



KEDD
L i m i t e d

BIODIVERSITY NET GAIN ASSESSMENT

In respect of

Land off Denford Road, Ringstead,

Northamptonshire

Report Ref – KD.RNG.ER.002V1

August 2023

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Revision	Author	Checked by	Date
V1	SP	RS/RD	August 2023

1.0 INTRODUCTION

1.1 Kedd Limited have been commissioned to undertake a Biodiversity Net Gain (BNG) assessment to determine the impact on biodiversity for land off Denford Road, Ringstead, Northamptonshire (hereafter referred to as the site).

1.2 The report should be read in conjunction with the supporting Defra Metric Calculator 4.0.

BNG objectives

1.3 Biodiversity net gain (BNG) is an approach that means changes brought about by development conclude with biodiversity faring better than it did before works took place and replaces the previous policy of 'no net loss'. BNG is strongly referenced in the NPPF and the current planning decision making process.

1.4 BNG encourages developers to provide an increase in natural habitats and ecological features over and above that being impacted on during development and aims to restore ecological networks. This should ideally be at the same location, but where that is not possible may be achieved by improvements for biodiversity in other locations.

Site Location and Description

1.5 The land surveyed and centred on Ordnance Survey grid ref. SP 9882 7502 lies south of Denford Road, Ringstead, Northamptonshire and adjacent the east of Raunds Road.

1.6 The Site comprised a horse feed factory unit of three buildings and an associated farm shop (Nene Valley Country Store) fronting Denford Road and fields to the rear. At its north-western edge adjacent the factory further single storey sheds were recorded in association with tree cover.

1.7 The surrounding land to the south, east and west comprised arable and pasture fields within a network of hedgerows and a few small woods. Existing residential development of Ringstead village was to the north and Kinewell Lake and the River Nene corridor (encompassing local, national and international designations for wildlife) was to the west.

Proposed Development

- 1.8 The proposals are to construct 35 new residential buildings on the site in conjunction with new infrastructure which includes access roads, footpaths, car parking and amenity grassland gardens.

2.0 NATIONAL LEGISLATION AND PLANNING POLICY

National Planning Policy

2.1 The National Planning Policy Framework (NPPF 2021) paragraphs 179 to 182 set out the Government's policies on protection of biodiversity through the planning system. These policies are expected to be incorporated into development planning documents at regional and local scales and are also of material worth in considering individual planning applications.

2.2 In relation to biodiversity, the NPPF states that 'To protect and enhance biodiversity and geodiversity, plans should:

- a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity⁶¹; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

2.3 When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Biodiversity Net Gain (BNG)

- 2.4 Biodiversity net gain (BNG) is an approach that means changes brought about by development conclude with biodiversity faring better than it did before works took place and replaces the previous policy of 'no net loss'. BNG is strongly referenced in the NPPF and the current planning decision making process.
- 2.5 BNG encourages developers to provide an increase in natural habitats and ecological features over and above that being impacted on during development and aims to restore ecological networks. This should ideally be at the same location, but where that is not possible may be achieved by improvements for biodiversity in other locations.
- 2.6 BNG relies on the mitigation hierarchy of avoidance, mitigation or compensation being applied, and should be used in addition rather than as a replacement.
- 2.7 Many councils and organisations have implemented their own BNG strategies which includes the use of a metric as a tool to identify the negative impacts rising from a development and calculates how much new or restored habitats is required to deliver BNG.

3.0 ASSESSMENT METHODOLOGY

- 3.1 The Biodiversity Net Gain calculations for the proposed scheme have been assessed using the DEFRA Biodiversity Metric 4 produced by Natural England and the Phase 1 Habitat Map produced as part of the PEA Report. The Biodiversity Metric 4 provides an updated way to measure and account for the losses, changes, and gains, in biodiversity as a result of development, or changes in land management, and includes a calculation tool to demonstrate these figures.
- 3.2 The metric has been used to calculate the baseline biodiversity units within the site red line boundary.
- 3.3 Figure 1 and Figure 2 below include the formulae used to calculate the baseline biodiversity units for habitats and linear habitats according to the Biodiversity Metric 4 User Guide.

Figure 1 Baseline Habitat Biodiversity Unit Formulae (taken from Biodiversity Metric 4 User Guide)

Equation 1: Pre-impact (t_0) biodiversity value

$$t_0 \text{ Baseline AHBU} = (A^{t_0} \times Q_D^{t_0} \times Q_C^{t_0}) \times (Q_{SC}^{t_0} \times Q_{SS}^{t_0})$$

A	Area of habitat (hectares)	R _T	Time to target condition (a risk factor)
Q _C	Condition (a quality measure)	R _{OS}	Off-site Risk
Q _D	Distinctiveness (a quality measure)	t ₀	Before intervention
Q _{SC}	Connectivity (a quality measure)	t ₁	Post intervention
Q _{SS}	Strategic Significance (a quality measure)	H1	Area habitat type before intervention
R _D	Difficulty (a risk factor)	H2	Area habitat type post intervention

Figure 2 Baseline Linear Habitat Biodiversity Unit Formulae (taken from Biodiversity Metric 4 User Guide)

Equation 1: Existing (pre-intervention) (T₀) biodiversity value

$$T_0 \text{ Baseline HBU} = (L^{t_0} \times Q_D^{t_0} \times Q_C^{t_0}) \times (Q_{SC}^{t_0} \times Q_{SS}^{t_0})$$

L	Length of hedge (kilometres)	R _T	Time to target condition (a risk factor)
Q _C	Condition (a quality measure)	t ₀	Before intervention
Q _D	Distinctiveness (a quality measure)	t ₁	Post intervention
Q _{SC}	Connectivity (a quality measure)	R _{OS}	Off-site Risk
Q _{SS}	Strategic Significance (a quality measure)		
R _D	Difficulty (a risk factor)		

3.4 The metric is then used to calculate the biodiversity units present in the post development proposal. Where the number of biodiversity units is lower/higher than the baseline calculations, an assessment can be made as to whether the scheme will achieve a net gain or a net loss for biodiversity.

3.5 Calculations of biodiversity units remaining following the construction of the proposed development take account of –

- Habitat that is lost due to development;
- Habitat retained post development;
- Retained and enhanced habitats; and
- Habitats created due to the development.

3.6 Post construction assessment is based upon the target state (size and condition) for the habitats that are being enhanced or created.

3.7 Figure 3 and Figure 4, below, includes the formulae used to calculate the post-development biodiversity units for habitats and linear habitats according to the Biodiversity Metric 4 User Guide.

Figure 3 Post-development Habitat Biodiversity Unit Formulae (taken from Biodiversity Metric 4 User Guide)

Equation 2: Post-impact (t₁) biodiversity value for habitat creation

$$t_1 \text{ Creation AHBU} = \{[A^{t1} \times Q_D^{t1} \times Q_C^{t1}] \times [R_D \times R_T] \times [Q_{sc}^{t1} \times Q_{ss}^{t1}]\} \times R_{os}$$

Equation 3: Post-impact (t₁) biodiversity value for habitat restoration and enhancement

$$\begin{aligned} t_1 \text{ Enhancement AHBU} \\ = & \{ [\{ [\{ [A^{t1} \times Q_D^{t1} \times Q_C^{t1}] - \{ A^{t0} \times Q_D^{t0} \times Q_C^{t0} \}] \} \times \{ R_D \times R_T \}] \\ & + \{ A^{t0} \times Q_D^{t0} \times Q_C^{t0} \}] \times \{ Q_{sc}^{t1} \times Q_{ss}^{t1} \} \} \times R_{os} \end{aligned}$$

Equation 4: Post-impact (t1) biodiversity value for accelerated succession habitat

$$\begin{aligned} t1 \text{ Accelerated Succession AHBU} \\ = & \{ \{ [\{ [\{ [H1A^{t0} \times H1Q_D^{t0} \times H1Q_C^{t0}] \times \{ H1Q_{sc}^{t1} \times H1Q_{ss}^{t1} \}] \} \times (0.5(1 - H2R_T^{t1}))] \\ & + [\{ [\{ [H2A^{t1} \times H2Q_D^{t1} \times Q_C^{t1}] - \{ H1A^{t0} \times H1Q_D^{t0} \times H1Q_C^{t0} \}] \\ & \times \{ H2R_D^{t1} \times H2R_T^{t1} \} + \{ H1A^{t0} \times H1Q_D^{t0} \times H1Q_C^{t0} \}] \times \{ H2Q_{sc}^{t1} \times H2Q_{ss}^{t1} \}] \}] \\ & \times R_{os} \end{aligned}$$

A	Area of habitat (hectares)	R _T	Time to target condition (a risk factor)
Q _C	Condition (a quality measure)	R _{OS}	Off-site Risk
Q _D	Distinctiveness (a quality measure)	t ₀	Before intervention
Q _{SC}	Connectivity (a quality measure)	t ₁	Post intervention
Q _{SS}	Strategic Significance (a quality measure)	H1	Area habitat type before intervention
R _D	Difficulty (a risk factor)	H2	Area habitat type post intervention

Figure 4 Post-development Linear Habitat Biodiversity Unit Formulae (taken from Biodiversity Metric 4 User Guide)

Equation 2: Post-intervention (T₁) biodiversity value for hedgerow creation

$$T_1 \text{ Creation HBU} = [L^{t1} \times Q_D^{t1} \times Q_C^{t1}] \times [R_D^{t1} \times R_T^{t1}] \times [Q_{sc}^{t1} \times Q_{ss}^{t1}] \times R_{os}$$

Equation 3: Post-intervention (T₁) biodiversity value for hedgerow restoration and enhancement

$$\begin{aligned} T_1 \text{ Total HBU after Enhancement} \\ = & \{ [\{ [\{ [L^{t1} \times Q_D^{t1} \times Q_C^{t1}] - \{ L^{t0} \times Q_D^{t0} \times Q_C^{t0} \}] \} \times \{ R_D \times R_T \}] \\ & + \{ L^{t0} \times Q_D^{t0} \times Q_C^{t0} \}] \times \{ Q_{sc}^{t1} \times Q_{ss}^{t1} \} \} \times R_{os} \end{aligned}$$

L	Length of hedge (kilometres)	R _T	Time to target condition (a risk factor)
Q _C	Condition (a quality measure)	t ₀	Before intervention
Q _D	Distinctiveness (a quality measure)	t ₁	Post intervention
Q _{SC}	Connectivity (a quality measure)	R _{OS}	Off-site Risk
Q _{SS}	Strategic Significance (a quality measure)		
R _D	Difficulty (a risk factor)		

- 3.8 Once the post-development biodiversity units have been calculated, the mitigation hierarchy is further applied; application of the mitigation hierarchy is one of the guiding principles for biodiversity no net loss/net gain proposals. Through its application, the hierarchy highlights action to avoid, minimise or restore biodiversity losses within the Site, and account for unavoidable losses off site.
- 3.9 The information from the biodiversity unit calculations enables us to identify the habitat types and the areas needed for the ecological mitigation and compensation in line with the mitigation hierarchy. This maximises the onsite compensation, which in turn minimises the offset compensation that would be needed to deliver no net loss or net gain for biodiversity. This is the most efficient and cost-effective way of delivering no net loss or net gain for biodiversity.
- 3.10 Following the finalisation of the scheme design, and after applying any onsite mitigation proposals, the biodiversity units will be updated to reflect any proposed changes.
- 3.11 The difference between the baseline biodiversity units and those calculated using the scheme design indicate the number of units that would be required to deliver no net loss or net gain for biodiversity. Using this information we can identify the habitat types and the size that would be needed off site to deliver no net loss or net gain. This in turn will be used to provide rough cost estimates for the potential offsets.

4.0 DESCRIPTION OF THE DEVELOPMENT SCENARIO

Habitats

Broad leaved woodland (JNCC Code A1.1.1 – UK Habitat Classification – Other Woodland – broad leaved)

- 4.1 As with the previous ecological survey, there are three small woodland compartments located within the site boundary. These are located around the periphery of the site and are also bordered two fields in narrow strips between 5-7m wide. BW2 is located adjacent Rounds Road footpath and BW3 is located adjacent hardstanding factory curtilage colonised steep ground. BW1 was on level ground and dominated by a common ash (*Fraxinus excelsior*) within the canopy. The understorey of BW1 included blackthorn (*Prunus spinosa*) and purging buckthorn (*Rhamnus cathartica*). In addition, Ivy (*Hedera helix*) dominated the ground flora and no woodland indicators were recorded. As with the previous assessment, semi-mature planted specimens were recorded but seedlings were also absent. Open areas were noted, and no diseased trees were observed during the assessment.
- 4.2 BW2 colonised a steep slope dominated by a canopy of semi-mature wych elm (*Ulmus glabra*) trees. The understorey vegetation was well represented and included hawthorn (*Crataegus monogyna*) and field maple (*Acer campestre*). There were also patches of bare ground with patches of ivy located within the woodland. No woodland indicators or seedling regeneration was observed within this woodland.
- 4.3 As with the previous assessment, both BW1 and BW2 scored as moderate condition under the Defra 4.0 criteria. The reason for this assessment was due to the lack of deadwood, veteran trees and poor ground flora diversity.
- 4.4 BW3 was located on steep slopes of the site, which in some cases were near vertical. Semi-mature and younger tree and shrub specimens predominated with sycamore (*Acer pseudoplatanus*) and common ash the obvious constituents. As with previous woodlands, bare soils predominated, and no woodland indicator species were recorded.
- 4.5 Within the Defra metric 4.0 condition assessment, BW3 scored as poor. The reason for this assessment was due to the lack of deadwood, veteran trees and poor ground flora diversity. There were also areas of disturbance and a limited tree / shrub diversity.

Coniferous Plantation Woodland (JNCC Code A1.2.2 – UK Habitat Classification – Other Coniferous Woodland)

4.6 There is a small section of coniferous plantation woodland located within the centre of the site. This woodland covers an area of 0.05ha and is dominated by Leyland cypress (*Cupressocyparis leylandii*). Other species present within the woodland include sycamore and silver birch (*Betula pendula*). The under-storey vegetation within the woodland was dominated with ivy with other species such as cow parsley (*Anthriscus sylvestris*) common nettle (*Urtica dioica*) with rare lords and ladies (*Arum maculatum*).

4.7 Due to the limited species diversity and structural diversity this woodland was assessed of poor quality.

Scattered trees (JNCC Code A3.1 – UK Habitat Classification - Rural Trees)

4.8 There are a number of scattered trees located within the site boundary. These include mature Atlantic cedar (*Cedrus atlantica*), wild cherry (*Prunus avium*) and a number of domestic apple trees (*Malus domestica*). There is also a line of mature Leyland cypress trees which border the north-west boundary of the site.

Scrub (JNCC A2.1 – UK Habitat Classification - Bramble scrub/Blackthorn scrub)

4.9 There are two areas of scrub located within the site boundary. The northern section compartment covers 0.03ha and is assessed as bramble scrub. The second compartment is located within the centre of the site and is assessed as blackthorn scrub.

4.10 The blackthorn scrub is assessed as moderate within the condition assessment.

4.11 There are also patches of scattered scrub located along the western and eastern boundary of the site.

Semi-improved species poor grassland – UK Habitat Classification – Modified grassland)

4.12 Two small grassland compartments were associated with derelict buildings at the north-western edge of the site. The first of these is unmanaged and shaded by tree cover and bordered by tall herbs in periphery of B5 and B6. Since the previous Creeping bent *Agrostis stolonifera* dominated and tall herbs, which included common nettle and cow parsley which were dominant at the margins. False oat-grass (*Arrhenatherum elatius*) was present and germander speedwell frequent. 70% ruderal cover was recorded and no bare ground or

scrub. It should be noted that since the previous assessment grass and ruderal species have become more dominant since the previous assessment.

- 4.13 SI2 is adjacent to the site fence boundary and coniferous plantation woodland. This grassland is unmanaged and is approximately 1m high. As with the previous assessment, the unmanaged grassland was dominated by creeping bent (*Agrostis stolonifera*) although red fescue (*Festuca rubra*) was locally dominant. Germander speedwell and yarrow (*Achillea millefolium*) were frequent and smooth hawk's-beard (*Crepis capillaris*) was rare. Less than 5% ruderal and scrub cover was recorded although four semi-mature cultivated apple trees were growing within the grassland.
- 4.14 F1 is small compartment of unmanaged grassland with a sward of 1m high. The species present include Cock's-foot (*Dactylis glomerata*) dominated with an average height of just under 1m. Creeping thistle (*Cirsium arvense*) was occasional; meadow buttercup (*Ranunculus acris*), vervain (*Verbena officinalis*) and ribwort plantain (*Plantago lanceolata*), ragwort (*Jacobaea vulgaris*) and cow parsley were all rare. There is also patches of bramble forming within this area of the site.
- 4.15 F2 is located within the south-western corner of the site boundary and contains areas of dense and scattered scrub across the northern extent of the compartment. As with the other grassland compartments, this grassland was unmanaged and contained a sward up to 1m in height. Roughly 10% scrub cover; 10% tall ruderal; and no bare ground was recorded within the grassland. Cock's-foot dominated and creeping bent was abundant while red fescue was frequently occurring. This concurs with the previous PEA assessment. Herbs included frequent meadow buttercup and rare common sorrel (*Rumex acetosa*) and yarrow. Cow parsley and ragwort were also rarely present.
- 4.16 F3 is located within the south-eastern compartment of the site boundary and contains an open sward to a height of over 1m with a cover of approximately 30% tall ruderals. Cock's-foot and creeping bent dominated. Herbs were little recorded aside from more obvious tall ruderals which included occasional patches of hogweed, cow parsley and ragwort. Yarrow was also recorded as rare. No bare ground was recorded within the grassland.
- 4.17 All semi-improved grasslands within the site were assessed as modified grassland within the UK Habitat Classification. Since the previous assessment, the grassland have become dominated with grass species due to the lack of management and contain little species diversity. There are no patches of bare ground within the grasslands and very little structural

variation. As a result, the grasslands within the site have been assessed as of poor quality within the condition criteria.

Tall ruderal vegetation (JNCC Code C3.1 – UK Habitat Classification – Ruderal/ephemeral)

- 4.18 There is one area of tall ruderal vegetation located near the northern site boundary. This area is comprised of cow parsley, hogweed common nettle, creeping thistle ragwort and black horehound (*Ballota nigra*).

Amenity grassland (JNCC Code J1.2 – UN Habitat Classification – Modified grassland)

- 4.19 There is a small patch of amenity grassland located within the centre of the site. This grassland had been recently mown and in line with the previous assessment contained bent grasses *Agrostis* sp. with other species recorded including cock's-foot, and common dandelion (*Taraxacum officinale*) and greater plantain (*Plantago major*).

Hedgerow (JNCC Code J2.3.1 – UK Habitat Classification – Hedgerow with trees – species rich)

- 4.20 The central hedgerow within the site was assessed as species rich with trees. The species occurring were blackthorn, ash, field maple and bramble. This hedgerow was assessed moderate condition within the Defra Metric 4.0 condition criteria.

Buildings

- 4.21 There is a total of 9 buildings located within the site boundary. Four of these buildings are located within the onsite industrial works and the remaining five buildings are variations of stable buildings.

Baseline areas

- 4.22 The baseline habitats of the site consist of the following areas:

- Bramble scrub – 0.0317 hectares;
- Blackthorn scrub – 0.0161 hectares;
- Modified grassland – 0.8238 hectares;
- Ruderal ephemeral – 0.0315 hectares;

- Developed land – sealed surface – 0.5605 hectares;
- Rural trees – 0.61 hectares;
- Other woodland – broadleaved – 0.1003 hectares;
- Other coniferous woodland – 0.0513 hectares; and
- Species-rich native hedgerow with trees – 0.0823 linear metres.

Proposed Development/ Landscape Scheme

4.23 The proposed site habitat creation includes;

- Vegetated garden (Front and rear gardens) – 0.4316 hectares
- Mixed scrub (Native Scrub / Shrub Mix to Street Scene and Boundaries (including Access)– 0.0403 hectares
- Lowland meadow (POS Space - Biodiversity Focussed / Managed) – 0.0633 hectares;
- Introduced shrub (Garden frontages and street scene) – 0.0111 hectares;
- Urban trees (planting of 24 trees) – 0.0977 hectares;
- Developed land; sealed surface – 0.819 hectares; and
- Modified grassland – 0.0274.

5.0 RESULTS

5.1 The below figure provides the biodiversity units for the baseline site against the post development site. The calculations give the unit scores for each individual habitat type. This also provides the onsite unit change from baseline to the post development phase. The below figure also provides the overall biodiversity units for the baseline stage, the total net unit change and the overall percentage biodiversity net change.

Figure 5 – Biodiversity unit change for each individual broad habitat type for baseline, post development and the overall change in biodiversity units

On-site change by broad habitat type						
Habitat group	Baseline		Post-development on-site		On-site change	
	On-site existing area	On-site existing value	On-site proposed area	On-site proposed value	On-site area change	On-site unit change
Cropland	0.00	0.00	0.00	0.00	0.00	0.00
Grassland	0.82	1.65	0.17	1.10	-0.65	-0.55
Heathland and shrub	0.05	0.26	0.05	0.44	0.01	0.18
Lakes	0.00	0.00	0.00	0.00	0.00	0.00
Sparsely vegetated land	0.03	0.13	0.01	0.06	-0.02	-0.07
Urban	0.56	0.00	1.26	0.85	0.70	0.85
Wetland	0.00	0.00	0.00	0.00	0.00	0.00
Woodland and forest	0.15	0.92	0.12	1.05	-0.03	0.13
Intertidal sediment	0.00	0.00	0.00	0.00	0.00	0.00
Coastal saltmarsh	0.00	0.00	0.00	0.00	0.00	0.00
Rocky shore	0.00	0.00	0.00	0.00	0.00	0.00
Coastal lagoons	0.00	0.00	0.00	0.00	0.00	0.00
Intertidal hard structures	0.00	0.00	0.00	0.00	0.00	0.00
Watercourse footprint	0.00	0.00	0.00	0.00	0.00	0.00
Individual trees	0.06	0.27	0.10	0.33	0.04	0.06

Hedgerows

- 5.2 The onsite species – rich hedgerow with trees is to be removed as part of the proposed works. This will be replaced with an ornamental and native hedgerow. As a result, there will be an increase of 0.04 biodiversity units for hedgerows. This unit increase onsite equates to a percentage gain of 3.35%.

Figure 6 – Biodiversity Net Gain Summary

Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	<i>Habitat units</i>	0.61
	<i>Hedgerow units</i>	0.04
	<i>Watercourse units</i>	0.00
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	<i>Habitat units</i>	18.91%
	<i>Hedgerow units</i>	3.35%
	<i>Watercourse units</i>	0.00%

6.0 EVALUATION

Broad Habitats

- 6.1 The development will result in a decrease of 0.07 units for sparsely vegetated land and by 0.55 units for grassland. There will however be an increase in units of 0.06 for individual trees, 0.13 for woodland and forest, 0.85 for urban and 0.18 for heathland and shrub.
- 6.2 The changes to habitats onsite result in an increase of 0.61 habitat units which equate to a gain of 18.91%.

Hedgerows

- 6.3 The onsite species – rich hedgerow with trees is to be removed as part of the proposed works. This will be replaced with an ornamental and native hedgerow. As a result, there will be an increase of 0.04 biodiversity units for hedgerows. This unit increase onsite equates to a percentage gain of 3.35%.

7.0 CONCLUSIONS

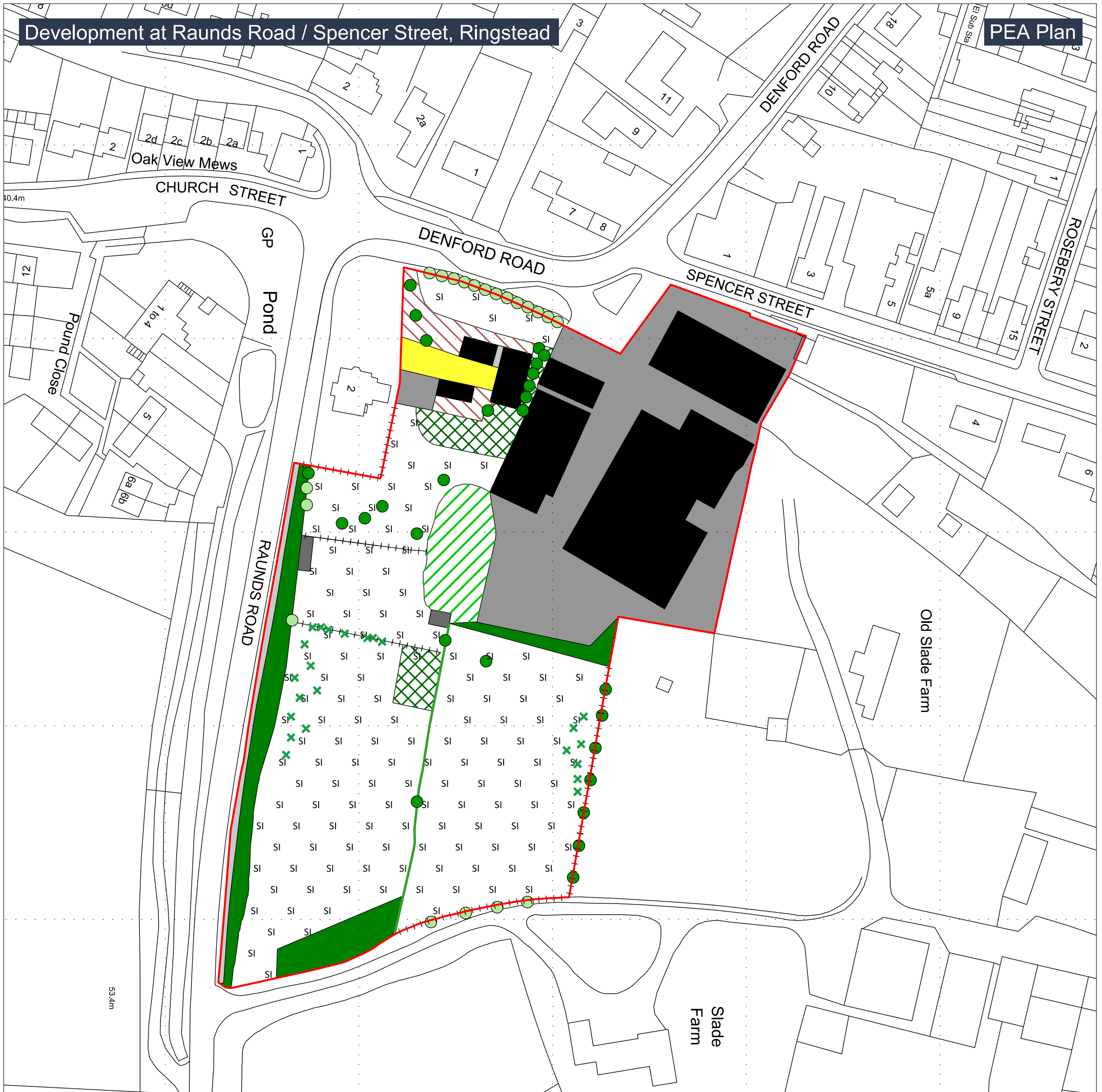
- 7.1 Kedd Limited have been commissioned to undertake a Biodiversity Net Gain (BNG) assessment to determine the impact on biodiversity for land off Denford Road, Ringstead, Northamptonshire.
- 7.2 The report should be read in conjunction with the supporting Defra Metric Calculator 4.0.
- 7.3 Biodiversity net gain (BNG) is an approach that means changes brought about by development conclude with biodiversity faring better than it did before works took place and replaces the previous policy of 'no net loss'. BNG is strongly referenced in the NPPF and the current planning decision making process.
- 7.4 The proposals are to construct 35 new residential buildings on the site in conjunction with new infrastructure which includes access roads, footpaths, car parking and amenity grassland gardens.
- 7.5 The development will result in a decrease of 0.07 units for sparsely vegetated land and by 0.55 units for grassland. There will however be an increase in units of 0.06 for individual trees, 0.13 for woodland and forest, 0.85 for urban and 0.18 for heathland and shrub.
- 7.6 The changes to habitats onsite result in an increase of 0.61 habitat units which equate to a gain of 18.91%.
- 7.7 The onsite species – rich hedgerow with trees is to be removed as part of the proposed works. This will be replaced with an ornamental and native hedgerow. As a result, there will be an increase of 0.04 biodiversity units for hedgerows. This unit increase onsite equates to a percentage gain of 3.35%.
- 7.8 It is considered that due to the small- scale nature of the site, that the 18.91% gain represents a significant gain for biodiversity within the context of the scheme. This is further supported with a large increase of biodiversity units for hedgerows and further ecological enhancements within the scheme that include the provision of bird and bat boxes to be installed within the new buildings onsite.

8.0 REFERENCES




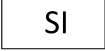

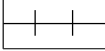








1. CIRIA (2019) Biodiversity Net Gain. Good Practice principles for Development – A Practical Guide
2. Ian Crosher A, Susannah Gold B, Max Heaver D, Matt Heydon A, Lauren Moore D, Stephen Panks A, Sarah Scott C, Dave Stone A & Nick White A. 2019. The Biodiversity Metric 4: Auditing and Accounting For Biodiversity Value. User Guide (Beta Version, July 2019). Natural England (A – Natural England, B – Imperial College, University Of London, C – Environment Agency, D – Department For Environment, Food And Rural Affairs)
3. National Planning Policy Framework (2021) [online]

Appendix A

Phase 1 Habitat Map – KD.RNG.1.ED.001



LEGEND

	Site Boundary		Cultivated / Disturbed Land - Amenity Grassland		Scrub - Scattered
	Semi-Improved Grassland		Hardstanding		Fence
	Broadleaved Woodland		Buildings		Broadleaved Tree
	Coniferous Woodland		Species Rich Hedgerow with Trees		Coniferous Tree
	Scrub				
	Ruderal - Tall Herb & Fern				



PROJECT:
Development at Raunds Road / Spencer Street, Ringstead

TITLE:
PEA Plan

REF NO:
KD.RNG.1.ED.001

DATE:
August 2023

SCALE:
1:1,000 @ A3

STATUS:
FINAL



Appendix B

Landscape layout – KD.RNG. D.001

Proposed Tree Planting - 24N° Trees (Total within Development)

The following trees are to be planted:

Abbreviation	Species	Height (cm)	Specification	N°
AC	<i>Acer campestre</i>	350-425	Heavy standard: 3x RB	1
APDR	<i>Acer platanoides 'Drummondii'</i>	200-250	Heavy standard: 3x RB	1
APDE	<i>Acer platanoides 'Deborá'</i>	200-250	Heavy standard: 2x RB	1
BPs	<i>Betula pendula</i>	125-150	Feather: 2x C	2
Bp	<i>Betula pendula</i>	250-300	Selected standard: 3x RB	8
CBF	<i>Carpinus betulus 'Frans Fontaine'</i>	350-425	Heavy standard: 3x RB	1
MD	<i>Malus domestica</i>	300-350	Selected standard: 3x B	3
MS	<i>Malus sylvestris</i>	300-350	Selected standard: 2x BR	3
tc	<i>Tilia cordata</i>	400-450	Selected standard: 3x RB	1
QR	<i>Quercus robur</i>	350-425	Heavy standard: 3x RB	3
				24 trees

Proposed Enhanced Native Scrub - Area: 229m² (Total within Development)

The following native species mix is to be applied to the existing areas of Mixed Scrub within the site, to provide overall enhancement and to increase species diversity, habitat and visual quality. The existing habitat area is to be supplemented based upon a 20% additional stocking rate of 1,500 plants per hectare - based upon the following species composition and percentages.

Abbreviation	Species	Height (cm)	CG / BR	%	N°
CM	<i>Crataegus monogyna</i>	60-80	BR	15	28
CA	<i>Corylus avellana</i>	60-80	BR	15	28
FA	<i>Frangula alnus</i>	60-80	BR	15	28
CS	<i>Cornus sanguinea</i>	60-80	BR	10	18
SCA	<i>Salix caprea</i>	60-80	BR	5	9
SCI	<i>Salix cinerea</i>	60-80	BR	5	9
PS	<i>Prunus spinosa</i>	60-80	BR	10	18
VO	<i>Viburnum opulus</i>	60-80	BR	10	18
RC	<i>Rosa canina</i>	60-80	BR	10	18
AC	<i>Acer campestre</i>	60-80	BR	5	9
					183 plants

Proposed New Native Shrub / Scrub Planting - Area: 305m² (Total within Development)

The following native species mix is to be applied internally within the development to supplement the street scene and its landscape structure, together with its biodiversity potential.

Abbreviation	Species	Height (cm)	CG / BR	%	N°
CM	<i>Crataegus monogyna</i>	60-80	BR	15	142
CA	<i>Corylus avellana</i>	60-80	BR	15	142
FA	<i>Frangula alnus</i>	60-80	BR	15	142
CS	<i>Cornus sanguinea</i>	60-80	BR	10	95
SCA	<i>Salix caprea</i>	60-80	BR	5	47
SCI	<i>Salix cinerea</i>	60-80	BR	5	48
PS	<i>Prunus spinosa</i>	60-80	BR	10	96
VO	<i>Viburnum opulus</i>	60-80	BR	10	96
RC	<i>Rosa canina</i>	60-80	BR	10	96
AC	<i>Acer campestre</i>	60-80	BR	5	48
					952 plants

Proposed Ornamental Shrub Planting (Total within Development)

The following shrubs are to be planted:

Species	Height (cm)	Pot Size	Specification	N°
<i>Aucuba japonica 'Variegata'</i>	20-30cm	3L	Bushy: 3 brks: C	20
<i>Ceanothus thyrsiflorus repens</i>	-	3L	Leader with laterals: 3 brks: C	56
<i>Euonymus 'Emerald & Gold'</i>	-	5-7.5L	Bushy: 6 / 9 brks: C	6
<i>Euonymus 'Silver Queen'</i>	-	5-7.5L	Bushy: 6 / 9 brks: C	41
<i>Hebe 'Great Orme'</i>	40-60cm	5-7.5L	Bushy: 4 brks: C	112
<i>Lavandula angustifolia 'Folgate'</i>	30-40cm	5-7.5L	Bushy: 7 brks: C	73
<i>Potentilla fruticosa 'Abbotswood White'</i>	-	5-7.5L	Bushy: 5 brks: C	13
<i>Potentilla fruticosa 'Yellow Queen'</i>	-	5-7.5L	Bushy: 5 brks: C	11
<i>Prunus luscianica angustifolia</i>	40-60cm	-	Branched: BR	23
<i>Rosa 'Flower Carpet Gold'</i>	-	2L	Bushy: 3 brks: C	18
<i>Rosa 'Ballerina'</i>	-	2L	Bushy: 3 brks: C	9
<i>Viburnum davidii</i>	30-40cm	5-7.5L	Bushy: 4 brks: C	8
<i>Viburnum opulus 'Compacticum'</i>	40-60cm	10L	Bushy: 5 / 6 brks: C	17
<i>Viburnum tinus 'Eve Price'</i>	30-40cm	3L	Bushy: 4 brks: C	8
				415 plants

Proposed Hedgerows

The following hedgerow species are to be planted to plot frontages / street scene:

Type A - Length: 361m (Total within Development)

Abbreviation	Species	Height (cm)	CG / BR	Density	N°
PL	<i>Prunus laurocerasus</i>	60-80	CG (5L Pot)	4/m	1,444

Type B - Length: 172m (Total within Development)

Abbreviation	Species	Height (cm)	CG / BR	Density	N°
FSh	<i>Fagus sylvatica</i>	60-80	CG (5L Pot)	5/m	942

Grassland - Area: 4,677m² (Total within Development)

The following grass seed mix (Emorsgate EG22 or similar) is to be utilised for areas of defined grassland - supplied as both turf and seed.

Latin name	Common name	%
<i>Agrostis capillaris</i>	Common Bent	5
<i>Festuca rubra</i>	Red Fescue	50
<i>Lolium perenne</i>	Perennial Ryegrass	25
<i>Poa pratensis</i>	Smooth-stalked Meadow-grass	20
		100



LEGEND

- Application Site Boundary
- Existing Woodland / Hedgerows / Individual Trees - to be Enhanced & Managed
- Existing Mixed Scrub - to be Enhanced & Managed
- Proposed Mixed Native Scrub / Shrub Planting
- Proposed Shrub Planting to Plot Frontages / Development Street Scene
- Proposed Grassland to Managed Plot Frontages / Development Street Scene
- Enhanced Grassland to POS - to be managed for conservation
- Proposed Hedgerow Type A
- Proposed Hedgerow Type B
- Proposed Individual Tree Planting (Street / Garden Trees)
- Bird & Bat Boxes (14No.)
- Hibernacula (3No.)

SPECIFICATION
Ground Preparation, General
Preparing for topsoil
 Grading and cultivation shall be in accordance with BS 4428:1989 section 4. Subsoil that is to receive topsoil shall, whether obviously overcompacted or not, be thoroughly broken up and, by heavy rotavator, by subsoiler or tined equipment with adequate passes made to thoroughly break up the surface to a depth of 150mm, cleared of all large stones, bricks, perennial weeds, tree roots (excluding living roots) coarse vegetation and other extraneous matter.
Subsoil grading
 Subsoil shall only be graded after loosening as above, and this shall be undertaken by the use of a tractor and blade grader on large areas and by a small mechanical grader or by hand on small areas. Ground shall at no time be traversed by heavy machinery, for grading or any other purposes after subsoiling and / or topsoiling has taken place.
Making up levels
 When subsoil is deposited in low lying areas to raise formation levels, it shall be lightly consolidated ad left broken up ready to receive topsoil. Imported fill material shall be natural subsoil free from metal, concrete, or organic material with any one dimension greater than 100mm. All imported fill material shall be approved by the Landscape Architect prior to spreading on site.
Supply of topsoil
 Topsoil to be supplied shall be approved by the Landscape Architect and details of the source of supply shall be provided in order that inspection may be made before delivery commences. Topsoil shall conform to BS 3882:2007. Recommendations and clarification for the topsoil, clause 4.1a. The soils shall be free of weeds, roots or perennial weeds, pests, diseases, debris, tree roots, sticks, subsoil and foreign matter and shall be capable of being broken down into a fine tilth.
Temporary topsoil heaps
 The depositing of temporary heaps of topsoil shall be so arranged that possible damage to existing grass, plants, tarmac, paving etc. is avoided. Unless otherwise agreed by the Landscape Architect, temporary spoil heaps shall be on protected ground. Such protection shall take the form of tarpaulins, plastic sheets, boards or similar covering. If damage does occur, it shall be made good at the contractor's own expense. Areas excavated to receive topsoil but have not had the base loosened shall not be used as temporary off loading areas. If the bottom of the excavation has been loosened off, loading on these areas is permissible.
Spreading topsoil
 Prior to topsoil replacement, the formation level shall be cleared of all stones, rubbish, debris with any one dimension greater than 75mm. Areas to be seeded or turfed shall be covered by topsoil 100mm thick and areas to be plated shall be covered by topsoil 400mm thick. Topsoil shall be spread in an evenly consolidated layer and shall be left cleared of all roots, stones and debris with any one dimension greater than 50mm throughout its depth. Unless otherwise stated, the finished level shall be 25mm above adjacent hard areas. No topsoil shall be spread until the subsoil grade has been inspected by a Landscape Architect.
Planting
Cultivation
 Planting areas shall be retowed to a depth of 225mm in the original ground, or where the ground is compacted, ripped and retowed. Pick off stones, bricks, timber and all other debris arising which have any dimensions greater than 50mm and remove off site to tip. Do not cultivate across any drain where the stone is flush with the ground surface.
Soil improvements
 Where directed composts, fertilisers or other additives shall be incorporated into the soil. Spent mushroom compost or similar shall be spread to the specified thickness and incorporated, by rotavating, into the top 150mm. Fertilisers, organic or inorganic, shall be raked into the top 25mm.
Retention of plants
 All plant material should comply with the minimum requirements in BS 3936:part 1, specification for trees and shrubs and part 4, specification for forest trees; BS 4043, recommendations for transplanting semi-mature trees and BS 5236 recommendations for cultivation and planting trees in the advanced nursery stock category. Any plant material, which in the opinion of the Landscape Architect, does not meet the requirements of the Specification, or is unsuitable, or defective in any other way, will be rejected. The minimum specified sizes in the plant schedule will be strictly enforced. The contractor shall replace all plants rejected at his own cost.
Planting
 All plant material shall generally be planted between November and March in open cool weather. Planting shall not take place in frosty, snowy or waterlogged conditions. Where approved, pot or container grown plants may be planted outside the described season, but adequate watering shall be supplied. Torn or damaged roots and branches shall be cleanly pruned prior to planting.
Planting of whips, transplants and shrubs
 The nature of the material to be planted is variable and the contractor shall allow for planting to be properly carried out in all cases as described in BS 4428: 1989 section 7 Amenity tree planting, section 8 Woodland planting and section 9 Planting of shrubs, herbaceous and bulbs. All plants shall be planted at same depth, or very slightly deeper, as they were grown. Roots shall not be bent, broken or forced into inadequate pits or notches. Plants shall be upright, firmed in and wind resistant, with no air pockets around roots. All pots and root wrappings shall be carefully removed prior to planting. All pots and wrappings arising shall immediately be picked up and stored ready for removal to tip. No plants shall be planted at the specified centres. On steep slopes this will be in the horizontal measure.
Tree Planting
 Trees shall conform to BS 3936 and be planted in tree pits of the following sizes unless directed otherwise: Feathered trees 900 x 900 x 450 up to 3 metres high Extra heavy standards 1200 x 1200 x 600. Excavated subsoil or stone shall be carted off site to tip. The bottom 250mm of the pit shall be dug and broken up. Backfill shall be imported topsoil as specified unless directed otherwise.
Compost for planting pits
 Compost shall be a proprietary product, bark based incorporating fertilisers and improving additives. The type of compost shall be approved before its delivery on site, and the details of the product shall be supplied. Compost planting compost is approved. Where directed compost shall be added to and mixed with topsoil backfill at the following rates: Feathered trees - 1 bag; 80 litres Extra heavy standards - 2 bags; 160 litres.
Stakes for trees
 Stakes shall be peeled round softwood, pointed or minimum diameter 75mm. The stakes shall be driven into the base of the tree pit prior to placing the tree and Stakes shall in general have a clear height above the finished ground level as follows unless directed otherwise: Feathered trees - 750mm (one 105) Extra heavy standards - 1200mm (2 stakes, one tie each) The stake shall be long enough to drive until they hold the tree firmly without rocking.
Tree ties
 Ties shall be approved nail-on type with cushioned spacer such as Toms, or other equal quality approved. Nails shall be flat headed galvanised and shall hold the ties securely into the stake. Ties shall not be over tight on the tree stems. Ties available from J Toms Limited, Wheeler Street, Headon, Ashford, Kent, TN27 9SH. Feathered Type-04 Extra heavy standards Type-13
Planting of trees
 The tree shall be set upright and at the same depth as grown in the nursery, the roots shall be spread out and the topsoil, or compost topsoil mixture, backfilled. Backfilling should be done to ensure close contact between roots and the firming in layers. The soil shall be left level and tidy, any subsoil clods, bricks or stones over 50mm arising, collected and carted off site.
Mulching
 A 75mm compacted layer of medium grade pulverised bark, with a particle size of not more than 100mm and containing no more than 10% fines, shall be spread to form a continuous layer covering the whole of the bed, or in the case of standard trees shall be in the form of a circle of 600mm diameter around the base of the tree. Whips and transplants shall be mulched in the form of a 300mm diameter circle around the base of the tree. This is to be maintained up until the sale of the house.
TURFING
Soil preparation and cultivation
 All areas to be turfed shall be cultivated to a depth of at least 100mm, all weeds, stones and refuse larger than 50mm shall be removed to Contractor's tip, and shall be Drought to a fine tilth. Allow for hand cultivation where machine work is not possible.
Turf
 Turf shall be extra-quality meadow turf and shall comply to BS 3969 and shall be laid in accordance with BS 4426 section 6, Turfing. The contractor shall supply a sample of the turf he proposed to use for approval of the Landscape Architect and shall ensure that all turves are similar to the approved sample. The Contractor shall inform the Landscape Architect of the location of the supply, so that turf can be inspected prior to lifting.
Season
 Turf shall be laid when weather and soil conditions are suitable and, where possible, preference should be given for autumn and early winter operations. No turf shall be laid in exceptionally dry or frosty weather or in other unsuitable weather conditions.
Delivery and stocking
 For large areas, turf shall be delivered at appropriate intervals throughout the work so as to avoid stacking for long periods.
Laying
 No turf shall be laid until the soil preparation has been satisfactorily completed by being brought to an even tilth and firmness. Turves from the stack shall be wheeled to turf layers on planks laid closely side by side. Adequate timber planks shall be used to support operatives and barrows, and provide access. The turves shall be laid in consecutive rows with broken joints (stretcher bond), closely butted and to the correct levels. The turf shall be laid off planks working over turves previously laid. Where necessary, the turves shall be lightly and evenly firmed with wooden beaters, the bottom of the beaters being frequently scraped clean of accumulated soil or mud. A dressing of freshly sifted topsoil shall be applied and well brushed into the joints. Any inequalities in finished levels owing to variation in turf thickness or uneven consolidation of soil shall be adjusted by raking and/or packing fine soil under the turf. A roller shall not be used. The finished levels of the turf shall conform to the levels indicated, allowing for final settlement. Turf edges and margins shall be laid with whole turves. Turves adjoining buildings, walls or fences shall be taken to the face of the structure, giving complete soil cover.
Laying around trees
 Turf shall not be laid to within 300mm of any tree trunk.
Watering
 The Contractor shall be responsible for the replacement of any scorched turf. All necessary watering shall be carried out with sprinklers or oscillating sprays so as to wash soil out of joints. If shrinkage occurs and the joints open, fine topsoil shall be brushed in and well watered.
MAINTENANCE
 All maintenance to be carried out up to handover to the adopting authority/ householders from the date of planting and turfing to ensure successful establishment All dead, diseased, damaged plants must be replaced during this time unless the local Planning Authority states, in writing, any variation to this.
Weeding
 All beds to be kept weed free by cultivating and by using approved herbicides. Beds to be forked over as necessary to keep soil loose to approved cambers with no hollows.
Pruning
 At appropriate time, prune plants to remove dead, dying or diseased wood and suckers to promote healthy growth and natural shape.
Watering
 The Contractor shall ensure that sufficient water is applied to maintain healthy growth.
Litter
 Site to be kept free of litter.
Grass cutting
 The initial cut shall be carried out when first growth is apparent, blades set 20mm above ground. The Contractor shall continue cutting at appropriate intervals during the growing season and maintain 40mm high sward until grass areas are handed over. Watering, weeding, cutting, repair of all erosion and settlement and re-seeding as necessary to establish a uniform and healthy stand of grass shall continue until handover to the householders.
PROTECTION TO EXISTING TREES
 The recommendations in BS 5637 (2012), Trees in Relation to Design, Demolition & Construction must be complied with at all times. No pruning, lopping, felling or severance of roots is to take place without prior consent of the local authority. Any work to the existing trees is to be carried out by a qualified tree surgeon. The position and construction of protective fencing shall be agreed with the local authority prior to any site works commencing. Under no circumstances must any materials be stored under the canopy of existing trees, and no cement, diesel or oil stored near them. No vehicles should pass under the canopy of existing trees. No fires should be lit in close proximity to existing trees. No ropes, cables, services or notice boards shall be fixed to existing trees. Under no circumstances should the levels around existing trees be either raised or reduced. Scaffolding may only be erected within protected areas if it is done so in accordance with BS 5837. Any excavations under existing tree canopy spreads shall be done by hand.



PROJECT:
 Development at Raunds Road / Spencer Street, Ringstead

TITLE:
 Landscape Layout

REF NO:
 KD.RGST.D.001

DATE:
 August 2023

SCALE:
 1:500 @ A1

STATUS:
 FINAL

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