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DATED 6 January **2021**[2]

EASTLEIGH BOROUGH COUNCIL

and

HAMPSHIRE COUNTY COUNCIL

and

HIGHWOOD HOMES LIMITED

and

VIVID HOUSING LIMITED

and

VESTAL DEVELOPMENTS LIMITED

and

STONEHAM PARK DEVELOPMENTS LLP

and

CKS INVESTMENTS PROPERTIES LIMITED

and

NORTH STONEHAM DEVELOPMENTS LIMITED

and

ASPECT (EASTLEIGH) LIMITED

and

HOUSING 21

DEED OF VARIATION

Pursuant to Section 106A of the Town and Country Planning Act 1990 and Section 111 of the Local Government Act 1972 relating to Land South of Chestnut Avenue North Stoneham Park Chestnut Avenue Stoneham Lane Eastleigh in Hampshire

Eastleigh Borough Council
Eastleigh House
Upper Market Street
EASTLEIGH
SO50 9YN
SYJ/6/13/760/101966
12377

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THIS DEED is made on 6 January 2022

BETWEEN

The Council

(1) **EASTLEIGH BOROUGH COUNCIL** of Eastleigh House Upper Market Street Eastleigh Hampshire SO50 9YN ("**the Council**")

The County Council

(2) **HAMPSHIRE COUNTY COUNCIL** of The Castle Winchester Hampshire SO23 8UJ ("**the County Council**")

The Owners

(3) **HIGHWOOD HOMES LIMITED** (Company Registration No 10417361) of Hay Barn, Upper Ashfield Farm, Ashfield, Romsey, SO51 9NJ ("**the First Owner**")

(4) **VIVID HOUSING LIMITED** (Community Benefit Society No 7544) of Peninsular House, Wharf Road, Portsmouth, PO2 8HB ("**the Second Owner**")

(5) **VESTAL DEVELOPMENTS LIMITED** (Company Registration No 05509078) of Peninsular House, Wharf Road, Portsmouth, PO2 8HB ("**the Third Owner**")

(6) **STONEHAM PARK DEVELOPMENTS LLP** (Company Registration No. OC418077) c/o TIAA Limited, Artillery House, Fort Fareham, Newgate Lane, Fareham PO14 1AH ("**the Fourth Owner**")

(7) **CKS INVESTMENTS PROPERTIES LIMITED** (Company Registration No. 10722915) of the Hay Barn, Upper Ashfield Farm, Ashfield, Romsey, SO51 9NJ ("**the Fifth Owner**")

(8) **NORTH STONEHAM DEVELOPMENTS LIMITED** (Company Registration No. 07811445) of the Hay Barn, Upper Ashfield Farm, Ashfield ("**the Sixth Owner**")

(9) **ASPECT (EASTLEIGH) LIMITED** (Company Registration No. **10200615**) of C/O Tiaa Ltd, Artillery House Fort Fareham, Newgate Lane, Fareham, Hampshire, England, PO14 1AH ("**Seventh Owner**")

(10) **HOUSING 21** (Co-operative and Community Benefit Society number IP16791R and registered provider of social housing under the Housing and Regeneration Act 2008 number L0055) of 19th Floor, Tricom House, 51-53 Hagley Road, Birmingham B16 8TP ("**the Eighth Owner"**)

RECITALS

(1) The Council and the County Council are the local planning authorities for the purposes of the Act for the area within which the Site is situated.

(2) The Council is the registered proprietor of title number HP842150

(3) The County Council is the registered proprietor of title number HP835900

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(4) The First Owner is the registered proprietor of title numbers HP742844, HP808554, HP809426 and HP813802 as successor in title to Highwood Land LLP

(5) The Second Owner is the registered proprietor of title number HP816307, HP816310, HP816315, HP816316, HP809378, HP812739, HP816148, HP816150, HP809425 and HP849999 and is entitled to be registered of part of the Site pursuant to a transfer dated 19 October 2020 (with provisional title number HP849998)

(6) The Third Owner is the registered proprietor of title numbers HP816306, HP816309, HP816318 and HP816151

(7) The Fourth Owner is the registered proprietor of title number HP809431

(8) The Fifth Owner is the registered proprietor of title numbers HP809244 and HP809424

(9) The Sixth Owner has the benefit of a Caution under title number HP782704

(10) The Seventh Owner is entitled to be registered as freehold owner of part of the Site pursuant to two transfers both dated 19 October 2020

(11) The Eighth Owner is the register proprietor of title number HP843039

(12) The County Council is the Highway Authority and Education Authority for Hampshire

(13) Pursuant to planning permission reference O/15/76023 the Council (1) the County Council (2) Highwood Land LLP (3) Rupert Attlee, Anthony Attlee, and Sophie Banham (4) Charles Edmund Browning, Timothy Mark Browning, Peter Malcolm Browning and Juliet Helen Hooper (5), Denton and Co Trustees Limited, Stephen John Harvey, Deborah Joanne Harvey, Rebecca Caroline Mollicone, and David Rocco Mollicone (6) Angela Marion Fright, Carol Alexander Smith and Caroline Dawn McIntyre (7) Mark Hedley Hallett and Andrea Hallett (8) Maurice Hiscock, Clive Staddon and Lara Staddon (9) Stoneham Park Social Club Limited (10) and National Westminster Bank PLC (11) have entered into the principal agreement pursuant to Section 106 of the Town and Country Planning Act 1990 and Section 111 of the Local Government Act 1972 relating to Land South of Chestnut Avenue North Stoneham Park Chestnut Avenue Stoneham Lane Eastleigh in Hampshire dated 8th January 2016 (the "Principal Agreement").

(14) The Council (1) the County Council (2) Highwood Land LLP (3) Charles Edmund Browning, Timothy Mark Browning, Peter Malcolm Browning and Juliet Helen Hooper (4), Denton and Co Trustee Limited, Stephen John Harvey, Deborah Joanne Harvey, Rebecca Caroline Mollicone, and David Rocco Mollicone (5) Angela Marion Fright, Carol Alexander Smith and Caroline Dawn McIntyre (6) Mark Hedley Hallett and Andrea Hallett (7) Maurice Hiscock, Clive Staddon and Lara Staddon (8) and Stoneham Park Social Club Limited (9) have entered into a deed of variation pursuant to Section 106 of the Town and Country Planning Act 1990 and Section 111 of the

Local Government Act 1972 relating to Land South of Chestnut Avenue North Stoneham Park Chestnut Avenue Stoneham Lane Eastleigh in Hampshire dated 2 May 2017 (the "First Deed of Variation")

(15) The Council (1) the County Council (2) Highwood Homes Limited (3) Vivid Housing Limited (4) Vestal Developments Limited (5) Stoneham Park Developments LLP (6) CKS Investments Properties Limited (7) North Stoneham Developments Limited (8) Mark Hedley Hallett and Andrea Hallett (9) have entered into a deed of variation pursuant to Section 106A of the Town and Country Planning Act 1990 and Section 111 of the Local Government Act 1972 relating to Land South of Chestnut Avenue North Stoneham Park Chestnut Avenue Stoneham Lane Eastleigh in Hampshire dated 29 May 2019 (the "Second Deed of Variation")

(16) The Council (1) the County Council (2) Highwood Homes Limited (3) Vivid Housing Limited (4) Vestal Developments Limited (5) Stoneham Park Developments LLP (6) CKS Investments Properties Limited (7) North Stoneham Developments Limited (8) Mark Hedley Hallett and Andrea Hallett (9) have entered into a deed of variation pursuant to Section 106A of the Town and Country Planning Act 1990 and Section 111 of the Local Government Act 1972 relating to Land South of Chestnut Avenue North Stoneham Park Chestnut Avenue Stoneham Lane Eastleigh in Hampshire dated 12 May 2020 (the "Third Deed of Variation")

(17) Pursuant to a Non Material Amendment and Discharge of Condition applications registered on 30 November 2020 under references DC/20/89359, R/17/79892, DC/20/89631 and RM/17/81168 and Section 106A of the Act the Council the County Council and the Owners intend to amend the terms of the Principal Agreement as varied by the First Deed of Variation and the Second Deed of Variation and the Third Deed of Variation

OPERATIVE PROVISIONS

1 This Deed is made pursuant to Section 106A of the Act, Section 111 of the Local Government Act 1972, Section 1 of the Localism Act 2011 and all other enabling powers and in consideration of the covenants contained in this Deed.

2 The obligations by the Owners in this Deed are deemed to be planning obligations for the purposes of Section 106A of the Act and are enforceable by the Council and the County Council.

3 The definitions, clauses, obligations and provisions of the Principal Agreement (as varied by the First Deed of Variation and the Second Deed of Variation and the Third Deed of Variation) shall remain in full force and effect except as varied or added to by this Deed and shall continue to be applicable to the Site in respect of the Development and remain to be performed to the extent that they have not already been performed.

4 Save where the context otherwise requires the expressions used in this Deed shall have the same meaning or meanings as those stated in the Principal Agreement (as varied by the First Deed of Variation and the Second Deed of Variation and the Third Deed of Variation)

5 The Principal Agreement (as varied by the First Deed of Variation and the Second Deed of Variation and the Third Deed of Variation) shall be varied as set out in Schedule 1 of this Deed

6 This Deed is a local land charge and shall be registered as such by the Council

7 No person other than a party to this Deed shall have any rights under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this deed

8 The First Owner hereby covenants to pay to the Council and County Council on completion of this Deed its reasonable legal and other costs in connection with the preparation and approval of this Deed such costs to be paid prior to completion of this Deed

9 This Deed and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractual disputes or claims) shall be governed by and construed in accordance with the law of England and Wales

10 This document has been executed as a Deed and is delivered and takes effect on the date stated at the beginning of it

SCHEDULE 1

VARIATIONS TO THE PRINCIPAL AGREEMENT (AS VARIED BY THE FIRST DEED OF VARIATION THE SECOND DEED OF VARIATION AND THE THIRD DEED OF VARIATION)

1. DEFINITIONS

1.1 The following definitions shall be added to the Principal Agreement:

"Allocate"	means the method by which the Stage 1 Capacity or Stage 2 Capacity or Stage 3 Capacity (as applicable) shall be utilised to mitigate the impact on the Solent of the developments listed in Part 2 of Schedule 26 and "Allocated" shall be construed accordingly;
"Allocation Plan"	means the plan annexed hereto titled Deacon Design Allocation Plan ref DD145L70 Revision A and dated 19th January 2021
"Highwood"	means Highwood Homes Limited (Company Registration No 10417361) of Hay Barn, Upper Ashfield Farm, Ashfield, Romsey, SO51 9NJ for itself only and not in its capacity as the First Owner
"LEMP"	means the plan annexed hereto titled Deacon Design Landscape and Ecology Management Strategy Revision F and dated 25th January 2021 (including such amendments agreed in writing with the Council)
"Monitoring Protocol"	means the Tetra Tech Nutrient Monitoring Protocol annexed hereto (including such amendments agreed in writing with the Council)
"Nitrate Monitoring Commuted Sum"	means the sum of Fifteen Thousand Pounds (£15,000) to be paid by the Owners to the Council to be applied towards the Council's costs of complying with the Monitoring Protocol from the 10th anniversary of the transfer of the final Open Space Phase to the Council
"Nitrogen Mitigation Specification"	the details for laying out of the Stoneham SUDS Nitrogen Mitigation Works set out in the Deacon Design North Stoneham Park Nitrate Mitigation Proposals Landscape Statement Revision B dated 25th January 2021 and plan referenced DD145L60 Rev B and plan referenced DD145L62 Rev A approved pursuant to applications DC/20/89361

	and R/17/79892 and RM/17/81168 and DC/20/89359
"Nitrate S106 Monitoring Contribution"	means the sum of Fifteen Thousand Pounds (£15,000) to be paid by the Owners to the Council to be applied towards the Council's costs of monitoring compliance with the obligations relating to the Stoneham SUDS Nitrogen Mitigation Works in this Deed
"Nitrogen Mitigation Strategy"	means the WYG Nitrogen Strategy dated August 2020 annexed hereto including any amendments as agreed in writing with Eastleigh
"Open Space Phase"	means Open Space Phase 1 or Open Space Phase 2 or Open Space Phase 3 or Open Space Phase 4 (as appliable)
"Open Space Phase Plan"	means the plan annexed hereto with title "Transfer Plan" reference DD145L69 Revision A
"Open Space Phase 1"	means the area of On-Site Open Space Land shown coloured brown on the Open Space Phase Plan
"Open Space Phase 2"	means the area of On-Site Open Space Land shown coloured blue on the Open Space Phase Plan
"Open Space Phase 3"	means the area of On-Site Open Space Land shown coloured green on the Open Space Phase Plan
"Open Space Phase 4"	means the whole area of On-Site Open Space Land shown coloured purple on the Open Space Phase Plan or any one or more sub-phases thereof
"Solent"	means the strait that separates the Isle of Wight from the mainland of England
"Stage 1 Land"	means the land shown on the Allocation Plan coloured brown (including ponds numbered 5, 13 and 14 and the Avenue Park North Swale) and forming part of the On-Site Open Space Land
"Stage 2 Land"	means the land shown on the Allocation Plan coloured blue (including ponds numbered 1, 6, 12 and 15) and forming part of the On-Site Open Space Land
"Stage 3 Land"	means the land shown on the Allocation Plan coloured green (including ponds numbered 7 and 10) and forming part of the On-Site Open Space Land

"Stage 1 Capacity"	means 274.52 TN/kg of nitrogen removed by the creation of enhanced landscape to approved SUDS system on the Stage 1 Land as detailed in Option B of the Nitrogen Mitigation Strategy and approved pursuant to applications DC/20/89361 and R/17/79892 and RM/17/81168 and DC/20/89359 of which 262.309 TN/kg (or such other amount that may be required of this Stage 1 Capacity to mitigate the development set out in Table 1 of Part 2 of Schedule 26) will be allocated in accordance with Schedule 26 of this Deed
"Stage 2 Capacity"	means 214.68 TN/kg of nitrogen removed by the creation of enhanced landscape to approved SUDS system on the Stage 2 Land as approved pursuant to applications DC/20/89361 and R/17/79892 and RM/17/81168 and DC/20/89359 of which 210.020 TN/kg (or such other amount of this Stage 2 Capacity that may be required to mitigate the development set out in Table 2 of Part 2 of Schedule 26) will be allocated in accordance with Schedule 26 of this Deed
"Stage 3 Capacity"	means 42.31 TN/kg of nitrogen removed by the creation of enhanced landscape to approved SUDS system on the Stage 3 Land as approved pursuant to applications DC/20/89361 and R/17/79892 and RM/17/81168 and DC/20/89359 of which 40.738TN/kg (or such other amount of this Stage 3 Capacity that may be required to mitigate the development set out in Table 3 of Part 2 of Schedule 26) will be allocated in accordance with Schedule 26 of this Deed
"Stoneham SUDS Nitrogen Mitigation Land"	means the land upon which the Stoneham SUDS Nitrogen Mitigation Works as set out in the Nitrogen Mitigation Strategy shall be carried out being the Stage 1 Land, the Stage 2 Land and the Stage 3 Land and which is allocated pursuant to Schedule 26 of this Deed
"Stoneham SUDS Nitrogen Mitigation Works"	means the nitrogen mitigation works set out in "Option B" of the Nitrogen Mitigation Strategy and approved pursuant to applications DC/20/89361 and R/17/79892 and RM/17/81168 and DC/20/89359 upon the Stoneham SUDS Nitrogen Mitigation Land and forming part of the On-Site Open Space Land
"Unallocated Capacity"	means any part of the Stage 1 Capacity or the Stage 2 Capacity or the Stage 3 Capacity that has not been Allocated to mitigate the

developments set out in Table 1, Table 2 and Table 3 in Part 2 of Schedule 26

1.2 The following definitions shall be amended as follows:

"On-Site Open Space Land"	means an area not less than 15.897 hectares of new public open space to be provided on the Site (including, green routes, wetland walks, Avenue Park, SUDS, Stoneham SUDS Nitrogen Mitigation Land drainage areas, Park Farm setting and Play Areas) and excluding Lakeside Extension Land and the Avenue Park SINC Land and "On-Site Open Space" shall be construed accordingly

2 SCHEDULE SEVEN

Schedule Seven of the Principal Agreement (as varied by the First Deed of Variation, and the Second Deed of Variation and the Third Deed of Variation) shall be amended as follows:

2.1 **The words "The Owners covenant with the Council as follows" before paragraph 1 shall be deleted and replaced as follows:**

"The Owners covenant with the Council as follows and the Council covenants with the Owner as set out in paragraphs 4.2 and 4.3 and Highwood covenants with the Council as set out in paragraph 10:"

2.2 **Paragraph 2 shall be deleted and replaced as follows:**

2.. Prior to completion of the last ten Dwellings constructed within each Phase to lay out the On-Site Open Space for that Phase in accordance with the Approved Specification and the Nitrogen Mitigation Specification (as applicable).

2.3 **Paragraph 4 shall be deleted and replaced as follows:**

4.1 On completion of the laying out of the On-Site Open Space Land within each Open Space Phase in accordance with the Approved Specification and Nitrogen Mitigation Specification (as applicable) to:

i) comply in full with the LEMP in respect to the relevant area of On-Site Open Space Land within an Open Space Phase until such On-Site Open Space Land is transferred to the Council; and

ii) request that the Council carry out an inspection of the relevant Open Space Phase (the "Inspection Notice") and issue a notice to the First Owner confirming that the Council considers that the Open Space Phase has been satisfactorily provided in accordance with the Approved Specification and Nitrogen Mitigation Specification and that the Council will accept a transfer of the said Open Space Phase (the "Completion Notice")

4.2 Upon receipt of the Inspection Notice pursuant to paragraph 4.1 above the Council shall inspect the relevant Open Space Phase within 14 Working Days and if after inspection of the relevant Open Space Phase the Council considers that the relevant Open Space Land has been provided in accordance with the Approved Specification

and Nitrogen Mitigation Specification the Council shall issue a Completion Notice within 5 working days of carrying out the inspection.

4.3 If after inspection of an Open Space Phase the Council considers that the Open Space Phase has been not provided in accordance with the Approved Specification and the Nitrogen Mitigation Specification the Council shall notify the First Owner of the outcome of the inspection within 5 Working Days of carrying out the inspection and the First Owner shall at their own expense rectify any deficiencies or carry out such works or operations as may be reasonably required by the Council to bring the relevant Open Space Phase up to the standard required in the Approved Specification and Nitrogen Mitigation Specification and the procedure at 4.1 and 4.2 shall be repeated until a Completion Notice for the relevant Open Space Phase is issued.

2.4 **Paragraph 5 shall be amended (paragraph 5.1, 5.2, 5.3 and 5.4 shall remain unchanged) and replaced as follows:**

5A Upon receipt of the Completion Notice pursuant to paragraph 4.2 above to offer to transfer the relevant Open Space Phase 1, Open Space Phase 2 or Open Space Phase 3 (as applicable) to the Council and deliver an executed transfer to the Council released unconditionally for completion on the terms set out at 5.1 to 5.5 below.

5B Upon receipt of the Completion Notice pursuant to paragraph 4.2 in relation to the whole of Open Space Phase 4 or any sub-phase of Open Space Phase 4 (as applicable) to offer to transfer the whole of Open Space Phase 4 or the relevant sub-phase of Phase 4 to the Council and deliver an executed transfer to the Council released unconditionally for completion on the terms set out at 5.1 to 5.5 below.

2.5 A new paragraph 5.5 shall be inserted after 5.4 as follows:

5.5 any charge over the On-Site Open Space Land has been released and all necessary steps have been taken to enable the Council or its nominee to be registered with an absolute freehold title and Land Registry free from incumbrances;

2.6 **Paragraph 8 shall be deleted and replaced as follows:**

8.1 On the transfer of On-Site Open Space Land in any Open Space Phase to pay the Council the On-Site Open Space Commuted Maintenance Sum and On-Site Open Space Supervision Fee payable in respect of the On-Site Open Space Land in that Open Space Phase;

8.2 Upon the first transfer of On-Site Open Space Land within Open Space Phase 1 or Open Space Phase 2 or Open Space Phase 3 (as applicable) to the Council to pay the Nitrate S106 Monitoring Contribution and the Nitrate Monitoring Commuted Sum to the Council;

2.6 **Paragraph 10 shall be deleted and replaced as follows:**

10. Upon the first transfer of On-Site Open Space Land within Open Space Phase 1 or Open Space Phase 2 or Open Space Phase 3 to the Council, Highwood shall commence or procure the commencement of the monitoring of the Stoneham SUDS Nitrogen Mitigation Works in accordance with the Monitoring Protocol and shall implement the Monitoring Protocol for a 10 year period ending on the 10th anniversary of the date of transfer of the final Open Space Phase to the Council

2.7 **Paragraph 13 shall be deleted and replaced as follows:**

13. To lay out and complete 'Avenue Park' in accordance with both the Approved Specification and the Nitrogen Mitigation Specification within 6 months of the grant of permissions DC/20/89361 and R/17/79892 and RM/17/81168 and DC/20/89359 (unless otherwise agreed in writing with the Council)

2.8 **Paragraph 14, 15, 16, 17 and 18 shall be deleted**

2.9 The Allocation Plan, LEMP, Monitoring Protocol, Nitrogen Mitigation Strategy, Open Space Phase Plan annexed to this Deed shall be read and construed as if it were annexed to the Original Agreement

3. **SCHEDULE 25**

Schedule 25 of the Principal Agreement (as varied by the First Deed of Variation, and the Second Deed of Variation and the Third Deed of Variation) shall be amended as follows:

3.1 **New paragraphs 4, 5 and 6 shall be added after paragraph 3 in the section headed "(Covenants by the Council") as follows:**

4. Upon receipt of the transfer pursuant to paragraph 5A or 5B of Schedule 7 the Council shall use reasonable endeavours to complete the said transfer within 28 working days of receipt.

5. Upon transfer of the On-Site Open Space Land within the relevant Open Space Phase pursuant to paragraph 5A or 5B of Schedule 7 the Council shall maintain the relevant On-Site Open Space Land and shall implement and comply in full with the LEMP in relation to such On-Site Open Space Land.

6. From the 10th anniversary of the transfer of the final On-Site Open Space Land within Open Space Phase 1 and Open Space Phase 2 and Open Space Phase 3 (as applicable) to the Council, the Council shall commence or procure the commencement of the monitoring of the Stoneham SUDS Nitrogen Mitigation Works in accordance with the Monitoring Protocol

4. **SCHEDULE 26**

4.1 **A new Schedule 26 shall be inserted into the Principal Agreement after Schedule 25 as follows:**

"SCHEDULE TWENTY SIX

Nitrates Allocations

Part 1

1. ALLOCATION

1.1 The parties hereto agree that:

1.1.1 Upon transfer of all parts of the Stage 1 Land to the Council the Stage 1 Capacity shall be Allocated to mitigate the development set out in Table 1 of Part 2 of this Schedule or as otherwise agreed in writing with the Council

1.1.2 Upon transfer of all parts of the Stage 2 Land to the Council the Stage 2 Capacity shall be Allocated to mitigate the development as set out in Table 2 of Part 2 of this Schedule or as otherwise agreed in writing with the Council

1.1.3 Upon transfer of all parts of the Stage 3 Land to the Council the Stage 3 Capacity shall be Allocated to mitigate the development as set out in Table 3 of Part 2 of this Schedule or as otherwise agreed in writing with the Council

1.1.4 the Council may Allocate any Unallocated Capacity at its sole discretion.

Part 2

Allocation Tables

Table 1 – Stage 1 Land

Planning Reference	Site	Estimated Nitrate Output of Development (TN/kg)	Stage 1 Land Capacity (TN/kg)	Over Capacity provided by the Stage 1 Land (TN/kg)	Local planning authority
F/19/86946 & 19/02811/FULLS	Land at Park Farm / North Stoneham Park Stoneham Lane Eastleigh	264 (or such additional amount of the Stage 1 Capacity that may be required to mitigate the development permitted pursuant to **F/19/86946 & 19/02811/FULLS)**	274.52 made up of Avenue Park North Swale – 33.41 Pond 5: Avenue Park North – 45.46 Pond 13: 1A1B – 95.4 Pond 14: 1A1B – 100.25	12.211 (or such amount reduced pro rata by any additional amount of the Stage 1 Capacity that may be required to mitigate the development permitted pursuant to **F/19/86946 & 19/02811/FULLS)**	Eastleigh Borough Council and Test Valley Borough Council

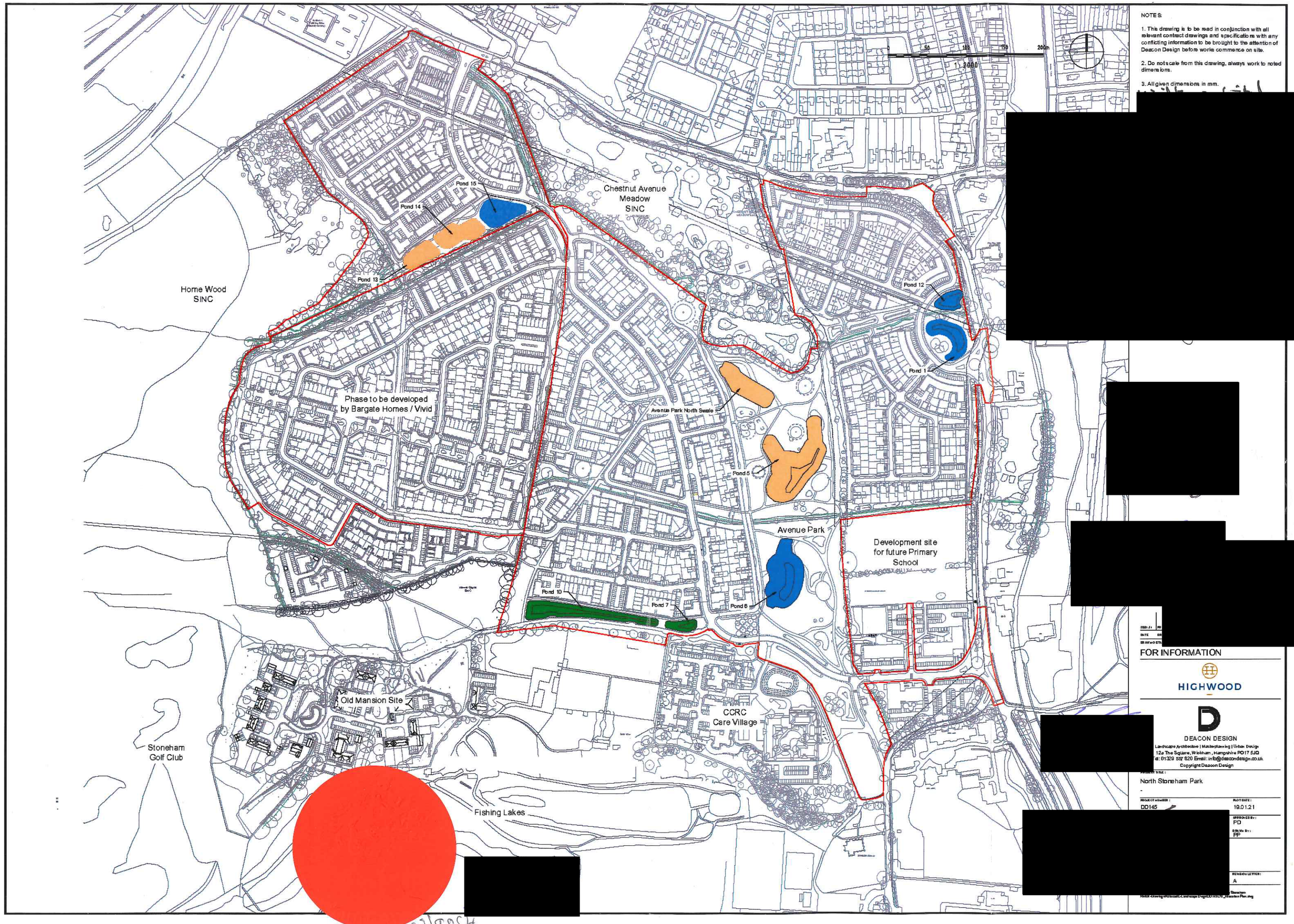
Table 2 – Stage 2 Land

Planning Reference	Site	Estimated Nitrate Output of Development (TN/kg)	Stage 2 Capacity (TN/kg)	Over Capacity provided by the Stage 2 Land (TN/kg)	Local planning authority
19/02630/FULLS	Old Mansion Site, Stoneham Lane, South Eastleigh	212 (or such additional amount of the Stage 2 Capacity that may be required to mitigate the development permitted pursuant to 19/02630/FULLS)	214.68 made up of Pond 15: 1A1B – 100.24 Pond 6: Avenue Park South – 49.66 Pond 12: The Crescent – 12.09 Pond 1: The Crescent – 52.69	4.66 (or such amount reduced pro rata by any additional amount of the Stage 2 Capacity that may be required to mitigate the development permitted pursuant to 19/02630/FULLS)	Test Valley Borough Council

Table 3 – Stage 3 Land

Planning Reference	Site	Estimated Nitrate Output of Development (TN/kg)	Stage 3 Capacity (TN/kg)	Over Capacity provided by the Stage 3 Land (TN/kg)	Local planning authority
20/01781/FUL	Site Of Former Captain Barnard Otterbourne Road Compton Hampshire	42 (or such additional amount of the Stage 3 Capacity that may be required to mitigate the development permitted pursuant to 20/01781/FUL	42.31 made up of Pond 7: OMS Access – 22.43 Pond 10: OMS access 1 – 19.88	1.572 (or such amount reduced pro rata by any additional amount of the Stage 3 Capacity that may be required to mitigate the development permitted pursuant to 20/01781/FUL	Winchester City Council

Allocation Plan



NOTES:

1. This drawing is to be read in conjunction with all relevant contract drawings and specifications with any conflicting information to be brought to the attention of Deacon Design before works commence on site.

2. Do not scale from this drawing, always work to noted dimensions.

3. All given dimensions in mm.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

FOR INFORMATION

HIGHWOOD

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Copyright Deacon Design

PROJECT TITLE:
North Stoneham Park
-

PROJECT NUMBER: DD145

PLOT DATE: 19.01.21

APPROVED BY: PD

DRAWN BY: PP

REVISION LETTER: A

Plotted: Drawing Set Issued 21_Landscape Drawings\DD145\DWG\DD145_Illustrative Plan.dwg

31/9024

LEMP

DEACON DESIGN

HIGHWOOD

Landscape & Ecology Management Strategy

On behalf of:

Highwood Land LLP, Vivid Housing Ltd and Vestal Developments Ltd

Stage 2 Reserved Matters

Final

Date: 25/07/17

Ref: DD145.R02

Revision	Notes	Date
Revision E	Additional Ponds to support Nitrate Mitigation	11.11.2020
Revision F	Amended following EBC Ecology comments received 4th January 2021.	25.01.2021

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DEACON DESIGN

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Written by:

Phil Deacon CMLI (Landscape Architect - Deacon Design)

Signed: [redacted]

Date: 2[redacted]

David West (WYG) – Ecologist

Signed: [redacted]

Date: 2[redacted]

DD Ref: DD145.R02

Document Status: FOR PLANNING

Date: July 2017

DEACON DESIGN

1 Introduction

Purpose of This Document

1.1 This Landscape and Ecology Management Strategy (LEMS) has been prepared for Highwood Land LLP, Vivid Housing Ltd and Vestal Developments Ltd (the developers) and Eastleigh Borough Council to inform the on-going landscape and ecological management and maintenance operations for the 2nd Stage of residential development at the Land to the South of Chestnut Avenue (hereafter referred to as 'the site'), as required under Condition 10 of the associated planning application No: O/15/76023 which states;

No development shall take place until a landscape and ecology management strategy for each phase of development, including long-term design objectives, management responsibilities and maintenance schedules for all landscaped areas (except privately owned domestic gardens), have been submitted to and approved in writing by the Local Planning Authority. Each phase of the development must demonstrate compliance with this strategy through the submission of a landscape and ecology management plan and implementation report and the development shall not be carried out otherwise than in accordance with approved strategy and details.

The strategy and plan shall include the following elements:

- *Detail, extent and type of new planting (NB planting to be of native species);*
- *Details of maintenance regimes;*
- *Details of new habitat created on-site;*
- *Details of any wetlands/ SUDs created on-site and their future management;*
- *Details of treatment of site boundaries and/or buffers around waterbodies;*
- *Details of management responsibilities*

This condition is necessary to ensure the protection of wildlife and supporting habitat found on the site and to secure opportunities for the improvement of wildlife corridors and wider enhancement of the nature conservation value of the site in line with national planning policy.

1.2 This LEMS describes the range of proposed landscape mitigation, biodiversity planting and amenity planting, objectives and post construction aftercare to safeguard specific landscape features, habitats and species.

Persons wishing to contact the Council regarding any matters related to the landscape and ecological maintenance for this site should contact Paul Naylor, Direct Services Manager Tel: 02380 68 8260 or Sarah Boyd, Biodiversity Officer Tel: 02380 688064.

Site Location

1.3 The proposed development site is located on Land to the South of Chestnut Avenue and west of Stoneham Lane, in Eastleigh, Hampshire. The site is bound by Chestnut Avenue to the north, Lakeside Country Park to the east, Home Wood to the west and Stoneham Golf Club, North Stoneham Sports Ground and adjacent angling lakes to the south west and south. The residential area of Eastleigh lies beyond the site to the north and north east, with Southampton International airport to the east. The M3 and M27 motorways otherwise separate the site from the city of Southampton to the south and west, whilst further woodland extends north westwards from the site beyond the motorways. Stoneham Lane separates the vast majority of the site from a further two, small areas of land located immediately east, through which the Monk's Brook watercourse flows.

1.4 The site contains a mosaic of habitats including marshy grassland, amenity grassland, poor semi-improved grassland, neutral semi-improved grassland, mixed plantation woodland, broadleaved, scattered trees, tall ruderal, hedgerows, scrub and buildings. The site contains one pond with two water courses flowing through the site.

Baseline Information

Landscape Strategy

1.5 Realising the landscape vision for North Stoneham Park, developed through the consultation process, requires a long-term commitment and careful consideration to the landscape and ecological management of the site. The landscape framework identifies several overarching Green Infrastructure tools which have informed the public open space network (See Appendix 2). Together these will provide a mechanism for delivering a robust landscape setting to the development that meets residents and visitor needs, including:

- Provision of high quality public open space;
- Conserving the legacy of the site's historical landscape character;
- Enhanced biodiversity corridors within the site including an extension to the parkland landscape, wetland areas and woodland mosaic;
- Improved pedestrian / cycle connections, including provision for future connections to the proposed Forest Park to the west and Lakeside Country Park extension, to the east of Stoneham Lane;
- An improved / consistent landscape setting with less fragmentation and greater order that will be resilient to climate change impacts;
- Relocation of formal recreation within the site to the south with improved connections as part of the wider green infrastructure network;
- Sustainable Drainage Systems;
- Nett gain in tree planting;

1.6 The Detailed Planting Plans submitted as part of reserved matters application sets out the proposed planting for the Stage 2 works which comprises a mix of trees, shrubs and herbaceous plants that together delivers a minimum 80% preference to native species indigenous or appropriate alternative species approved by the appointed ecologist and able to withstand climate adaptation.

Ecological Surveys

1.7 The Ecology information provided within this LEMS is based on the results of surveys completed by WYG on the site. The surveys conducted inform this strategy are as follows;

- Land to the South of Chestnut Avenue Extended Phase 1 Habitat Survey Report (WYG, 2015a)
- Land to the South Chestnut Avenue Botanical Survey Report (WYG, 2015b)
- Land to the South of Chestnut Avenue Aquatic Invertebrate Survey Report (WYG, 2015c)
- Land to the South of Chestnut Avenue Terrestrial Invertebrate Survey Report (WYG, 2015d)
- Land to the South of Chestnut Avenue White Clawed Crayfish Survey Report (WYG, 2015e)
- Land to the South of Chestnut Avenue Breeding Bird (including barn owl) Survey (WYG, 2015f)
- Land to the South of Chestnut Avenue Great Crested Newt Presence/ Likely Absence Survey Report (WYG, 2015g)
- Land to the South of Chestnut Avenue Reptile Presence/ Likely Absence Survey Report (WYG, 2015h)
- Land to the South of Chestnut Avenue Badger Survey Report (WYG, 2015i)
- Land to the South of Chestnut Avenue Bat Survey Report (WYG, 2015j)
- Land to the South of Chestnut Avenue Hazel Dormouse Presence/ Likely Absence Survey Report (WYG, 2015k)
- Land to the South of Chestnut Avenue Harvest Mouse Presence/ Likely Absence Survey Report (WYG, 2015l)
- Land to the South of Chestnut Avenue Otter and Water Vole Survey Report (WYG, 2015m)

Development Proposals / POS Enhancements

1.8 The Stage 2 Reserved Matters Application (RMA) seeks planning permission for:

- 514 dwellings comprising parcels 1A, 3A(1), 3A(2) and 5A (part);
- Provision of public open space in parcel 1A;

- Associated access roads, drainage, car parking, refuse storage, boundary treatments and other supporting works and infrastructure.

1.9 This application follows the grant of reserved matters by Eastleigh Borough Council for the first stage of development at North Stoneham Park on 26th May 2017 (ref. R/17/79892) which comprised the first 560 homes, public open space and other associated development, including the spine road to serve the new community. A separate LEMS was produced by DD / WYG for this Stage of development Ref: DD145.R01.

Aims and Objectives

1.10 The LEMS will provide a comprehensive programme of landscape and ecological management, enhancements and future monitoring. This will provide details of the on-going landscape management and maintenance operations for the development which will build confidence in the integrity of the landscape strategy and encourage involvement, activity and community ownership.

1.11 The landscape design and ecological mitigation proposals provide a robust environment which is capable of withstanding human activity, phased development and associated construction implications which in time will enhance the setting of the residential development.

1.12 A considered palette of native and non-native species will provide a smooth transition and balance between the landscape and built environment which together will reinforce the unique character and bring identity to individual streets. Species should seek to provide both amenity value, seasonal interest and support wildlife for example: nectar or berries from flowering shrubs.

1.13 Attention has been given to enhancing the existing habitats across the site associated with the agricultural grasslands, hedgerow framework, watercourses and woodland edges which together will complement the parkland setting, to result in extended and less fragmented connective corridors benefitting local species.

1.14 This LEMS will ensure that the landscape vision is realised through a programme of regular maintenance that will deliver the following objectives:

- The successful establishment of the planting design using best horticultural practices to maintain healthy growth, seasonal interest and legibility for the future enjoyment of residents;
- Protection, conservation and enhancement of existing trees, vegetation and associated habitats to achieve ecology value in both biodiversity terms and human amenity – bringing, for example, the benefits of bird song, butterflies and the restorative effects of natural environments to residents and visitors;
- To achieve and maintain a high standard of cleanliness, appearance and repair using sustainable management techniques as far as possible.

1.15 This strategy document is intended to cover the first five years of the sites establishment.

1.16 It should be noted that as the establishment of the new planting progresses, the operation and management may need to be altered from that included within this document to better suit a maturing landscape. However, this document provides minimum standards to be achieved and a 'benchmark' system, which is capable of adjustment and fine tuning in order to achieve the stated objectives and standards. No changes should be made without the prior consent of the Countryside Team Manger or the Biodiversity Officer.

2 Preliminaries

2.1 This document should be read in conjunction with the supporting landscape plans and appended to this report and the detailed planting plans approved as part of the reserved matters application.

2.2 Subject to the relevant conveyancing information being agreed the landscape maintenance of the private areas will be the responsibility of the domestic owners with all remaining areas within the public open space (POS) will be adopted and managed by the local authority. Please refer to the POS Adoption Plan appended to this report which shows the extent of area to be adopted as POS under the Stage 2 works.

2.3 Any public areas not adopted by the local authority will be maintained by the appointed Management Company, the agreement for which shall be set up by the Developer.

2.4 The local authority and/or the appointed Management Company shall be responsible for all periodic maintenance as set out in this document and replacements thereafter for all planted areas to which its management covers.

2.5 The maintenance of trees, shrubs and other plants after the date of practical completion will be carried out by the Contractor until the responsibility is transferred to the persons responsible for future management (local authority and/or Management Company).

2.6 Any tree and plant showing the following attributes must be replaced within a period of 5 years from the date of completion unless sated elsewhere within this document. These include those plants that:

- Dead, diseased or dying
- Are missing or not in accordance with the specification
- Lack any vigour

Replacements must be carried out immediately, or in the next planting season, by the contractor at his own cost.

2.7 Any additional topsoil applied to the planting should be quality loam to BS 3882.

2.8 All loss or damage arising from theft or malicious damage prior through the contract shall be made good by the Contractor at his own expense.

2.9 Inspection checks shall be carried out by a competent person, either a current member of BALI or the Landscape Institute, acting for the local authority and/or Management Company, at minimum monthly intervals and as appropriate work is carried out. Six-monthly to annual checks may also be carried out by the Local Authority Biodiversity Officer or the Countryside Manager.

2.10 All site operatives to refer to O&M Manual for identified site risks.

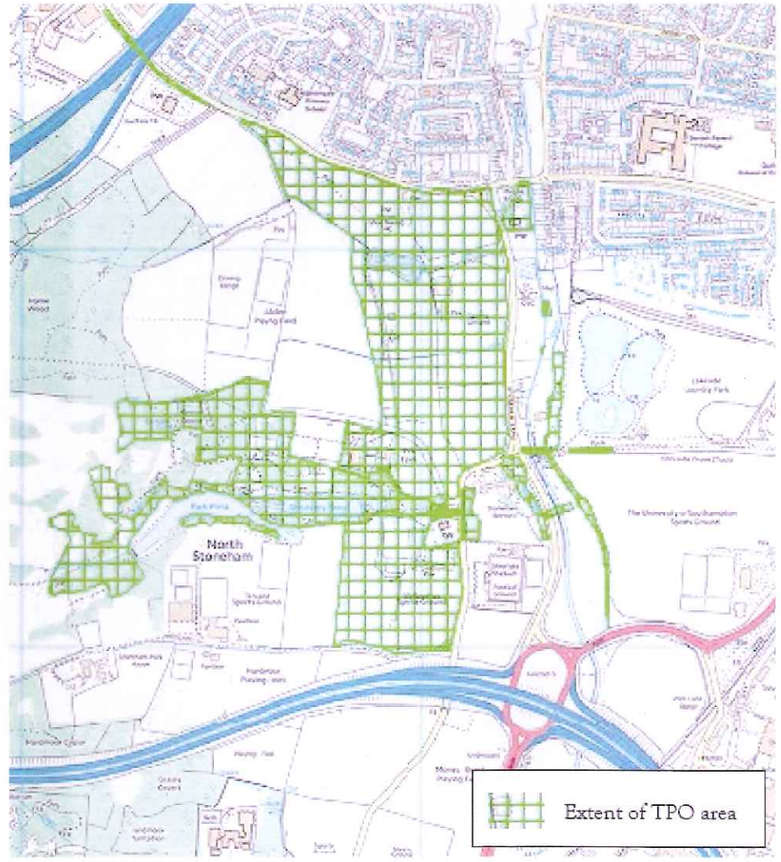
2.11 No existing trees, shrubs or other plants shall be removed or cut without specific instructions from the Contract Administrator. Existing trees are to be retained, protected and undisturbed throughout the contract.

Protected Trees

2.12 There is an extant Tree Preservation Order (TPO); Ref: TPO No.55 – 1947 which relates to trees surrounding the site (see Figure 1). This order protects specific trees, groups of trees or woodlands in the interests of amenity. Any works to trees within close proximity to this area (not already forming part of any planning consent) will need ensure there is no impact to these trees.

2.13 Any works within that may affect these trees will need to obtain prior approval from the relevant local authority arboricultural team.

Figure 1: Blanket TPO covering the site Ref: TPO No.55 – 1947



2.14 It is advisable that any amendments to the approved landscape proposals should consult with the local planning authority.

3 Ecological Planting / Habitat Creation

All Planting

3.1 All planting beyond the boundaries of domestic ownership will be maintained in perpetuity by the local authority or management company to which its management covers.

Habitat Corridor

3.2 Attention has been given to the retention and enhancement of the boundary vegetation including rough grassland and hedgerows to create a green swathe around the development and opportunity to create an enhanced habitat corridor including:

- Primary Routes / Dark Corridor through Avenue Park to support bats and dormice movement;
- Secondary Routes – Reinforced hedgerow / woodland / wetland areas;
- Tertiary Routes – Landscape framework through residential areas to provide supplementary connections and food source for wildlife
- Residential Planting – Palette of Amenity and wildlife friendly planting.

3.3 In limited areas, where private rear gardens are directly adjacent to existing hedgerows or woodland, 1.8m high timber post 'n' wire mesh 'deer' fence will define the boundary, reduce unsociable waste being discarded and retain the integrity of this linear ecological route.

3.4 Further details of the ecological enhancements proposed for the boundaries can be found within the supporting ecological reports prepared by WYG.

Trees

3.5 During construction, all existing trees to be retained shall be protected by root protection fencing in accordance with 'British Standards 5837:2012 Trees in relation to design, demolition and construction – Recommendations'.

3.6 Refer to the accompanying Arboricultural report prepared by CBA trees for full details of which trees are to be retained and protected during construction.

3.7 Management of trees will require periodic management and should be undertaken by an Arboricultural Association Approved Contractor to British Standard 3998 Tree Work specifications.

3.8 Any further works to trees protected by a Tree Preservation Order or within a Conservation Area will need to obtain the necessary approval from the Local Planning Authority prior to any works. Refer to general note 2.12-2.14 above.

3.9 All tree surgery works to be carried out between September and February. No works should be carried out between the start of March and mid-September to avoid the bird nesting season.

3.10 Trees planted within amenity grass areas to have a weed free circle of 1.2 metre diameter maintained for the first three years.

Native Field Hedgerows

3.11 During construction, the existing hedgerow vegetation to be retained within the site, shall also be protected in accordance with the measures described in 'British Standards 5837:2012 Trees in relation to design, demolition and construction – Recommendations' will be followed. A 5m buffer will be established between the hedgerows and any development to occur on-site.

3.12 Any new hedgerows including infill planting will assist in reinforcing the character of the hedgerow framework providing improved green corridors for wildlife to migrate around the site and seek refuge. The species selected have been chosen to complement these natural edges, avoiding unnecessary maintenance operations and instead allowing their natural form to establish along this generous edge.

3.13 Adopting the management principles for a field hedgerow the maintenance regime will aim to increase flowering, nectar and berrying fruits for wildlife. With the exception of visibility splays, hedges should be trimmed on a three-year rotation not annually. Alternate sides should be cut in the first two years with the top cut within the third season. Trimming should ensure a consistent screen from ground level, and a suitable nesting habitat for birds.

3.14 Any failures to new hedgerows should be replaced during the next suitable planting period for that species. This will be undertaken in September annually for five years' post construction.

3.15 Pruning operations should take place between November and February to avoid harm to nesting birds and plant health during the spring / summer growing period. During this period, no cutting of the hedgerow bases should take place to avoid harm to hibernating dormice. If bases require cutting this should occur in April after an appropriate check for nesting birds.

Communal Orchards

3.16 Supporting the overarching GI legacy, edible landscapes will be created in the form of communal orchard planting sited within the informal areas of public open space.

3.17 Comprising a mix of apples, pear and plum varieties these fruit bearing trees will allow residents and the wider community to graze the landscape as part of their wider enjoyment of the landscape.

3.18 Species will be carefully selected to suit the soil conditions and future maintenance will require a specific pruning regime to maximise the harvest opportunities.

3.19 Apple and pear varieties should be pruned in January /February to encourage fruiting wood to establish during the growing period with the emphasis being on maintaining a straight leader and limiting crown reduction to no more than 25%.

3.20 Damsons / Plum trees are best pruned in late spring / summer for plums and trained to form a natural bushy shape.

3.21 Grass beneath the trees should be kept short no more than 100mm (to create a soft thatch for the fruit to fall onto) and remove any stalks / suckers from around the trunk.

3.22 Autumn is the best time to harvest and to check whether the apples / pears are ripe remove and cut through to check whether the pips are black which indicates the fruit is ripe.

Native Understorey / Coppice Planting / Home wood Approach

3.23 Clumps of native shrub / coppicing will provide improved habitat and refuge whilst providing low level screening and assist in tying the character of the adjacent woodland to the residential areas.

3.24 Native planting varieties have been chosen for their native provenance, aesthetic value and their suitability to the site conditions. The proposed species will provide all year interest for visitors and residents, while attracting wildlife with shelter and food.

3.25 Adopting similar management principles for a field hedgerow the maintenance regime will aim to increase flowering, nectar and berrying fruits for wildlife; maintenance is limited to a yearly trim ensuring a consistent screen from ground level, and a suitable nesting habitat for birds.

3.26 Stands of Hazel will adopt traditional coppicing techniques including occasional thinning 'coppicing' during winter months to remove any deadwood and promote growth and regular pruning to maintain a healthy and attractive form. It is envisaged that the harvest wood will support natural play elements associated with the play provision philosophy found across the site.

3.27 Coppiced stools should be at least 75mm in circumference and should be cut no more than every three years initially. This interval should be lengthened as the stands mature and soil fertility decreases. Any clearance during winter should take place with due regard to hibernating dormice (cuts should be above ground level and arisings should not be dragged through the stand).

3.28 Deadwood located within these areas will be retained on site and utilised to create log piles wherever possible to encourage invertebrates.

Home Wood Approach

3.29 Assimilating the woodland setting and forming a distinct character to the streescape, large beds of understorey planting will assist in defining the pedestrian approach to Home Wood.

3.30 Comprising a mix of native woodland species and ornamental species the planting will provide seasonal interest all year round. Towards the edges, where the path connect to the woodland buffers native planting will be used to reinforce this important ecological corridor. Further inside the development, the planting will revert to more ornamental species, helping to integrate the adjoining the streets.

3.31 The planting for this areas will provide both refuge and food supporting the local bird and insect population.

Rough Grassland / Meadows

Existing Grassland to Hedgerow / Woodland Buffers

3.32 Buffer areas associated with the existing woodland edge and hedgerow framework will retain and enhance the existing grassland habitats including a new mowing regime cut annually in October to maintain an overall height of 300mm.

3.33 The grassland and woodland mosaic buffer of at least 15m from the edge of the SINC sites will be fenced off with Heras fencing during the works phase and will be cut annually in October to a height no greater than 15cm (6 inch).

3.34 To mitigate for the loss of species rich neutral grassland within the future development, seeds from flora found within the identified neutral grassland habitat (to the north west of parcel 4a) will be collected and sown within the grassland habitats. Seed will be brush harvested between July and September and sown within the same period.

3.35 Identified receptor areas will be scarified prior to sowing. Species to be sown within Avenue Park will include bird's foot trefoil; common fleabane; fragrant agrimony and other species.

3.36 Additional plug planting will be sourced locally to the site and used to reinforce the biodiversity of the site.

3.37 To ensure the buffer zones are not damaged through the tipping of garden waste, boundary treatments will be sufficiently high to make tipping difficult. Regular checks should be completed, and any waste found removed. If residents are observed tipping waste they should be reminded of appropriate disposal methods.

New Grassland / Meadows

(Emorsgate Flowering Lawn Mixture EF1)

3.38 A rich grassland planted with native wildflowers will be established to create a natural green swathe around highway verges, flat amenity lawns and larger front gardens. The

mixture contains slow growing grasses with a selection of native wildflowers that respond well to regular short mowing.

3.39 This grassland type can form a good habitat for insects, small mammals, birds, amphibians and reptiles, providing nesting sites during spring, food during summer and autumn, and shelter during winter.

3.40 The flowering lawn mixture (Emorsgate EF1) will be sown over these areas which once established, can be mowed as regularly as required to retain a neat sward of 25-40mm.

3.41 To maximise the ecological benefits and permit flowering, mowing can be relaxed from late June. Cut again when the sward gets untidy (after 4-8 weeks). Mowing may be suspended earlier in the year to allow cowslips to flower.

3.42 Heavy quantities of cuttings should be collected and removed from site. The cutting is best done on a rotational basis so that no more than half the area is cut in any one year leaving part as an undisturbed refuge for wildlife.

Mown Verges

3.43 To provide a sense of order and legibility to the pedestrian routes a mowing strip of at least 1 metre either side of the pathways through the open space areas will be maintained. This will not apply to the buffer zones.

3.44 These areas will be increased in open areas where recreational use is envisaged such as kickabout areas and to respond to desire lines not envisaged at the design stage.

3.45 The extent of this should be adapted seasonally to balance the use of the space with biodiversity protection.

Scrub Management

3.46 Bramble scrub, within grassland habitats will be subject to selective removal, cut to a height no greater than 15cm (6 inch), within the months of October to February inclusive. Greater burnet-saxifrage, which is a notable plant in Hampshire, will be retained within the site. If ground disturbance is required to remove roots, this should take place between March and September. Scrub will be monitored, annually in October, and any scrub over encroaching onto grassland habitats will be cut back in order to maintain a structural diversity within these buffers, which will benefit reptiles and other species.

Invasive Species

Removal of Japanese Knotweed

3.47 There are no current known location of invasive species found across the site however large clumps of Japanese Knotweed are located adjacent to the Phase 1 southern boundary close to the remnant walled garden.

4 Watercourses / SUDS Strategy

Existing Watercourses

4.1 There are two existing watercourses on site, which contribute to the green infrastructure and provide linkages with habitats within and around the site connecting to Monks Brook via culverts beneath Stoneham Lane.

4.2 A line of dense vegetation comprising hedgerow species, scrub and willow follow the watercourses crossing the site in a western – easterly direction.

4.3 Tall emergent plants will be planted along the margins of both waterbodies. Reeds provide an oxygenating function which maintains water quality as well as benefiting the aquatic ecology. Suitable emergent vegetation plants will include common reed Phragmites communis, common club-rush Schoenoplectus lacustris, lesser reedmace Typha angustifolia and reedmace (commonly referred to as 'bulrush') Typha latifolia. Reed management will be required to prevent reedmace dominating the pond whilst vegetation is establishing.

SuDS / Attenuation Areas

4.4 As part of the sustainable drainage strategy a bio-retention pond will be located at the southern edge to Parcel 1A.

4.5 Set within an existing area of wetland flora the ecologist has recommended the existing wetland turf habitats be lifted and re-laid at an appropriate time to retain the richness of the wetland landscape.

4.6 To supplement this a rich flora grass seed mix will be used to enhance the wetland habitats including species such as river plain/ water meadow grass seed containing native species of local provenance. This seed mix comprises 95% fine grasses and 5% wildflower seed. Seed will be sown at the appropriate time of year when the ground temperature will be high enough for germination i.e. between April and October.

Nitrate Mitigation / Wetland Enhancements

4.7 In addition to the above, this section seeks to provide details of enhancements to selected SUDs feature found across the site to support nitrate mitigation offsetting to future development across the wider North Stoneham masterplan.

Background

4.8 The water environment within the Solent region is one of the most important for wildlife in the United Kingdom. It is internationally important for its wildlife and is protected under the Water Environment Regulations and the Conservation of Habitats and Species Regulations.

3.48 Future ownership and maintenance of the site within which Japanese knotweed of any other invasive species are present should be made aware of the impact of this invasive species and their obligations to undertake all measure to eradicate this invasive plant prior to any operations on site.

3.49 It is advisable that an Invasive Species eradication specialist is commissioned immediately to prepare a report and make recommendations for its removal in accordance with the current Environment Agency guidelines.

3.50 As part of the ongoing landscape management the site will be monitored to ensure that the Japanese knotweed does not remerge and if it does the management company or local authority to whom has responsibility for; will carry out the necessary measures.

3.51 Relevant stakeholder should be consulted with at all times.

Hedgehog Access

3.52 Where specified on the Boundary Treatment Strategy Plan, gaps for hedgehog access will be provided within boundaries and rear garden fences. These will comprise a 150 mm x 150 mm gap left, or hole cut into gravel boards or the base of brick walls.

Swift Nesting

3.53 Swift nesting bricks will be installed within the three blocks of flats proposed within Stage 3. Each block will have three Manthorpe Swift Bricks (or comparable product) installed on the south east or south west elevations. They will be installed below the eaves with a minimum clearance of 5m below the access and where there are clear, unobstructed flight paths.

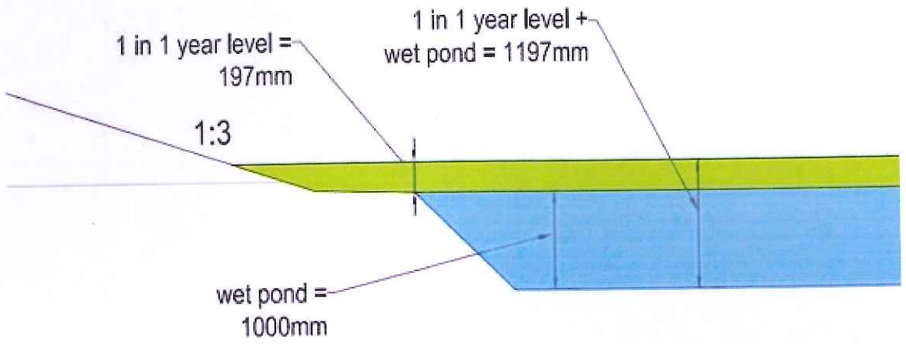


Figure 1 – Typical Pond cross section showing permanently wet areas (blue) and marginal planting (green) opportunities.

Floating Reed Beds

4.18 The introduction of propriety floating reed beds to open areas of water provides an opportunity to create an effective solution to the nitrate filtration process by establishing a well- balanced reed bed system.



Figure 2 – View of a Floating red bed system anchored to the pond base.

4.19 Typically grown on a coir mattress, this provides an ideal growing medium for the wetland plants to establish. Over time the root system grows down allowing contaminants in the water to be captured and stored within the plant.

4.9 Excessive nutrients, principally nitrogen and phosphates are entering the Solent from several sources mainly:

- Surface Water run-off;
- Groundwater; and
- Wastewater discharged from Waste Water Treatment Works (WWTW)

4.10 This causes significant harm to the marine environment and in recent years Natural England have sought developers and landowners via the Local Planning Authorities to seek nitrate neutrality through mitigation.

4.11 As the site falls within the catchment area for the Solent SAC (Special Area of Conservation and SPA (Special Protection Area) the design team have sought to identify opportunities to improve the SuDS found at North Stoneham Park to support nutrient neutrality using a range of associated wetland planting enhancements.

Proposed Nitrate Mitigation

4.12 The ponds and swales identified for mitigation have been carefully informed by detailed analysis by the project Drainage Engineer and Ecologist to understand the amount of water flow (filtration improvement opportunities) and capability to support suitable wetland plants that contribute to the filtration/ nitrate capture process.

4.13 Studies have shown that wetlands receiving nitrogen-rich water can remove a proportion of this nitrogen through processes such as denitrification and sedimentation[1].

4.14 The location of these can be found on Drawing Ref: DD145L59A appended to this report.

Wetland Planting

4.15 The three ponds to the south of Parcel offer an opportunity to support a mix of wetland / reed bed habitats fed by development stormwater runoff and existing groundwater.

4.16 Figure 1 below shows how the proposals include a combination of permanently wet (See blue area) areas to support floating reed beds and areas for enhanced marginal planting (shown green) to the edges.

4.17 Details of the Planting can be found on Drawing Ref: DD145L60A & DD145L62 appended to this report.

[1] Kadlec R H, and S D Wallace (2009). Treatment Wetlands. 2nd ed. CRC press, Taylor & Francis Group.

4.20 Islands can be used on fluctuating water levels, plus vegetation can be established in areas where water depth would normally be too deep for traditional planting.

4.21 Not only does this provided improvements to water quality but support biodiversity enhancements where vegetation establishment within water bodies can be problematic.

4.22 Reedbeds in deep water need little management but, in most cases, a reedbed needs cutting each year to maintain a mosaic of vegetation at different stages of growth. Reedbed management is often aimed at increasing structure and diversity and preventing the invasion of scrub and eventual natural succession to carr/wet woodland.

4.23 Future management should aim to keep a suitable balance between open water and reed bed. RSPB recommended that proportionally new reedbeds should aim to provide around 25-30% open pools, 40-50% wet reed, 15-25% dryer reed and 5% scrub.

4.24 Conservation cutting to maintain reed dominance should be undertaken anytime during the non-growing season.

Marginal / Aquatic Planting

4.25 Set at the 1:1-year water flow and varying in depth from 5mm to 200mm the proposed marginal planting will form an integral feature and is able to tolerate intermittent flows and periodic dry periods whilst still providing effective filtration. See figure 3 below.

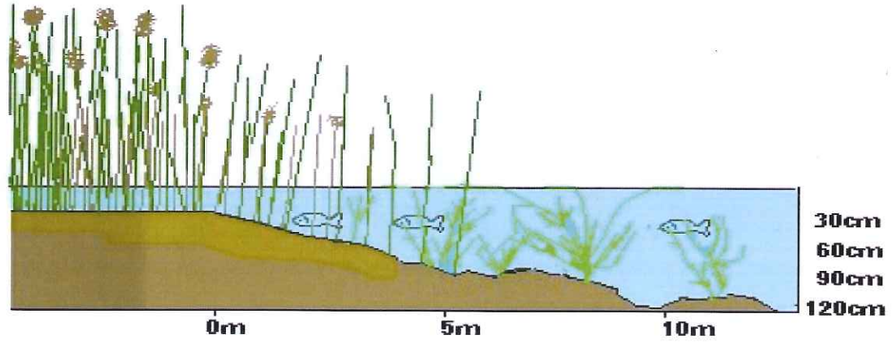


Figure 3 - Natural Marginal Planting (RSPB Reedbed Design Guidance Version 4 July 2004)

Planting Seedlings

4.26 Planting plug grown seedlings by hand using a dibber is the most widely used method of establishing marginal planting and can compete and survive adverse weather conditions.

4.27 Whilst the anticipated water levels will sustain the plants once established, it is advisable that during any drought periods the seedlings should be regularly irrigated.

4.28 Once established, management of the marginal planting should be limited and allowed to spread naturally (in accordance with 4.14) to allow enough balance been reed bed establishment and open water. Key maintenance requirements /operations should include:

- Checks for debris or litter build-up;
- Checks for invasive non-native species;
- Annual vegetation cutting and maintenance;
- Removal of unwanted self-sown trees, scrub or other such plants that could damage the hydraulic design;
- As required de-silting operations; and
- Periodic checks for any compromise of the hydraulic / filtration integrity

4.29 Wetlands do offer additional benefits above offering neutrality but will also require ongoing monitoring, maintenance and adjustments beyond any particular development's completion.

4.30 Consideration of the long-term security of facilities and their adoption at an early stage is advisable.

4.31 Pond maintenance will be carried out, including dredging to be undertaken on a cyclic basis, to control the accumulation of silt, to prevent succession and improve water quality. Removal of rubbish will also be undertaken. Management of the pond habitat will occur during the winter, after the amphibian breeding season. Monitoring of the pond by a suitably qualified hydrologist and ecologist will inform the management required for the wetland areas.

4.32 Dredged material will be removed from the pond and left to one side for a period of 48 hours so that fauna may return to the water body. A waste management licence may be required to dredge plant material from the pond.

4.33 The grassland in the vicinity of the attenuation pond will be managed in a traditional manner, without artificial fertiliser, to maintain and enhance its nature conservation interest. This will include an autumn cut after the herbs and grasses have seeded. A carefully controlled cut, i.e. using light machinery and cutting the sward to no less than 6 inches, is unlikely to harm reptiles, and should benefit them by maintaining the grassland in an open condition and preventing scrub encroachment. Additionally, cutting a rotational basis i.e. leaving selected areas unmown for an entire season, should assist in providing structural diversity to the sward, and provide suitable basking, foraging and refuge areas for reptiles, as well as enhancing its invertebrates' diversity.

5 Residential Amenity Planting

Street Tree Planting

5.1 Native tree planting has been proposed on site where possible. Large trees are located towards the site edges and existing boundary vegetation, whilst their more formal varieties were located to the streets, where the proximity of the building require smaller species selection.

5.2 Management operations will include thinning to remove any deadwood and promote growth.

5.3 All tree works to be undertaken by an Arboricultural Association Approved Contractor to British Standard 3998 Tree Work specifications.

5.4 Any thinning works are to be carried out outside of the nesting season to avoid disturbance to birdlife.

5.5 Trees planted within amenity grass areas to have a weed free circle of 1.2 metre diameter.

Formal Hedgerow Planting

5.6 A series of formal Hornbeam hedgerows will be established to provide protection between the highway, areas of public open spaces and private residential frontages.

5.7 Even though hornbeam is deciduous, the dry leaves stay on for winter to provide structure and screening all year round.

5.8 Where this forms the only boundary treatment, temporary post and wire fence will be positioned along the middle of the hedge prior to planting to prevent people from gaining access to the embankment behind. It is envisaged that once the hedge has fully established this fencing will not need to be replaced.

5.9 These hedgerows should be kept neat and formal at a height no greater than 1 metre to retain visibility, natural surveillance and retain a consistent form. Lateral growth to be trimmed at 1m wide, ensuring that growth does not obstruct public rights of way.

5.10 The maintenance regime for these hedgerows will aim to increase a dense structure for habitat provision while avoiding the creation of unsafe traffic routes with overgrown vegetation. Maintenance is limited to a yearly trim ensuring a consistent screen from ground level, and a suitable nesting habitat for birds.

Shrub Planting

5.11 Shrub planting varieties have been chosen for their native provenance, aesthetic value and their suitability to the site conditions. The proposed species will provide all year interest for residents, while attracting wildlife with shelter and food.

5.12 Management operations will include thinning of shrubs to remove any deadwood and promote growth and regular pruning to maintain a healthy and attractive form. Thinning promotes new dense growth thus encouraging a strong, more robust planting in the mid to long term, and also increases air flow within the planting to maintain its good health.

5.13 A programme of thinning will also maintain a balance between the shrub and perennial planting types, increasing biodiversity rather than allowing one to dominate and kill off the weaker which would potentially happen in a natural situation. This system is to be managed to maintain a point in succession, which provides a greater ecological and aesthetic benefit to the residential areas.

5.14 Any growth which will obscure windows, signs or sight-lines shall be removed. Once established, any support canes shall be removed from the shrubs.

5.15 A blend of wall shrubs and self-clinging climbers will be grown against walls facing the public realm to soften these structures. This defensible planting not only helps to increase the 'greening' of the site, aiding the development of comfortable micro-climates for health and well-being, but also deters would-be trespassers from scaling the walls.

5.16 Most climbers and wall shrubs need limited pruning, only to keep them trimmed against the wall structure.

5.17 Trailing and climbing material shall be assisted in its growth by securing growing leaders where necessary.

5.18 Any thinning works are to be carried out outside of the nesting season to avoid disturbance to birdlife.

5.19 Operations are to be carried out by hand and waste is to be recycled as compost wherever possible or appropriate.

5.20 The density of planting will require that all weeding is carried out by hand (unless agreed with CA otherwise), using the appropriate tools. All resultant material should be removed from site.

5.21 The management company is responsible for litter picking in those areas that it manages. Litter should be cleared every two weeks.

5.22 All plants shall be watered as may be required to maintain healthy growth following planting, during the maintenance period and subsequently in cases of extreme drought.

5.23 Whilst species in drier locations especially prone to drought have been chosen for their drought tolerance, if the local temperature exceeds 25 degrees centigrade, then planting should be watered daily during the first season, and at least every three days in the second and third seasons until the onset of natural rainfall.

5.24 Any failures due to drought shall be replaced by the management company at their own cost.

5.25 Bark mulch, which also helps to retain soil moisture, should be maintained at an even spread, 75mm deep, of consistent thickness, to ensure that it is effective as a weed suppressant and moisture conserver.

5.26 Following any maintenance operations and on a biannual basis, the mulch shall be supplemented to allow for any material which may have been lost.

Herbaceous Planting

5.27 Herbaceous plants will provide seasonal interest to the planting. The proposed species will provide flowers and attractive leaf structure.

5.28 Perennials will need selective cutting back in the autumn and early winter. Most herbaceous plants will need aesthetical pruning after their flowering period, although some species will provide winter interest when dry flower heads and long shoots are left on.

5.29 Any attractive dead stems or flowerheads can be left until early spring.

Ornamental Grasses

5.30 Similar to management of the herbaceous plant, attractive flower heads can be left on during winter. With this treatment, ornamental grasses will provide striking winter structure within the planting beds.

5.31 Detailed pruning methods of ornamental grasses are described in Section 6 of this document.

Amenity Grass / Mown Areas

5.32 Continuing the fluid nature of the landscape design provision has been made for a series of sweeping lawn areas.

5.33 Lawn areas shall be cut by means of ride-on or pedestrian guided motor cylinder mowers. Arisings should always be removed from site unless a suitable composting on site is agreed with the developer.

5.34 Frequency of cutting shall be regulated so that the grass, including any flowering stalks, does not exceed 50 mm in height at any time unless otherwise agreed. Machines shall be so adjusted to cut no lower than 25 mm.

5.35 When cut, the turf must not show any corrugated or 'washboarding' effect caused by travelling at excessive speed, incorrect gear selection or by the use of cutting reels having insufficient blades. There must be no uncut grass due to failure to overlap adjacent passes on straight runs or at the turning points.

5.36 Any slight hollows which appear due to settlement or other causes shall be top dressed, early in the growing season, with fine compost lightly rolled in and the grass allowed to grow through before cutting.

5.37 Deeper hollows shall be treated by neatly cutting out a square of turf, building up beneath with the fine compost plus and equal quantity of sharp sand, and the turf replaced at the correct level for rolling. Cutting may proceed without interruption.

5.38 Grassed edges to planted areas to be trimmed to maintain a clear smooth edge to planted beds; strim edges elsewhere but not against trees; spike annually in October.

5.39 Nylon Line Grass Cutters. This specification refers to the hand-held machines which utilise horizontally revolving strips of nylon to cut grass and other herbage obstacles.

5.40 Particular care must be exercised when cutting grass and weed growth close to trees and shrubs. No damage is to be caused to the bark of such trees and shrubs by the nylon cutting line.

5.41 The nylon line is not to be allowed to touch the ground, thereby creating the danger of throwing soil and stones into the air.

5.42 The Contractor shall submit for Employer's approval a method statement for mowing and maintaining grass and planting on steep banks.

Bulb Planting within Grassland Areas

5.43 Bulb planting within verges and amenity lawn areas will provide seasonal interest and a swathe of colour amongst the grassland areas throughout the winter months and early spring whilst other areas of the site are dormant.

5.44 Once established they require little maintenance but will need to be factored into the mowing regime for the lawn areas to encourage growth and avoid damage before and during flowering periods.

Soil Aeration	All areas of planting suffering compaction by pedestrian or vehicular movements should be lightly forked over Prick surface to a depth of 75mm Reduce soil to crumbs and level off Do not damage plant roots	Once every 2 months
Digging Over	All planting beds, should be lightly forked over to maintain health soil condition to a depth of 75mm	Once a year in Spring

North Stoneham Park, Stage 2 – Reserved Matters
Landscape & Ecology Management Strategy
DD145.R02
March 2020

6 Maintenance Schedule – General Schedule of Activities

6.1 The following maintenance activities should be carried out for all areas of soft landscaping under management control:

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Watering	Water all areas of grass, perennials, shrub and tree planting to ensure healthy development and survival	As required during periods of dry weather
Plant replacements	All plant deaths should be replaced as soon as practical Remove dead plants within one week and replace within the next planting season, with originally specified species at a size to match maturity of established planting or a soon as practical	As required
Clearing of services	All plant material is to be kept clear of the following structural elements where present: ventilation ducts and openings, drainage channels and gullies, service access points, and light fittings	Once a month
Debris and Litter	Keep planting beds clear of litter and debris	Total 18 visits. Twice a month from May to October. Once a month from November to April.
Weed Control	Keep residential planting beds free from weeds at all times Remove weeds entirely, including roots Remove the minimum quantity of soil, and disturb plants, bulbs and mulch as little as possible Rake area to a neat and tidy condition Where present reinstate mulch. Do not mulch where ground cover planting has established and no bare ground is visible	Total 18 visits.

Annual Maintenance	Check tree ties, stakes, irrigation pipes and adjust as required Stakes: replace loose, broken or decayed stakes Ties: Adjust, re-fix and replace loose or defective ties allowing for growth and to prevent chafing. Where chafing has occurred, reposition or replace ties to prevent further chafing	Twice a year March and August
Replacement planting	Inspect short lived wood stemmed shrub species and carry replacement planting to maintain healthy stock and appearance	As required straight away or during the next planting season
Annual Maintenance year 4 onwards	Remove tree ties, stakes and guys, make good stake holes on adequately established trees	Once in August

Communal Orchards

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Establishment	Inspect newly planted trees to ensure healthy development, carry out necessary arboricultural works as necessary	Twice a year Spring and Autumn for first 3 years
Assessment	Arrange for all site trees to be inspected by a qualified arboriculturalist, and recommendation report obtained to identify any health problems or necessary arboricultural works	Once every 5 Years
Formative Pruning	Type and timing to suit species	

7 Maintenance Schedule – Activities to Public Open Space / Ecological Mitigation Areas

7.1 The following maintenance activities are specific to the plant species and planting combinations and habitats created within the public open space and habitat corridor at North Stoneham Park. They should be carried out in addition to the above standard activities.

New Tree Planting

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Establishment	Inspect newly planted trees to ensure healthy development, carry out necessary arboricultural works as necessary	Twice a year Spring and Autumn for first 3 years
Assessment	Arrange for all site trees to be inspected by a qualified arboriculturalist, and recommendation report obtained to identify any health problems or necessary arboricultural works	Once every 5 Years
Formative Pruning Young trees up to 4m	Type and timing to suit species Do not prune during late winter/ early spring sap flow period Crown prune by removing dead branches and reducing selected side branches by 1/3rd to preserve a well-balanced head and ensure development of a single leader Remove duplicated branches and potential weak or tight forks Whips and feathers do not prune	Once a year late spring or early autumn
Crown Lifting	Where required and as growth of tree allows crown lift street trees to maintain a clear stem of 2.5m within pedestrian areas and 2.5- 3m where crowns will overhang roads Ensure clear stem does not represent more than 50% of total height of tree to maintain a natural appearance	Once a year until mature

Annual Maintenance year 4 onwards	Remove tree ties, stakes and guys, make good stake holes on adequately established trees	Once in August

Native Hedgerows

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Pruning / Trimming	Trim to specified heights and profiles using suitable mechanical cutters In accordance with good horticultural and arboricultural practice to suit species To encourage healthy and busy growth Type and timing to suit species Do not prune during late winter/ early spring sap flow period Allow hedge to reach planned dimensions only by gradual degrees, depending on growth rate and habit.	To suit species - Three-year rotation and alternate sides should be cut in the first two years with the top cut within the third season. Any hedge cutting to take place between December and February to avoid disturbance of nesting birds or dormice. Arisings must be removed by hand and not dragged.
Replacement planting	Inspect hedgerow for gaps and carry replacement planting to maintain healthy stock and appearance	Once every 10 years
Removal of dead plant material	At end of growing season, check all plants and remove all dead foliage, wood and broken or damaged branches and stems	Once a year in late autumn

Apples / Pear	Apple and pear varieties should be pruned to encourage fruiting wood to establish during the growing period with the emphasis being on maintaining a straight leader and limiting crown reduction to no more than 25%. Crown prune by removing dead branches and reducing selected side branches by 1/3rd to preserve a well-balanced head and ensure development of a single leader Remove duplicated branches and potential weak or tight forks	January / February
Prunus Varieties (damson / plums)	Damsons / Plum trees are best pruned and trained to form a natural bushy shape.	Late Spring / Early Summer
Crown Lifting	Where required and as growth of tree allows crown lift street trees to maintain a clear stem of 2.5m within pedestrian areas and 2.5- 3m where crowns will overhang roads Ensure clear stem does not represent more than 50% of total height of tree to maintain a natural appearance	Once a year until mature
Annual Maintenance	Check tree ties, stakes, irrigation pipes and adjust as required Stakes: replace loose, broken or decayed stakes Ties: Adjust, refix and replace loose or defective ties allowing for growth and to prevent chafing. Where chafing has occurred, reposition or replace ties to prevent further chafing Grass beneath the trees should be kept short no more than 100mm (to create a soft thatch for the fruit to fall onto) and remove any stalks / suckers from around the trunk.	Twice a year March and August
Replacement planting	Inspect short lived wood stemmed shrub species and carry replacement planting to maintain healthy stock and appearance	As required straight away or during the next planting season

Cutting (Newly Created Flowering lawn mixture to highways verges – Emorsgate EL1– Flowering Lawn Mixture	- Mown path / clearings to be maintained at 40-60mm depths - Arisings spread across adjacent grassland areas no deeper than 30mm or remove.	Every 7 -10 days during first year growing season to control annual weeds
Once Established	- Subsequent cuts (to match existing course grassland treatment) - Cut to no lower than 25-40mm depth - To permit flowering, mowing can be relaxed from late June. Cut again when the sward gets untidy (after 4-8 weeks). Mowing may be suspended earlier in the year to allow cowslips to flower. Heavy quantities of cuttings should be collected and removed from site. - For more details refer to https://wildseed.co.uk/mixtures/view/56/flowering-lawn-mixture -	Mow regularly as a lawn but not too short (25-40mm).
Assessment	- Arrange for all wildflower meadow areas / ponds / swales to be inspected by a qualified ecologist to ascertain the establishment of the meadow areas and associated habitat enhancements. - Make recommendations as necessary to address any health problems or necessary remedial works.	Once every 5 Years
Attenuation Areas	- Hydrologist to check ponds periodically to ensure functioning requirements are being achieved. - Make recommendations as necessary	Once a year

Watercourses / SUDS / Nitrate Mitigation

Reed Bed System (Floating Islands) to Permanently Wet Areas

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Anchoring	Check raft system during establishment to prevent displacement of the reed raft by water flow or wind.	Annually.

Native Understorey Planting / Coppicing / Home Wood Approach

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Pruning / Trimming / Coppicing	Trim to specified heights and profiles using suitable mechanical cutters – a maximum height of 5 m In accordance with good horticultural and arboricultural practice to suit species To encourage healthy and bushy growth Type and timing to suit species Do not prune during late winter/ early spring sap flow period	To suit species – Areas should be cut on a three-year rotation to maintain shelter across the site and allow for consistent fruit bearing. Any cutting to take place in autumn/early winter to avoid disturbance of nesting birds
Replacement planting	Inspect hedgerow for gaps and carry replacement planting to maintain healthy stock and appearance	As required straight away or during the next planting season
Removal of dead plant material	At end of growing season, check all plants and remove all dead foliage, wood and broken or damaged branches and stems	Once a year in late autumn

Existing Rough Grassland

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Watering	- During establishment / germination of seed / wildflower mixtures	As required
Cutting (Existing Course Grassland)	- Arisings to be removed from site	Once every year (on a three-year rotation)
	- First Cut: Mow to just top grass (100mm minimum) - Remove arisings	
	- Annually to no greater than 150mm - Remove arisings (Leave the 'hay' to dry and shed seed for 1-7 days then remove from site.) - Mow or graze the re-growth through to late autumn/winter to 50mm.	
	- Mown path edges / recreational areas to to be maintained at 40-60mm depths - Arisings to be removed from site	Fortnightly during summer / Monthly all other times

	Subsequent cuts Work in 2/3 years rotation.	Between September / November
Assessment	- Arrange for all wildflower meadow areas / ponds / swales to be inspected by a qualified ecologist to ascertain the establishment of the meadow areas and associated habitat enhancements. Make recommendations as necessary to address any health problems or necessary remedial works. - Hydrologist to check Attenuation areas periodically to ensure functioning requirements are being achieved. - Make recommendations as necessary	Once every 5 Years Once a year

Summary of Ecological Planting Management / Once Established

PLANTING TYPOLOGY	MANAGEMENT ACTIVITIES	NOTES	TIMING	SUGGESTED FREQUENCY
All areas	Scrub Management	To control scrub, bramble development and unwanted perennial weeds (docks, thistles) occasional hand weeding	September to February	As required
Standard Trees +	Formative Pruning	Crown pruning only	Once a year late spring or early autumn outside of bird nesting season	Annually
Native hedges	Cutting and trimming	Cut one side only and avoid cutting to less than 3m.	November to February	Once every 2-3 years.
	Fill gaps	Gaps should be filled if hedgerows are damaged.	October - December	As required

Removing Reeds	Prevent decomposition, litter build-up and nutrient enrichment and to keep some reed young and healthy. Machine cutting and removal – of different compartments in different years	Annually in winter.
Cutting	Cutting and removing different areas of reeds on a 4–7 year rotation to prevent the build-up of nutrients and dead plant material. Cutting needed to provide diverse, scrub free marginal areas.	Once during March

Marginal / Tall Emergent Planting

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Watering	During establishment of wildflower plug germination During periods of prolonged dry weather	
Cutting	Cutting needed to provide diverse, scrub free marginal areas. First year cut: Annual weed growth to be cut back to encourage perennial ground coverage	Once during March
	Subsequent cuts Work in 2/3 years' rotation, work on one bank each year.	Between September / November

Newly Sown Meadow Areas to Attenuation Pond

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Watering	During establishment of wildflower plug germination During periods of prolonged dry weather	As required
Cutting Emorsgate EP1 – Pond Edge Mixture	Cutting needed to provide diverse, scrub free areas. First year cut: Annual weed growth to be cut back to encourage perennial ground coverage	Once during March

8 Maintenance Schedule – Activities to Residential Areas

8.1 The following maintenance activities are specific to the plant species and planting combinations created within the residential area at North Stoneham Park. They should be carried out in addition to the above standard activities.

Street Trees

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Establishment	Inspect newly planted trees to ensure healthy development, carry out necessary arboricultural works as necessary	Twice a year Spring and Autumn for first 3 years
Assessment	Arrange for all site trees to be inspected by a qualified arboriculturalist, and recommendation report obtained to identify any health problems or necessary arboricultural works	Once every 5 Years
Formative Pruning Young trees up to 4m	Type and timing to suit species Do not prune during late winter/ early spring sap flow period Crown prune by removing dead branches and reducing selected side branches by 1/3rd to preserve a well-balanced head and ensure development of a single leader Remove duplicated branches and potential weak or tight forks Whips and feathers do not prune	Once a year late spring or early autumn
Crown Lifting	Where required and as growth of tree allows crown lift street trees to maintain a clear stem of 2.5m within pedestrian areas and 2.5- 3m where crowns will overhang roads Ensure clear stem does not represent more than 50% of total height of tree to maintain a natural appearance	Once a year until mature

Understorey Planting	Thinning of woody understorey to retain herbaceous species that encourage invertebrate diversity.	Thinning of understory plants by hand.	January to February	Once, in year 1 post construction, and then monitored in year 5.
Hazel Stands	Coppicing	Coppice 50% of area to height of 300mm.	November to February	Once every 10 years
Meadow Areas	Mowing Regime – 100-150mm to aid seasonal regeneration and prevent scrub encroachment	Annually - This cutting is best done on a rotational basis so that no more than half the area is cut in any one year leaving part as an undisturbed refuge. Ecologist to advise location strategy for rotational cutting) Remove offsite or to agreed location	September/ October	Once a year
Existing Watercourses / Attenuation Ponds	Blanket Weed and duckweed removal	Remove with the hand tools avoiding damage to other vegetation.	October to November	Annually

Native and Specimen Shrub Planting

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Removal of dead plant material	At end of growing season, check all shrubs and remove all dead foliage, wood and broken or damaged branches and stems	As required
	Trim to specified heights and profiles using suitable mechanical cutters	To suit species (once or twice a year)
Pruning Ornamental Shrubs	In accordance with good horticultural and arboricultural practice to suit species To encourage healthy and busy growth and desirable ornamental features, such as flowers, fruit or autumn colour	To suit species. Once a year
Replacement planting	Inspect short lived wood stemmed shrub species and carry replacement planting to maintain healthy stock and appearance	As required straight away or during the next planting season

Herbaceous Planting

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Removal of dead plant material	At end of growing season, check all perennials and remove all dead foliage and flower heads once plants have shed seed.	Retain flower / seed heads to extend seasonal interest
	Trim to specified heights and profiles using suitable mechanical cutters	To suit species (once or twice a year)
Replacement planting / Splitting	Inspect species and carry out replacement planting to maintain healthy stock and appearance / Lift and split healthy stock periodically (in accordance with good horticultural principles) to maintain coverage	As required / Lift and split every 2-4 years

Ornamental Grasses

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Deciduous Species	Prune to remove dead and remaining foliage in late November to 150mm	Once a year in Winter
	Remove remaining last season's foliage by hand when first buds of new growth appear	Once a year in Spring

DEACON DESIGN

Annual Maintenance	Check tree ties, stakes, irrigation pipes and adjust as required Stakes: replace loose, broken or decayed stakes Ties: Adjust, refix and replace loose or defective ties allowing for growth and to prevent chafing. Where chafing has occurred, reposition or replace ties to prevent further chafing	Twice a year March and August
Replacement planting	Inspect short lived wood stemmed shrub species and carry replacement planting to maintain healthy stock and appearance	As required straight away or during the next planting season
Annual Maintenance year 4 onwards	Remove tree ties, stakes and guys, make good stake holes on adequately established trees	Once in August

Formal Native (Hornbeam) Hedgerow

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Removal of dead plant material	At end of growing season, check all plants and remove all dead foliage, wood and broken or damaged branches and stems Trim to specified heights and profiles using suitable mechanical cutters	Twice a year in late spring and late Autumn To suit species. (Once or twice a year)
Pruning / trimming	In accordance with good horticultural and arboricultural practice to suit species To encourage healthy and busy growth Type and timing to suit species Do not prune during late winter/ early spring sap flow period Allow hedge to reach planned dimensions only by gradual degrees, depending on growth rate and habit.	As required to maintain height of 1 metre
Replacement planting	Inspect hedgerow for gaps and carry replacement planting to maintain healthy stock and appearance	Once every 10 years

DEACON DESIGN

Evergreen Species	Trim down foliage to 150 mm above ground	Once every two years in Spring
Large Specimens	DO NOT PRUNE	
Selective Thinning	Selectively remove 1/3rd of plants. Where possible select larger, mature and over developed individuals to encourage natural regeneration	Once every 3 years
Lift and split	Lift and split healthy stock periodically (in accordance with good horticultural principles) to maintain coverage	Every 2-4 years

Amenity Grass

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Watering	Area of high quality turf should be watered as required during period of prolonged dry weather	As required
Cutting - Bulbs in grassed Areas	Do not cut before flowering	Intervals between end of flowering and start of grass cutting to be agreed by landscape architect and maintenance contractor.
Cutting – all other areas	First Cut: Mow to just top grass (50-75mm)	Once during March
	Spring Cut: (50mm)	As required to maintain between 30-50mm
	Summer Cutting: (30mm)	As required to maintain between 30-50mm
	Late summer cutting: once a week (50mm)	Four times during September
	Autumn cutting: Once every two weeks (50-75mm)	Twice during October
Topdressing	Apply to a depth of 5-6mm	As required to maintain heath thatch in October / November
Scarifying	To a depth of 25mm	As required to maintain heath thatch in October / November
Fertilizer	Apply organic fertilizer at recommended rate	Twice a year Spring and Autumn

Bulb Planting in grass areas

ITEM	ACTIVITIES	SUGGESTED FREQUENCY
Establishment	- During flowering season, ensure area is NOT mown. - Mowing must only recommence when flowering stems have completely dried out and turned yellow.	
Watering	- During period of prolonged dry weather	As required
Fertilizer	- Apply organic fertilizer at recommended rate	Twice a year Spring and Autumn
Mowing regime	- Once flowering season over, and stems have completely dried out, mowing regime to continue as amenity lawns.	See amenity lawns

9 Monitoring and Ongoing Review

9.1 During the construction period a suitably qualified Landscape Architect and Ecologist, as Ecology Clerk of Works appointed by the developer - will monitor the success of the scheme implementation and ongoing maintenance of the works during Year 1. Thereafter a Landscape Manager or suitably qualified member of Eastleigh Borough Council's Open Space Team will be required to manage ongoing operations. This will ensure compliance and appropriate development of the scheme and remedial action is taken with regard to plant replacements and habitat creation.

9.2 Close monitoring of the environmental indicators, watering requirements and species identification will provide a clearer view of the actual performance of the landscape planting and will form a closer indicator of possible changes in management focus to respond to climate change.

9.3 The management objectives and maintenance prescriptions should be reviewed regularly and any refinements incorporated into an updated management plan for on-going medium and long-term management.

9.4 Methods and techniques identified in these documents will be updated where relevant to respond to updated best practices in landscape and ecological management.

9.5 The results of all any monitoring surveys/reports will feed back into the general management of the site, and management strategies will be altered where necessary to ensure the long-term objectives for the landscape and ecological planting is achieved.

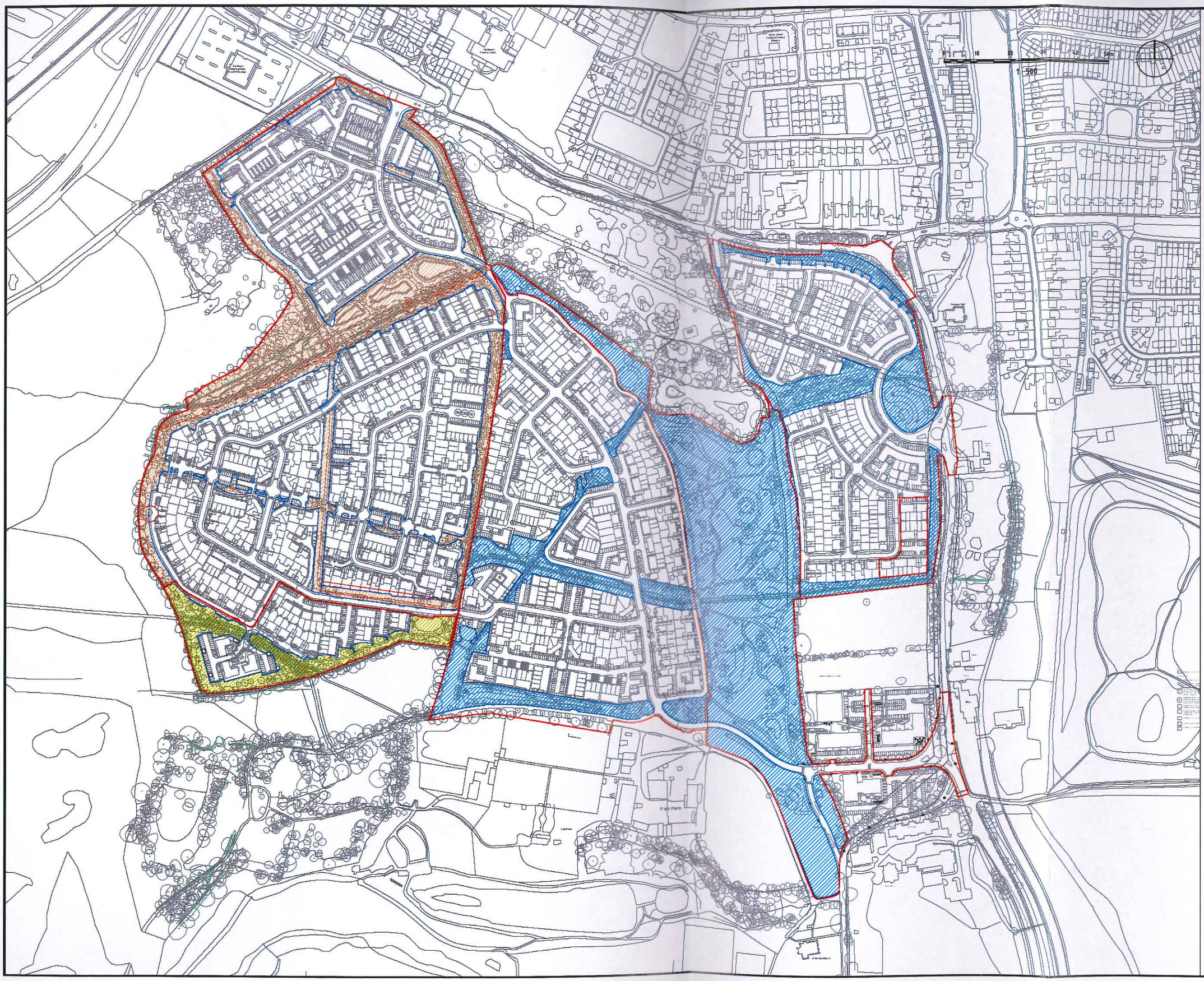
9.6 Where possible management undertaken in conjunction with local residents should be encouraged to instil a sense of ownership and value to the landscape.

10 Appendices

Refer to Latest Revision

- Appendix 1 - POS Adoption Plan - Drawing Ref: DD145.L31
- Appendix 2 - GI Strategy Plan - Drawing Ref: DD145.L44
- Appendix 3 - Nitrate Mitigation Location Plan Ref: DD145L59
- Appendix 4 - Nitrate Mitigation Planting Strategy Plan Ref: DD145L60
- Appendix 5 - Additional Nitrate Mitigation Planting Plan Ref: DD145L62
- Appendix 6 – Parcel 3A(1), 3A(2), 5A, Tree Planting & POS Planting Strategy Plans Ref: DD145L65 & L66

Appendix 1 - POS Adoption Plan - Drawing Ref: DD145.L31



NOTES:

1. This drawing is to be read in conjunction with all relevant contract drawings and specifications with any conflicting information to be brought to the attention of Deacon Design before works commence on site.

2. Do not scale from this drawing, always work to noted dimensions.

3. All given dimensions in mm.

KEY

- Application Boundary
- Stage 1 Area: 10.02 Ha
- Stage 2 Area: 4.49 Ha
- Stage 3 Area: 1.06 Ha

Total Open Space Area = 15.57 Ha

FINAL

DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER	CHECKED BY
11.12.20	PP	Stage 2 (Parcels N1,N2,N7 & N8) amended	G	PD
23.04.20	MM	Stage 1 amended southern SuDS area	F	PD
11.03.20	RH	Updated Stage 3 Layout	E	PD

DRAWING STATUS

FOR PLANNING

HIGHWOOD

DEACON DESIGN
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PROJECT TITLE:
North Stoneham Park
-

PROJECT NUMBER:	PLOT DATE:
DD145	18.07.17
DRAWING SCALE: 1:2000	APPROVED BY: PD
PAPER SIZE: A1	DRAWN BY: PP

DRAWING TITLE:
Public Open Space Adoption Plan
-
-

DRAWING NUMBER:	REVISION LETTER:
DD145L31	G

DRAWING FILE LOCATION:
2 Graphics\Deacon Design Ltd\02 PROJECTS\DD145\05 Stoneham Rd\04 Drawings\sub-cad\L4 and maps Dwgs\DD145L31 POS Adoption Plan.dwg

Appendix 2 - GI Strategy Plan - Drawing Ref: DD145.L44



KEY

- Phase 2 Reserved Matter Application
- New Link Roads
- Development Gateway to Chestnut Avenue
- Site of Importance to Nature Conservation (SINC) 15m buffer zones
- Existing watercourses enhanced to improve riparian habitats
- Wildlife Links & Connections
  - **Primary Routes** – Improve connectivity between Home Wood SINC and Chestnut Avenue meadow SINC
  - **Secondary Routes** – Enhanced hedgerow framework and wetlands (5m buffer zone / 8m on watercourses) to provide dark corridors for common and bat connectivity.
  - **Tertiary Routes** - Improved connectivity between Phase 1 and Home Wood for invertebrates and birds
- Pocket Park Locations / Stepping Stones to Home Wood
- Wildlife underpass to Spine Road - to maintain and enhance connectivity for reptiles and dormice
- Green Spaces / Landscape and Public open space character areas
  1. Willow Walk
  2. Home Wood approach
  3. Woodland Buffer / Greenways
  4. Kennel Copse (Phase 3)
- Transitional Landscapes / Residential Planting Strategy – Developable areas to include native and non-native species that together provides a seamless transition from the ecologically rich edges to the more urban streetscape. Emphasis on supporting seasonal interest, food for invertebrates / pollinators while providing identity to the streetscape and setting within the masterplan.
- Pedestrian / Cycle Connectivity
- Existing Cycleway
- Existing Pedestrian Network
- Proposed new Footway / Cycleway routes (connecting to existing network)
- Proposed Pedestrian Routes through Green Spaces
- Proposed Play Area Destinations
  Local Equipped Areas of Play (LEAP)

Notes:
All Residential Properties to within the required distances of 'natural' green space in compliance with ANGSt (both within and beyond the site boundary).

Eastleigh Borough Council GI4 Planning for Open Space, Sport and Recreation recommended distances:

- Amenity Space (Informal recreation) = 300m
- Play Area (0-12) = 600m
- Play Area (13-18) = 900m
- Country Park = 20Ha within 2km

This GI strategy plan demonstrates the desired extent, design, location and uses as agreed following consultation with statutory bodies, communities and other stakeholders

0 30 60 90 120 150m

1 : 1500

FOR PLANNING

DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER	CHECKED BY

HIGHWOOD
HIGHWOOD LAND LLP

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PROJECT TITLE
North Stoneham Park - Phase 2
Reserved Matters Application

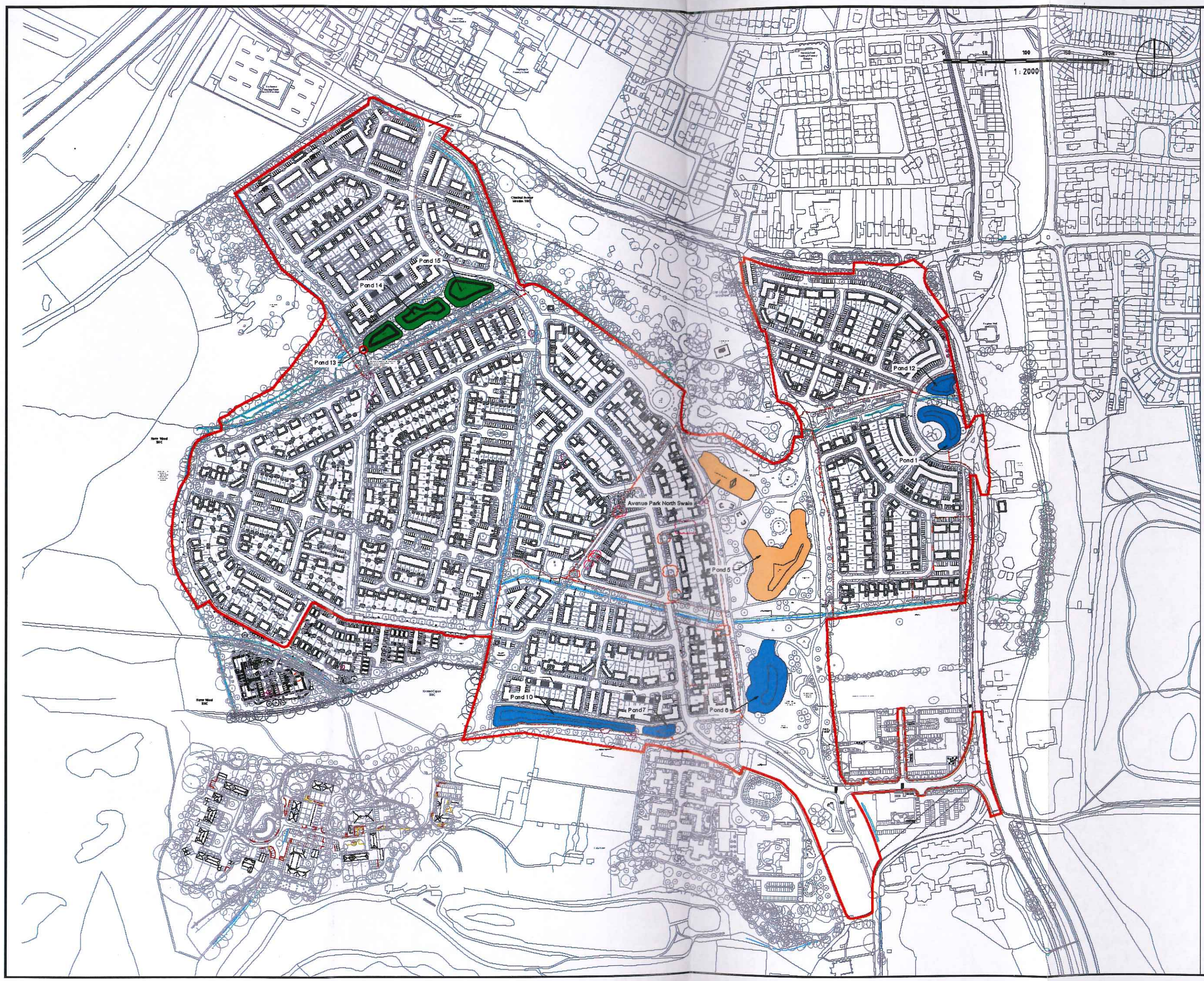
PROJECT NUMBER	PLOT DATE
DD145	24.07.17
DRAWING SCALE	APPROVED BY
1:1500	PD
PAPER SIZE	DRAWN BY
A1	PM

DRAWING TITLE
Green Infrastructure Strategy Plan
-
-

DRAWING NUMBER	REVISION LETTER
DD145L44	-

DRAWING FILE LOCATION
D:\Deacon Design Limited\400 PROJECTS\100-DD145 Stoneham Park\4-Drawings\Autocad\4-Landscape Dwgs\DD145L44 Phase 2 GI Strategy Planning

Appendix 3 - Nitrate Mitigation Location Plan Ref: DD145L59B



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KEY

Proposed SUDS Wetland Enhancements to support Nitrate Mitigation

- Phase 6+ 7 Ponds
- Avenue Park Pond and Swale
- Other Ponds to Support Nitrate Mitigation

FINAL

DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER	CHECKED BY
19/11/20	RH	Updated to client's comments	B	PD
28/11/20	RH	Additional Pond to Support Nitrate Mitigation	A	PD

DRAWING STATUS:
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PROJECT TITLE:
North Stoneham Park
Nitrate Mitigation Strategy

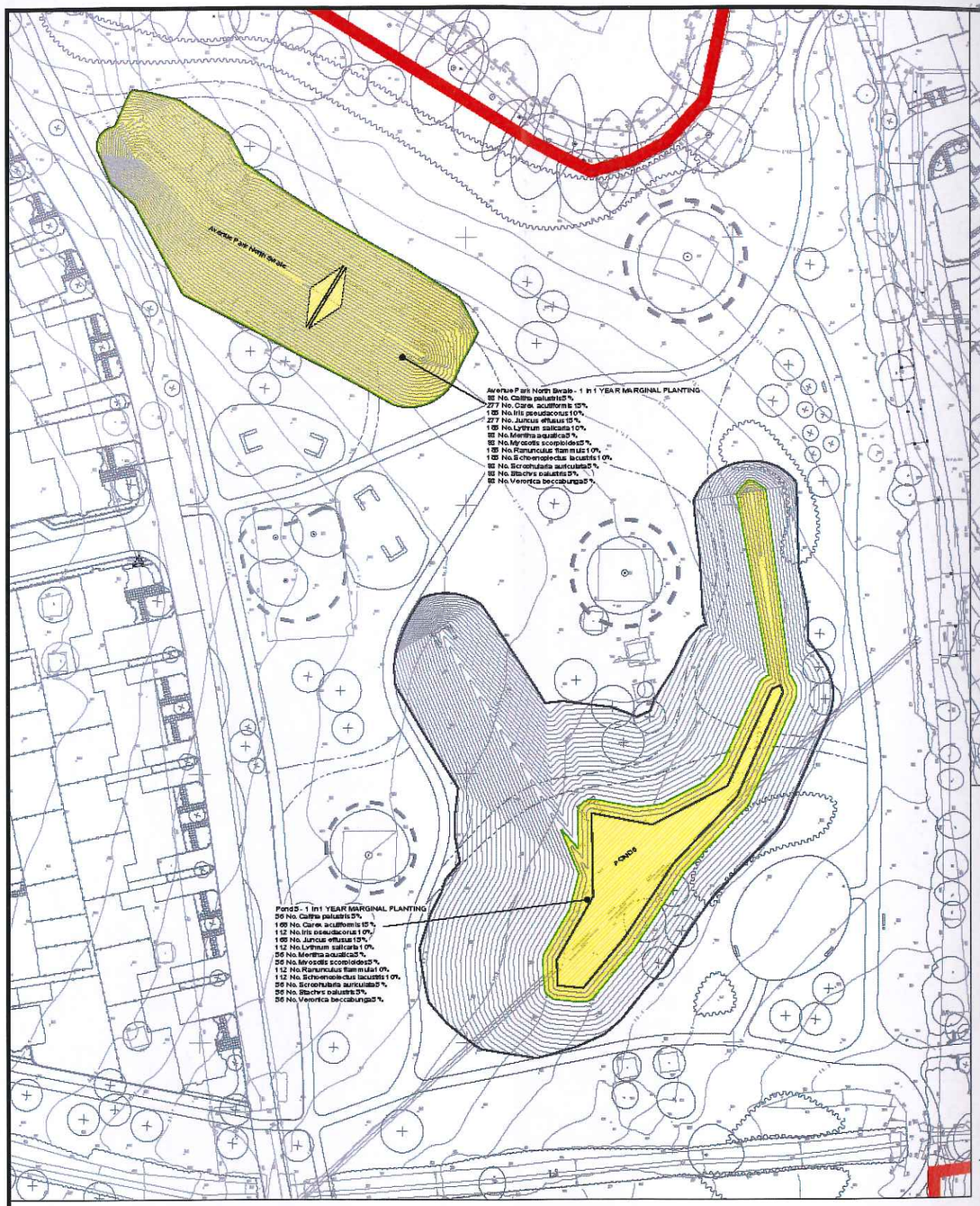
PROJECT NUMBER:	PLOT DATE:
DD145	27.05.20
DRAWING SCALE: 1:2000	APPROVED BY: PD
PAPER SIZE: A1	DRAWN BY: PD

DRAWING TITLE:
Mitigation Areas
Location Plan
-

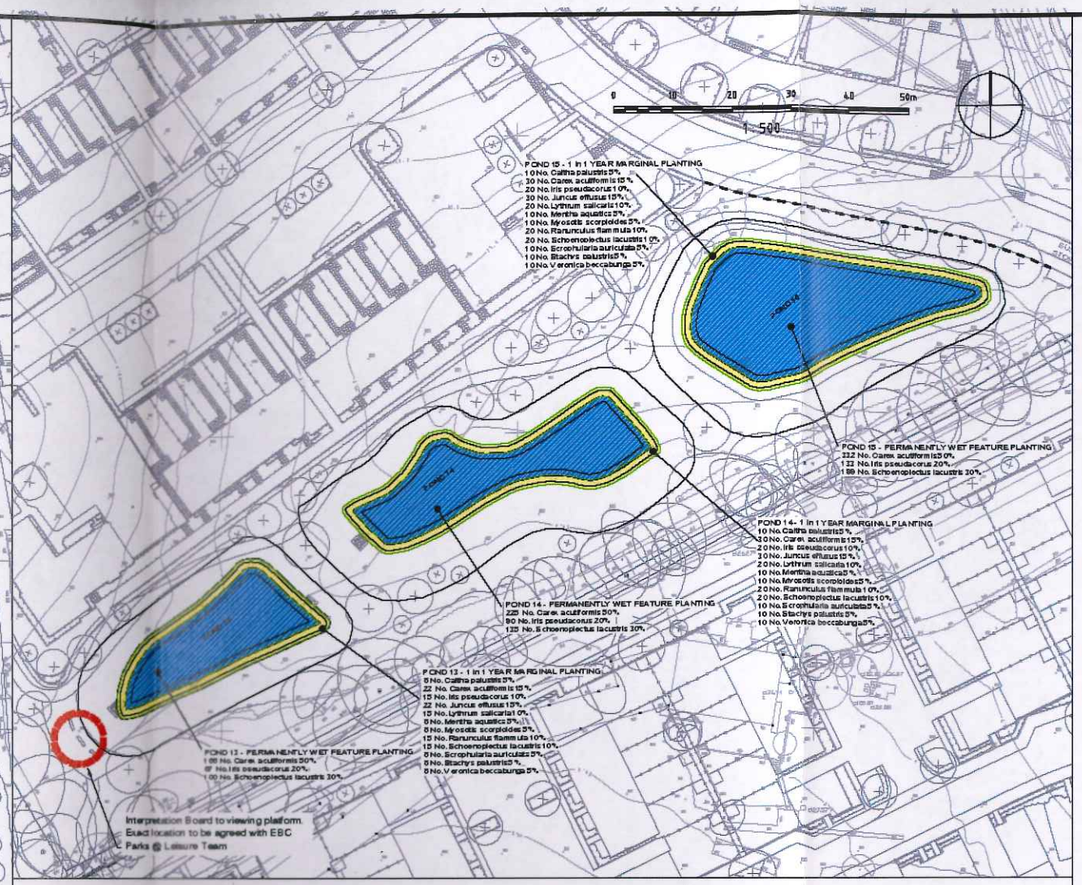
DRAWING NUMBER:	REVISION LETTER:
DD145L59	B

DRAWING FILE LOCATION:
Z:\Dropbox (Deacon Design Ltd)\5 PROJECTS\DD145 - Stoneham Park\04 Drawings\Illustrator\L-4. Landscape Design\DD145L59 - NSP Nitrate Mitigation Planning Strategy Plan PD.dwg

Appendix 4 - Nitrate Mitigation Planting Strategy Plan Ref: DD145L60B



01 L60 Avenue Park Mitigation Planting
1:500 @ A1



02 L60 Phase 6 & 7 Mitigation Planting
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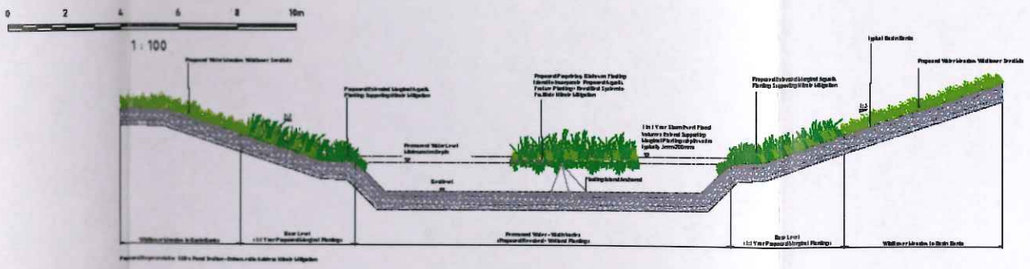

03 L60 Typical Mitigation Planting Section
1:100 @ A1

NOTES:

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KEY

Proposed SUDS Wetland Enhancements to support Nitrate Mitigation

Permanently Wet Feature Min 1 metre water depth incorporating Floating Island/ Reed Bed System. Anchored in accordance with manufacturer recommendations

1 in 1 year storm event flood volumes extend supporting marginal planting (depths varies typically 5mm-200mm)

Note: To be read in conjunction with DD145R03 Nitrate Mitigation Landscape Statement

FINAL

29.05.20	PD	Amends of Planting Mix following SSC Ecology + Natural England Interpretation Board added in viewing platform	B	PD
DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER	CHECKED BY

DRAWING STATUS:
FOR INFORMATION

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PROJECT TITLE:
North Stoneham Park
Nitrate Mitigation Strategy

PROJECT NUMBER: DD145	PLOT DATE: 29.05.20
DRAWING SCALE: AS_SHOWN	APPROVED BY: PD
PAPER SIZE: A1	DRAWN BY: PD

DRAWING TITLE:
Mitigation Areas
Proposed Planting Detail
-

DRAWING NUMBER: DD145L60	REVISION LETTER: B

DRAWING FILE LOCATION:
Z:\Deacon Design Ltd\03 PROJECTS\DD145\05 North Stoneham Park\04 Drawing Work\cad\4. Landscape Design\DD145-SK-06 NSP Nitrate Mitigation Planting Strategy Plan PD.dwg

04 L60 Mitigation Planting Palette

Planting Schedule

Wildflowers

No.	Seed Mix Name	Species Name	Common Name	Specification	Density Height
527 -		Carex acutiformis	Lesser Pond Sedge	Plug: Well Rooted	1/m²
723 -		Carex acutiformis	Lesser Pond Sedge	Pre Grown Floating Island Mix	1/m²
177 -		Mentha aquatica	Water Mint	Plug: Well Rooted	1/m²
352 -		Ranunculus flammula	Lesser Spearwort	Plug: Well Rooted	1/m²
352 -		Schoenoplectus lacustris	Common Club-rush	Plug: Well Rooted	1/m²
434 -		Schoenoplectus lacustris	Common Club-rush	Pre Grown Floating Island Mix	1/m²
177 -		Veronica beccabunga	Brooklime	Plug: Well Rooted	1/m²

Total 2742 -

Marginal / Aquatics

No.	Species Name	Common Name	Specification	Density Pot Size Height
177 -	Caltha palustris	Marsh marigold	Plug: Well Rooted	1/m²
352 -	Iris pseudacorus	Yellow Flag Iris	Plug: Well Rooted	1/m²
290 -	Iris pseudacorus	Yellow Flag Iris	Pre Grown Floating Island Mix	1/m²
527 -	Juncus effusus		Plug: Well Rooted	1/m²
352 -	Lythrum salicaria	Purple Loosestrife	Plug: Well Rooted	1/m²
177 -	Myosotis scorpioides		Plug: Well Rooted	1/m²
177 -	Scrophularia auriculata		Plug: Well Rooted	1/m²
177 -	Stachys palustris		Plug: Well Rooted	1/m²

Total 2229 -


Proposed Water Meadow Seed Mix

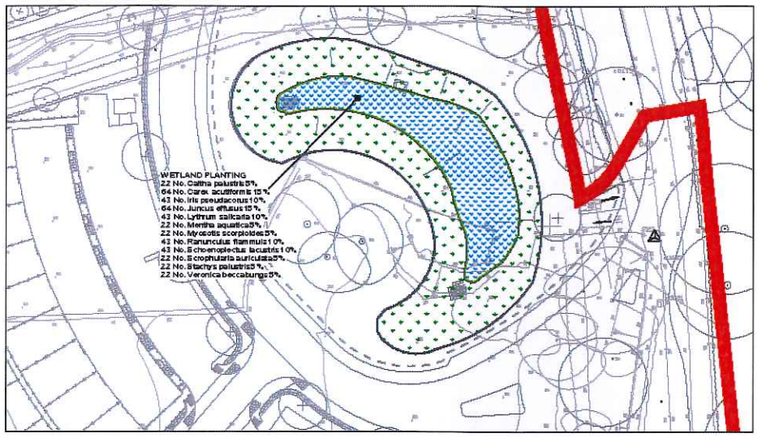

Proposed Marginal Aquatic Planting


Proposed Extended Wetland Pond Edge Planting

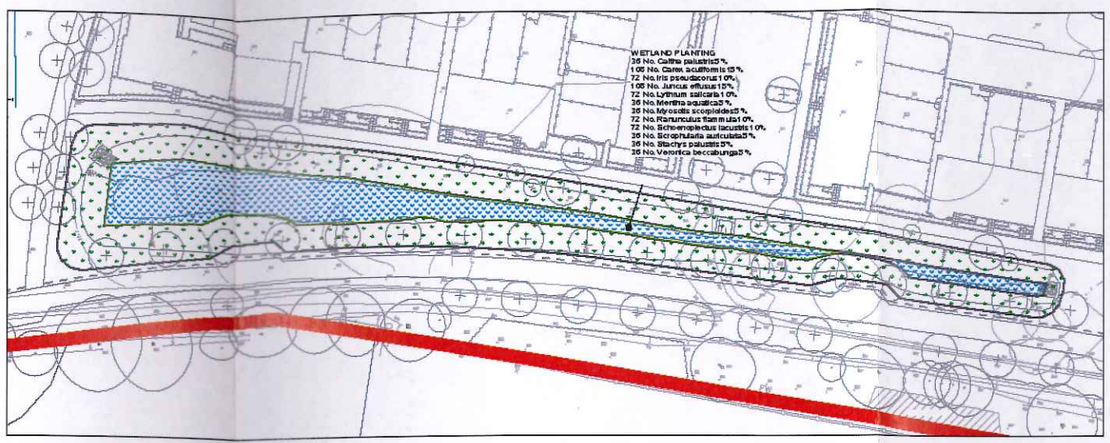

Proposed Reed Bed Planting


Proprietary Floating Island Aquatic Feature Planting

Appendix 5 - Additional Nitrate Mitigation Planting Plan Ref: DD145L62A



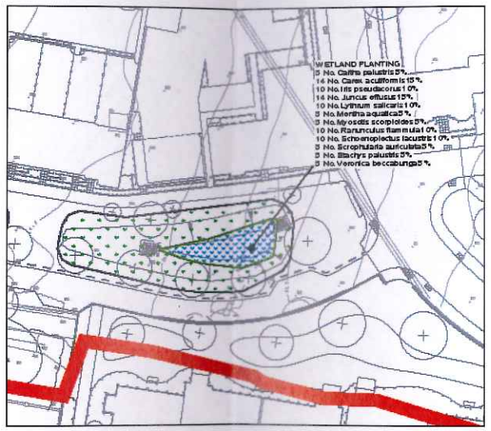
02 L61 Pond 1 Mitigation Planting
1:500 @ A1



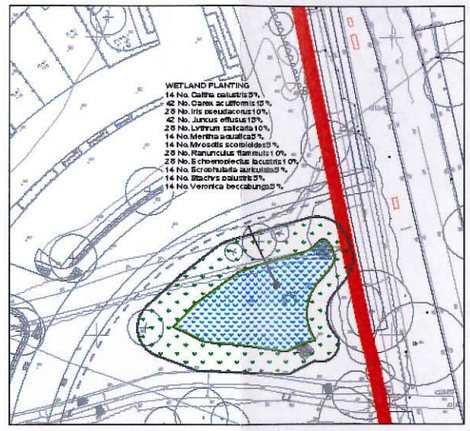
03 L61 Pond 10 Mitigation Planting
1:500 @ A1



01 L61 Pond 6 Mitigation Planting
1:500 @ A1



04 L61 Pond 7 Mitigation Planting
1:500 @ A1



05 L61 Pond 12 Mitigation Planting
1:500 @ A1

Planting Schedule

Wildflowers

No.	Seed Mix Name	Species Name	Common Name	Specification	Density
204-		Carex acutiformis	Lesser Pond Sedge	Plug: Well Rooted	1/m²
103-		Mentha aquatica	Water Mint	Plug: Well Rooted	1/m²
204-		Ranunculus flammula	Lesser Spearwort	Plug: Well Rooted	1/m²
204-		Schoenoplectus lacustris	Common Club-rush	Plug: Well Rooted	1/m²
103-		Veronica beccabunga	Brooklime	Plug: Well Rooted	1/m²

Total 918-

Marginal / Aquatics

No.	Species Name	Common Name	Specification	Density
103-	Caltha palustris	Marsh marigold	Plug: Well Rooted	1/m²
206-	Iris pseudacorus	Yellow Flag Iris	Plug: Well Rooted	1/m²
204-	Juncus effusus		Plug: Well Rooted	1/m²
206-	Lythrum salicaria	Purple Loosestrife	Plug: Well Rooted	1/m²
103-	Myosotis scorpioides		Plug: Well Rooted	1/m²
103-	Scrophularia auriculata		Plug: Well Rooted	1/m²
103-	Stachys palustris		Plug: Well Rooted	1/m²

Total 1124-



Proposed Reed Bed Planting



Proposed Wetland Pond Edge Planting



Proposed Water Meadow Seed Mix



Proposed Marginal Aquatic Planting

06 L61 Mitigation Planting Palette

0 10 20 30 40 50m
1:500

NOTES:

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2. Do not scale from this drawing, always work to noted dimensions.

3. All given dimensions in mm.

KEY

Proposed SUDS Wetland Enhancements to support Nitrate Mitigation

Proposed wetland planting to facilitate Nitrate Mitigation

Proposed wildflower meadow to basin banks Emorsgate EM8 - Meadow Mixture for Wetlands or similar and approved

Note: To be read in conjunction with DD145L59 Mitigation Areas Location Plan and DD145R03 Nitrate Mitigation Landscape Statement.

FINAL

DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER	CHECKED BY
23.12.21	PD	Amends of Planting Mix following EDC Ecology / Surrey Supply	A	PD

DRAWING STATUS
FOR PLANNING

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PROJECT TITLE:
North Stoneham Park
Nitrate Mitigation Strategy

PROJECT NUMBER:	PLOT DATE:
DD145	12.11.20
DRAWING SCALE: AS_SHOWN	APPROVED BY: PD
PAPER SIZE: A1	DRAWN BY: RH

DRAWING TITLE:
Additional Nitrate Planting Areas

DRAWING NUMBER:	REVISION LETTER:
DD145L62	A

DRAWING FILE LOCATION:
Z:\Projects\Deacon Design Ltd\03 PROJECTS\DD145\04 - Stoneham Park\04 - Drawing\Autocad\4.4 Landscape Dwgs\DD145L62 Additional Nitrate Mitigation Planting Strategy Plan PD.dwg

Site:	Stoneham SuDS
Client:	Highwood Group
Job Number:	784-B024778
Survey Type(s):	Nutrient Monitoring Protocol

INTRODUCTION

Tetra Tech were commissioned by Highwood Group to prepare a Nutrient Monitoring Protocol for the proposed wetland project at North Stoneham Park.

The Nutrient Monitoring Protocol will be undertaken by the Owner for the first 10 years from the first transfer of a piece of On-Site Open Space Land to the Council. Following the 10th anniversary of the date of transfer of the final Open Space Phase to the Council, the protocol will be undertaken by Eastleigh Borough Council. All results reported to the Council and Natural England on an annual basis.

The Protocol will be undertaken for 80 years following the first transfer of a piece of On-Site Open Space Land to the Council.

DETERMINANDS

FLOW

The water flow will be recorded by a device such as the Teledyne ISCO 2150 area velocity flow meter. The key consideration for sampling equipment is that it must be suitable for low-flow conditions. Meters typically take measurements every 15 minutes of water depth, velocity and total flow in metres per second. From these readings the total flow can be accurately calculated.

Flow readings will be taken at each designated sample location and recorded.

TOTAL NITROGEN

Water samples will be taken from each sample location and labelled.

Samples will then be sent to a suitable laboratory (such as NRM Laboratories) to measure total nitrogen only (sample containers are typically provided by the laboratory). Analytical reports will be returned by the laboratory giving a measurement of TN concentration for each sample point in mg/l.

SAMPLE FREQUENCY

Samples will be taken from all sample locations on a single day on a quarterly basis for the first five years following establishment (anticipated to commence January 2023).

Data will be reviewed following this period to assess the effectiveness of the wetland system. If it is determined that corrective action is required, this five-year monitoring period will be repeated to monitor the effectiveness of actions taken.

If data determines that the wetland system is operating as intended, the sample frequency will be reduced to annual samples taken every five years.

SAMPLE LOCATIONS

Sample locations are shown on Figure 1a-1b and detailed in Table 1.

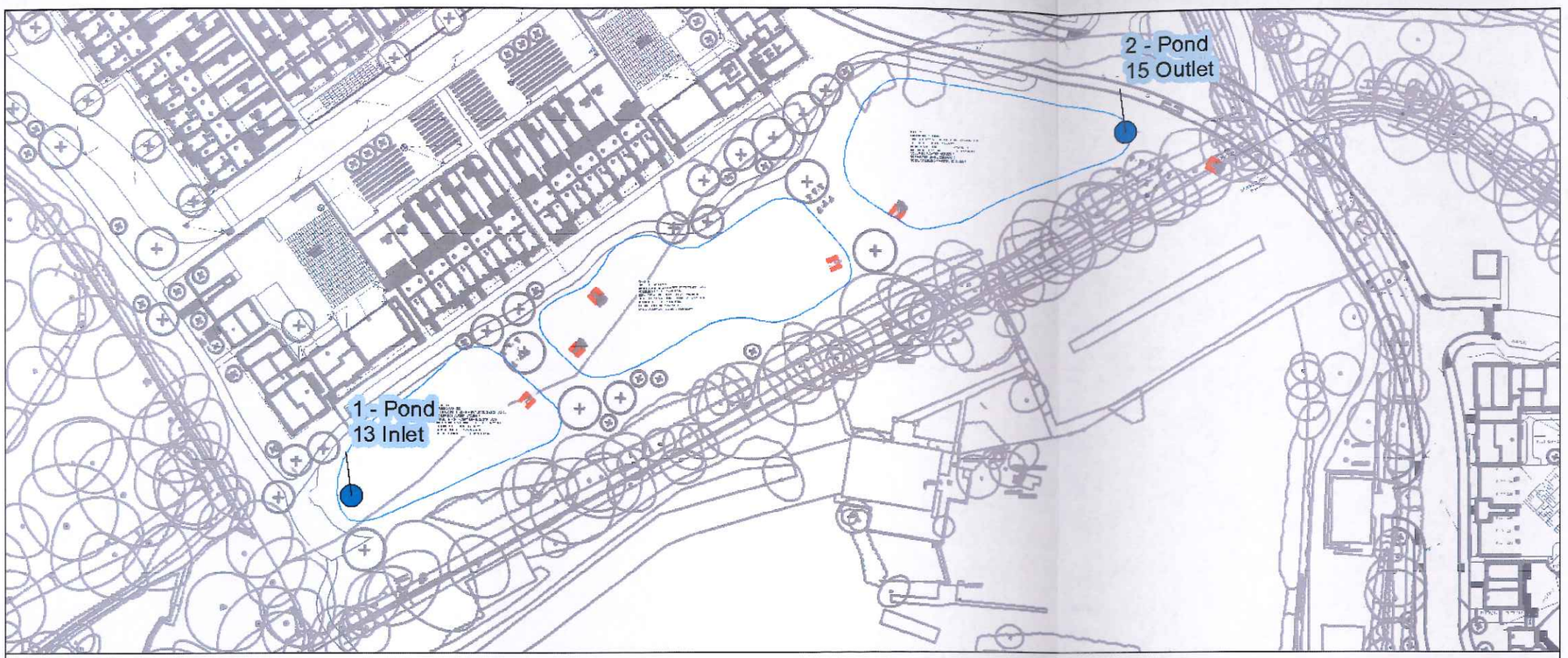
Table 1 Sample Locations and Descriptions

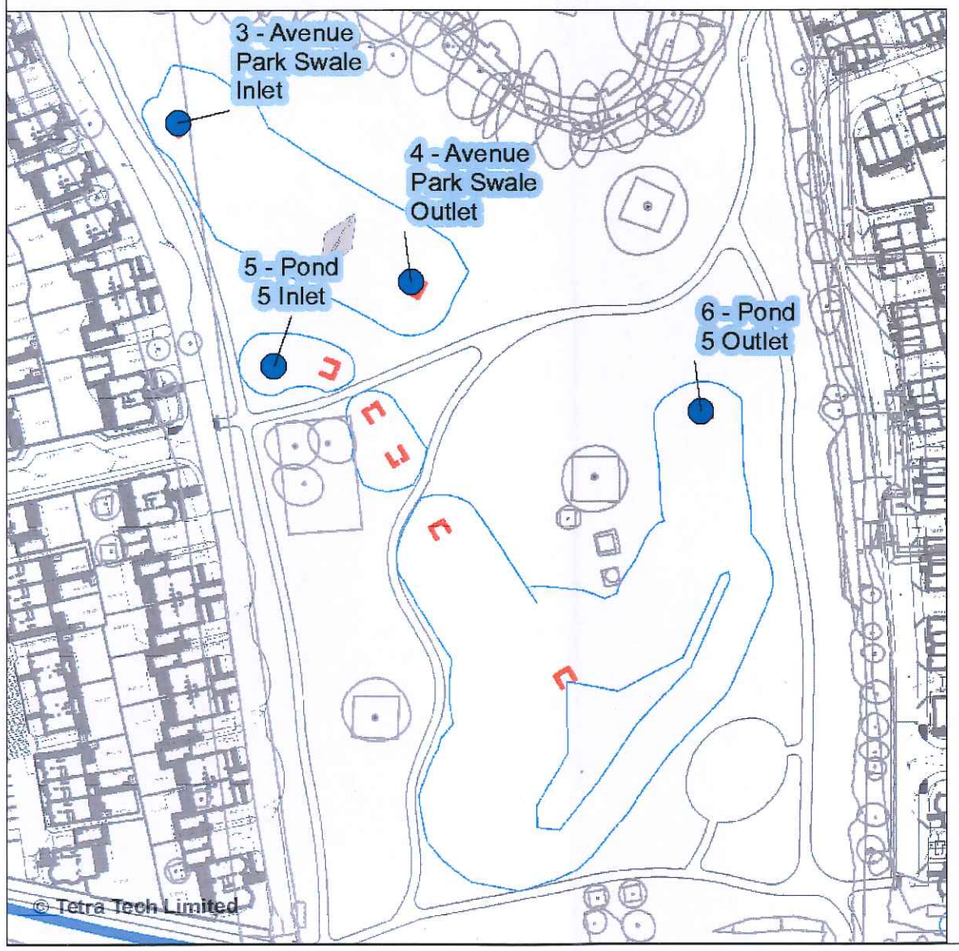
Sample Location	Description
1.	Pond 13 Inlet
2.	Pond 15 Outlet
3.	Avenue Park Swale Inlet
4.	Avenue Park Swale Outlet
5.	Pond 5 Inlet
6.	Pond 5 Outlet
7.	Pond 1 Inlet
8.	Pond 1 Outlet
9.	Pond 10 Inlet A (infiltration)
10.	Pond 10 Inlet B (infiltration)
11.	Pond 6 Inlet A (infiltration)
12.	Pond 6 Inlet B (infiltration)
13.	Pond 7 Inlet
14.	Pond 7 Outlet
15.	Pond 12 Inlet
16.	Pond 12 Outlet

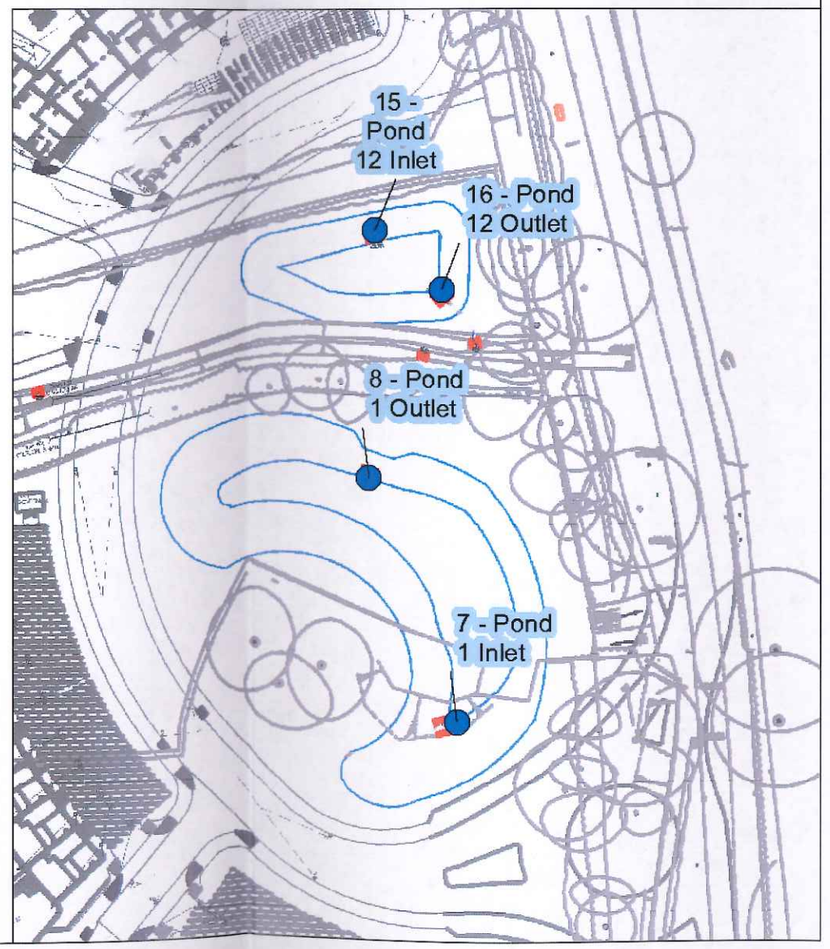
The majority of sample locations comprise inlet and outlet readings for individual features with the exception of Ponds 13 – 15 which are sampled as a group and Ponds 10 and 6 which are infiltration features with two inlets.

Document Control			
Revision:	**3**	**Status:**	**Final**
Date:	April 2021		
Prepared by: Emma Taylor		**Checked by** David West	**Approved By:** David West

Figure 1a – 1b: Sample Points







Sample Points

Stoneham

Highwood Group

Legend

- Sample points

Notes:

Drawn by: BB
Checked by:
Office: Southampton

Drawing No. 1a
Revision No. A

0 10 20 30 Meters
Scale 1:1,300 @A3

11 February 2021
NGR: 443953E 117839N

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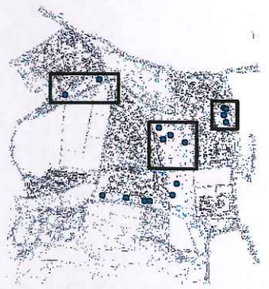

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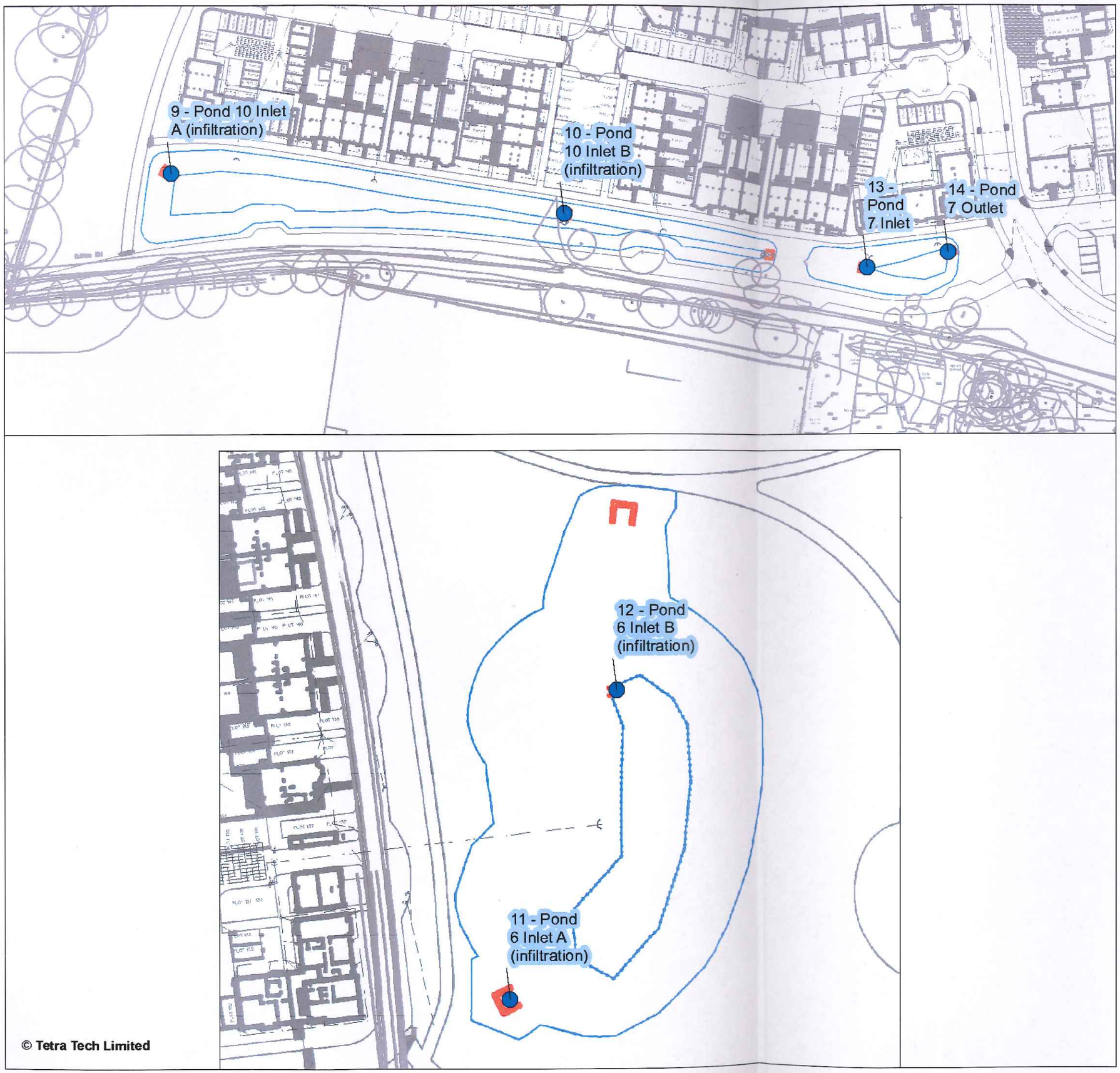

Sample Points

Stoneham

Highwood Group

Legend

- Sample points

Notes:

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Checked by:
Office: Southampton

Drawing No. 1b
Revision No. A

0 9 18 27 Meters
Scale 1:600 @A3

11 February 2021
NGR: 443957E 117660N

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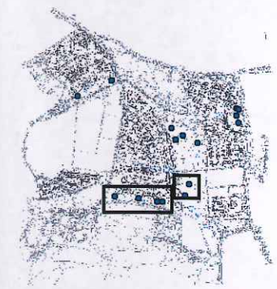

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Hampshire, SO30 2AF

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Nitrogen Strategy

Site:	CCRC, Park Farm, Stoneham
Client:	Highwood
Job Number:	A114741
Survey Type(s):	Nitrogen Strategy
Date of Report:	August 2020
File Location:	\\LDS-DC-VM-002\Group Ecology\Projects\Projects A114000 on\A114741 CCRC Stoneham\REPORTS

Introduction

WYG were appointed by Highwood in August 2020 to prepare a Nitrogen Strategy for the proposed CCRC, Stoneham development, to summarise the proposed options for nitrogen mitigation. This follows a request for further information from Eastleigh Borough Council and Test Valley Borough Council and is intended to sit alongside the Section 106 agreement.

This strategy sets out the proposed Section 106 obligations, and an overview of each nitrogen mitigation option along with principles for management, monitoring and security. Further details of each option are given in Appendices A – D along with location plans for each option.

Section 106 Agreement

Part 7 – Nitrogen Deposition Mitigation of the Section 106 Agreement states:

7. The First Owner and the Second Owner covenant with Eastleigh and Test Valley:

7.1 No later than three months following Commencement of Development to pay the Nitrogen Mitigation Monitoring Contribution to Eastleigh.

7.2 Prior to first Occupation of the Development:

7.2.1 to implement and complete, to the reasonable satisfaction of Eastleigh and Test Valley, a scheme of measures to off-set nitrogen deposition arising from the Development for a period of at least 80 years as set out in the Nitrogen Mitigation Strategy; and

7.2.2 to submit to Eastleigh and Test Valley the Nitrogen Mitigation Management Plan.

7.3 Not to first Occupy the Development or any part thereof until the requirements of paragraph 7.2.1 above have been complied with.

7.4 Not to Occupy the Development or any part thereof until Eastleigh and Test Valley have both approved in writing the Nitrogen Mitigation Management Plan submitted pursuant to paragraph 7.2.2 above.

7.5 Following approval of the Nitrogen Mitigation Management Plan to implement and comply in full with the approved Nitrogen Mitigation Management Plan.

Management

It is intended that the land will be managed through non-intervention. For the first five years, natural regeneration will be allowed. Following the woodland planting (if required) further management is not anticipated to be required. Although some trees will likely fail the woodland will reach a natural density of mature specimens as dictated by nutrient availability and ground conditions. Full details of the management proposals will be set out in a management plan which will be submitted to and approved by the LPA in accordance with the provisions of the Section 106 agreement.

Monitoring

For Years 1 – 5, an annual monitoring check is proposed to confirm that there have been no agricultural operations within the offsetting land. Following the woodland planting (if required), monitoring checks are proposed every five years to confirm the woodland remains.

No monitoring of the effectiveness of the mitigation in terms of nitrogen removal is required as the design follows Natural England guidance and therefore has a high confidence of success.

Security

As per the Section 106 Agreement, Highwood Homes Limited is obligated to maintain the mitigation land for a period of 80 years.

Option B – Stoneham SuDS

As per Para. 7. 1 of the Section 106 Agreement, Highwood Homes Limited has the option of providing alternative nitrogen mitigation measures prior to occupation. The first alternative option is the Stoneham SuDS scheme, which involves amendments to the approved surface water drainage strategy for the approved development at North Stoneham Park to introduce a nitrogen removal component. This includes new planting, including an innovative floating reedbed system in three of the deeper, permanently wet storage basins. This will reduce nitrogen in surface water discharge entering Monks Brook and subsequently the River Itchen to offset any increase from wastewater generated by the development.

Full details of this option, including location and area of offset are given in Appendix B.

Implementation

The implementation of the Stoneham SuDS scheme will be in accordance with amended plans to be submitted to and approved by Eastleigh Borough Council as a variation of condition application. These predominately relate to landscape and planting specifications.

Management

Management of the Stoneham SuDS scheme will be detailed and approved as part of the above application, and will be implemented by Eastleigh Borough Council.

The primary requirement of the management is the maintenance of riparian vegetation (including reeds) which will require a cutting regime (this is typically infrequent and takes place every 5 – 10 years).

7.6 Not to Occupy the Development or any part thereof until the owner of and any other person with a legal interest in the Chickenhall Lane Land or the Stoneham SUDs Land or the Attlee Acre Land (or any other land upon which any alternative nitrogen mitigation scheme is approved pursuant to the Nitrogen Mitigation Strategy) (as applicable) upon which or in connection with which any works or measures as set out in the Nitrogen Mitigation Strategy are to be delivered shall have entered into an agreement with both Eastleigh and Test Valley pursuant to s106 of the Act binding such land with an obligation or obligations to observe and perform the obligations set out in paragraph 7 of this Schedule 4 together with such other obligations as may reasonably be required by Eastleigh and Test Valley in order effectively to secure the implementation of such works and measures.

7.7 Without prejudice to any other legal remedy or redress which may be available to Eastleigh and Test Valley in the event that the First Owner and/or the Second Owner are in breach of their obligations set out in paragraph 7.1, 7.2, 7.3, 7.4, 7.5 or 7.6 (as applicable), Highwood Homes for itself only and not in its capacity as First Owner and Second Owner agrees that:

7.7.1 Eastleigh and/or Test Valley may serve written notification ("the Notice") on Highwood Homes setting out the details of the breach and requiring Highwood Homes to rectify such breach within the period stipulated in the Notice; and

7.7.2 in the event that Highwood Homes does not comply with the terms of the Notice within the period stipulated therein, Eastleigh and/or Test Valley (as applicable) may enter onto the relevant land and rectify the breach stipulated in the Notice; and

7.7.3 Eastleigh and/or Test Valley (as applicable) will be permitted to recover its costs in rectifying the said breach in full from Highwood Homes.

Option A – Chickenhall Lane Offset

As per Para. 7.1 of the Section 106 Agreement, Highwood Homes Limited must provide nitrogen mitigation measures prior to occupation. The default mitigation option for the development is offsetting at Chickenhall Lane by removing land from agricultural use. This will reduce nitrogen entering the River Itchen from agricultural operations to offset any increase from wastewater generated by the development.

Full details of this option, including location and area of offset are given in Appendix A.

Implementation

As agreed with Natural England, no additional measures beyond the cessation of agricultural operations is required for the first five years from implementation. Therefore the only actions required are the removal of agricultural operations. The offsetting land will be left to naturally regenerate from the existing seedbank, with no intervention (such as use of fertilisers).

Following Year 5, if the Chickenhall Wetland project has not been implemented, a woodland planting specification will be submitted to and approved by the local planning authorities. This will comprise native species of whip at a minimum density of 1000 trees per hectare, with associated tree stakes, guards etc.

In addition, it is intended that monitoring of TN concentration in surface water outfall will take place to improve the availability of data on the effectiveness of treatment wetlands.

Security

The implementation, management and monitoring of the Atlee Acre scheme will be secured through a Section 106 Agreement specific to that application.

Option D – Chickenhall Wetland

As per Para. 7. 1 of the Section 106 Agreement, Highwood Homes Limited has the option of providing alternative nitrogen mitigation measures prior to occupation. The third alternative option is the Chickenhall wetland scheme, which involves the creation of a new wetland east of the River Itchen. This will provide an additional stage of treatment to the wastewater outfall from Chickenhall Wastewater Treatment Works, removing nitrogen before outfalling to the River Itchen (as it does currently). This will be subject to a full planning application including engineering and planting details. This will reduce nitrogen in wastewater discharge entering the River Itchen to offset any increase from wastewater generated by the development.

Full details of this option are not yet available, the principles including initial nitrogen calculations are set out in Appendix D.

Implementation

The implementation of the Chickenhall Wetland scheme will be in accordance with plans to be submitted to and approved by Eastleigh Borough Council as part of a full planning application. These will include engineering and landscape details. Due to the size of the scheme, it is likely to be subject to Environmental Impact Assessment and will have significant input from Southern Water, Natural England and the Environment Agency.

Management

Management of the Chickenhall Wetland scheme will be detailed and approved as part of the above application, and will be implemented by the owner.

The primary requirement of the management is the maintenance of riparian vegetation (including reeds) which will require a cutting regime (this is typically infrequent and takes place every 5 – 10 years). Further requirements will include the management of infrastructure including pumping station and outfall.

Monitoring

Monitoring of the Chickenhall Wetland scheme will be detailed and approved as part of the above application. It is anticipated that this will comprise regular monitoring of the approved features at an agreed frequency to make sure that the treatment mechanism (in this case reedbeds and other vegetation) remains in a suitable condition to achieve the target level of TN removal.

In addition, it is intended that monitoring of TN concentration in surface water outfall will take place to improve the availability of data on the effectiveness of treatment wetlands.

It is also likely that further monitoring will be secured as part of the discharge permit which will be issued and enforced by the Environment Agency.

Monitoring

Monitoring of the Stoneham SuDS scheme will be detailed and approved as part of the above application. It is anticipated that this will comprise regular monitoring of the approved features at an agreed frequency to make sure that the treatment mechanism (in this case reedbeds and other vegetation) remains in a suitable condition to achieve the target level of TN removal.

In addition, it is intended that monitoring of TN concentration in surface water outfall will take place to improve the availability of data on the effectiveness of treatment wetlands.

Security

The implementation, management and monitoring of the Stoneham SuDS scheme will be secured through an amendment to the existing Section 106 Agreement, or other appropriate agreement, for North Stoneham Park.

Option C – Atlee Acre

As per Para. 7. 1 of the Section 106 Agreement, Highwood Homes Limited has the option of providing alternative nitrogen mitigation measures prior to occupation. The second alternative option is the Atlee Acre wetland scheme, which involves the creation of a new wetland immediately west of Monk's Brook. This will intercept surface water and remove nitrogen before discharging to the brook. This will be subject to a full planning application including engineering and planting details. This will reduce nitrogen in surface water discharge entering Monks Brook and subsequently the River Itchen to offset any increase from wastewater generated by the development.

Full details of this option are not yet available, a General Arrangement Plan is provided in Appendix C. Initial calculations prove that the Atlee Acre wetland will achieve, as a minimum, an offset of 282 kg/yr of TN required for the CCRC and in total approximately 292 kg/yr of TN removal (subject to final design).

Implementation

The implementation of the Atlee Acre scheme will be in accordance with plans to be submitted to and approved by Eastleigh Borough Council as part of a full planning application. These will include engineering and landscape details.

Management

Management of the Atlee Acre scheme will be detailed and approved as part of the above application, and will be implemented by the owner.

The primary requirement of the management is the maintenance of riparian vegetation (including reeds) which will require a cutting regime (this is typically infrequent and takes place every 5 – 10 years).

Monitoring

Monitoring of the Atlee Acre scheme will be detailed and approved as part of the above application. It is anticipated that this will comprise regular monitoring of the approved features at an agreed frequency to make sure that the treatment mechanism (in this case reedbeds and other vegetation) remains in a suitable condition to achieve the target level of TN removal.

Security

The implementation, management and monitoring of the Chickenhall Wetland scheme will be secured through a Section 106 Agreement specific to that application.

Alternative Options

In the event that further alternative options are identified which can be implemented (subject to the relevant consents), an amendment to this document will be issued along with an updated Appropriate Assessment.

Additional Measures

It is not considered that a mechanism to secure additional measures is required (should any of the above options fail to achieve the target level of nitrogen reduction).

Option A is fully in accordance with Natural England guidance and therefore meets the necessary test of reasonable scientific certainty under the Conservation of Habitats and Species Regulations 2017 (as amended).

The alternative options (B – D and any further alternative options which may be implementable in accordance with any updated Appropriate Assessment) are all subject to planning applications which will be subject to consultation with Natural England and approval by the local planning authority (Eastleigh Borough Council). Options B – D have been (or are being) designed in accordance with Natural England guidance on wetlands and will only be approved if there is sufficient certainty over the level of nitrogen removal targeted. Thereafter, each will be secured by legal agreement and it will be the responsibility of the owner or appointed management body (subject also to the step in rights in favour of Eastleigh Borough Council and Test Valley Borough Council provided by paragraph 7.2 of the Section 106 Agreement) to maintain the approved features.

Quality Control		
Version:	1	FINAL
Prepared by:	[redacted]	Ben Cooke **Project Ecologist**
Verified By:	[redacted]	David West **Associate Ecologist**

Version:	Date:	Updated by:	Verified by:	Description of changes:

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Appendix A Chickenhall Lane Offset

- The previous use of the site comprises existing urban area (1.42 ha) and lowland grazing (1.37 ha), the unmanaged woodland south of the site has been excluded from the calculations in accordance with Natural England guidance;
- The future area of urban land will be 2.79 ha;
- The habitat areas in the attached Land Use Plan (Appendix B) were used in the calculations.

Natural England's guidance states that areas not in agricultural use should be excluded from the calculations. In this case, none of the site is in current agricultural use, however the combination of woodland and grassland on site still contributes to nitrogen runoff (for example through atmospheric nitrogen deposition). According to Natural England, the 5.0 kg/TN/ha/yr figure for open space is the lowest applicable value (and includes atmospheric deposition). Therefore this has been used for the pre-development land use nitrogen value. Natural England have confirmed that this is appropriate and will be reflected in Version 3 of their calculator when it is published.

There is no Total Nitrogen (TN) discharge consent limit at Chickenhall WWTW. Natural England (2019) advise that where there is no discharge consent limit for TN, that best available evidence is used to determine a suitable discharge concentration to use in the calculator. It then advises that a precautionary value of 27.0 mg/l is applied. According to Natural England, this value can be reduced by 2.0 mg/l to account for existing background nitrogen levels in drinking water supplied to new dwellings. This gives an output concentration of 25 mg/l which has been used in this calculation.

The proposed development is a care village and as such the average 2.4 persons per dwelling figure used in Natural England's calculator is not appropriate. Occupancy figures have been provided by Cinnamon Retirement Living based on detailed occupation analysis across seven existing care villages. These figures are provided in Appendix G and give occupancy rates for each of the three dwelling types (extra care suites, care-assisted living apartments and care home beds). The figures also take into account the number of vacant units (net voids) in a calendar year in order to calculated accurate population figures. This calculation takes into account that at a certain number of units are expected to be vacant at any one time (due to deaths) and will be undergoing a process of renovation before being available for occupation again. The expected population calculations are given in Appendix A and conclude a total population of 216 across the three unit types.

Results and Summary

The calculations using the method in Appendix A for determining the nitrogen budget for the proposals are provided in Table 2. The workings are shown in Appendix B.

Table 1: Summary of the results

Current Land Use TN Load (A)	Waste water from Future Land Use TN Load (B)	Future Land Use TN Load (C)	Change (B+C-A)	Apply 20% Buffer
38.116 Kg/TN/yr	216.810 Kg/TN/yr	39.897 Kg/TN/yr	218.591 Kg/TN/yr	262.309 Kg/TN/yr

Site:	CCRC, Park Farm, Stoneham
Client:	Highwood
Job Number:	A114741
Survey Type(s):	Nutrient balancing assessment
Date of Report:	July 2020
File Location:	\\LDS-DC-VM-002\Group Ecology\Projects\Projects A114000 on\A114741 CCRC Stoneham\REPORTS

Introduction

WYG were appointed by Highwood in August 2019 to calculate the change in nutrient outputs from existing to future use as associated with the proposed development of the site.

The site comprises an industrial yard, an existing dwelling (the coach house) and an improved grassland field used for horse grazing.

The proposed development is a Continuing Care Retirement Community comprising 40 care bedrooms (with nursing and dementia care), 41 care suites (offering fully supported living) and 91 care apartments.

The calculations are required in response to recent consultation with Natural England on residential projects in the vicinity of the Solent following the findings of the Integrated Water Management Study for South Hampshire, published by the Partnership for Urban South Hampshire (PUSH)[1].

Due to the uncertainty over whether new development can be accommodated by existing wastewater treatment infrastructure without causing harm to coastal European sites, Natural England advise that all residential development should achieve nitrogen neutrality.

Methodology

To make the assessment, Version 4 of the Natural England Working Draft Methodology for calculating nitrogen budgets was used[2].

Assumptions

The assumptions used in this assessment are as follows:

- 110 litres of waste water will be generated per person per day;
- Waste water will be treated at Chickenhall Wastewater Treatment Works (WWTW);

[1] PUSH, (2018), *Integrated Water Management Study*, [online] Available at https://www.push.gov.uk/wp-content/uploads/2018/07/IWMS-Appendix-1.pdf, Accessed April 2019.
[2] Natural England, (2020), *Advice on Achieving Nutrient Neutrality for New Development in the Solent Region for Local Planning Authorities*.

Appendix A Workings for calculating population

Table 2 Population Forecast

Expected Population		Units	Gross Population Estimate	Net of Voids	Population Estimate Net of voids
Care Bed Occupancy expected at 97% singles	Care Beds	40	41	93%	38
Care Apartment Occupancy expected at 60% couples	Care Apartments	91	146	95%	138
Care Suite Occupancy expected at 15% couples	Care Suites	41	47	85%	40
	Total	**172**	**234**		**216**
Notes on expected average age when established:					
The occupation characteristics are based on the Cinnamon teams experience from operating 7 established Care Villages. Average age in the Care apartments there was 82 Average age in the Care Suites was 86 Average age in the Care Beds was 87					

The calculations show that, in the absence of mitigation, the development would result in an increase in nitrogen load of 262.309 Kg/TN/yr. It is therefore considered that the development would have the potential to result in Likely Significant Effects (LSE) on the Solent European Sites.

To avoid an adverse effect, it is proposed that an area of land adjacent to the River Itchen east of the Chickenhall WWTW is removed from agricultural use. This will result in a net reduction in Total Nitrogen within the River Itchen and subsequently the Solent.

The mitigation area is shown in Appendix C and comprises 8.41 ha of land which is currently in dairy production (it is used to grow silage for dairy cattle with a fertiliser application rate of 220 kg/ha of nitrate and 180 kg/ha of potash). The existing nitrogen output for this land is 304.442 Kg/TN/yr (36.2 Kg/TN/ha/yr x 8.41 ha). Once taken out of agricultural use the output will be 42.05 Kg/TN/yr (5.0 Kg/TN/ha/yr x 8.41 ha). This results in a reduction of 262.392 Kg/TN/yr which is sufficient to offset the 262.309 Kg/TN/yr produced as a result of the development. Therefore with the application of mitigation there will be no impact on the integrity of any of the Solent European sites as a result of nitrogen discharge.

Quality Control				
Version:	1	FINAL		
Prepared by:	[redacted]	Jonathan Jackson CEnv MCIEEM **Principal Ecologist**		
Verified By:	[redacted]	David West CEnv MCIEEM **Associate Ecologist**		

Version:	Date:	Updated by:	Verified by:	Description of changes:
2	July 20	DW	DW	Updated occupancy rates.

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Table 4 Calculating TN Load From Current Land use (Stage 2)

Step	Measurement	Farm type	Value	Unit	Explanation
1	Total area of existing land	Urban land	1.42	ha	Area of land lost to development
	Total area of existing land	Lowland grazing	1.37		
2	Land type nitrate loss.	Urban land	26.90	Kg/ha/yr	The existing dwelling and industrial yard are urban land and the field is lowland grazing.
	Land type nitrate loss.	Lowland grazing	13.00		
3	Multiply total area by land type nitrate loss	Urban land	20.316	Kg/TN/yr	Area x nitrate loss
	Multiply total area by land type nitrate loss	Lowland grazing	17.810		
TN Load - current land use (Kg/TN/yr)	38.116				

Table 5 Calculating TN Load From Future Land Uses (Stage 3)

Step	Measurement	Value	Unit	Explanation
1	Future urban land	2.790	ha	Area of development that will change from agricultural land to urban land use
2	Total nitrogen load from future urban area	39.897	Kg/TN/yr	area (ha) x 14.3 Kg/TN/yr (nitrogen leaching from urban land each year)

Appendix B Workings for calculating nitrogen change

Table 3 Calculating Total Nitrogen (TN) Load From Development Wastewater (Stage 1)

Step	Measurement	Value	Unit	Explanation
1	Additional population	216.000	Persons	Uses calculations in Appendix A
2	Wastewater volume generated by development	23760.000	L/day	Persons x 110 litres/day. Where relevant, deduct wastewater volume of population displaced by the proposed development.
3	TN discharge concentration	25.000	mg/l TN	27 mg/l default value with 2 mg/l reduction as per Natural England guidance.
4	TN discharged after WWTW	594000.000	mg/TN/day	Step 3 x Step 2
5	Convert mg/TN to kg/TN per day	0.594	Kg/TN/day	Divide by 1,000,000
6	Convert kg/TN per day to kg/TN per year	216.810	Kg/TN/yr	x365 days
TN Load wastewater (Kg/TN/yr)	216.810			

Appendix C Mitigation Area Plan

Nutrient Balancing Assessment

Step	Measurement	Value	Unit	Explanation
3	New SANG / open space	0.000	ha	Area of development that will change from agricultural land to SANG / open space
4	TN load from SANG / open space	5.000	Kg/TN/yr	area (ha) x 5.0 (nitrogen leaching from SANG / open space each year)
7	Combine TN load from future land uses	39.897	Kg/TN/yr	
TN Load - future land use (Kg/TN/yr)	39.897			

Table 6 Calculating Net Change in TN From The Development (Stage 5)

Step	Measurement	Value	Unit	Explanation
1	Identify TN loads from wastewater	216.810	Kg/TN/yr	(Stage 1)
2	Calculate TN from land use - subtract TN load from future land uses (Stage 3) from existing land uses (Stage 2)	-1.781	Kg/TN/yr	(Stage 2 - Stage 3)
3	Determine nitrogen budget - the difference between the TN load for the proposed development and the existing uses	218.591	Kg/TN/yr	(Step 1 - Step 2)
4	Calculate and include 20% buffer	262.309	Kg/TN/yr	Step 3 + (Step 3 / 5)
TN Budget (Kg/TN/yr)	262.309			



Rev	Date	Notes
A	23/07/20	Initial map production

Legend

CCRC Mitigation Area

Silage

0 25 50 100 Metres

N

Nitrate Areas

Land East of Chickenhall
Highwood

Scale at A3:	Project No:	Drawing No:	Revision:
1:1,750	E9301	Figure 2	A

Drawn by:	Drawn date:	Approved by:
Maddie Errington	23/07/2020	Dave West

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Nitrogen Assessment

Site:	North Stoneham
Client:	Highwood Group
Job Number:	A114743
File Location:	I:\Projects\Projects A114000 on\A114743 Chestnut Avenue\REPORTS\

Introduction

Calculations for nutrient balancing are required in response to recent consultation with Natural England on residential projects in the vicinity of the Solent following the findings of the Integrated Water Management Study for South Hampshire, published by the Partnership for Urban South Hampshire (PUSH)[1].

Due to the uncertainty over whether new development can be accommodated by existing wastewater treatment infrastructure without causing harm to coastal European sites, Natural England advise that all residential development should achieve nitrogen neutrality.

North Stoneham Park (previously Land South of Chestnut Avenue) is a residential development of 1157 dwellings consented under permission O/15/76023 (and subsequent permissions R/17/79892, RM/17/81168, RM/18/84537, F/17/81165 and F/17/81167). The development includes large areas of open space and an extensive Sustainable Drainage System (SuDS). The SuDS was a key component of the development to prevent harmful pollutants or sediment in surface water runoff from entering the nearby Monks Brook which flows into the River Itchen Special Area of Conservation (SAC). When the applications were determined, nitrogen neutrality was not a consideration and nitrogen outputs from the development were not considered to represent a pathway to a likely significant effect within the Appropriate Assessment undertaken by the competent authority.

Given the size of the North Stoneham Park development, and extensive SuDS network, there is an opportunity to redesign elements of the system to create suitable wetland features (such as reedbeds) for removing nitrogen from surface water runoff. This capacity could then be used to offset nitrogen outputs from new development within the borough. This assessment assesses the SuDS features on site and calculates the potential capacity for nitrogen removal.

SuDS Network

The approved SuDS network for the site is shown in Appendix A. This comprises 18 wetland features as summarised in Table 1.

Table 1 North Stoneham Park SuDS Features

Feature Name	Infiltration
Pond 13 (Phase 6&7)*	No
Pond 14 (Phase 6&7)*	No
Pond 15 (Phase 6&7)*	No

[1] PUSH, (2018), *Integrated Water Management Study*, [online] Available at https://www.push.gov.uk/wp-content/uploads/2018/07/IWMS-Appendix-1.pdf, Accessed March2020.

Appendix B Stoneham SuDS

Avenue Park North Swale	No
Pond 5	No
Pond 1	Yes
Pond 10	Yes
Pond 7	Yes
Pond 6	Yes
Pond 4	No
Pond 3	No
Pond 2	No
Pond 12	Yes
Pond 11	No
Pond 14	No
Pond 8	No
Pond 9	No
Pond 13	No

As per Table 1, Ponds 1, 10, 7, 6 and 12 are designed to act as infiltration features, where all other features store and convey surface water. Although measures to improve nitrogen removal from infiltration basins are likely to have some benefit, there are a number of additional complications which would need to be considered. Firstly is the infiltration basins will not retain water during drier conditions as by design they have a permeable base. Secondly, the pathway by which groundwater reaches the European sites which are at risk from nitrogen outputs is much less clear than direct surface water connections. Therefore it would be extremely challenging to prove with sufficient certainty that additional nitrogen removal could be used to offset additional impacts elsewhere. For these reasons, the infiltration features have not been considered within this assessment.

Wetland Performance

A detailed study of wetlands was completed by Land et al. in 2016[2], covering 5853 records (this is referenced in Natural England's March 2020 methodology[3]). This study concludes a mean nitrogen removal efficiency of 37%. Following discussions and a meeting held on 30th September 2019, Natural England recommended that a nitrogen removal rate of 200-300 g/m^2/yr was used in the calculations. In order to take a suitably precautionary approach (as explained above) the lower value of 200 g/m^2/yr has been used. An inlet TN concentration of 3.0 mg/l in accordance with Appendix 4 of the Natural England guidance.

[2] Land, M., Graneli, W., Grimvall, A., Hoffmann, C. C., Mitsch, W. J., Tonderski, K. S., and Verhoeven, J. T. A., (2016), *How effective are created or restored freshwater wetlands for nitrogen and phosphorus removal? A systematic review.* Environmental Evidence (2016) 5:9.
[3] Natural England, (2020), *Advice on Achieving Nutrient Neutrality for New Development in the Solent Region for Local Planning Authorities.*

As the SuDS network at North Stoneham Park was originally designed to control and treat surface and storm water flows, they have been sized to account for a much higher level of flow than is typical (1 in 100 storm plus climate change). To make sure that the assessment is suitably precautionary, the engineers (Odyssey) have provided both 1 in 1 flow rates (i.e. each year) for the features and the surface area of each feature which accommodates this level of water.

The key inputs are therefore:

- Inlet TN Concentration – 3.0 mg/l;
- TN Removal Rate – 200 g/m^2/yr;
- TN Removal Efficiency – 37%;
- 1 in 1 flow (provided by Odyssey) and
- Wetland Area (provided by Odyssey).

The flow rates, wetland areas and calculations to predict the annual nitrogen removal performed by the features is shown in Table 2 below.

Table 2 Nitrogen Removal Calculations

Pond Name	Inflow 1 in 1 (l/s)	Outflow 1 in 1 (l/s)	Inflow 1 in 1 (l/yr)	Outflow 1 in 1 (l/yr)	TN (mg/l)	TN in outflow (mg/yr)	TN (kg/yr)	TN Removed (37% rate)	Area (m2)	Removal Rate (g/m2)	Max Removal (kg)
Pond 13 (Phase 6&7)*	135	48.6	4257360000	1532649600	3	4597948800	4597.949	1701.241056	477	200	95.4
Pond 14 (Phase 6&7)*	53.1	27	1674561600	851472000	3	2554416000	2554.416	945.13392	978	200	195.6
Pond 15 (Phase 6&7)*	27.2	18.1	857779200	570801600	3	1712404800	1712.405	633.589776	857	200	171.4
Avenue Park North Swale	57	36.9	1797552000	1163678400	3	3491035200	3491.035	1291.683024	600	200	120
Pond 5	129.1	47.8	4071297600	1507420800	3	4522262400	4522.262	1673.237088	1320	200	264
Pond 4	6	1	189216000	31536000	3	94608000	94.608	35.00496	150	200	30
Pond 3	23.2	1	731635200	31536000	3	94608000	94.608	35.00496	226	200	45.2
Pond 2	1.4	1	44150400	31536000	3	94608000	94.608	35.00496	111	200	22.2
Pond 11	28.5	5	898776000	157680000	3	473040000	473.04	175.0248	206	200	41.2
Pond 14	7.8	3	245980800	94608000	3	283824000	283.824	105.01488	16	200	3.2
Pond 8	4	3	126144000	94608000	3	283824000	283.824	105.01488	25	200	5
Pond 9	37.2	23.4	1173139200	737942400	3	2213827200	2213.827	819.116064	65	200	13
Pond 13	27.3	7	860932800	220752000	3	662256000	662.256	245.03472	45	200	9

Table 2 shows that the most significant potential for nitrogen removal is from Ponds 13, 14, 15 (Phase 6 & 7), the Avenue Park North Swale, and Pond 5. These five features have therefore been selected to enhance to maximise the potential for nitrogen removal.

Proposed enhancements have been provided by Deacon Design and are included in Appendix B. With the addition of suitable wetland vegetation to meet the target TN removal rate of 37%, the enhancement of these five features should remove up to 846.40 kg/yr of Total Nitrogen from the surface water entering Monks Brook, and subsequently the River Itchen and Solent European sites. Table 2 also demonstrates that there are more than sufficient levels of nitrogen passing through the features to have confidence in the predicted nitrogen removal performance. Indeed the potential amount of nitrogen which could be removed (assuming 37% efficiency) is much higher (e.g. up to 1,701 kg/yr for Pond 13) but the performance is limited by the size of the features.

One further consideration is the baseline condition as per the approved design of the SuDS network. Although this was not designed for nitrogen removal it did include an element of wetland planting for landscape and biodiversity which would provide some nitrogen removal. From consultation with Deacon Design it was confirmed that this comprised 120m^2 of Coir Rolls across Ponds 13, 14 and 15 (Drawing DD179L15). These are biodegradable mats pre-planted with marginal aquatic vegetation to provide quick establishment. The species mix includes suitable species for nitrogen removal such as common reed *Phragmites australis* and it is therefore assumed that the approved planting could reach a comparable efficiency of 37%. This would therefore achieve approximately 24 kg/yr TN removal and this should be deducted from the total TN removal predicted in Table 2.

Summary

It is proposed that existing wetland features created as part of the North Stoneham Park development are enhanced with a wetland planting scheme. This will create wetland features capable of removing nitrogen from surface water which is discharged into Monks Brook (and subsequently the River Itchen and Solent European Sites). Five features have been targeted to enhance in this manner and it has been calculated that they should achieve a reduction in Total Nitrogen of 822.40 kg/yr. This figure accounts for wetland planting which is already included within the approved scheme (to avoid double-counting and be sure of a precautionary approach).

Quality Control		
Version:	1	FINAL
Prepared by:	[redacted]	Ben Cooke **Project Ecologist**
Verified By:		David West CEnv MCIEEM **Associate Ecologist**

Version:	Date:	Updated by:	Verified by:	Description of changes:

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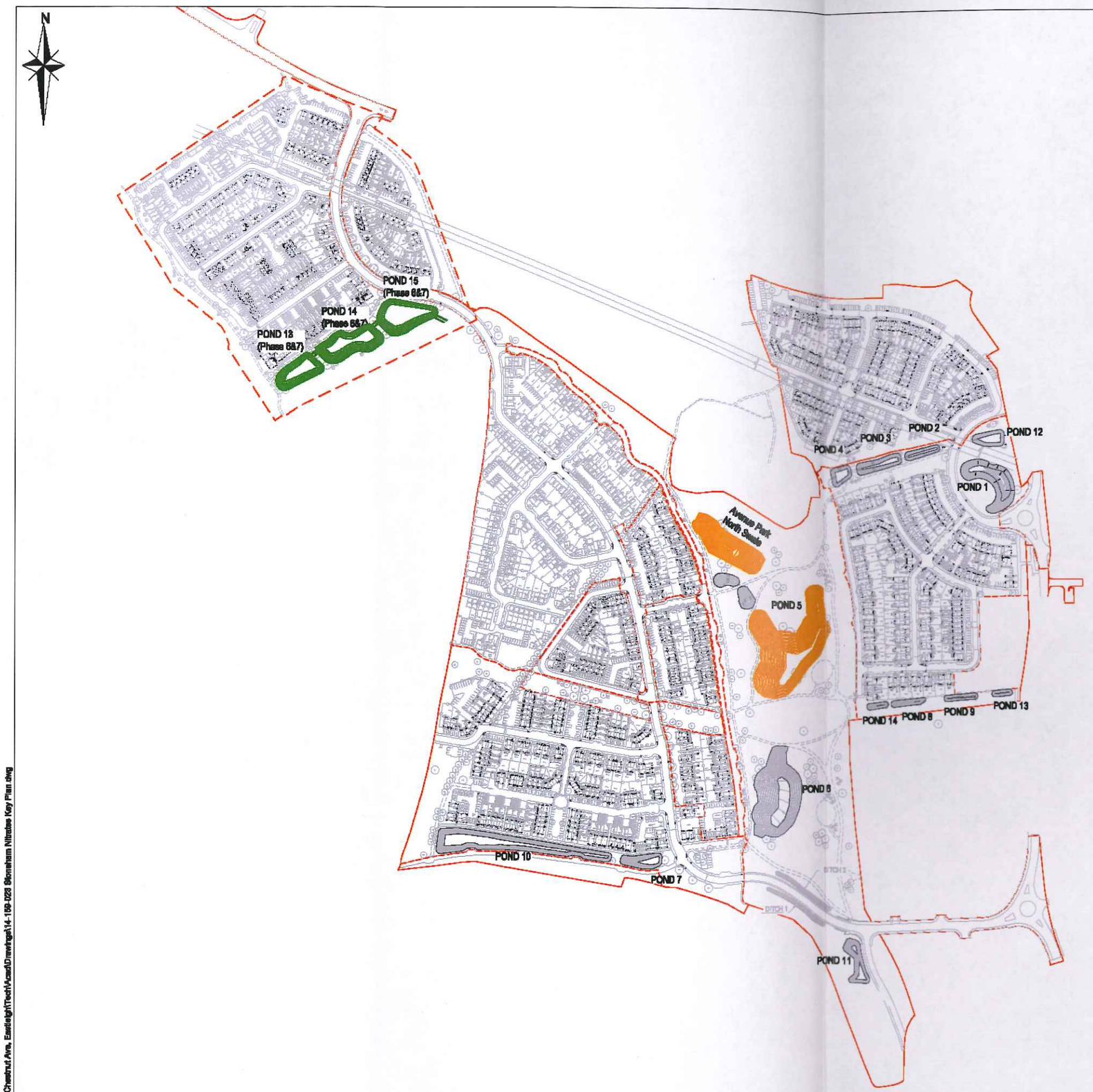
Appendix A SuDS Network



NOTES

1. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.

FOR INFORMATION PURPOSES ONLY

Rev	Amendments	Drn	Chk	App	Date
A	SCHEDULE ADDED	GC	NT	BAC	27.03.20

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Job Title
STONEHAM,LAND AT CHESTNUT AVE. EASTLEIGH

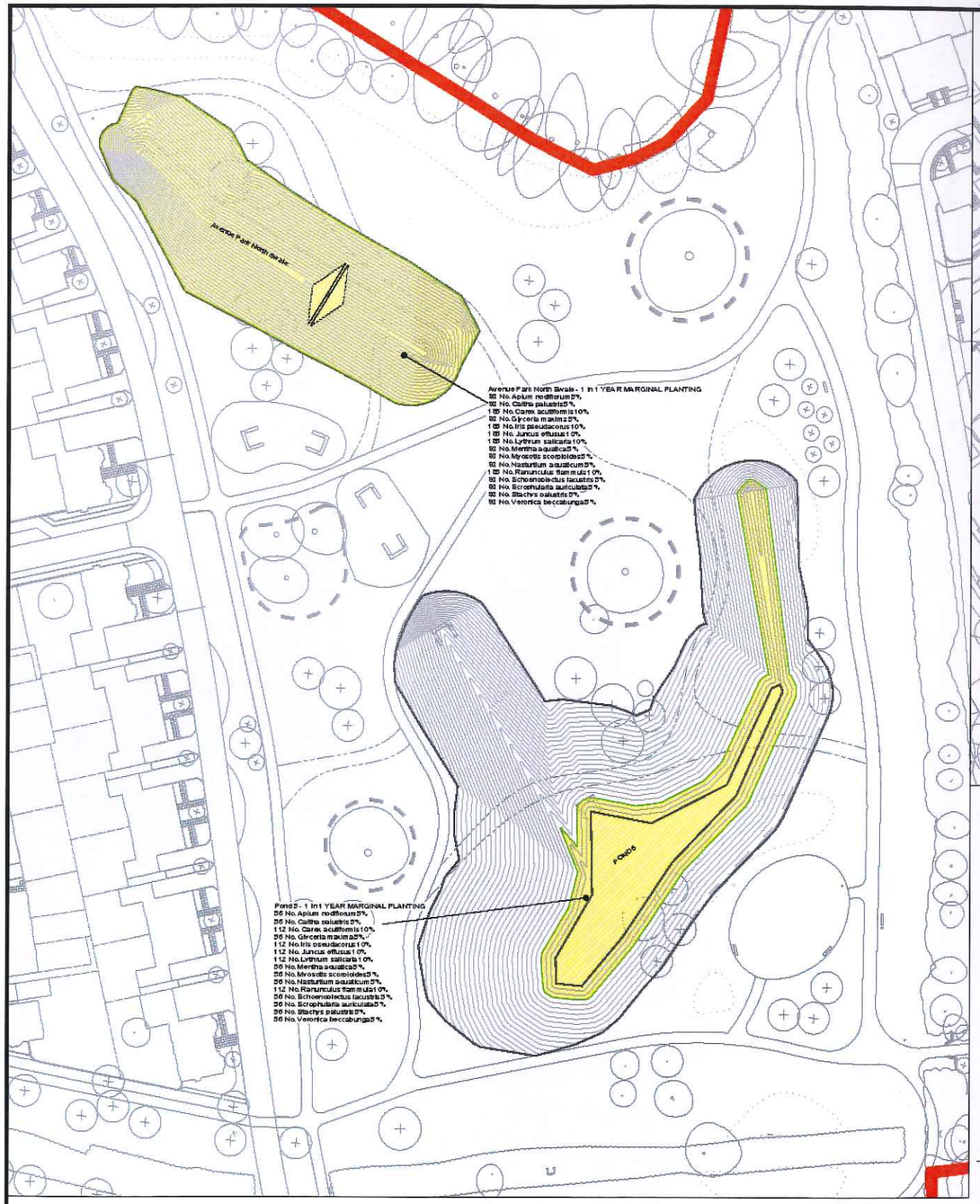
Drawing Title
STONEHAM NITRATES KEY PLAN

Client
HIGHWOOD CONSTRUCTION

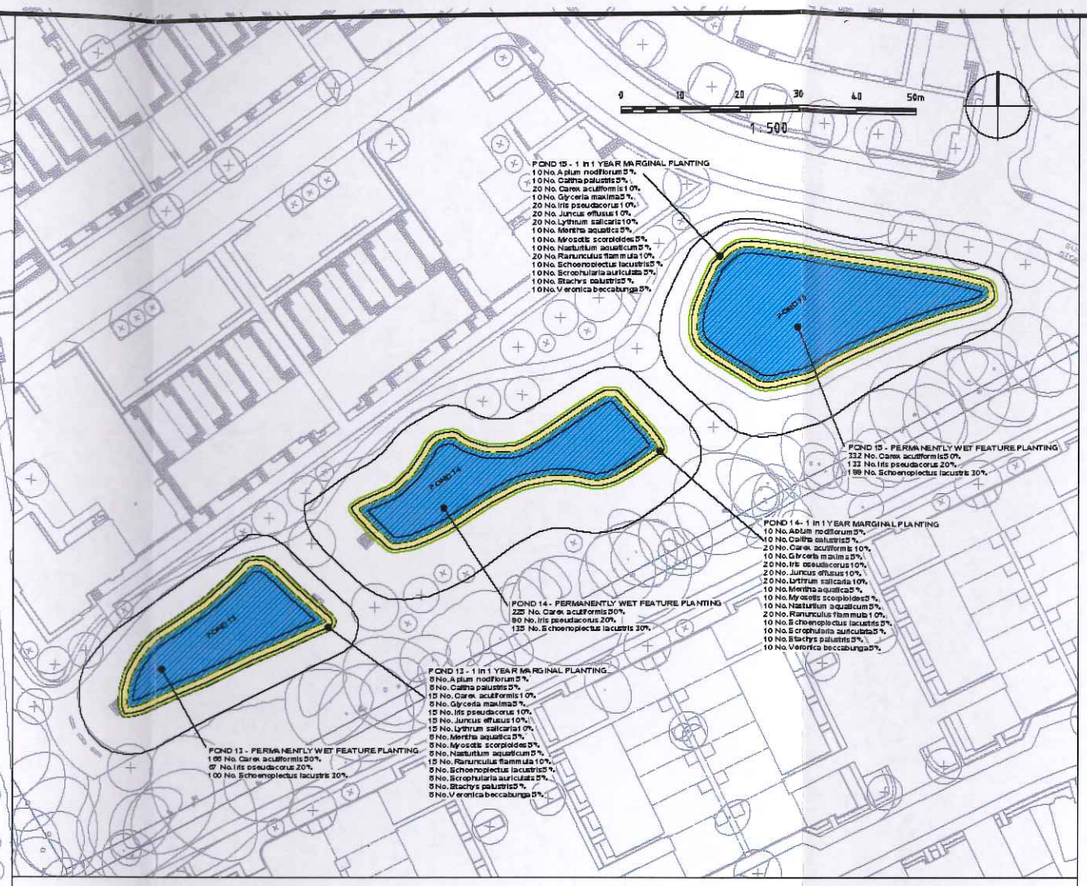
Scale	Date	Designed
1:2000 @A1	MAY 2020	NT
Drawn	Checked	Approved
NT	NT	BAC
Job No	Drawing No	Rev
14-159	14-159-023	

N:\14-159 - Land at Chestnut Ave, Eastleigh\Tech\Acad\Drawings\14-159-023 Stoneham Nitrates Key Plan.dwg

Appendix B Wetland Planting Proposals



01 L60 Avenue Park Mitigation Planting
1:500 @ A1



02 L60 Phase 6 & 7 Mitigation Planting
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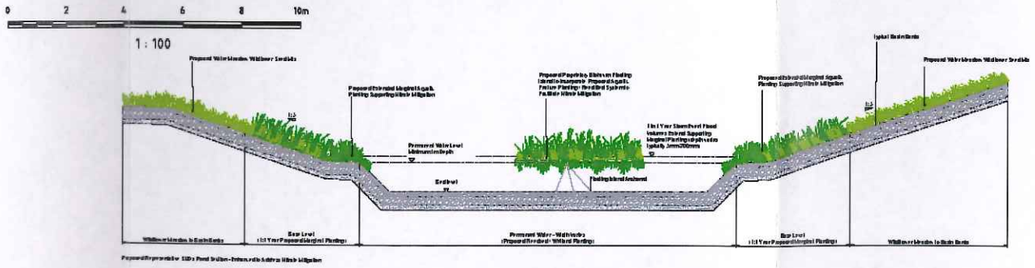

03 L60 Typical Mitigation Planting Section
1:100 @ A1

04 L60 Mitigation Planting Palette

Planting Schedule

Wildflowers

No.	Seed Mix Name	Species Name	Common Name	Specification	Density Height
352 -		Carex acutiformis	Lesser Pond Sedge	Plug Well Rooted	1/m²
723 -		Carex acutiformis	Lesser Pond Sedge	Pre Grown Floating Island Mix	1/m²
177 -		Glyceria maxima	Reed Sweet Grass	Plug Well Rooted	1/m²
177 -		Mentha aquatica	Water Mint	Plug Well Rooted	1/m²
352 -		Ranunculus flammula	Lesser Spearwort	Plug Well Rooted	1/m²
177 -		Schoenoplectus lacustris	Common Club-rush	Plug Well Rooted	1/m²
434 -		Schoenoplectus lacustris	Common Club-rush	Pre Grown Floating Island Mix	1/m²
177 -		Veronica beccabunga	Brooklime	Plug Well Rooted	1/m²

Total 2569 No

Marginal/ Aquatics

No.	Species Name	Common Name	Specification	Density Pot Size Height
177 -	Apium nodiflorum		Plug Well Rooted	1/m²
177 -	Caltha palustris	Marsh-marigold	Plug Well Rooted	1/m²
352 -	Iris pseudacorus	Yellow Flag Iris	Plug Well Rooted	1/m²
230 -	Iris pseudacorus	Yellow Flag Iris	Pre Grown Floating Island Mix	1/m²
352 -	Juncus effusus		Plug Well Rooted	1/m²
352 -	Lythrum salicaria	Purple Loosestrife	Plug Well Rooted	1/m²
177 -	Myosotis scorpioides		Plug Well Rooted	1/m²
177 -	Nasturtium aquaticum		Plug Well Rooted	1/m²
177 -	Scrophularia auriculata		Plug Well Rooted	1/m²
177 -	Stachys palustris		Plug Well Rooted	1/m²

Total 2403 No


Proposed Water Meadow Seed Mix


Proposed Marginal Aquatic Planting


Proposed Extended Wetland Pond Edge Planting


Proposed Reed Bed Planting


Proposed Floating Island Aquatic Feature Planting

NOTES:

1. This drawing is to be read in conjunction with all relevant contract drawings and specifications with any conflicting information to be brought to the attention of Deacon Design before works commence on site.

2. Do not scale from this drawing, always work to noted dimensions.

3. All given dimensions in mm.

KEY

Proposed SUDS Wetland Enhancements to support Nitrate Mitigation

Permanently Wet Feature Min 1 metre water depth incorporating Floating Island / Reed Bed System

1 in 1 year storm event flood volumes extend supporting marginal planting (depth varies typically 5mm-200mm)

FINAL

DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER	CHECKED BY
-	-	-	-	-

DRAWING STATUS:
FOR INFORMATION

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PROJECT TITLE:
North Stoneham Park
Nitrate Mitigation Strategy

PROJECT NUMBER:	PLOT DATE:
DD145	29.05.20
DRAWING SCALE: 1:2000	APPROVED BY: PD
PAPER SIZE: A1	DRAWN BY: PD

DRAWING TITLE:
Mitigation Areas
Proposed Planting Detail
-

DRAWING NUMBER:	REVISION LETTER:
DD145L60	-

DRAWING FILE LOCATION:
C:\Users\PH\Documents\Projects\DD145\DD145-D- NSP Nitrate Mitigation Planting Strategy Plan.dwg

Appendix C Atlee Acre

LANE

STONEHAM LANE

Proposed 300mm high bund

Proposed pond A 300mm deep

Proposed pond B 300mm deep

Proposed tree planting and native shrub mix infill planting to enhance eastern boundary vegetation (under separate application currently approved - App. Number: F/20/87451)

Monk's Brook

10

14

15

0 10 20 30 40 50m

1 : 500

NOTES:

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3. All given dimensions in mm.

KEY

- Application Site boundary
- Existing trees to be retained. Redline denotes Root Protection Area (RPA) to be read in accordance with JFA Tree Survey Report
- Existing vegetation to be retained and enhanced
- Proposed Tree Planting
- Proposed tree planting to enhance eastern boundary vegetation (under separate application F/20/87451)
- Proposed native coppice / shrub mix infill planting to enhance eastern boundary vegetation / wildlife corridor (under separate application F/20/87451)

Existing Services
Note: Refer to Engineer's Constraints Plan for further details

- Gas main
- Gas main easement zone (1m.)
- Water main (8m. easement zone)
- Water main easement zone (16m.)
- 8m. buffer to existing watercourse

FINAL

ISSUED	DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER	CHECKED BY
DD	11.08.20	DA	Pond size amended following ecologist's recommendations	A	MM

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PROJECT TITLE:
Atlee Acre
-

PROJECT NUMBER: DD426
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APPROVED BY: MM
PAPER SIZE: A1
DRAWN BY: JT

DRAWING TITLE:
Site layout / Constraints Plan
-
-

DRAWING NUMBER: DD426/KR01
REVISION LETTER: A

DRAWING FILE LOCATION:
Z:\Deacon Design Ltd\03 PROJECTS\06 HDD\426 ATLEE ACRE\04 Drawings\Autocad\XR Working Dwgs\DD426KR01 Working Drawing.dwg

Letter Report

Site:	Land East of Chickenhall
Client:	Highwood Group
Job Number:	A116963
File Location:	I:\Projects\Projects A116000 on\A116963 Land East of Chickenhall\REPORTS\

Introduction

Calculations for nutrient balancing are required in response to recent consultation with Natural England on residential projects in the vicinity of the Solent following the findings of the Integrated Water Management Study for South Hampshire, published by the Partnership for Urban South Hampshire (PUSH)[1].

Due to the uncertainty over whether new development can be accommodated by existing wastewater treatment infrastructure without causing harm to coastal European sites, Natural England advise that all residential development should achieve nitrogen neutrality.

It is proposed that a wetland is created at Land East of Chickenhall which will reduce nitrogen levels entering the River Itchen from the Southern Water Chickenhall Wastewater Treatment Works (WwTW), and consequently nitrogen levels entering the Solent and Southampton Water Special Protection Area (SPA) and Ramsar Site, and the Solent Maritime Special Area of Conservation. The project will divert part of the outflow from Chickenhall WwTW into a constructed wetland east of the River Itchen and provide an additional treatment stage to reduce the total nitrogen (TN) output. This will create capacity for new development in the region.

The proposed location is east of the River Itchen and south of Bishopstoke Road and is shown in Figure 1.

Methodology

Calculating Baseline Nitrogen Level

Chickenhall WwTW does not have a discharge limit for TN. Therefore there is no long-term monitoring that can be reviewed to determine the output concentration. Natural England[2] advise that in the absence of a TN discharge limit, a value of 27 mg/l should be assumed.

Although not routinely monitored, five TN sample points are available from the Environment Agency[3]. The results of monitoring undertaken are shown in Table 1.

---

[1] PUSH, (2018), *Integrated Water Management Study*, [online] Available at https://www.push.gov.uk/wp-content/uploads/2018/07/IWMS-Appendix-1.pdf, Accessed March2020.
[2] Natural England, (2019), *Advice on Achieving Nutrient Neutrality for New Development in the Solent Region for Local Planning Authorities.*
[3] Environment Agency Water Quality Archive. [online] Available at https://environment.data.gov.uk/water-quality/view/sampling-point/SO-G0003791, Accessed March2020.

Appendix D Chickenhall Wetland

Wetland Performance

A detailed study of wetlands was completed by Land et al. in 2016[4], covering 5853 records (this is referenced in Natural England's June 2019 methodology[5]). This study concludes a mean nitrogen removal efficiency of 37% and removal rate of 181 g/m^2/yr. Following discussions and a meeting held on 30th September 2019, Natural England recommended that a nitrogen removal rate of 200-300 g/m^2/yr was used in the calculations. In order to take a suitably precautionary approach (as explained above) the lower value of 200 g/m^2/yr has been used.

The key inputs are therefore:

- TN Concentration – 27.0 mg/l;
- DWF – 23,067 m^3/day;
- TN Removal Rate – 200 g/m^2/yr;
- TN Removal Efficiency – 37%; and
- Wetland Area – 22.86.0 ha.

To calculate the predicted annual nitrogen removal performed by the wetland, the Area is converted to m^2 and multiplied by the TN Removal Rate:

228600 x 200 = 45720000 g/yr.

Converted to kilograms this gives a predicted level of annual nitrogen removal:

45720000 / 1000 = 45720 kg/yr TN.

A further set of calculations are performed to test whether this level of removal is possible, given the level of nitrogen present within the effluent, and the removal efficiency of the wetland. To calculate the baseline nitrogen within the effluent, the Flow Rate is converted from m^3/day to l/yr:

23067 x 365000 = 8419455000 l/yr.

The Flow Rate is multiplied by the TN concentration:

8419455000 x 27.0 = 2.27325E+11 mg/yr.

Converted to kilograms this gives an annual amount of nitrogen within the foul effluent:

2.27325E+11 / 1000000 = 227325.285 kg/yr TN.

To calculate the amount of nitrogen required to meet the predicted removal level, the annual removal is divided by the TN Removal Efficiency:

[4] Land, M., Graneli, W., Grimvall, A., Hoffmann, C. C., Mitsch, W. J., Tonderski, K. S., and Verhoeven, J. T. A., (2016), *How effective are created or restored freshwater wetlands for nitrogen and phosphorus removal? A systematic review.* Environmental Evidence (2016) 5:9.
[5] Natural England, (2019), *Advice on Achieving Nutrient Neutrality for New Development in the Solent Region for Local Planning Authorities.*

Table 1 TN Levels (mg/l) at Chickenhall WwTW Outfall

Date	24/05/2019	11/06/2019	04/07/2019	02/08/2019	17/09/2020
TN mg/l	28.9	11.4	8.5	27.0	29.0

The results in Table 1 show that the mean TN concentration in the effluent from Chickenhall WwTW is 20.96 mg/l, however the sample size is too small to provide a robust assessment. Therefore the Natural England default value of 27 mg/l has been used in subsequent calculations to determine the performance of the wetland.

Calculating the Site Watershed

There is no requirement to calculate the watershed of the proposed wetland as flows will be sourced from the outfall from Chickenhall WwTW. This is anticipated to be via pumping and a new piped connection.

Calculating Flow Rates

Chickenhall has a consented dry weather flow (DWF) of 32,000 m^3/day, or 370 l/s. The flow to full treatment is 788 l/s which is the maximum flow the treatment system can accommodate (DWF plus an amount of surface or flood water). Flows in excess of this are released to the storm tanks. According to the PUSH Integrated Water Management Study (PUSH, 2018) the measured DWF from Chickenhall between 2013 – 2015 was 23,067 m^3/day.

For the purposes of this assessment, it has been assumed that the maximum flow available for treatment is the measured DWF as flows above this level are uncertain. Storm flows are not counted because the storm flow outfall connects to the foul effluent pipe downstream of the foul effluent chamber (the most likely location of a new pump and foul effluent pipe).

Wetland Design

The proposed wetland location is shown in Appendix A. It will measure 22.86 ha in area which is the maximum area considered practical based on levels and land ownership.

Part of the flow from the WwTW will be pumped to the northern extent of the wetland before passing through an extensive reedbed. The reeds will take up nitrogen from the water, as well as providing a large surface area for biofilms to establish and remove further nitrogen. The levels for the wetland will be designed to accommodate the calculated flow rate (see below), whilst maximising the time available for nitrogen removal to occur. At the southern extent of the wetland, treated water will re-enter the River Itchen in close proximity to the existing foul effluent outfall for Chickenhall WwTW.

Figure 1 Site Location Plan

45720 / 0.37 = 123567.5676 kg/yr TN. This is 54.36% of the annual amount of nitrogen within the effluent (as calculated above) and as such the predicted annual nitrogen removal of 45,720 kg/yr TN is practical.

To calculate the flow rate for the wetland, the calculations are reversed with the nitrogen input required (123567.5676 kg/yr) converted to milligrams and divided by the monitored TN concentration giving a rate of 12538.56596 m^3/day.

Summary

It is proposed that a wetland is created at Land East of Chickenhall to reduce the amount of Total Nitrogen which enters the Solent and Southampton Water SPA and Ramsar and the Solent Maritime SAC via the River Itchen SAC. This reduction will be used to offset nitrogen within wastewater created by proposed housing developments within the South Hampshire region (which connect to Chickenhall or other WWTW as agreed by Natural England or the Competent Authority).

The proposed wetland will measure 22.86 ha and will remove a total of 45,720 kg/yr TN by diverting foul effluent flow from Chickenhall WwTW.

Quality Control		
Version:	1	DRAFT
Prepared by:	[redacted]	David West CEnv MCIEEM **Associate Ecologist**
Verified By:		

Version:	Date:	Updated by:	Verified by:	Description of changes:

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Rev	Date	Notes
A	03/03/20	Initial map production

Legend

Possible wetland area

0 25 50 100 Metres

N

Possible Wetland Area

Land East of Chickenhall
Highwood

Scale at A3:	Project No:	Drawing No:	Revision:
1:2,500	E9301	Figure 3	A
Drawn by:	**Drawn date:**	**Approved by:**	
Maddie Errington	09/03/2020	Dave West	

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[Header]

Open Space Phase Plan

[Footer]

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[redacted]

Phase 2

Phase 3

[redacted]

[redacted]

0 50 100 150 200m

1 : 2000

Chestnut Avenue Meadow SINC

Horne Wood SINC

Pond 15

Pond 14

Pond 13

Pond 12

Pond 1

Phase to be developed by Bargate Homes / Vivid

Avenue Park North Swale

Pond 5

Avenue Park

Development site for future Primary School

Pond 10

Pond 7

Pond 6

Old Mansion Site

CCRC Care Village

Stoneham Golf Club

Fishing Lakes

[redacted]

[redacted]

22.01.21	MO	Drg title updated to read 'Transfer Plan'	C
13.01.21	MH	Swales added to Phase 1 as per comments from Bargate Homes	B
08.01.21	PD	Key & Description Changes	A
DATE	DRAWN	DESCRIPTION OF REVISION	REVISION LETTER

DRAWING STATUS:

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HIGHWOOD

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PROJECT TITLE:

North Stoneham Park

-

PROJECT NUMBER: DD145	PLOT DATE: 19.01.21
DRAWING SCALE: 1:2000	APPROVED BY: PD
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DRAWING TITLE:

Transfer Plan

-

DRAWING NUMBER: DD145L70	REVISION LETTER: C

DRAWING FILE LOCATION:

37/9054

[redacted]

Signed as a deed in the name and on behalf of **VIVID HOUSING LIMITED** by [redacted], an officer appointed for the purpose by its attorney **Trowers & Hamlins LLP** under section 74(4) of the Law of Property Act 1925 in the presence of:

[redacted]

.....

Trowers & Hamlins LLP
3 Bunhill Row
London
EC1Y 8YZ

VIVID HOUSING LIMITED

by its attorney
Trowers & Hamlins LLP
[redacted]

Signed as a deed in the name and on behalf of **VESTAL DEVELOPMENTS LIMITED** by [redacted] appointed for the purpose by its attorney **Trowers & Hamlins LLP** under section 74(4) of the Law of Property Act 1925 in the presence of:

[redacted]

witness signature: .....

name: [redacted]

address: .....

occupation: SOLICITOR

Trowers & Hamlins LLP
3 Bunhill Row
London
EC1Y 8YZ

VESTAL DEVELOPMENTS LIMITED

by its attorney
Trowers & Hamlins LLP
acting by
[redacted]

In Witness hereof the parties hereto have today executed and delivered this agreement as a Deed

EXECUTED as a DEED by affixing)
THE COMMON SEAL of **EASTLEIGH**)
BOROUGH COUNCIL in the)
presence of:)

[redacted]

Head[redacted]rvices

THE SEAL OF THE BOR[redacted] (1571)

EXECUTED as a DEED by affixing
THE COMMON SEAL of **HAMPSHIRE**
COUNTY COUNCIL in the presence of:

[redacted]

Authorised Signatory

Name Timothy Spender
Position Assistant Head of Legal Services

37/9054

EXECUTED as a DEED by
HIGHWOOD HOMES LIMITED
acting by:

[redacted]

EXECUTED as a DEED by

NORTH STONEHAM DEVELOPMENTS LIMIT

acting by:

[redacted]

~~EXECUTED as a DEED by)~~

~~**HIGHWOOD VENTURES LIMITED**)~~

~~acting by:)~~

~~Director~~

~~Director / Secretary~~

EXECUTED as a DEED by)

Affixing the Common Seal of)

HOUSING 21 in the presence of

[redacted]

EXECUTED as a DEED by TIAA Limited by a)

Director, as attorney for **STONEHAM PARK**)

DEVELOPMENTS LLP)

in the presence of:)

[redacted]

Director

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[redacted]

EXECUTED as a DEED by)

CKS INVESTMENTS PROPERTIES LIMITED)

acting by:)

[redacted]

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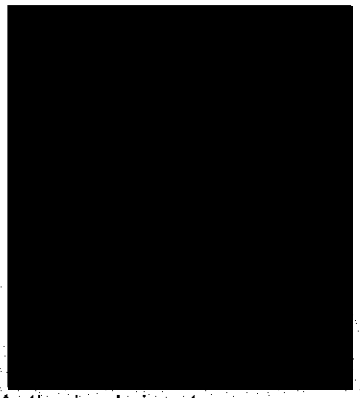
[Header]

EXECUTED as a DEED by

ASPECT (EASTLEIGH) LIMITED

acting by an authorised signatory

in the presence of:



Authorised signatory



Witness signatur

Witness name

Witness address

[Footer]