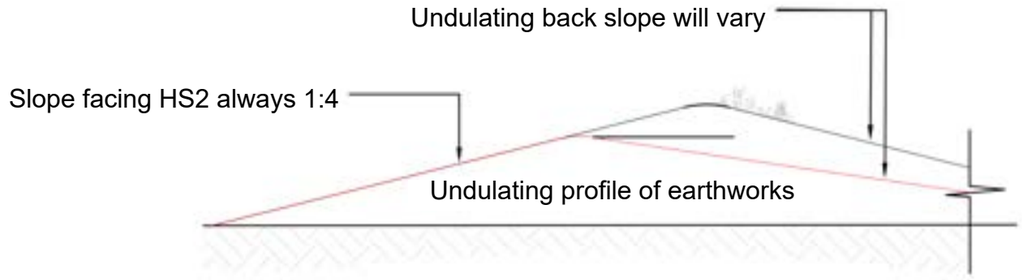
HS2 Track side

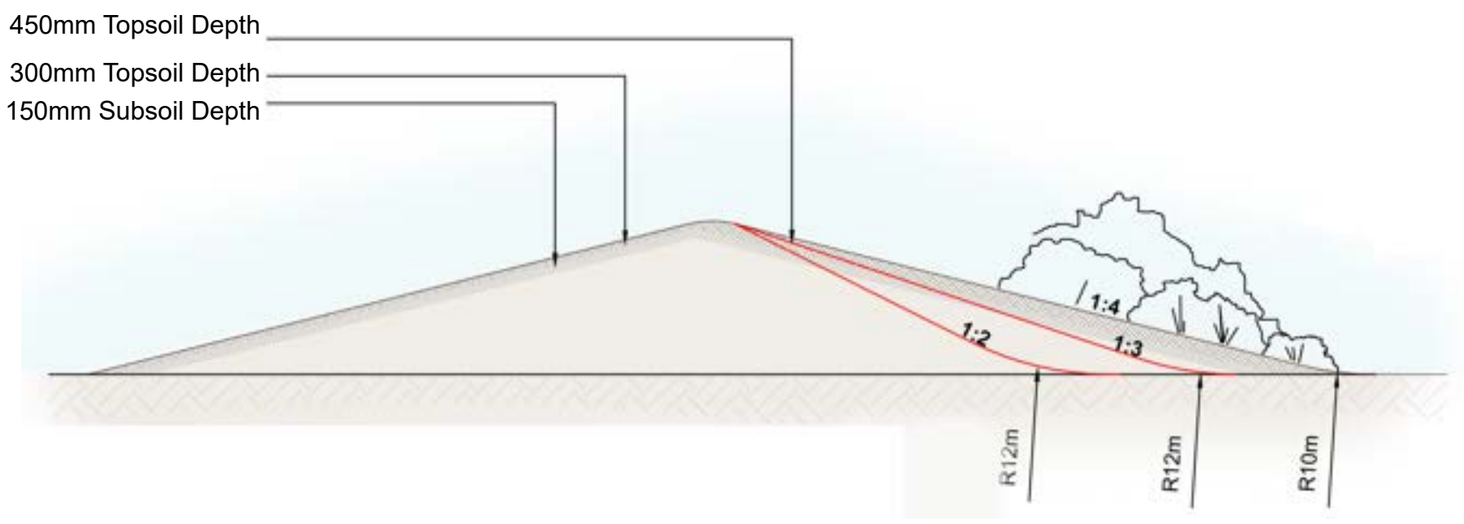


LANDSCAPE EARTHWORKS PROFILE



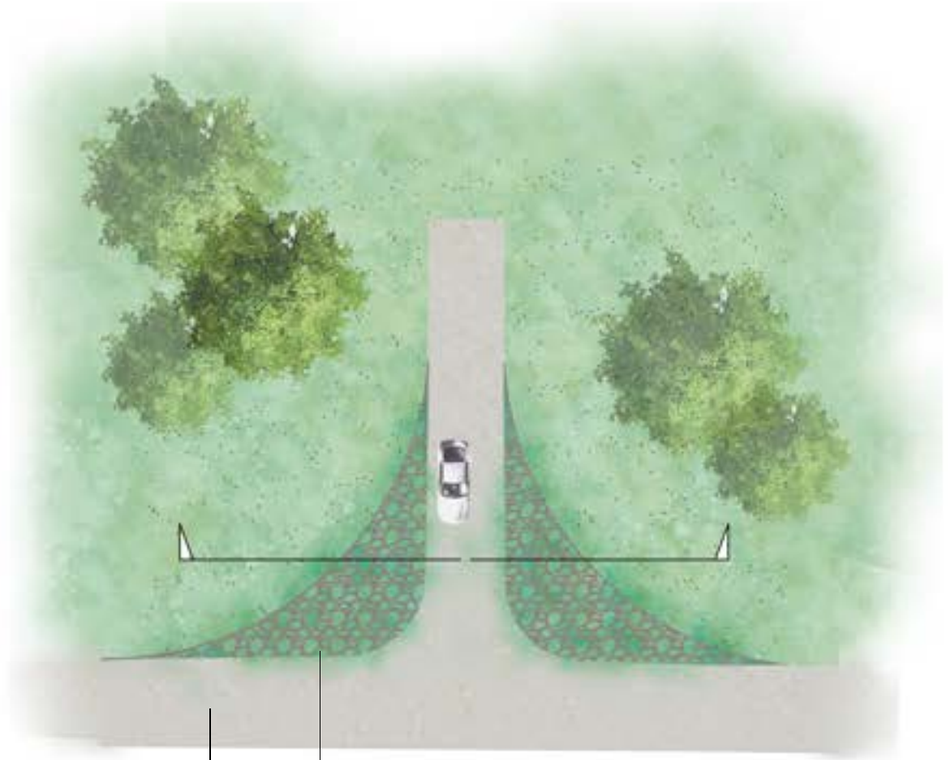
Landscape False Cutting Elevation





Typical Bund Radii Detail

LANDSCAPE EARTHWORKS PROFILE

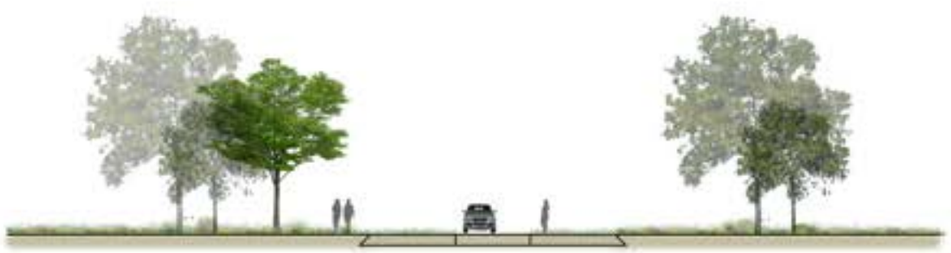


Permeable stone to green up over time

Stone Access Road
Well compacted stone, 3.5m wide to provide access route for maintenance access areas



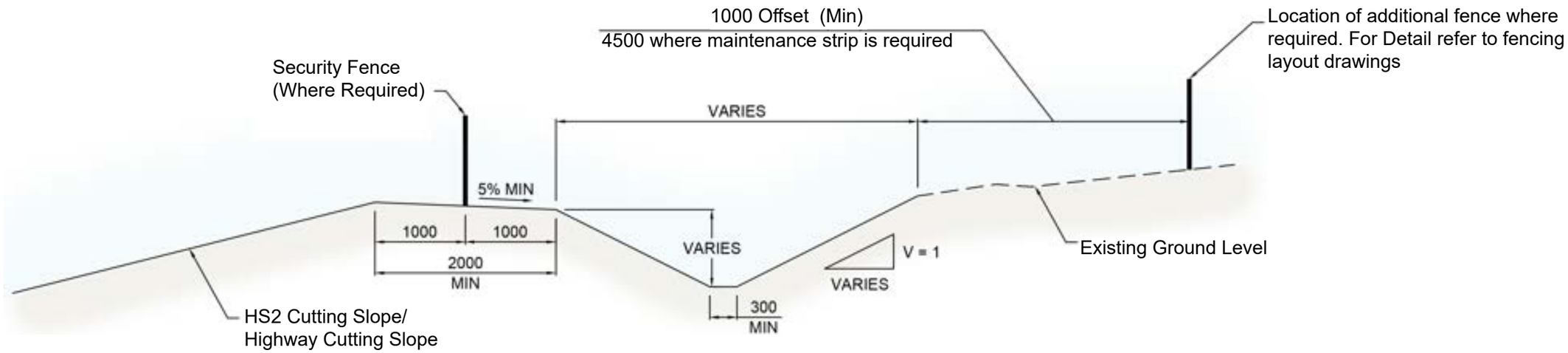
Stone Radii
Lightly compacted stone edge radii to access tracks, this will allow hard standing for vehicle turning and parking but will green up over time to limit the impact of the access track and provide a visual softening.



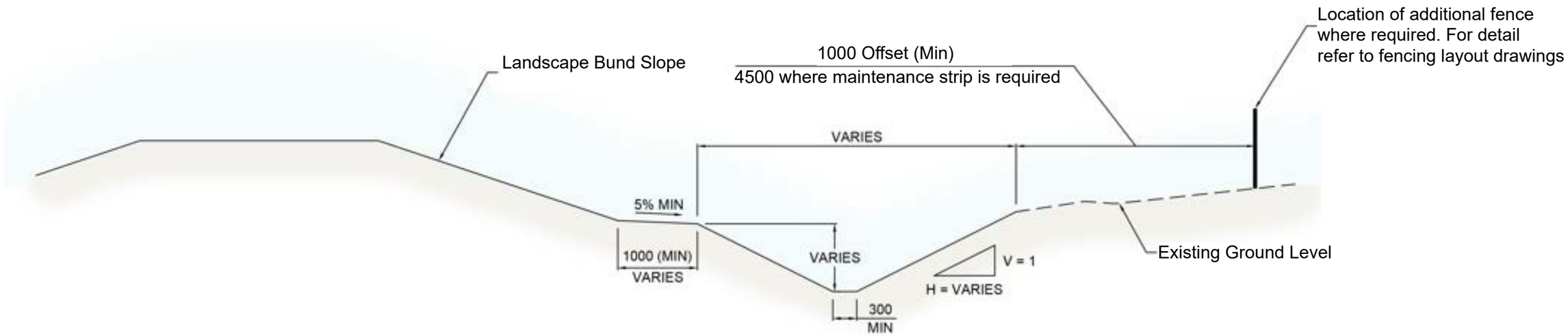
Soft Landscape Area
Soft landscape & grass areas around access routes to blend in with surrounding vernacular



PERMEABLE MAINTENANCE ACCESS ARRANGEMENT

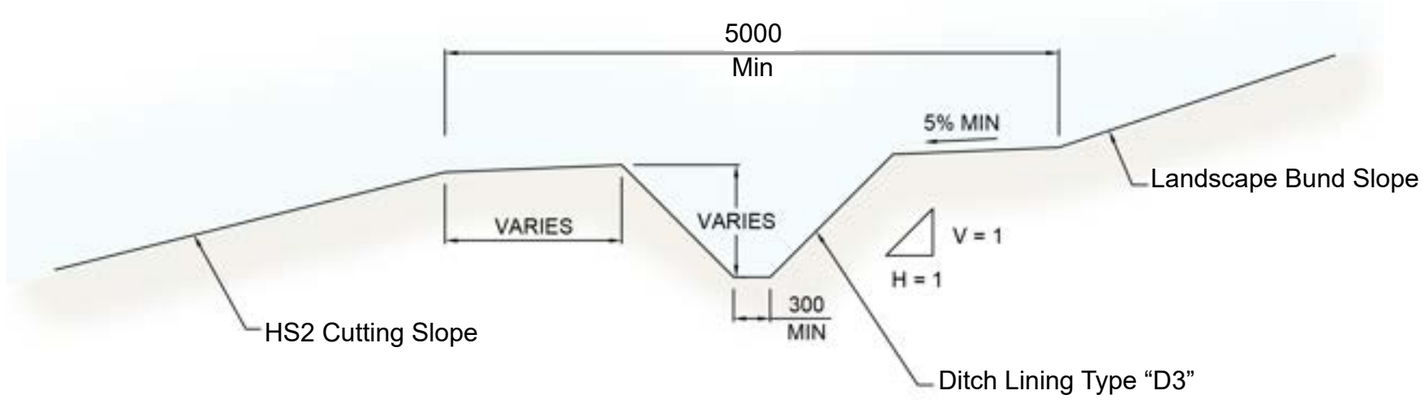


Typical Ditch Layout Adjacent to HS2 Cutting/ Highway Cutting

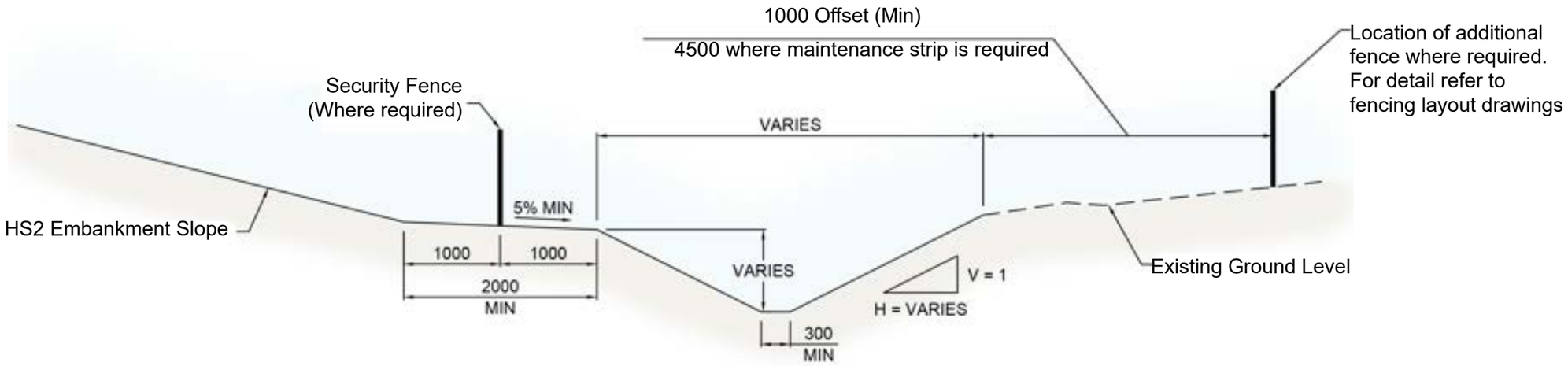


Typical Ditch Layout Adjacent to Landscape Bund

DRAINAGE DITCH PROFILES

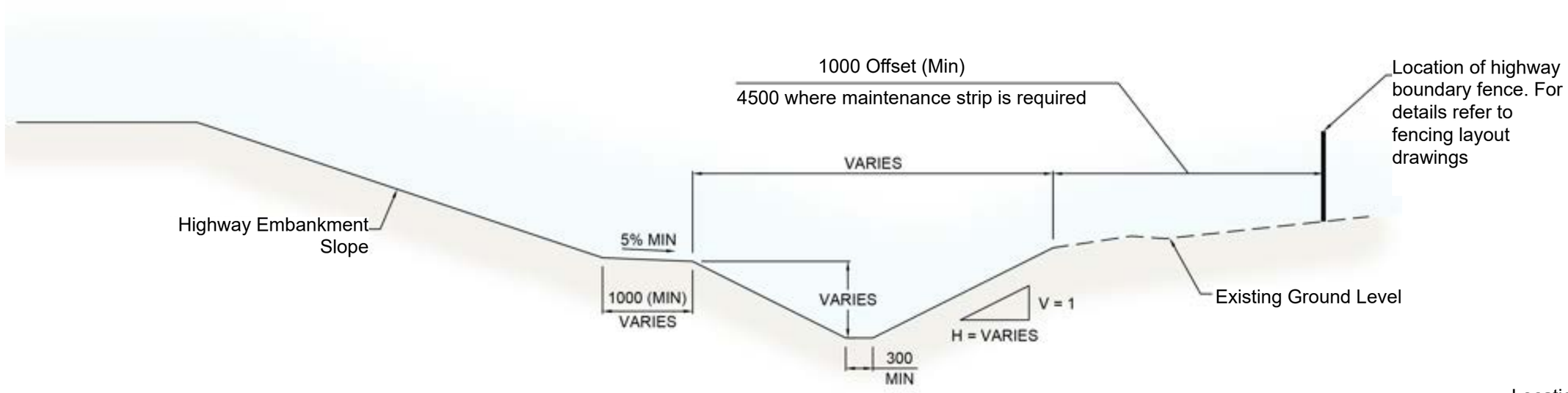


Typical Ditch Layout Between Landscape Bund and HS2 Cutting Slope

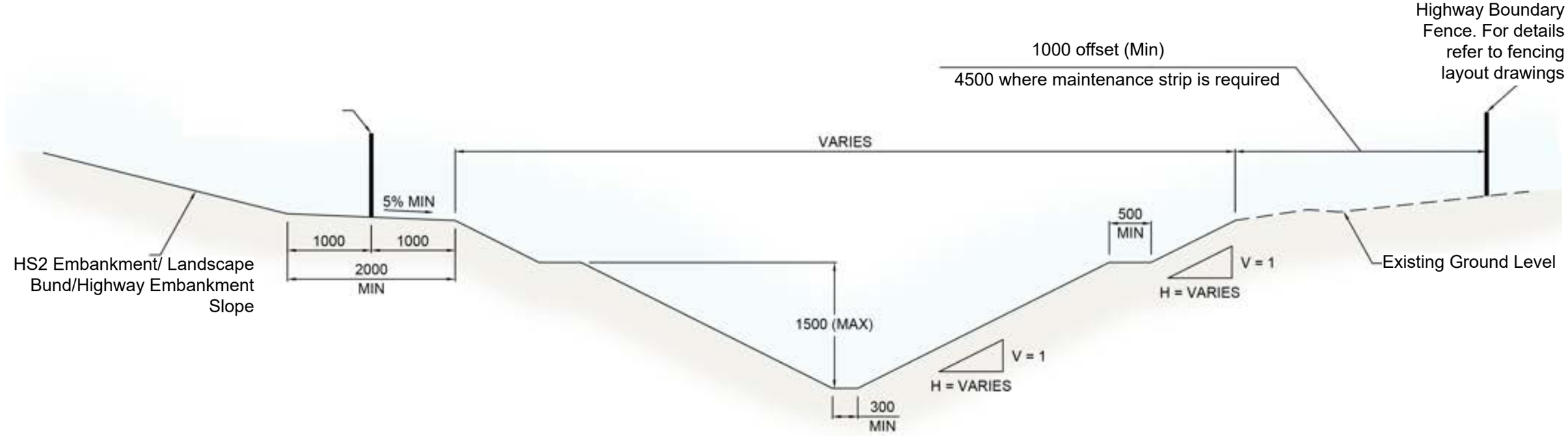


Typical Ditch Layout Adjacent to HS2 Embankment

DRAINAGE DITCH PROFILE

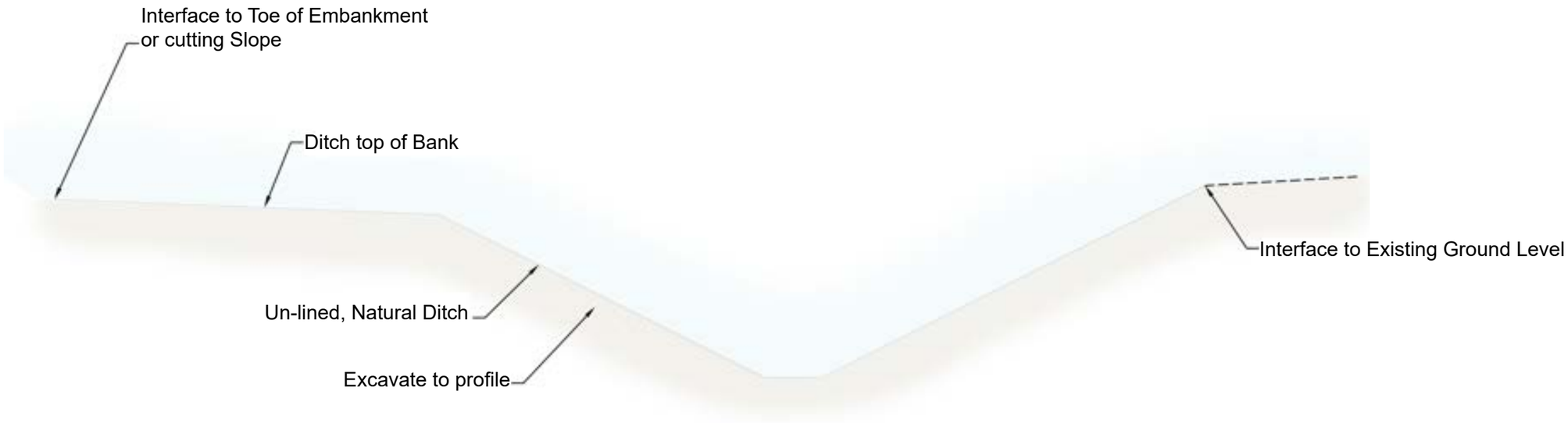


Typical Ditch Layout Adjacent to Highway Embankment

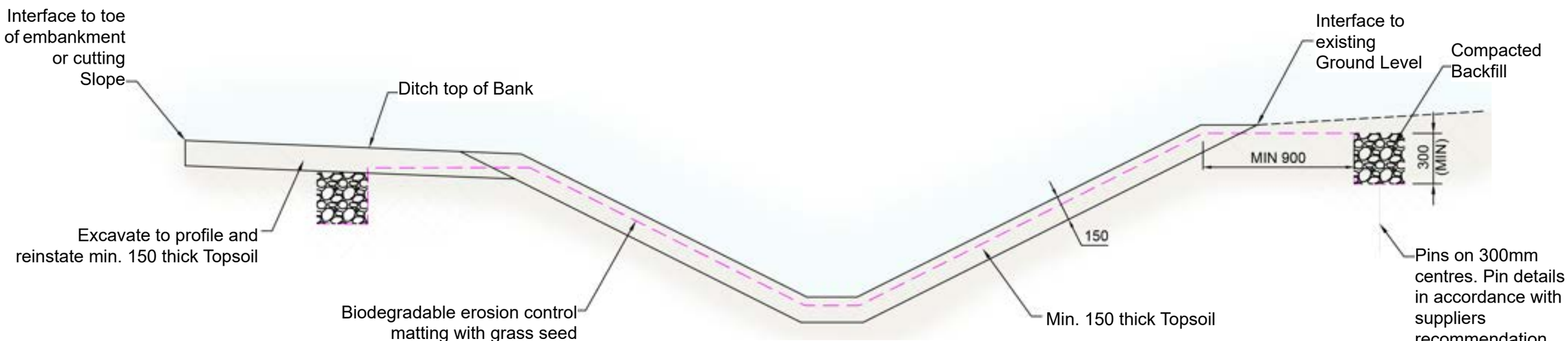


Typical Deep Ditch Layout

DRAINAGE DITCH PROFILE

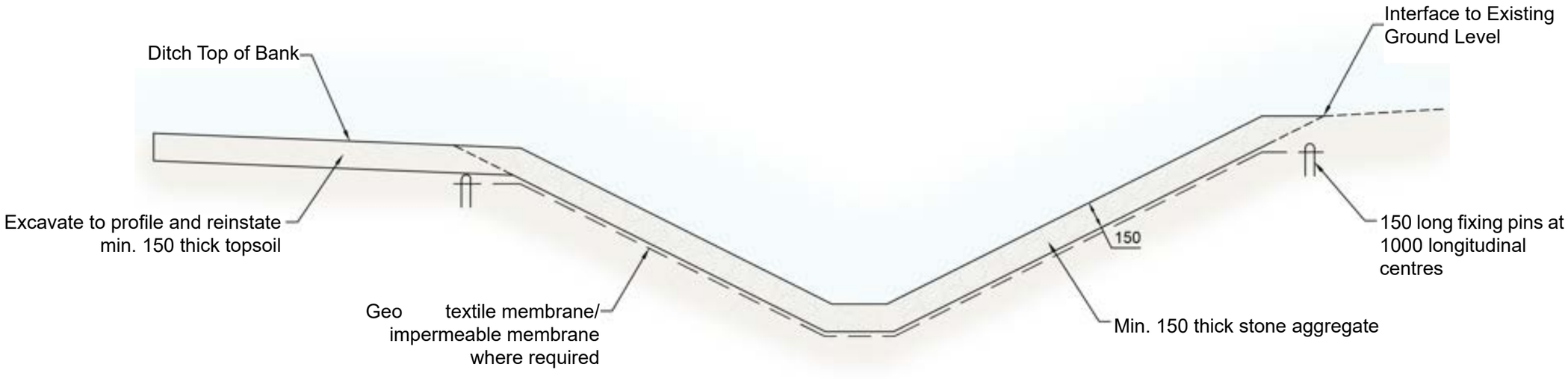


Ditch Lining Type D1
(Earthwork, Un-Lined)

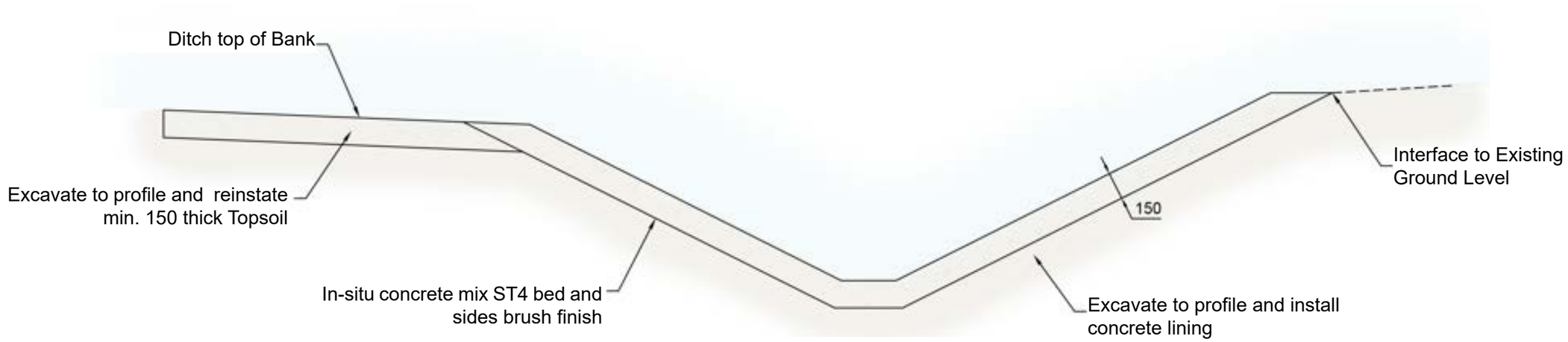


Ditch Lining Type D2
(Topsoil with Erosion Control)

DRAINAGE DITCH PROFILE

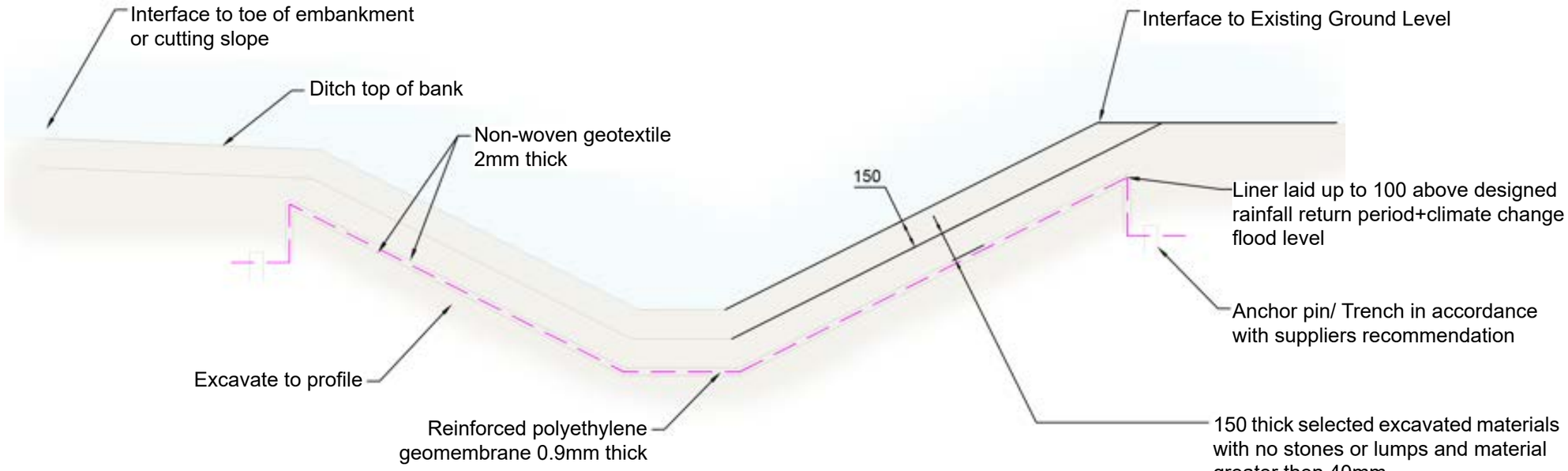


Ditch Lining Type D3
(Stone)

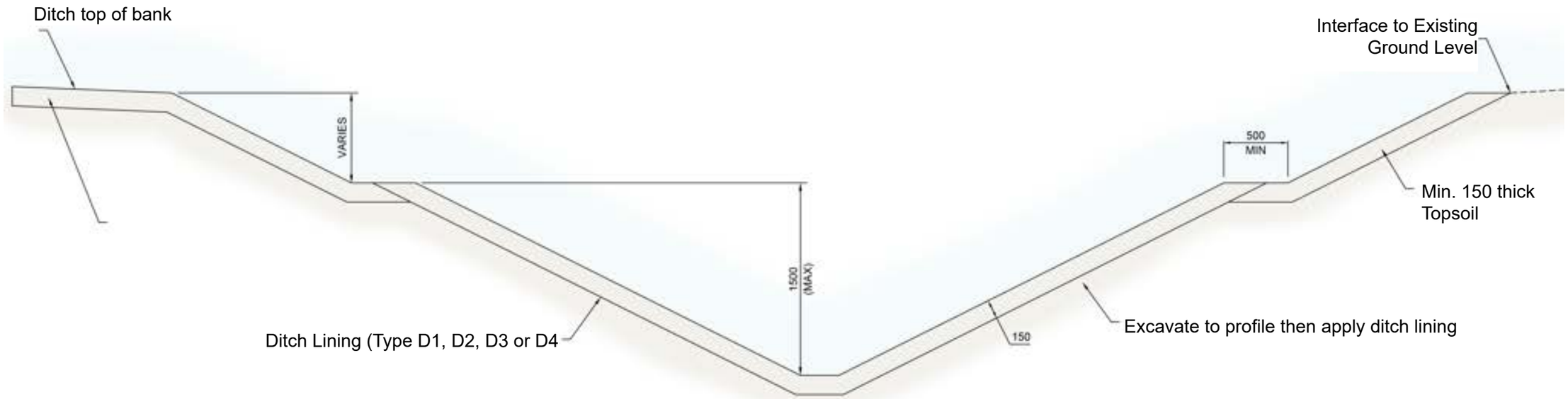


Ditch Lining Type D5
(Mass Concrete)

DRAINAGE DITCH PROFILES



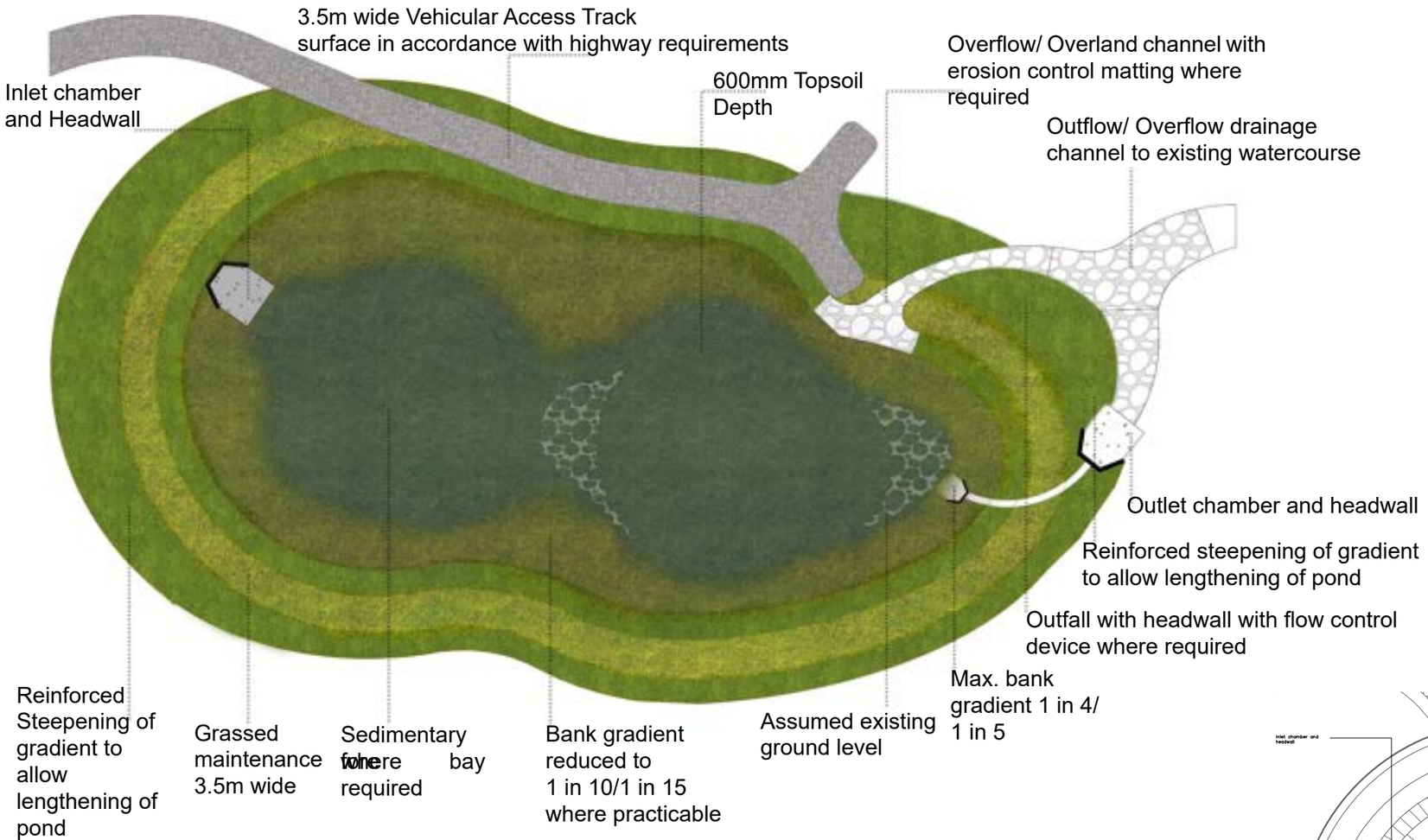
Ditch Lining Type D6 (Bespoke)
(D1 to D5 with impermeable liner)



Deep Ditch Section
(1.5m Maximum Depth)

DRAINAGE DITCH PROFILE

HS2 Typical Details- Drainage



Pond Plan;

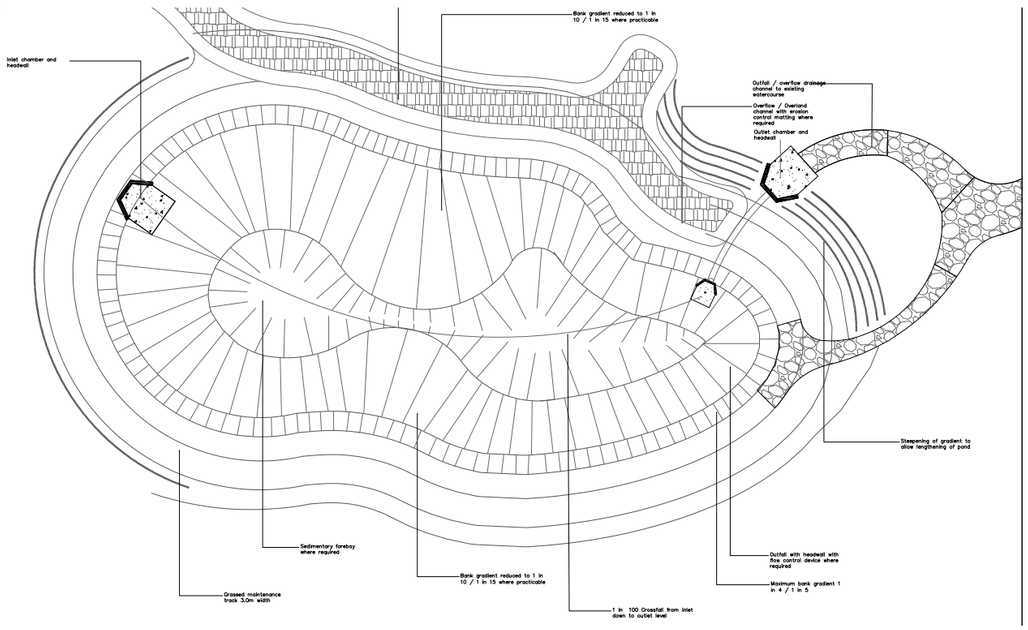
STRATEGY

The HS2 development incorporates ditches and ponds throughout the landscape to drain and store water designed to accommodate land drainage track drainage and highways drainage requirements.

Where possible the design of the ponds will be developed to include a dished base with a gentle gradient to create a flow of water between the inlet and outlet levels. The base of the pond is intended to remain damp and the dished base introduces shallow gradients between 1 in 8 - 1 in 12 which will help promote integration into the landscape and promote biodiversity. The dished base is at a level generally beneath the level of the water storage capacity and does not adversely affect storage volumes. The pond embankments are at a minimum 1 in 4 gradient and depth will vary according to location.

Each pond requires an access track 3.5m width and the design has been rationalised to combine part of the grassed access surround with the unbound stone access track to avoid duplication. The unbound stone surfaced track must extend as far as the outlet chamber for maintenance purposes. Turning is to be provided at this point to allow safe vehicular egress from the site. Each pond requires a 3.5m width grassed access track around the pond for planned maintenance activity such as dredging or vegetation removal. The ponds have an inlet pipe and headwall, and outlet chamber and headwall to the outfall pipe and an overflow which connects to a land drainage ditch . The overflow channel potentially forms part of the bund which may retain the pond and would be constructed from durable materials designed to prevent erosion in a flood event.

The pond is not designed to hold a permanent water body however there will be depressions and channels formed to facilitate the flow of water from inlet to outlet and this will be sown with a wet grassland sward mix appropriate to the pond setting.



POND LAYOUT DETAILS

HS2 Typical Details - Fencing

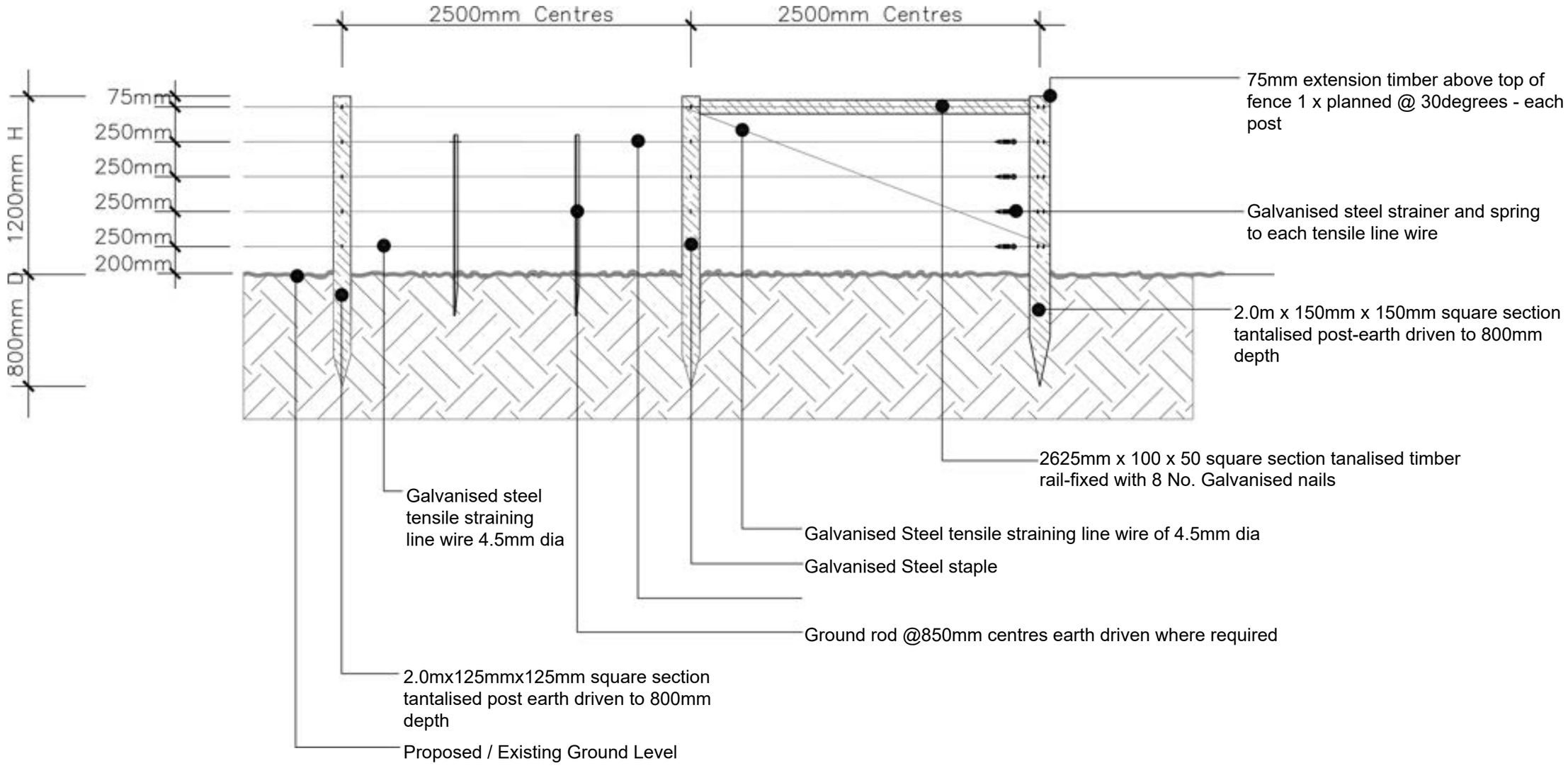




Photo 1: Timber Strainer Detail



Photo 2: Mesh and 2 strained barbed wires



Photo 3: Corner post strainer detail

FENCE DETAIL- STOCKPROOF FENCE

HS2 Typical Details - Fencing



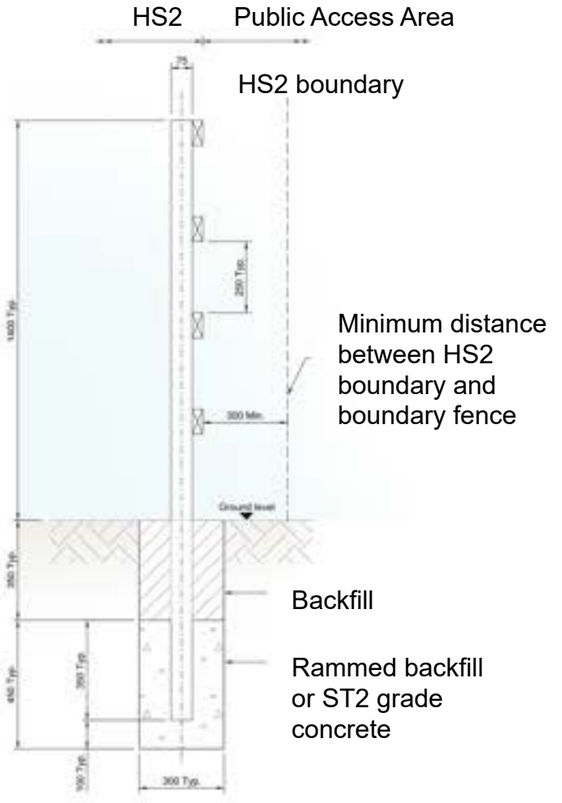
Photo 1: Curved Detail



Photo 2: 4 x Rails Post and Rail Detail



Photo 3: Fixing Detail



FENCE DETAIL-POST AND RAIL FENCE

HS2 Typical Details - Fencing

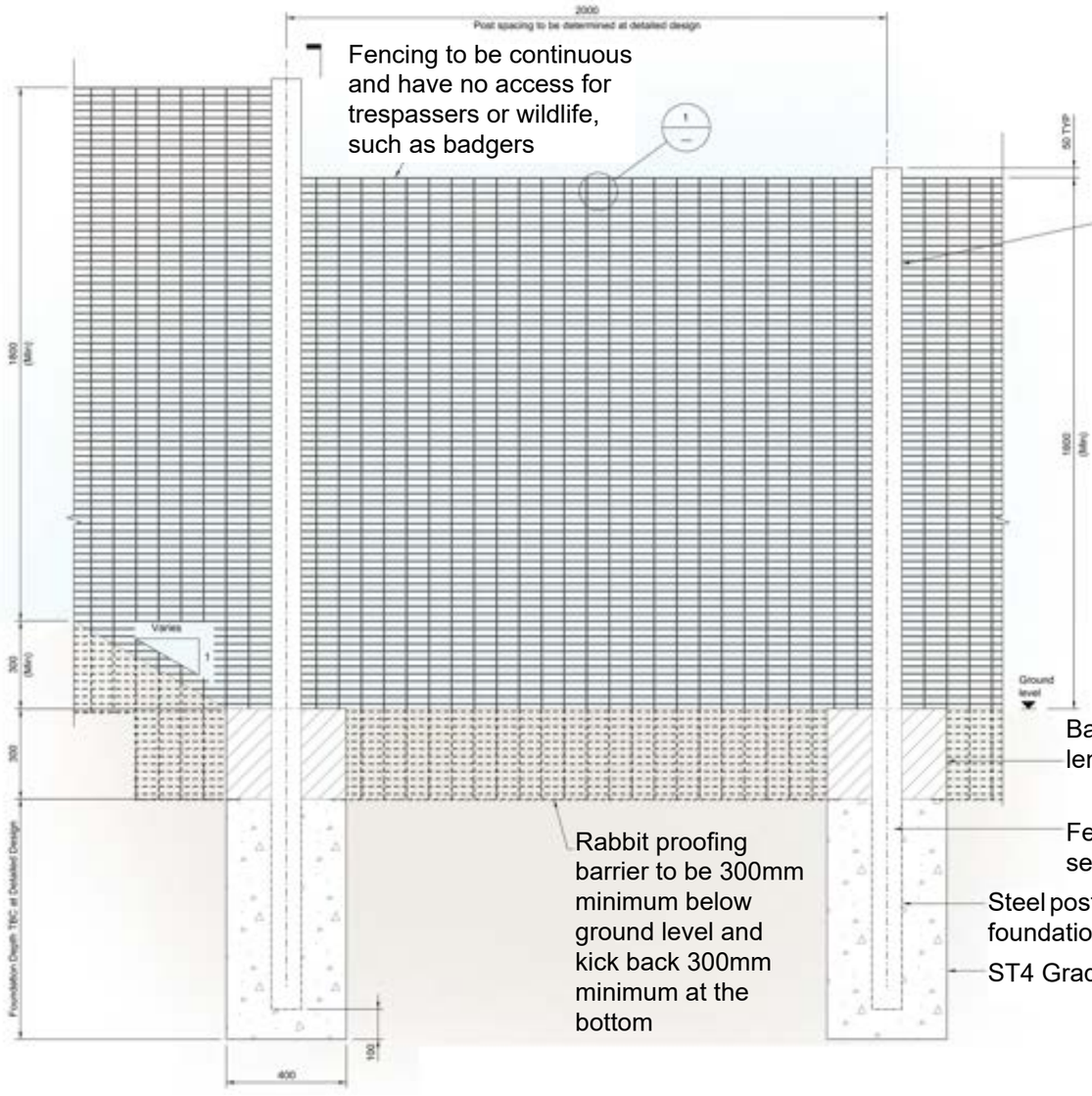
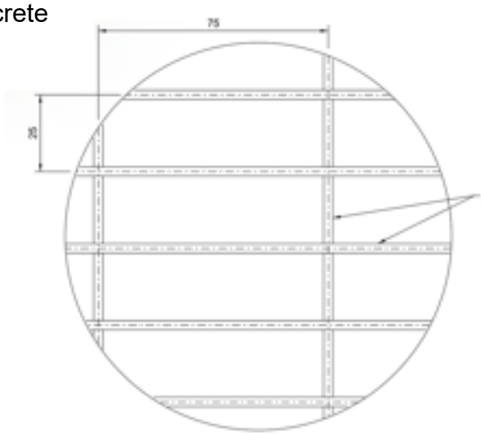




Photo 1: Secure Fence



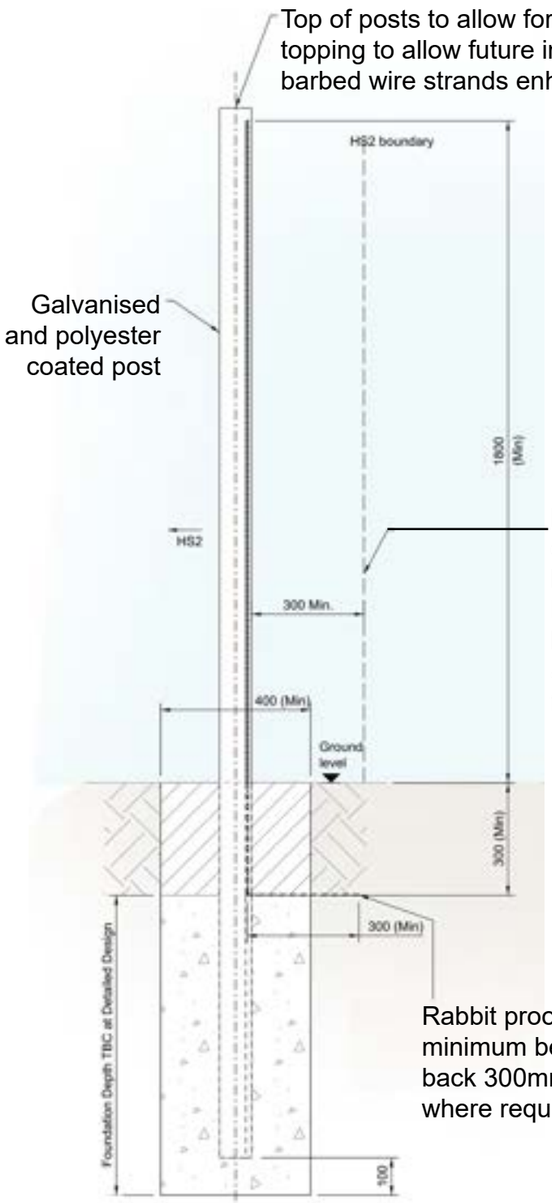
Photo 2: Secure Fence



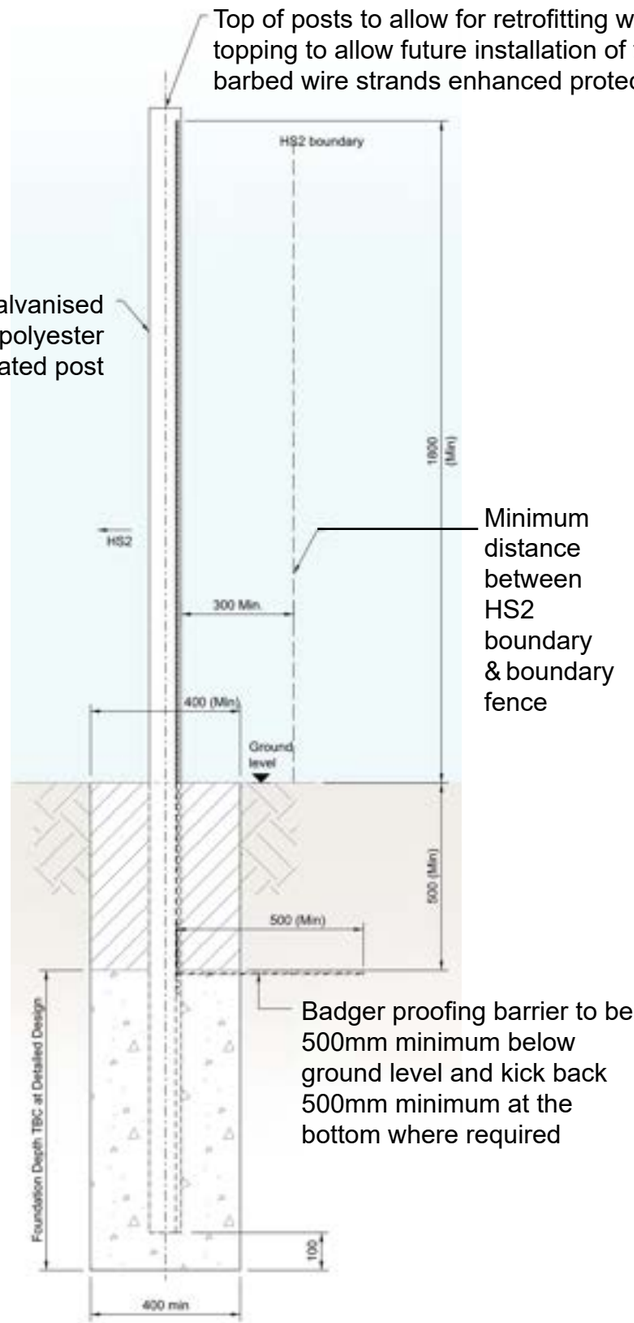
Galvanised and polyester coated 3mm dia steel wire

FENCE DETAIL- SECURITY FENCE TYPE 2

HS2 Typical Details - Fencing



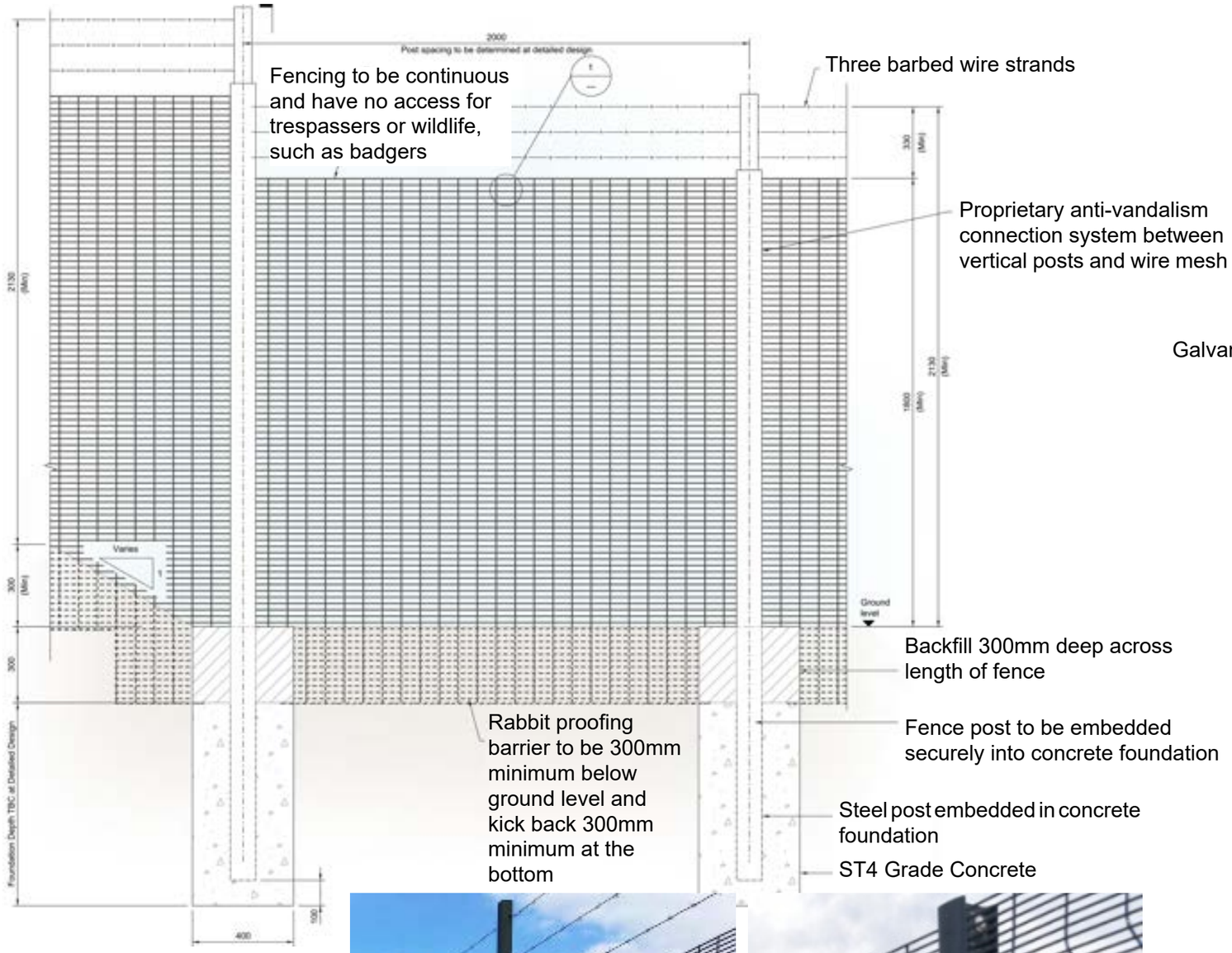
Rabbit proofing barrier to be 300mm minimum below ground level and kick back 300mm minimum at the bottom where required



Badger proofing barrier to be 500mm minimum below ground level and kick back 500mm minimum at the bottom where required

FENCE DETAIL-SECURITY FENCE TYPE 2

HS2 Typical Details - Fencing



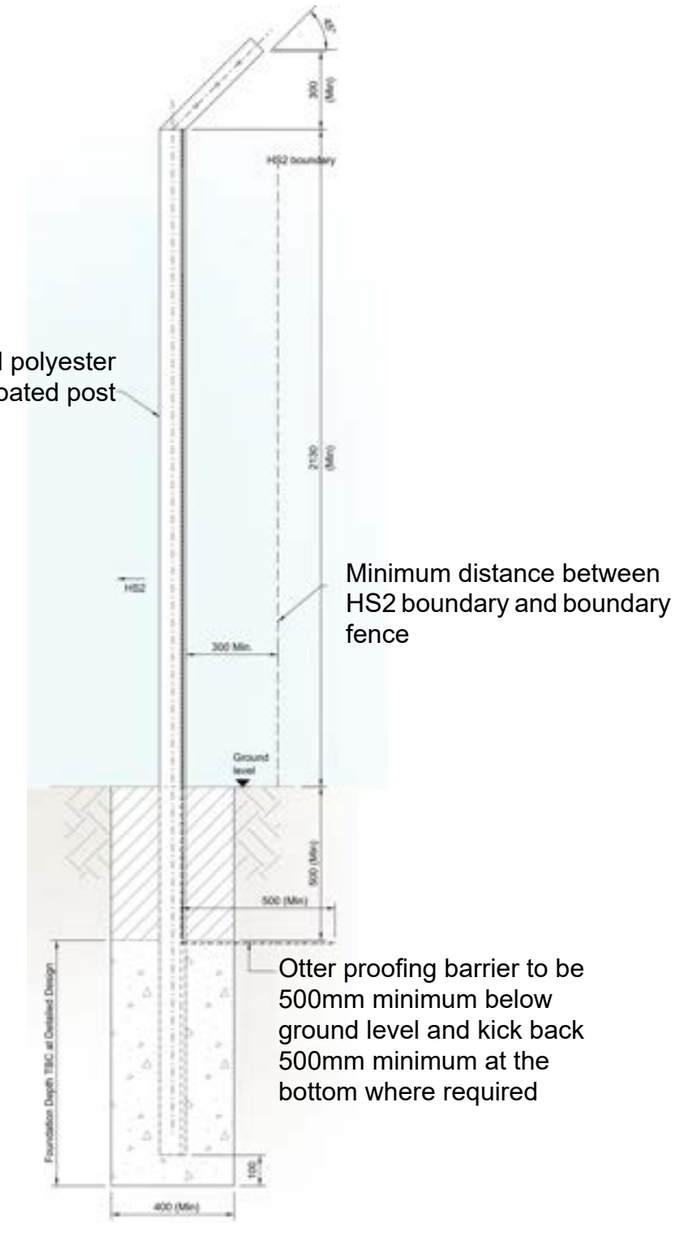




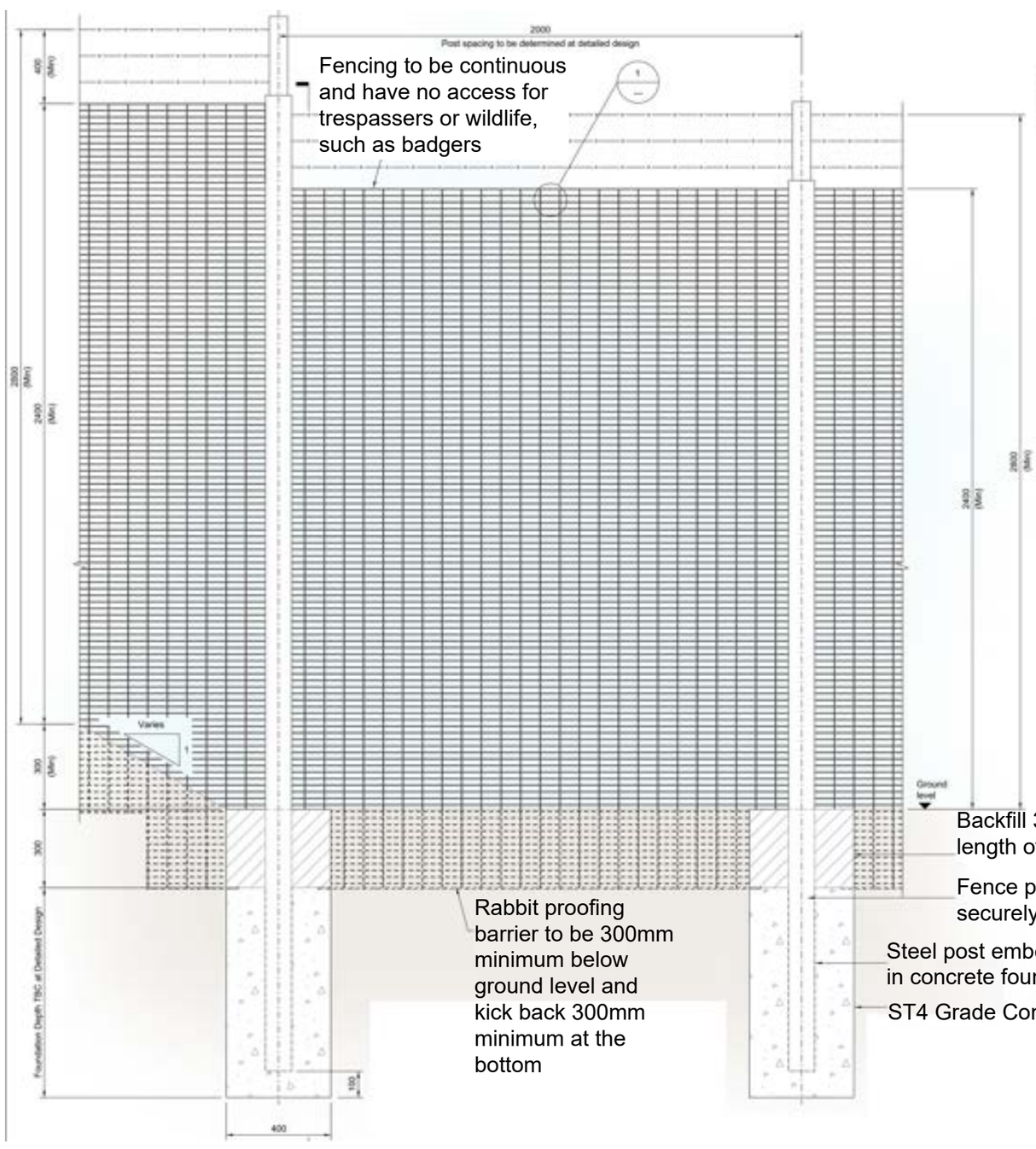
Photo 1: Secure Fence Triple Barbed Wire

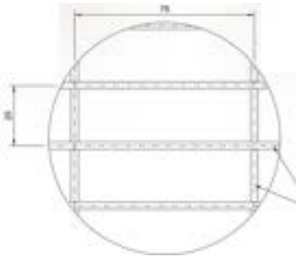


Photo 2 : Folded Top Detail

FENCE DETAIL SECURITY FENCE TYPE 3

HS2 Typical Details - Fencing





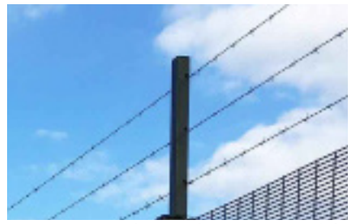
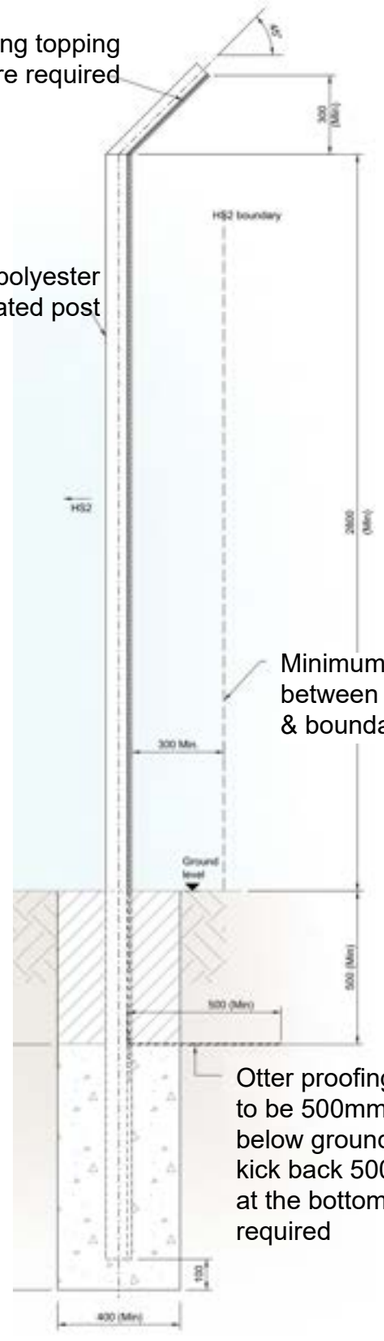


Photo 1: Secure Fence Triple Barbed Wire

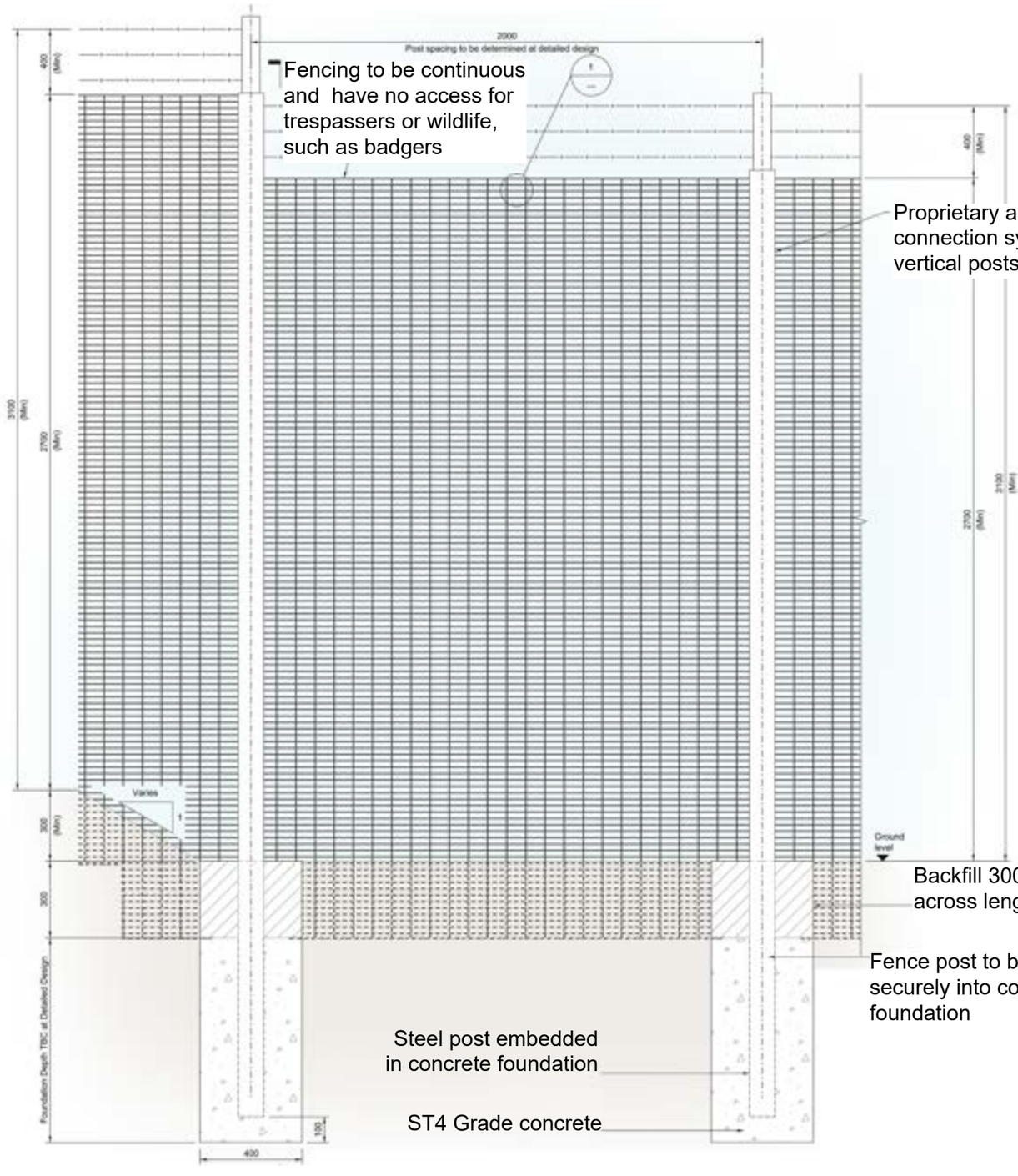


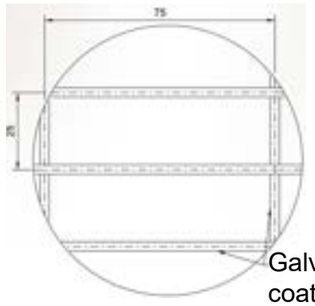
Photo 2: Folded Top Detail



FENCE DETAIL-SECURITY FENCE TYPE 4

HS2 Typical Details - Fencing





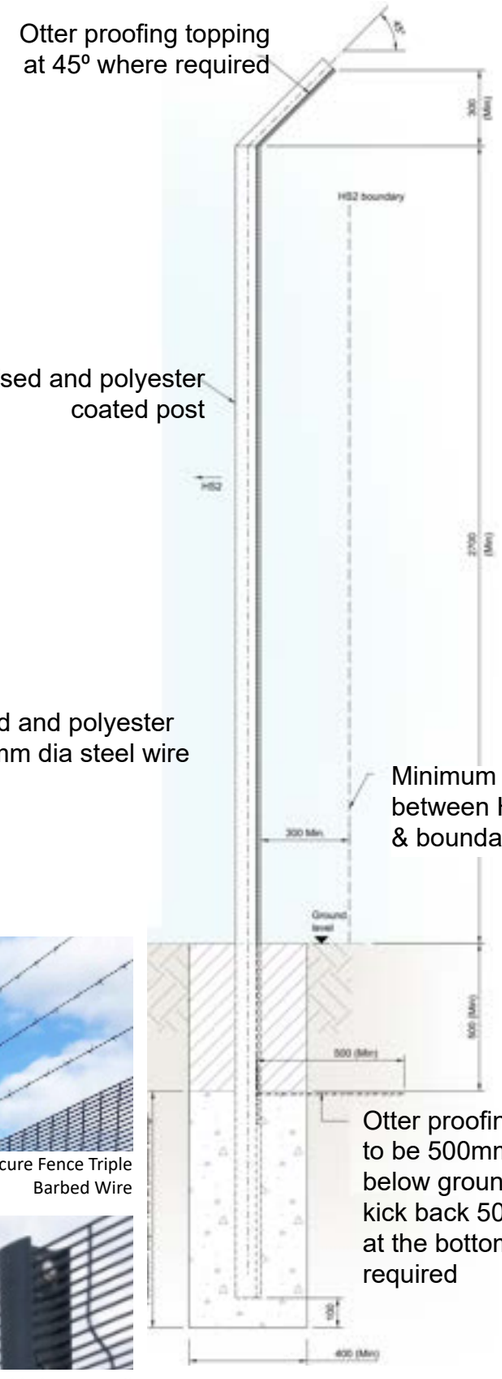




Photo 1: Secure Fence Triple Barbed Wire

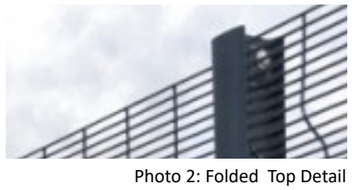
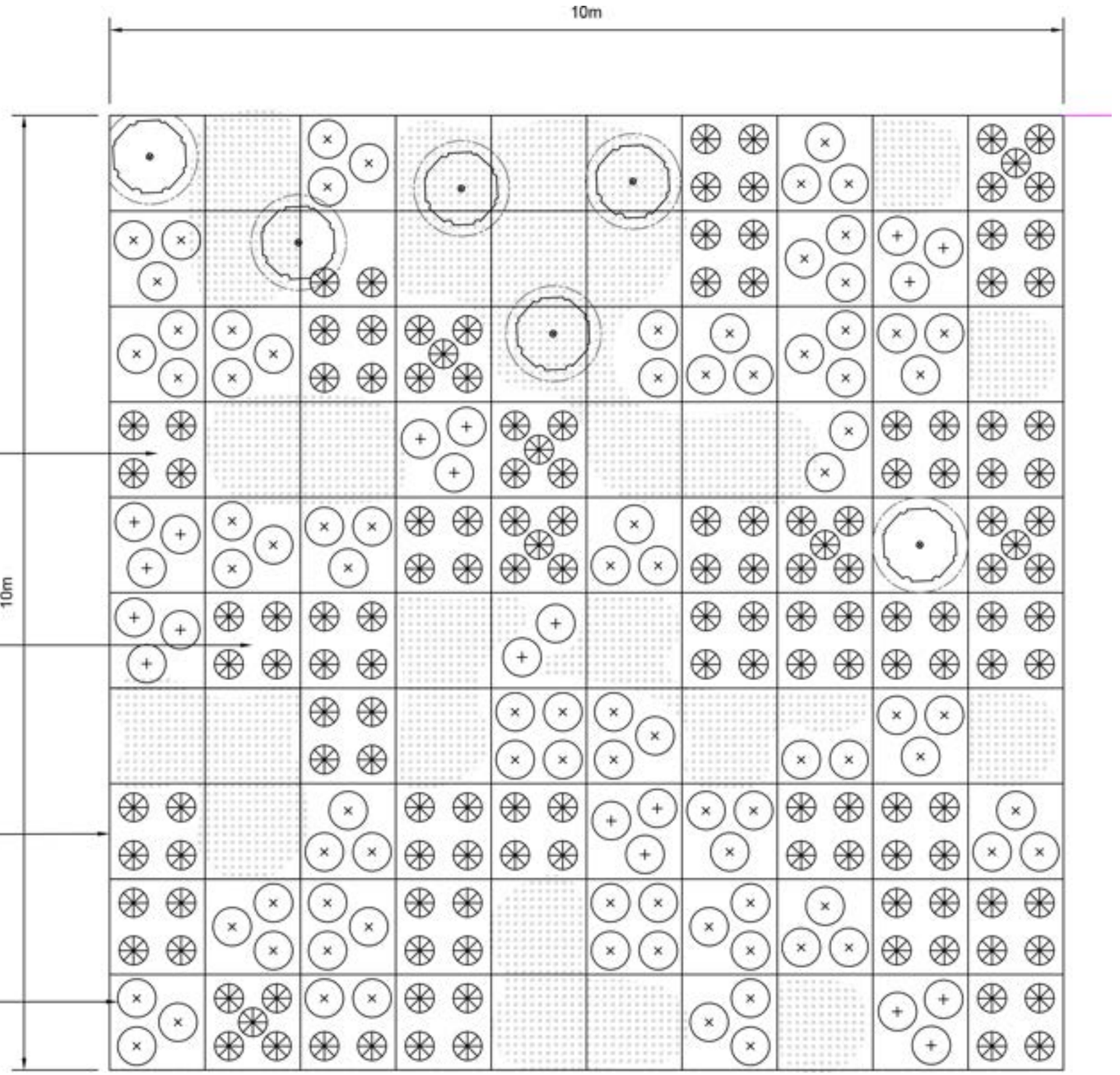


Photo 2: Folded Top Detail

FENCE DETAIL- SECURITY FENCE TYPE 5





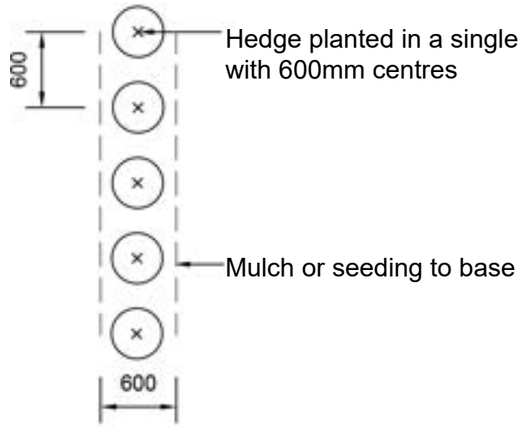
Random planting arrangement. Trees and shrubs to be planted in single species groups of 7-15. Refer to Planting Symbols Key for further information on planting types and densities. Tree planting location dependent.

Wildflower seeding to woodland understorey

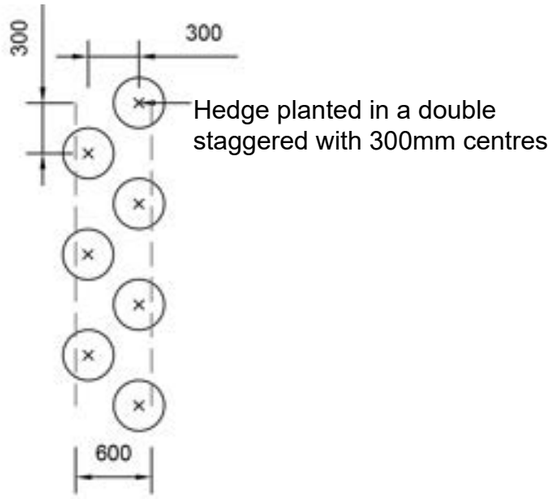
Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of all trees to maintain a 1m dia. weed and grass free area to aid establishment.

Random planting equating to an overall density of 1 plant per 2.25m² (0.44 plants per m²)

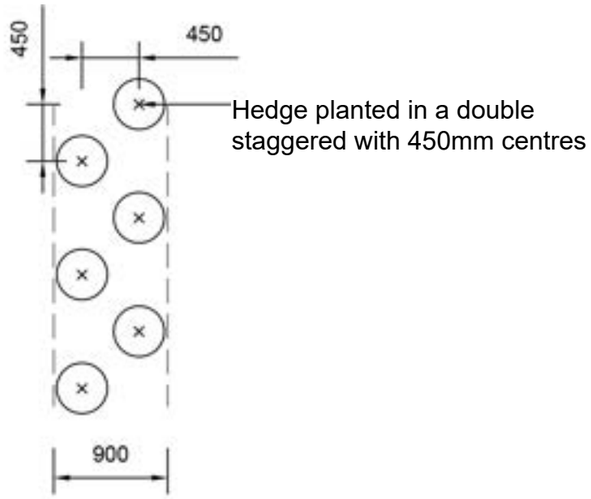
PLANTING PLAN SAMPLE LAYOUT: EDGES WOODLAND



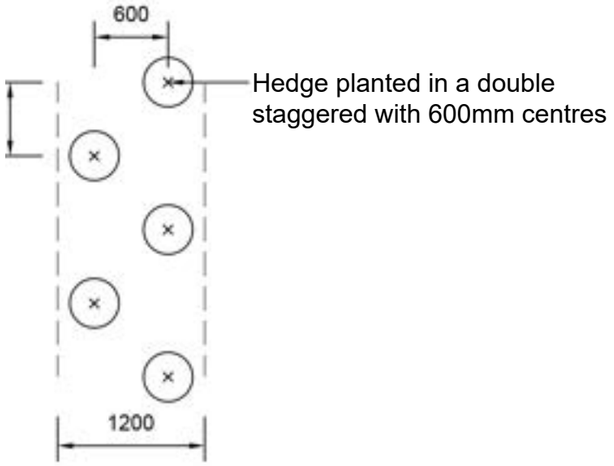
Plan of Single Row Hedgerow with 600mm spacing



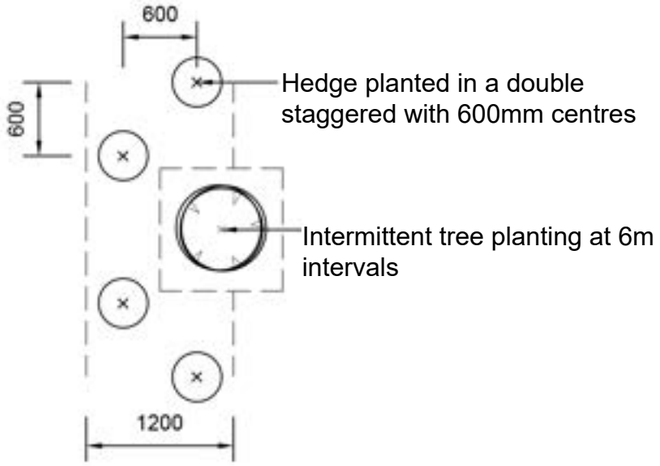
Plan of Double Staggered Hedgerow with 300mm spacing



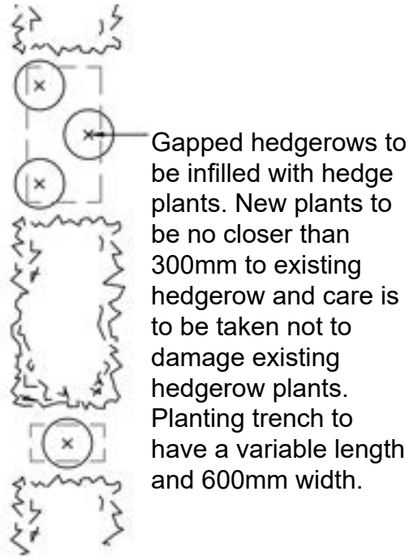
Plan of Double Staggered Hedgerow with 450mm spacing



Plan of Double Staggered Hedgerow with 600mm spacing



Plan of Double Staggered Hedgerow and intermittent Tree planting with 600mm spacing

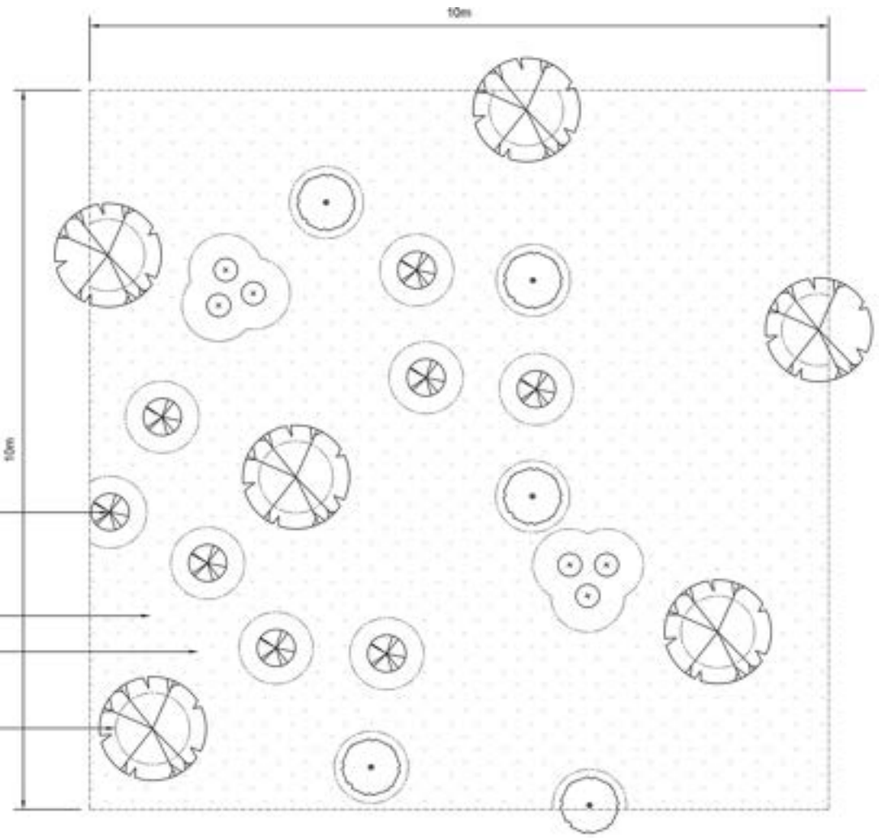


Infill Hegerow Planting

NATIVE PLANTING MATRIX

Planting Symbol Key

Symbol	Percentage mix	Spacing	Type
	25%	5m Centres	Standard Tree
	20%	3m Centres	Feathered Tree
	30%	1.5m Centres	Transplant Tree
	25%	0.5m Centres	Transplant Shrub



Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Wildflower seeding to woodland understorey

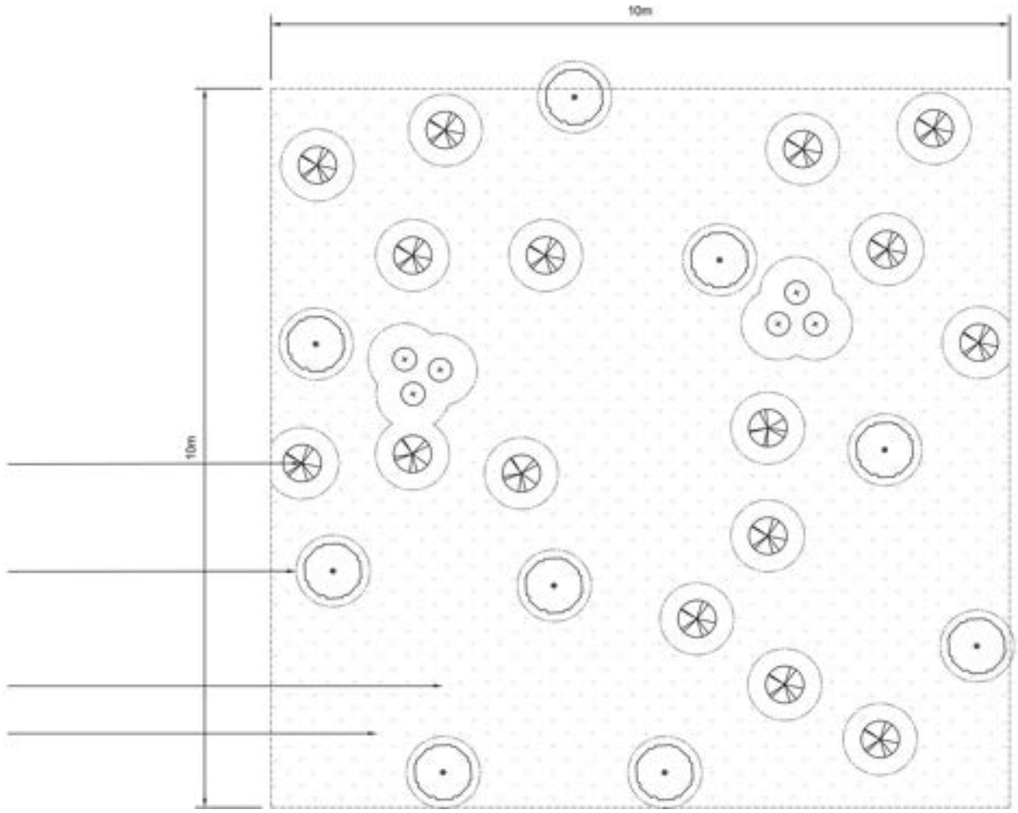
Random planting equating to an overall density of 1 plant per 4m^2 *(0.25 plants per m^2)*

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of ll the trees to maintain a 1m dia. Wee and grass free area to aid establishment

PLANTING PLAN SAMPLE LAYOUT: GENERIC WOODLAND QUICK EFFECT

Planting Symbol Key

Symbol	Percentage mix	Spacing	Type
	30%	3m Centres	Feathered Tree
	50%	1.5m Centres	Transplant Tree
	20%	0.5m Centres	Transplant Shrub



Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of the trees to maintain a 1m dia. Weed and grass free area to aid establishment

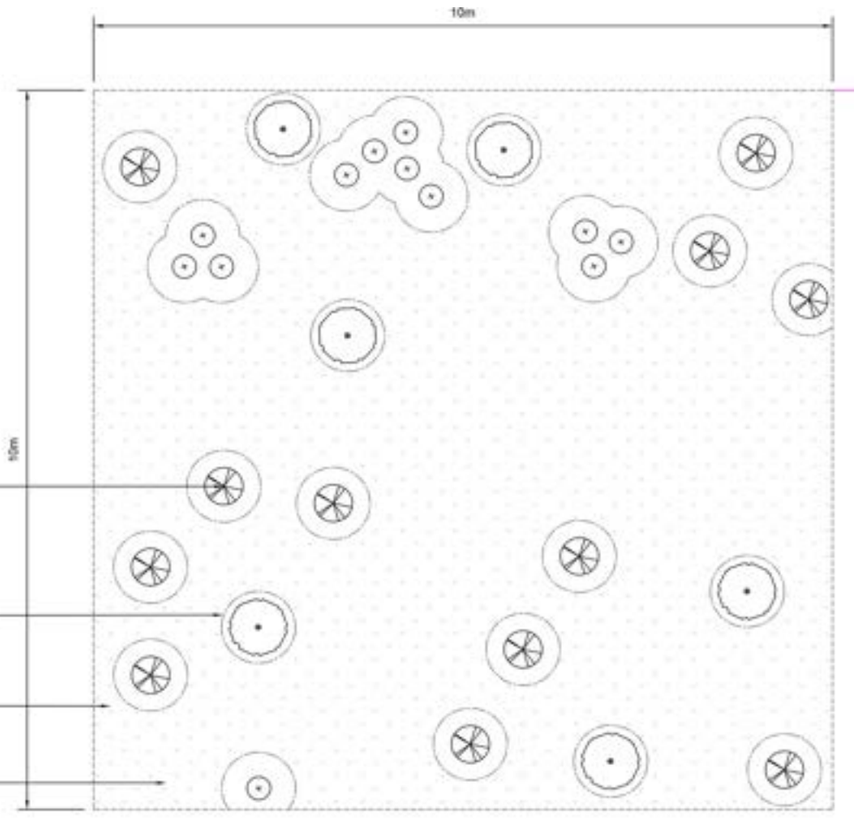
Wildflower seeding to woodland understorey

Random planting equating to an overall density of 1 plant per 3.24m^2 *(0.31 plants per m^2)*

PLANTING PLAN SAMPLE LAYOUT: WOODLAND ALONG CANALS

Planting Symbol Key

Symbol	Percentage mix	Spacing	Type
	20%	3m Centres	Feathered Tree
	40%	1.5m Centres	Transplant Tree
	40%	0.5m Centres	Transplant Shrub



Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of the trees to maintain a 1m dia. Wee and grass free area to aid establishment

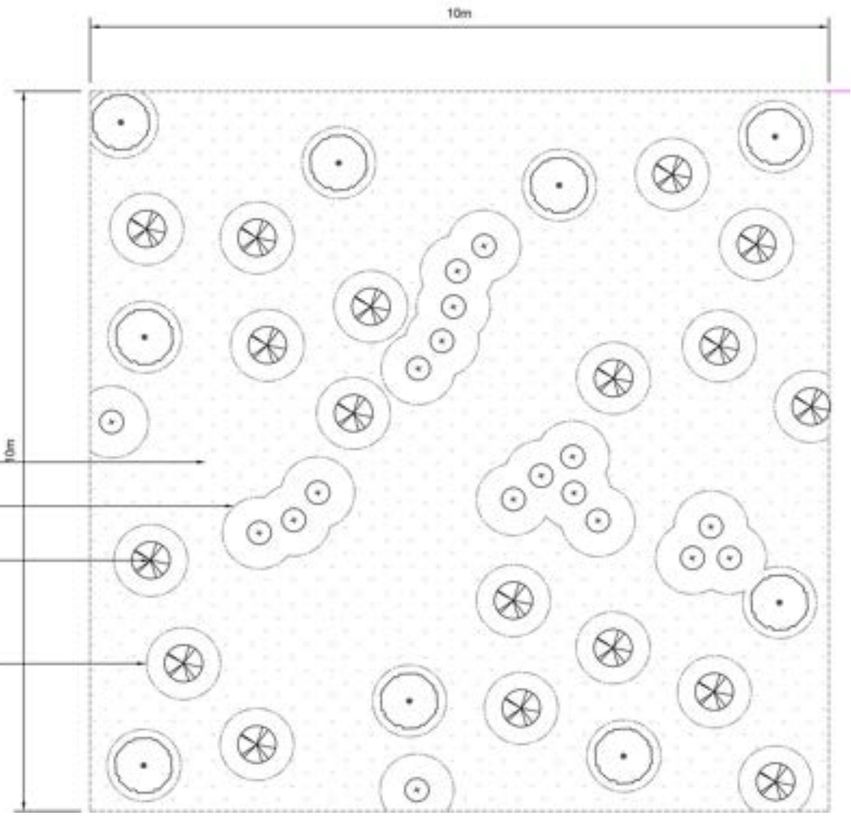
Random planting equating to an overall density of 1 plant per 3.24m^2 *(0.31 plants per m^2)*

Wildflower seeding to woodland storey

PLANTING PLAN SAMPLE LAYOUT: GENERIC WOODLAND MEDIUM TERM EFFECT

Planting Symbol Key

Symbol	Percentage mix	Spacing	Type
	20%	3m Centres	Feathered Tree
	40%	1.5m Centres	Transplant Tree
	40%	0.5m Centres	Transplant Shrub



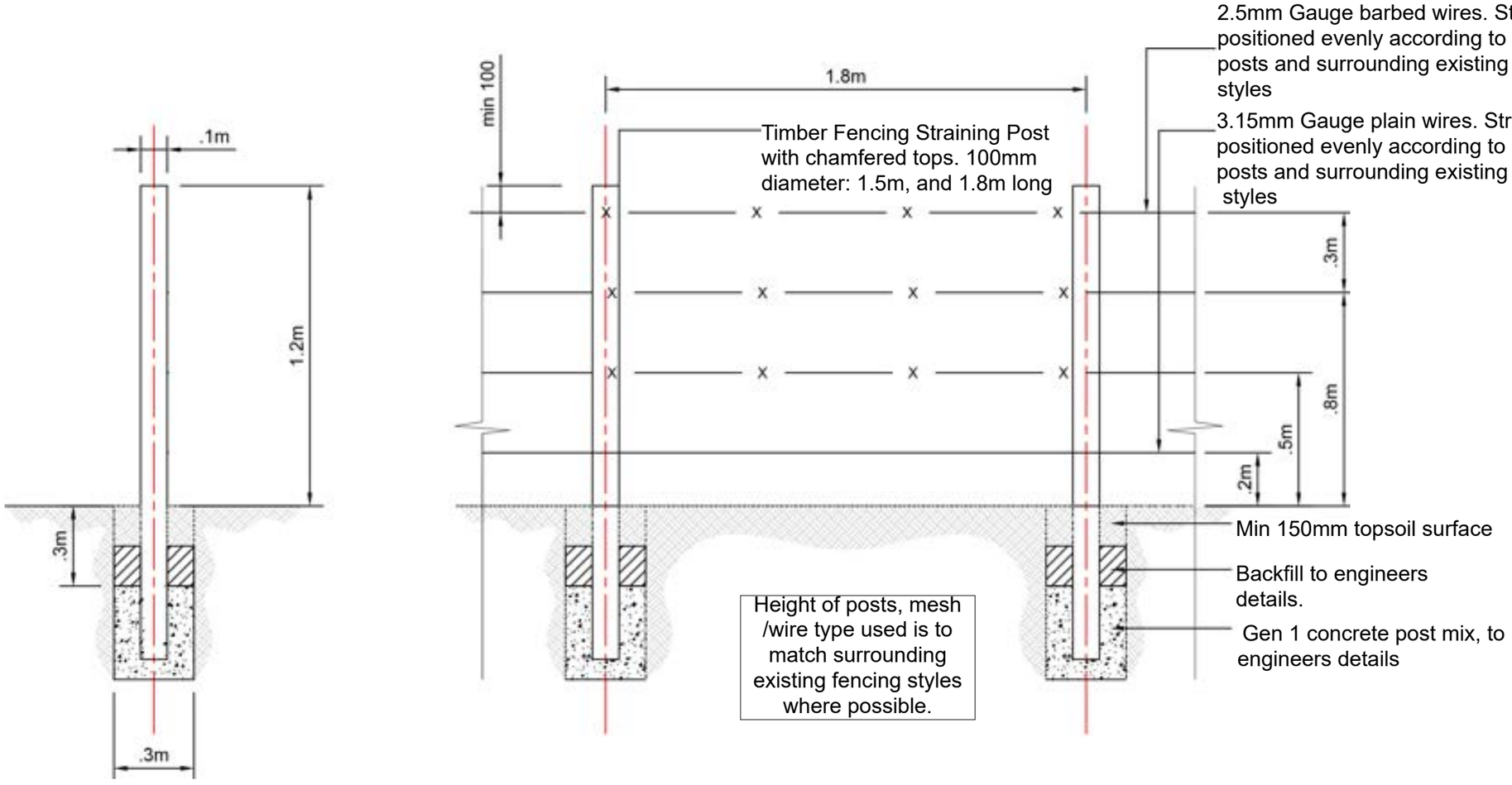
Random planting equating to an overall density of 1 plant per 2.25m^2 *(0.44 plants per m^2)*

Wildflower seeding to woodland understorey

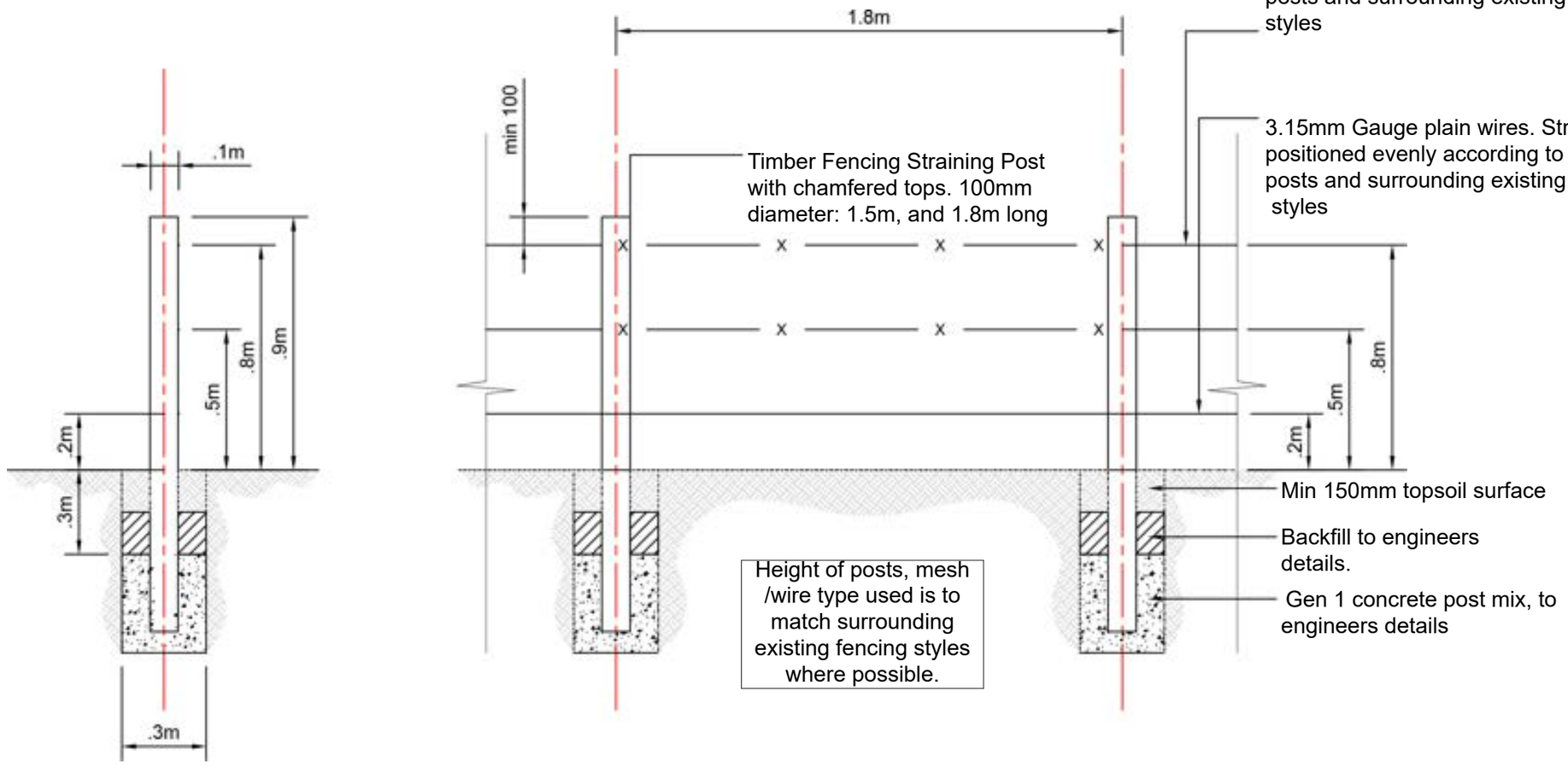
Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of ll the trees to maintain a 1m dia. Wee and grass free area to aid establishment

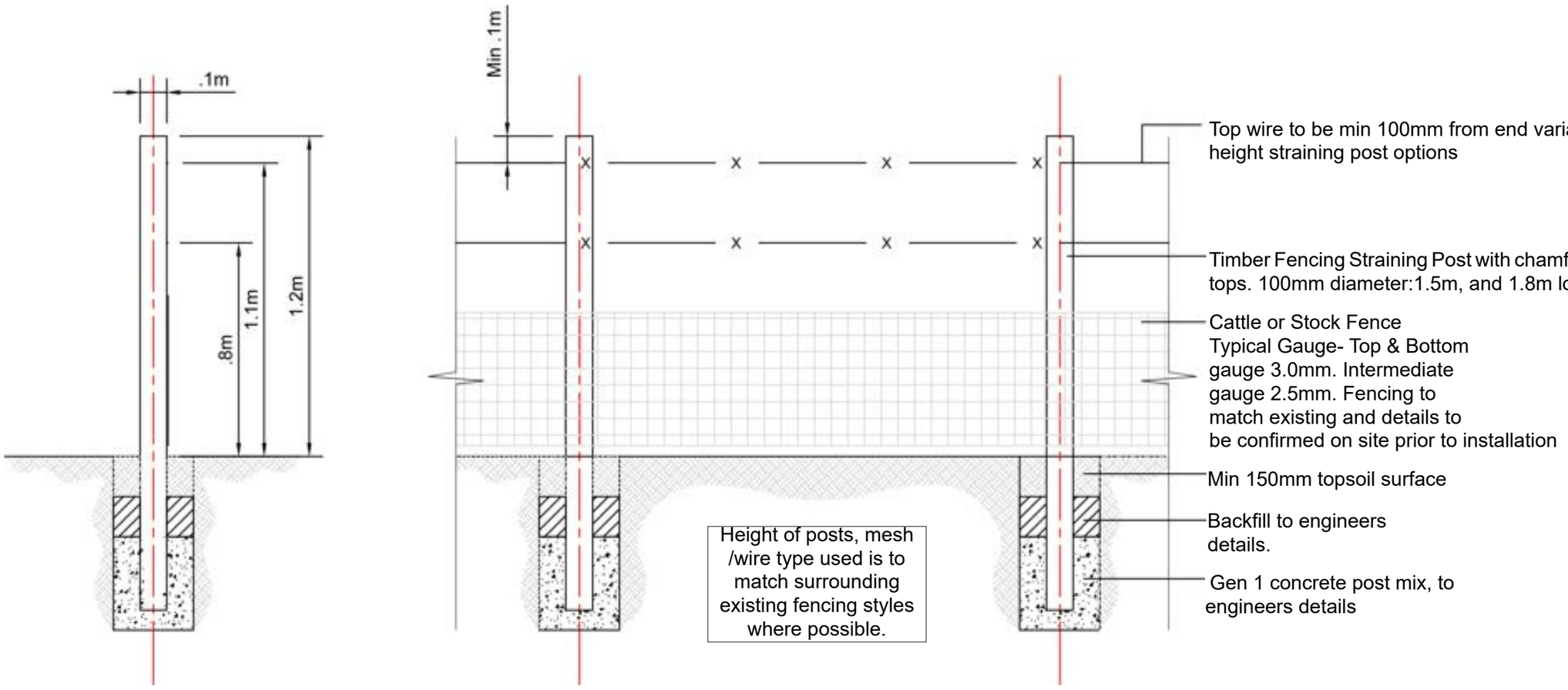
PLANTING PLAN SAMPLE LAYOUT: GENERIC WOODLAND LONG TERM EFFECT



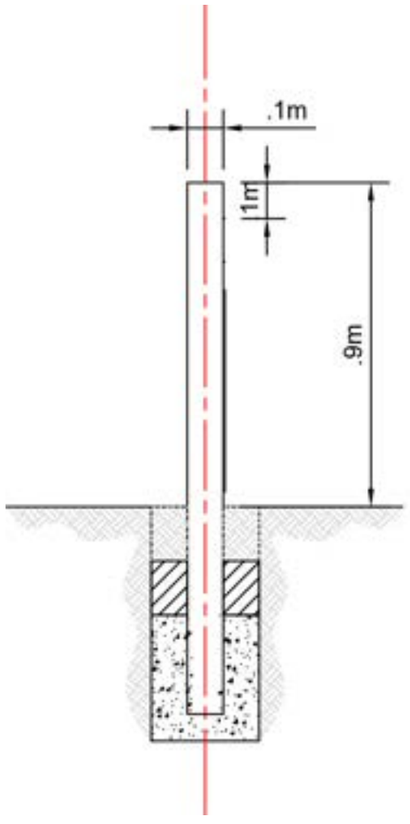
HEDGEROW PLANTING PROTECTION DETAILS

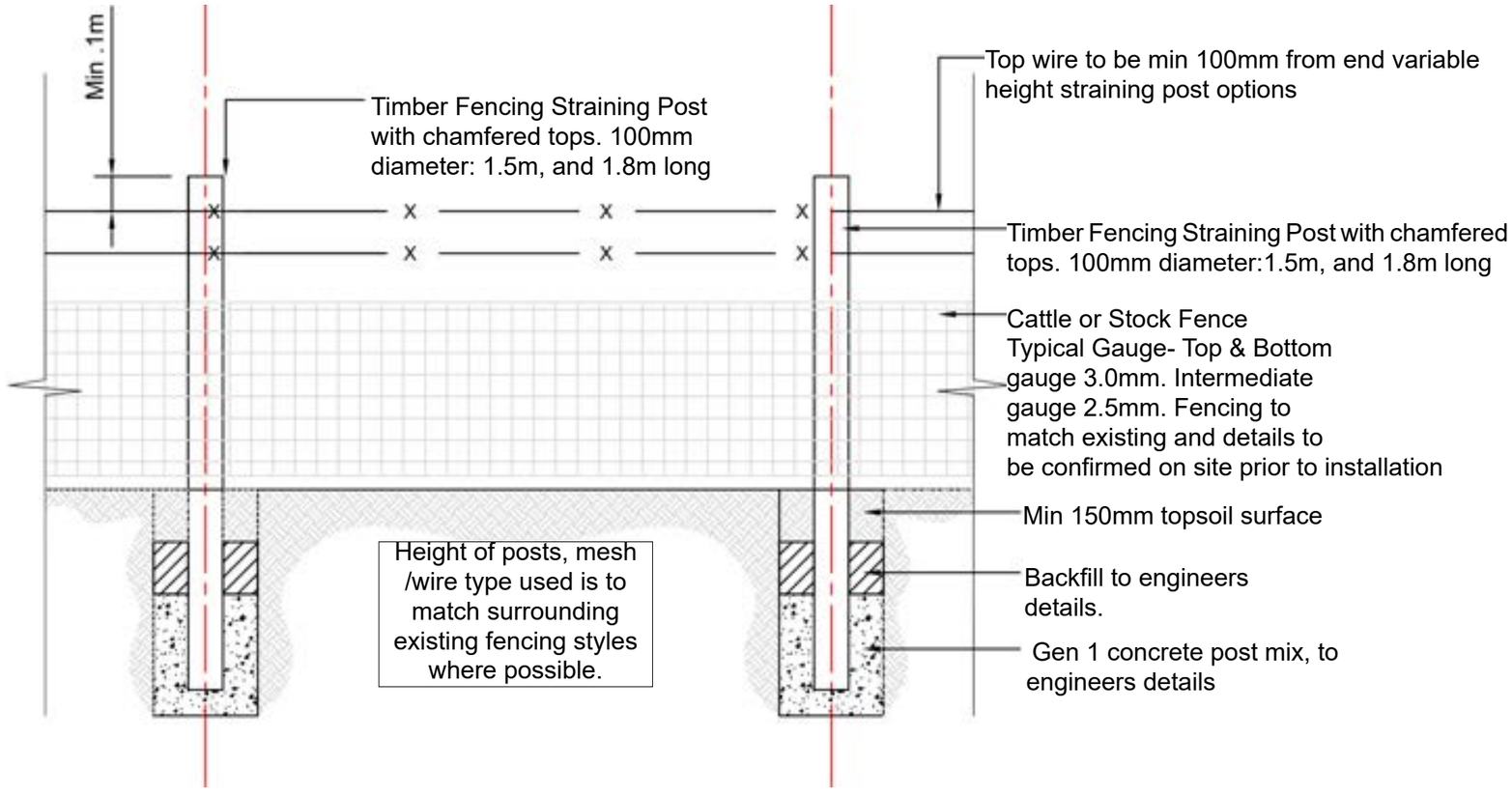


HEDGEROW PLANTING PROTECTION DETAILS



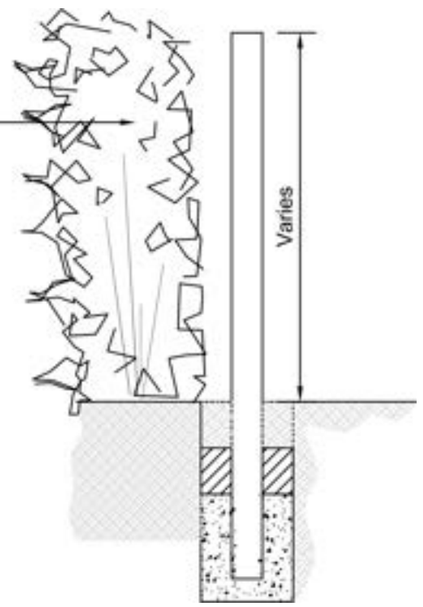
HEDGEROW PLANTING PROTECTION DETAILS

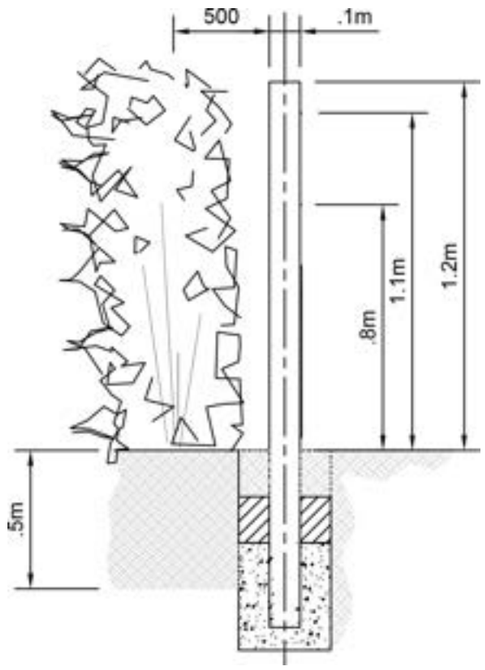




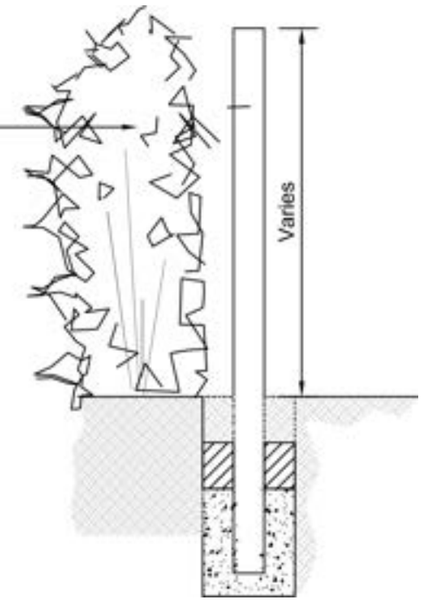
HEDGEROW PLANTING PROTECTION DETAILS

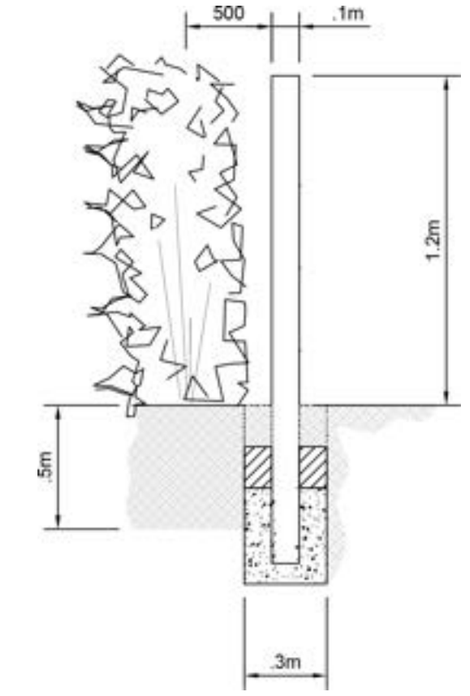
Hedge to be maintained to a height of X and a width of X, with an angled front face profile.



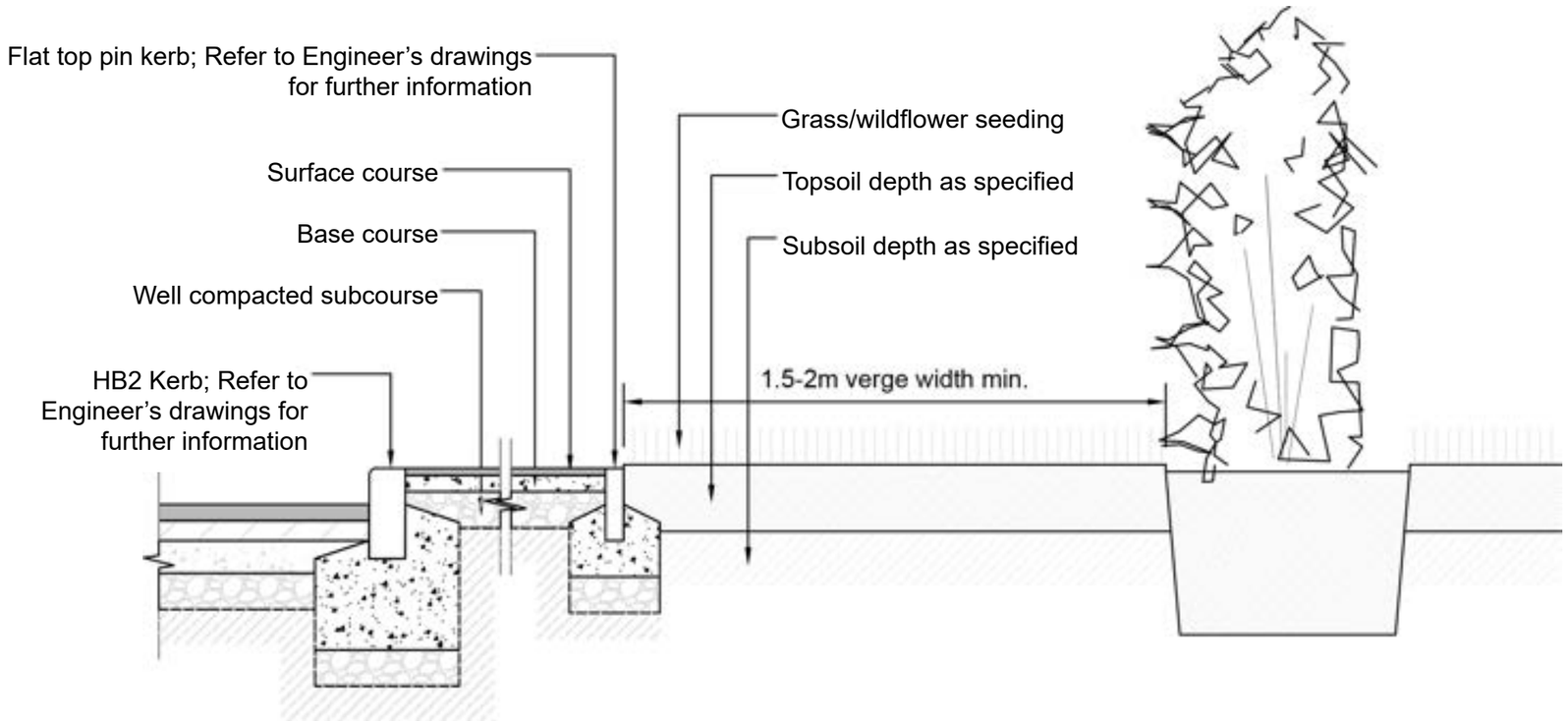


Hedge to be maintained to a height of X and a width of X, with a rectangular profile.

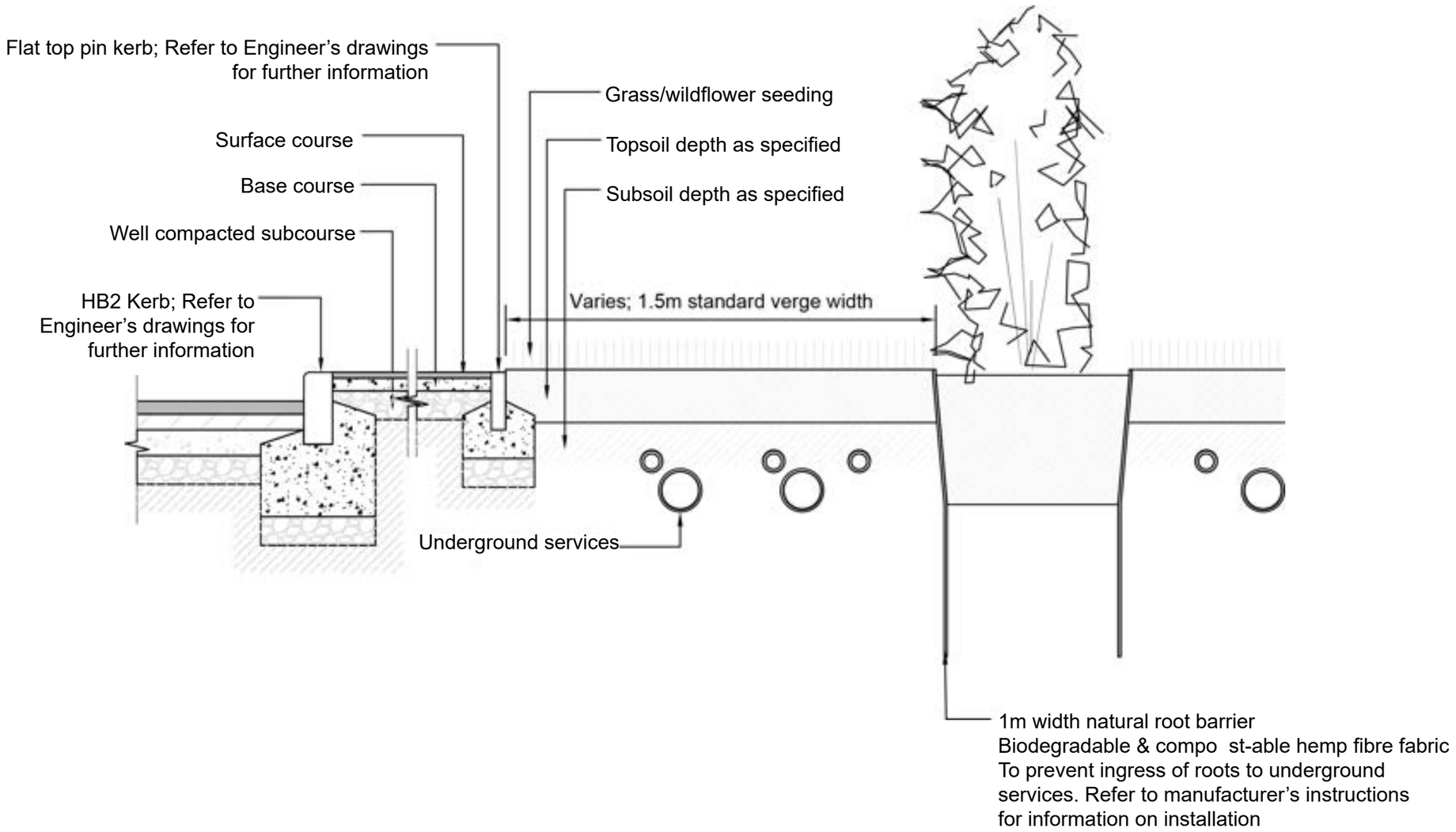




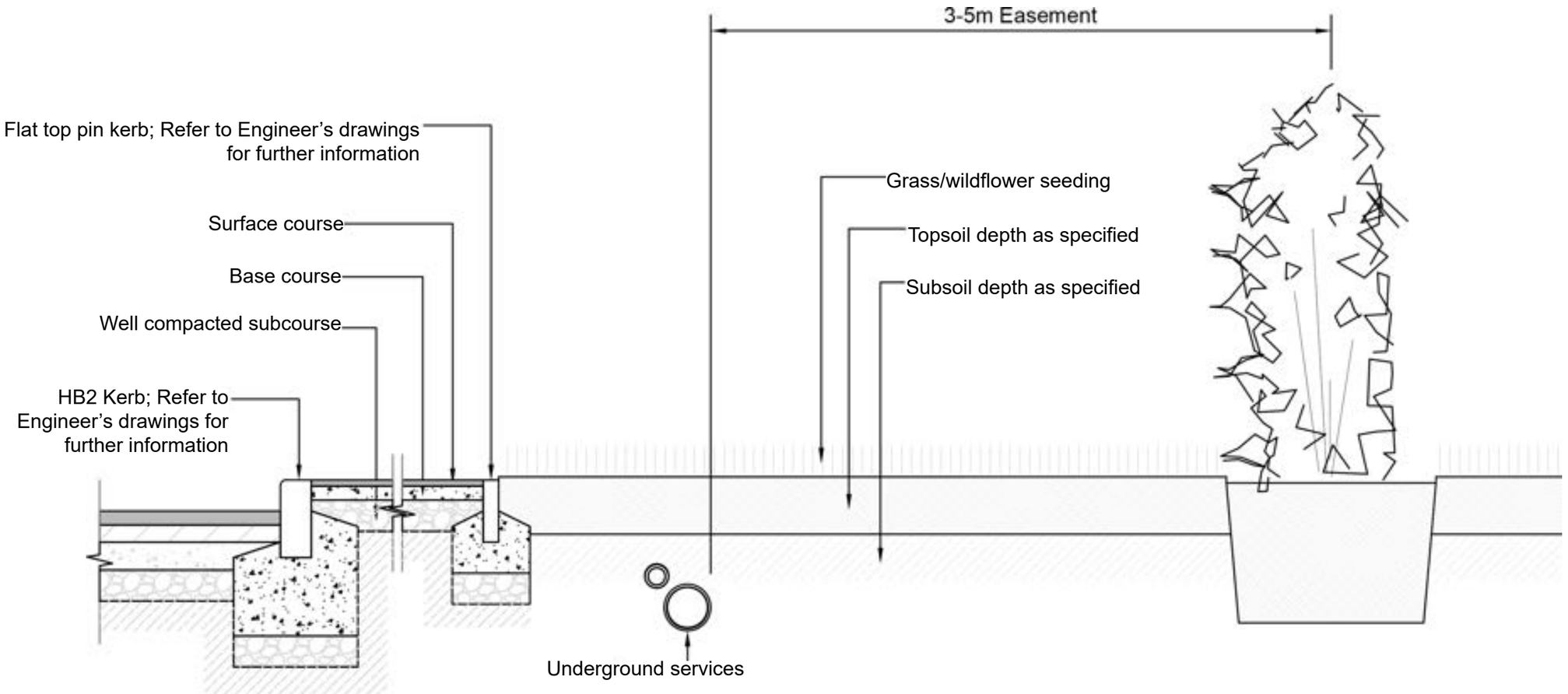
HEDGEROW DETAILS



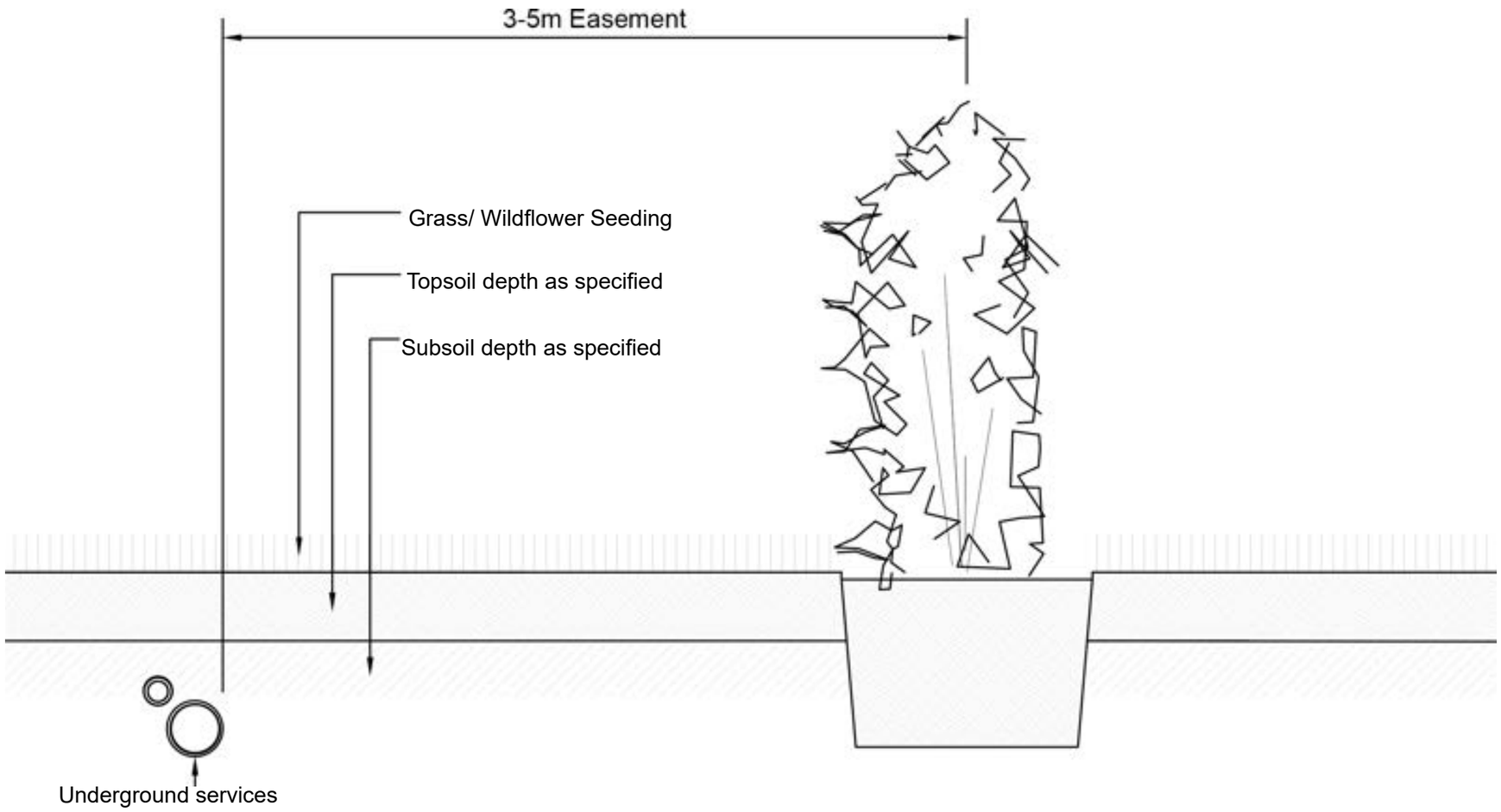
HEDGEROW DETAILS



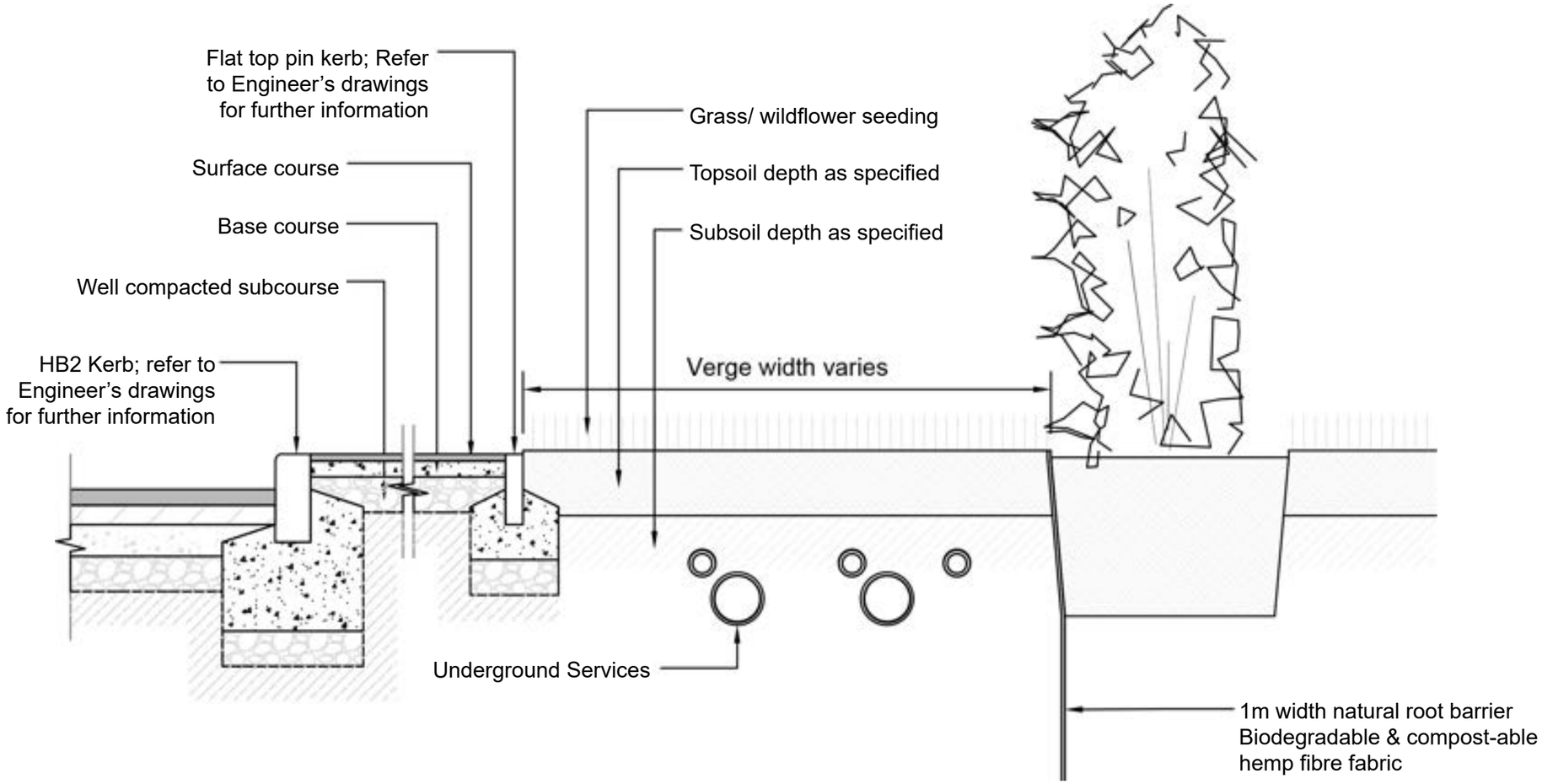
HEDGEROW DETAILS



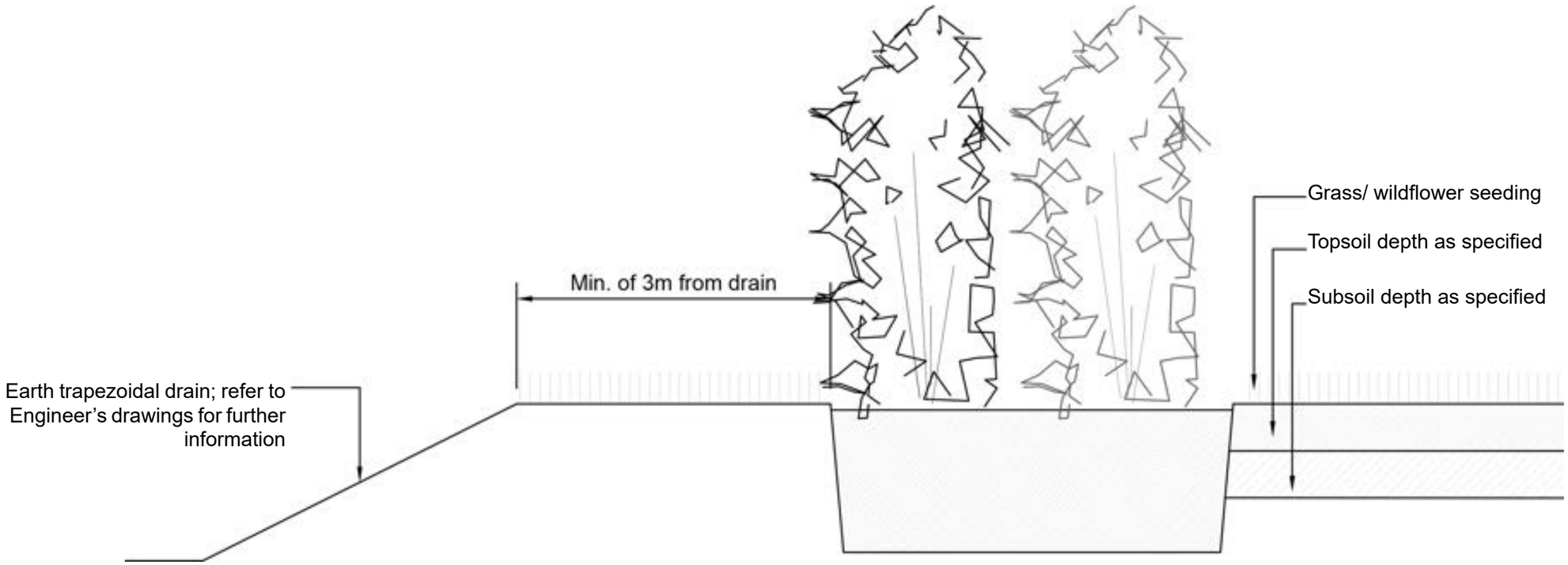
ROAD EDGE AND VERGE DETAILS



VERGE AND HEDGEROW PLANTING DETAILS

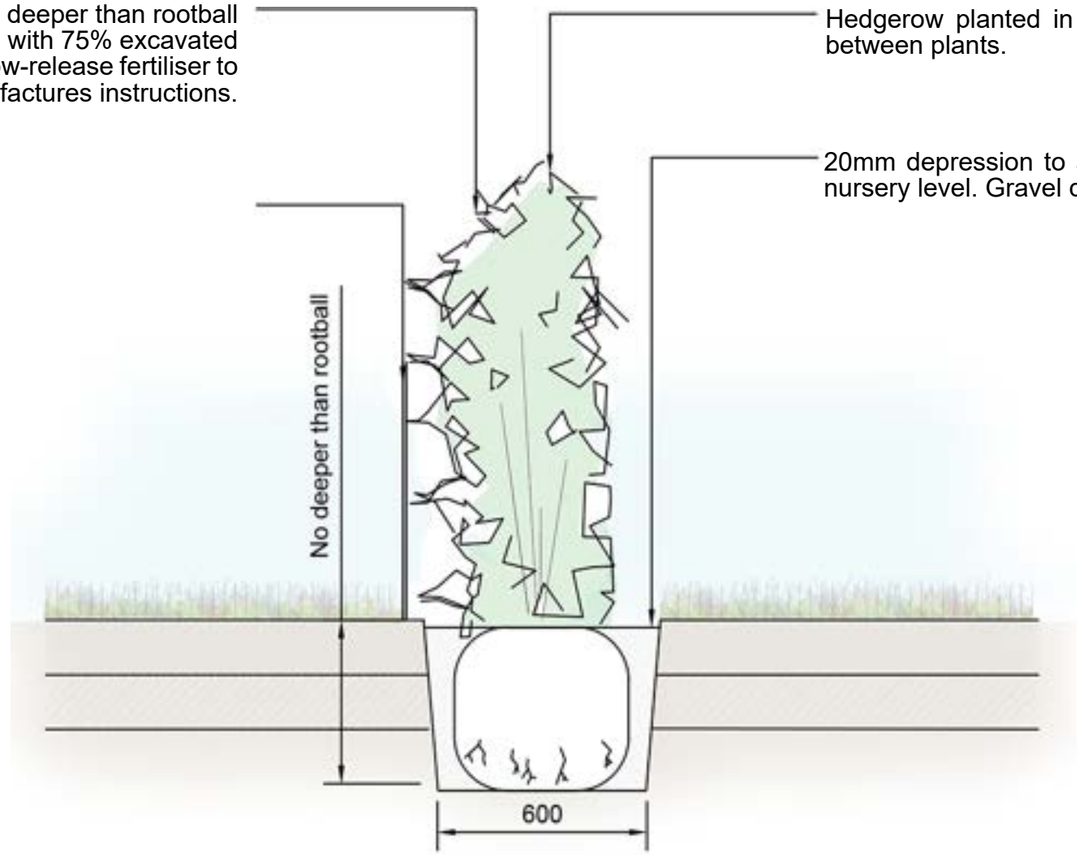


PAVEMENT VERGE AND HEDGE PLANTING DETAILS



DRAIN VERGE AND HEDGEROW PLANTING DETAILS

Trench to be excavated to a depth no deeper than rootball and a width of 600mm. Backfill trench with 75% excavated topsoil mixed with 25% compost. A slow-release fertiliser to be applied as per manufactures instructions.



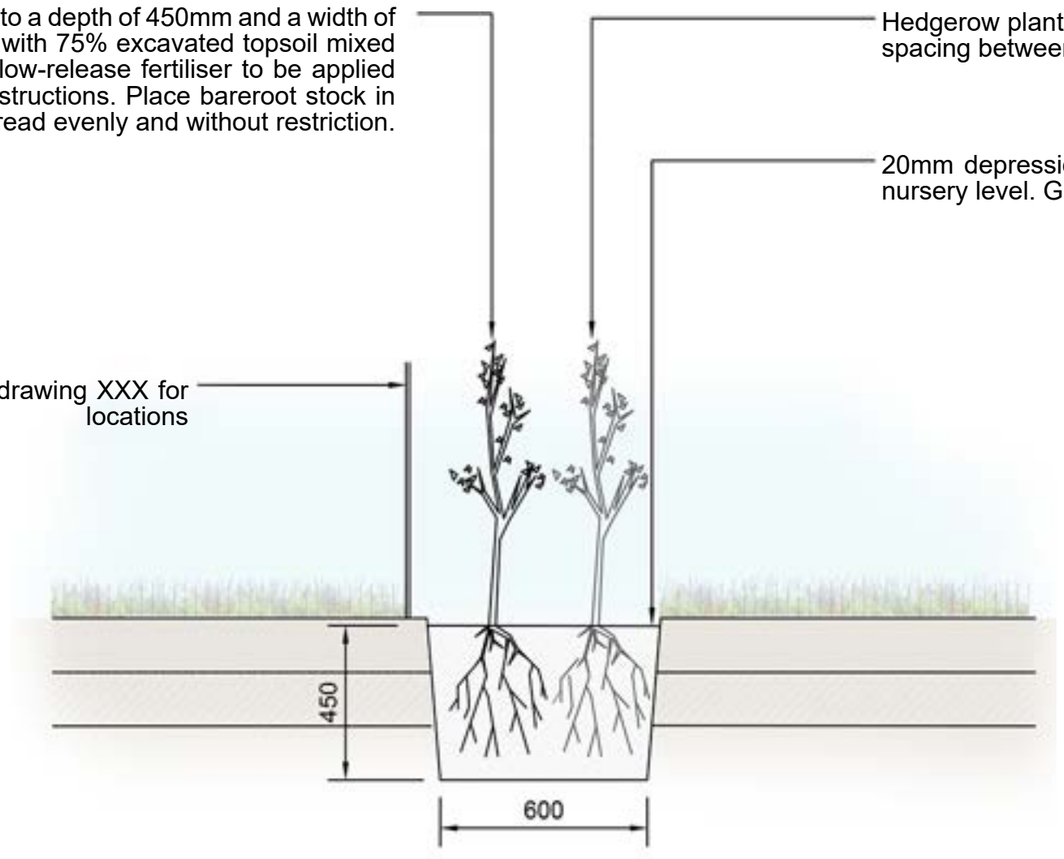
ROOTBALLED HEDGEROW PLANTING TRENCH DETAIL_SINGLE ROW WITH 600mm PLANT SPACING

Trench to be excavated to a depth of 450mm and a width of 600mm. Backfill trench with 75% excavated topsoil mixed with 25% compost. A slow-release fertiliser to be applied as per manufactures instructions. Place bareroot stock in pit allowing roots to spread evenly and without restriction.

Hedgerow planted in a double-staggered row with 300mm spacing between plants.

20mm depression to aid natural watering. Backfill soil to nursery level. Gravel drainage layer may be required.

Rabbit fencing where required. Refer ro drawing XXX for locations



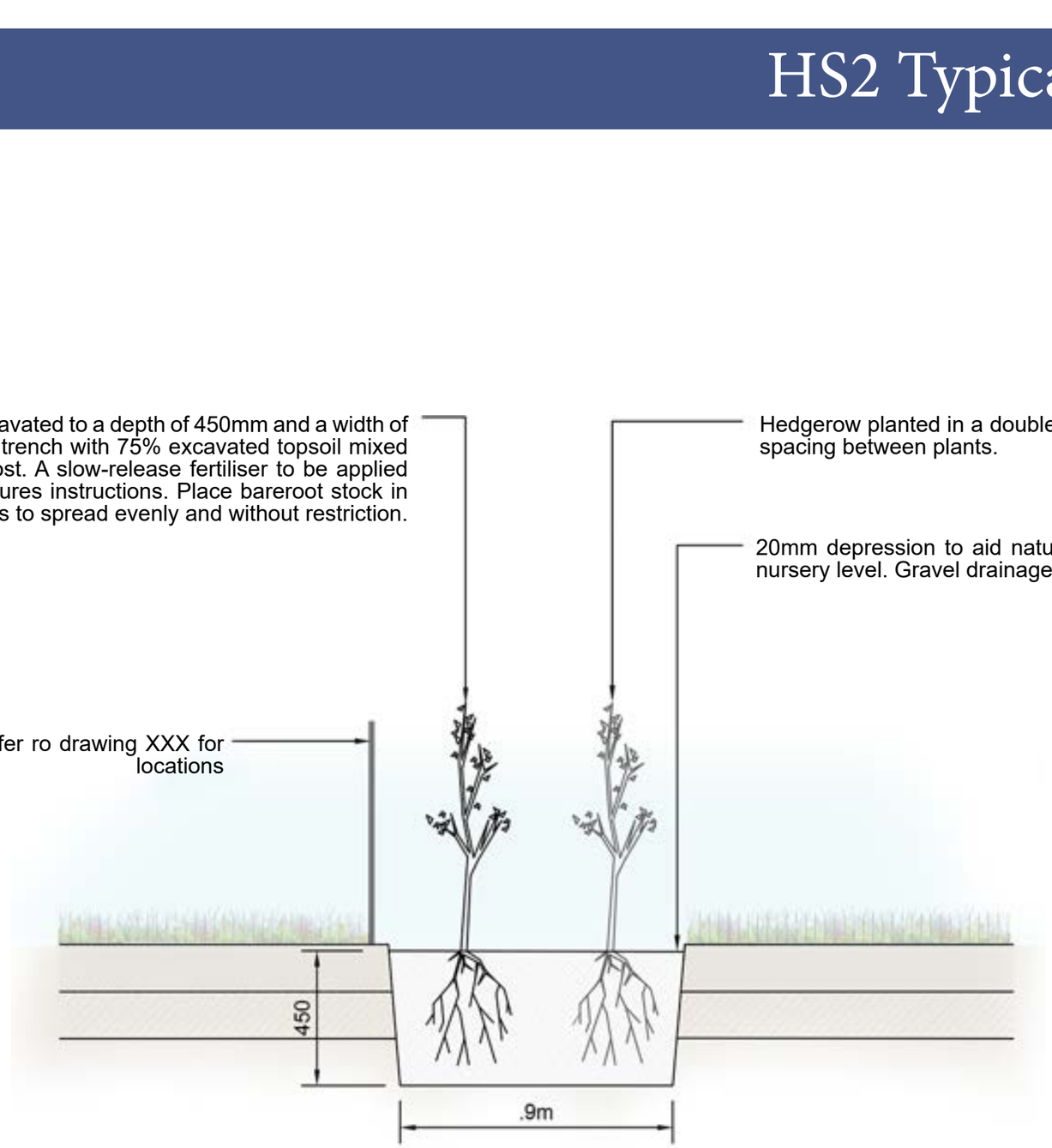
BAREROOT HEDGEROW PLANTING TRENCH DETAIL_DOUBLE STAGGERED WITH 300mm PLANT SPACING

Trench to be excavated to a depth of 450mm and a width of 600mm. Backfill trench with 75% excavated topsoil mixed with 25% compost. A slow-release fertiliser to be applied as per manufactures instructions. Place bareroot stock in pit allowing roots to spread evenly and without restriction.

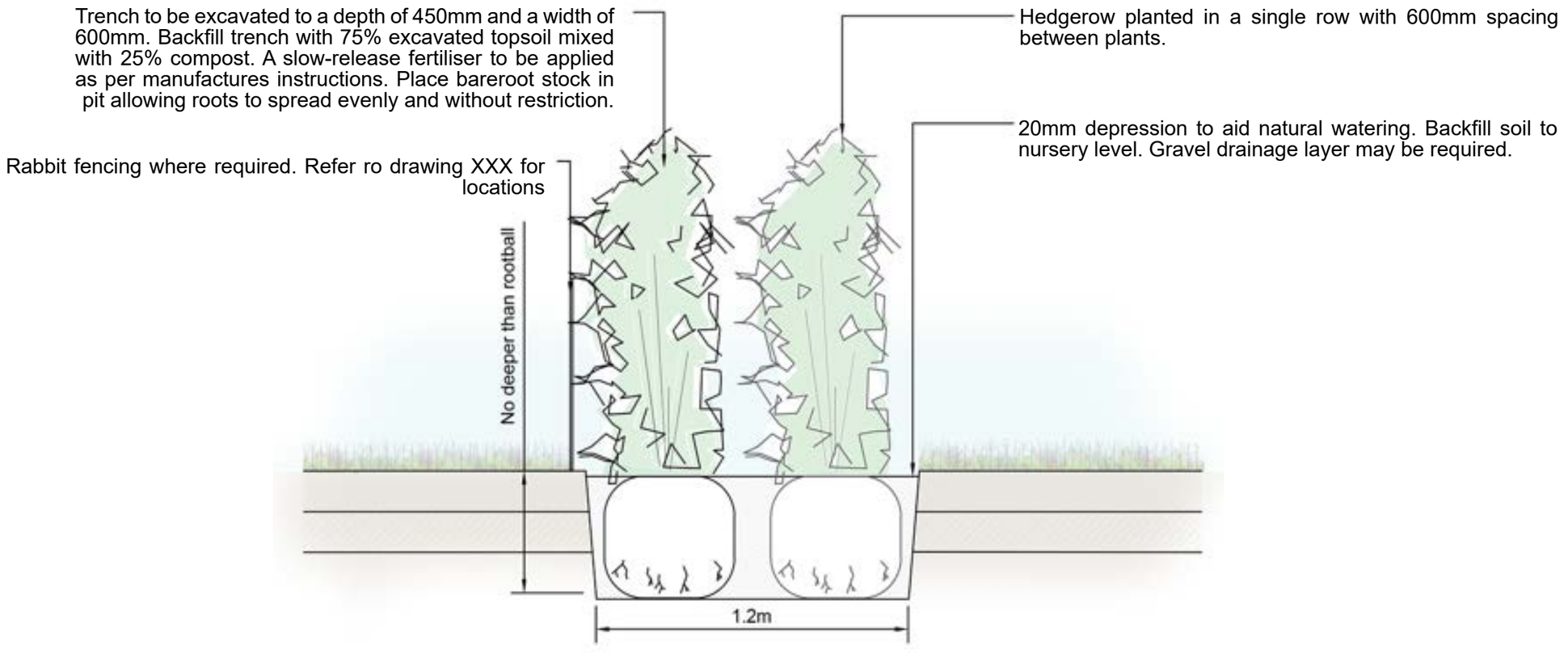
Hedgerow planted in a double staggered row with 450mm spacing between plants.

20mm depression to aid natural watering. Backfill soil to nursery level. Gravel drainage layer may be required.

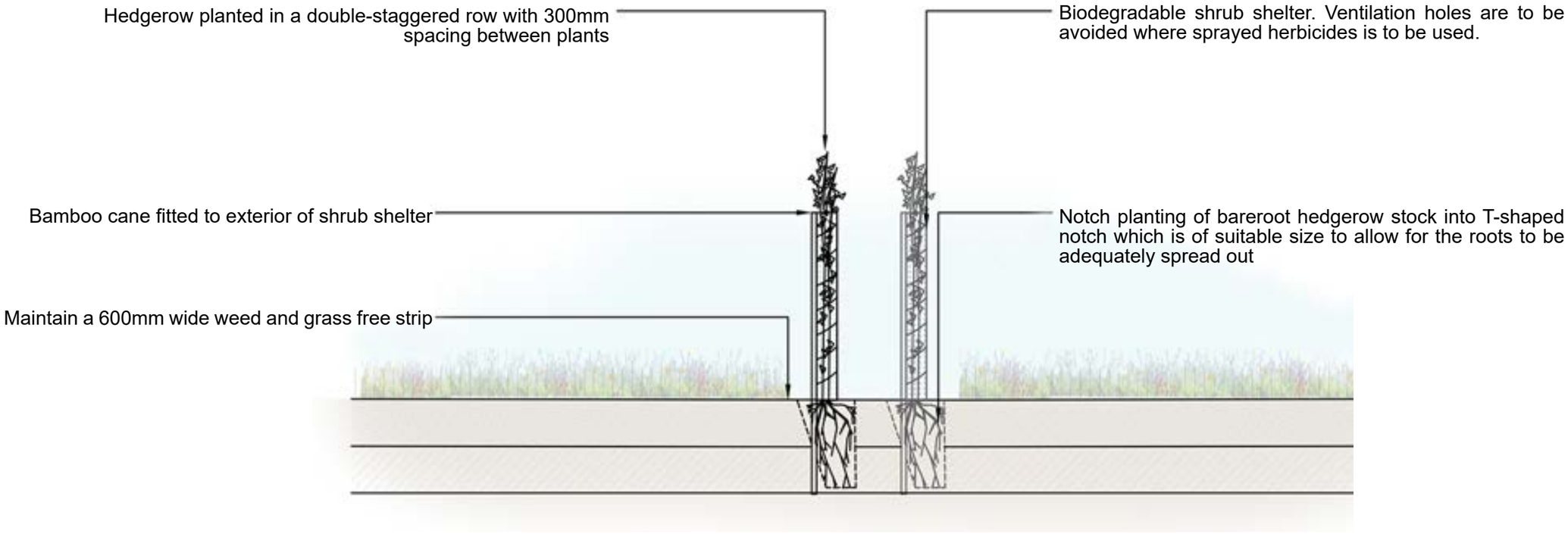
Rabbit fencing where required. Refer ro drawing XXX for locations



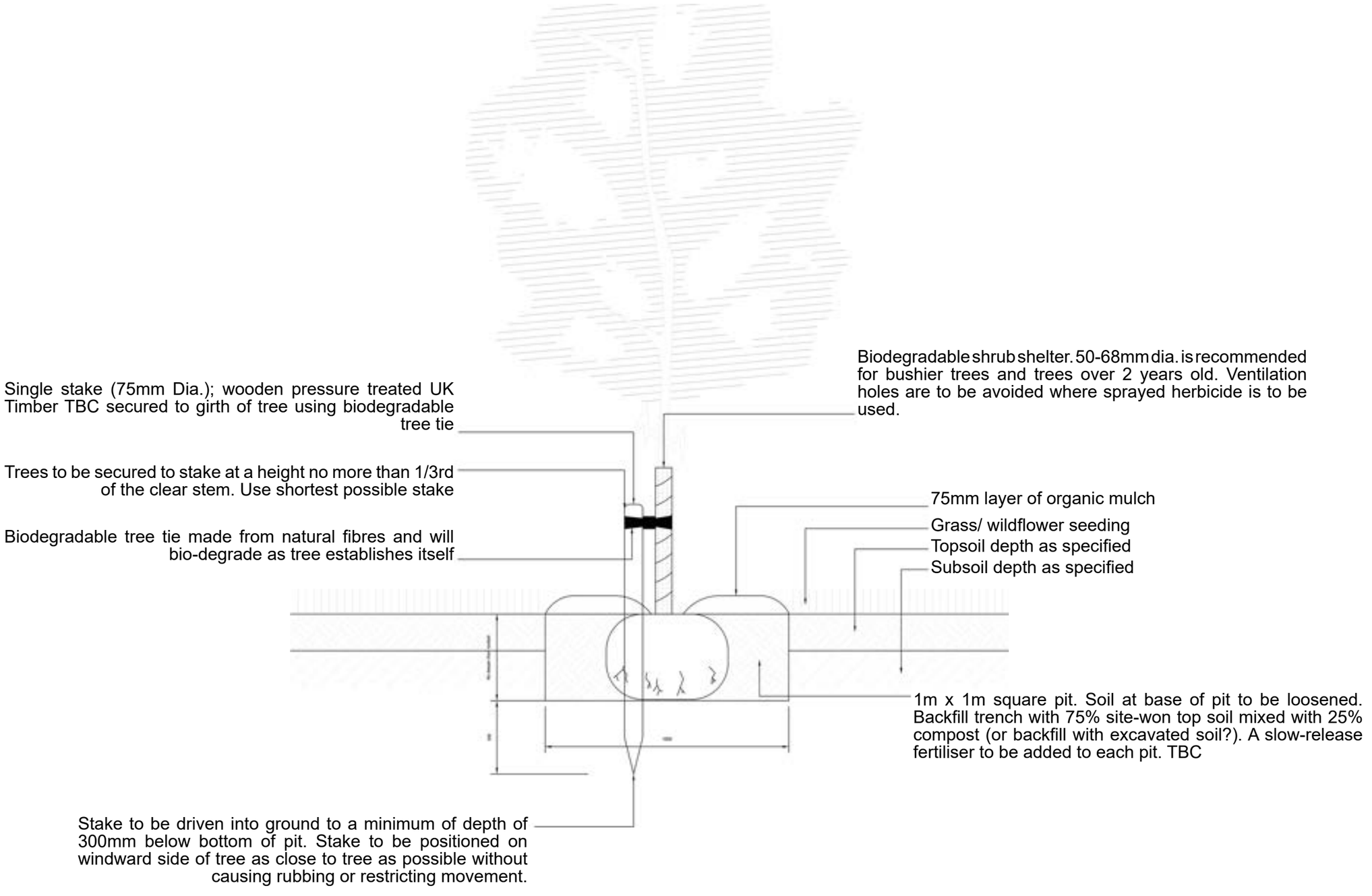
BAREROOT HEDGEROW PLANTING TRENCH DETAIL_DOUBLE STAGGERED WITH 450mm PLANT SPACING



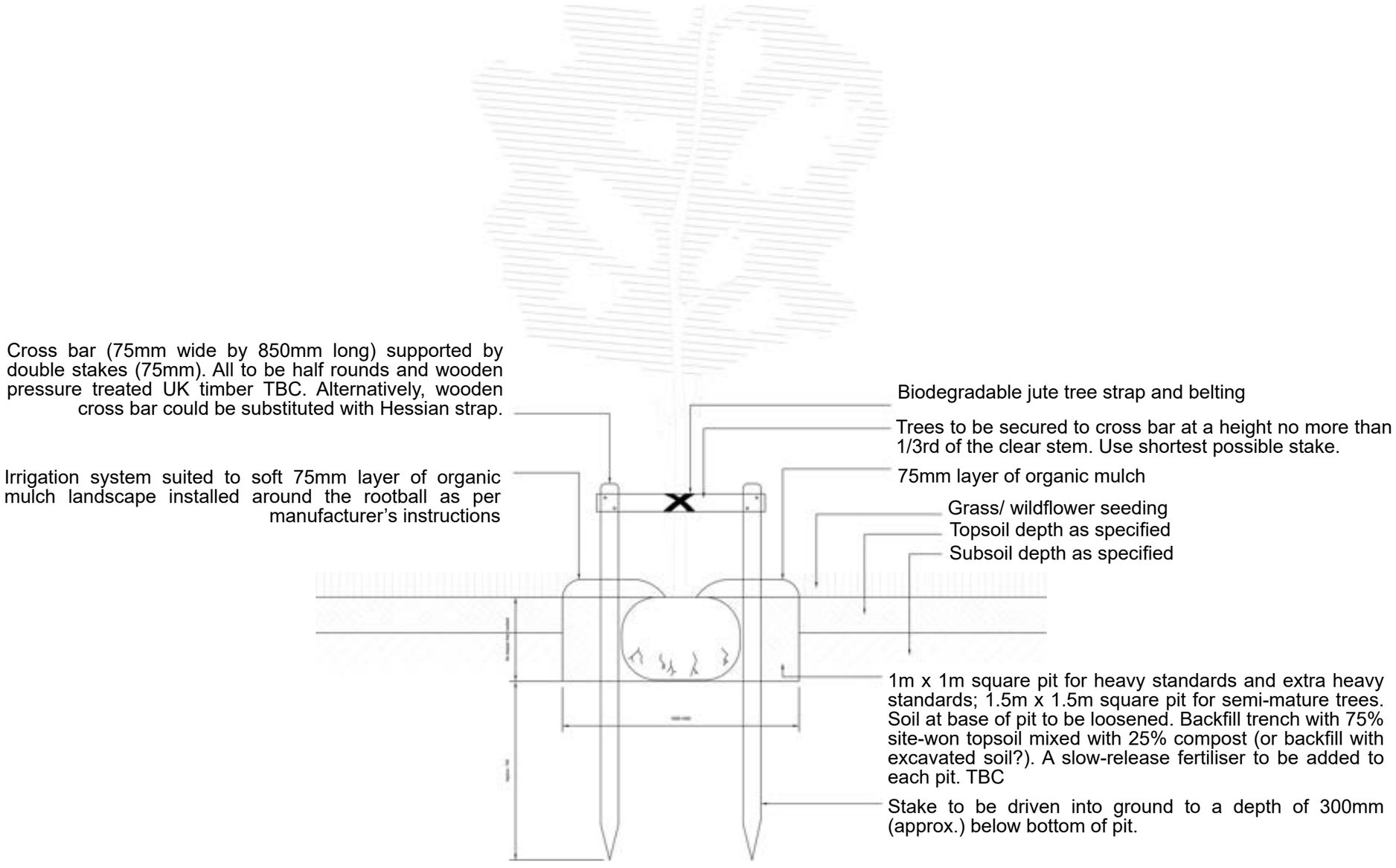
ROOTBALLED HEDGEROW PLANTING TRENCH DETAIL_DOUBLE STAGGERED WITH 600mm PLANT SPACING



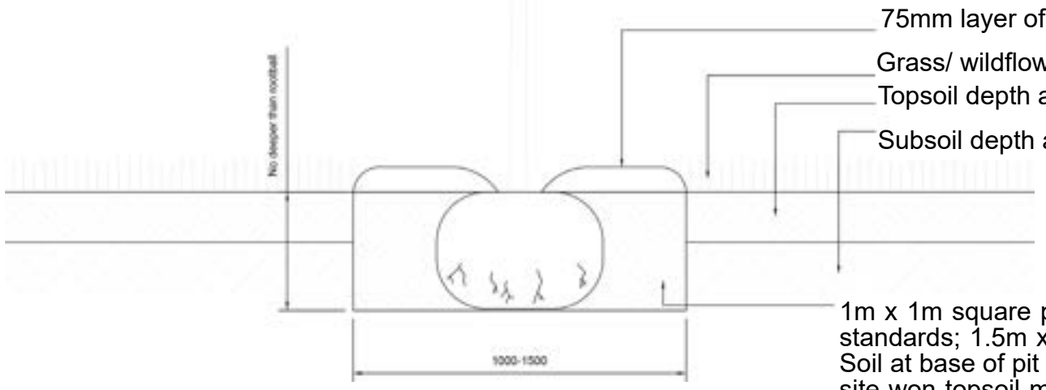
NATIVE HEDGEROW PLANTING DETAIL



STANDARD TREE PLANTING PIT DETAILS_SINGLE STAKE



STANDARD TREE PLANTING PIT DETAILS_CROSS BAR STAKE



75mm layer of organic mulch

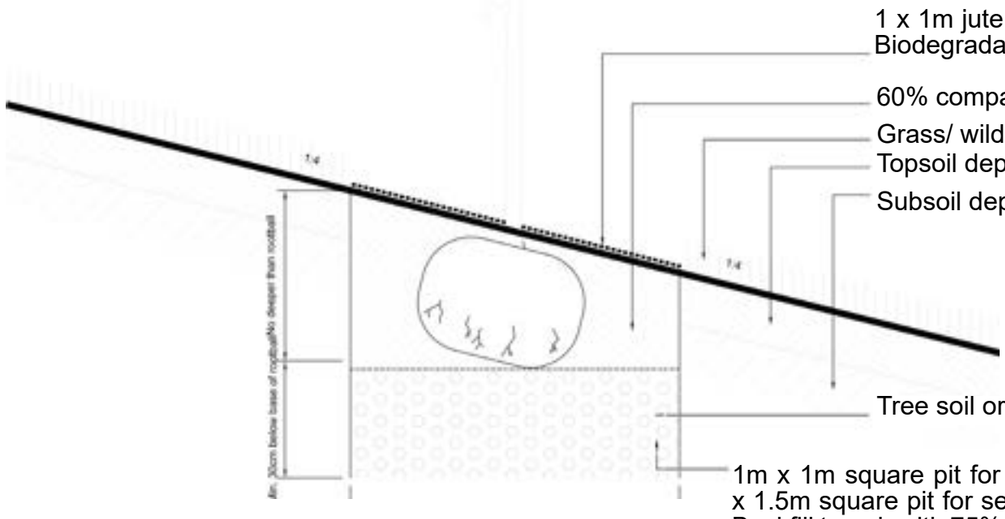
Grass/ wildflower seeding

Topsoil depth as specified

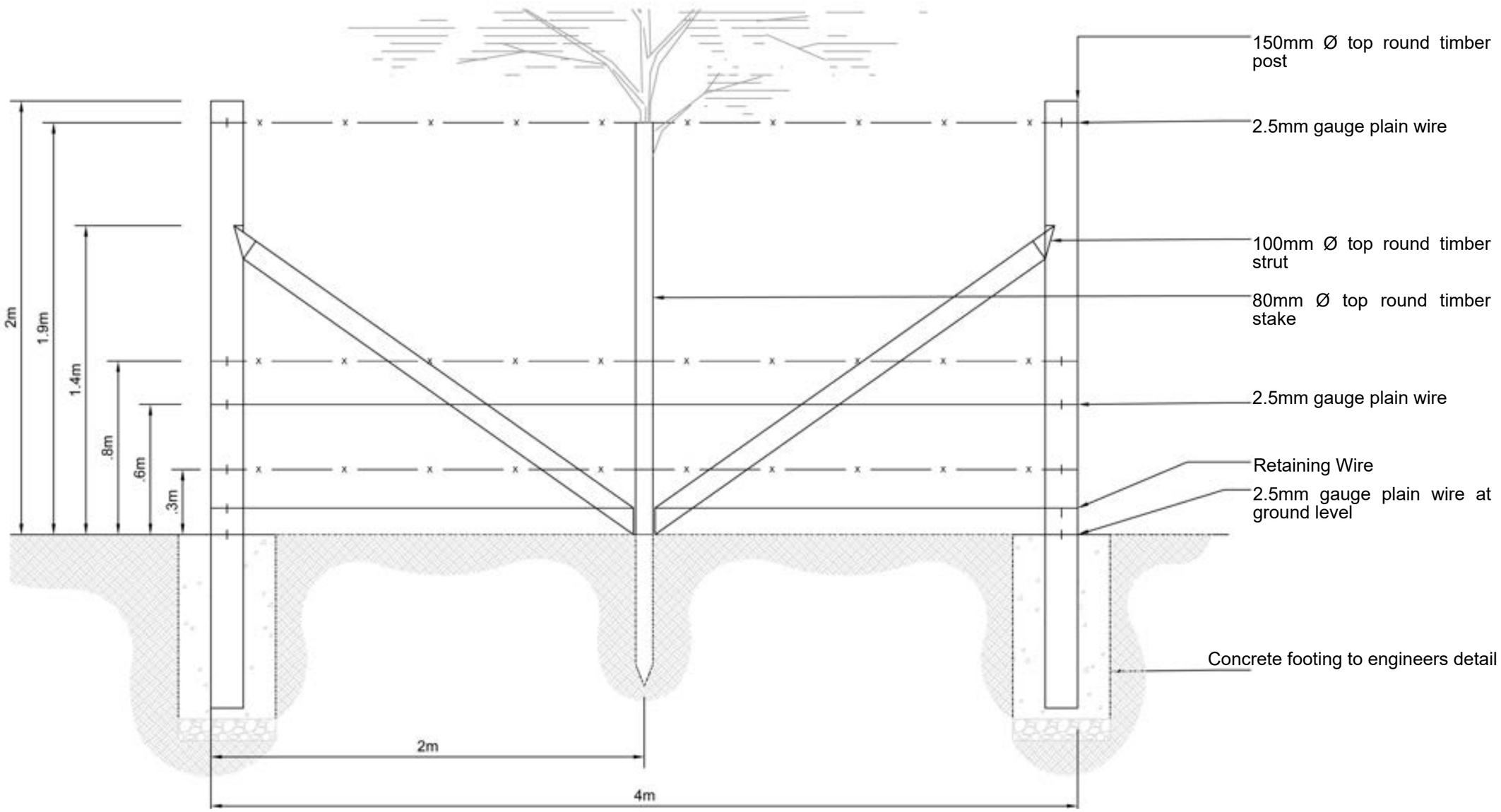
Subsoil depth as specified

1m x 1m square pit for heavy standards and extra heavy standards; 1.5m x 1.5m square pit for semi-mature trees. Soil at base of pit to be loosened. Backfill trench with 75% site-won topsoil mixed with 25% compost (or backfill with excavated soil?). A slow-release fertiliser to be added to each pit. TBC

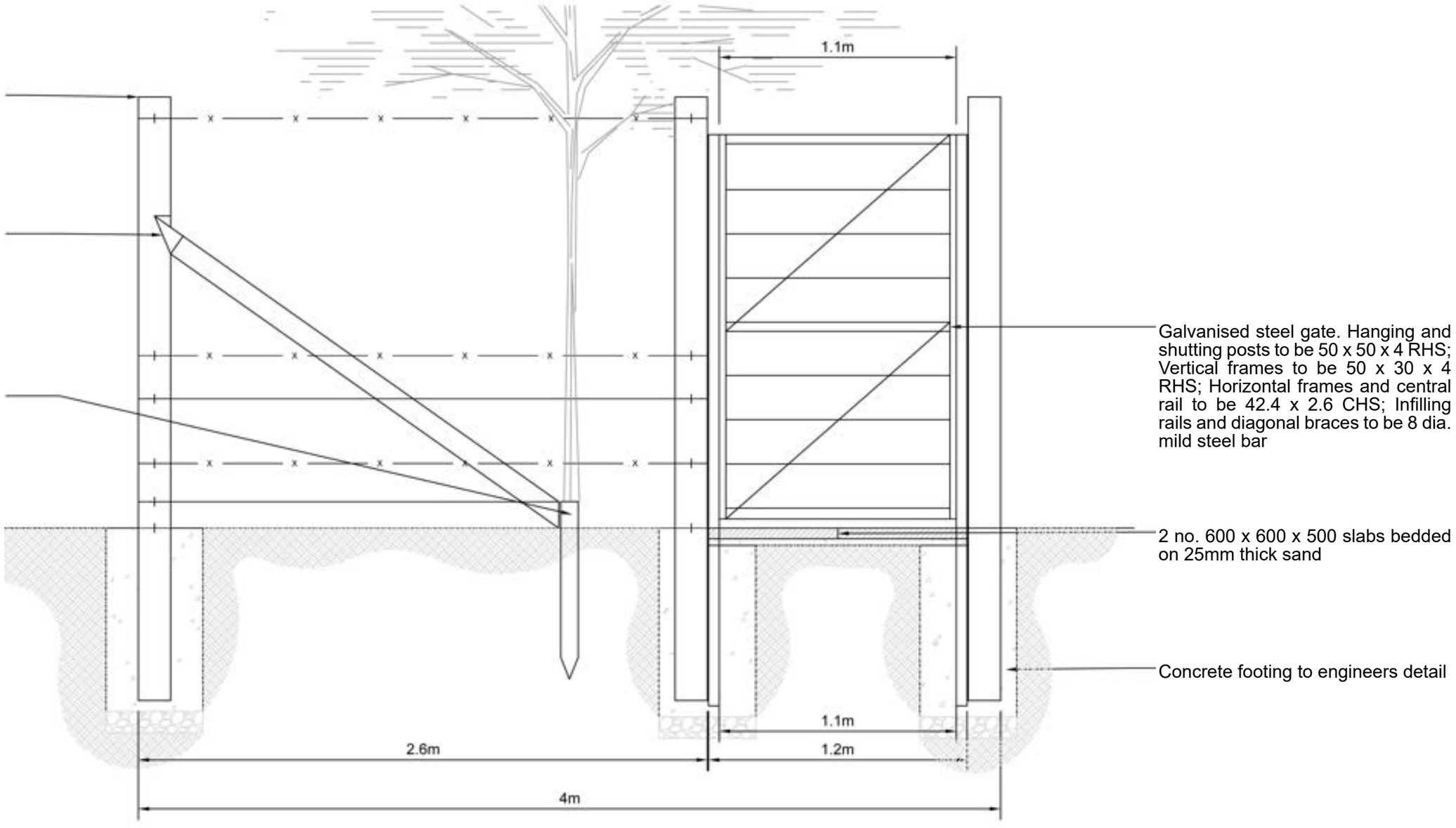
STANDARD TREE PLANTING PIT DETAIL A_TREE ANCHORING SYSTEM



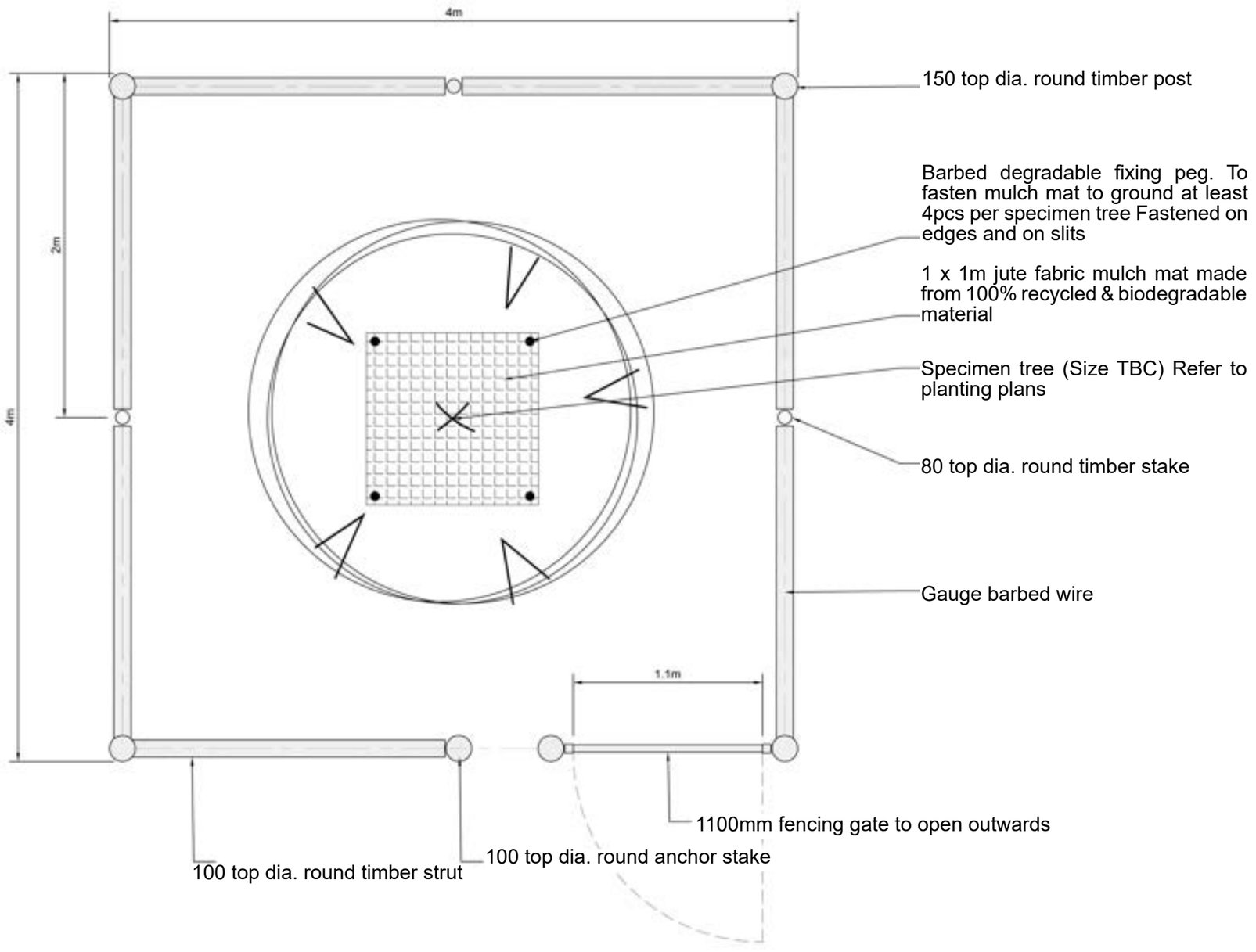
STANDARD TREE PLANTING PIT DETAIL B



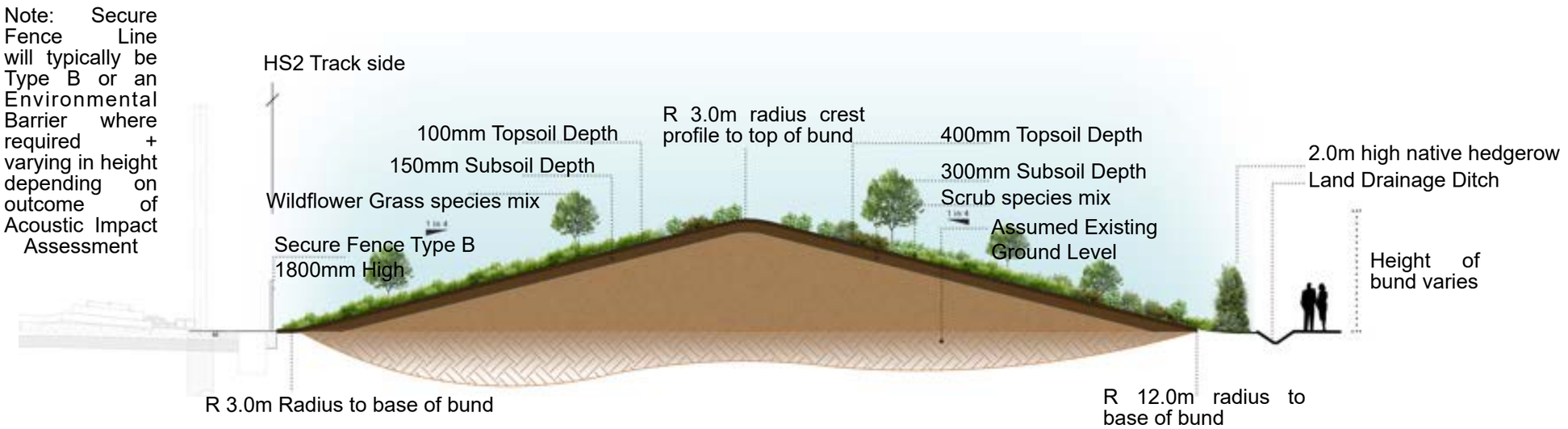
CATTLE PROOF FENCING FOR SPECIMEN TREES

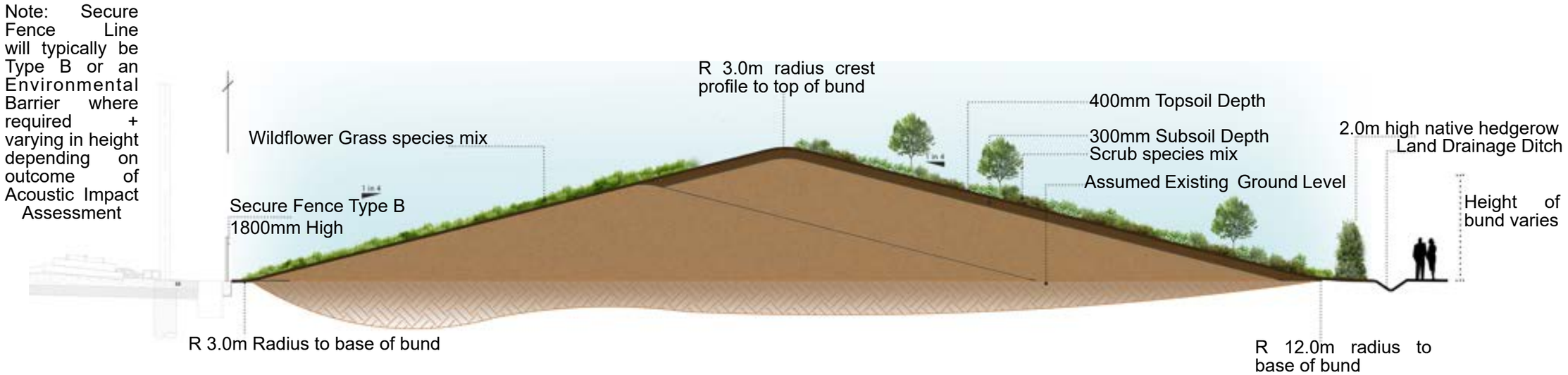


FIELD STANDARD TREE PROTECTION DETAIL_ACCESS GATE FOR SPECIMEN TREE



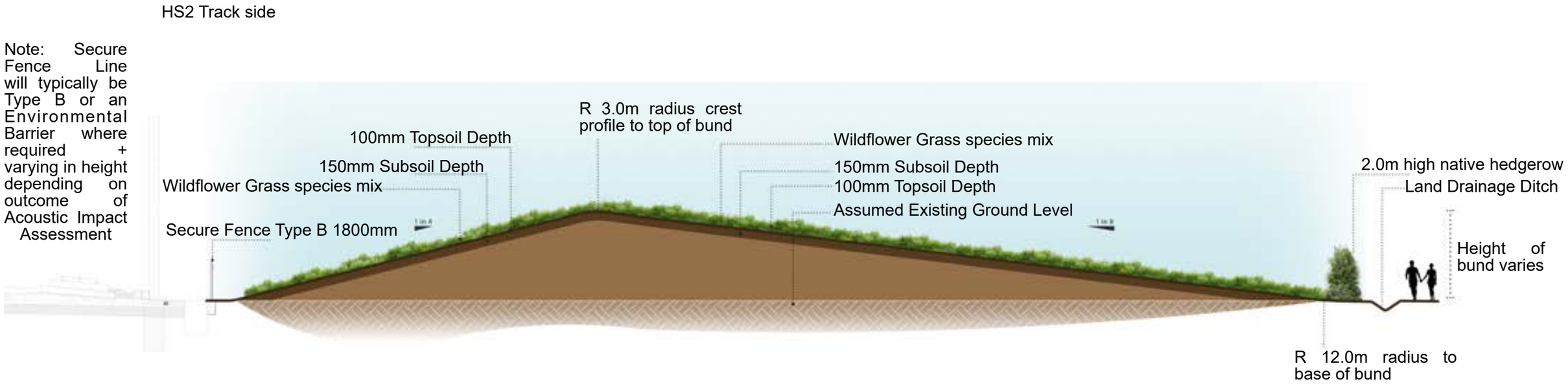
PLAN OF CATTLE PROOF FENCING FOR SPECIMEN TREES

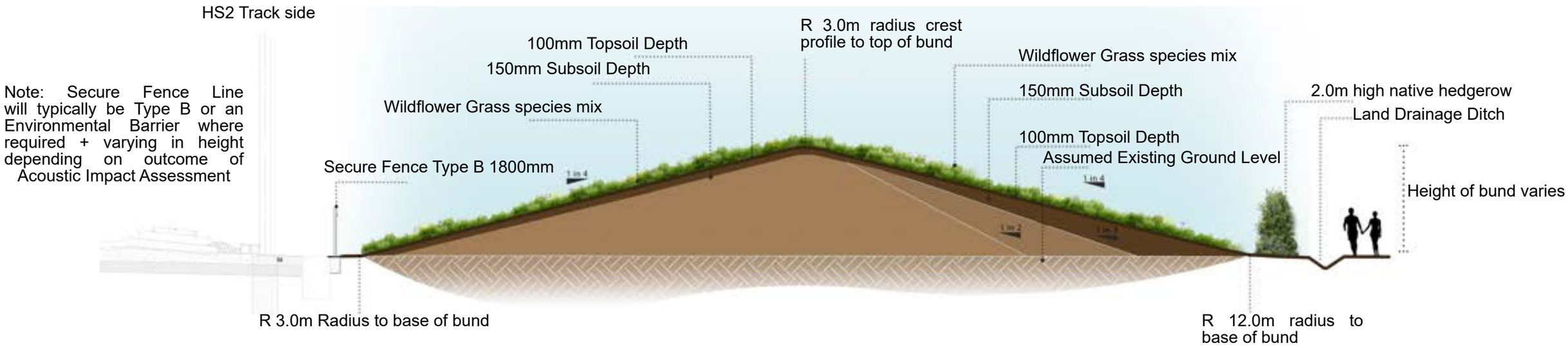




PLANTING PARAMETERS FOR VEGETATION TYPES

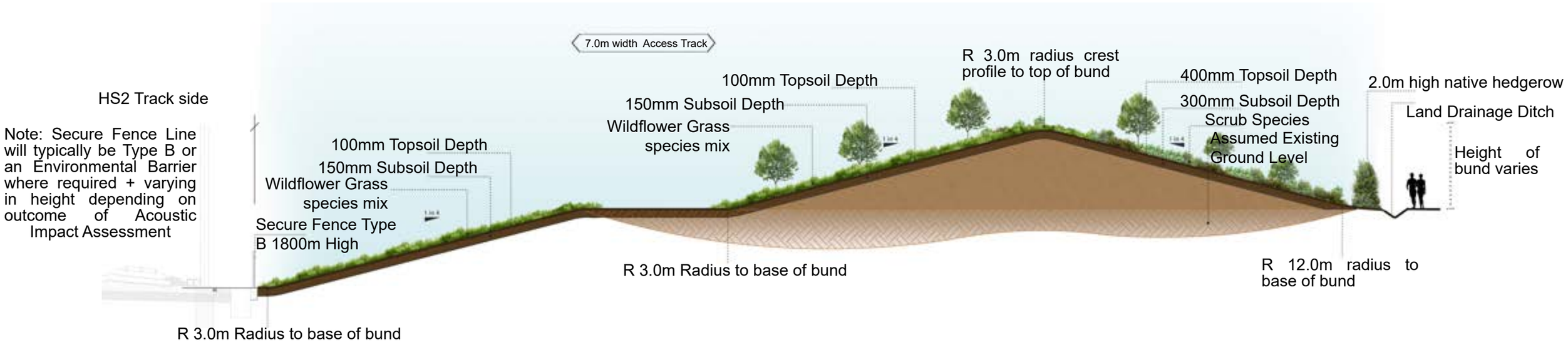
HS2 Typical Details- Planting

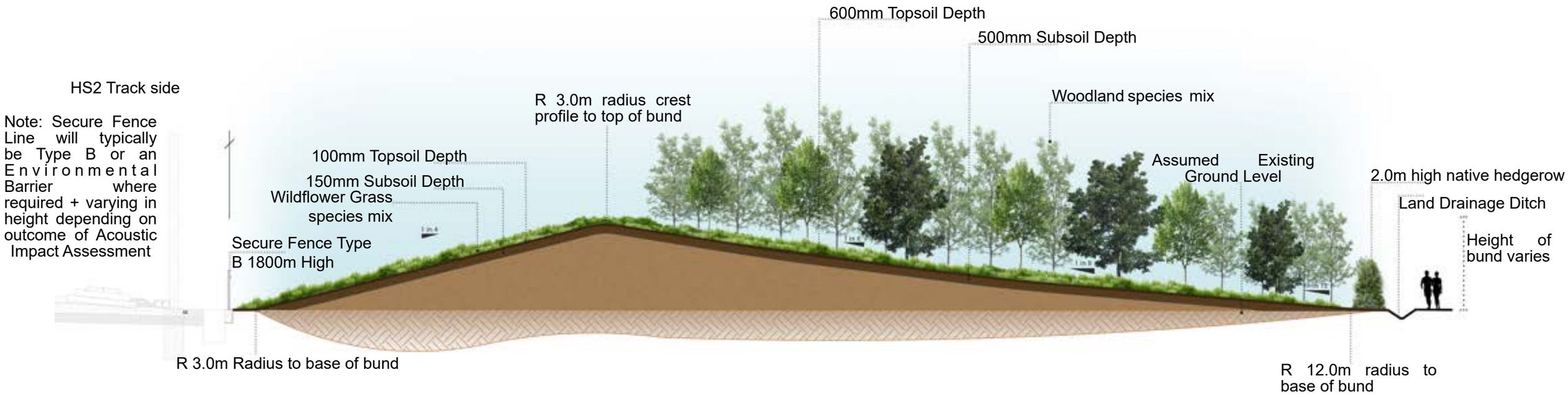




PLANTING PARAMETERS FOR VEGETATION TYPES

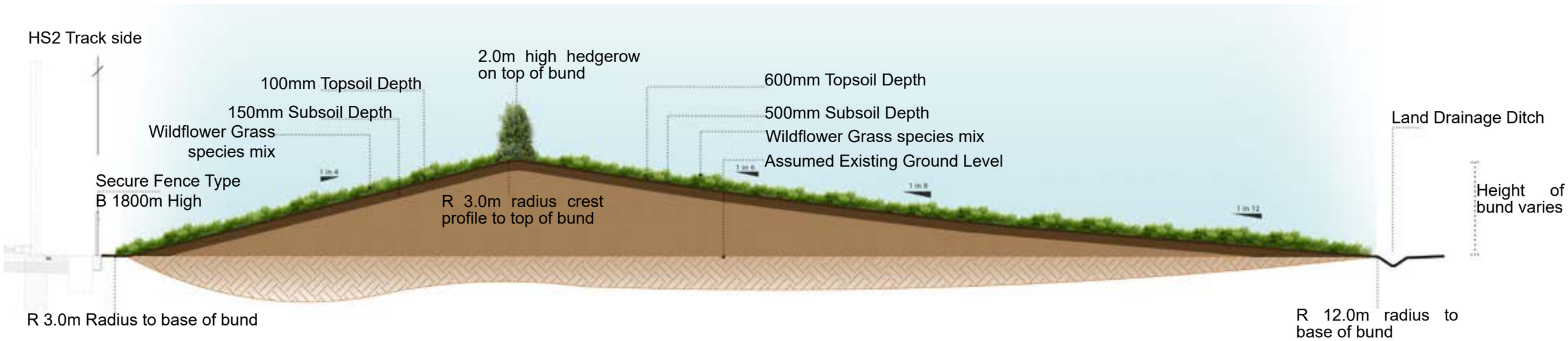
HS2 Typical Details - Planting

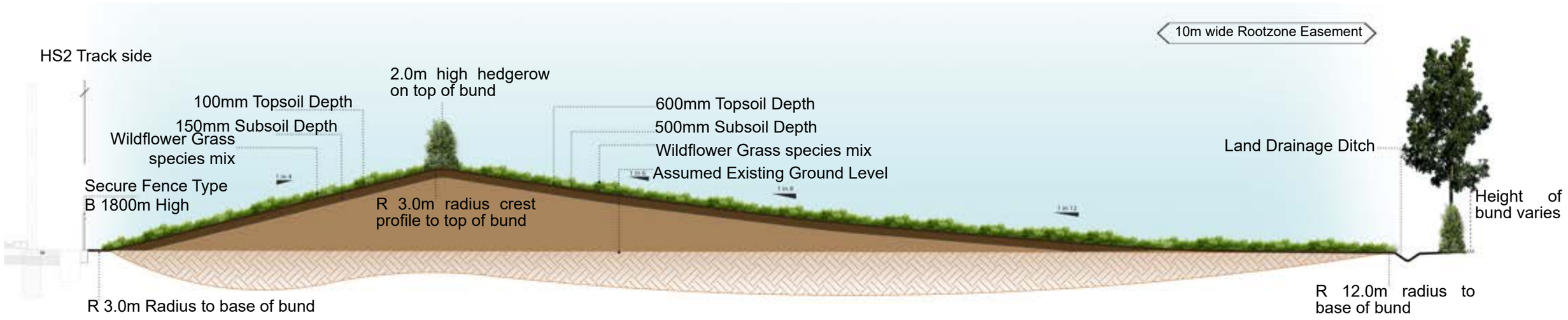




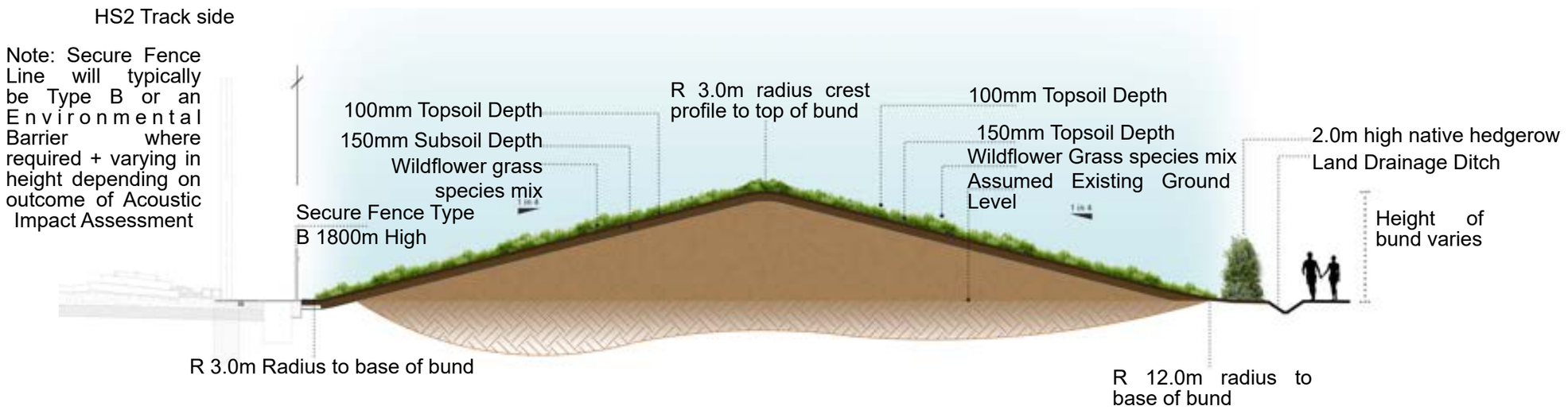
PLANTING PARAMETERS FOR VEGETATION TYPES

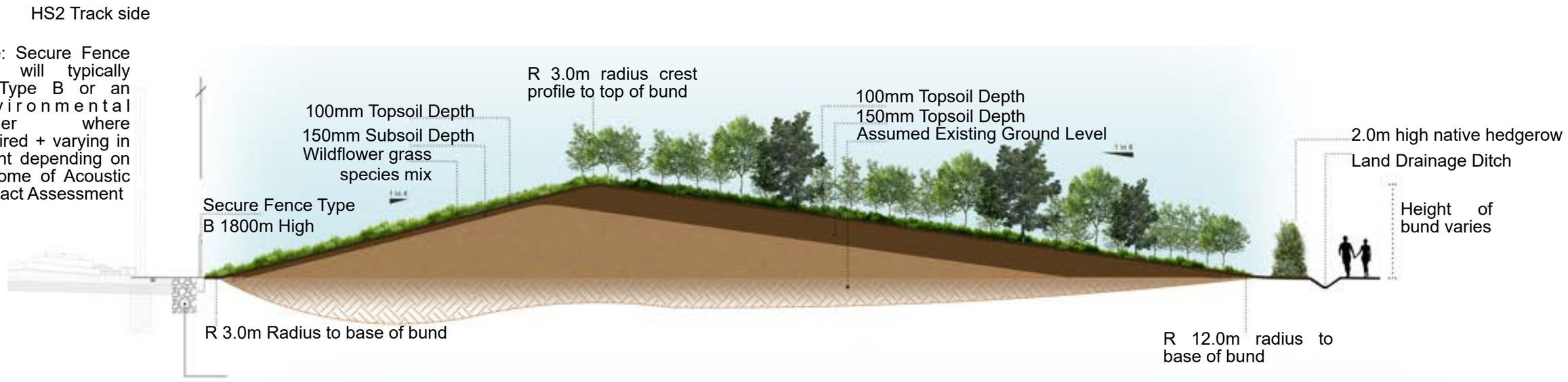
HS2 Typical Details - Planting





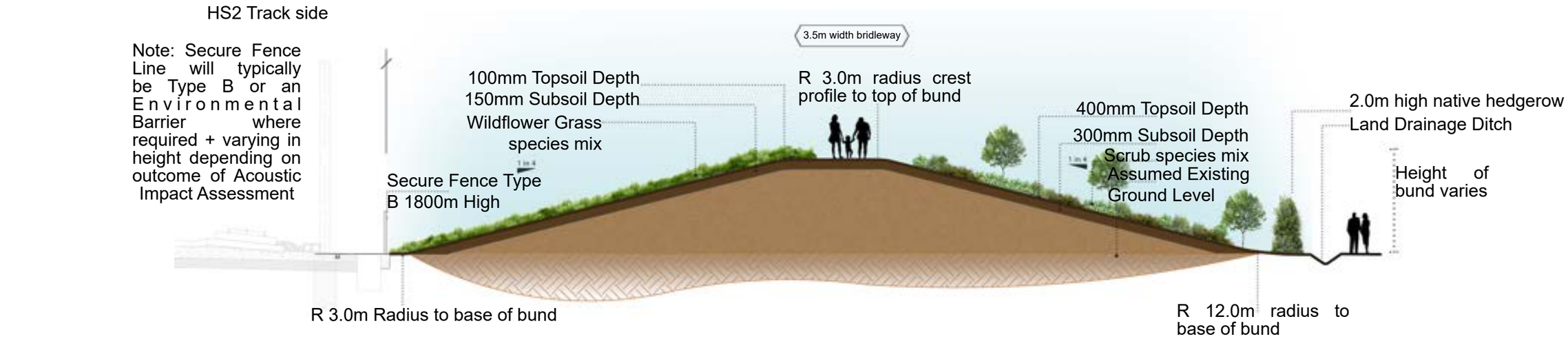
PLANTING PARAMETERS FOR VEGETATION TYPES

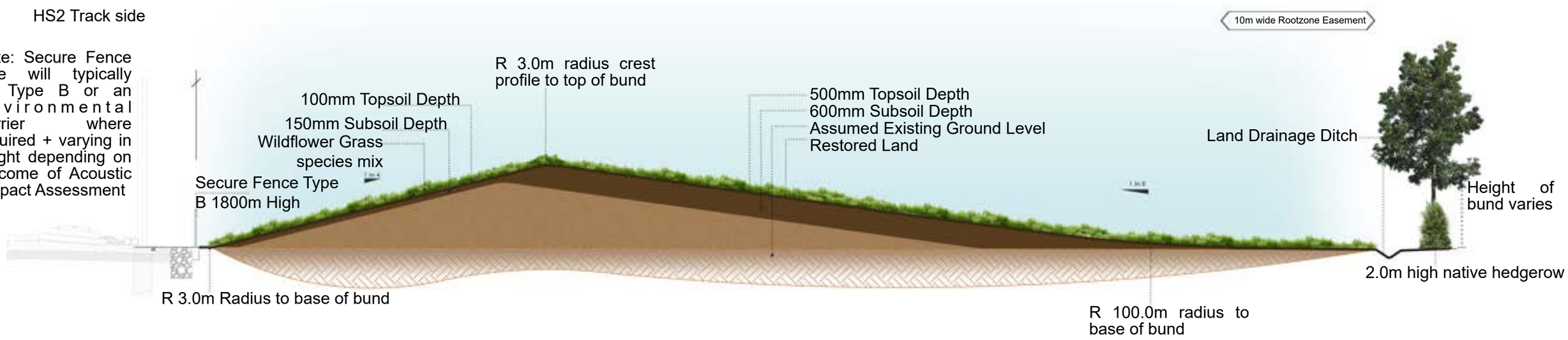




PLANTING SCOPE FOR CUTTINGS AND EMBANKMENTS

HS2 Typical Details- Planting





PLANTING PARAMETERS FOR VEGETATION TYPES

HS2 Typical Rainshadow Approach

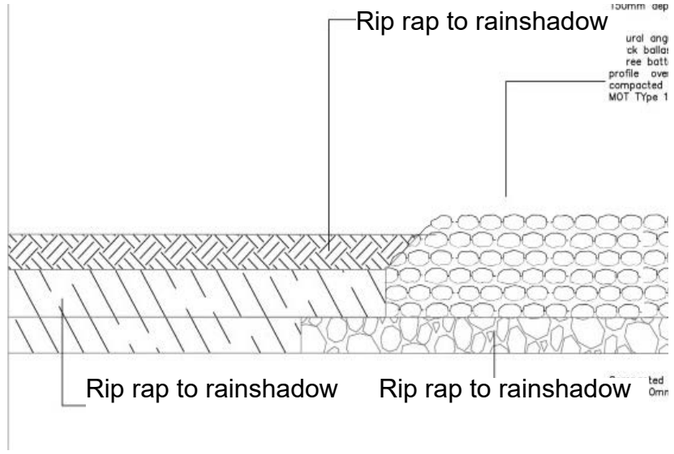


PLAN

Highfurlong Viaduct access track- between piers with Type 1 / Type 3 surface.

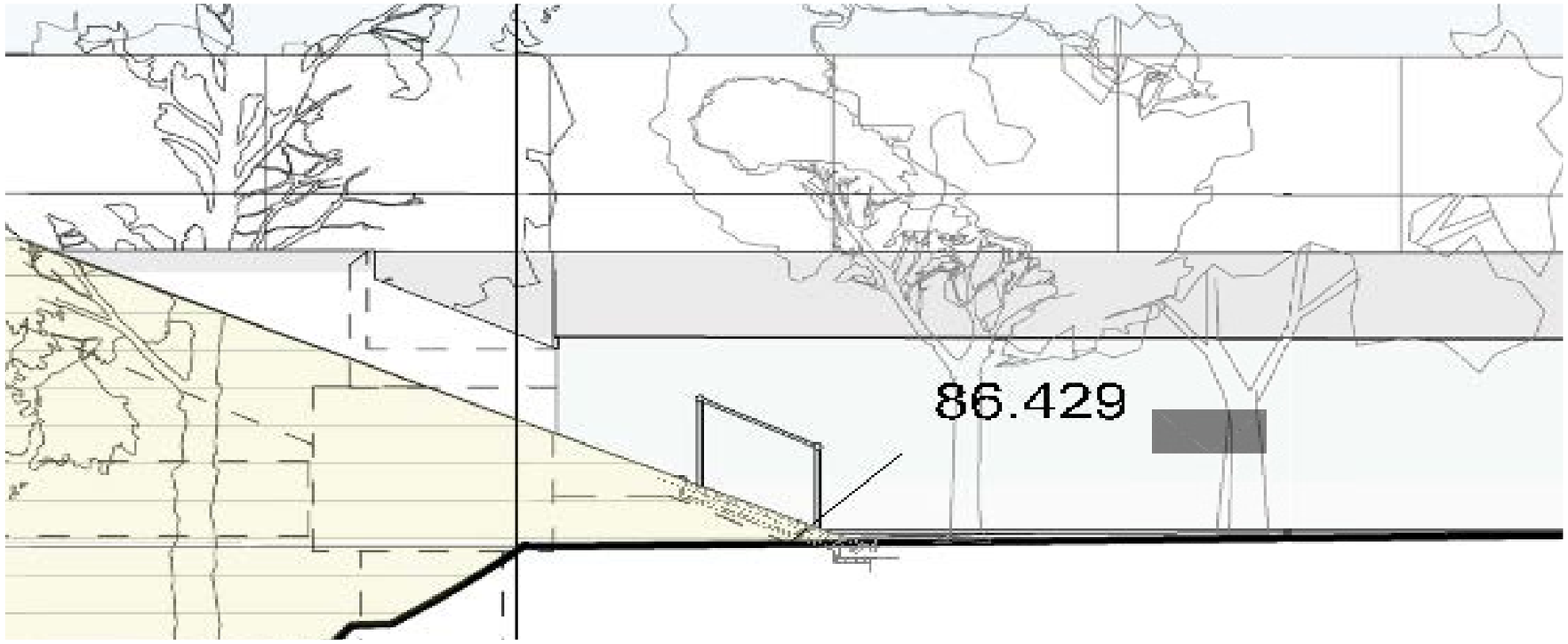
Rip rap to rainshadow area at 1 in 4 gradient or less; minimal rip rap coverage

Wildflower and grass sward sown beneath viaduct to extent of ground level hard surface- see plan [left]



SECTION; Thru' MOT Type 1 / Type 3 surface beneath viaduct - edge battered @ 45 degrees and backfilled with subsoil / topsoil mix

Highfurlong Viaduct



ELEVATION

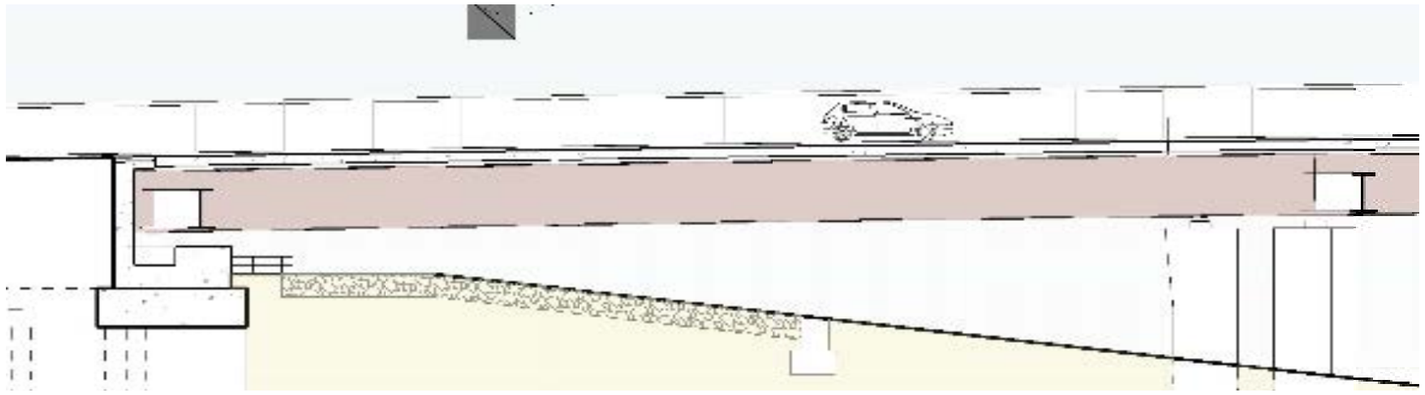
Maintenance access platform and protective rail 2.0m below OB soffit level

Rip rap to rainshadow area at 1 in 2 gradient or less; Rip rap coverage from base of embankment with edge restraint to toe of embankment.

Wildflower and grass sward sown beneath viaduct to extent of ground level hard surface- see plan above

RAINSHADOW LOW LEVEL VIADUCT eg Godington Viaduct

HS2 Typical Rainshadow Approach

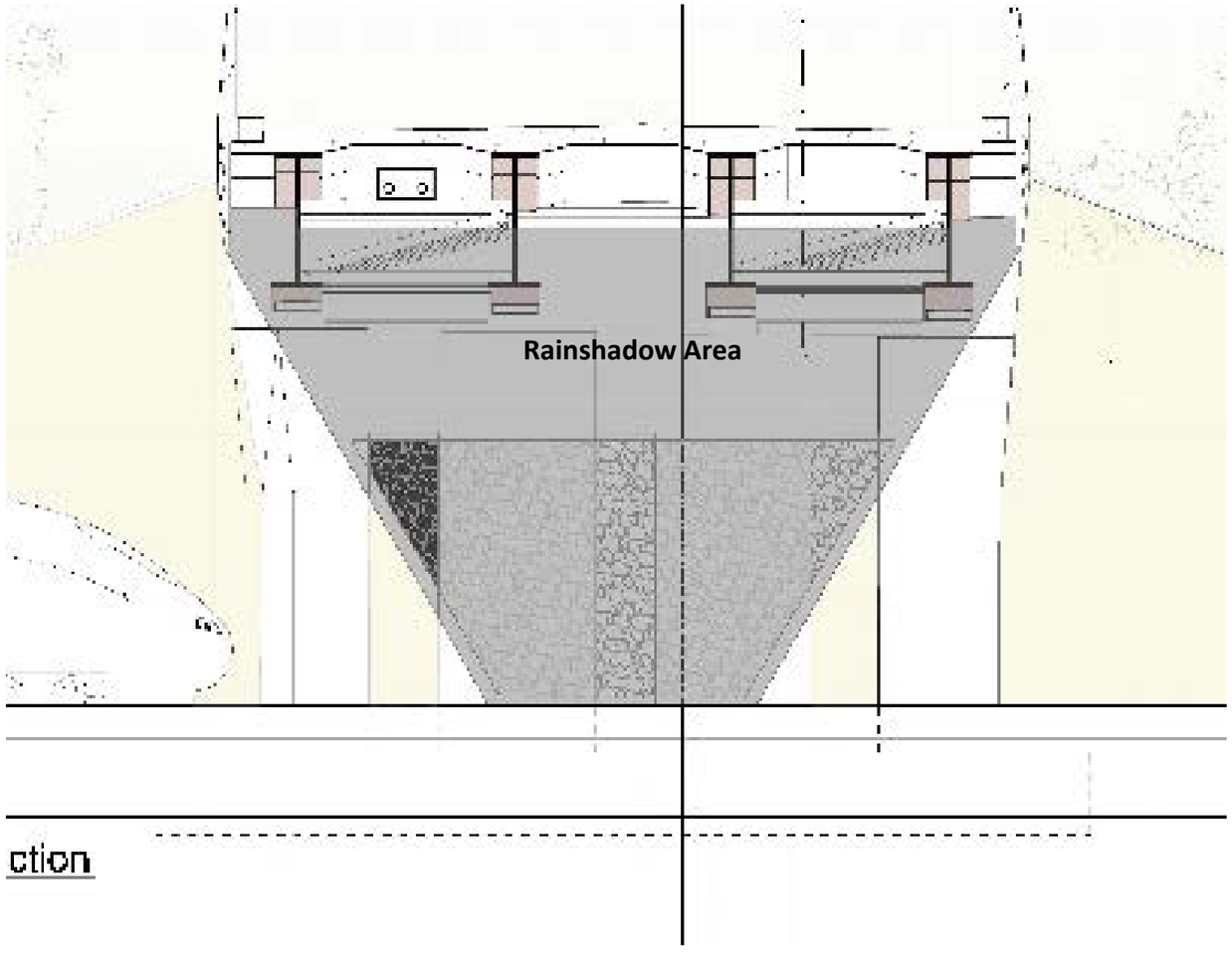


SECTION

Maintenance access platform and protective rail 2.0m below OB soffit level

Rip rap to rainshadow area at 1 in 2 gradient or less; Rip rap coverage from base of embankment with edge restraint to toe of embankment.

Wildflower and grass sward sown beneath viaduct to form continuous green connectivity

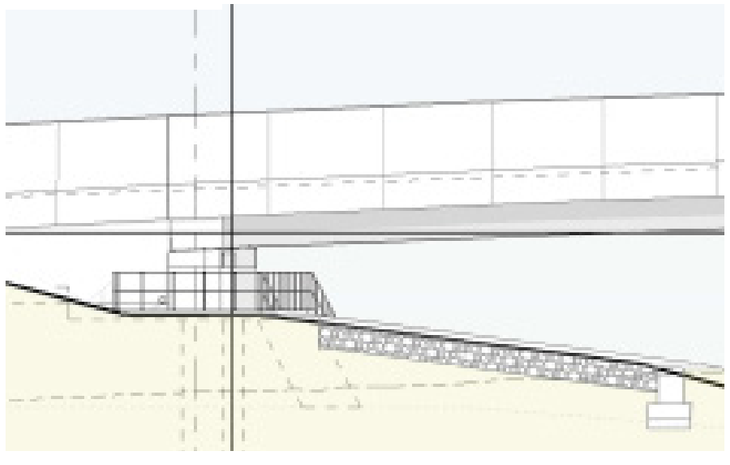


ELEVATION

Maintenance access platform and protective rail 2.0m below viaduct soffit

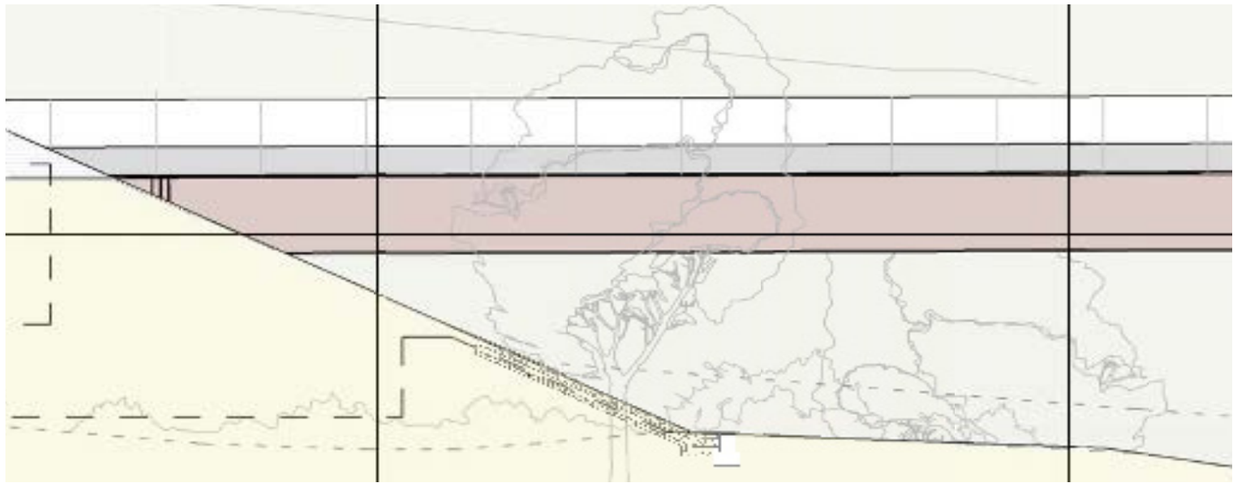
Rip rap to rainshadow area at 1 in 3 gradient or less; rip rap surface from maintenance platform to base of embankment

Wildflower and grass sward sown to either side of rip rap surface and beneath edge of bridge parapet.



RAINSHADOW OVERBRIDGE DETAILS [WIDE > 7.0] EG Nash Lee Overbridge

HS2 Typical Rainshadow Approach

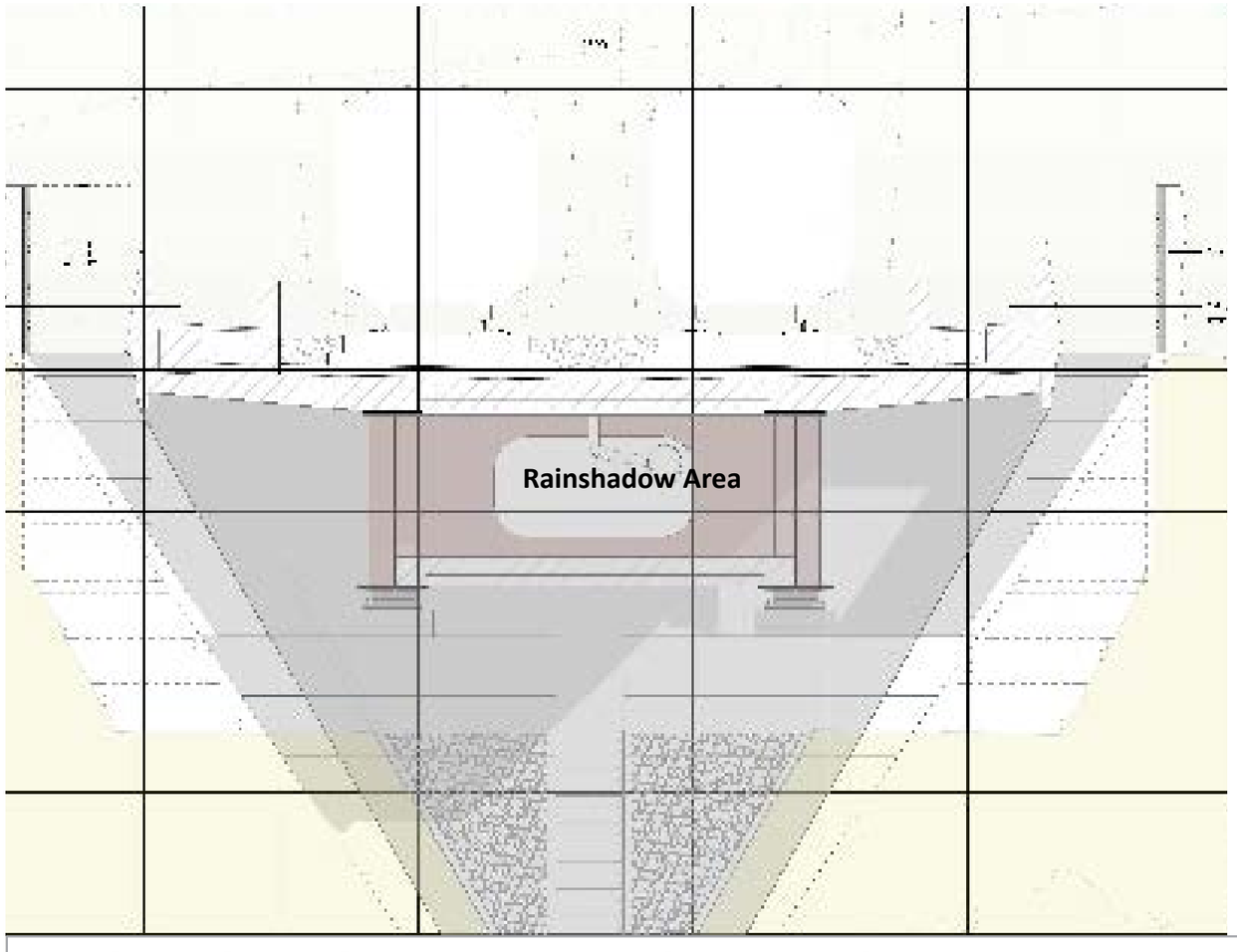


SECTION

Maintenance access platform and protective rail 2.0m below OB soffit level

Rip rap to rainshadow area at 1 in 2 gradient or less; Rip rap coverage from base of embankment with edge restraint to toe of embankment.

Wildflower and grass sward sown beneath viaduct to form continuous green connectivity



ELEVATION

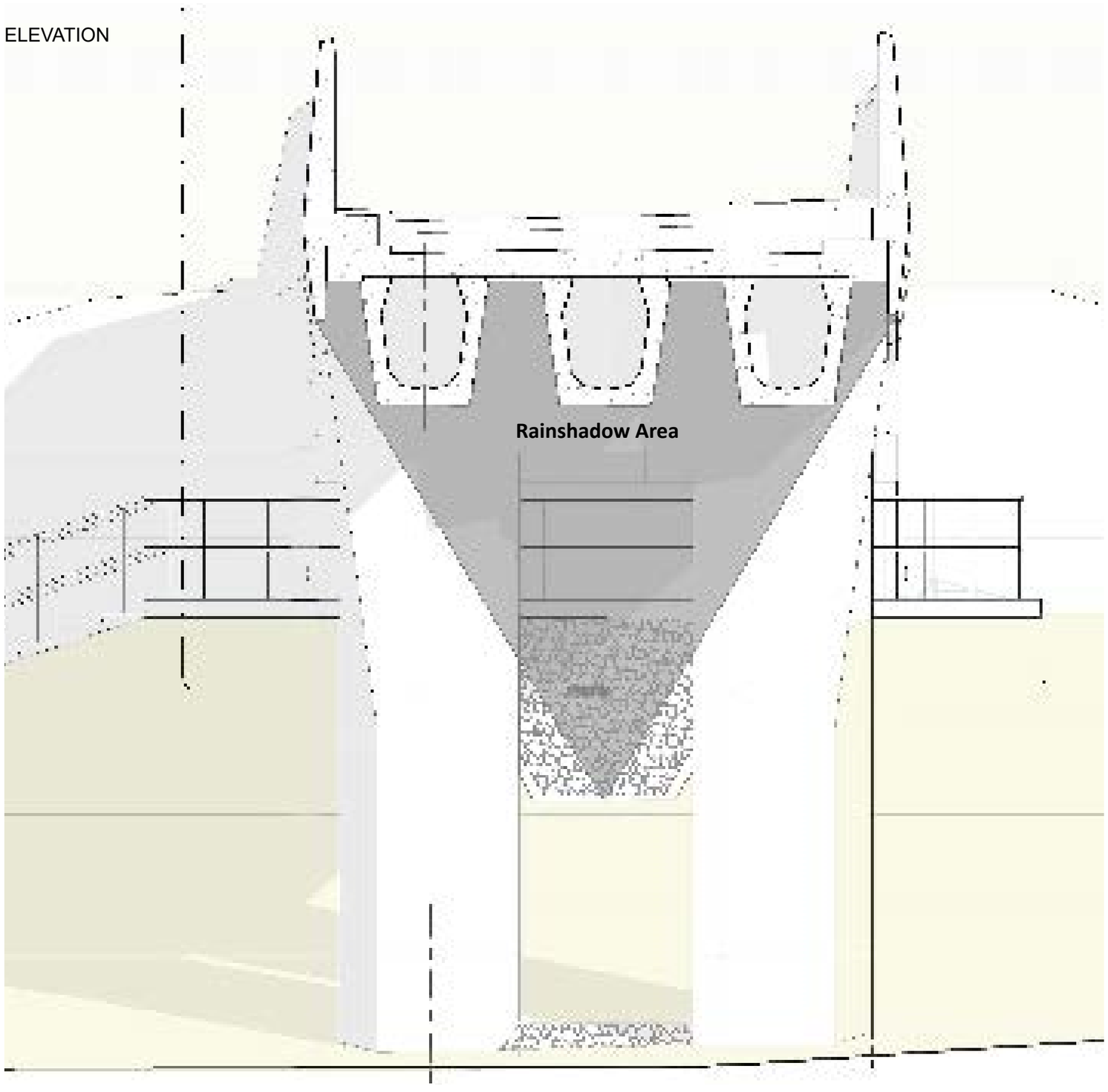
Maintenance access platform and protective rail 2.0m below viaduct soffit

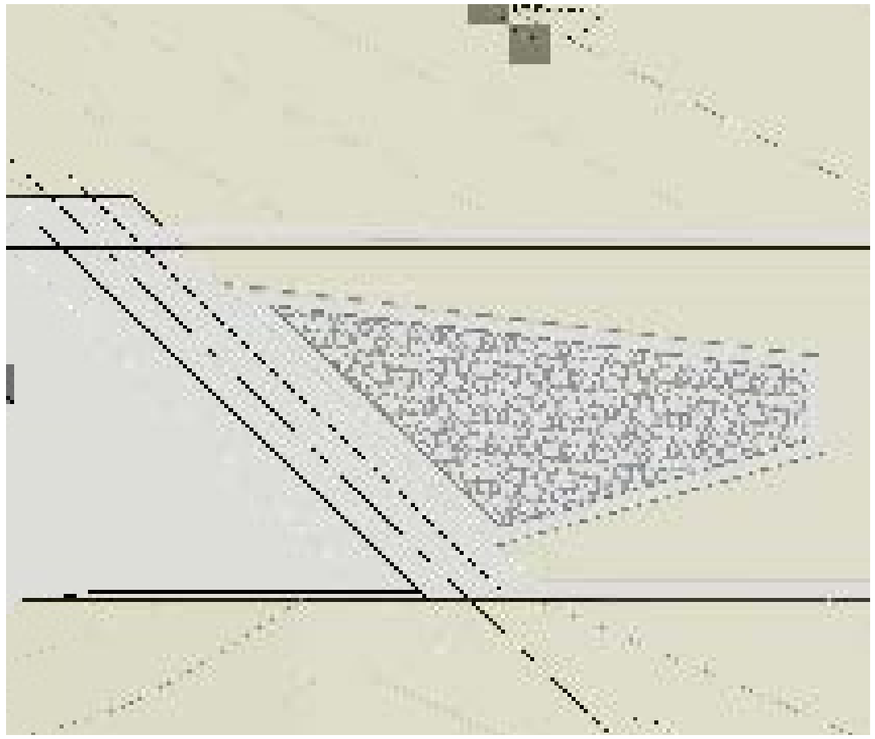
Rip rap to rainshadow area at 1 in 3 gradient or less; rip rap surface from maintenance platform to base of embankment

Wildflower and grass sward sown to either side of rip rap surface. As

RAINSHADOW HIGH LEVEL VIADUCT DETAILS eg Wendover Dean Viaduct

HS2 Typical Rainshadow Approach





Plan

Maintenance access platform and protective rail

Rip rap to rainshadow area at 1 in 3 gradient or less; minimal rip rap coverage- with lateral and vertical edge restraint

Wildflower and grass sward sown beneath narrow overbridge to form continuous green connectivity

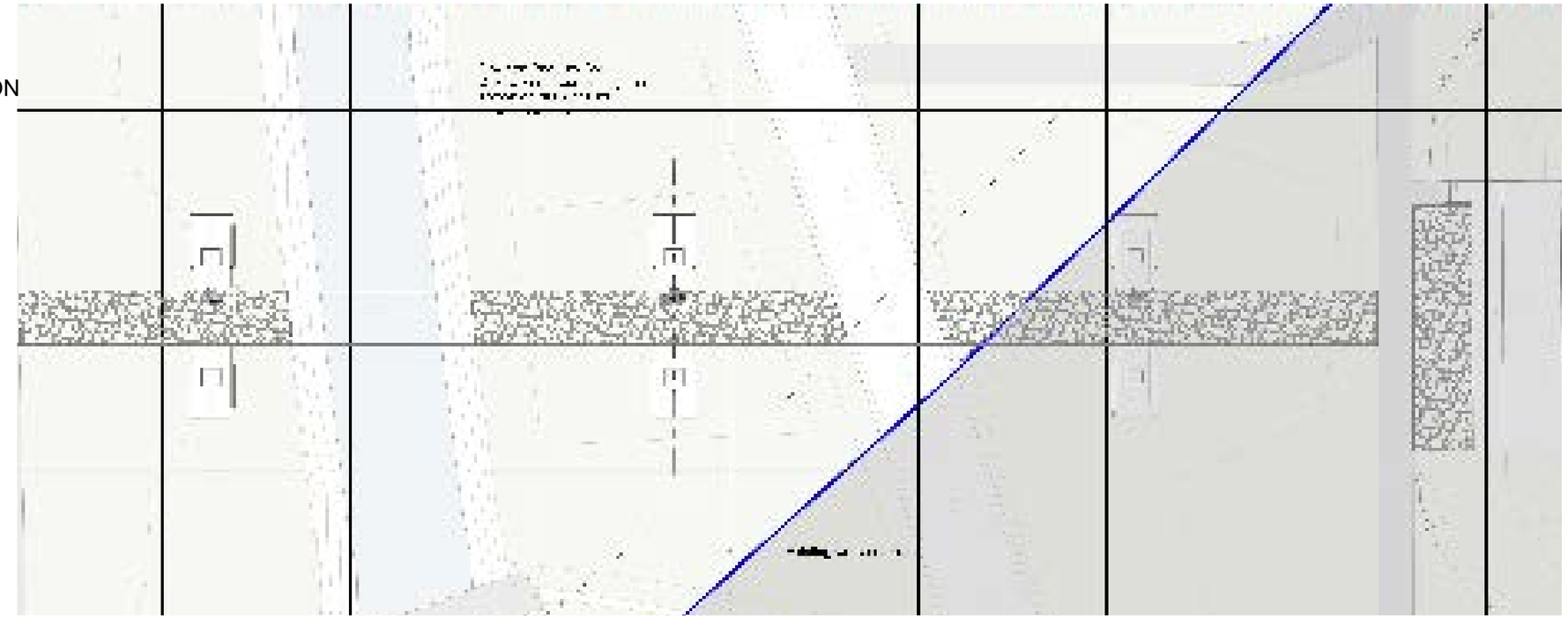
Rip rap surface between piers

Rip rap surface extent on embankment beneath wide overbridge- trapezoid panel

RAINSHADOW OVERBRIDGE DETAILS [WIDE > 7.0M WIDTH] eg Nash Lee Overbridge

HS2 Typical Rainshadow Approach

LEVATION

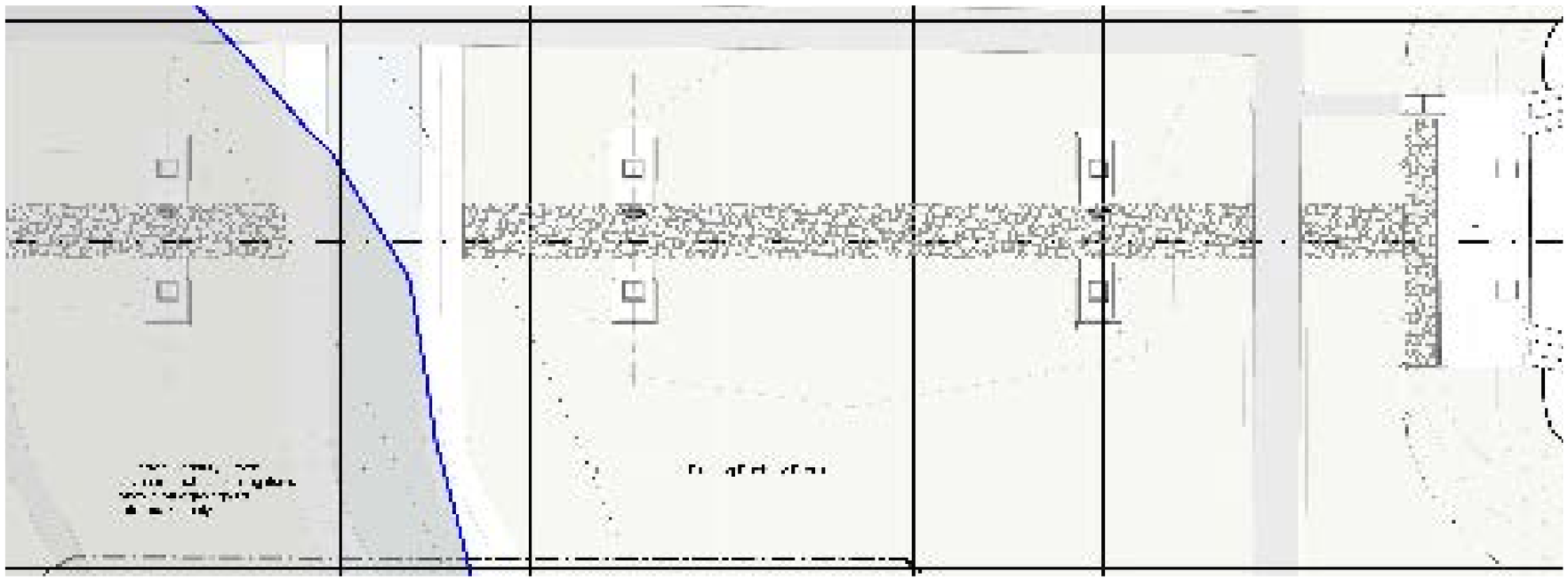


PLAN

Maintenance access platformand protective rail

Rip rap to rainshadow area at 1 in 3 gradient or less; minimal rip rap coverage

Wildflower and grass sward sown beneath narrow overbridge to form continuous green connectivity



PLAN

Maintenance access platformand protective rail

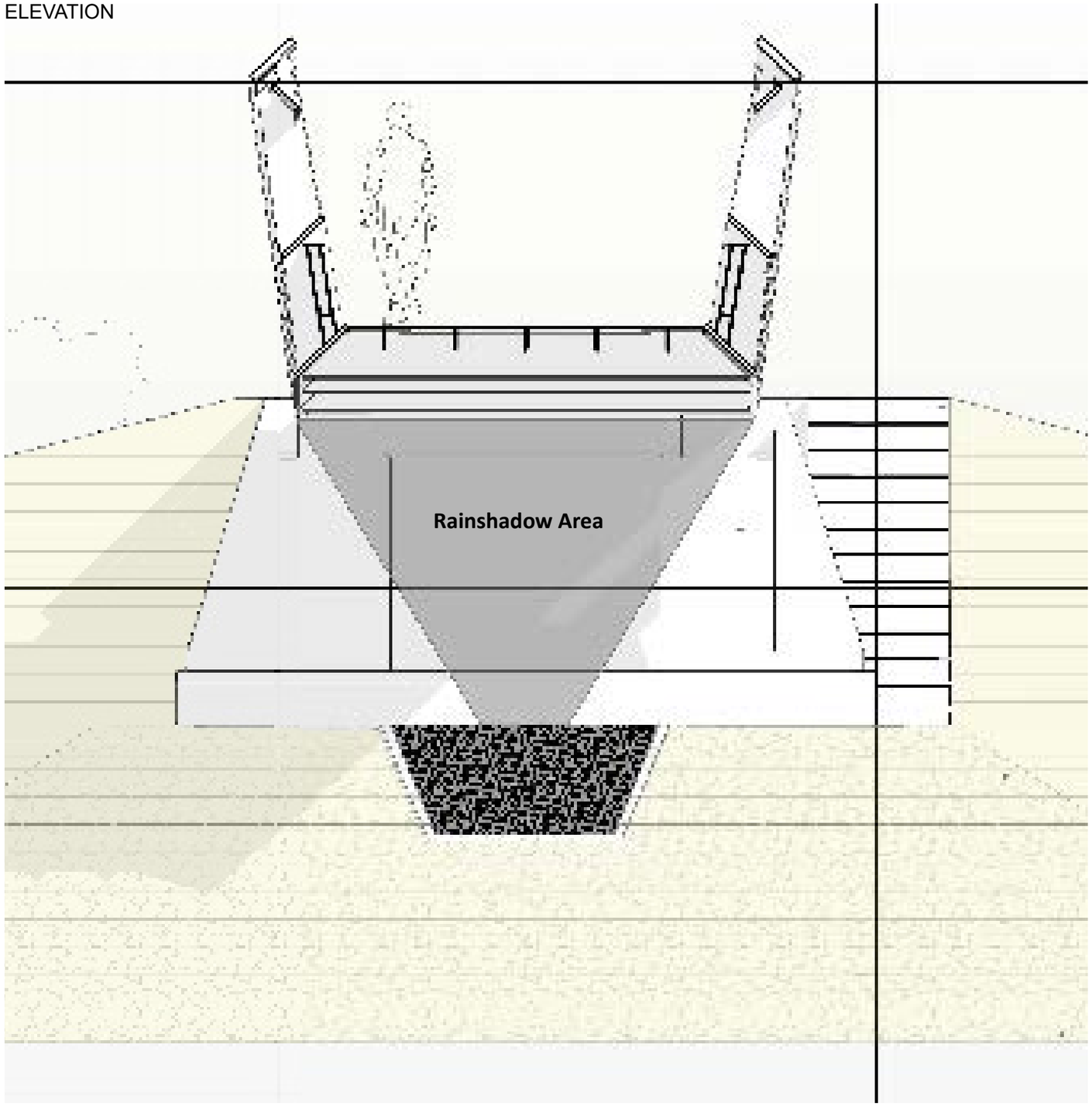
Rip rap to rainshadow area at 1 in 3 gradient or less; minimal rip rap coverage

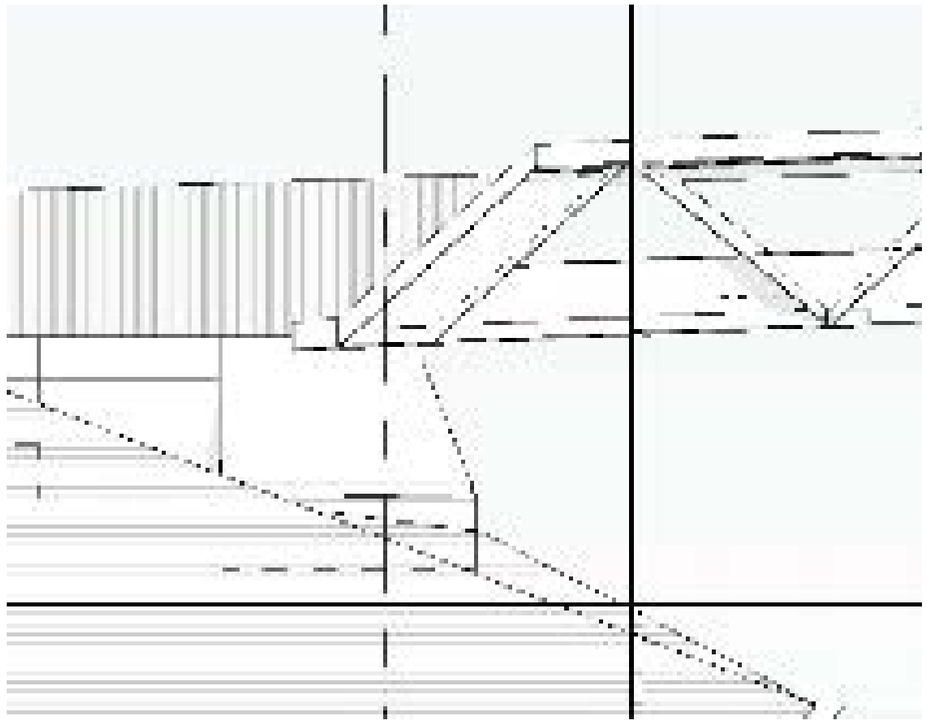
Wildflower and grass sward sown beneath narrow overbridge to form continuous green connectivity

RAINSHADOW UNDER BRIDGE SURFACE PLAN

HS2 Typical Rainshadow Approach

ELEVATION





SECTION

Rip rap extent on embankment beneath narrow footbridge OB

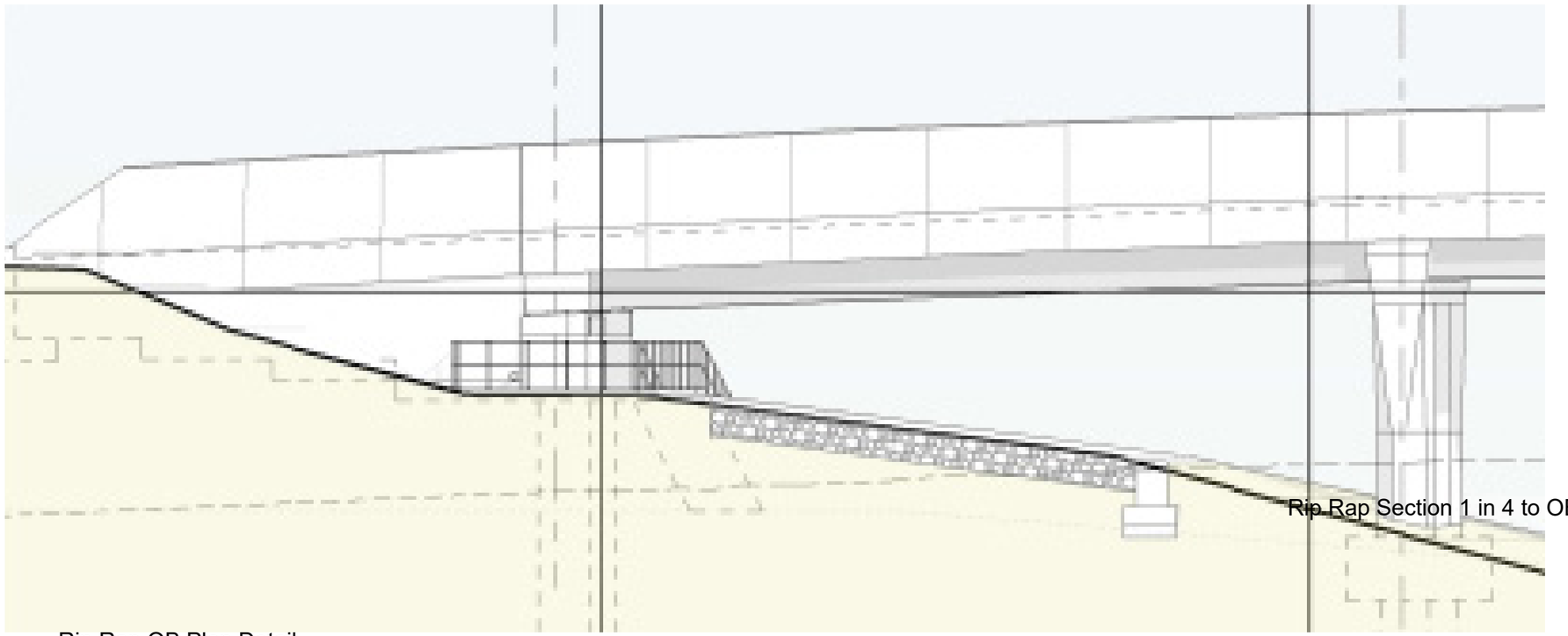
Maintenance access platformand protective rail

Rip rap to rainshadow area at 1 in 3 gradient or less; minimal rip rap coverage

Wildflower and grass sward sown beneath narrow overbridge to form continuous green connectivity

RAINSHADOW OVERBRIDGE DETAILS; FOOTBRIDGE [NARROW < 7.0m WIDTH] eg PB1/5A

HS2 Typical Rainshadow Approach



Rip Rap OB Plan Detail

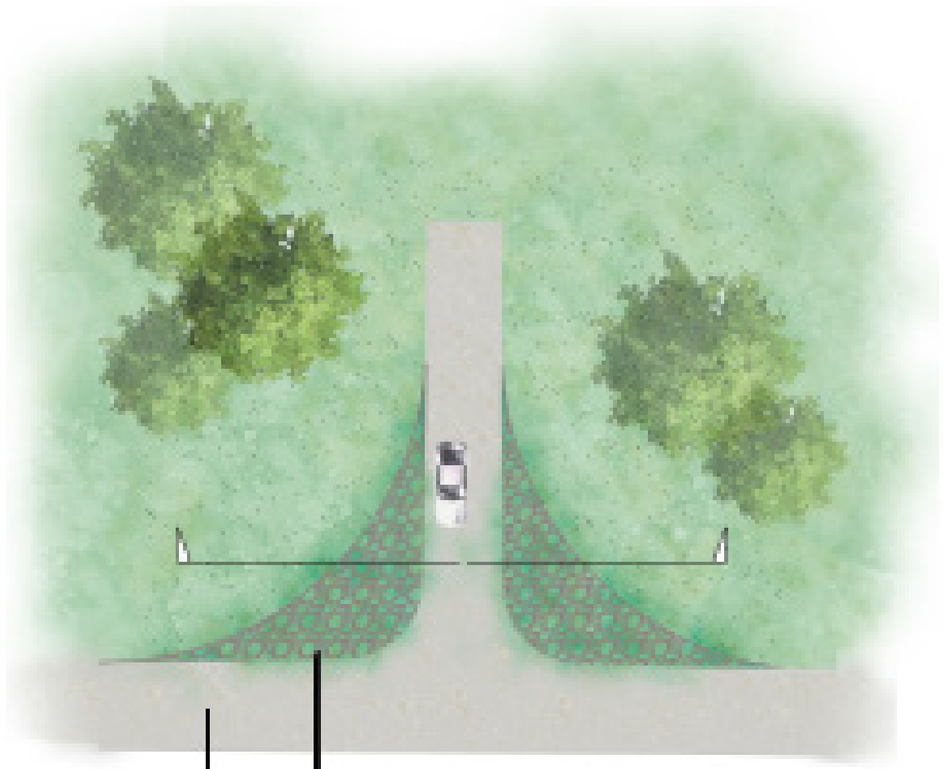
SECTION

Maintenance access platform and protective rail- 2.0m below OB soffit level

Rip rap to rainshadow area at 1 in 4 gradient or less; minimal rip rap coverage

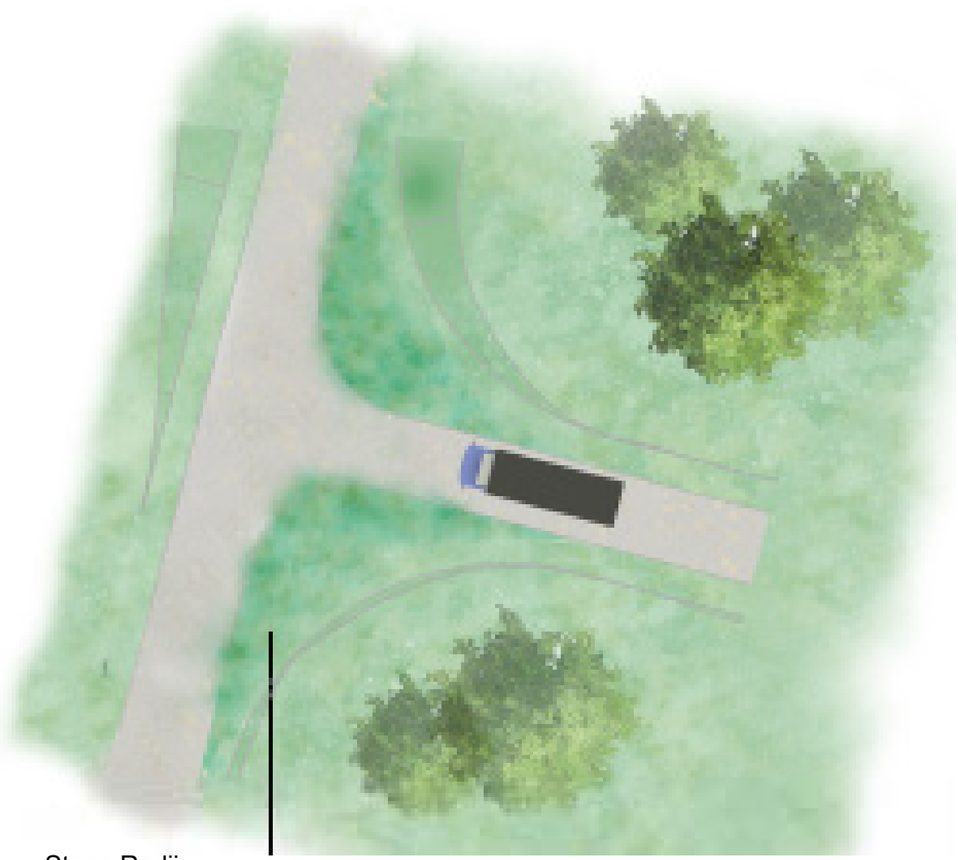
Wildflower and grass sward sown beneath overbridge to form continuous green connectivity

RAINSHADOW LOW LEVEL VIADUCT eg Godington Viaduct

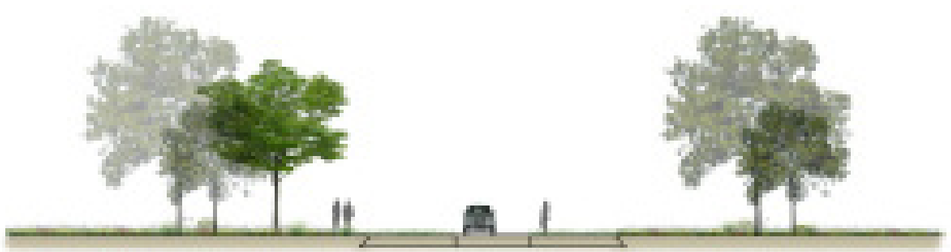


Permeable stone to green up over time

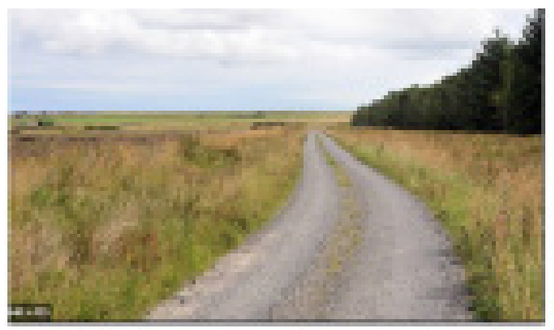
Stone Access Road
Well compacted stone, 3.5m wide to provide access route for maintenance access areas



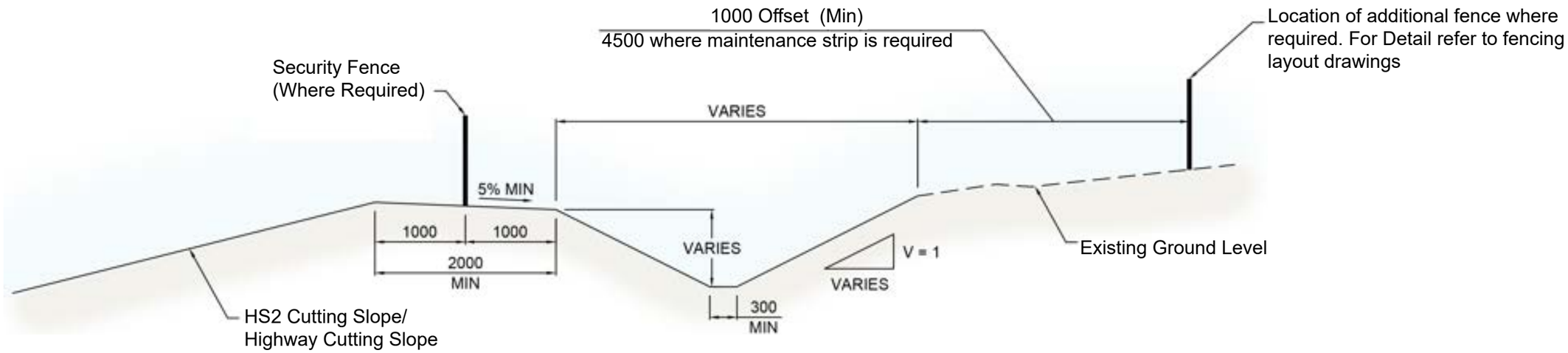
Stone Radii
Lightly compacted stone edge radii to access tracks, this will allow hard standing for vehicle turning and parking but will green up over time to limit the visual impact of the access track surface and provide a visual softening.



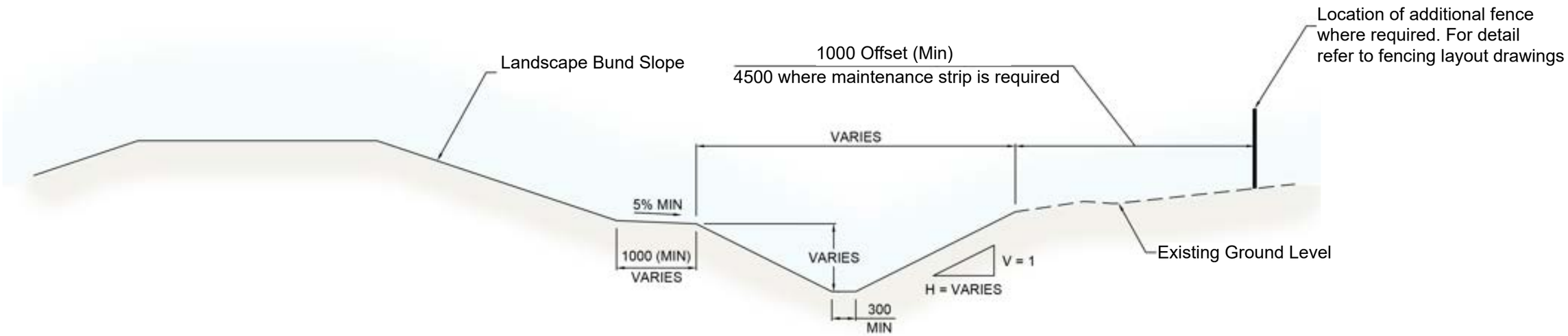
Soft Landscape Area
Soft landscape & grass areas around access routes to blend in with surrounding vernacular



PERMEABLE MAINTENANCE ACCESS ARRANGEMENT

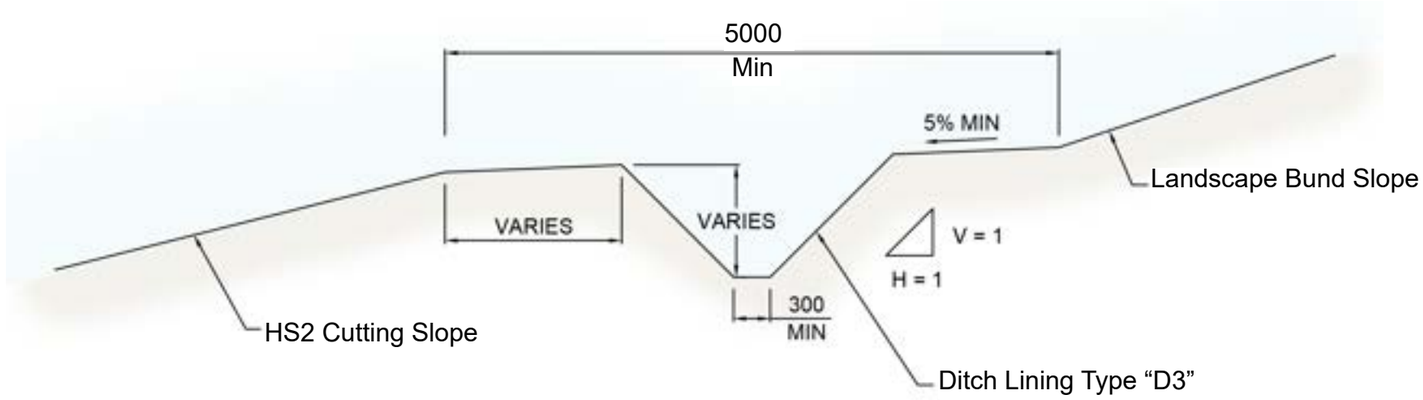


Typical Ditch Layout Adjacent to HS2 Cutting/ Highway Cutting

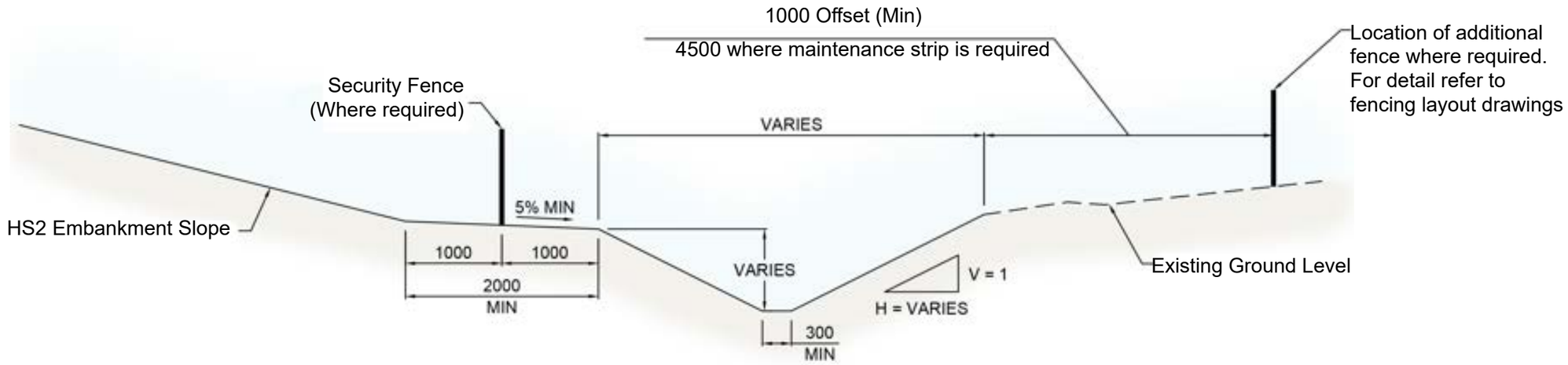


Typical Ditch Layout Adjacent to Landscape Bund

DRAINAGE DITCH PROFILES

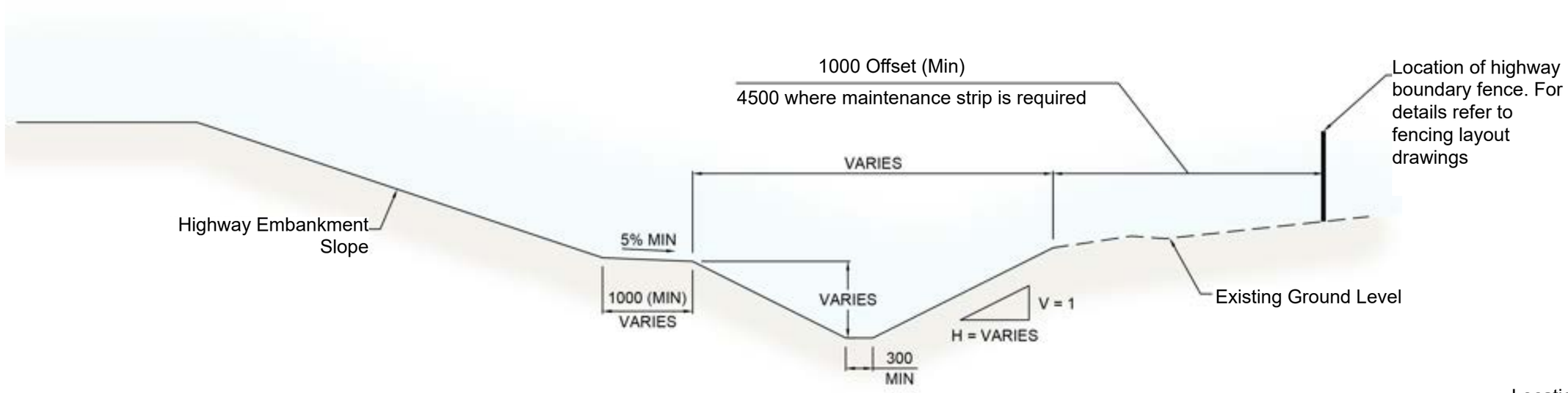


Typical Ditch Layout Between Landscape Bund and HS2 Cutting Slope

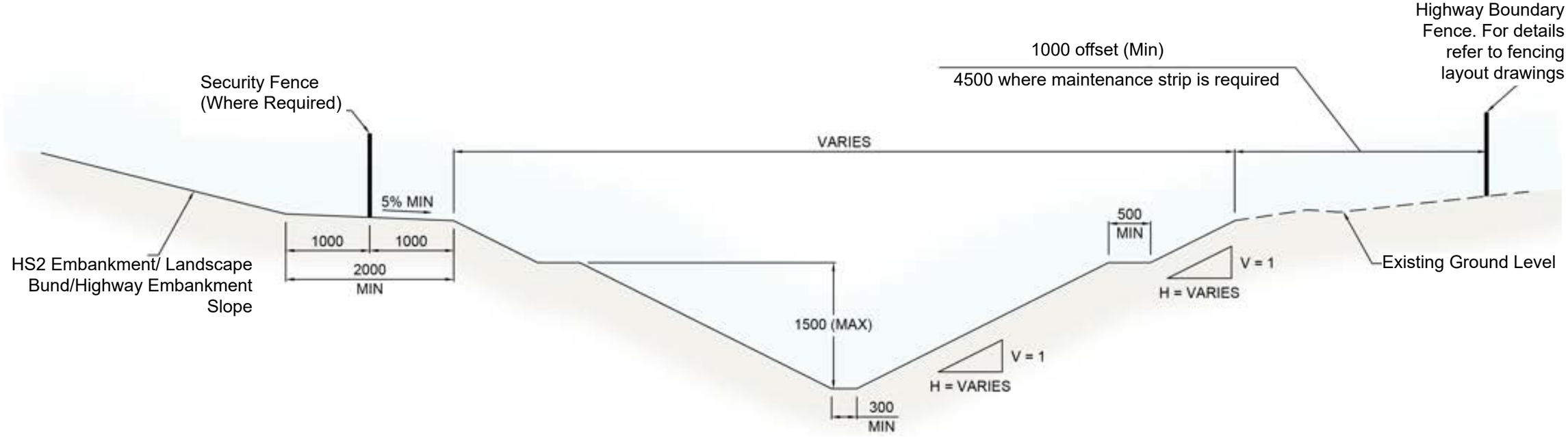


Typical Ditch Layout Adjacent to HS2 Embankment

DRAINAGE DITCH PROFILE

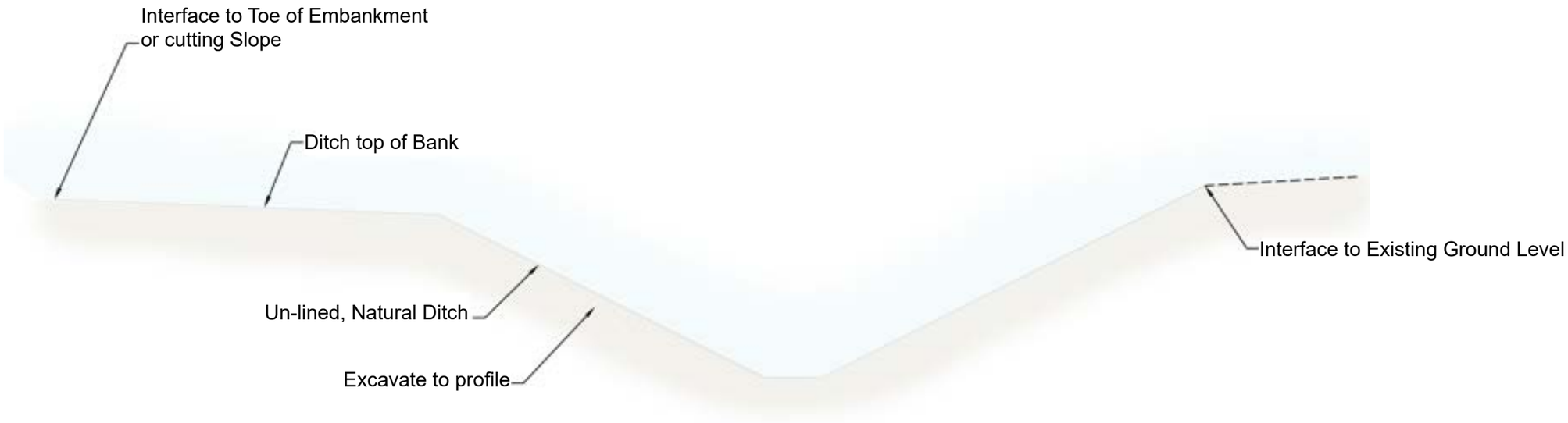


Typical Ditch Layout Adjacent to Highway Embankment

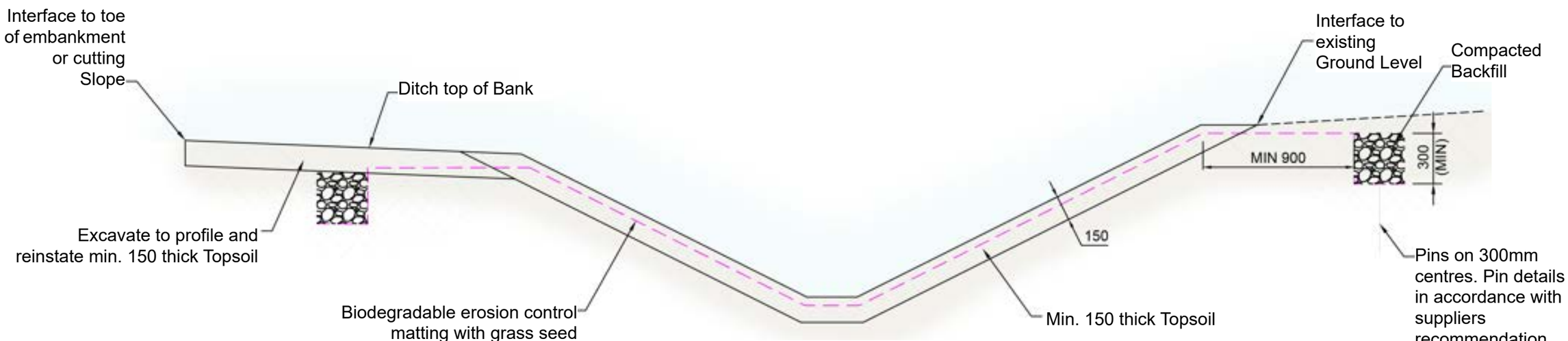


Typical Deep Ditch Layout

DRAINAGE DITCH PROFILE

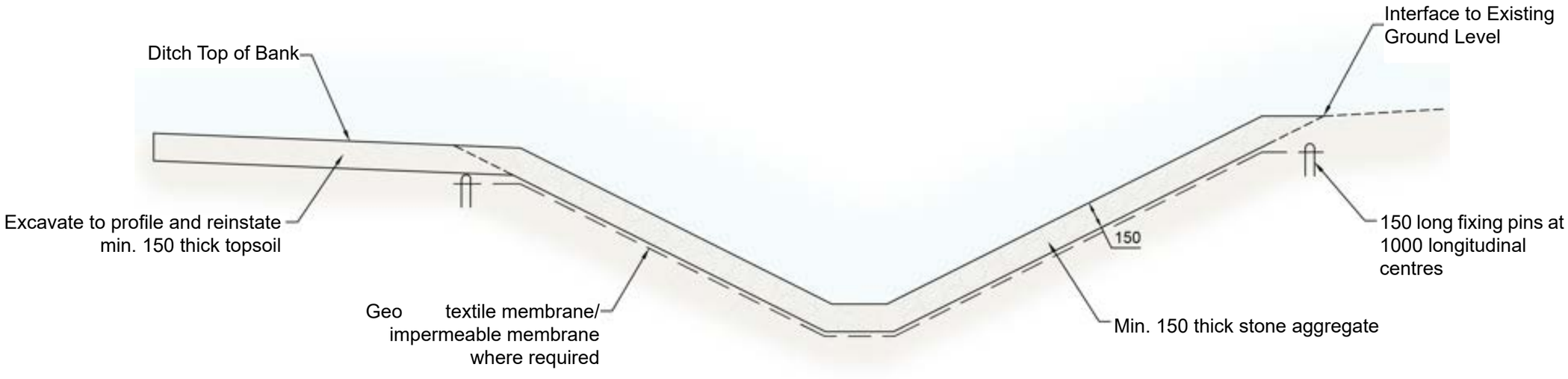


Ditch Lining Type D1
(Earthwork, Un-Lined)

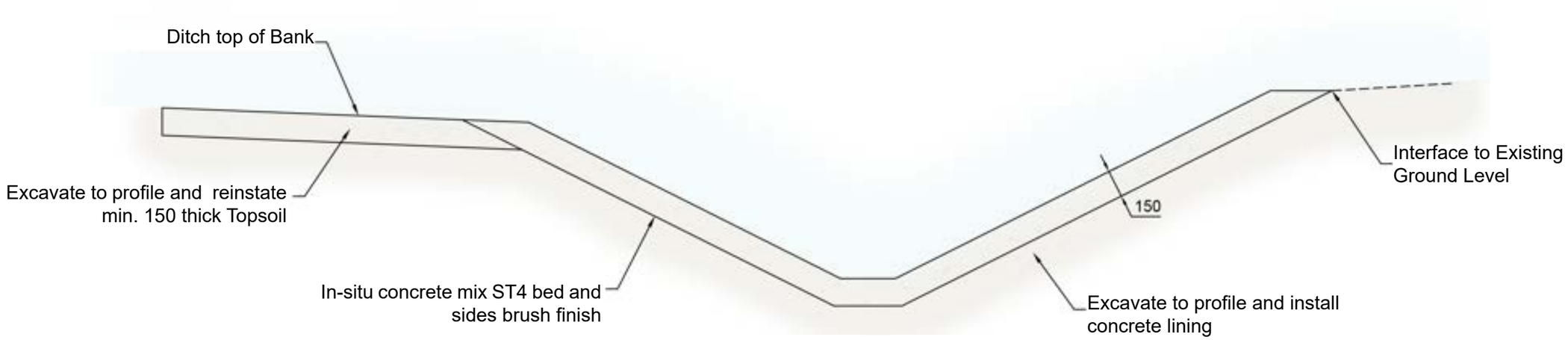


Ditch Lining Type D2
(Topsoil with Erosion Control)

DRAINAGE DITCH PROFILE

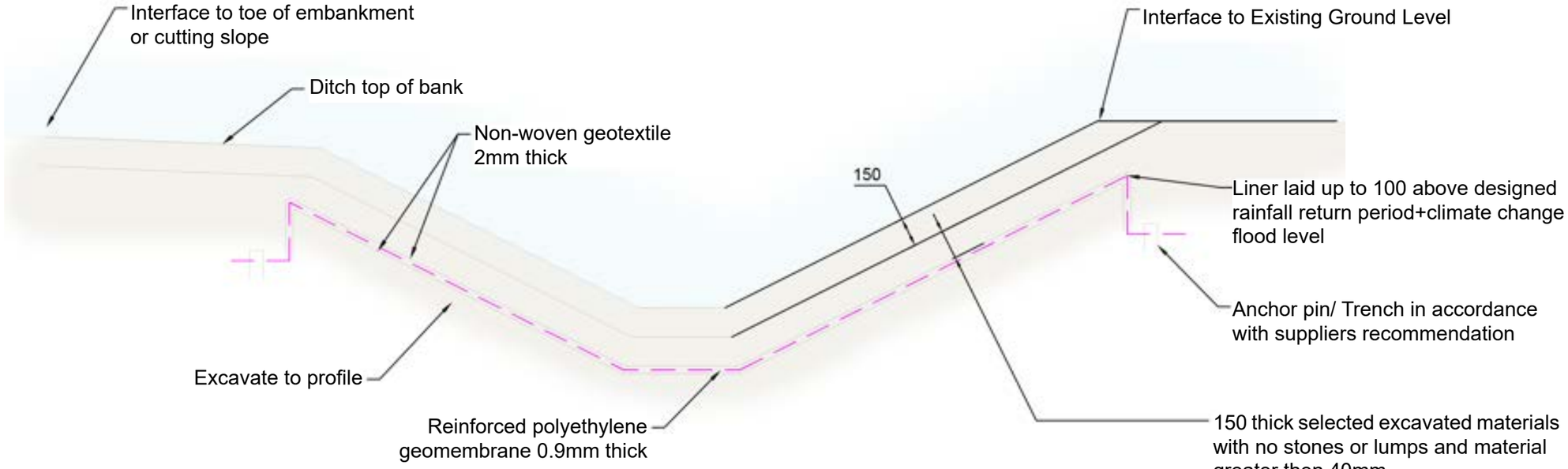


Ditch Lining Type D3
(Stone)

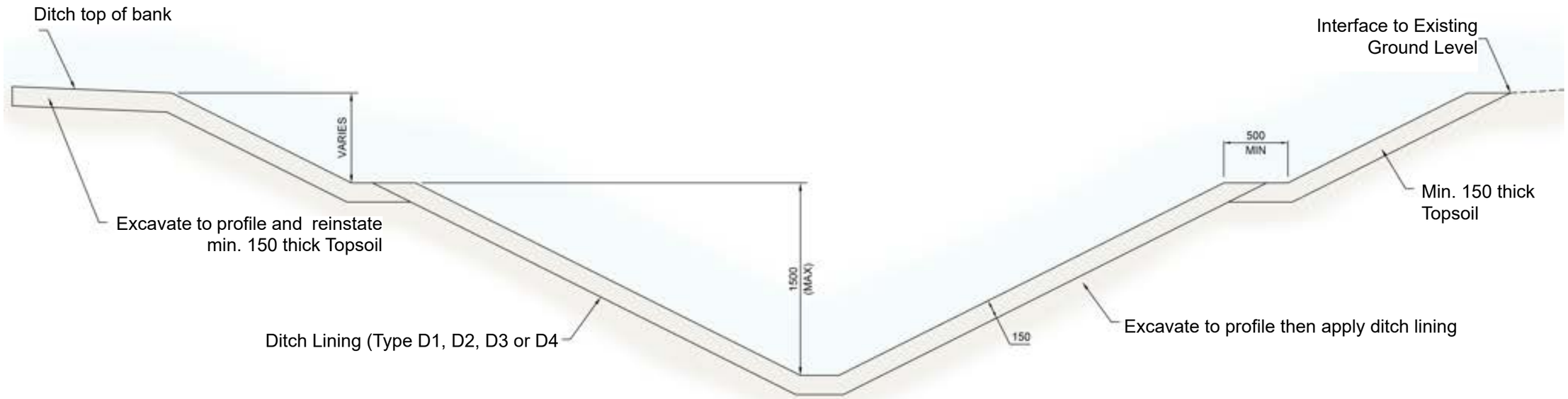


Ditch Lining Type D5
(Mass Concrete)

DRAINAGE DITCH PROFILES



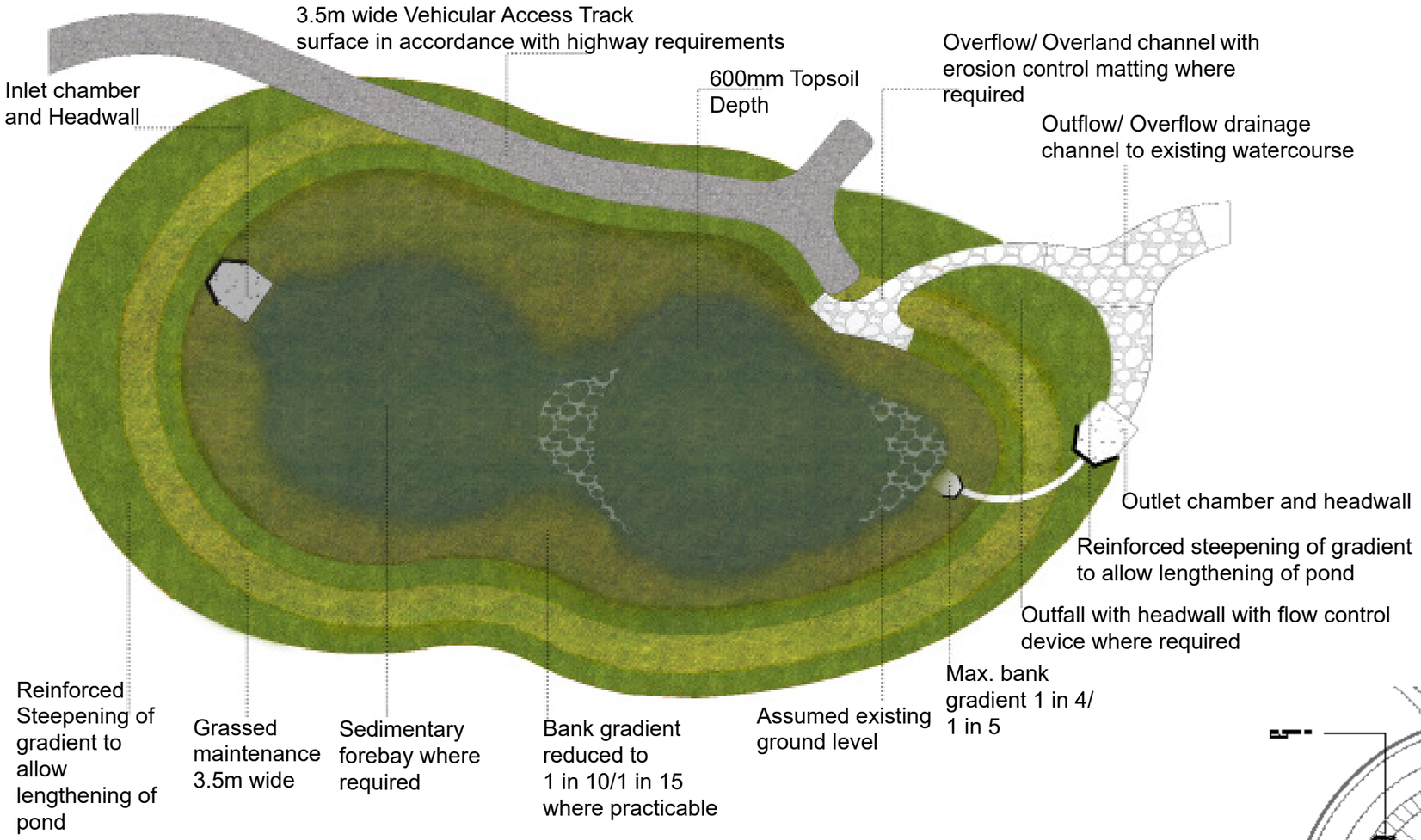
Ditch Lining Type D6 (Bespoke)
(D1 to D5 with impermeable liner)



Deep Ditch Section
(1.5m Maximum Depth)

DRAINAGE DITCH PROFILE

HS2 Typical Details- Drainage



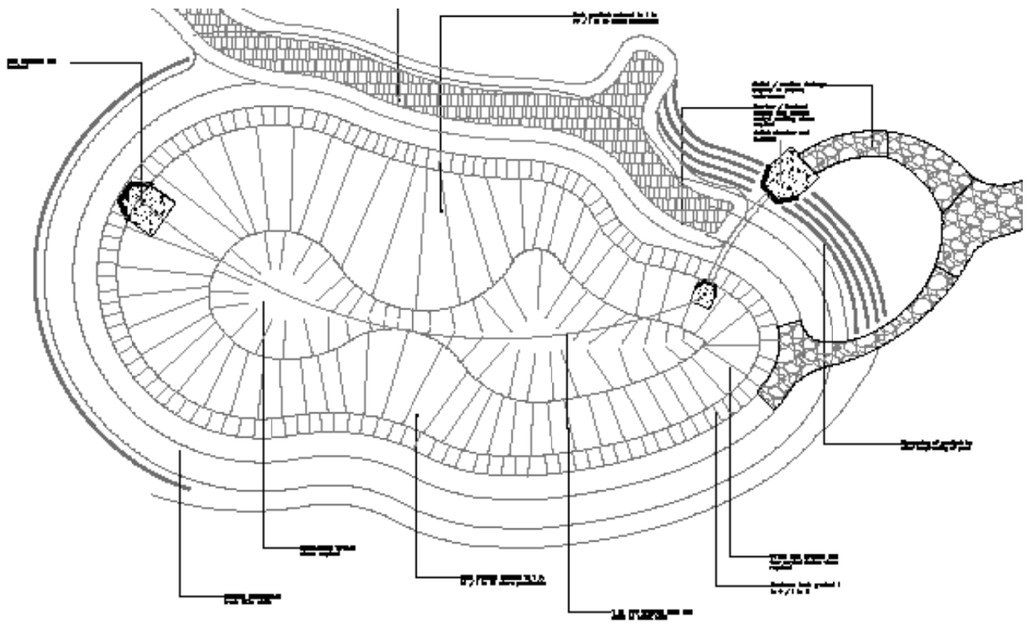
Pond Plan;

STRATEGY

The HS2 development incorporates ditches and ponds throughout the landscape to drain and store water designed to accommodate land drainage track drainage and highways drainage requirements.

Where possible the design of the ponds will be developed to include a dished base with a gentle gradient to create a flow of water between the inlet and outlet levels. The pond embankments are at a minimum 1 in 4 gradient and depth will vary according to location.

Each pond requires a maintenance access track 3.5m with a stone surface and a 3.0m width grassed access strip. The design has where possible been rationalised to combine part of the grassed access surround with the unbound stone access track to avoid duplication. The unbound stone surfaced track must extend as far as the outlet chamber for maintenance purposes. Turning is to be provided at this point to allow safe vehicular egress from the site. Each pond requires a 3.5m width grassed access track around the pond for planned maintenance activity such as dredging or vegetation removal. The ponds have an inlet pipe and



headwall, and outlet chamber and headwall to the outfall pipe and an overflow which connects to a land drainage ditch . The overflow channel potentially forms part of the bund which may retain the pond and would be constructed from durable materials designed to prevent erosion in a flood event.

The pond is not designed to hold a permanent water body however there will be depressions and channels formed to facilitate the flow of water from inlet to outlet and this will be sown with a wet grassland sward mix appropriate to the pond setting.

POND LAYOUT DETAILS

HS2 Typical Details - Fencing

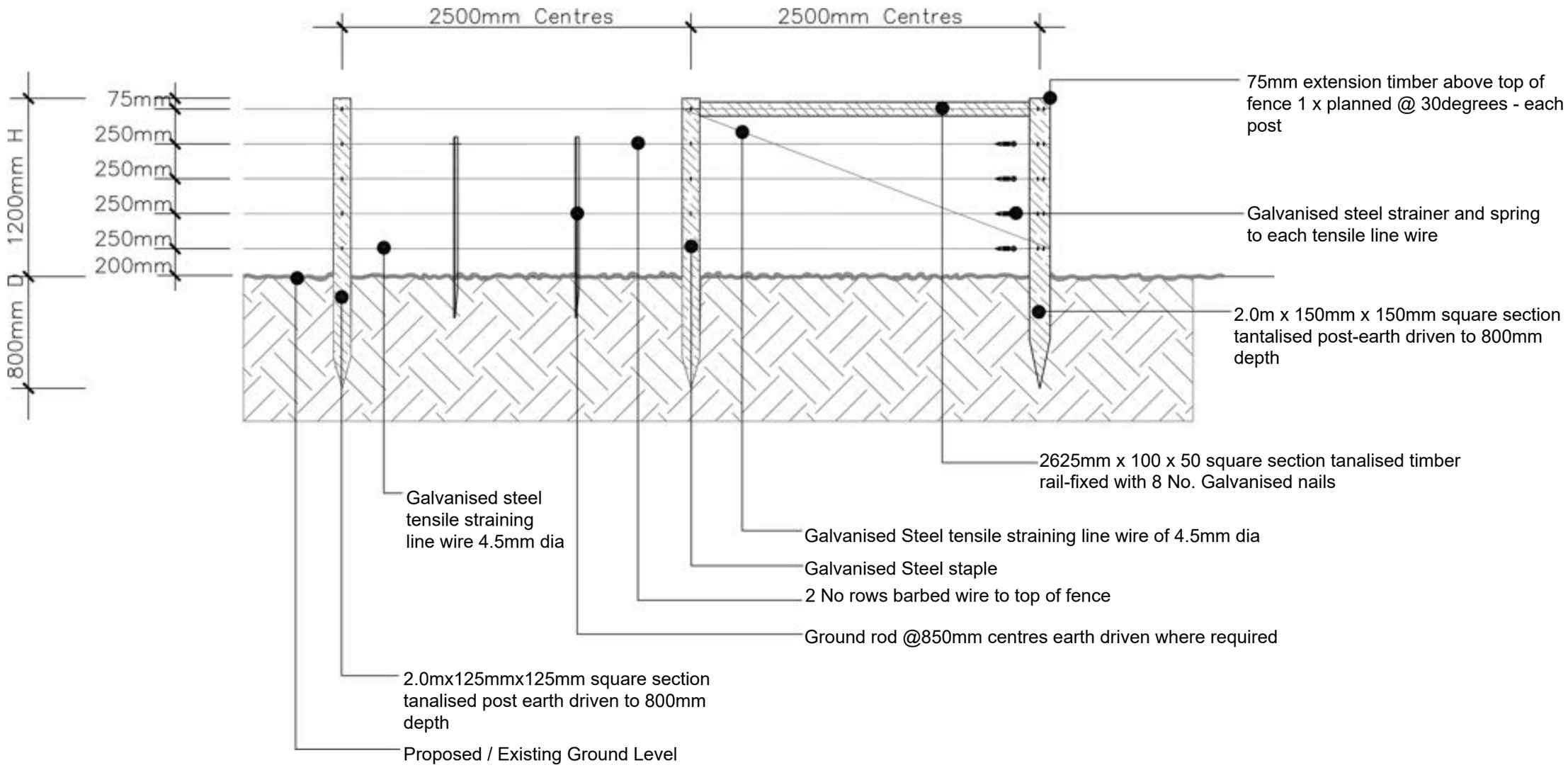




Photo 1: Timber Strainer Detail



Photo 2: Mesh and 2 strained barbed wires



Photo 3: Corner post strainer detail

FENCE DETAIL- STOCKPROOF FENCE

HS2 Typical Details - Fencing



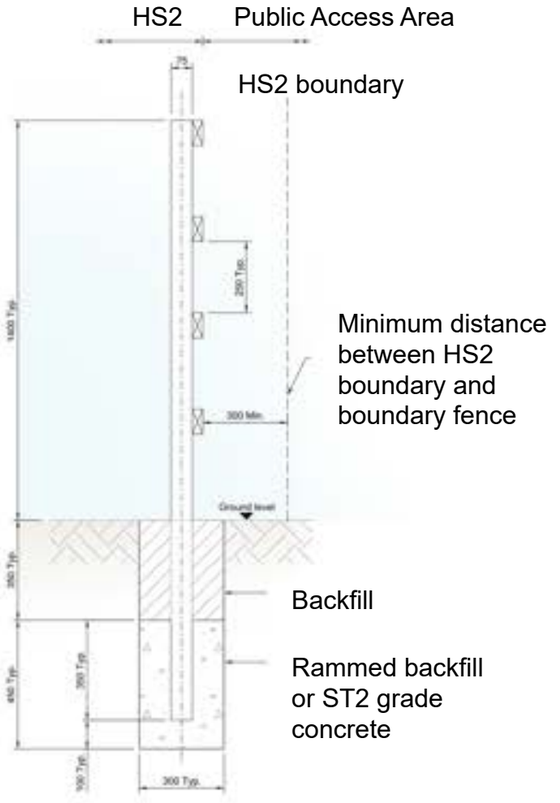
Photo 1: Curved Detail



Photo 2: 4 x Rails Post and Rail Detail

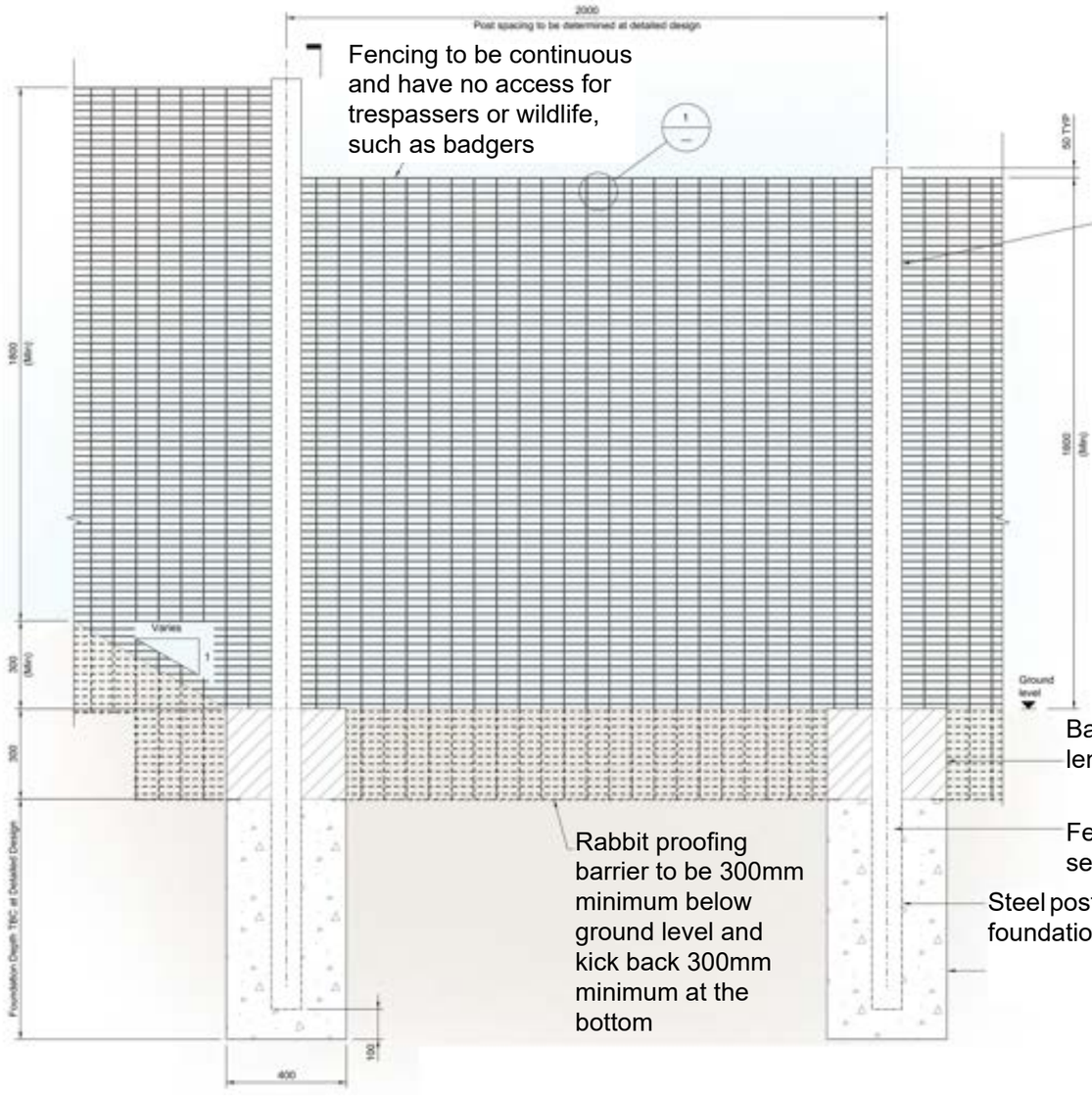


Photo 3: Fixing Detail



BOUNDARY FENCE DETAIL-POST AND RAIL FENCE

HS2 Typical Details - Fencing



Proprietary anti-vandalism connection system between vertical posts and wire mesh

Backfill 300mm deep across length of fence

Fence post to be embedded securely into concrete foundation

Steel post embedded in concrete foundation

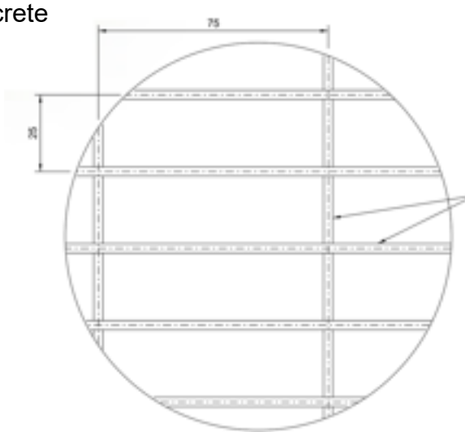
Rabbit proofing barrier to be 300mm minimum below ground level and kick back 300mm minimum at the bottom



Photo 1: Secure Fence



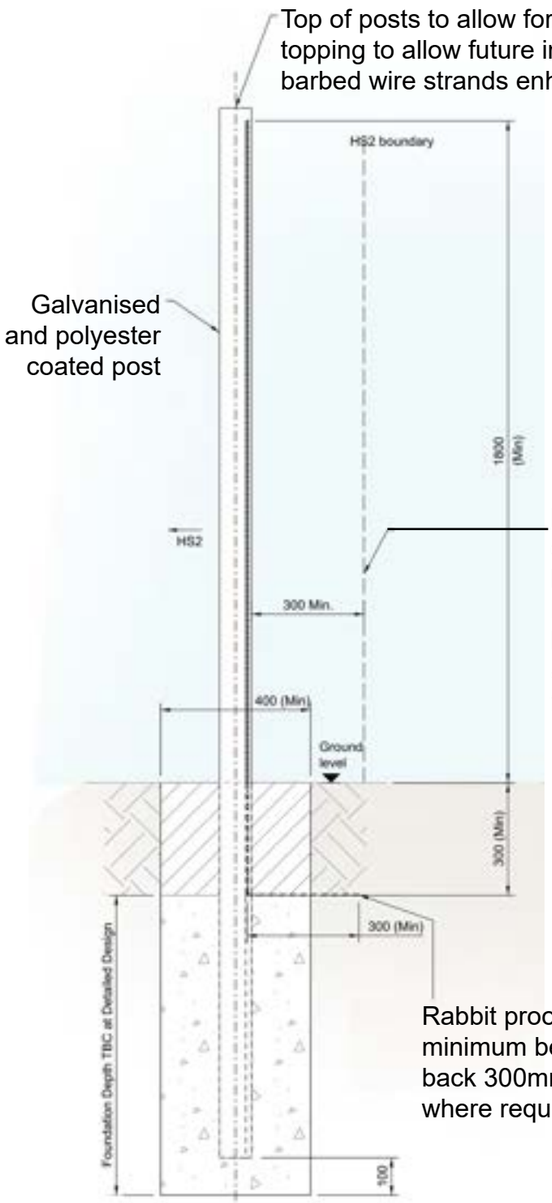
Photo 2: Secure Fence

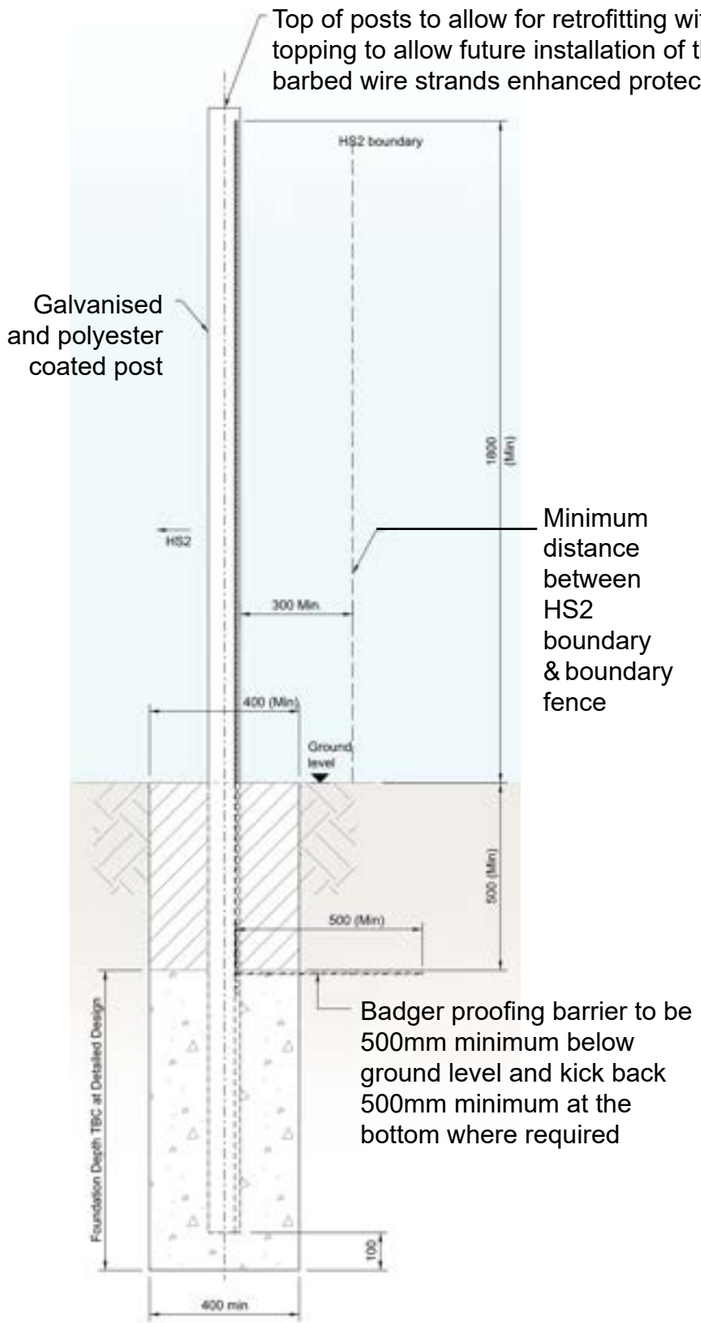


Galvanised and polyester coated, 3mm dia steel wire

FENCE DETAIL- SECURITY FENCE TYPE 2

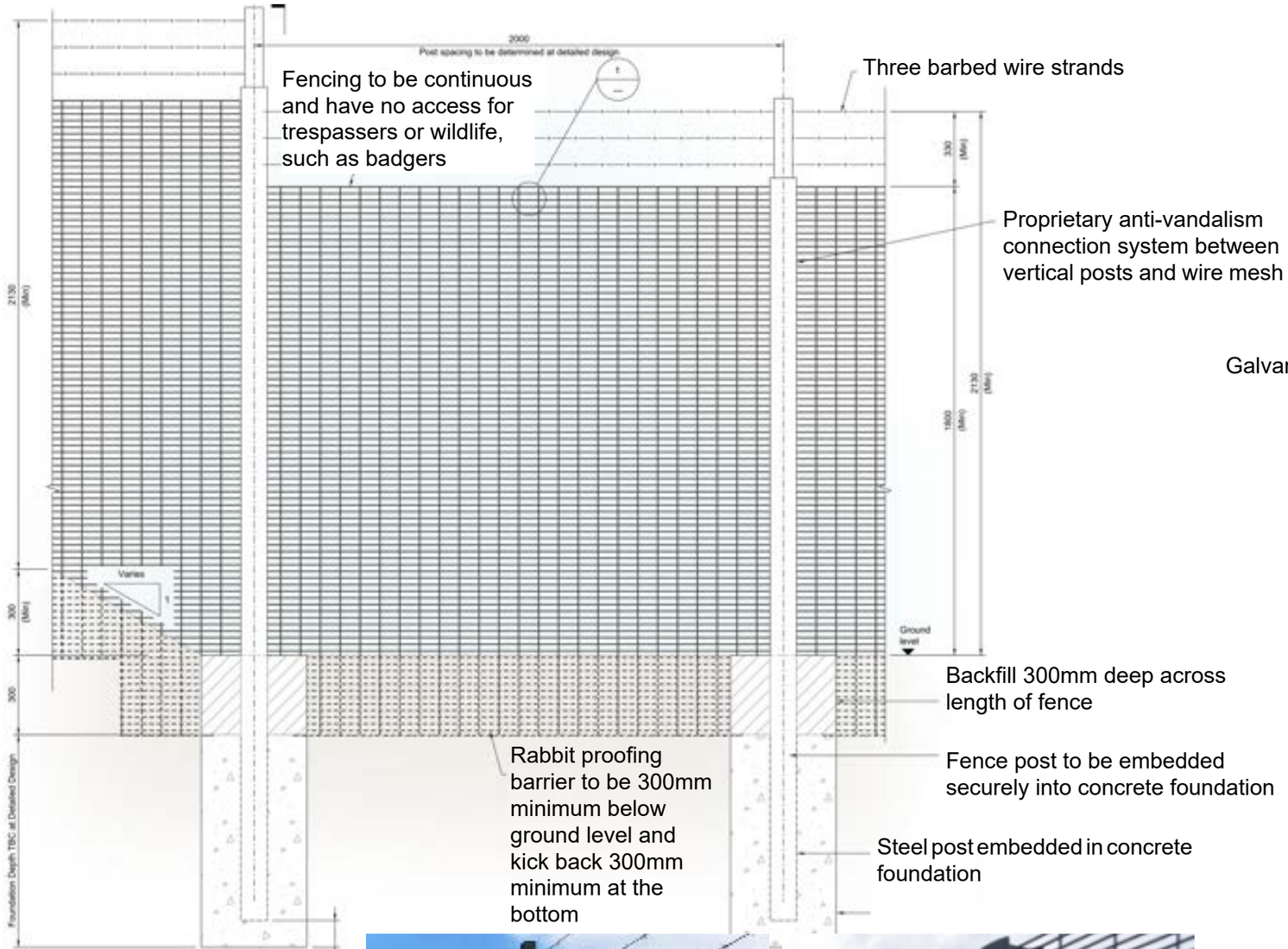
HS2 Typical Details - Fencing





FENCE DETAIL-SECURITY FENCE TYPE 2

HS2 Typical Details - Fencing



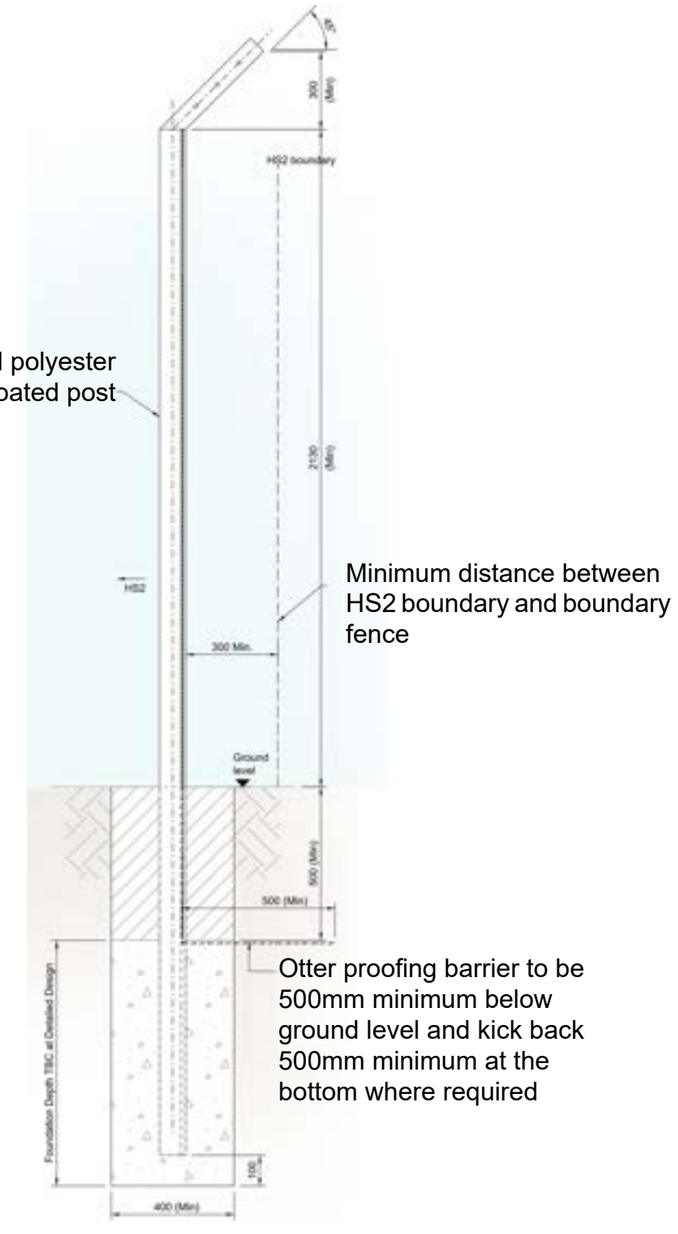




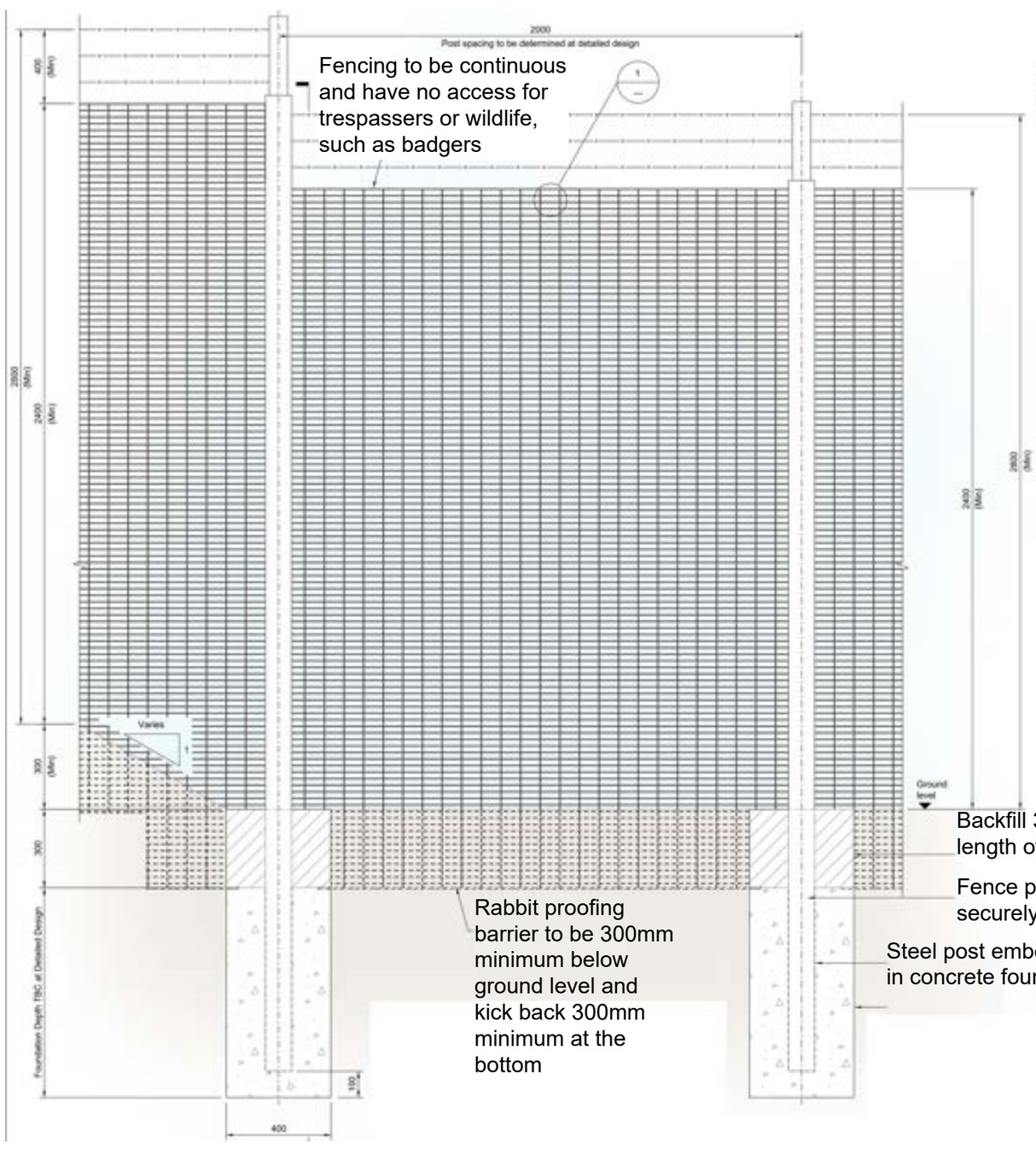
Photo 1: Secure Fence Triple Barbed Wire

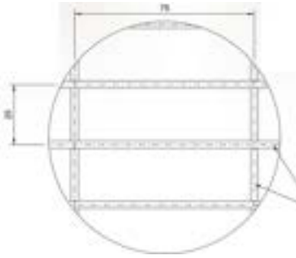


Photo 2 : Folded Top Detail

FENCE DETAIL SECURITY FENCE TYPE 3

HS2 Typical Details - Fencing





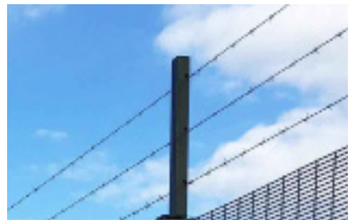
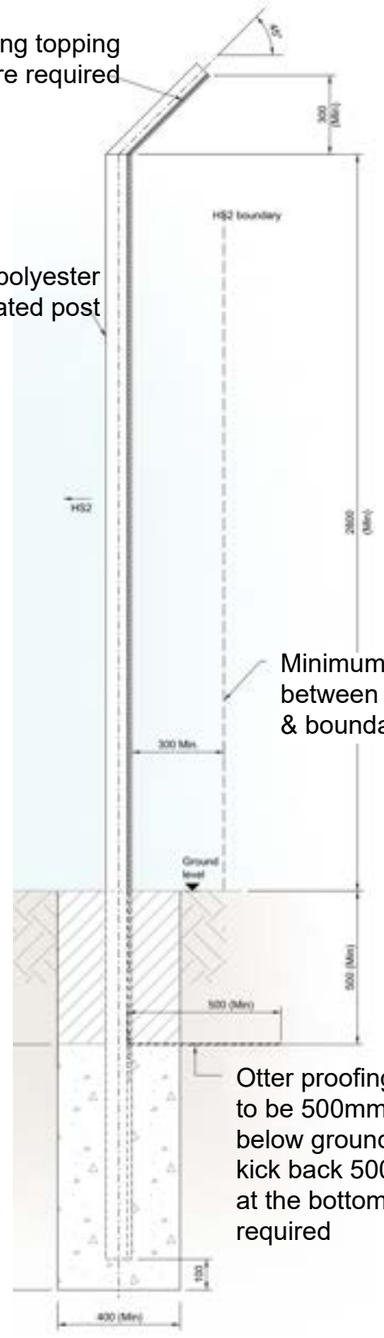


Photo 1: Secure Fence Triple Barbed Wire

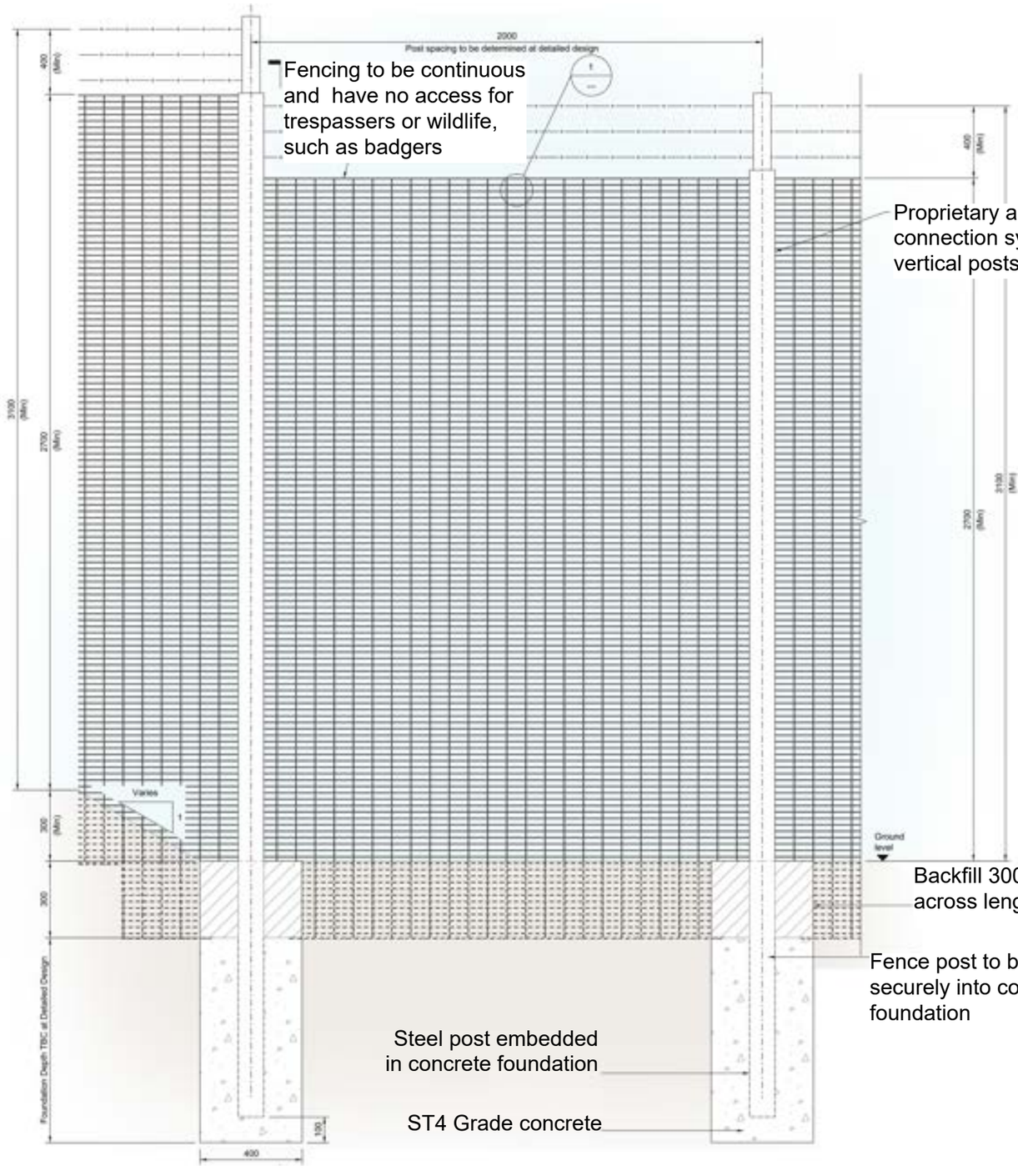


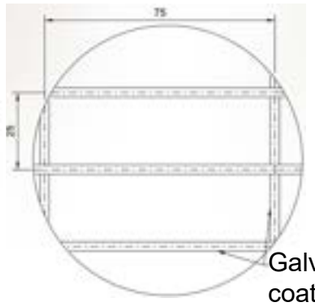
Photo 2: Folded Top Detail



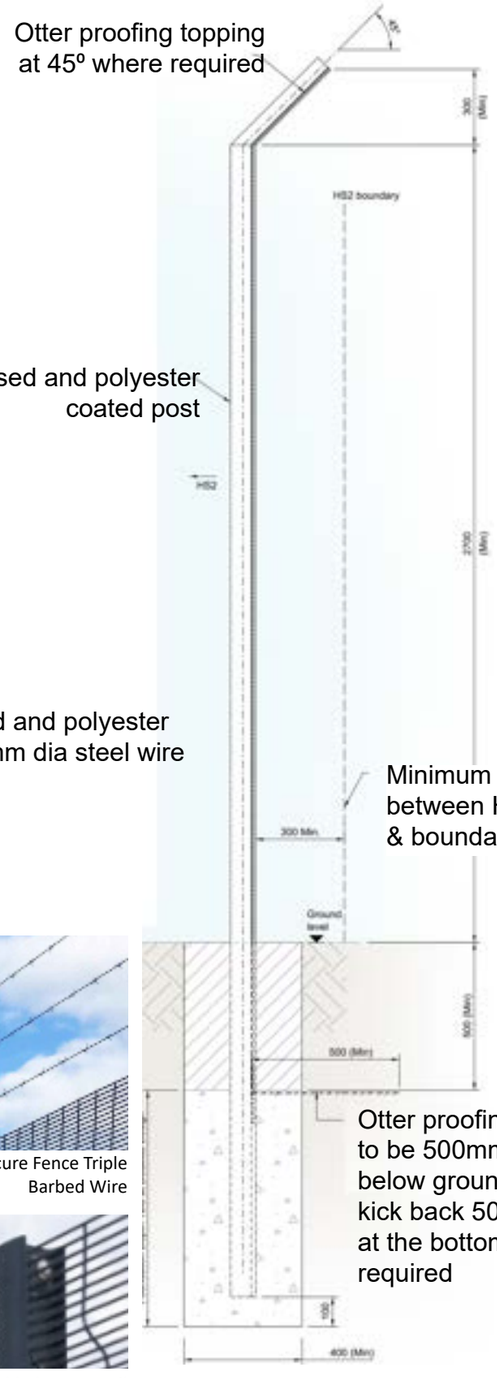
FENCE DETAIL-SECURITY FENCE TYPE 4

HS2 Typical Details - Fencing





Galvanised and polyester coated, 4mm dia steel wire



Otter proofing topping at 45º where required

Galvanised and polyester coated post

Minimum distance between HS2 boundary & boundary fence

Otter proofing barrier to be 500mm minimum below ground level and kick back 500mm minimum at the bottom where required



Photo 1: Secure Fence Triple Barbed Wire

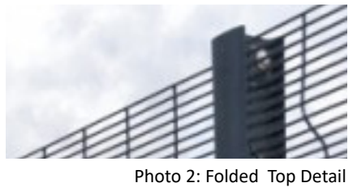
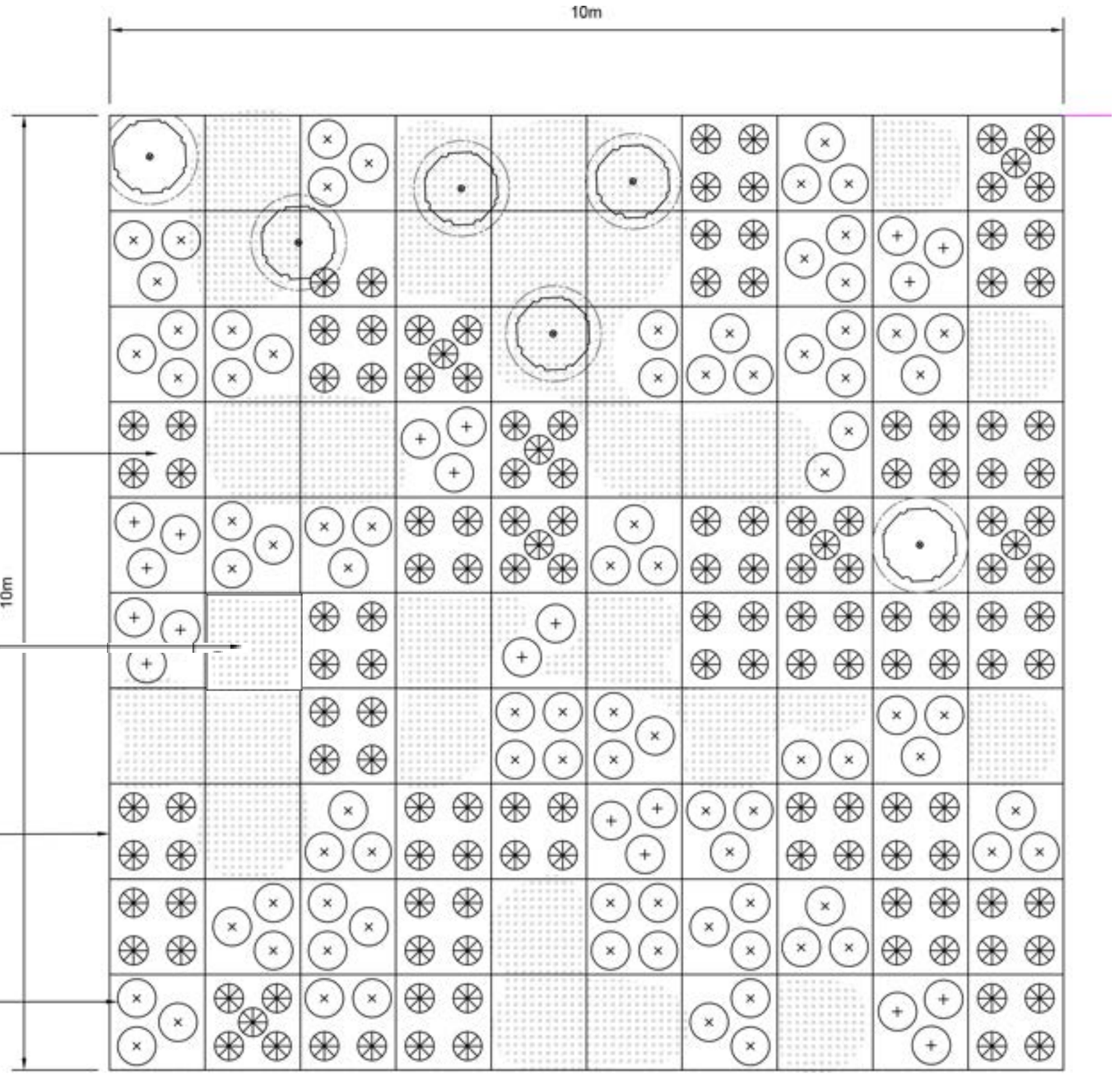


Photo 2: Folded Top Detail

FENCE DETAIL- SECURITY FENCE TYPE 5







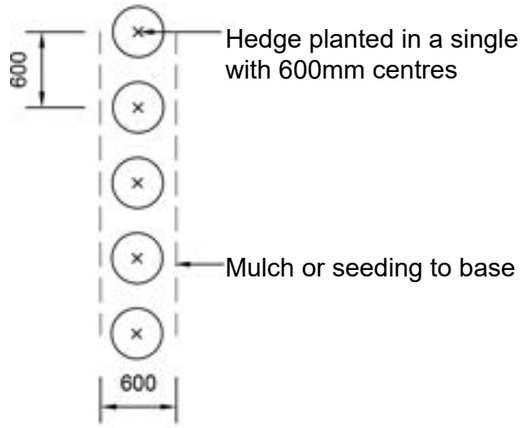
Random planting arrangement. Trees and shrubs to be planted in single species groups of 7-15. Refer to Planting Symbols Key for further information on planting types and densities. Tree planting location dependent.

Wildflower seeding to woodland understorey

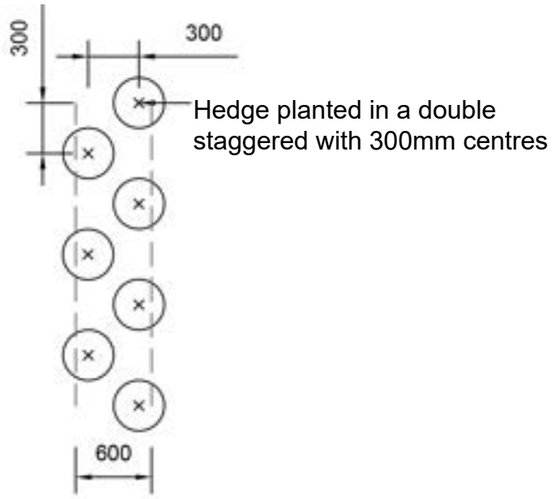
Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of all trees to maintain a 1m dia. weed and grass free area to aid establishment.

Random planting equating to an overall density of 1 plant per 2.25m² (0.44 plants per m²)

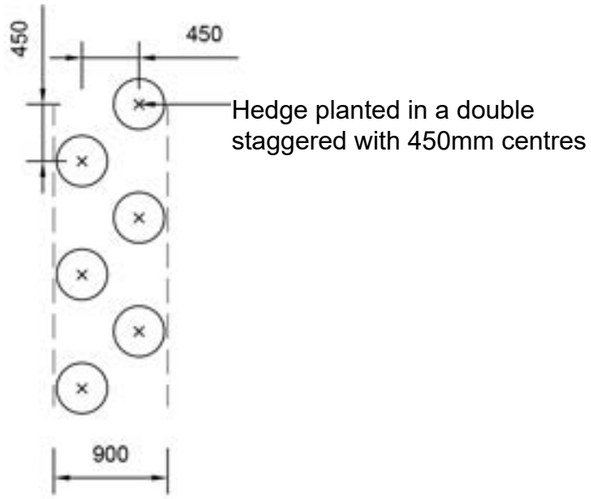
PLANTING PLAN SAMPLE LAYOUT: EDGES WOODLAND



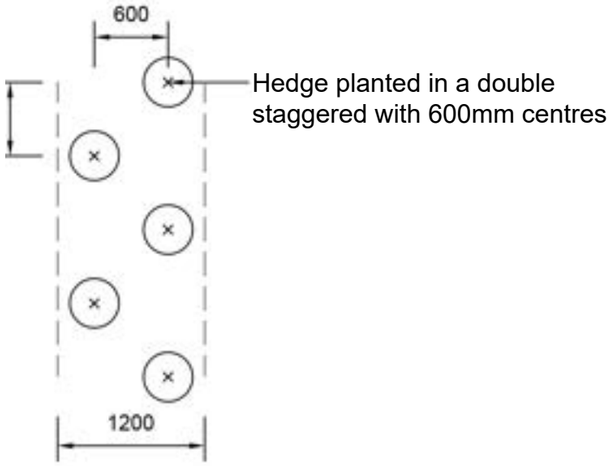
Plan of Single Row Hedgerow with 600mm spacing



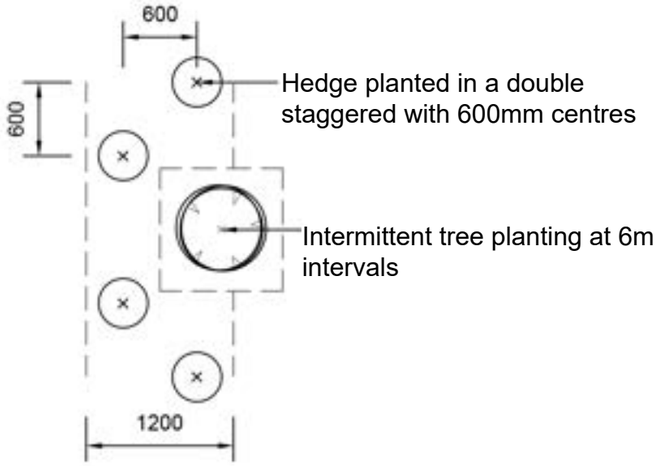
Plan of Double Staggered Hedgerow with 300mm spacing



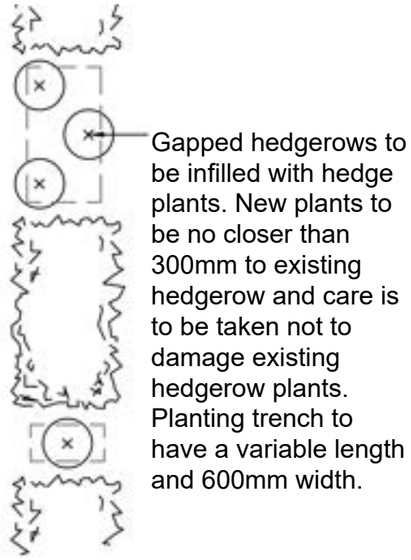
Plan of Double Staggered Hedgerow with 450mm spacing



Plan of Double Staggered Hedgerow with 600mm spacing



Plan of Double Staggered Hedgerow and intermittent Tree planting with 600mm spacing

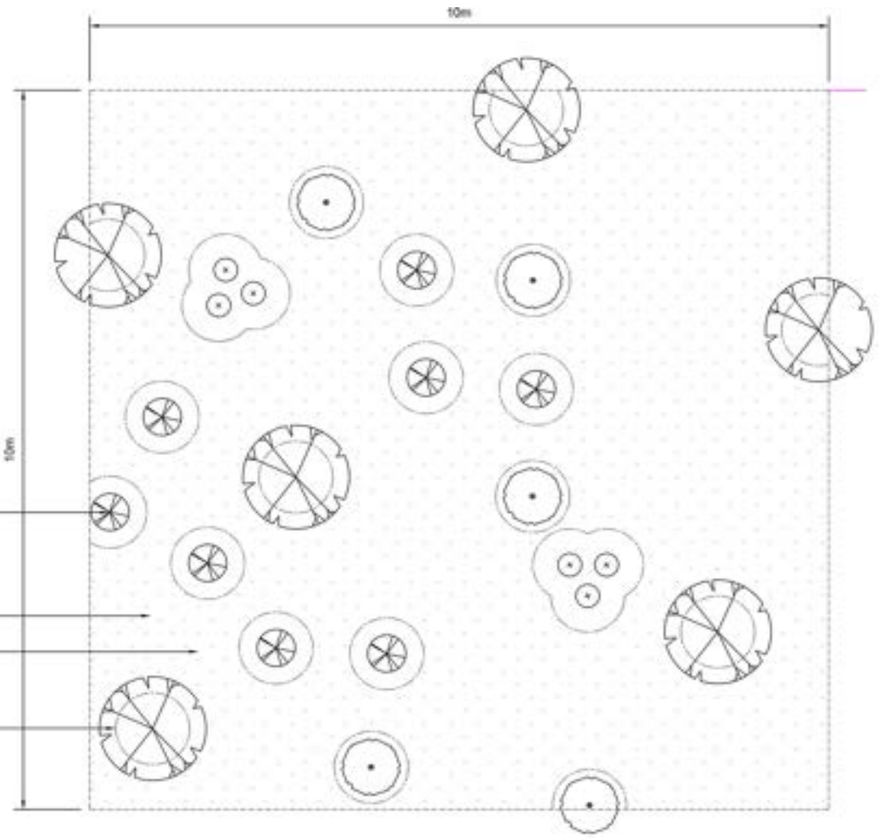


Infill Hegerow Planting

NATIVE PLANTING MATRIX

Planting Symbol Key

Symbol	Percentage mix	Spacing	Type
	25%	5m Centres	Standard Tree
	20%	3m Centres	Feathered Tree
	30%	1.5m Centres	Transplant Tree
	25%	0.5m Centres	Transplant Shrub



Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Wildflower seeding to woodland understorey

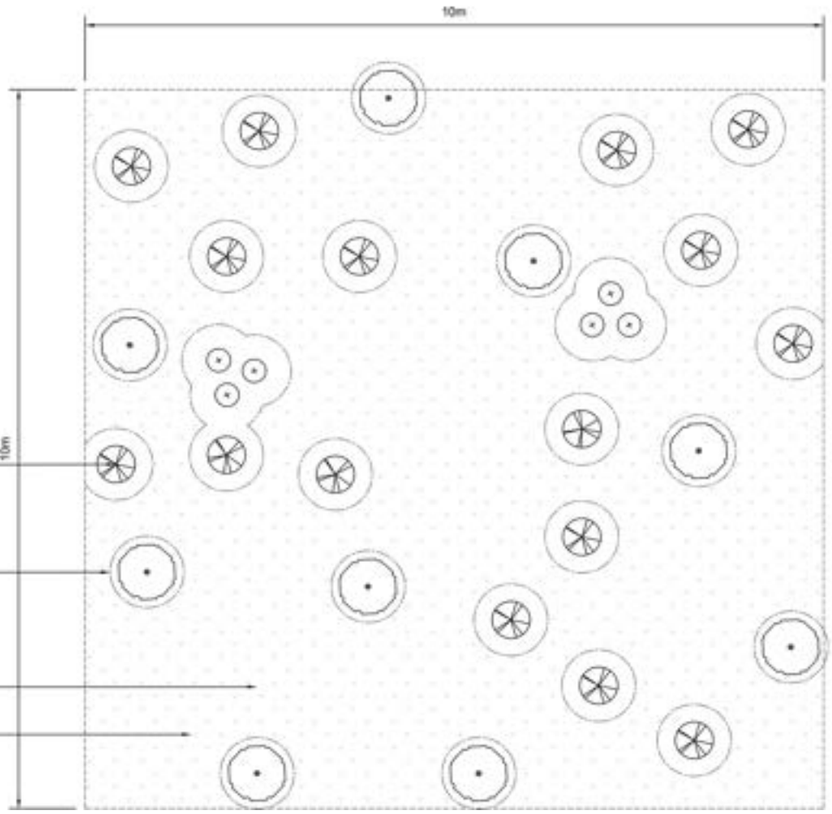
Random planting equating to an overall density of 1 plant per 4m^2 *(0.25 plants per m^2)*

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of ll the trees to maintain a 1m dia. Weed and grass free area to aid establishment

PLANTING PLAN SAMPLE LAYOUT: GENERIC WOODLAND QUICK EFFECT

Planting Symbol Key

Symbol	Percentage mix	Spacing	Type
	30%	3m Centres	Feathered Tree
	50%	1.5m Centres	Transplant Tree
	20%	0.5m Centres	Transplant Shrub



Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of the trees to maintain a 1m dia. Weed and grass free area to aid establishment

Wildflower seeding to woodland understorey

Random planting equating to an overall density of 1 plant per 3.24m^2 *(0.31 plants per m^2)*

PLANTING PLAN SAMPLE LAYOUT: WOODLAND ALONG CANALS

Planting Symbol Key

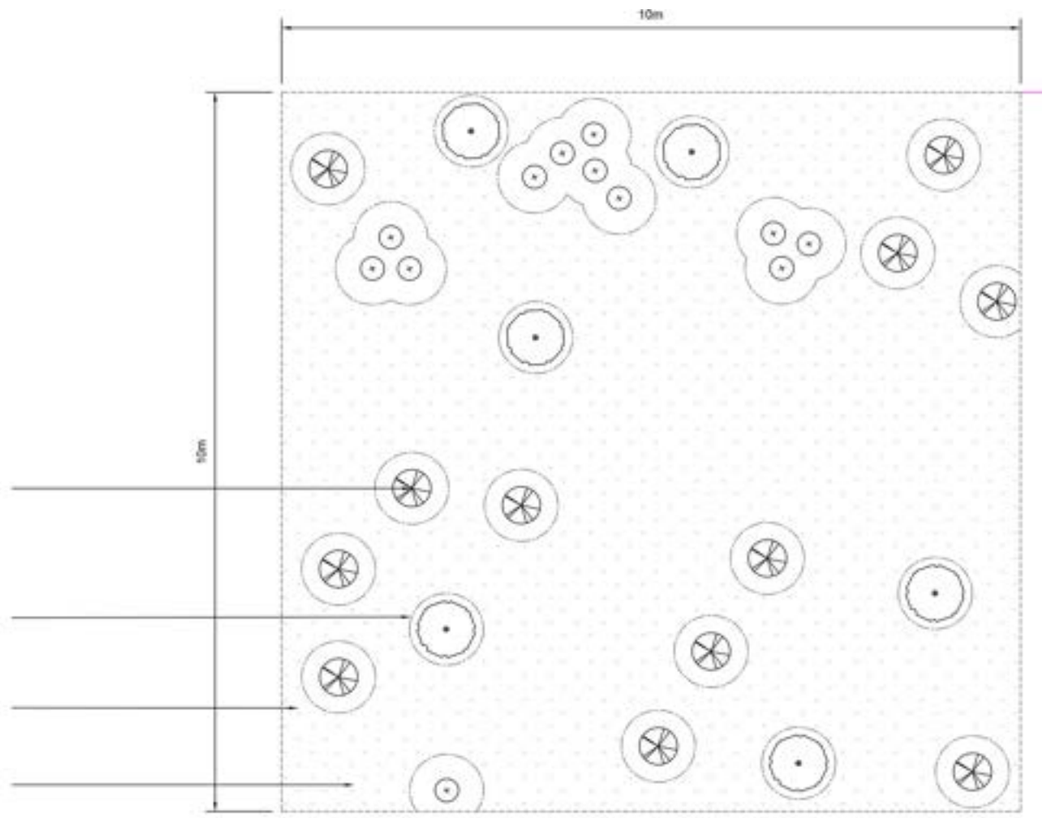
Symbol	Percentage mix	Spacing	Type
	20%	3m Centres	Feathered Tree
	40%	1.5m Centres	Transplant Tree
	40%	0.5m Centres	Transplant Shrub

Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of the trees to maintain a 1m dia. Weed and grass free area to aid establishment

Random planting equating to an overall density of 1 plant per 3.24m^2 *(0.31 plants per m^2)*

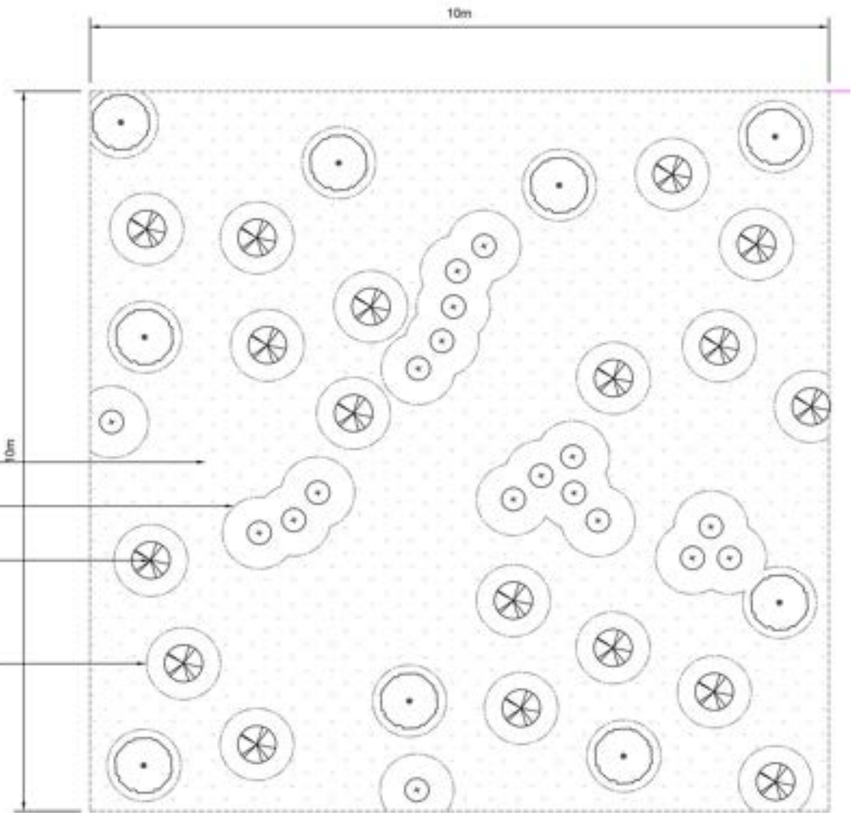
Wildflower seeding to woodland storey



PLANTING PLAN SAMPLE LAYOUT: GENERIC WOODLAND MEDIUM TERM EFFECT

Planting Symbol Key

Symbol	Percentage mix	Spacing	Type
	20%	3m Centres	Feathered Tree
	40%	1.5m Centres	Transplant Tree
	40%	0.5m Centres	Transplant Shrub



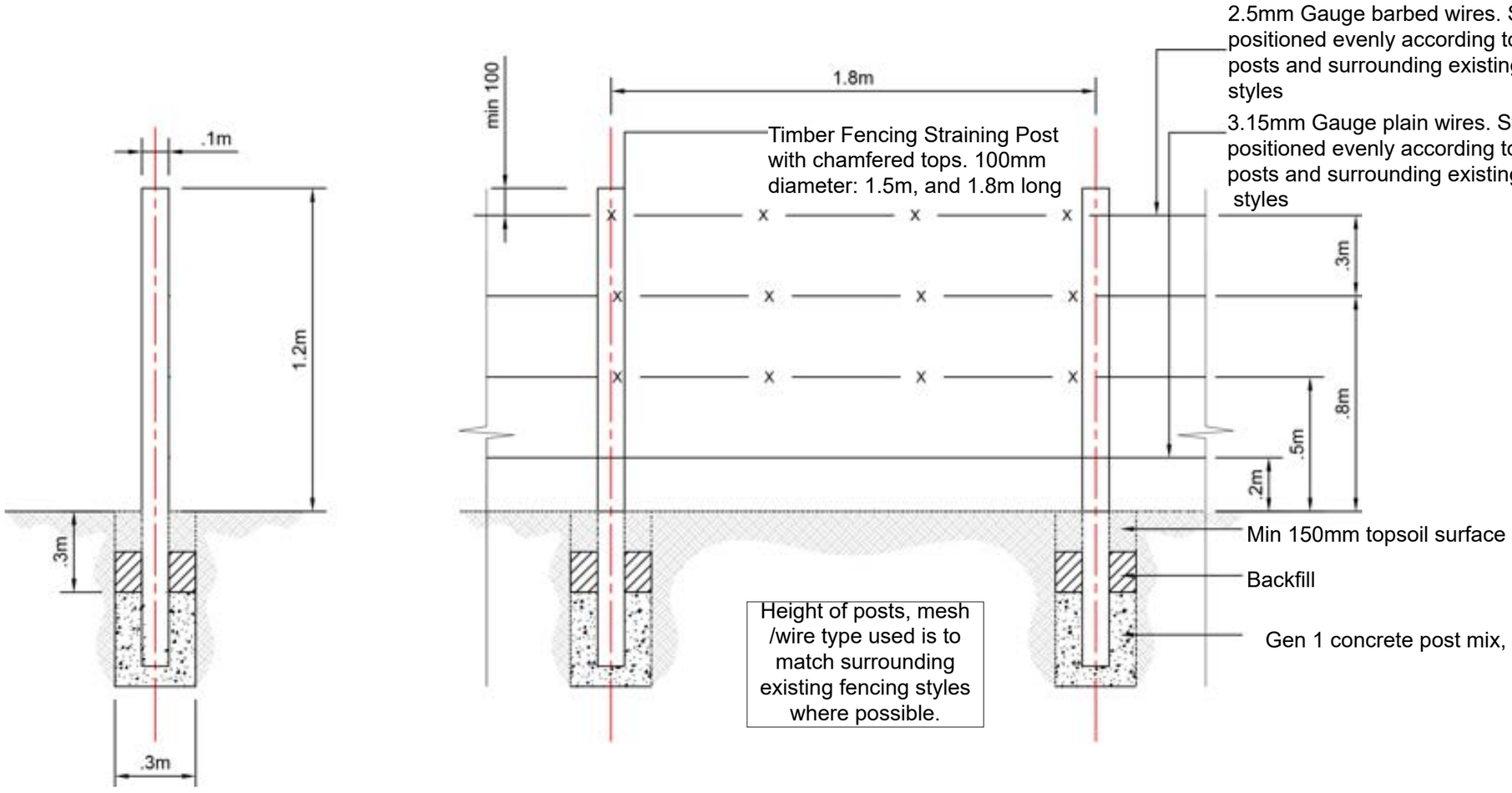
Random planting equating to an overall density of 1 plant per 2.25m^2 *(0.44 plants per m^2)*

Wildflower seeding to woodland understorey

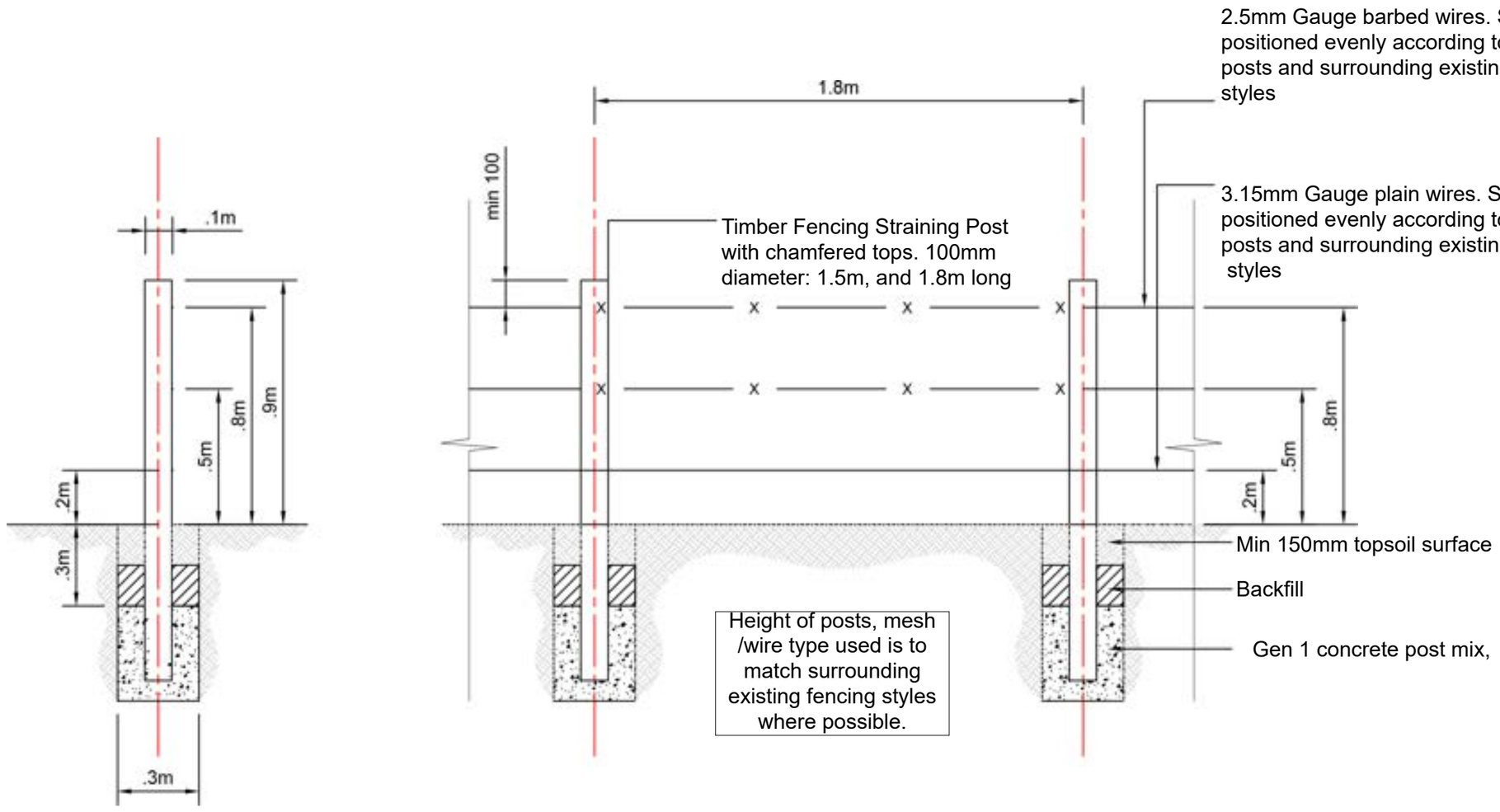
Random planting arrangement. Trees and shrubs to be planted in single species groups of 3-5. Refer to planting symbols key for further information on planting types and densities. Tree planting location dependent

Base of trees to be kept in a weed free condition. A translocated herbicide is to be applied to the base of ll the trees to maintain a 1m dia. Weed and grass free area to aid establishment

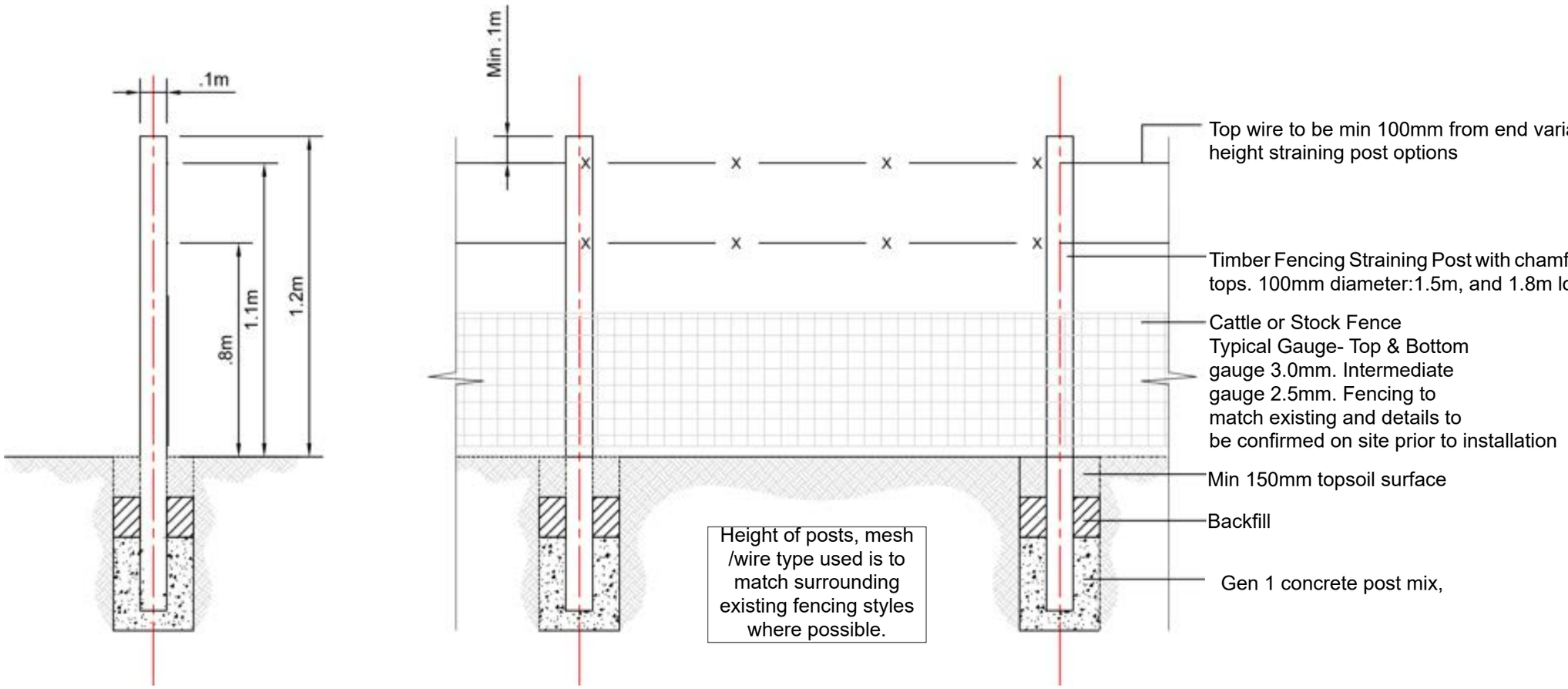
PLANTING PLAN SAMPLE LAYOUT: GENERIC WOODLAND LONG TERM EFFECT



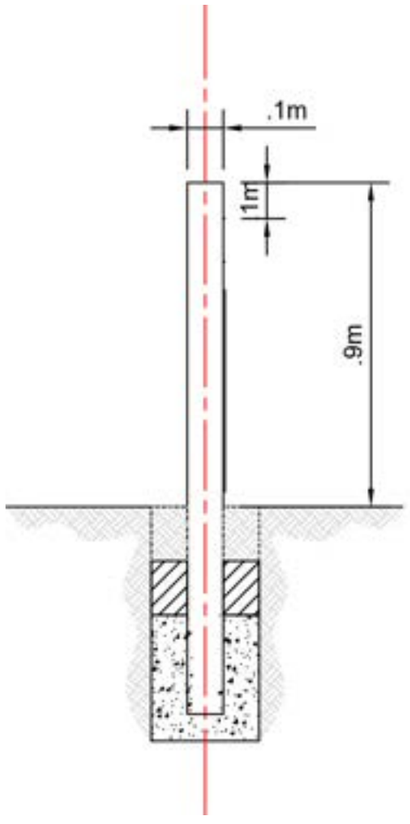
HEDGEROW PLANTING PROTECTION DETAILS

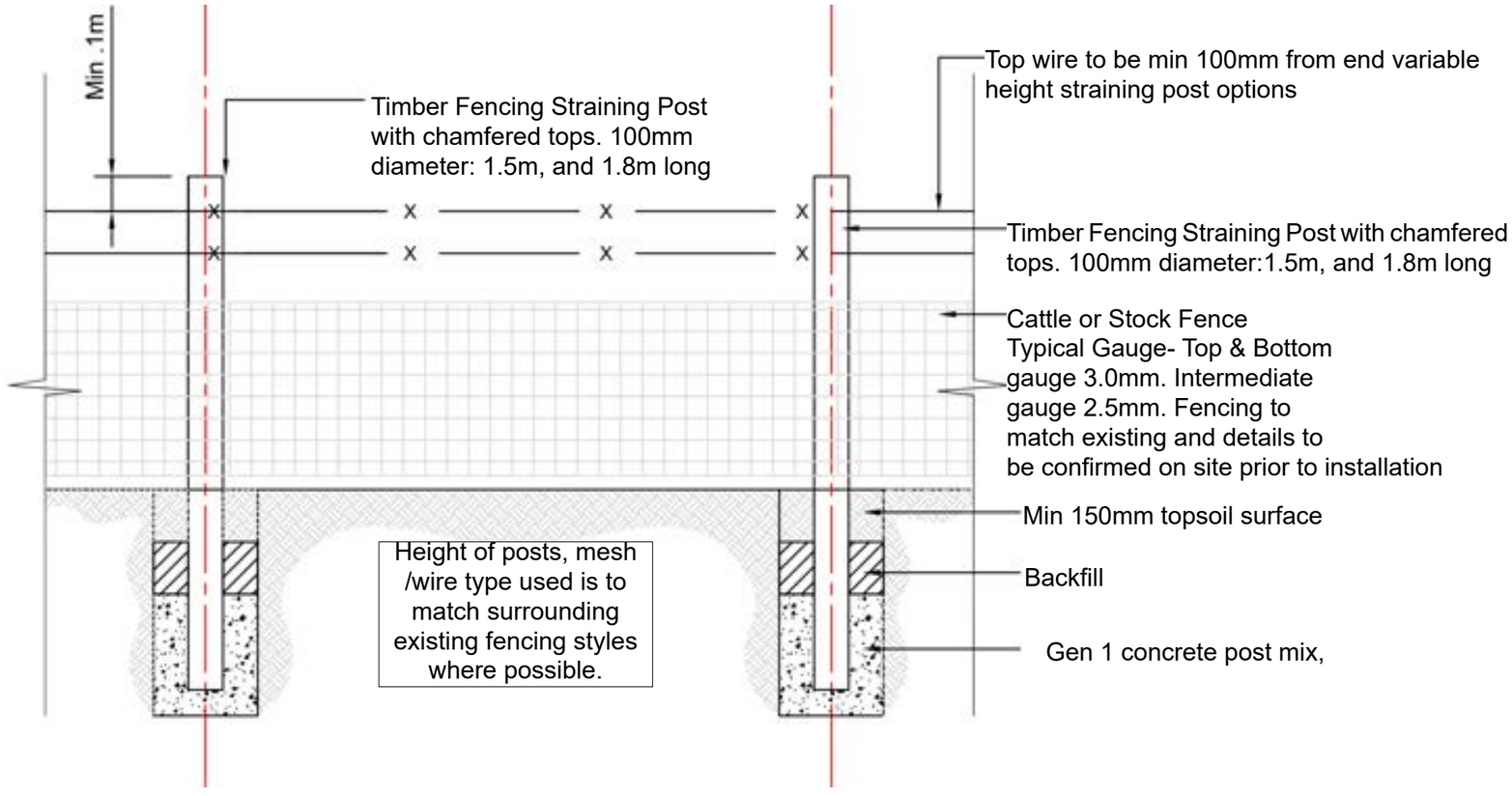


HEDGEROW PLANTING PROTECTION DETAILS

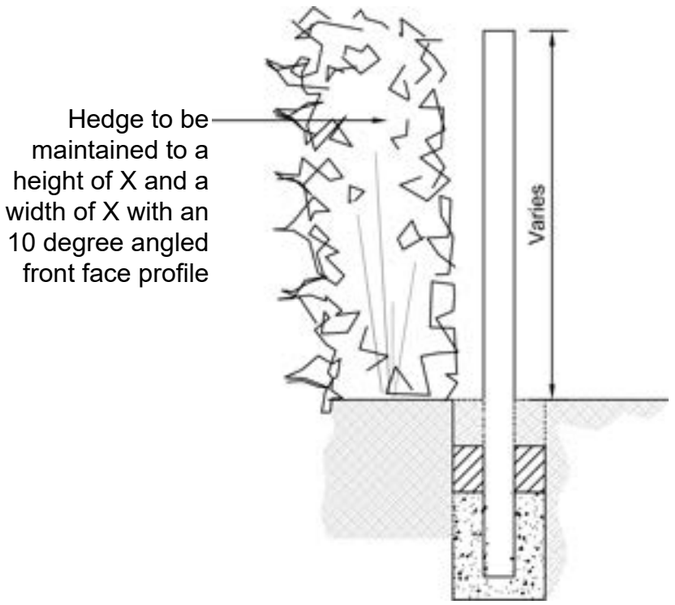


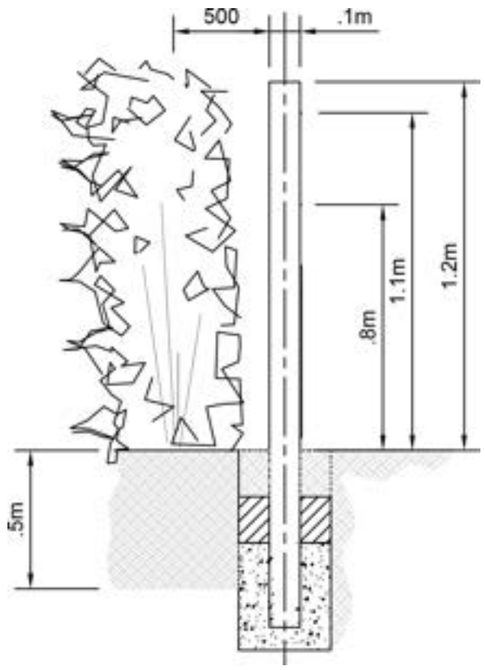
HEDGEROW PLANTING PROTECTION DETAILS

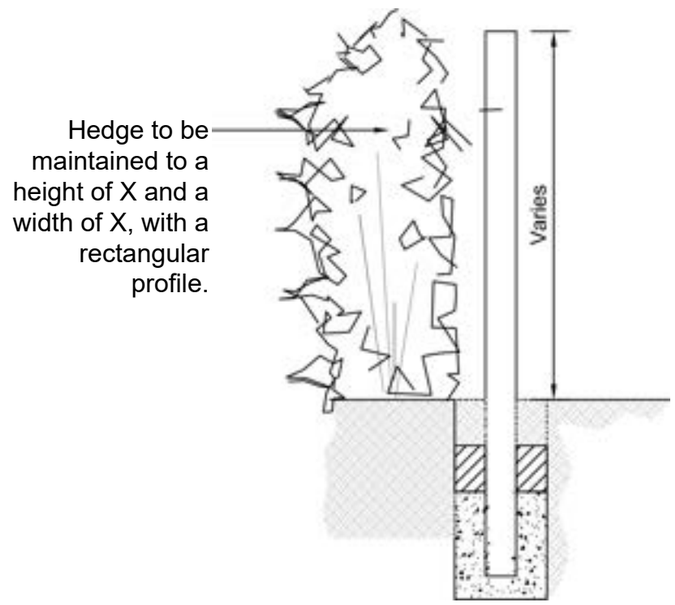


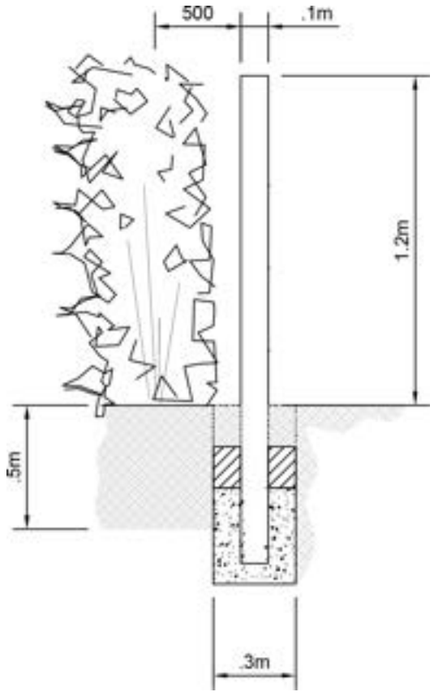


HEDGEROW PLANTING PROTECTION DETAILS

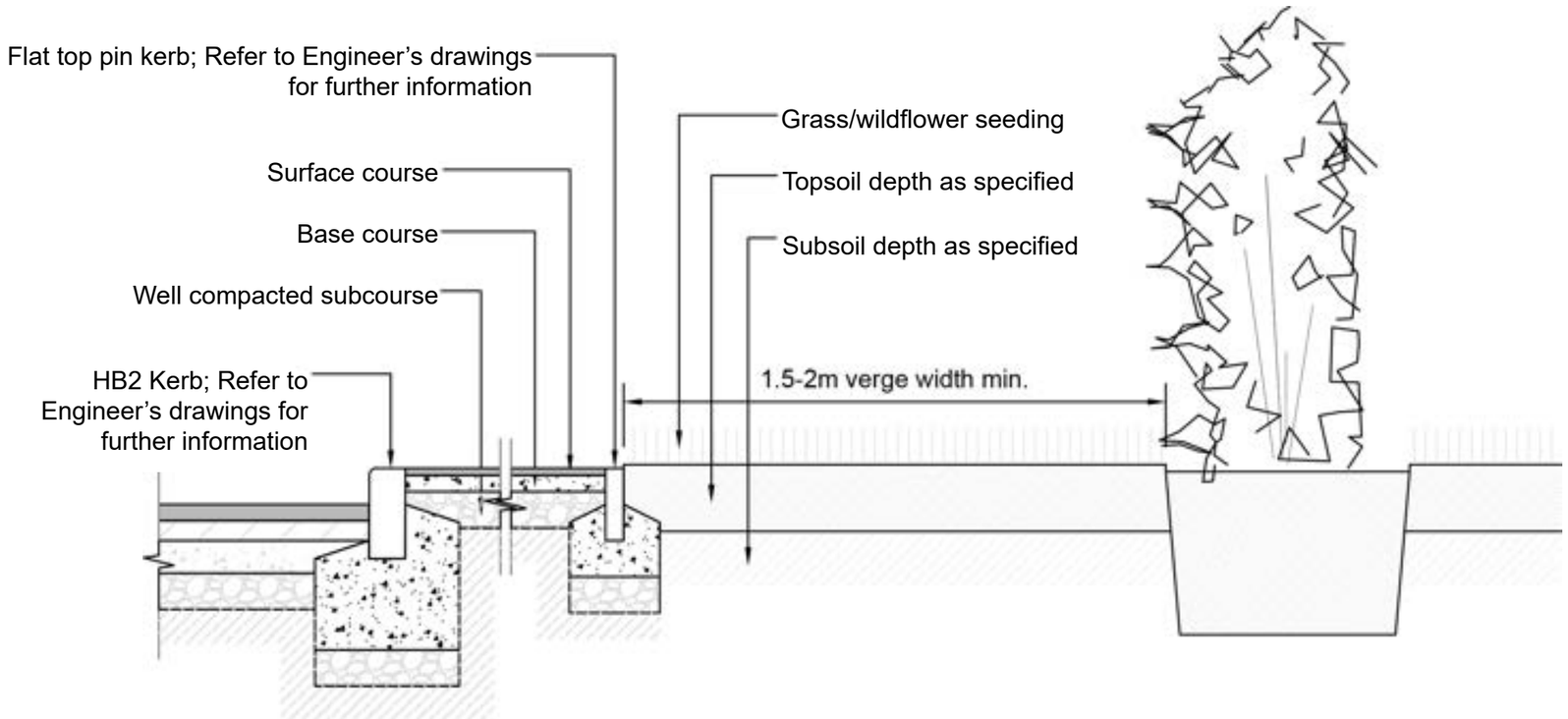




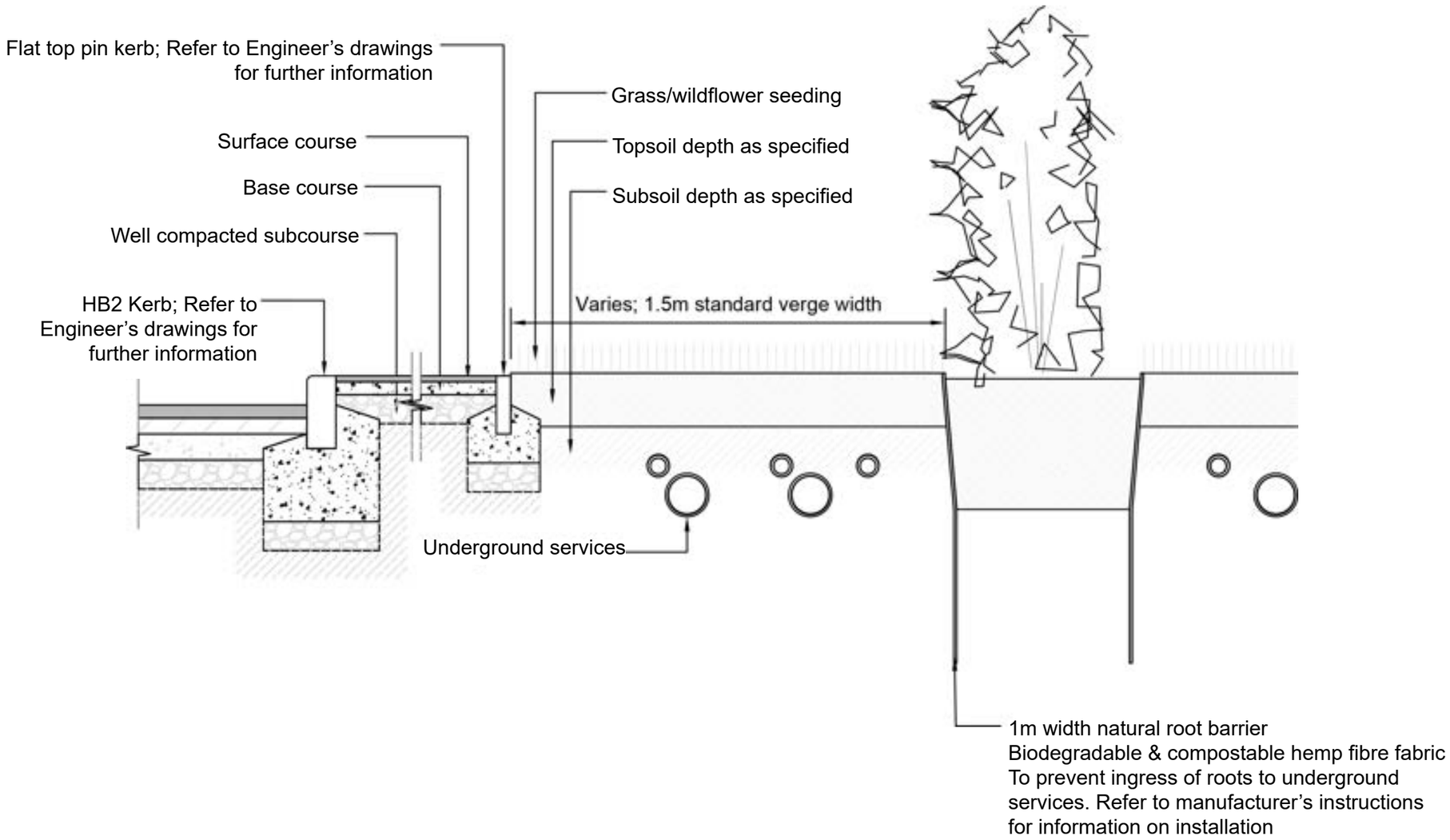




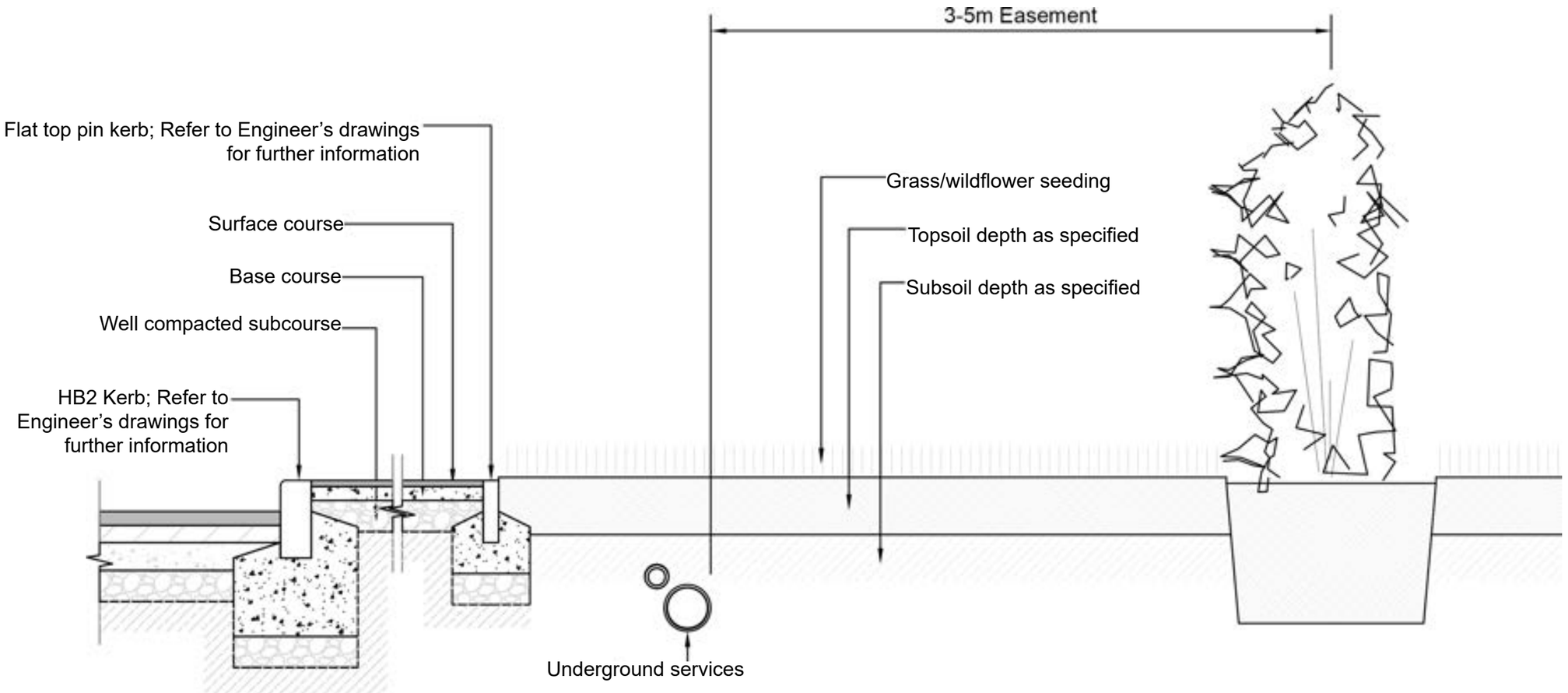
HEDGEROW DETAILS



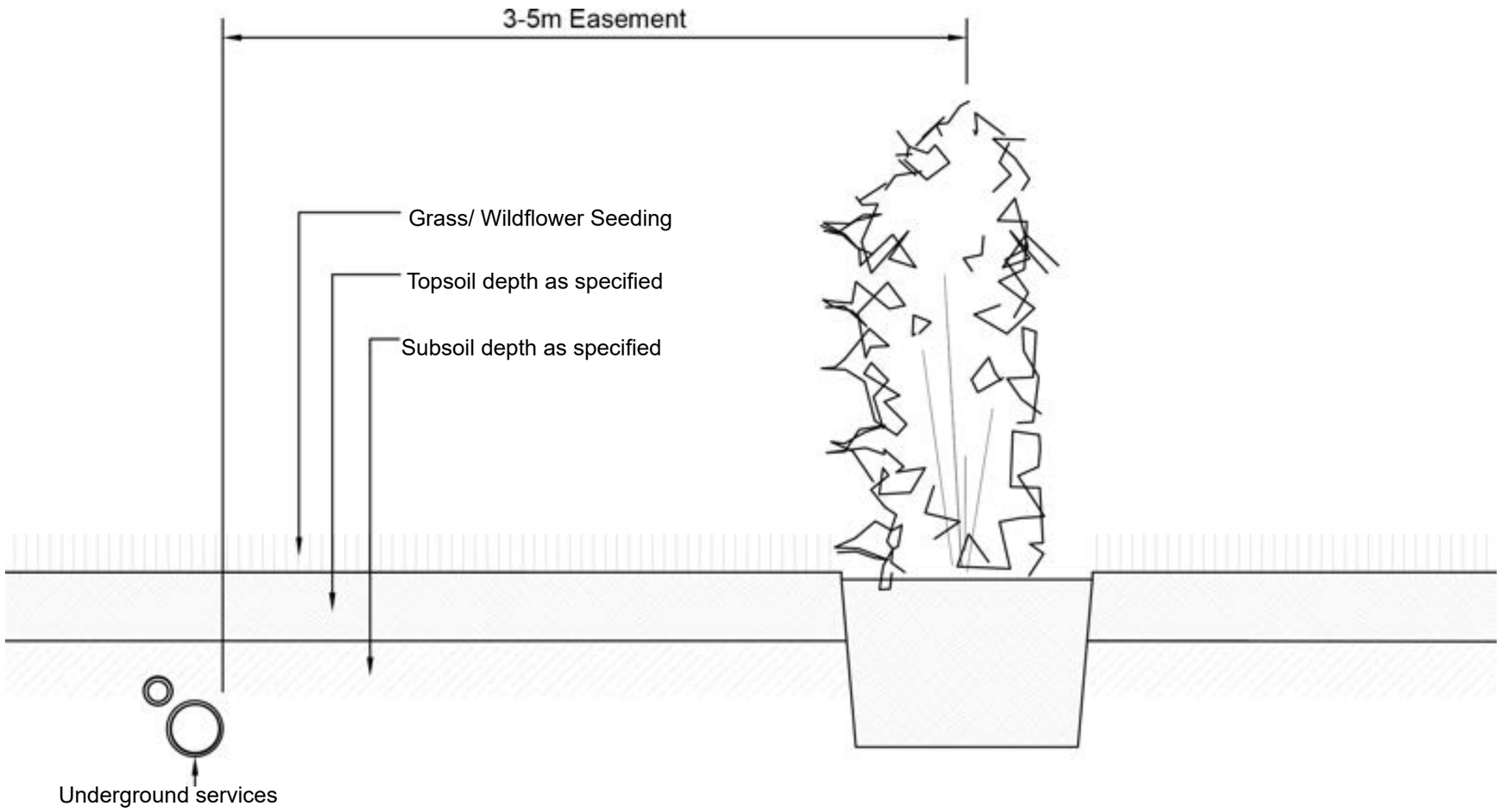
HEDGEROW DETAILS



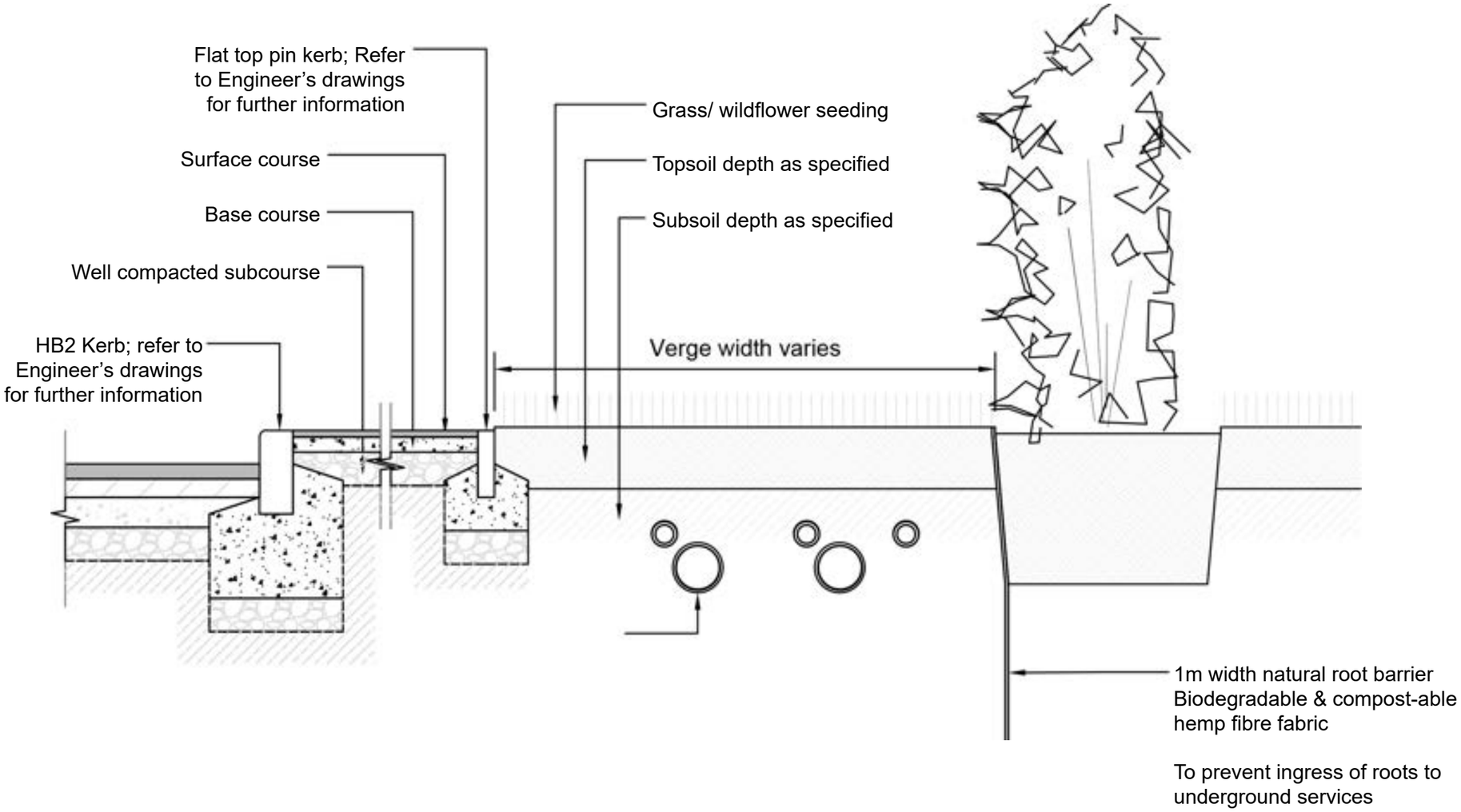
HEDGEROW DETAILS



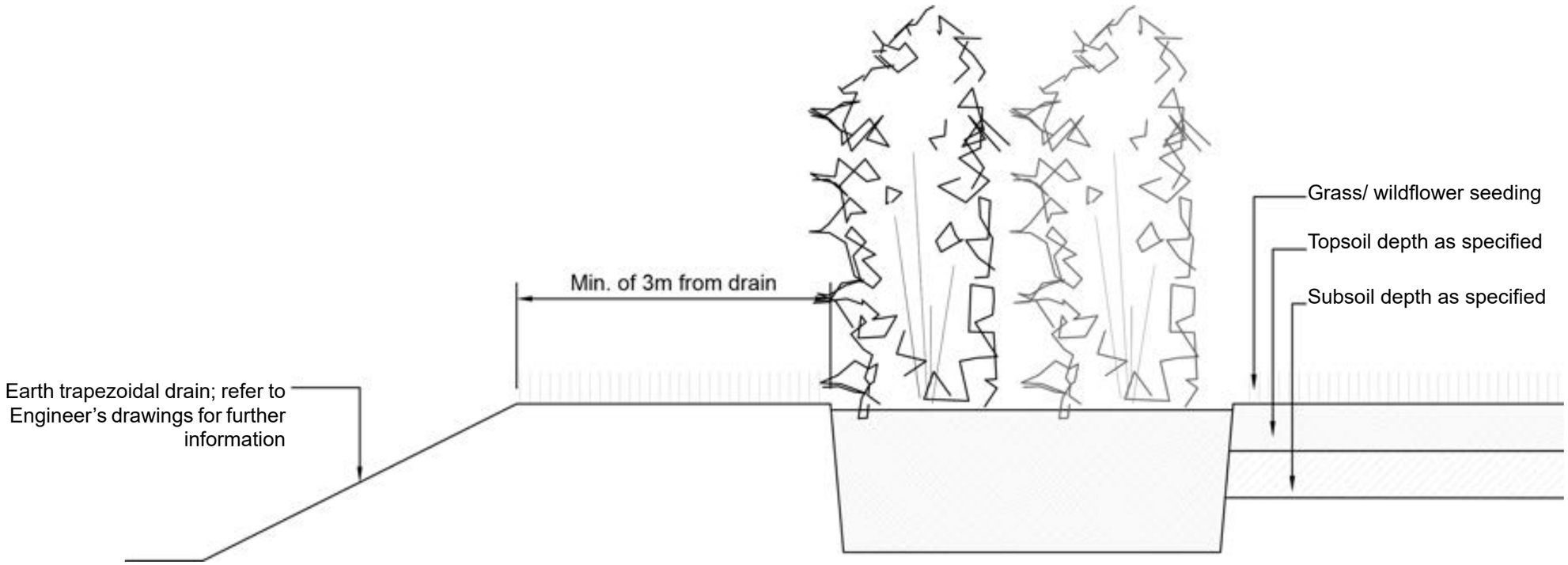
ROAD EDGE AND VERGE DETAILS



VERGE AND HEDGEROW PLANTING DETAILS

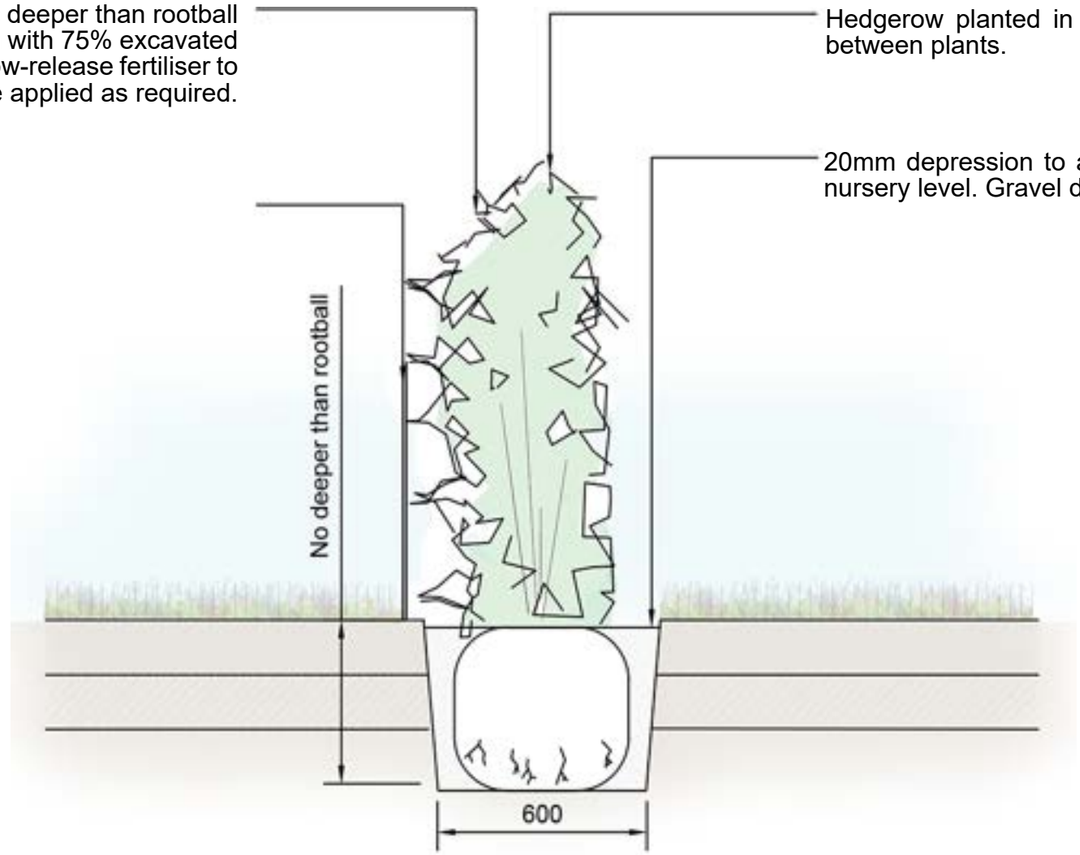


PAVEMENT VERGE AND HEDGE PLANTING DETAILS



DRAIN VERGE AND HEDGEROW PLANTING DETAILS

Trench to be excavated to a depth no deeper than rootball and a width of 600mm. Backfill trench with 75% excavated topsoil mixed with 25% compost. A slow-release fertiliser to be applied as required.



Hedgerow planted in a single row with 600mm spacing between plants.

20mm depression to aid natural watering. Backfill soil to nursery level. Gravel drainage layer may be required.

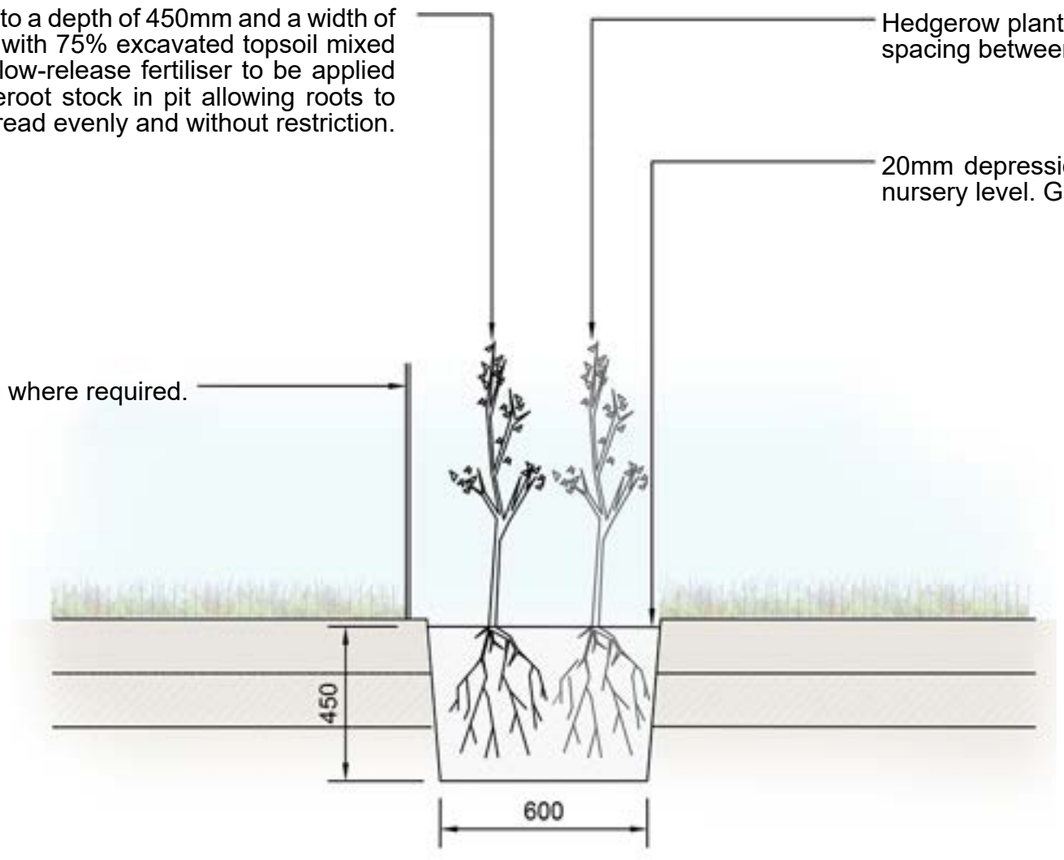
ROOTBALLED HEDGEROW PLANTING TRENCH DETAIL_SINGLE ROW WITH 600mm PLANT SPACING

Trench to be excavated to a depth of 450mm and a width of 600mm. Backfill trench with 75% excavated topsoil mixed with 25% compost. A slow-release fertiliser to be applied as required. Place bareroot stock in pit allowing roots to spread evenly and without restriction.

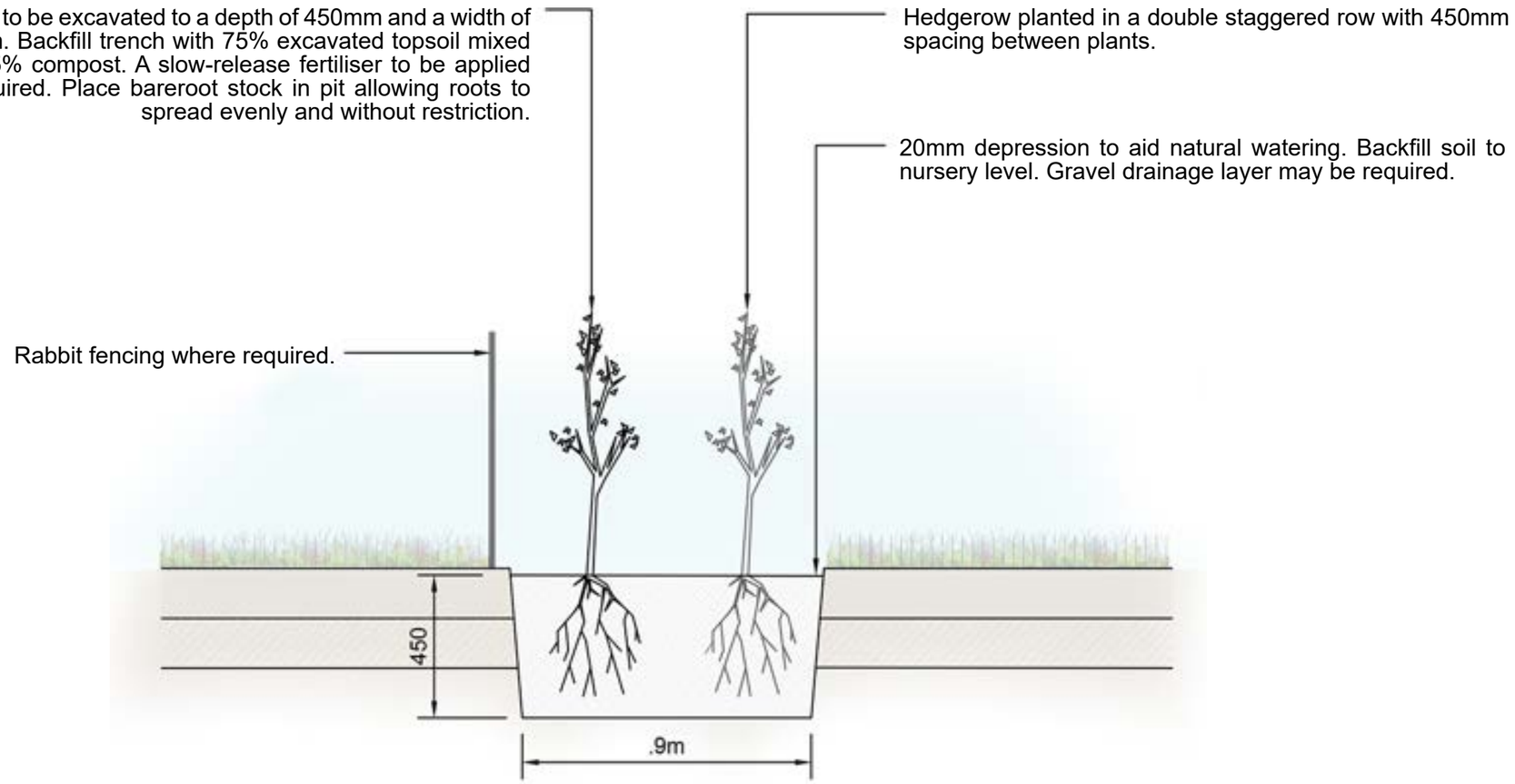
Hedgerow planted in a double-staggered row with 300mm spacing between plants.

20mm depression to aid natural watering. Backfill soil to nursery level. Gravel drainage layer may be required.

Rabbit fencing where required.



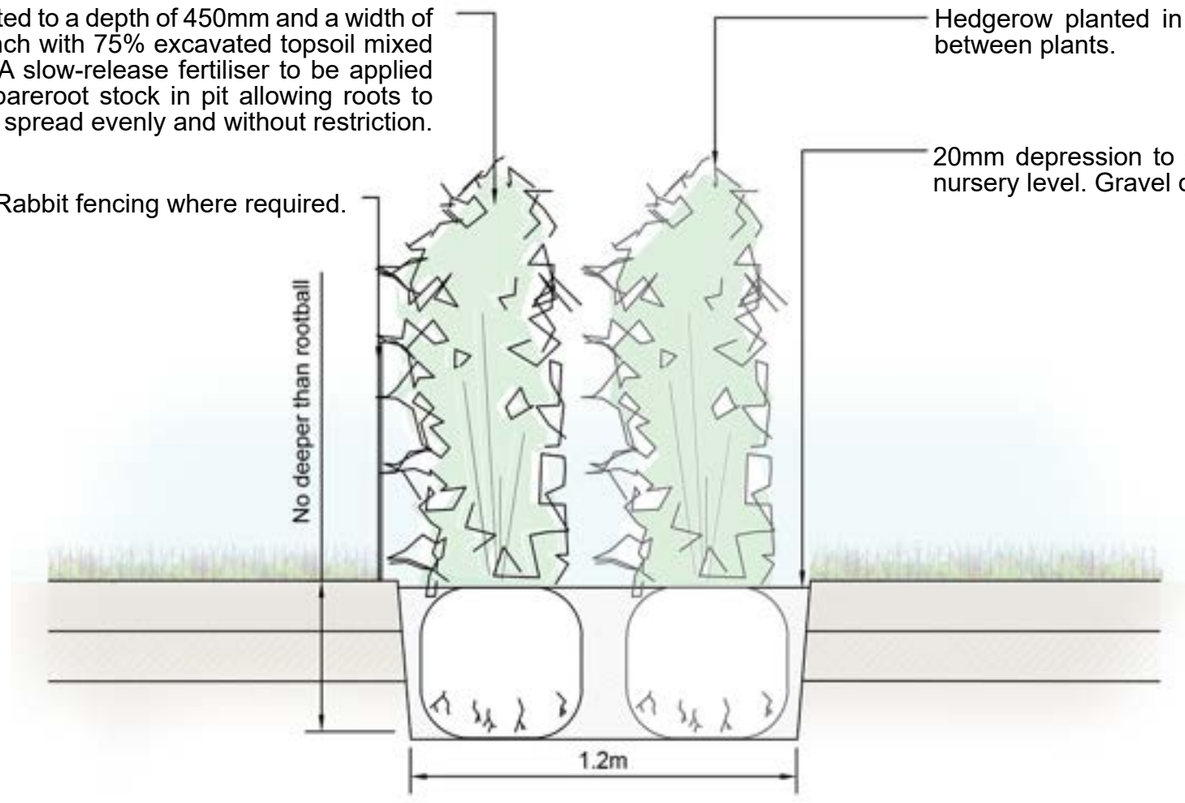
BAREROOT HEDGEROW PLANTING TRENCH DETAIL_DOUBLE STAGGERED WITH 300mm PLANT SPACING



BAREROOT HEDGEROW PLANTING TRENCH DETAIL_DOUBLE STAGGERED WITH 450mm PLANT SPACING

Trench to be excavated to a depth of 450mm and a width of 600mm. Backfill trench with 75% excavated topsoil mixed with 25% compost. A slow-release fertiliser to be applied as required. Place bareroot stock in pit allowing roots to spread evenly and without restriction.

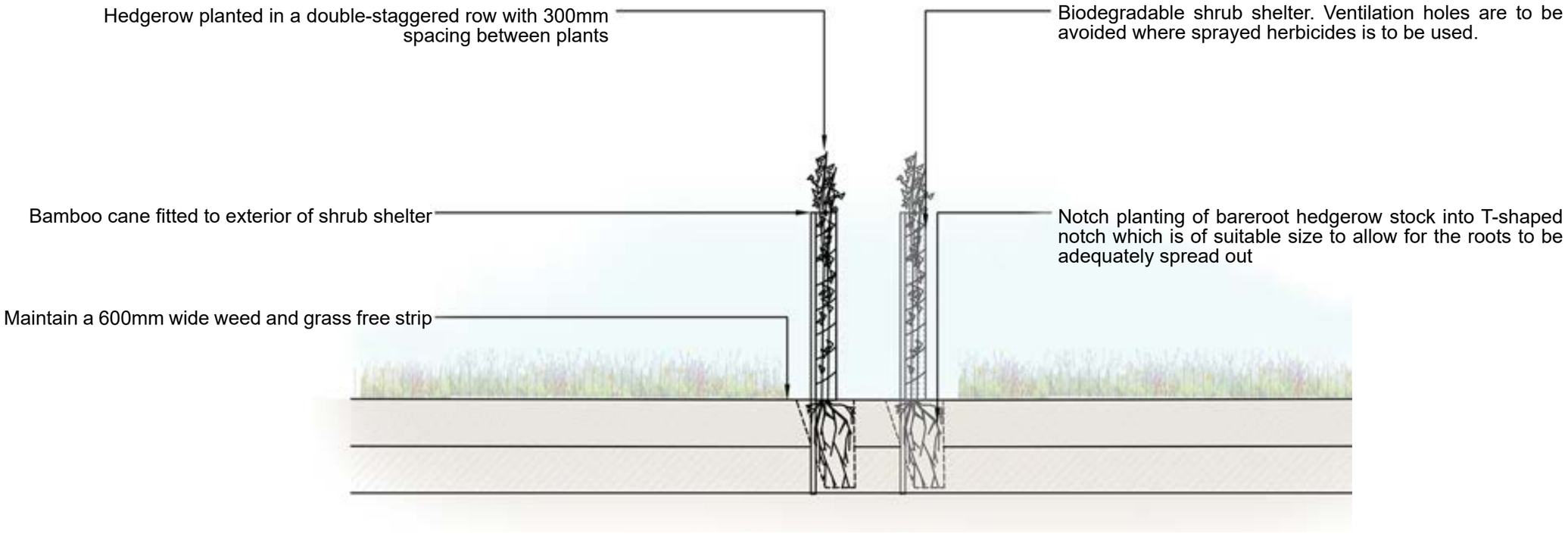
Rabbit fencing where required.



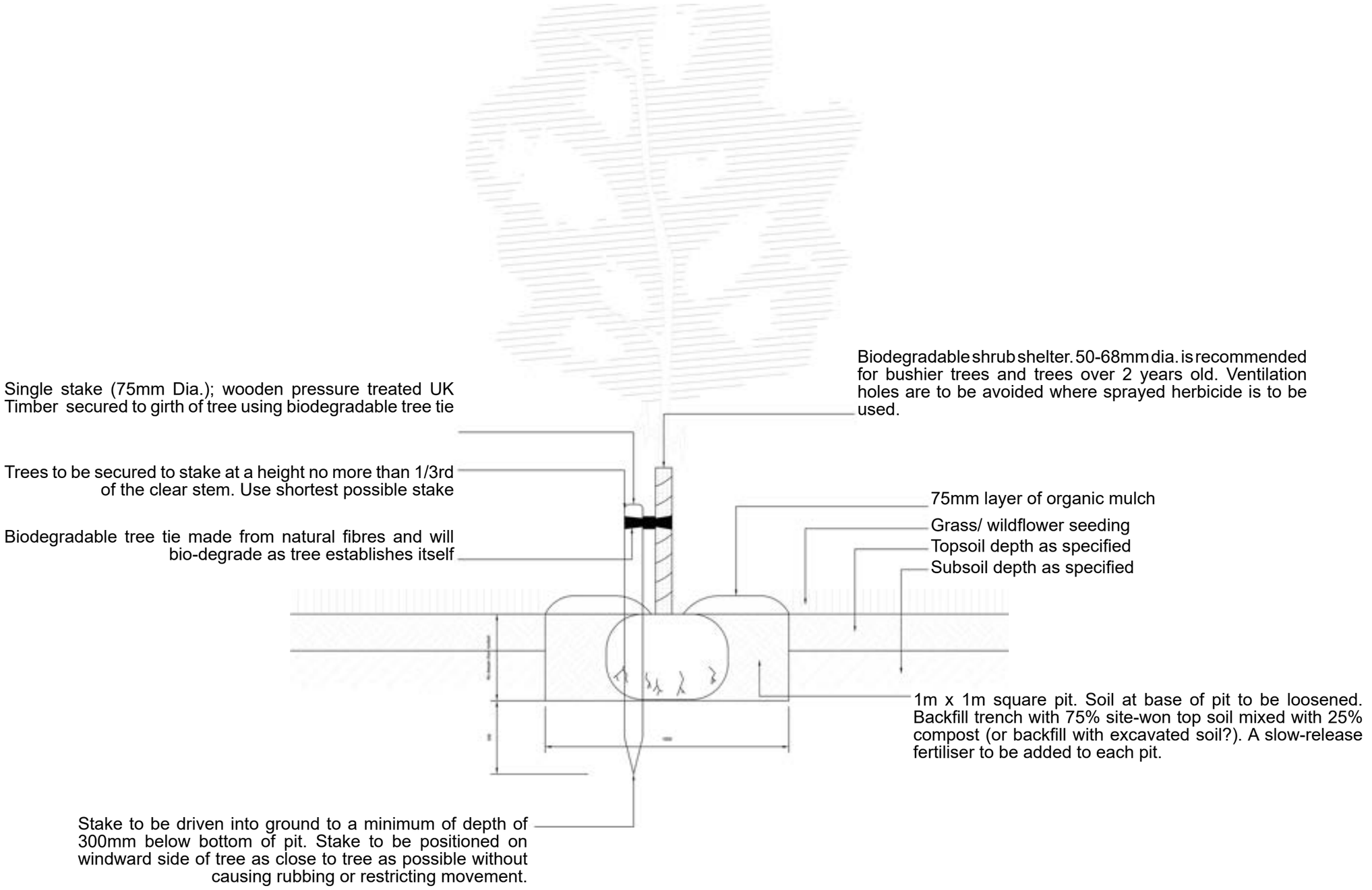
Hedgerow planted in a single row with 600mm spacing between plants.

20mm depression to aid natural watering. Backfill soil to nursery level. Gravel drainage layer may be required.

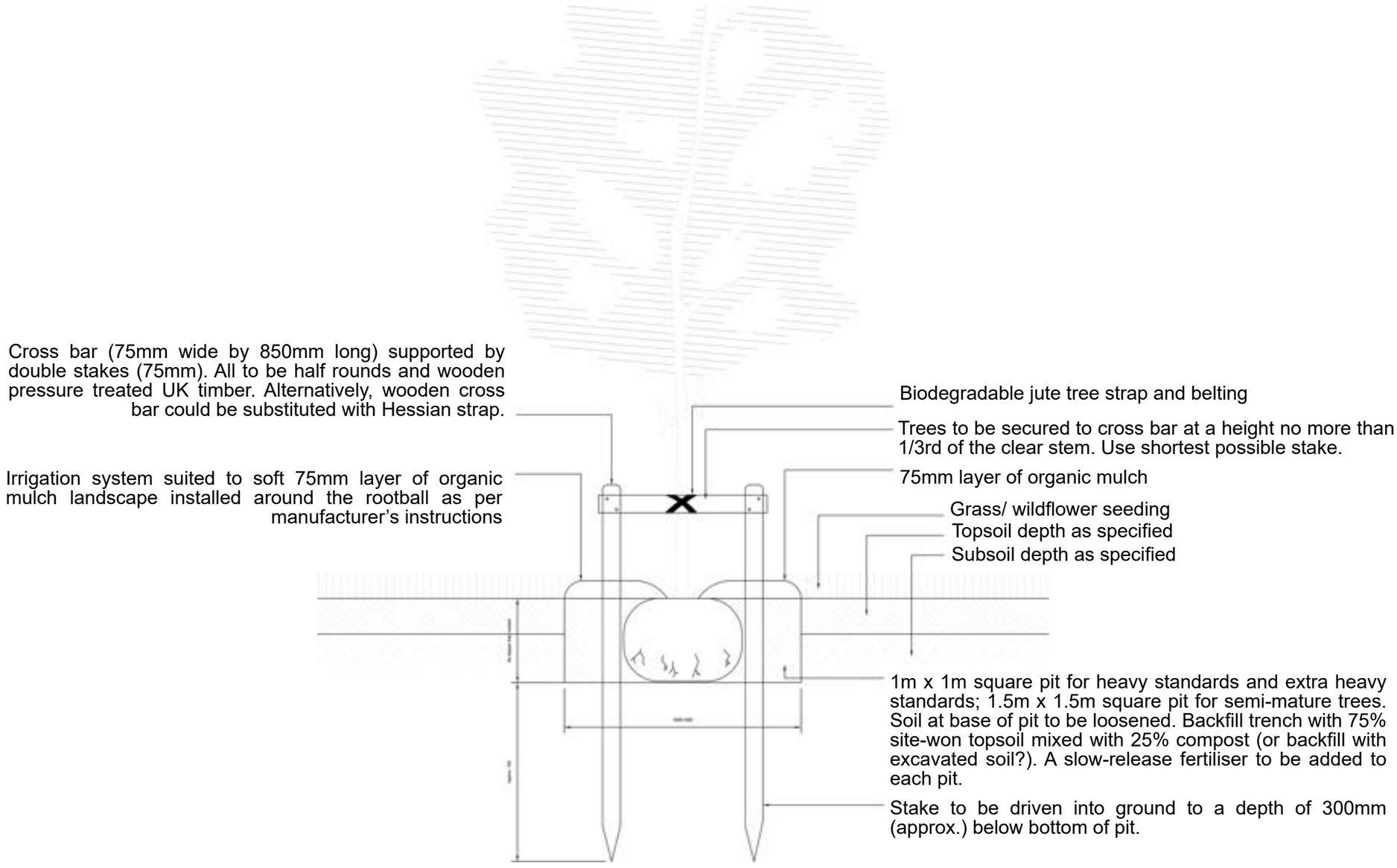
ROOTBALLED HEDGEROW PLANTING TRENCH DETAIL_DOUBLE STAGGERED WITH 600mm PLANT SPACING



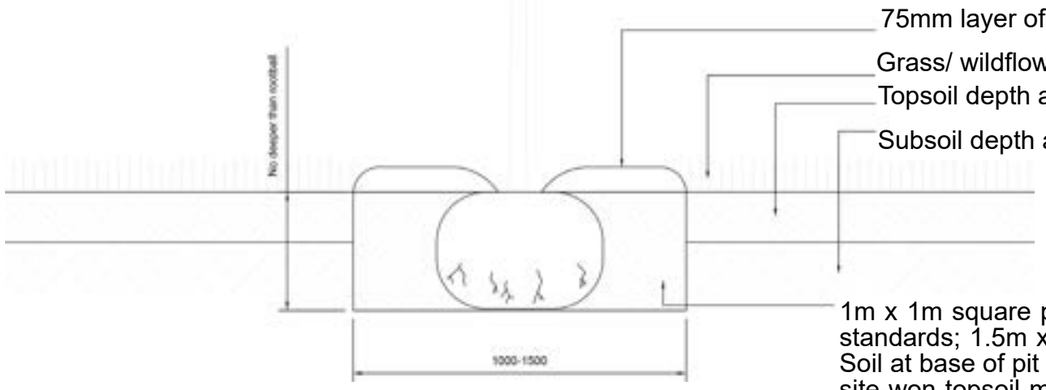
NATIVE HEDGEROW PLANTING DETAIL



STANDARD TREE PLANTING PIT DETAILS_SINGLE STAKE



STANDARD TREE PLANTING PIT DETAILS_CROSS BAR STAKE



75mm layer of organic mulch

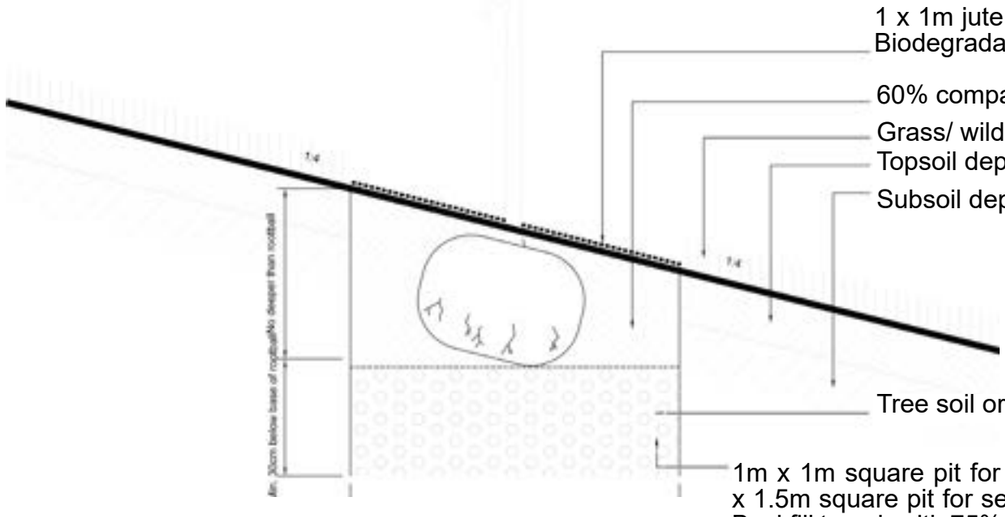
Grass/ wildflower seeding

Topsoil depth as specified

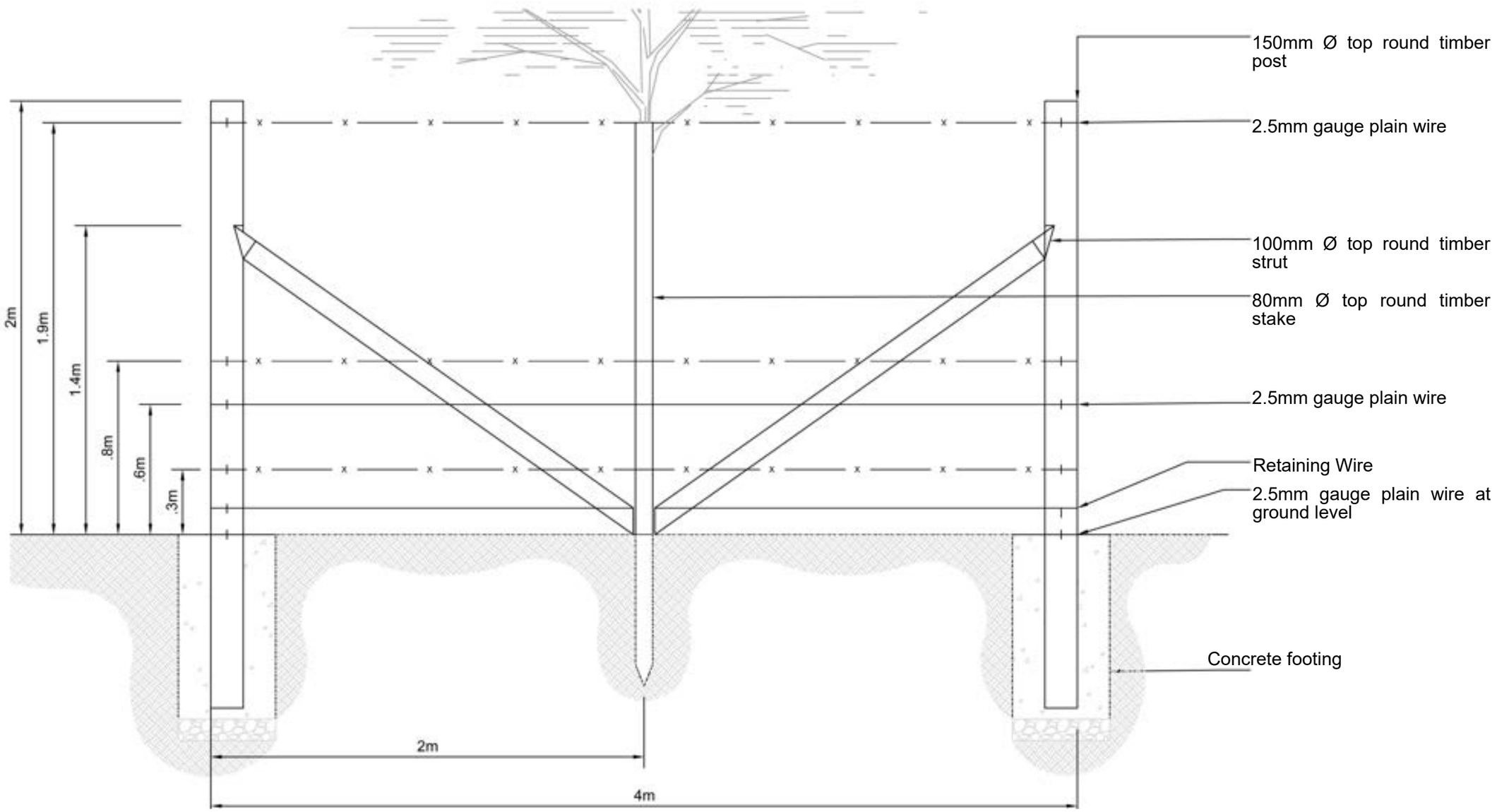
Subsoil depth as specified

1m x 1m square pit for heavy standards and extra heavy standards; 1.5m x 1.5m square pit for semi-mature trees. Soil at base of pit to be loosened. Backfill trench with 75% site-won topsoil mixed with 25% compost (or backfill with excavated soil?). A slow-release fertiliser to be added to each pit.

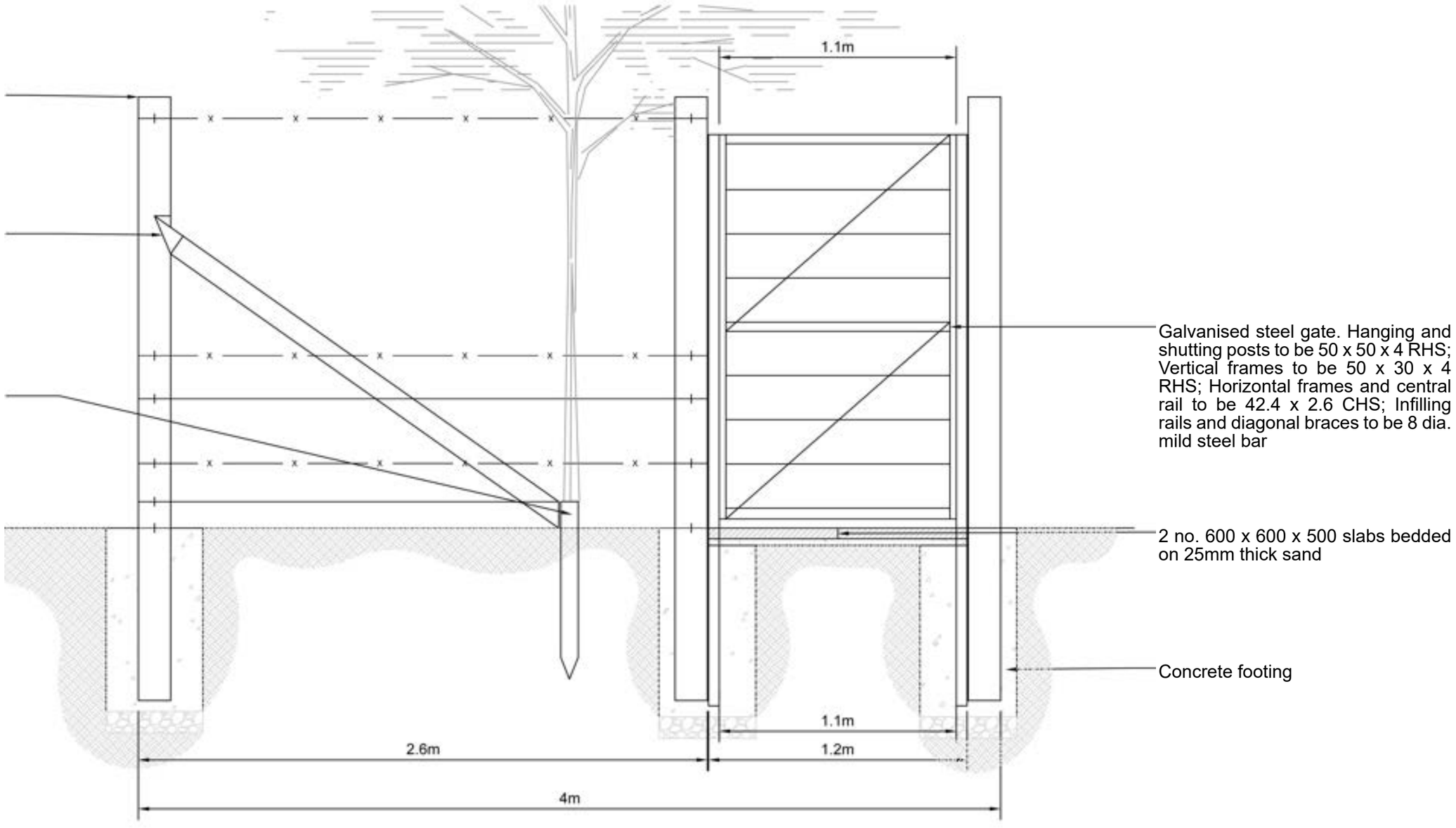
STANDARD TREE PLANTING PIT DETAIL A_TREE ANCHORING SYSTEM



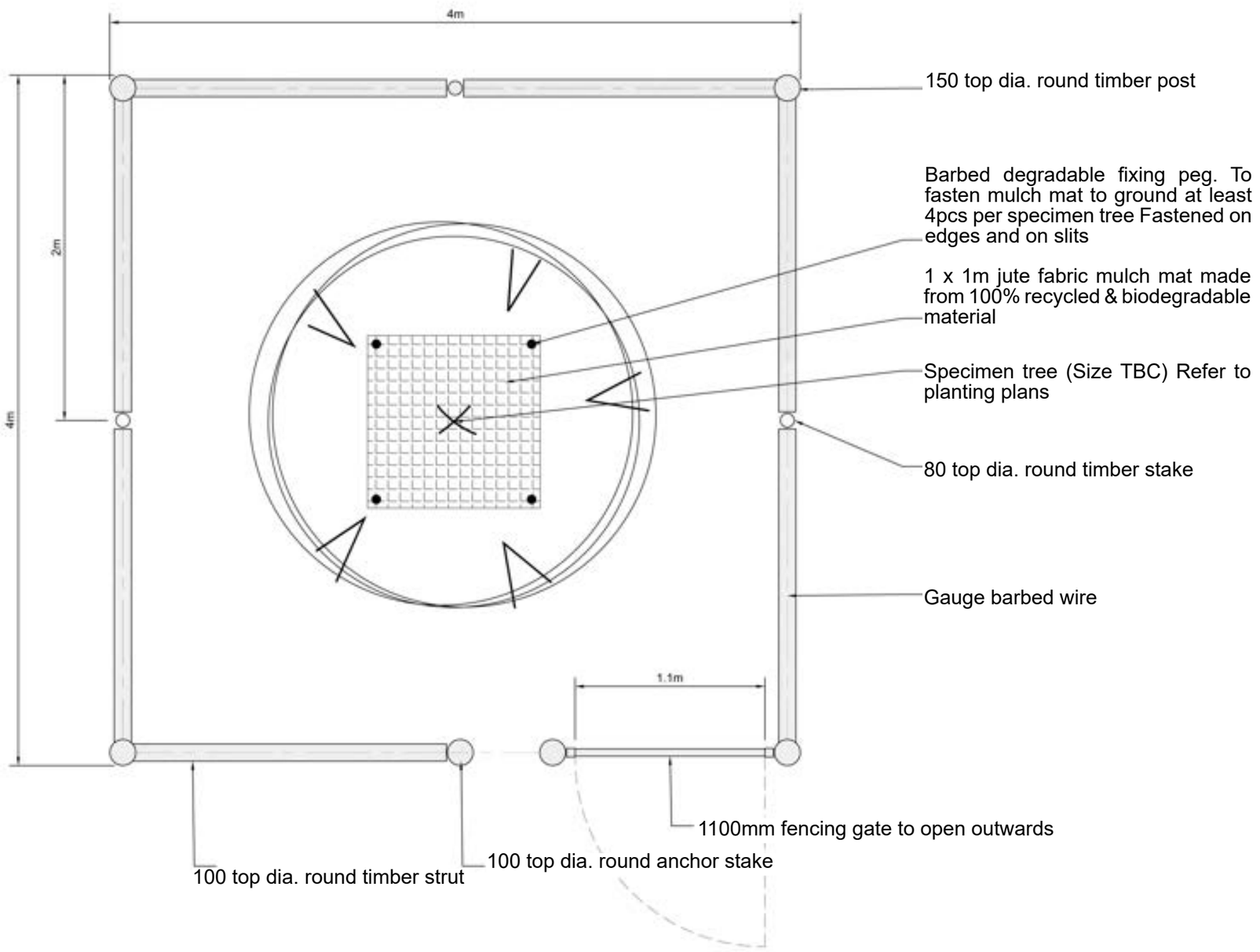
STANDARD TREE PLANTING PIT DETAIL B



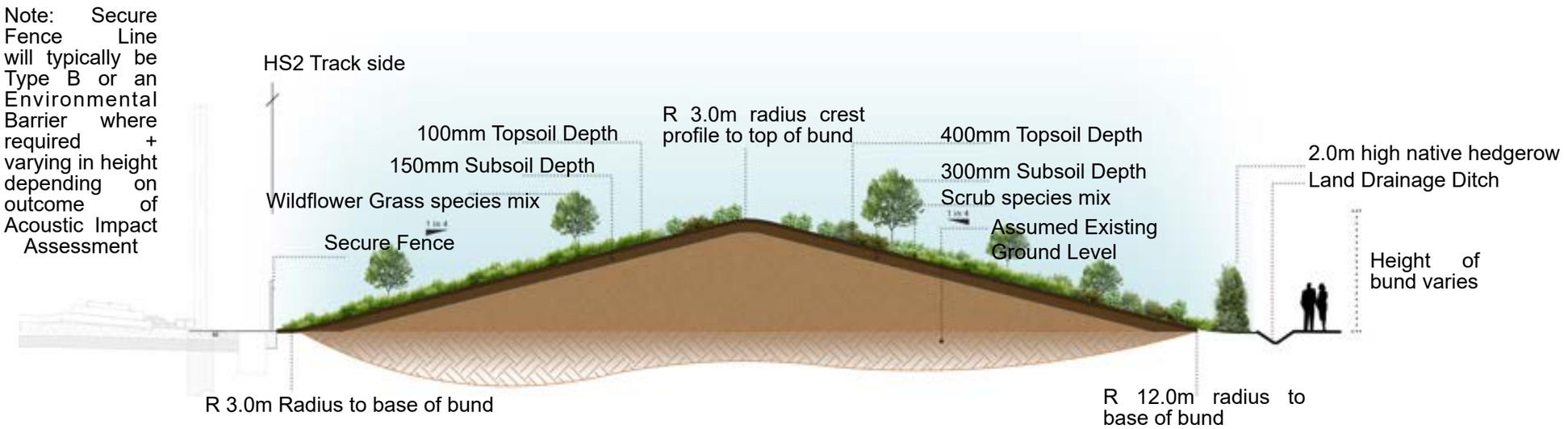
CATTLE PROOF FENCING FOR SPECIMEN TREES



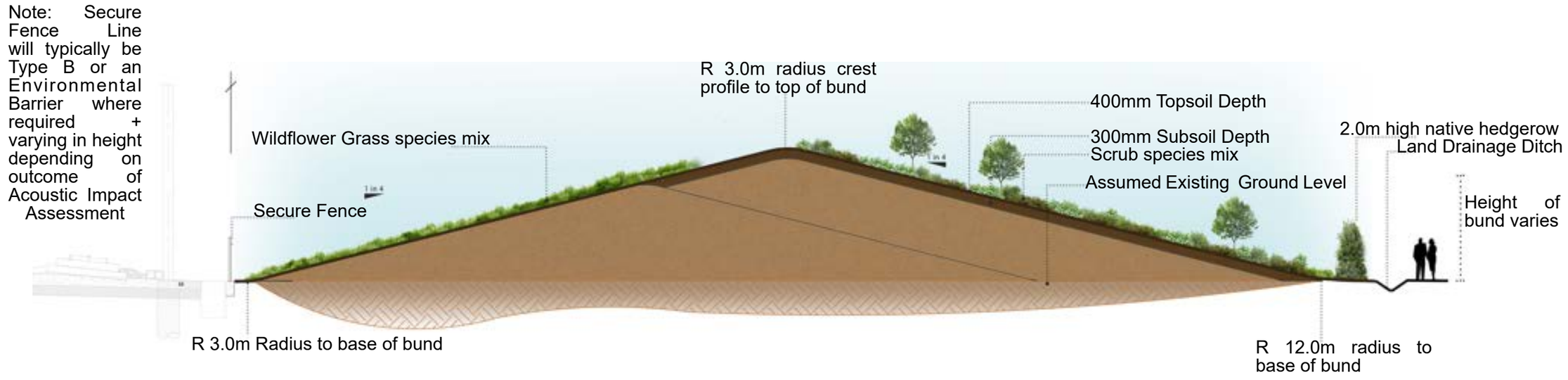
FIELD STANDARD TREE PROTECTION DETAIL_ACCESS GATE FOR SPECIMEN TREE



PLAN OF CATTLE PROOF FENCING FOR SPECIMEN TREES

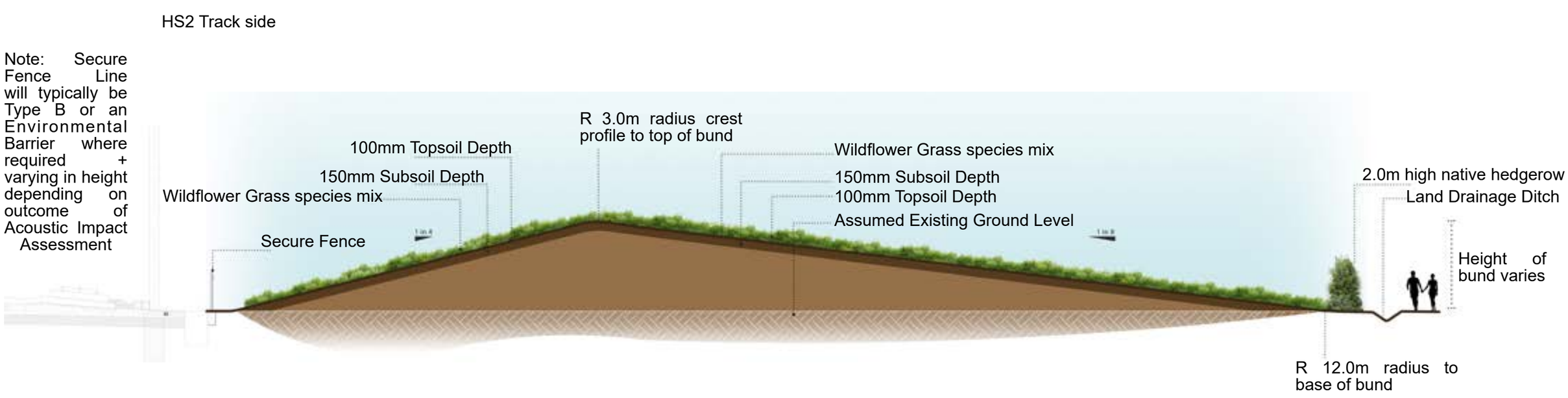


PLANTING PARAMETERS FOR EARTHWORK BUND 1 in 4 INWARD SLOPE and 1 in 4 OUTWARD SLOPE

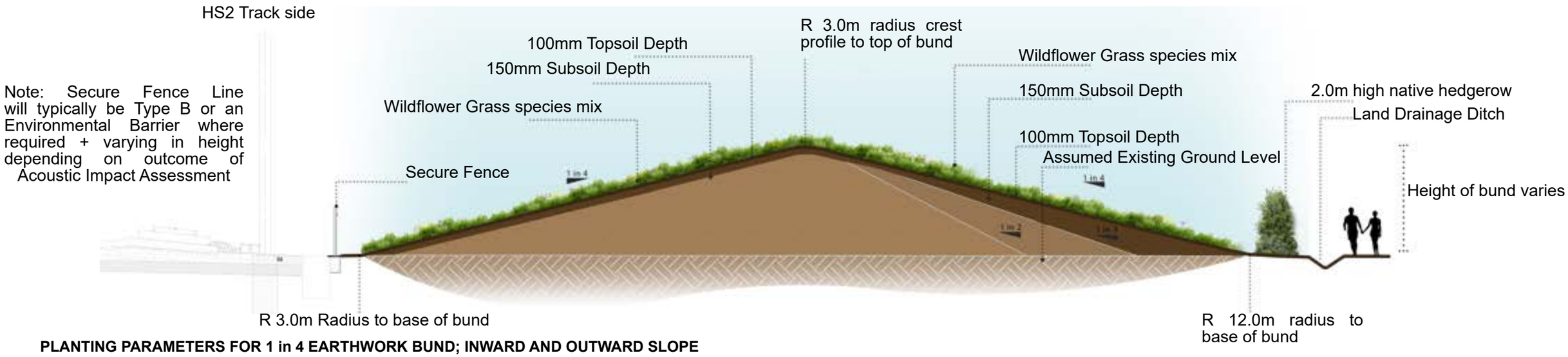


PLANTING PARAMETERS FOR EARTHWORK BUND 1 in 4 INWARD AND 1 in 4 OUTWARD SLOPES- WITH UNDULATING CREST

PLANTING PARAMETERS FOR VEGETATION TYPES



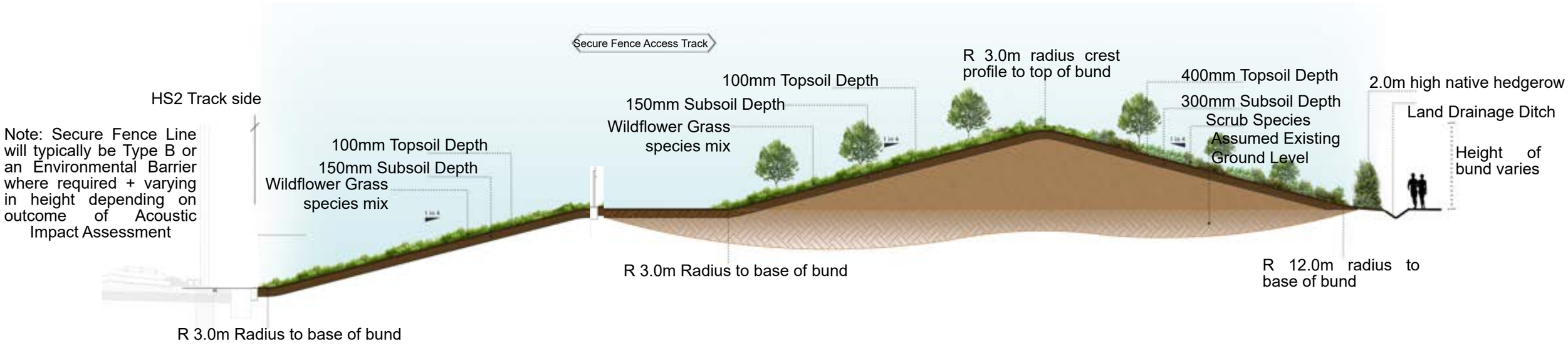
PLANTING PARAMETERS FOR EARTHWORK BUND 1 in 3 INWARD SLOPE / 1 in 8 OUTWARD SLOPE



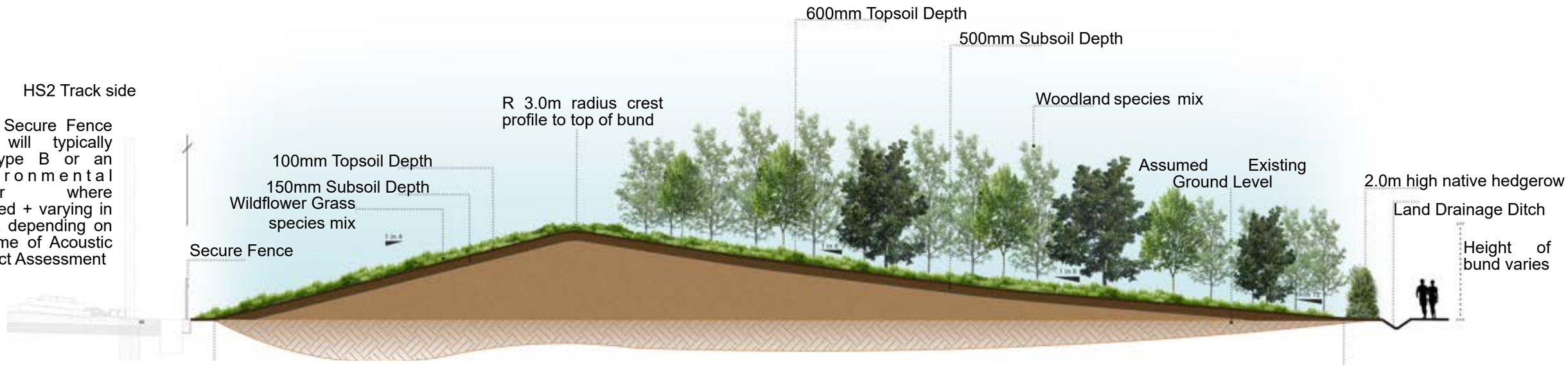
PLANTING PARAMETERS FOR 1 in 4 EARTHWORK BUND; INWARD AND OUTWARD SLOPE

PLANTING PARAMETERS FOR VEGETATION TYPES

HS2 Typical Details - Planting

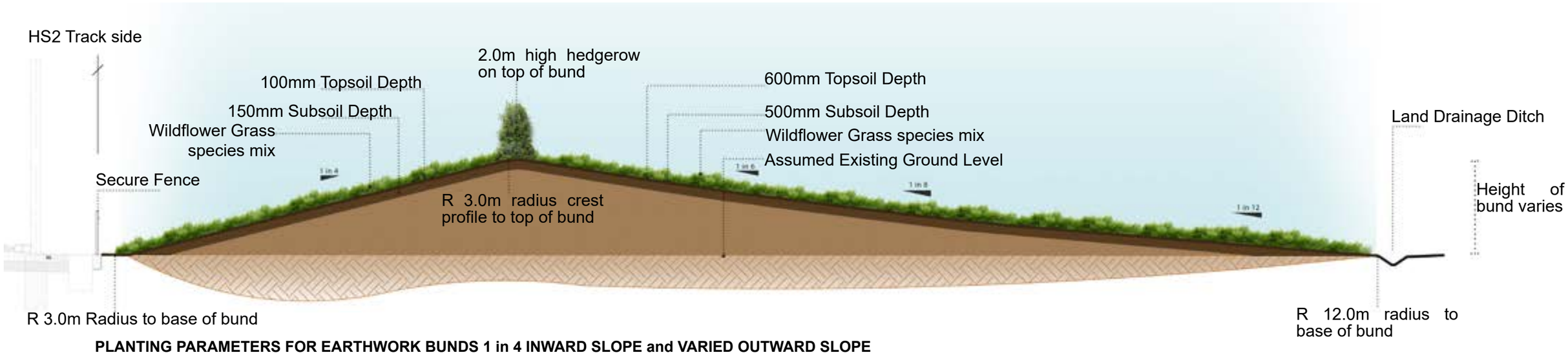


PLANTING PARAMETERS FOR CUTTING AND EARTHWORK BUND 1 in 4 INWARD SLOPE and 1 in 4 OUTWARD SLOPE

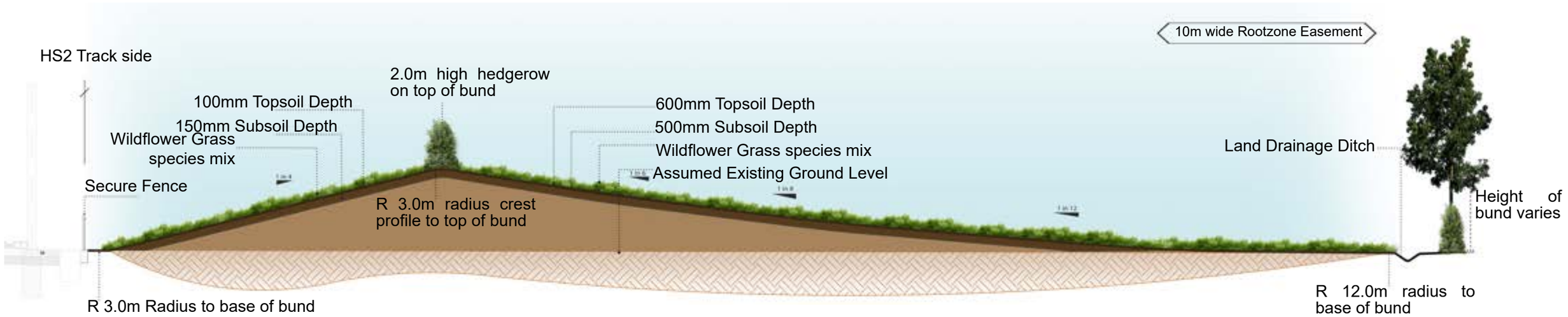


PLANTING PARAMETERS FOR EARTHWORK BUND 1 in 4 INWARD SLOPE AND VARIED OUTWARD SLOPE SLACKER THAN 1 in 4

PLANTING PARAMETERS FOR VEGETATION TYPES

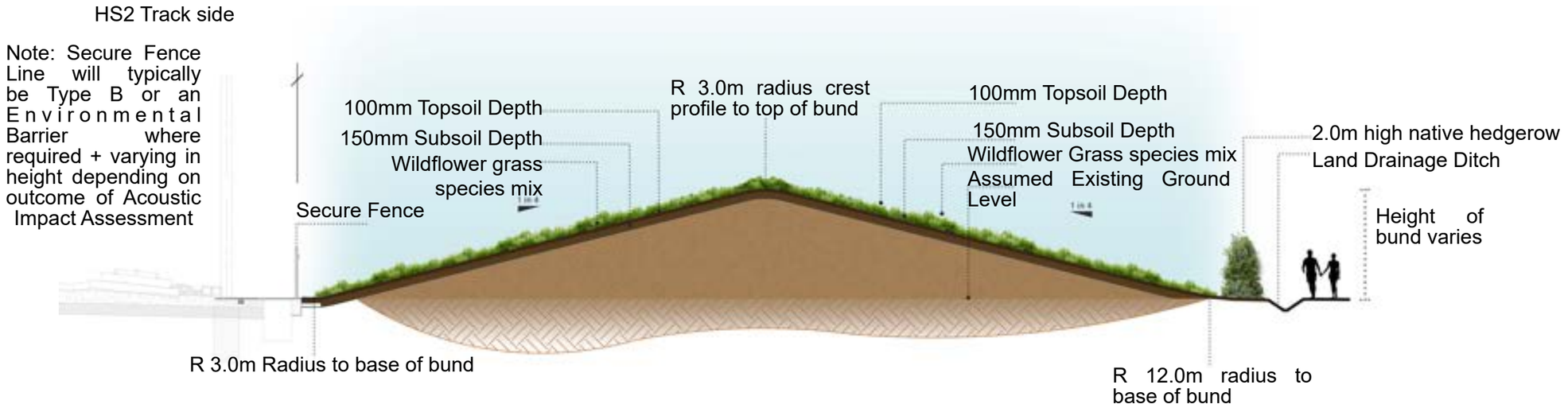


PLANTING PARAMETERS FOR EARTHWORK BUNDS 1 in 4 INWARD SLOPE and VARIED OUTWARD SLOPE

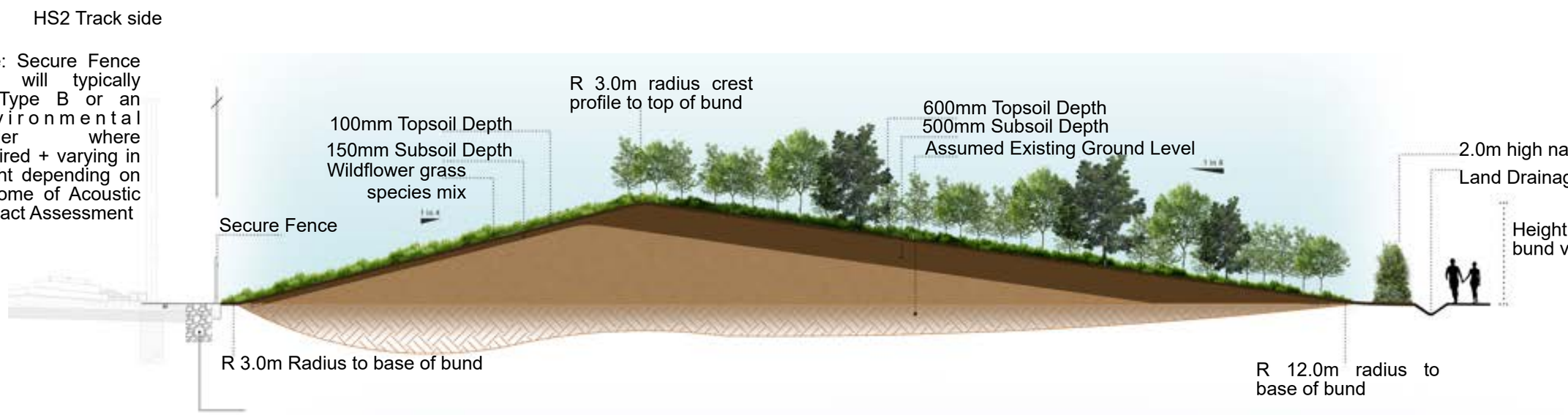


PLANTING PARAMETERS FOR EARTHWORK BUND 1 in 4 INWARD SLOPE and VARIED OUTWARD SLOPE; RESTORED LAND TO FIELD BOUNDARY

PLANTING PARAMETERS FOR VEGETATION TYPES

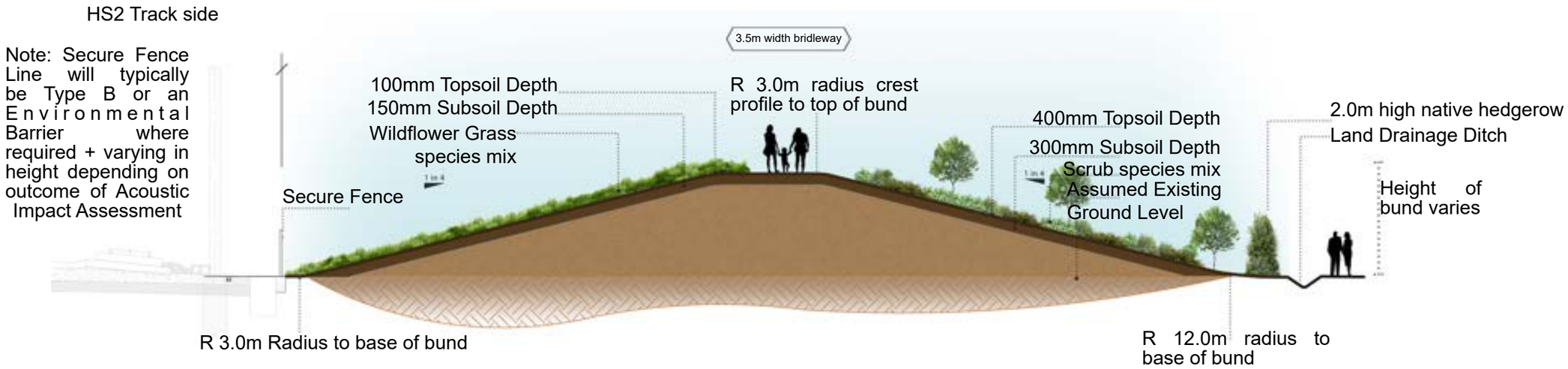


PLANTING PARAMETERS FOR 1 in 4 INWARD and 1 in 4 OUTWARD SLOPE

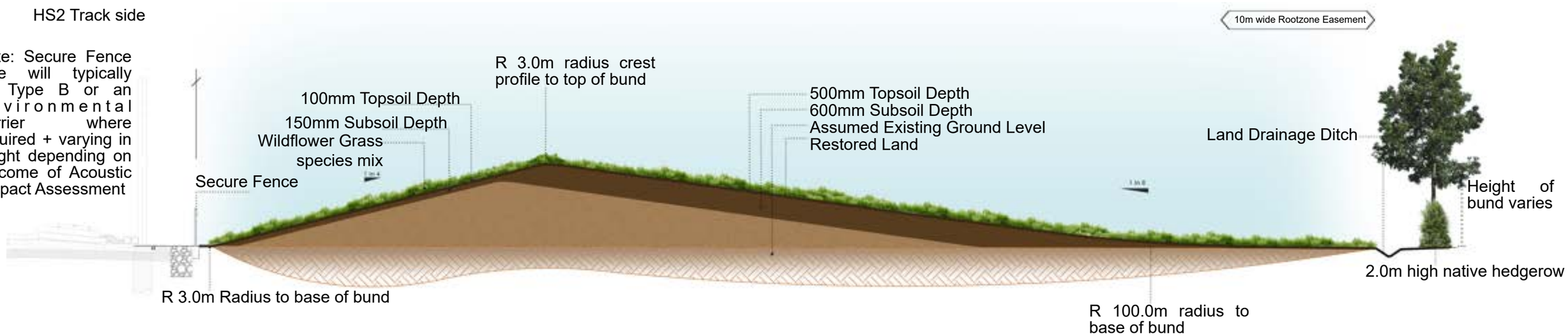


PLANTING PARAMETERS FOR EARTHWORK BUND 1in 4 INWARD SLOPE 1 in 8 OUTWARD SLOPE

PLANTING PARAMETERS FOR VEGETATION TYPES



PLANTING PARAMETERS FOR EARTHWORK BUND 1 in 4 INWARD and OUTWARD SLOPES



PLANTING PARAMETERS FOR ERATHWORK BUND 1 in 4 INWARD and 1 in 8 OUTWARD SLOPES-RESTORED LAND

PLANTING PARAMETERS FOR VEGETATION TYPES