SHEPHERD+WEDDERBURN

MINUTE OF AGREEMENT

Under Section 75 of The Town and Country Planning (Scotland Act) 1997

between

The Renfrewshire Council

and

BAE Systems (Property Investments) Limited

Subjects: Site of Former Royal Ordnance Factory, Bishopton

October 2018

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MINUTE OF AGREEMENT

between

THE RENFREWSHIRE COUNCIL, constituted under the Local Government etc. (Scotland) Act 1994 and having its principal office at Renfrewshire House, Cotton Street, Paisley (who and whose successors as local planning authority and local roads authority are hereinafter referred to as ("the Council")

and

BAE SYSTEMS (PROPERTY INVESTMENTS) LIMITED, a company incorporated under the Companies Acts (Company Number 03653604) and having its registered office at Warwick House, PO Box 87, Farnborough Aerospace Centre, Farnborough, Hampshire GU14 6YU (who and, in substitution therefor, whose successors as heritable proprietor of the Agreement Subjects are hereinafter referred to as "the Landowner")

CONSIDERING:

(One) That the Council is the Planning Authority for the local government area of Renfrewshire in which the Agreement Subjects are situated in terms of Section 1 of the 1997 Act;

(Two) That the Council as Planning Authority is entitled in terms of Section 75 of the 1997 Act to enter into an agreement with any persons interested in land in its district (insofar as the interest of that person enables him to bind the land) for the purpose of restricting or regulating the development or use of land, either permanently or during such period as may be prescribed by the agreement and any such agreement may contain such incidental and consequential provisions (including provisions of a financial character) as appear to the planning authority to be necessary or expedient for the purposes of the agreement;

(Three) That the Landowner is heritable proprietor of the Agreement Subjects;

(Four) That the Landowner submitted Planning Application 17/0393/PP and Planning Application 17/0394/PP to the Council under the 1997 Act, both registered on 26 May 2017;

(Five) That the Council has granted the Planning Permission and that this Agreement varies the Original Section 75 Agreement, which variation has been agreed between the parties;

(Six) That this Agreement secures planning obligations which provide *inter alia* for the phasing and implementation of the Development.

NOW THEREFORE the parties hereto have agreed and do hereby agree as follows:-

1. Definitions

In this Agreement (including the foregoing preamble) where the context so admits the following expressions shall have the meanings set opposite to them: -

"1997 Act"	means the Town and Country Planning (Scotland) Act 1997 as varied or amended from time to time;
"Adopt"	means to add to the list of public roads prepared by the Council, as roads authority, in accordance with the Roads (Scotland) Act 1984 (and Adopted and Adoption shall be construed accordingly);
"Affordable Housing"	means housing that is Social Rented Housing, Shared Equity, Shared Ownership, Mid-Market Rent, and Lower Market Sector;
"Affordable Rent"	means a rent which is not more than 80% of the rent which could be achieved on the open market between a willing landlord and willing tenant;
"Affordable Units"	means a Residential Unit to be used for Affordable

	Housing;
"Agreement Subjects"	means that land more particularly described in Part 1 of the Schedule;
"Agreement"	means this agreement together with the Schedule;
"Bishopton Community Development Trust"	means the Bishopton Community Development Trust, established under the Original Section 75 Agreement;
"Bus Service Delivery Strategy"	means a strategy to be agreed between the parties for the timetable of payment and the use of the Bus Services Contribution;
"Bus Services Contribution"	means the sum of THREE HUNDRED AND FIFTY THOUSAND POUNDS (£350,000) STERLING;
"CCTV Contribution"	means the sum of ONE HUNDRED THOUSAND POUNDS (£100,000) STERLING;
"Central Park"	means land to be approved in writing by the Council (both parties acting reasonably);
"Clerk of Works and Project Manager Contribution"	means the sum of SEVENTY-FIVE THOUSAND POUNDS (£75,000) STERLING;
"Commencement of Development"	means the initiation of development by the carrying out of a Material Operation;
"Community Development Fund Contribution"	means the sum of TWO HUNDRED THOUSAND POUNDS (£200,000) STERLING;
"Community Woodland"	means that area or those areas of land to be approved in writing by the Council (both parties acting reasonably);
"Completed"	means constructed to that point where a notice of acceptance of completion certificate has been issued by the Council in accordance with Section 18 of the Building (Scotland) Act 2003;
"Development"	means the development approved by the Planning Permission;
"Early Years Provision Duty"	means the Council's ongoing duty under section 47 of the Children and Young People (Scotland) Act 2014 to secure the mandatory amount of early learning and childcare for each eligible pre-school child in its area.
"Education and Community Facilities Building"	means a building and grounds suitable to accommodate: • a two stream primary school with necessary landscaping, access, and parking; and • all weather synthetic turf playing field suitable for use by pupils of primary school age and of no less than 60 metres x 40 metres, with associated ball stop fencing and flood lighting;
"Education and Community Facilities Development Brief"	means the detailed brief and specification of the Education and Community Facilities Building approved under Clause 5 of this Agreement;
"Education and Community Facilities Land"	means Serviced land appropriate in size to accommodate the Education and Community Facilities Building, the location of which land is to be approved in writing by the Council (both parties acting reasonably);
"First Phase Park and Ride Facility"	has that meaning stated in Clause 11.1;

"Intermediate Housing"	means Mid-Market Rent, Shared Equity, and Shared Ownership (and any combination thereof);
"Landscape Management and Maintenance Schedule"	means the landscape management and maintenance schedule forming Part 2 of the Schedule;
"Local Areas of Play"	means a play area: 1. primarily equipped for children aged 4-6 years but with ancillary provision for supervised children younger than this age range; 2. located within 1 minute walking time from the Residential Units that it is intended to serve; 3. capable of accommodating low-key games on a level grass surface; and 4. be enclosed with a guard rail, fence, or landscaping to act as a safety buffer to protect against potential road related incidents.
"Local Equipped Areas of Play"	means a play area: 1. primarily equipped for children aged 4-8 years but with ancillary provision for supervised children younger than this age range; 2. located within 5 minutes walking time from the Residential Units that it is intended to serve; 3. capable of accommodating at least five differing types of play equipment providing challenges and enjoyment appropriate to 4-8 years age group; and 4. seating for accompanying adults.
"Lower Market Sector Housing"	means non-subsidised entry level housing for sale;
"M8 Capacity Improvement Contribution"	means the sum of ONE MILLION AND TWO HUNDRED THOUSAND POUNDS (£1,200,000) STERLING for the purposes set out in Clause 7.3 which shall be payable in four equal instalments as set out in Clause 7.1;
"Material Operation"	means a material operation in accordance with Section 27(4) of the 1997 Act;
"Mid-Market Rent"	means private rented accommodation available at a rent that is below market rent level for an equivalent accommodation in the area in which the accommodation is located and which may be provided either on a medium or long term basis;
"Neighbourhood Equipped Areas of Play"	means a play area: 1. primarily equipped for children aged 8-14 years but with ancillary provision for children younger than this age range; 2. located within 15 minutes walking time from the Residential Units that it is intended to serve; 3. capable of accommodating at least eight differing types of play equipment providing challenges and enjoyment appropriate to 8-14 years age group; 4. teenager meeting areas; and 5. seating for accompanying adults.

"Newton Road Recreation Ground Contribution"	means the sum of ONE HUNDRED THOUSAND POUNDS (£100,000) STERLING;
"Original Planning Permissions"	means (i) planning permission reference 06/0602/PP, (ii) planning permission reference 12/0584/PP, and (iii) planning permission reference 17/0025/PP, all granted by the Council;
"Original Section 75 Agreement"	means together: (i) the Minute of Agreement in respect of the Agreement Subjects under section 75 of the Town and Country Planning (Scotland) Act 1997 between The Renfrewshire Council and BAE Systems (Property Investments) Limited in respect of the Site of Former Royal Ordnance Factory, Bishopton and dated 20 and 27 November 2012, (ii) the Minute of Agreement in respect of the Agreement Subjects under section 75 of the Town and Country Planning (Scotland) Act 1997 between The Renfrewshire Council and BAE Systems (Property Investments) Limited in respect of the Site of Former Royal Ordnance Factory, Bishopton and dated 14 and 21 December 2012, (iii) the Minute of Agreement in respect of the Agreement Subjects under section 75 of the Town and Country Planning (Scotland) Act 1997 between The Renfrewshire Council and BAE Systems (Property Investments) Limited in respect of the Site of Former Royal Ordnance Factory, Bishopton and dated 28 February and 13 March 2014; and (iv) the Minute of Agreement in respect of the Agreement Subjects under section 75 of the Town and Country Planning (Scotland) Act 1997 between The Renfrewshire Council and BAE Systems (Property Investments) Limited in respect of the Site of Former Royal Ordnance Factory, Bishopton and dated 6 and 23 June 2017;
"Park and Ride Facility"	means together the First Phase Park and Ride Facility and the Second Phase Park and Ride Facility;
"Planning Application"	means (i) Planning Application 17/0393/PP, and (ii) Planning Application 17/0394/PP, both registered by the Council on 26 May 2017;
"Planning Permission"	means the planning permissions for the Development issued by the Council pursuant to the Planning Application;
"Primary Healthcare Contribution"	means the sum of ONE MILLION POUNDS (£1,000,000) STERLING;
"Primary Healthcare Facility Cost of Occupation Contribution"	means a contribution towards the rent of the Primary Healthcare Facility by the Landowner of ONE MILLION POUNDS (£1,000,000) STERLING;
"Primary Healthcare Facility Site"	means an area of Serviced land of not less than 0.4 hectares, the location of which is to be approved in writing by the Council (both parties acting reasonably);
"Primary Healthcare Facility"	means the buildings and ancillary facilities to be constructed by the Landowner in accordance with clause 12;

"Registered Social Landlord"	means a body registered as a social landlord in the register maintained by the Scottish Ministers in terms of Section 57 of the Housing (Scotland) Act 2001 or such other body, company or person approved by the Council in writing;
"Remediation Contribution"	means the sum of TWO HUNDRED AND SIXTY THOUSAND POUNDS (£260,000) STERLING;
"Residential Unit"	means a residential unit, including an Affordable Unit, on the Agreement Subjects completed pursuant to the Planning Permission;
"Schedule"	means the schedule annexed and executed as relative hereto;
"Second Phase Park and Ride Facility"	means the facilities described in Clause 11.2;
"Second Phase Park and Ride Location"	means land appropriate in size to accommodate 150 car parking spaces, the location of which land is to be approved in writing by the Council (both parties acting reasonably) but which land shall be adjacent to the existing First Phase Park and Ride Facility;
"Secondary School Strategy"	means the strategy prepared by the Landowner following consultation with the Council's Director of Children's Services which will propose a fair and reasonable financial contribution for the provision of secondary school facilities necessary to accommodate the additional pupils that will require secondary education directly as a result of, and within the catchment of, the Development.
"Secondary School Contribution"	means the financial contribution for the provision of secondary school education due to the anticipated impact resulting from the Development, such sum and payment schedule forming part of the Secondary School Strategy agreed and approved under Clause 5.9 of this Agreement;
"Serviced"	means that the relevant area of land will be remediated to the appropriate standard by the Landowner for the proposed use in the Original Planning Permissions and Planning Permission and the following will be provided by the Landowner at the boundary of the relevant area of land: • All necessary road links, footpaths and cycleways; • All necessary connection points to the foul and surface water drainage; and • Connection points to the utility services network including without limitation electricity and gas
"Shared Equity"	means accommodation where part only of the property is purchased by the proprietor, with the remaining part held by a third party;
"Shared Ownership"	means accommodation where part only of the property is purchased by the proprietor, with an occupancy payment made to the Registered Social Landlord on the remaining part;
"Social Rented Housing"	means housing provided at an Affordable Rent by a Registered Social Landlord (or such other approved provider);

"SUDS Contribution"	means the sum of TWO HUNDRED AND FIFTY THOUSAND POUNDS (£250,000) STERLING.
"SUDS Design Schedule and Maintenance Manual"	means the SUDS design schedule and maintenance manual forming Part 3 of the Schedule;

2. Statutory Authorities

2.1 The obligations contained in Clauses 4 – 20 (inclusive) of this Agreement are made under Section 75 of the 1997 Act and are planning obligations for the purposes of the 1997 Act and are enforceable by the Council as Planning Authority.

2.2 If any provision of this Agreement is held to be invalid or illegal or unenforceable the validity, legality and enforceability of the remaining provisions shall not in any way be deemed thereby to be affected or impaired.

3. Conditionality

3.1 Subject to clause 3.2 below the parties hereby agree that upon implementing the Planning Permission:

3.1.1 this Agreement shall take effect and be in substitute of the Original Section 75 Agreement, and

3.1.2 upon that event, neither party shall enforce the terms of the Original Section 75 Agreement.

3.2 Where any clause in the Original Section 75 Agreement required a sum of money to be paid, that sum has been paid, that sum is required to be used for a particular purpose, and that sum is to be refunded if not used for that purpose by a specific deadline, those clauses shall remain enforceable by the Landowner against the Council.

3.3 The parties hereby acknowledge that the Original Planning Permissions have been implemented in respect of the larger Bishopton regeneration of which the Planning Permission and this Agreement form part. In order to take account of those Residential Units already sold to individual residential proprietors, and those further Residential Units to be constructed for sale to individual residential proprietors, under the Original Planning Permissions, the parties hereby agree that where reference in this Agreement is made to a number of Residential Units being Completed, that number shall include 1000 Residential Units already Completed in respect of the larger Bishopton regeneration.

4. Affordable Housing

Stage 1 Affordable Housing

4.1 For the purposes of this Clause 4, Stage 1 shall consist of the first 2,500 Residential Units that are Completed under the Original Planning Permissions and the Planning Permission ("Stage 1").

4.2 Stage 1 shall include 625 Affordable Units as follows:

4.2.1 200 Affordable Units for Social Rented Housing;

4.2.2 20 Affordable Units for Intermediate Housing; and

4.2.3 No fewer than 405 Affordable Units for Lower Market Sector Housing with a gross internal floor area not exceeding $95m^2$ for each unit.

4.3 The Social Rented Housing will be constructed on Serviced land.

4.4 The location of the Affordable Housing constructed in Stage 1 will be identified having regard to the proximity to services and education and other facilities and shall be integrated with other Residential Units in Stage 1 that are not Affordable Housing.

4.5 In lieu of delivering 200 units of Social Rented Housing to be provided under Clause 4.2.1, the Landowner shall be entitled to transfer Serviced land of a size sufficient to accommodate the relevant number of Social Rented Housing units to the Council or a Registered Social Landlord at nil consideration. Such a transfer of Serviced land shall amount to a discharge of

the Landowner's obligation to deliver the relevant number of Social Rented Housing units. In the event that there is a transfer of Serviced land in accordance with this Clause 4.5, the terms of this Clause 4 shall apply *mutatis mutandis* to that transfer.

4.6 The Landowner shall submit a Stage 1 Affordable Housing Review report to the Council on 30 June of each year until Commencement of Development of the 2,501st Residential Unit has occurred. Each Stage 1 Affordable Housing Review report shall provide details in respect of the extent of implementation of the Affordable Housing under Clause 4.2.

Stage 2 Affordable Housing

4.7 For the purposes of this Clause 4, Stage 2 shall consist of those Residential Units Completed after (but not including) the 2,500th Residential Unit that is Completed under the Original Planning Permissions and the Planning Permission ("Stage 2").

4.8 Unless otherwise agreed in writing with the Council, Stage 2 shall include 425 Affordable Units.

4.9 Prior to commencement of construction of any Residential Unit in Stage 2, the Landowner will prepare and submit an affordable housing development brief to the Council for written approval, the Council acting reasonably. Commencement of construction of any Residential Unit in Stage 2 shall not occur until the affordable housing development brief has been approved by the Council, the Council acting reasonably.

4.10 The affordable housing development brief referred to in Clause 4.9 shall specify Affordable Housing in phases. For each phase of Affordable Housing, the affordable housing development brief shall:-

4.10.1 have regard to the need for Affordable Housing in each phase,

4.10.2 have regard to the viability/feasibility of delivering Affordable Housing in each phase,

4.10.3 shall prescribe details of the timing of delivery, location(s), and tenure mix (if any) of Affordable Housing to be delivered by the Landowner.

4.11 Subject to the remaining terms of this Clause 4, the affordable housing development brief shall be implemented by the Landowner.

4.12 The affordable housing development brief referred to in Clause 4.9 shall be reviewed by the parties every three years and may be varied in writing upon each review, both parties acting reasonably. Such review shall not preclude the parties varying the affordable housing development brief at any other time, which variations shall be in writing by agreement of the parties (both parties acting reasonably).

4.13 Any Social Rented Housing to be provided in Stage 2 shall be constructed on Serviced land.

4.14 The location of Affordable Housing constructed in Stage 2 will be identified having regard to the proximity to services and education and other facilities and shall be integrated with other Residential Units in Stage 2 that are not Affordable Housing.

4.15 In lieu of delivering any Social Rented Housing to be provided in Stage 2, the Landowner shall be entitled to transfer Serviced land of a size sufficient to accommodate the relevant number of Social Rented Housing units to the Council or a Registered Social Landlord at nil consideration. Such a transfer of Serviced land shall amount to a discharge of the Landowner's obligation to deliver the relevant number of Social Rented Housing units. In the event that there is a transfer of Serviced land in accordance with this Clause 4.15, the terms of this Clause 4 shall apply *mutatis mutandis* to that transfer.

4.16 The Landowner shall submit a Stage 2 Affordable Housing Review report to the Council on 30 June of each year once Commencement of Development of the 2,501st Residential Unit has occurred. Each Affordable Housing Review report shall provide details in respect of the extent of implementation of the Affordable Housing under Stage 2.

5. Education and Community Facilities

Education and Community Facilities Specification

5.1 No later than 31 January 2019 the Landowner will prepare and submit an Education and Community Facilities Development Brief to the Council for approval. The Education and Community Facilities Development Brief will outline the Landowner's proposal for the delivery of the Education and Community Facilities Building as part of, and to serve, the Development and will include:

5.1.1 a detailed specification of the Education and Community Facilities Building;

5.1.2 details of the internal layout of the Education and Community Facilities Building; and

5.1.3 evidence that the Education and Community Facilities Building shall comply with all relevant and applicable legislation, standards and guidance.

Education and Community Facilities Building

5.2 Subject to the Council approving the Education and Community Facilities Development Brief within three months of its submission, the Landowner (or an approved third party) shall procure all necessary consents and construct the Education and Community Facilities Building in accordance with the approved Education and Community Facilities Development Brief.

5.3 Unless otherwise agreed in writing with the Council (both parties acting reasonably), the Landowner (or the approved third party if applicable) shall have complied with Clause 5.2 of this Agreement no later than 1 June 2021.

5.4 On or within 28 days of 1 June 2021, the Landowner shall deliver a disposition conveying the Education and Community Facilities Building to the Council (or its nominee) at nil consideration and with the benefit of all contracts, warranties and other rights which may exist in relation to the design and construction of the Education and Community Facilities Building, such benefit being assigned to the Council at nil consideration.

5.5 The approved Education and Community Facilities Development Brief shall be implemented by the Landowner but may be varied at any time upon written application by the Landowner to the Council. The Council shall act reasonably in agreeing (or not, as the case may be) to any variation proposed under this Clause 5.5.

Clerk of Works and Project Manager Contribution

5.6 The Landowner shall pay to the Council the Clerk of Works and Project Manager Contribution prior to 31 December 2020.

5.7 Upon receipt, the Council shall pay the Clerk of Works and Project Manager Contribution into an interest bearing deposit account and shall thereafter only use the Clerk of Works and Project Manager Contribution in payment of time for a professional officer appointed by the Council to provide dedicated input in respect of the delivery of the Education and Community Facilities Building.

5.8 In the event that the Clerk of Works and Project Manager Contribution has not been spent or committed in full by the date falling five (5) years from the last date of payment by the Landowner to the Council of any part of the Clerk of Works and Project Manager Contribution, then the Council shall repay any unspent or uncommitted amount of the Clerk of Works and Project Manager Contribution to the Landowner, together with all interest which has accrued thereon.

Secondary School Contribution

5.9 Prior to the occupation of 2350th Residential Unit, and subject to Clause 5.10 below, the Landowner shall submit a draft Secondary School Strategy to the Council for approval. Within 6 months of the submission of the Secondary School Strategy, the Council, acting reasonably, shall approve the Secondary School Strategy subject to any reasonable modifications that shall be agreed with the Landowner (both parties acting reasonably).

5.10 Prior to the occupation of the 2000th Residential Unit, the Council shall provide to the Landowner the following:

5.10.1 Robust and credible evidence in respect of the anticipated shortfall in secondary school places in the catchment of the Development,

5.10.2 A robust and credible methodology for the calculation of pupil yield arising from the Development (subject to a maximum pupil yield from the Development of 200), and confirmation that this methodology is applied across the catchment of the Development,

5.10.3 Robust and credible evidence of the anticipated costs to be incurred by the Council to provide the necessary secondary school infrastructure, and

5.10.4 Confirmation, by reference to housing land audits and any other relevant evidence, of the percentage share to be attributed to the Development relative to other catchment housing developments that are (i) constructed or being constructed, (ii) consented, and (iii) anticipated.

5.11 Where the Secondary School Strategy concludes that a Secondary School Contribution is required, Clauses 5.12 to 5.14 (inclusive) shall apply.

5.12 The Landowner shall pay the Secondary School Contribution to the Council on the dates and in the proportions specified in the agreed and approved Secondary School Strategy with the final payment to be made prior to the occupation of the 3,400th Residential Unit.

5.13 Upon receipt, the Council shall pay the Secondary School Contribution into an interest bearing deposit account and shall thereafter only use the Secondary School Contribution for the provision of secondary school facilities necessary to accommodate the additional pupils that will require secondary education directly as a result of, and within the catchment of, the Development.

5.14 In the event that the Secondary School Contribution has not been spent or committed in full by the date falling ten (10) years from the last date of payment by the Landowner to the Council of any part of the Secondary School Contribution, then the Council shall repay any unspent or uncommitted amount of the Secondary School Contribution to the Landowner, together with all interest which has accrued thereon.

Early Years Provision

5.15 The Council's Early Years Provision Duty is acknowledged by the Landowner. The parties hereby agree to meet at least once per annum to discuss the provision of early years education in the Bishopton area, with a view to assisting the Council to comply with its Early Years Provision Duty DECLARING THAT in such discussions the parties shall act reasonably and in good faith and that the Council shall not be entitled to ask the Landowner to make a financial contribution.

6. Bus Services

6.1 The Landowner shall submit a draft Bus Delivery Strategy to the Council for approval prior to the occupation of 1200th Residential Unit. Within 6 months of the submission of the draft Bus Delivery Strategy, the Council, acting reasonably, shall approve the Bus Delivery Strategy subject to any reasonable modification. Once approved, the Bus Delivery Strategy may be varied in writing at any time by agreement of the parties, both parties acting reasonably.

6.2 The Landowner shall pay the Bus Services Contribution to the Council on the dates and in the proportions specified in the Bus Service Delivery Strategy.

6.3 The Council shall pay the Bus Services Contribution into an interest bearing deposit account and shall thereafter only pay the Bus Services Contribution to Strathclyde Partnership for Transport or its statutory successor for the purpose of assisting in funding the delivery of bus services to serve the Development. The Council shall ensure that the Bus Services Contribution is spent only on the items identified the Bus Service Delivery Strategy.

6.4 In the event that the Bus Services Contribution has not been spent or committed in full by the date falling ten (10) years from the last date of payment by the Landowner to the Council of any part of the Bus Service Contribution, then the Council shall repay any unspent or

uncommitted amount of the Bus Services Contribution to the Landowner, together with all interest which has accrued thereon.

7. M8 Capacity Improvements

7.1 The Landowner shall pay the M8 Capacity Improvements Contribution to the Council in four equal instalments as follows:

7.1.1 Prior to the occupation of the 2200th Residential Unit, the Landowner will pay the first M8 Capacity Improvements Contribution instalment to the Council.

7.1.2 Prior to the occupation of the 2500th Residential Unit, the Landowner will pay the second M8 Capacity Improvements Contribution instalment to the Council.

7.1.3 Prior to the occupation of the 3500th Residential Unit, the Landowner will pay the third M8 Capacity Improvements Contribution instalment to the Council.

7.1.4 Prior to the occupation of the 3700th Residential Unit, the Landowner will pay the fourth M8 Capacity Improvements Contribution instalment to the Council.

7.2 The M8 Capacity Improvements Contribution shall be paid into an interest bearing account.

7.3 The Council shall pay each M8 Capacity Improvements Contribution instalment to Transport Scotland for the sole purpose of assisting Transport Scotland to fund measures to manage traffic movements between Junctions 26 and 29 on the M8.

7.4 When the Council pays a M8 Capacity Improvements Contribution instalment to Transport Scotland, payment will be made on the following terms:

7.4.1 the M8 Capacity Improvements Contribution is spent within a reasonable timescale and only on measures to manage traffic movements between Junctions 26 and 29 on the M8; and

7.4.2 In the event that the M8 Capacity Improvements Contribution has not been spent or committed in full by the date falling ten (10) years from the last date of payment by the Landowner to the Council of any part of the M8 Capacity Improvements Contribution, then Transport Scotland repays any unspent or uncommitted amount of the M8 Capacity Improvements Contribution to the Landowner, together with all interest which has accrued thereon.

7.5 Should the Landowner pay the M8 Capacity Improvements Contribution directly to Transport Scotland in accordance with the instalments and timescales provided in Clause 7.1, then the parties obligations under this Clause 7 shall be deemed discharged.

8. Station Road Improvements

8.1 The parties hereby acknowledge that the improvement works to Station Road have been fully implemented, and that no further works are required.

9. Newton Road/Rossland Crescent Improvements

9.1 The parties hereby acknowledge that the improvement works to Newton Road/Rossland Crescent have been fully implemented, and that no further works are required.

10. Kingston Road/ Greenock Road/Old Greenock Road Improvements

10.1 The parties hereby acknowledge that the improvement works to Kingston Road/Greenock Road/Old Greenock Road have been fully implemented, and that no further works are required.

11. Park and Ride

First Phase Park and Ride Facility

11.1 The parties hereby acknowledge that works to provide the First Phase Park and Ride Facility at Bishopton Railway Station (to include 150 car parking spaces) have been fully implemented, and that no further works are required.

Second Phase Park and Ride Facility

11.2 Prior to occupation of the 2200th Residential Unit, the Landowner will provide the Second Phase Park and Ride Facility at the Second Phase Park and Ride Location, to include a further 150 car parking spaces in addition to the number of existing parking spaces provided in the First Phase Park and Ride Facility.

11.3 The Landowner shall give the Council at least 7 days' notice of the intention to issue a certificate of practical completion in respect of the Second Phase Park and Ride Facility and the Council shall be entitled to inspect the works prior to the issue of the certificate of practical completion and the Landowner shall have due regard to any representations made by the Council in relation to the issue of the certificate of practical completion.

Ongoing operation of Park and Ride Facility

11.4 Prior to the date of issue of the certificate of practical completion of the Second Phase Park and Ride Facility (referred to in Clause 11.3 above), the parties shall agree which of Options 1, 2, or 3 described in Clause 11.5 below shall be implemented.

11.5 Upon the issue of a certificate of practical completion in accordance with Clause 11.3 above, for the purposes of ongoing management and maintenance, the Park and Ride Facility shall:

11.5.1 Option 1 – be retained in the ownership of BAE Systems (Property Investments) Limited (company number 03653604);

11.5.2 Option 2 – be transferred to the Council or its nominee at nil consideration and with the benefit of all contracts, warranties and other rights which may exist in relation to the construction of the Park and Ride Facility; or

11.5.3 Option 3 – be transferred to a third party agreed between the said BAE Systems (Property Investments) Limited and the Council.

CCTV Contribution

11.6 The Landowner shall pay to the Council the CCTV Contribution no later than 30 January 2022.

11.7 Upon receipt, the Council shall pay the CCTV Contribution into an interest bearing deposit account and shall thereafter only use the CCTV Contribution to provide CCTV at Village Square and Bishopton Rail Station (unless otherwise agreed in writing, both parties acting reasonably).

11.8 In the event that the CCTV Contribution has not been spent or committed in full by the date falling five (5) years from the last date of payment by the Landowner to the Council of any part of the CCTV Contribution, then the Council shall repay any unspent or uncommitted amount of the CCTV Contribution to the Landowner, together with all interest which has accrued thereon.

12. Primary Healthcare Facility

12.1 The parties agree that healthcare services shall be provided in respect of the Development by one only of the following three options:

12.1.1 Option 1 – The Landowner shall construct the Primary Healthcare Facility on the Primary Healthcare Site via a binding development agreement with the relevant Health Board;

12.1.2 Option 2 – The Landowner shall construct the Primary Healthcare Facility on the Primary Healthcare Site via an alternative binding development agreement (that need not be with the relevant Health Board); and

12.1.3 Option 3 – Payment of the Primary Healthcare Contribution

and in that order of preference.

Option 1

12.2 The Landowner shall use reasonable endeavours to enter into a binding agreement for lease with the relevant Health Board for the locality of Agreement Subjects for the construction and occupation of the Primary Healthcare Facility, which agreement for lease shall include:

12.2.1 a requirement that the Landowner shall construct the Primary Healthcare Facility on the Primary Healthcare Facility Site;

12.2.2 a detailed specification in respect of the Primary Healthcare Facility to be constructed. The specification referred to shall include details of the gross floor area, internal layout and ancillary facilities to be provided to serve the population currently served by the existing Bishopton Health Centre and the population generated by the Development;

12.2.3 a requirement on the Landowner (or an approved third party) to use reasonable endeavours to procure all necessary consents and construct the Primary Healthcare Facility in accordance with all appropriate legislation, standards and industry good practice; and

12.2.4 a requirement that following completion of the construction of the Primary Healthcare Facility in accordance with this clause 12.1 the Landowner will agree with the relevant Health Board (or such other provider of primary health care as appropriate) a long lease of the Primary Healthcare Facility for a minimum of twenty-five years at a rent that shall be subject to the Primary Healthcare Facility Cost of Occupation Contribution.

The deadline by which the Landowner shall have entered into such agreement for lease is 31 December 2022.

12.3 The Landowner will provide the Council with a written report of progress towards completion of the agreement for lease for the Primary Healthcare Facility Site no less frequently than annually. The Landowner will provide the first written report of progress no later than the date falling one year from the date of this Agreement.

Option 2

12.4 In the event that, despite using reasonable endeavours, the Landowner has not entered into the agreement for lease in accordance with the terms of Clause 12.1 above, the Landowner shall use reasonable endeavours to enter into an alternative binding agreement for lease to provide the Primary Healthcare Facility on the Primary Healthcare Facility Site, which alternative agreement for lease shall include:

12.4.1 a requirement that the Landowner shall construct the Primary Healthcare Facility on the Primary Healthcare Facility Site;

12.4.2 a detailed specification in respect of the Primary Healthcare Facility to be constructed. The specification referred to shall include details of the gross floor area, internal layout and ancillary facilities to be provided to serve the population currently served by the existing Bishopton Health Centre and the population generated by the Development;

12.4.3 a requirement on the Landowner (or an approved third party) to use reasonable endeavours to procure all necessary consents and construct the Primary Healthcare Facility in accordance with all appropriate legislation, standards and industry good practice; and

12.4.4 a requirement that following completion of the construction of the Primary Healthcare Facility in accordance with this clause 12.4 the Landowner will agree with an appropriate health care provider a long lease of the Primary Healthcare Facility for a minimum of twenty-five years at a rent that shall be subject to the Primary Healthcare Facility Cost of Occupation Contribution.

The deadline by which the Landowner shall have entered into such alternative agreement for lease is 31 December 2023.

12.5 The Landowner will provide the Council with a written report of progress towards completion of the alternative agreement for lease for the Primary Healthcare Facility Site no less frequently than annually.

Option 3

12.6 In the event that, despite having used reasonable endeavours to do so, the Landowner has not entered into the agreement for lease in accordance with the terms of Clause 12.1 above, and not entered into an alternative agreement for lease in accordance with the terms of Clause 12.4 above, the Landowner will, in substitute of providing the Primary Healthcare Facility, pay the Primary Healthcare Contribution.

12.7 The Landowner shall pay to the Council the Primary Healthcare Contribution no later than 31 December 2028.

12.8 Upon receipt, the Council shall pay the Primary Healthcare Contribution into an interest bearing deposit account and shall thereafter only use the Primary Healthcare Contribution to fund healthcare services or facilities to serve the Development (which may include a financial contribution to the Health Board for this purpose).

12.9 Upon payment in full of the Primary Healthcare Contribution, the requirement to provide a Primary Healthcare Facility shall fall, and the Primary Healthcare Facility Site may be used for whatever use the Landowner considers appropriate (subject to obtaining any necessary consents to do so).

12.10 In the event that the Primary Healthcare Contribution has not been spent or committed in full by the date falling ten (10) years from the last date of payment by the Landowner to the Council of any part of the Primary Healthcare Contribution, then the Council shall repay any unspent or uncommitted amount of the Primary Healthcare Contribution to the Landowner, together with all interest which has accrued thereon.

12.11 Should the Council have passed some or all of the Primary Healthcare Contribution to the Health Board, the Council shall procure that the terms of Clauses 12.8 and 12.10 above shall apply to that sum and to the Health Board *mutatis mutandis*.

13. Place of Worship

13.1 The parties hereby agree that it shall no longer be necessary to construct a place of worship on the Agreement Subjects.

14. Not Used

14.1 Not used.

15. Sport, Recreation and Play Facilities

15.1 Within twelve months of the final date of signing of this Agreement, the Landowner shall submit to the Council a Leisure Services Strategy for the Council's approval in writing.

15.2 The Leisure Services Strategy shall include details of the provision of the following items, including a programme for delivery:

15.2.1 the construction of Central Park;

15.2.2 the locations of Neighbourhood Equipped Areas of Play;

15.2.3 the locations of Local Equipped Areas of Play;

15.2.4 the locations of Local Areas of Play;

15.2.5 indicative walking and cycling routes through Central Park; and

15.2.6 maintenance and management of the facilities provided as part of the Leisure Services Strategy which may provide for:

(i) the Landowner managing and maintaining all or any such facilities; or

(ii) the Landowner transferring all or any such facilities to a third party for management and maintenance declaring for the purposes of this clause, that a third party shall not include a purchaser of a Residential Unit; or

(iii) subject to the Council accepting, at its sole discretion, such a transfer following written request from the Landowner, which request shall be made no earlier than 3 years after the date on which the relevant facilities have been completed, the Landowner transferring all or any such facilities to the Council on payment of a commuted sum representing the cost of twenty (20) years annual maintenance (based on an average of the preceding 3 years maintenance costs); or

(iv) any combination of (i), (ii), and (iii) above.

15.3 All of the facilities to be provided as part of the Leisure Services Strategy will be available for use by the public.

15.4 The approved Leisure Services Strategy shall be implemented by the Landowner, but may be varied in writing at any time by agreement of the parties, both parties acting reasonably.

15.5 The Landowner shall notify the Council of the date of practical completion of each element of the leisure services strategy.

Newton Road Recreation Ground

15.6 Prior to the occupation of the 2000th Residential Unit, the Landowner will pay the Newton Road Recreation Ground Contribution to the Council.

15.7 The Council shall pay the Newton Road Recreation Ground Contribution into an interest bearing deposit account and shall only use the Newton Road Recreation Ground Contribution to upgrade and refurbish the recreation ground and pavilion.

15.8 In the event that the Newton Road Recreation Ground Contribution has not been spent or committed in full by the date falling five (5) years from the date of payment by the Landowner to the Council, then the Council shall repay any unspent or uncommitted amount of the Newton Road Recreation Ground Contribution to the Landowner, together with all interest which has accrued thereon.

16. Landscaped Areas

16.1 The parties have agreed, and the Council has approved, the Landscape Management and Maintenance Schedule. The Landscape Management and Maintenance Schedule shall be implemented by the Landowner in accordance with its approved terms, but may be varied in writing at any time by agreement of the parties, both parties acting reasonably.

17. Community Woodland Park

17.1 Within twenty four months of the date of signing of this Agreement, the Landowner shall submit to the Council a Woodland Management Plan for the Council's approval in writing. Once approved, such Woodland Management Plan shall supersede any prior plan that has been agreed.

17.2 The Woodland Management Plan shall include details of the provision of the following:

17.2.1 The overriding aims and objectives for the Community Woodland.

17.2.2 Details of the essential infrastructure to be delivered, in phases, by the Landowner.

17.2.3 Details of the phased delivery of the Community Woodland.

17.2.4 An outline of the opportunities to engage with other parties in the enhancement and long term management of the Community Woodland.

17.2.5 A strategy for the long term management of the Community Woodland.

17.2.6 Details of the new habitat creation.

17.2.7 Details of archaeological constraints and opportunities.

17.2.8 Details of woodland management including new woodland and selective felling of existing woodland.

17.3 The approved Woodland Management Plan shall be implemented by the Landowner, but may be varied in writing at any time by agreement of the parties, both parties acting reasonably.

17.4 The Landowner shall notify the Council of the date of practical completion of each phase of the Woodland Management Plan.

17.5 All of the facilities to be provided as part of the Woodland Management Plan shall be available for use by the public.

18. Remediation and Ecological Mitigation

18.1 The Landowner shall pay to the Council the Remediation Contribution annually in eight instalments as set out in the following table:

Instalment	Sum	Payment Date
First	£45,000	31 March 2019
Second	£45,000	31 March 2020
Third	£45,000	31 March 2021
Fourth	£25,000	31 March 2022
Fifth	£25,000	31 March 2023
Sixth	£25,000	31 March 2024
Seventh	£25,000	31 March 2025
Eighth	£25,000	31 March 2026
TOTAL	**£260,000.00**	

18.2 The Council shall pay the Remediation Contribution into an interest bearing deposit account and shall only use the Remediation Contribution to cover the costs of (i) independent environmental consultants and/or (ii) a specialist contaminated land officer, appointed by the Council whose duties and responsibilities shall be to monitor and verify site decontamination, remediation, engineered earthworks, and the implementation of ecological mitigation arising from such works. In the event that the remediation contribution is used for the costs of a specialist contaminated land officer, the specialist contaminated land officer shall at all times deal wholly and exclusively with any relevant matter associated with the remediation activities being carried out on or in relation to the former Royal Ordnance Factory, Bishopton.

18.3 In the event that any part of the Remediation Contribution has not been spent or committed in full by the date falling five (5) years from the date of payment of the relevant year's contribution by the Landowner to the Council, then the Council shall repay any unspent or uncommitted amount of that part of the Remediation Contribution to the Landowner, together with all interest which has accrued thereon.

18.4 The Council hereby undertakes that it shall respond timeously, and in any event within 21 days, to requests made under this Clause 18 by the Landowner for information by providing the Landowner with that information.

19. Sustainable Urban Drainage Systems (SUDS)

SUDS Design Schedule and Maintenance Manual

19.1 The Development shall be completed in accordance with the SUDS Design Schedule and Maintenance Manual.

19.2 The SUDS Design Schedule and Maintenance Manual shall identify those parts and portions of the SUDS at the Development to be adopted by the Council for ongoing management and

maintenance. Upon payment of the SUDS Contribution, the Council shall adopt for ongoing management and maintenance the said parts and portions of the SUDS at the Development.

19.3 The SUDS Design Schedule and Maintenance Manual may be varied in writing at any time by agreement of the parties, both parties acting reasonably.

SUDS Contribution

19.4 The Landowner shall pay to the Council the SUDS Contribution prior to 31 December 2026.

19.5 The Council shall pay the SUDS Contribution into an interest bearing deposit account and shall only use the SUDS Contribution to manage and maintain those parts and portions of the SUDS at the Development, as identified in the SUDS Design Schedule and Maintenance Manual.

19.6 In the event that the SUDS Contribution has not been spent or committed in full by the date falling ten (10) years from the date of payment by the Landowner to the Council, then the Council shall repay any unspent or uncommitted amount of the SUDS Contribution to the Landowner, together with all interest which has accrued thereon.

20. Community Development Fund

20.1 The parties hereby acknowledge that the sum of £100,000 has already been paid to the Council under the Original Section 75 Agreement to be used in respect of the Community Development Fund.

20.2 The Landowner shall pay to the Council the Community Development Fund Contribution in four equal instalments as follows:

20.2.1 Prior to the occupation of the 1060th Residential Unit, the Landowner will pay the first Community Development Fund Contribution Instalment to the Council.

20.2.2 Prior to the occupation of the 1500th Residential Unit, the Landowner will pay the second Community Development Fund Contribution Instalment to the Council.

20.2.3 Prior to the occupation of the 1940th Residential Unit, the Landowner will pay the third Community Development Fund Contribution Instalment to the Council.

20.2.4 Prior to the occupation of the 2160th Residential Unit, the Landowner will pay the fourth Community Development Fund Contribution Instalment to the Council.

20.3 The Council shall pay each Community Development Fund Contribution Instalment to the Bishopton Community Trust.

20.4 The Council shall use reasonable endeavours to ensure that the Bishopton Community Trust uses each Bishopton Community Development Fund Contribution Instalment only to fund community development projects in Bishopton which may include the refurbishment, enhancement or extension of existing facilities, the provision of new facilities, general community development work including the provision of advice and support, and may be used for capital or revenue expenditure. In all cases, and subject to complying with this clause 20.4, the manner in which the Community Development Fund Contribution is spent will be a matter at the discretion of the Bishopton Community Trust.

20.5 In the event that the Community Development Fund Contribution has not been spent or committed in full by the date falling ten (10) years from the last date of payment by the Landowner to the Council of any part of the Community Development Fund Contribution, then the Council shall procure that the Bishopton Community Trust repays any unspent or uncommitted amount of the Community Development Fund Contribution to the Landowner, together with all interest which has accrued thereon.

21. Disputes

21.1 Any dispute or difference arising between the parties concerning the construction or implementation of this Agreement shall failing agreement be referred to and determined by an expert appointed by the parties who shall be a suitably qualified experienced member of the Royal Institution of Chartered Surveyors of at least 10 years standing, who will, failing

agreement between the parties be appointed by the Chairman for the time being of the Royal Institution of Chartered Surveyors on the application of any party to the dispute or difference, and who shall act as an expert and not as an arbitrator. The expert will be requested to reach his decision within two calendar months of his appointment and to take account of representations received within 21 days of his appointment, to enable the expert to provide a reasoned determination, which determination shall include a statement of the reasons therefor. The decision of the expert, including that as to costs, except in the case of manifest error or omission will be final and binding on the parties to the dispute or difference and, for the avoidance of doubt, there shall be specifically excluded the provisions of Rule 41 of the Scottish Arbitration Rules, which Scottish Arbitration Rules are contained in Schedule 1 to the Arbitration (Scotland) Act 2010 which would otherwise permit an application to the Court of Session on any question of law.

22. Discharge

22.1 In the event of the Planning Permission being revoked or in any way falling, the obligations under this Agreement shall fall and be deemed *pro non scripto*.

23. Notices

23.1 All notices which require to be given in terms of this Agreement shall be in writing and shall be deemed to be sufficiently served if signed by or on behalf of the party issuing the notice and either (i) delivered personally, or (ii) sent by pre-paid recorded delivery or registered post addressed:

23.1.1 In the case of the Council, to the Council at its principal office or to such other address as the Council may have notified the other parties previously in writing; and

23.1.2 In the case of the Landowner, at its Registered Office or Head Office and, for subsequent persons with an interest in the Agreement Subjects (if a body corporate) at its Registered Office or Head Office, and (if an individual) at his last known address in the United Kingdom and (if a partnership) to the partnership and any one or more of the partners thereof at its last know principal place of business in the United Kingdom or (in any case) at such address as the Landowner may have notified in writing to the other parties;

and any such notice shall be deemed to have been served (i) if delivered personally, at the time of delivery, and (ii) in the case of pre-paid recorded delivery or registered post, on the second business day after the date on which the same was posted (excluding weekends and public and statutory holidays).

24. Miscellaneous

24.1 The headings appearing in this Agreement are for ease of reference only and shall not affect the construction of this Agreement.

24.2 References to statutes, regulations, orders, delegated legislation shall include any such instrument re-enacting or made pursuant to the same power.

24.3 References to the singular include the plural and references to any gender include all genders.

24.4 Wherever in this Agreement the decision, approval, consent or declaration of satisfaction of the Council is required then, save where expressly otherwise provided, the Council shall act reasonably and expeditiously in respect of the same but under declaration that nothing herein contained shall constrain the proper discharge by the Council of their statutory duties, responsibilities and functions.

24.5 Any decision, approval, consent or declaration of satisfaction of the Council required under this Agreement must be issued in writing before it shall be binding on the Council.

24.6 The parties consent to the recording of this Agreement in the Books of Council and Session for preservation and execution.

24.7 The Landowner shall not assign, burden, convey, dispone, lease nor in any other way deal with his interests in the Agreement Subjects or any part of parts thereof prior to the registration of this Agreement in the Land Register of Scotland.

24.8 Except for the planning obligations contained in this Agreement specifically regulating the use of land or buildings after construction, no planning obligations contained in this Agreement shall be binding on owners or occupiers of buildings (and land associated with any building) constructed pursuant to the Planning Permission and the Original Planning Permission. For the avoidance of doubt, this clause 24.8 applies to land held by any of the statutory utilities for their operational purposes (and, if applicable, any substations or other necessary infrastructure constructed thereon).

24.9 Except in the case of an antecedent breach, former heritable proprietors shall only be liable for any of the planning obligations contained in this Agreement to the extent the Council has, having used all reasonable endeavours, exhausted the remedies available to it against the Landowner of the Agreement Subjects at the time any planning obligation becomes enforceable.

25. Provision of Information

25.1 The Council shall be entitled to establish by any reasonable means whether the provisions of this Agreement are being complied with, and the Landowner acknowledges and agrees to provide within a reasonable period, at no expense to the Council, and in such format as is required by the Council, such information as is reasonably required by the Council in connection with the monitoring of this Agreement and the implementation of its provisions.

26. Costs

26.1 The Landowner shall pay the Council's reasonable and properly incurred legal fees, expenses and outlays (together with any VAT thereon) in connection with the preparation and execution of this Agreement to a maximum liability in respect of the legal fees element of SEVEN HUNDRED AND FIFTY POUNDS (£750) STERLING, and the Landowner shall pay for the costs of registering this Agreement in the Land Register of Scotland and the costs of obtaining two extracts thereof.

27. Laws of Scotland

27.1 This Agreement shall be construed in accordance with the Laws of Scotland and the parties hereby submit to the exclusive jurisdiction of the Scottish courts.

IN WITNESS WHEREOF these presents consisting of this, the preceding 18 pages, and the Schedule are executed as follows:

They are sealed with the Common Seal and subscribed for and on behalf of

RENFREWSHIRE COUNCIL

at PAISLEY

on 22 OCTOBER 2019

by NJAIRW ROBERT YOUNG

one of its Proper Officers .....

(Signature of Proper Officer)

They are subscribed for and on behalf of

BAE SYSTEMS (PROPERTY INVESTMENTS) LIMITED

at Preston

on 15.10.2018

by Mark Reeson .....

one of its directors

(Signature of director)

in the presence of:

.....(Signature of witness)

Sharon Carter .....(Name)

Portway House, Preston .....(Address)

PR2 2YB .....

THIS IS THE SCHEDULE REFERRED TO IN THE FOREGOING MINUTE OF AGREEMENT BETWEEN THE RENFREWSHIRE COUNCIL AND BAE SYSTEMS (PROPERTY INVESTMENTS) LIMITED

SCHEDULE

Part 1
Agreements Subjects

ALL and WHOLE (i) the subjects being the Royal Ordnance Factory, Bishopton, PA7 5NJ and registered in the Land Register for Scotland under Title Number REN22000; and (ii) the subjects being Reilly Farm, Turningshaw Road, Houston, Johnstone, PA6 7BP and registered in the Land Register of Scotland under Title Number REN31783.

SCHEDULE

Part 2
Landscape Management and Maintenance Schedule

THIS IS THE LANDSCAPE MANAGEMENT AND MAINTENANCE SCHEDULE FORMING PART 2 OF THE SCHEDULE IN THE FORTHCOMING MINUTE OF AGREEMENT BETWEEN THE ROTHERHAM COUNCIL AND BAE SYSTEMS (PROPERTY INVESTMENTS) LIMITED

Introduction

This document has been produced by Cass Associates on behalf of BAE Systems. The contents of the document are intended to provide guidance on the establishment and management of the landscape and habitat typologies proposed within the development area at Royal Ordnance Bishopton, Refrewshire.

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Contents

Management of open space and recreation areas
Landscape phasing
Public access
01 Village square landscape
02 Avenue tree planting
03 Sports and amenity grassland
04 Managed existing woodland and habitat
05 Woodland planting
06 Meadow and trees
07 Burn corridor planting
08 Wetland trees and meadow

Management of open space and recreation areas

The management of the open space and recreation areas will be facilitated by BAE Systems as the owner of the site. It is the intention of the owner to establish a management company to discharge any responsibilities for the maintenance and management of the site.

The costs are to be funded by an estate rent charge to be levied against the owner of every building constructed on the site. This includes both residential and employment buildings.

It is anticipated that the management company will be enabled to manage, maintain, administer and deal with land and buildings on the site and to set up and maintain management funds.

The sustainable drainage system and key highways corridors will be managed by Scottish Water and Roads Authority respectively.

Engineered structures including bridges, culverts and Birch Road will be regularly inspected and maintained.

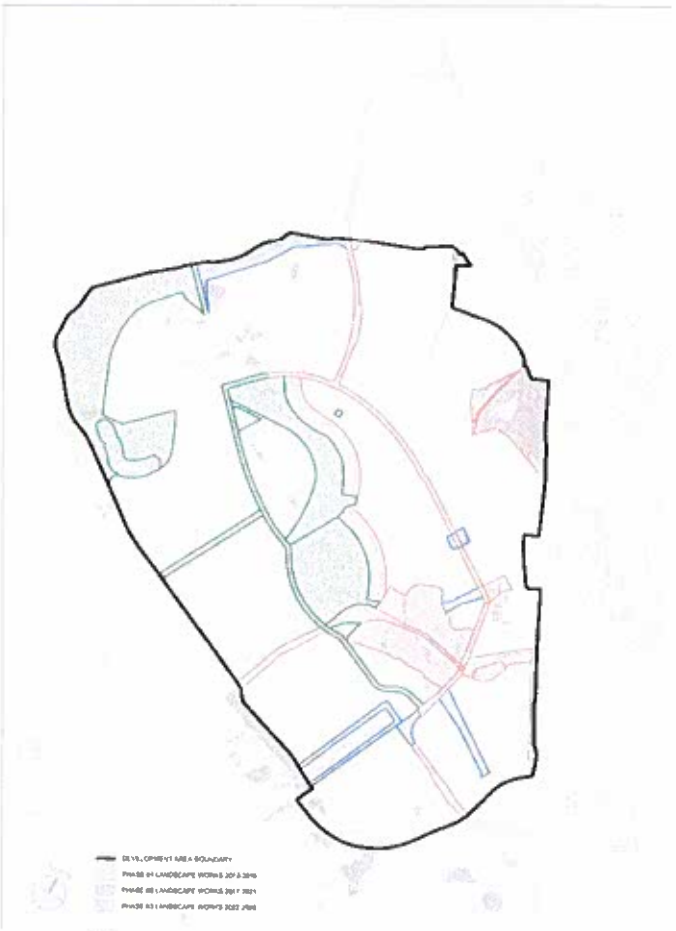
Landscape phasing

To facilitate the early implementation of the development landscape for public use, it will be completed in three landscape phases. The landscape restoration necessarily follows the remediation works with the development landscape split with the majority of the eastern areas being implemented in Phase 01, a number of specific areas in Phase 02 and the remaining areas in Phase 03.

Phase 01:
Phase 01 will consist of areas that lie to the east of the development with linkages to the existing settlement, primary road corridors, water courses and sustainable urban drainage areas. Landscape works carried out in 2012 to 2016 with public access thereafter.

Phase 02:
Phase 02 will be the implementation of key parts of the development area completing areas previously constructed in Phase 01. Specific areas will include, Dargave Square, completion of the village squares and works to the southern Craigton Park area. Landscape works carried out in 2017 to 2021 with public access thereafter.

Phase 03:
Phase 03 will see the completion of the development landscape with works to the west that link the eastern development area to the Community Wood and Park. This completes the landscape by integrating the remainder of the development area with the wider landscape. Landscape works carried out in 2022 to 2026 with public access thereafter.



Landscape phasing

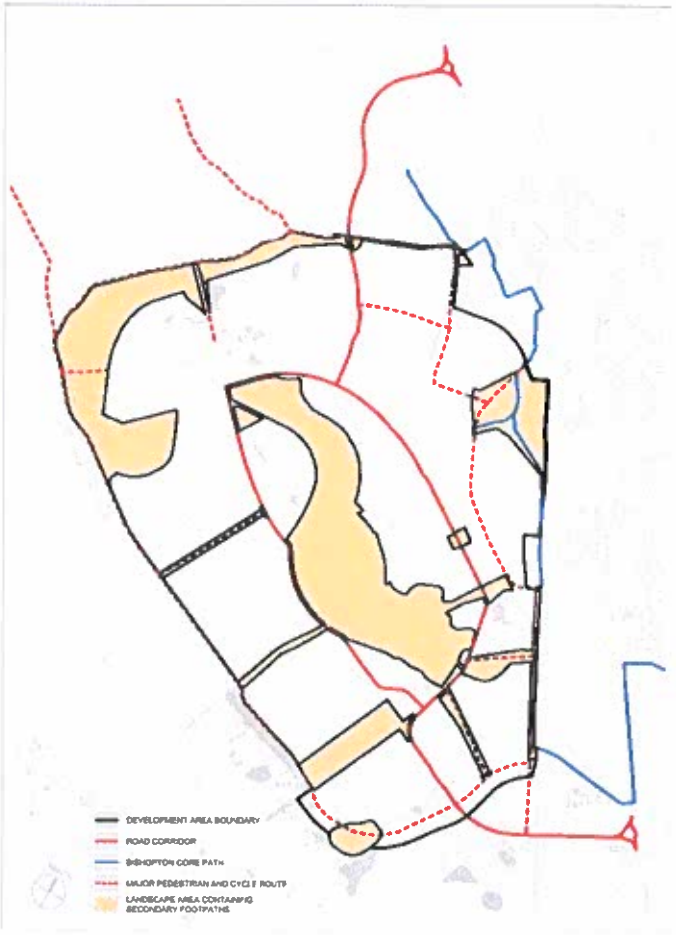
Public access

The development masterplan integrates vehicular routes, pedestrian routes and public spaces in a way which will enable interaction between people who are moving around the development. The movement framework places a high priority on meeting the needs of pedestrians and cyclists, discouraging non essential car use and providing direct and comfortable routes through different parts of the development.

The movement routes within the development area need to link with existing or proposed routes in the wider environment. This includes the northern and southern access roads from the A8, key community links at Newton Road, Ross Land Crescent and Station Road and links to the community wood and park which lies to the immediate west of the development area.

The masterplan seeks to incorporate clear routes through the site for all modes of travel, recognising that successful urban places are achieved by the integration of buildings, movement routes and public spaces. The layout of movement routes has a strong bearing on the urban grain and character of the development.

Cycle and pedestrian routes follow the guidance within Designing Streets and follow a similar pattern. All key spaces and areas within the masterplan are fully linked, by dedicated cycleways on or close to the main spine roads and through carefully considered shared/calmed streets within the development areas.



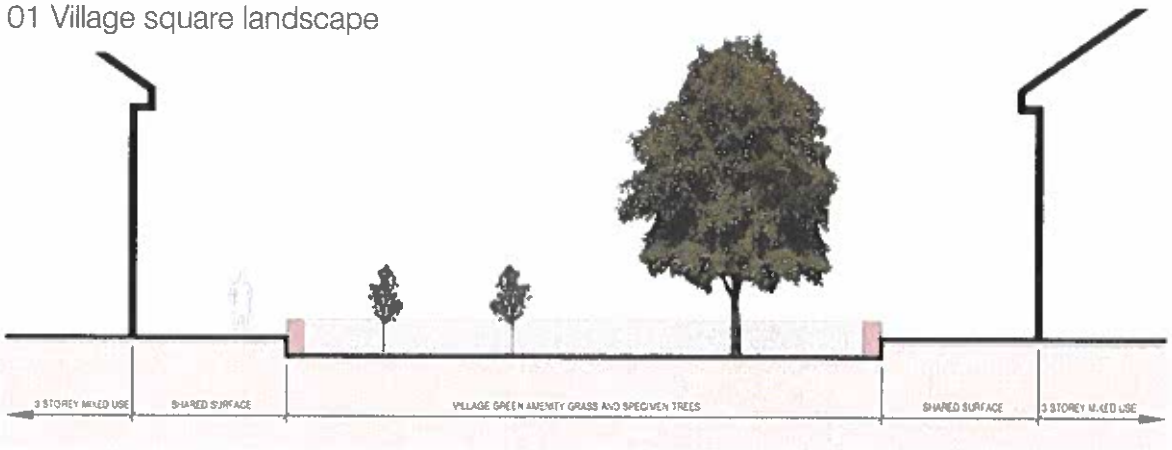
Public access routes

01 Village square landscape

Overview

A combination of formal and informal civic space designed to incorporate existing tree planting and local changes in topography. The spaces have been designed to reflect the civic importance of the village centre whilst providing a platform to express the mature character of the surrounding landscape. Opportunity exists to introduce new tree planting that can be managed to replace older specimens as illustrated opposite. The extent of adoption by the Roads Authority is subject to agreement.

01 Village square landscape



yr 01

Indicative landscape section: year 01

yr 25

Indicative landscape section: year 25

01 Village square landscape

Specification

Specimen tree locations shown on relevant drawings and to be staked standards, size 20-25.

Amenity grass BSH A18 seed or equal and approved.

Hedge planted in double staggered row at 4 plants per linear metre. Group size 5-15. Planted as whips.

SPECIES	COMMON NAME	% MIX
SPECIMEN TREES		
Fagus sylvatica	Common beech	-
Tilia cordata	Small leaved lime	[illegible]
AMENITY GRASS		
Festuca rubra	Corail creeping red fescue	30
Lolium perenne	Cadix perennial ryegrass	25
Festuca trachyphylla	Mentor hard fescue	20
Poa compressa	Canada meadow grass	12.5
Agrostis castellana	Highland bentgrass	10
Trifolium repens	Aberace white clover	2.5
Total		100
HEDGE		
Crataegus monogyna	Hawthorn	65
Corylus avellana	Hazel	30
Ilex aquifolium (male form)	Holly	5
Total		100

01 Village square landscape

Management schedule

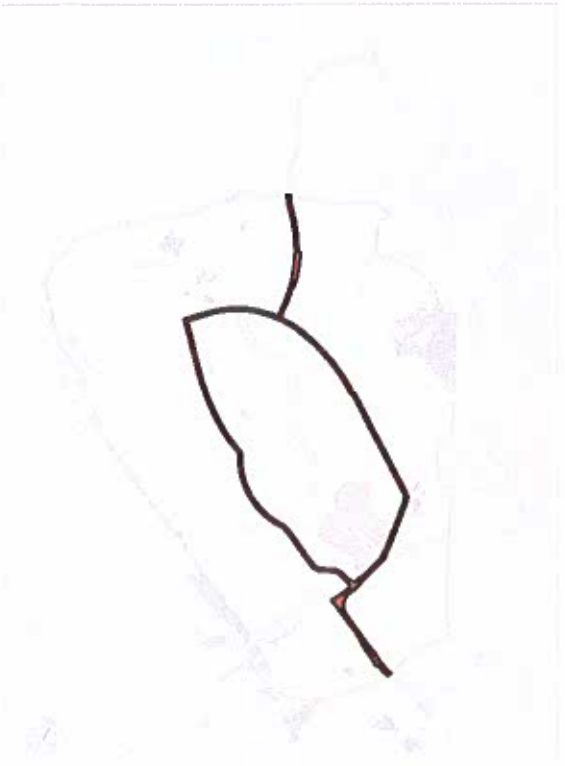
REF	OPERATION	NR / YR	J	F	M	A	M	J	J	A	S	O	N	D	NOTES
1	**GENERAL AMENITY GRASS**														
1.1	Cut to 75mm. Disperse cuttings	14			1	2	2	2	2	2	2	1			
1.2	Herbicide	1					1								Allowance for 10% of area annually
1.3	Fertiliser 15:15:15 NPK	1					1								Allowance for 10% of area annually
2	**BULBS IN GRASS**														
2.1	Cut to 75mm	1						1							After bulbs' top growth has died remove cuttings and revert to short grass regime
		8							2	2	2				Disperse cuttings
2.2	Herbicide	1								1					Allowance for 10% of area annually
3	**HEDGE**														
3.1	Hedge cutting	1	1												
4	**STANDARD TREE (NEW)**														
4.1	Herbicide to tree circles	1					1								
4.2	Replacement	1											1		Allowance of 1% of number annually
5	**SEMI-MATURE TREE (NEW)**														
5.1	Herbicide to tree circles	1					1								
5.2	Replacement	1											1		Allowance of 1% of number annually
6	**RETAINED WOODLAND**														
6.1	Herbicide	1					1								Allowance of 20% of area annually
6.2	Thin/prune - coppicing or removal of trees/shrubs especially close to routes. To improve structural diversity remove invasive species	1										1			Throughout winter and site specific requirements determined by landscape manager, eg along footpaths. Allowance of 20% of area annually
7	**AMENITY SHRUB PLANTING**														
7.1	Combined hand weed and herbicide	7					1		1						
7.2	Prune	1		1											As appropriate to species and variety. Allowance of 50% of area annually
7.3	Refurbishment	1			1										Re-plant at 4 plants per m. Allowance of 5% of area annually
7.2	Fertiliser	1					1								Allowance of 10% of area annually
8	**SEAT, BOLLARD, TREE GRILLE ETC**														
8.1	Inspect	4	1			1			1			1			Allowance of 10% of area annually
8.2	Minor repairs	1										1			Once a year when necessary

REF	OPERATION	NR / YR	J	F	M	A	M	J	J	A	S	O	N	D	NOTES
8.3	Replace	1										1			Allowance of 5% annually (average lifespan of 20 years)
9	**LIGHTING COLUMN (AMENITY STANDARD)**														
9.1	Inspect	4	1			1			1			1			Cuttings raked off
9.2	Minor repairs	1													Once a year when necessary
9.3	Replace	1													Allowance of 3% annually (average lifespan of 30 years)
10	**LEAP**														
10.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	
10.2	Minor repairs	4													As required
10.3	Replace	NA													Replace every 10 years
11	**FOOTPATH/CYCLEWAY**														
11.1	Weed control	1					1								
11.2	Minor repairs	1													As required. 1% allowance
11.3	Resurfacing every 40 years	NA													
11.4	Maintain drainage associated with parking area	1													As required
12	**HIGH QUALITY PAVING**														
12.1	Weed control	1					1								
12.2	Minor repairs	1													As required. 1% allowance
12.3	Resurfacing every 40 years	NA													
12.4	Maintain drainage	1													As required
13	**CLEANSING OPERATIONS**														
13.1	Weekly scavenge to all areas	52	4	5	4	4	5	4	4	5	4	4	5	4	
13.2	Remove fly-tipping and make good any vandalism	10													As required

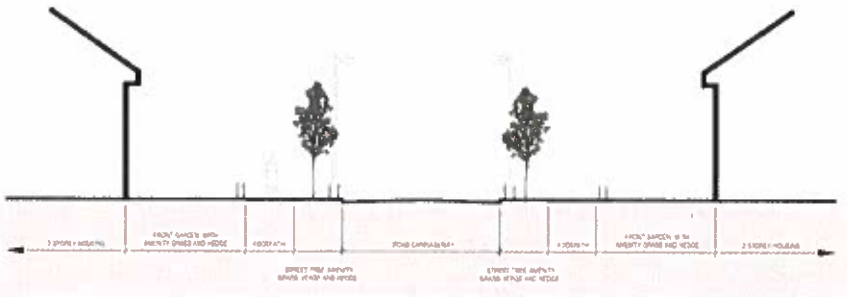
02 Avenue tree planting

Overview

Formal avenue streetscapes designed to provide a primary landscape structure to the routes through the site. The streetscape section has been designed to have formal hedge and semi-mature tree planting in the first years of the development. This will evolve to allow the growth of large, mature, deciduous trees that will form a distinctive character to the streetscape as illustrated on the drawings opposite. The extent of adoption by the Roads Authority is subject to agreement.

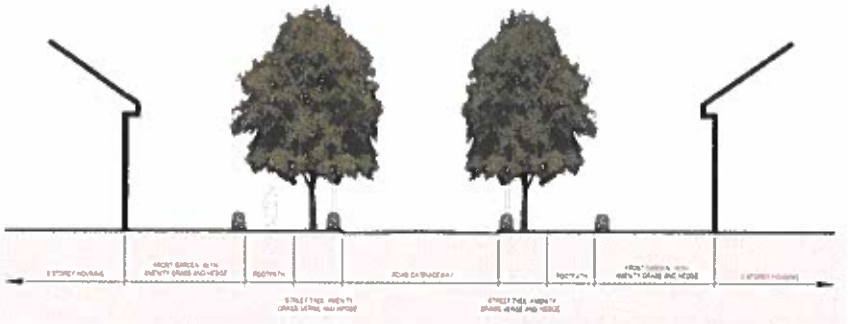


02 Avenue tree planting



Indicative landscape section: year 01

yr 01



Indicative landscape section: year 25

yr 25

02 Avenue tree planting

Specification

Street tree locations shown on relevant drawings and to be staked standards, size 20-25.

Hedge planted in double staggered row at 4 plants per linear metre. Group size 5-15. Planted as whips.

Amenity grass BSH A18 seed or equal and approved.

SPECIES	COMMON NAME	% MIX
SPECIMEN STREET TREES		
Fagus sylvatica	Common beech	
Tilia cordata	Small leaved lime	
HEDGE		
Crataegus monogyna	Hawthorn	60
Corylus avellana	Hazel	30
Acer campestre	Holly	10
Total		100
AMENITY GRASS		
Festuca rubra	Creeping red fescue	30
Lolium perenne	Dwarf perennial ryegrass	25
Festuca ovina	Hard fescue	20
Poa compressa	Canor meadow grass	12.5
Agrostis castellana	Highland bentgrass	10
Trifolium repens	Dutch white clover	2.5
Total		100

02 Avenue tree planting

Management schedule

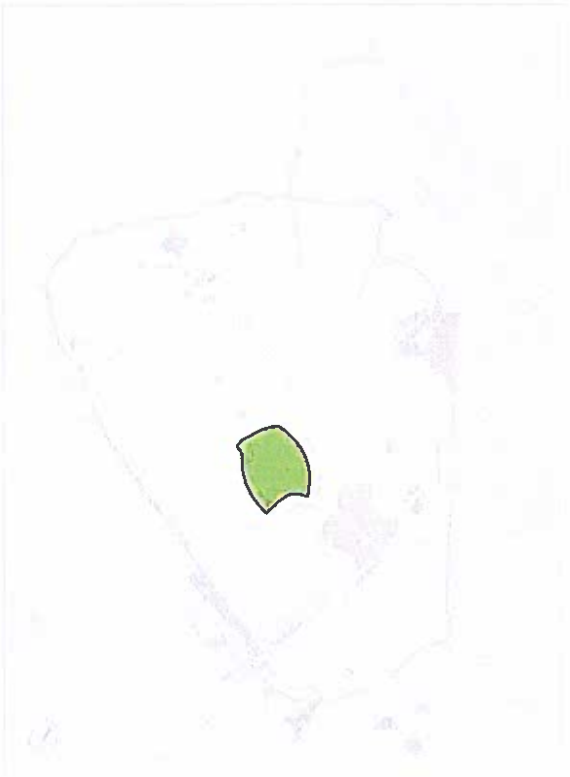
REF	OPERATION	NR./ YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
1	**GENERAL AMENITY GRASS**														
1.1	Cut to 75mm. Disperse cuttings	14	-	-	1	2	2	2	2	2	2	1	-	-	
1.2	Herbicide	1					1								Allowance for 10% of area annually
1.3	Fertiliser 15:15:15 NPK	1	-	-	-	-	1	-	-	-	-	-	-	-	Allowance for 10% of area annually
2	**BULBS IN GRASS**														
2.1	Cut to 75mm If	1 6	-	-	-	-	-	1	- 2	- 2	- 2	-	-	-	After bulb top growth has died remove cuttings and revert to short grass regime Disperse cuttings
2.2	Herbicide	1	-	-	-	-	-	-	-	1	-	-	-	-	Allowance for 10% of area annually
3	**STANDARD TREE (NEW)**														
3.1	Herbicide to tree circles	1	-	-	-	-	1	-	-	-	-	-	-	-	
3.2	Replacement	1	-	-	-	-	-	-	-	-	-	-	1	-	Allowance of 1% of trees annually
4	**SEMI-MATURE TREE (NEW)**														
4.1	Herbicide to tree circles	1	-	-	-	-	1	-	-	-	-	-	-	-	
4.2	Replacement	1	-	-	-	-	-	-	-	-	-	-	1	-	Allowance of 1% of trees annually
5	**HEDGE**														
5.1	Hedge cutting	1	1	-	-	-	-	-	-	-	-	-	-	-	
6	**AMENITY SHRUB PLANTING**														
6.1	Combined hand weed and herbicide	2				-	1	-	1						
6.2	Prune	1		1			-	-			-				As appropriate to species and variety. Allowance of 50% of area annually
6.3	Replacement	1			1	-	-	-			-			-	Replant at 4 plants per m. Allowance of 5% of area annually
6.2	Fertiliser	1	-	-	-	-	1	-	-	-	-	-	-	-	Allowance of 10% of area annually
7	**SEAT, BOLLARD, TREE GRILLE ETC**														
7.1	Inspect	3	1			1			1			1			Allowance of 10% of area annually
7.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	1	-	-	Once a year when necessary
7.3	Replace	1	-	-	-	-	-	-	-	-	-	1	-	-	Allowance of 5% annually (average lifespan of 20 years)
8	**LIGHTING COLUMN (AMENITY STANDARD)**														
8.1	Inspect	4	1	-	-	1	-	-	1	-	-	1	-	-	Cuttings reduced
8.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	-	-	-	Once a year when necessary

REF	OPERATION	NR./ YR.	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
8.3	Replace	1	-	-	-	-	-	-	-	-	-	-	-	-	Allowance of 3% annually (average lifespan of 30 years)
9	**FOOTPATH/CYCLEWAY**														
9.1	Weed control	1	-	-	-	-	1	-	-	-	-	-	-	-	-
9.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	-	-	-	As required. 1% allowance
9.3	Resurfacing every 40 years	N/A	-	-	-	-	-	-	-	-	-	-	-	-	
9.4	Mortar pointing associated with planting area	1	-	-	-	-	-	-	-	-	-	-	-	-	As required
10	**CLEANSING OPERATIONS**														
10.1	Weekly sweeping to all areas	52	4	5	4	4	5	4	4	5	4	4	5	4	
10.2	Remove fly tipping and make good any verges etc	10			-	-									As required

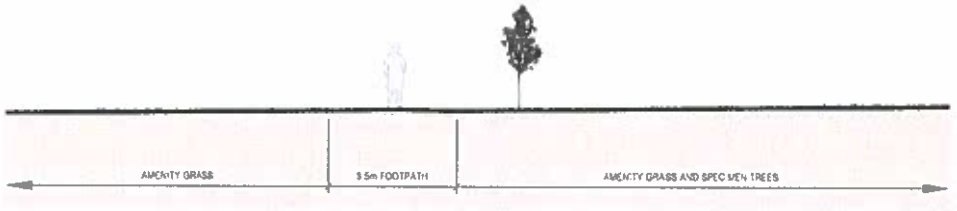
03 Sports and amenity grassland

Overview

An open parkland landscape set against an informal mix of native meadow, tree planting and water bodies. The areas of amenity and sports use will be incorporated into the topography with groups of parkland trees, more formal avenue trees and extensive footpaths.

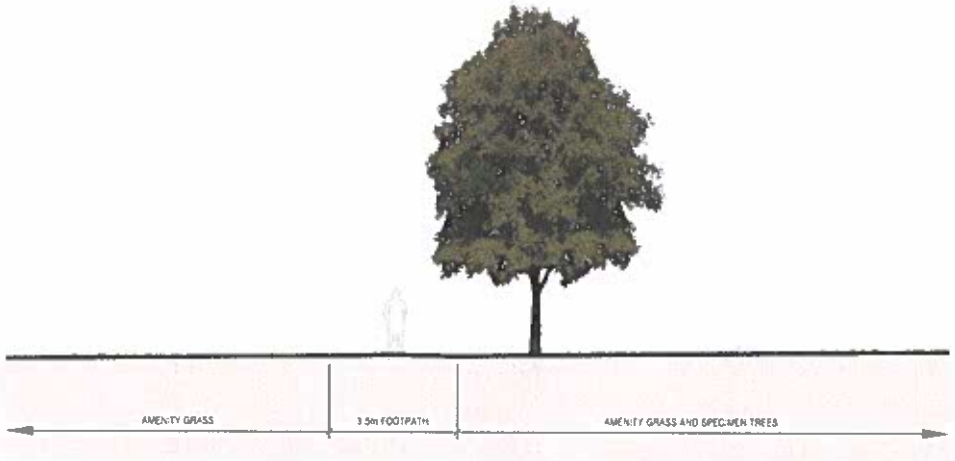


03 Sports and amenity grassland



yr 01

Indicative landscape section: year 01



yr 25

Indicative landscape section: year 25

03 Sports and amenity grassland

Specification

Park and tree locations shown on relevant drawings and to be staked standards, size 18-20.

Amenity grass BSH A18 seed or equal and approved.

Hedge planted in double staggered row at 4 plants per linear metre. Group size 5-15. Planted as whips.

SPECIES	COMMON NAME	% MIX
PARKLAND TREES		
Fagus sylvatica	Common beech	
Tilia cordata	Small-leaved lime	
AMENITY GRASS		
Festuca rubra	Corail creeping red fescue	30
Lolium perenne	Cadix perennial ryegrass	25
Festuca trachyphylla	Merlin hard fescue	20
Poa compressa	Canon meadow grass	12.5
Agrostis capillaris	Highland bentgrass	10
Trifolium repens	Aberace white clover	2.5
Total		100
HEDGE		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Total		100

03 Sports and amenity grassland

Management schedule

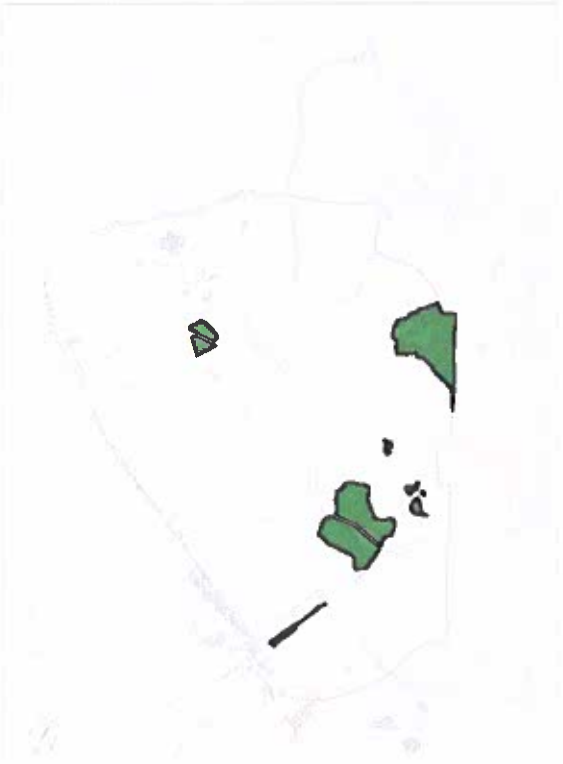
REF	OPERATION	NR/ YR.	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
1	**GENERAL AMENITY GRASS**														
1.1	Cut to 75mm. Disperse cuttings	14	-	-	1	2	2	2	2	2	2	1	-	-	
1.2	Herbicide	1	-	-	-	-	1	-							A cvallance for 10% of area annually
1.3	Fertiliser 15:15:15 NPK	1	-	-	-	-	1	-	-	-		-			A cvallance for 10% of area annually
2	**BULBS IN GRASS**														
2.1	Cut to 75mm	1	-	-	-	-	-	1							After bulb top growth has died remove cuttings and revert to short grass regime
		6	-	-	-	-	-	-	2	2	2				Disperse cuttings
2.2	Herbicide	1	-	-	-	-	-	-	-	1	-	-			A cvallance for 10% of area annually
3	**HEDGE**														
3.1	Hedge cutting	1	1	-	-	-	-	-	-						
4	**SEMI-MATURE TREE (NEW)**														
4.1	Herbicide to tree circles	1	-	-	-	-	1	-	-						
4.2	Replacement	1			-	-		-	-	-			1		A cvallance of 1% of number annually
5	**STANDARD TREE (NEW)**														
5.1	Herbicide to tree circles	1			-	-	-	1		-	-	-	-	-	
5.2	Replacement	1	-	-	-	-	-	-	-	-			1		A cvallance of 1% of number annually
6	**AMENITY SHRUB PLANTING**														
6.1	Combined hand weed and herbicide	2					1		1						
6.2	Prune	1			1										As appropriate to species and variety. A cvallance of 50% of area annually
6.3	Replacement	1				1									Replant at 4 plants per m. A cvallance of 5% of area annually
6.2	Fertiliser	1	-	-	-		1	-	-	-		-	-	-	A cvallance of 10% of area annually
7	**MEAP**														
7.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	
7.2	Minor repairs	4	-	-	-	-		-	-	-		-	-	-	As required
7.3	Replace	NA	-	-	-	-	-		-	-	-	-	-	-	Replace every 10 years
8	**SEAT, BOLLARD, TREE GRILLE ETC**														
8.1	Inspect	4	1			1			1			1			A cvallance of 10% of area annually
8.2	Minor repairs	1										1			Once a year when necessary
8.3	Replace	1										1			A cvallance of 5% annually (average lifespan of 20 years)

REF	OPERATION	NR/ YR.	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
9	**LIGHTING COLUMN (AMENITY STANDARD)**														
9.1	Inspect	4	1	-	-	1	-	-	1	-	-	1	-	-	Cuttings raised off
9.2	Minor repairs	1	-	-	-	-	-	-	1	-	-	-	-	-	Once a year when necessary
9.3	Replace	1	-	-	-	-	-	-	-	-	-	-	-	-	A cvallance of 3% annually (average lifespan of 30 years)
10	**SPORTS CHANGING ROOMS**														
10.1	Carry out site management and maintenance requirements	NA	-	-	-	-	-	-	-	-	-	-	-	-	As necessary. Changing rooms max area 250m gross internal floor area comprising 2 sets of changing rooms and ancillary facilities
11	**FULL SIZE TURF PLAYING SURFACE**														
11.1	Carry out site management and maintenance requirements	NA	-	-	-	-	-	-	-	-	-	-	-	-	As necessary. Min dimensions 100m x 50m together with area marginal and safety run off
12	**FULL SIZE ARTIFICIAL TURF PLAYING FIELD**														
12.1	Carry out site management and maintenance requirements	NA	-	-	-	-	-	-	-	-	-	-	-	-	As necessary. Min dimensions 105m x 68m floodlighting and peripheral ball stop fencing
13	**FOOTPATH/CYCLEWAY**														
13.1	Weed control	1	-	-	-	-	1	-	-	-	-	-	-	-	
13.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	-	-	-	As required. 1% allowance
13.3	Resurfacing every 40 years	NA	-	-	-	-	-	-	-	-	-	-	-	-	
13.4	Maintain drainage associated with pathways	1	-	-	-	-	-	-	-	-	-	-	-	-	As required
14	**CLEANSING OPERATIONS**														
14.1	Weekly sweeping to all areas	52	4	5	4	4	5	4	4	5	4	4	5	4	
14.2	Remove fly tipping and make good any vandalism	10	-	-	-	-	-	-	-	-	-	-	-	-	As required

04 Managed existing woodland and habitat

Overview

Areas of existing landscape that will be managed to provide a mature structural landscape within the overall development site. Each area of existing habitat will be managed to enhance its amenity value with pedestrian and cycle routes and increased bio-diversity and habitat development. Individual groups of mature trees will be protected and integrated within the proposed development spaces.



04 Managed existing woodland and habitat

Indicative landscape section: year 01

yr 01

Indicative landscape section: year 25

yr 25

04 Managed existing woodland and habitat

Specification

30% of each area designated as Woodland Core Mix to be planted with Main Canopy Species. Groups to be randomly located across each area designated as Mix 1, Woodland Core. Group size 3 - 8 number. Spacing 4 metre centres.*1

100% of each area designated as Woodland Core Mix to be planted with Secondary Canopy Species. Group size 10 - 25 number. Populus tremula to be planted at least 7m from edge of highway. Spacing 1.5 metre centres. Inter-planted with the main canopy species.Woodland Edge Mix group size 10 - 25 number. Spacing 1.5 metre centres.

For each woodland mix 95% planted as whips and 5% as staked standards.

*1 Quantity and planting density of main canopy tree species limited as required by the British Airports Authority.

*2 Berry bearing species make up a maximum of 20% of any woodland mix as required by the British Airports Authority.

Grass seed mix to be hydroseeded at sowing rate of 10g/m2 (10kg/ha). Over-sow grassed areas with wildflower meadow mix at sowing rate of 3g/m2 (3kg/ha).

SPECIES	COMMON NAME	% MIX
WOODLAND CORE (main canopy)		
Quercus petraea	Pedunculate oak	11
Quercus petraea	Sessile oak	8
Pinus sylvestris	Scots pine	7
Fraxinus excelsior	Ash	4
Total		30
WOODLAND CORE (secondary canopy)		
Betula pendula	Silver birch	35
Populus tremula	Aspen	25
Betula pubescens	Downy birch	15
Ilex aquifolium (male form)	Holly	15
Sorbus aucuparia	Rowan	11
Taxus baccata	Yew	5
Sorbus aria	Whitebeam	4
Total		100
WOODLAND EDGE		
Corylus avellana	Hazel	20
Salix caprea	Goat willow	20
Crataegus monogyna *2	Hawthorn	10
Alnus glutinosa	Common alder	8
Betula pendula	Silver birch	8
Salix cinerea	Common sallow	8
Betula pubescens	Downy birch	6
Malus sylvestris	Crab-apple	5
Prunus spinosa *2	Blackthorn	5
Rosa arvensis	Field rose	5
Sambucus nigra *2	Elder	3
Prunus avium *2	Wild cherry	2
Total		100
GRASSLAND		
Festuca rubra	Amenity creeping red fescue	35
Lolium perenne	Cardiff perennial ryegrass	20
Agrostis castellana	Highland bent grass	17.5
Cynosurus cristatus	Crested dog's tail	10
Festuca rubra rubra	Calliope chewings fescue	10
Trifolium repens	Aberystwyth clover	7.5
Total		100

04 Managed existing woodland and habitat

Management schedule

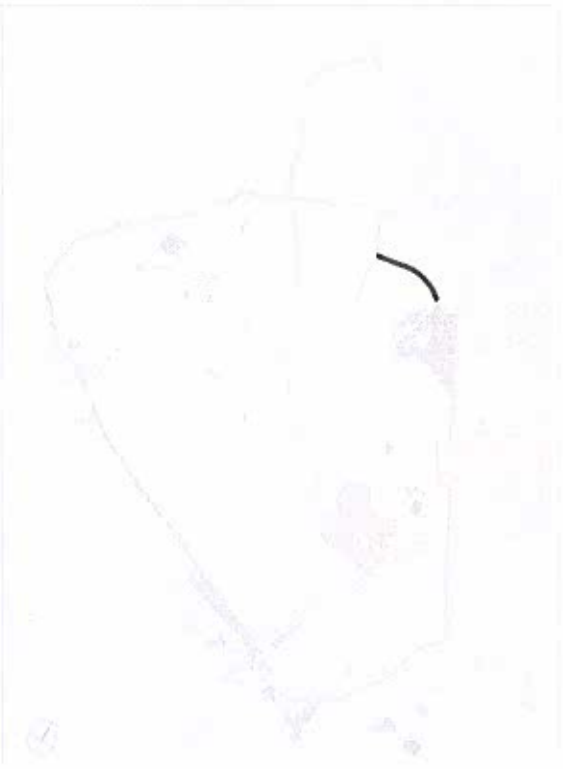
REF	OPERATION	NR /YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
1	**GENERAL AMENITY GRASS**														
1.1	Cut to 75mm. Disperse cuttings	14	-	-	1	2	2	2	2	2	2	1	-	-	
1.2	Herbicide	1	-	-	-	-	1	-	-	-	-	-	-	-	A overall for 10% of area annually
1.3	Fertiliser 15:15:15 NPK	1	-	-	-	-	1	-	-	-	-	-	-	-	A overall for 10% of area annually
2	**MEADOW GRASS**														
2.1	Cutting	2	-	-	-	1	-	-	-	-	-	1	-	-	Cuttings raked off
2.2	Herbicide	1	-	-	-	-	1	-	-	-	-	-	-	-	Spot treatment only to weed species as to be confirmed. A overall for 10% of area annually
3	**STANDARD TREE (NEW)**														
3.1	Herbicide to tree circles	1					1								
3.2	Replacement	1	-	-	-	-	-	-	-	-	-	-	1	-	A overall of 1% of number annually
4	**RETAINED WOODLAND**														
4.1	Herbicide	1	-	-	-	-	1	-	-	-	-	-	-	-	A overall of 20% of area annually
4.2	Thin/prune - coppicing or removal of trees/shrubs especially close to routes to improve structure overall & remove invasive species	1										1			Throughout winter and site specific requirements determined by landscape manager eg Along footpaths. A overall of 20% of area annually
5	**NEW WOODLAND PLANTING**														
5.1	Herbicide	1	-	-	-	-	1	-	-	-	-	-	-	-	Spot treatment only to weed species as to be confirmed. A overall of 20% of area annually
5.2	Thin/prune - coppicing or removal of trees/shrubs especially close to routes to improve structure overall & remove invasive species	1										1			Throughout winter and site specific requirements determined by landscape manager eg Along footpaths. A overall of 20% of area annually
6	**OPEN WATER AND REED BEDS (OUTSIDE SUDS SYSTEM)**														
6.1	De-silt (mechanical)	NA	-	-	-	-	-	-	-	1	-	-	-	-	50% of area every 5 years
6.2	Thin out reeds (spot detailed assessment)	1					1								A overall for 5% of area annually as majority of area is open water
6.3	Remove invasive species	1	-	-	-	-	1	-	-	-	-	-	-	-	A overall for 2.5% of area annually as majority of area is open water
6.4	Remove of obstructions	4	-	1	-	-	1	-	-	1	-	-	1	-	As required
7	**FOOTPATH/CYCLEWAY**														
7.1	Weed control	1	-	-	-	-	1	-	-	-	-	-	-	-	
7.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	-	-	-	As required 1% allowance
7.3	Resurfacing every 40 years	NA	-	-	-	-	-	-	-	-	-	-	-	-	

REF	OPERATION	NR /YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
7.4	Maintain verge associated with parking area	1	-	-	-	-	-	-	-	-	-	-	-	-	As required
8	**SEAT, BOLLARD, TREE GRILLE ETC**														
8.1	Inspect	4	1	-	-	1	-	-	1	-	-	1	-	-	A overall of 10% of area annually
8.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	1	-	-	Once a year when necessary
8.3	Replace	1	-	-	-	-	-	-	-	-	-	1	-	-	A overall of 5% annually (average lifespan of 20 years)
9	**LIGHTING COLUMN (AMENITY STANDARD)**														
9.1	Inspect	4	1	-	-	1	-	-	1	-	-	1	-	-	Cuttings raked off
9.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	-	-	-	Once a year when necessary
9.3	Replace	1	-	-	-	-	-	-	-	-	-	-	-	-	A overall of 3% annually (average lifespan of 30 years)
10	**LEAP**														
10.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	
10.2	Minor repairs	4	-	-	-	-	-	-	-	-	-	-	-	-	As required
10.3	Replace	NA	-	-	-	-	-	-	-	-	-	-	-	-	Replace every 10 years
11	**CLEANSING OPERATIONS**														
11.1	Weekly scavenge to & from	52	4	5	4	4	5	4	4	5	4	4	5	4	
11.2	Remove fly tipping and miscellaneous arisings	10	-	-	-	-	-	-	-	-	-	-	-	-	As required

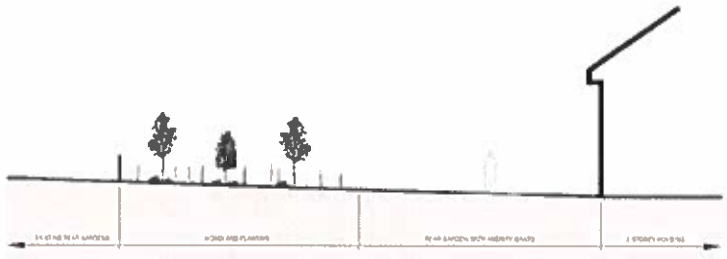
05 Woodland planting

Overview

Native woodland planting designed to provide screening and habitat development along key boundaries within the development. The woodland corridors will be integrated within residential gardens to create a sense of ownership by individual residents. Larger areas of new woodland will provide greater opportunities for habitat development alongside routes for public footpath and cycleway access. The developer is responsible for the management of the new woodland planting.



05 Woodland planting



Indicative landscape section: year 01

yr 01

Indicative landscape section: year 25

yr 25

05 Woodland planting

Specification

30% of each area designated as Woodland Core Mix to be planted with Main Canopy Species. Groups to be randomly located across each area designated as Mix 1, Woodland Core. Group size 3 – 8 number. Spacing 4 metre centres.*1

100% of each area designated as Woodland Core Mix to be planted with Secondary Canopy Species. Group size 10 – 25 number. Populus tremula to be planted at least 7m from edge of highway. Spacing 1.5 metre centres. Inter-planted with the main canopy species.

Woodland Edge Mix group size 10 – 25 number. Spacing 1.5 metre centres. For each woodland mix 95% planted as whips and 5% as staked standards.

*1 Quantity and planting density of main canopy tree species limited as required by the British Airports Authority.

*2 Berry bearing species make up a maximum of 20% of any woodland mix as required by the British Airports Authority.

Amenity grass in residential gardens to be specified by developer.

SPECIES	COMMON NAME	% Mix
WOODLAND CORE (main canopy)		
Quercus robur	Pedunculate oak	11
Quercus petraea	Sessile oak	6
Pinus sylvestris	Scots pine	7
Fraxinus excelsior	Ash	6
Total		30
WOODLAND CORE (secondary canopy)		
Betula pendula	Silver birch	25
Populus tremula	Aspen	25
Alnus glutinosa	Downy birch	15
Acer pseudoplatanus	Holly	15
Sorbus aucuparia[*2]	Rowan	11
Taxus baccata[*2]	Yew	5
Sorbus aria[*2]	Whitebeam	4
Total		100
WOODLAND EDGE		
Corylus avellana	Hazel	20
Salix caprea	Goat willow	20
Crataegus monogyna[*2]	Hawthorn	10
Alnus glutinosa	Common alder	8
Betula pendula	Silver birch	8
Salix cinerea	Common sallow	8
Betula pubescens	Downy birch	6
Malus sylvestris	Crab-apple	5
Prunus spinosa[*2]	Blackthorn	5
Acer campestre	Field maple	5
Sambucus nigra[*2]	Elder	3
Prunus avium[*2]	Wild cherry	2
Total		100

05 Woodland planting

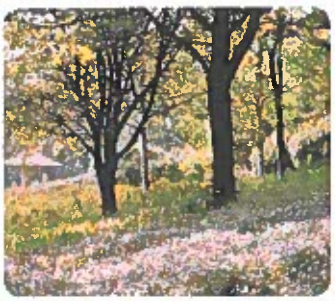
Management schedule

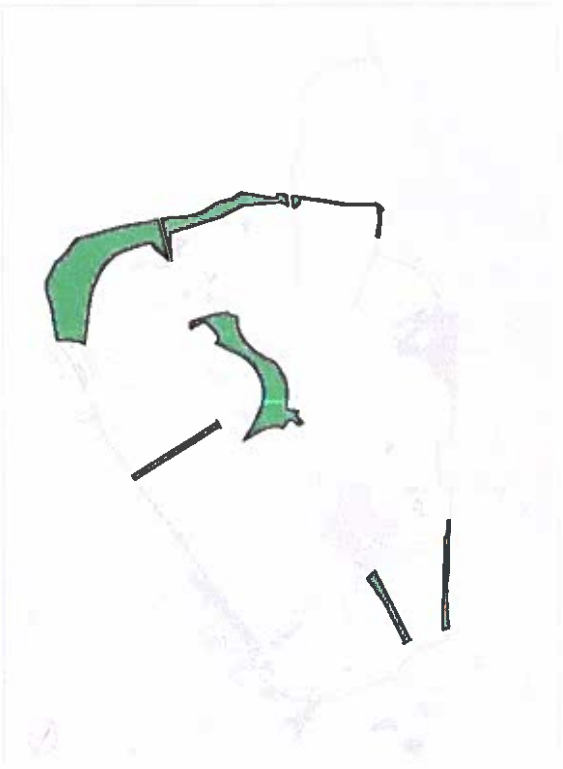
REF	OPERATION	NR. /YR.	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
1	**SEMI-MATURE TREE (NEW)**														
1.1	Herbicide to tree circles	1					1								
1.2	Replacement	1											1		Allowance of 1% of number annually
2	**STANDARD TREE (NEW)**														
2.1	Herbicide to tree circles	1					1								
2.2	Replacement	1											1		Allowance of 1% of number annually
3	**NEW WOODLAND PLANTING**														
3.1	Herbicide	1					1								Spot treatment only to weed species to be controlled. Allowance for 20% of area annually
3.2	Thin/prune – coppicing or removal of trees/shrubs especially close to routes, to improve structural diversity, remove invasive species	1													Throughout winter and site specific requirements determined by landscape manager, eg along footpaths. Allowance for 20% of area annually
4	**FOOTPATH/CYCLEWAY**														
4.1	Weed control	1					1								
4.2	Minor repairs	1													As required. 1% allowance
4.3	Resurfacing every 40 years	N/A													
4.4	Maintain drainage associated with parking area	1													As required
5	**BADGER PROOF FENCING**														
5.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	
5.2	Minor repairs	2													Twice a year as necessary
5.3	Replace	N/A										1			Replace every 15 years
6	**CLEANSING OPERATIONS**														
6.1	Weekly scavenging to all areas	52	4	5	4	4	5	4	4	5	4	4	5	4	
6.2	Remove fly tipping and make good any vandalism	10													As required

06 Meadow and trees

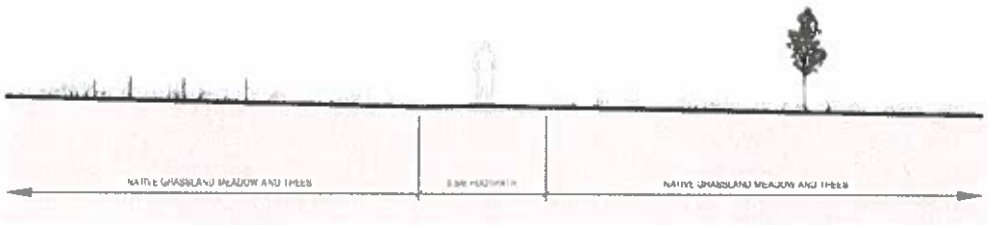
Overview

Open areas of native grassland habitat designed to integrate the surrounding landscape into the amenity areas of the development. Native grassland species together with groups of parkland trees provide a semi-natural, low maintenance environment for amenity use. Tree planting will be managed to provide a mature structure to the open spaces illustrated in the drawings opposite.



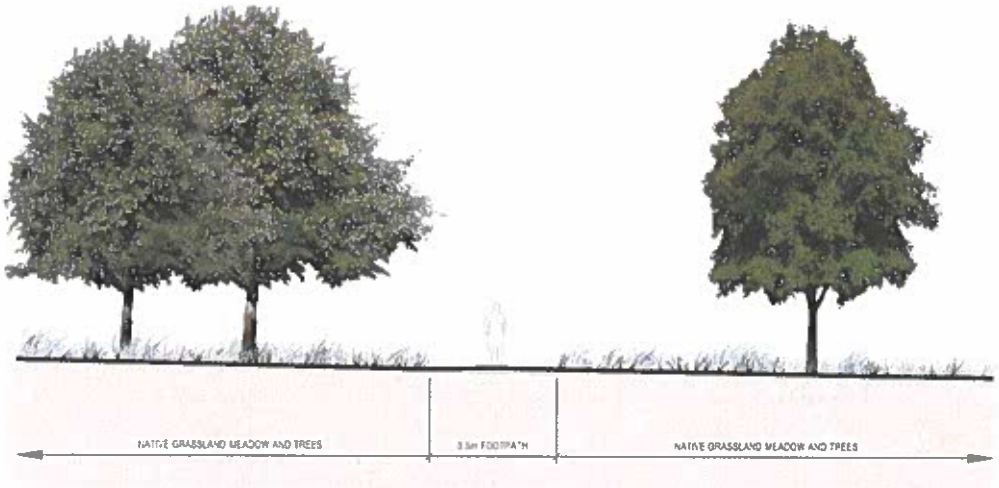


06 Meadow and trees



yr 01

Indicative landscape section: year 01



yr 25

Indicative landscape section: year 25

06 Meadow and trees

Specification

Grass seed mix to be hydroseeded at sowing rate of 10g/m2 (10kg/ha). Over-sow grassed areas with wildflower meadow mix at sowing rate of 3g/m2 (3kg/ha).

Specimen tree locations shown on relevant drawings and to be staked standards, size 18-20.

Hedge planted in double staggered row at 4 plants per linear metre. Group size 5-15. Planted as whips.

SPECIES	COMMON NAME	% MIX
SPECIMEN MEADOW TREES		
Acer pseudoplatanus	Sycamore	
Fagus sylvatica	Common beech	
Tilia cordata	Small leaved lime	
GRASSLAND		
Festuca rubra	Aniset creeping red fescue	35
Lolium perenne	Cadix perennial ryegrass	20
Agrostis capillaris	Highland bent grass	17.5
Cynosurus cristatus	Crested dogstail	15
Festuca rubra fallax	Calliope chewings fescue	10
Trifolium repens	Aberace white clover	2.5
Total		100
WILDFLOWER MEADOW		
Achillea millefolium	Yarrow	
Anthyllis vulneraria	Kidney vetch	
Centaurea nigra	Common knapweed	
Chrysanthemum segetum	Corn marigold	
Daucus carota	Wild carrot	
Digitalis purpurea	Foxglove	
Galium verum	Lady's bedstraw	
Geranium pratense	Meadow cranesbill	
Hypochoeris radicata	Cat's ear	
Knautia arvensis	Field scabious	
Leucanthemum vulgare	Ox-eye daisy	
Lotus corniculatus	Birdsfoot trefoil	
Papaver rhoeas	Corn poppy	
Plantago lanceolata	Ribwort plantain	
Prunella vulgaris	Self heal	
Ranunculus bulbosus	Bulbous buttercup	
Rhinanthus minor	Yellow rattle	
Rumex acetosa	Common sorrel	
Silene dioica	Red campion	
Stachys officinalis	Betony	
Vicia cracca	Tufted vetch	
Cynosurus cristatus	Crested dogstail	
Festuca rubra ssp trimale	Creeping red fescue	
Festuca arundinacea	Tall fescue	
HEDGE		
Crataegus monogyna	Hawthorn	65
Corylus avellana	Hazel	30
Ilex aquifolium (male form)	Holly	5
Total		100

06 Meadow and trees

Management schedule

REF	OPERATION	NR / YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
1	**GENERAL AMENITY GRASS**														
1.1	Cut to 75mm. Disperse cuttings	16			1	2	2	2	2	2	2	1			
1.2	Herbicide	1					1								A.llowance for 10% of area annually
1.3	Fertiliser 15:15:15 NPK	1					1								A.llowance for 10% of area annually
2	MEADOW GRASS														
2.1	Cutting	2				1						1			Cuttings raked off
2.2	Herbicide	1					1								Spot treatment only to weed species to be controlled. Allowance for 10% of area annually
3	HEDGE														
3.1	Hedge cutting	1	1												
4	STANDARD TREE (NEW)														
4.1	Herbicide to tree circle	1					1								
4.2	Replacement	1											1		Allowance of 1% of number annually
5	**SEMI-MATURE TREE (NEW)**														
5.1	Herbicide to tree circle	1					1								
5.2	Replacement	1											1		Allowance of 1% of number annually
6	**NEW WOODLAND PLANTING**														
6.1	Herbicide	1					1								Spot treatment only to weed species to be controlled. Allowance for 20% of area annually
6.2	Thin/prune - coppicing or removal of trees/shrubs especially close to rides to improve structure/variety remove invasive species	1													Throughout winter and site specific requirements determined by landscape manager, eg along footpaths. Allowance for 20% of area annually
7	**RETAINED WOODLAND**														
7.1	Herbicide	1					1								Allowance of 20% of area annually
7.2	Thin/prune - coppicing or remove of trees/shrubs especially close to rides to improve structure/variety remove invasive species	1										1			Throughout winter and site specific requirements determined by landscape manager, eg along footpaths. Allowance of 20% of area annually
8	**AMENITY SHRUB PLANTING**														
8.1	Combined hand weed and herbicide	2					1		1						
8.2	Prune	1		1											As appropriate to species and variety. Allowance of 50% of area annually

REF	OPERATION	NR / YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
8.3	Refurbishment	1			1										Replace at 4 plants per m. Allowance of 5% of area annually
8.7	Fertiliser	1					1								Allowance of 10% of area annually
9	**FOOTPATH/CYCLEWAY**														
9.1	Weed control	1					1								
9.2	Minor repairs	1													As required. 1% allowance
9.3	Refurfacing every 40 years	NA													
9.4	Maintain drainage associated with planting area	1													As required
10	**SEAT, BOLLARD, TREE GRILLE ETC**														
10.1	Inspect	4	1			1			1			1			Allowance of 10% of area annually
10.2	Minor repairs	1										1			Once a year when necessary
10.3	Replace	1										1			Allowance of 5% annually (average lifespan of 20 years)
11	**LIGHTING COLUMN (AMENITY STANDARD)**														
11.1	Inspect	4	1			1			1			1			Cuttings raked off
11.2	Minor repairs	1													Once a year when necessary
11.3	Replace	1													Allowance of 3% annually (average lifespan of 30 years)
12	**BADGER PROOF FENCING**														
12.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	
12.2	Minor repairs	2													Twice a year as necessary
12.3	Replace	NA										1			Replace every 15 years
13	**NEAP**														
13.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	
13.2	Minor repairs	4													As required
13.3	Replace	NA													Replace every 10 years
14	**LEAP**														
14.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	
14.2	Minor repairs	4													As required
14.3	Replace	NA													Replace every 10 years
15	**CLEANSING OPERATIONS**														
15.1	Weekly sweeping to A roads	52	4	5	4	4	5	4	4	5	4	4	5	4	
15.2	Remove fly tipping and make good any vandalism	10													As required

07 Burn corridor planting

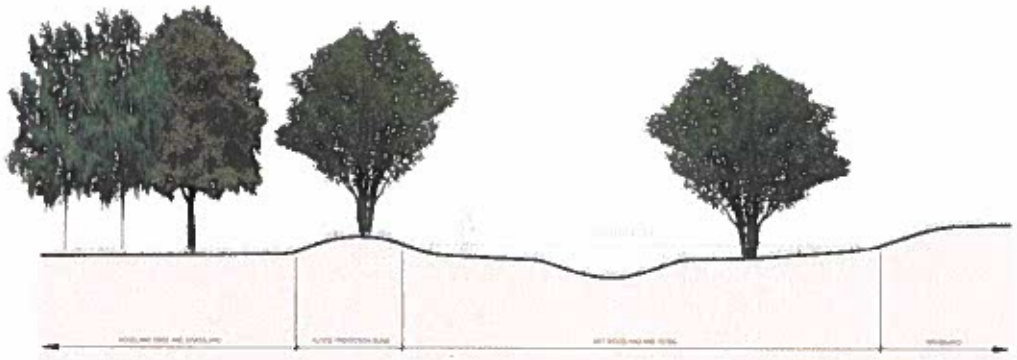
Overview

The enhancement of the existing water courses within the development site to increase their biodiversity, enhance their visual amenity and to provide a greater flood attenuation capacity. The main water course of Craigton Burn provides a diverse routing through the development combining habitat development and pedestrian and cycle access along its length.

07 Burn corridor planting

Indicative landscape section: year 01

yr 01



Indicative landscape section: year 25

yr 25

07 Burn corridor planting

Specification

Wetland trees group size 10-25 number. Spacing 1.5 metre centres. 95% planted as whips, 5 % staked standards. Berry bearing species make up a maximum of 20% of any woodland mix as required by the British Airports Authority. 30% of each area designated as Woodland Core Mix to be planted with Main Canopy Species. Groups to be randomly located across each area designated as Mix 1, Woodland Core. Group size 3 - 8 number. Spacing 4 metre centres *1

100% of each area designated as Woodland Core Mix to be planted with Secondary Canopy Species. Group size 10 - 25 number. Populus tremula to be planted at least 7m from edge of highway. Spacing 1.5 metre centres. Inter-planted with the main canopy species.

Woodland Edge Mix group size 10 - 25 number. Spacing 1.5 metre centres. For each woodland mix 95% planted as whips and 5% as staked standards.

*1 Quantity and planting density of main canopy tree species limited as required by the British Airports Authority

*2 Berry bearing species make up a maximum of 20% of any woodland mix as required by the British Airports Authority.

Grass seed mix to be hydroseeded at sowing rate of 10g/m2 (10kg/ha). Reeds to be translocated from existing on-site stream corridor.

SPECIES	COMMON NAME	% MIX
WETLAND TREES		
Alnus glutinosa	Common alder	25
Prunus spinosa	Blackthorn	15
Populus tremula	Aspen	*2
Salix alba	White willow	*2
Salix caprea	Goat willow	8
Populus alba	White poplar	5
Populus canescens	Grey poplar	6
Salix cinerea	Common sallow	5
Sorbus aucuparia	Rowan	4
Betula pubescens	Downy birch	3
Total		100

WOODLAND CORE (main canopy)		
Quercus robur	Pedunculate oak	*1
Quercus petraea	Sessile oak	8
Pinus sylvestris	Scots pine	7
Fraxinus excelsior	Ash	4
Total		30

WOODLAND CORE (secondary canopy)		
Betula pendula	Silver birch	25
Populus tremula	Aspen	20
Betula pubescens	Downy birch	15
Ilex aquifolium (male form)	Holly	15
Sorbus aucuparia	Rowan	*1
Taxus baccata	Yew	5
Sorbus aria	Whitebeam	4
Total		*20

WOODLAND EDGE		
Corylus avellana	Hazel	20
Salix caprea	Goat willow	20
Crataegus monogyna	Hawthorn	15
Alnus glutinosa	Common alder	8
Betula pendula	Silver birch	8
Salix cinerea	Common sallow	6
Betula pubescens	Downy birch	6
Malus sylvestris	Crab-apple	5
Prunus avium *	Blackthorn	5
Rosa arvensis	Field rose	5
Sambucus nigra *	Elder	5
Prunus avium *	Wild cherry	2
Total		100

SPECIES	COMMON NAME	% MIX
GRASS MIX		
Festuca rubra	Amenity creeping red fescue	35
Lolium perenne	Cadix perennial ryegrass	20
Agrostis castellana	Highland bentgrass	17.5
Cynosurus cristatus	Crested dogstail	15
Festuca rubra rubra	Calibra chewings fescue	10
Trifolium repens	Alsike white clover	2.5
Total		100

07 Burn corridor planting

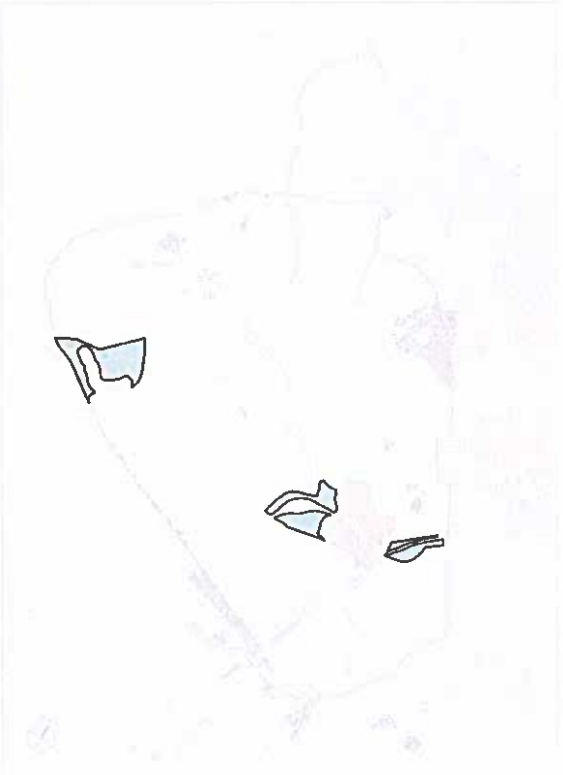
Management schedule

REF	OPERATION	NR / YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
1	MEADOW GRASS														
1 1	Cutting	2				1						1			Cuttings raked off
1 2	Herbicide	1					1								Spot treatment only to weed species to be controlled. Allowance for 10% of area annually
2	STANDARD TREE (NEW)														
2 1	Herbicide to tree circles	1					1								
2 2	Replacement	1											1		Allowance of 1% of number annually
3	SEMI-MATURE TREE (NEW)														
3 1	Herbicide to tree circles	1					1								
3 2	Replacement	1											1		Allowance of 1% of number annually
4	CRAIGTON BURN														
4 1	Desilt (mechanical)	NA													50% of area every 2 years
4 2	Thin out reeds (post establishment)	1					1								Allowance for 20% of area annually
4 3	Remove invasive species	1					1								Allowance for 10% of area annually
4 4	Remove of obstructions	4		1			1			1			1		As required
5	FOOTPATH/CYCLEWAY														
5 1	Weed control	1					1								
5 2	Minor repairs	1													As required 1% allowance
5 3	Resurfacing every 40 years	NA													
5 4	Maintain drainage associated with planting area	1													As required
6	SEAT, BOLLARD, TREE GRILLE ETC														
6 1	Inspect	4	1			1			1			*			Allowance of 10% of area annually
6 2	Minor repairs	1										*			Once a year when necessary
6 3	Replace	1										1			Allowance of 5% annually (average lifespan of 20 years)
7	CLEANSING OPERATIONS														
7 1	Weekly scavenge to all areas	52	4	5	4	4	5	4	4	5	4	4	5	4	
7 2	Remove fly tipping and refuse point any vehicle arr	10													As required

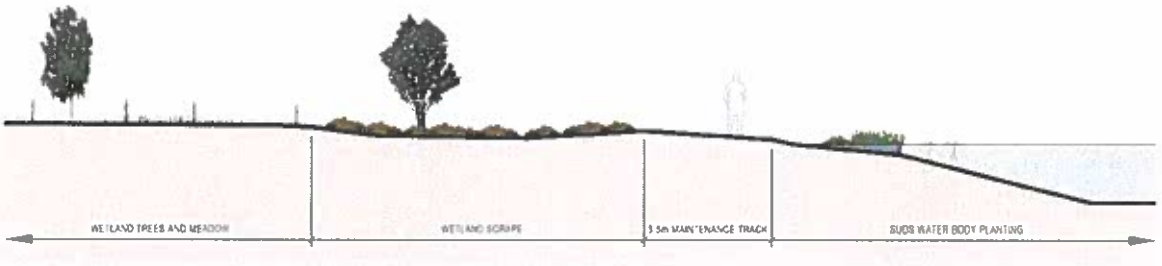
08 Wetland trees and meadow

Overview

A native grass and and tree planted landscape that integrates the watercourses that flow through the development site into the surrounding amenity spaces. The mix of grass and species will match the landscape character established in the drier areas to the north of Central Park and the development edges. The wet and landscape will be carefully managed to provide a diverse habitat alongside a rich amenity resource.

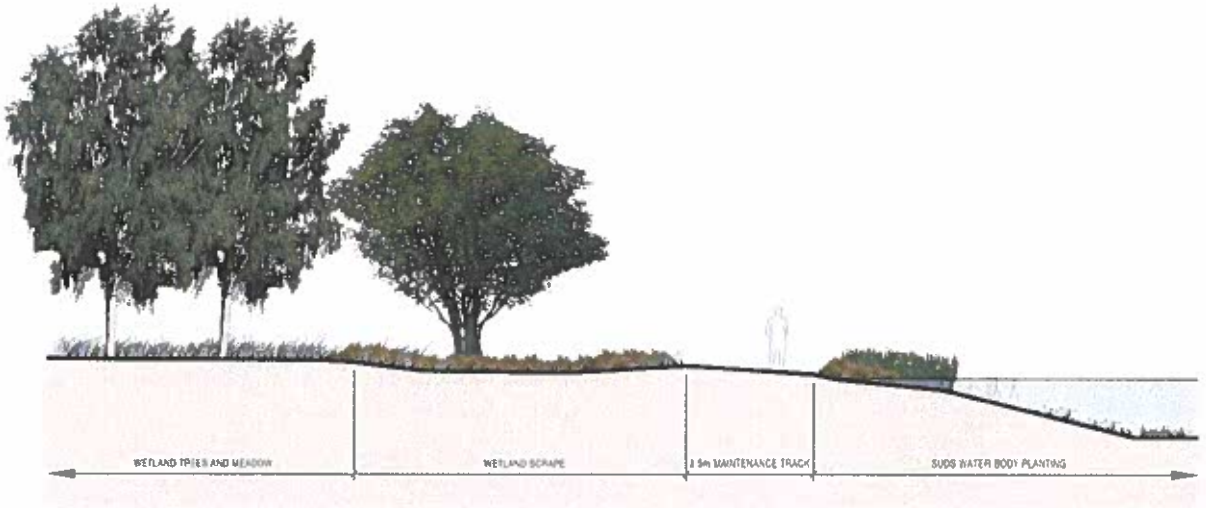


08 Wetland trees and meadow



yr 01

Indicative landscape section: year 01



yr 25

Indicative landscape section: year 25

08 Wetland trees and meadow

Specification

Wet and trees group size 10-25 number. Spac ng 1.5 metre centres. 95% planted as wh ps, 5 % staked standards. Berry bear ng spec es make up a max mum of 20% of any wood and m x as requ red by the Br t sh A rports Authority.

Grass seed m x to be hydroseeded at sow ng rate of 10g/m2 (10kg/ha).

Reeds for wet and scrape to be trans located from ex st ng on-s te stream corr dor.

SPECIES	COMMON NAME	% MIX
WETLAND TREES		
Alnus glutinosa	Common alder	25
Prunus spinosa	Blackthorn	15
Populus tremula	Aspen	15
Salix alba	White willow	15
Salix caprea	Goat willow	8
Populus alba	White poplar	6
Populus canescens	Grey poplar	4
Salix cinerea	Common sallow	5
Sorbus aucuparia	Rowan	4
Betula pubescens	Downy birch	3
Total		100

GRASSLAND		
Festuca rubra	Anset creeping red fescue	35
Lolium perenne	Cadix perenne ryegrass	20
Agrostis castellana	Highland bentgrass	17.5
Cynosurus cristatus	Crested dogstail	15
Festuca rubra litoralis	Calliope chewings fescue	10
Trifolium repens	Alsatia white clover	2.5
Total		100

WILDFLOWER MEADOW	
Achillea millefolium	Yarrow
Anthyllis vulneraria	Kidney vetch
Centaurea nigra	Common knapweed
Chrysanthemum segetum	Corn marigold
Daucus carota	Wild carrot
Digitalis purpurea	Foxglove
Galium verum	Lady's bedstraw
Geranium pratense	Meadow cranesbill
Hypochaeris radicata	Cat's ear
Knautia arvensis	Field scabious
Leucanthemum vulgare	Ox-eye daisy
Lotus corniculatus	Birdsfoot trefoil
Papaver rhoeas	Corn poppy
Plantago lanceolata	Ribwort plantain
Prunella vulgaris	Self heal
Ranunculus bulbosus	Bulbous buttercup
Rhinanthus minor	Yellow rattle
Rumex acetosa	Common sorrel
Silene dioica	Red campion
Stachys officinalis	Betony
Vicia cracca	Tufted vetch
Cynosurus cristatus	Crested dogstail
Festuca rubra rubra	Creeping red fescue
Festuca arundinacea	Tall fescue

08 Wetland trees and meadow

Management schedule

REF	OPERATION	NR /YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
1	**MEADOW GRASS**														
1.1	Cutting	2					-	1	-		1				Cuttings raked off
1.2	Herbicide	1					1								Spot treatment only to weed species to be controlled. Allowance for 10% of area annually
2	**RETAINED WOODLAND**														
2.1	Herbicide	1		-	-	-	1	-	-	-	-	-	-	-	Allowance of 20% of area annually
2.2	Tree nature - coppicing or removal of trees/shrubs especially close to routes to improve structural diversity remove invasive species	1									1				Throughout winter and site specific replacements determined by landscape manager eg along footpaths. Allowance of 20% of area annually
3	**NEW WOODLAND PLANTING**														
3.1	Herbicide	1					1						-	-	Spot treatment only to weed species to be controlled. Allowance for 15% of area annually
3.2	Tree nature - coppicing or remove of trees/shrubs especially close to routes to improve structural diversity remove invasive species	1					-		-	-	-	-	-		Throughout winter and site specific replacements determined by landscape manager eg along footpaths. Allowance for 15% of area annually
4	**STANDARD TREE (NEW)**														
4.1	Herbicide to tree circles	1					1								
4.2	Replacement	1											1		Allowance of 1% of number annually
5	**SEMI-MATURE TREE (NEW)**														
5.1	Herbicide to tree circles	1					1								
5.2	Replacement	1											1		Allowance of 1% of number annually
6	**FOOTPATH/CYCLEWAY**														
6.1	Weed control	1					1								
6.2	Minor repairs	1													As required. 1% allowance
6.3	Resurfacing every 60 years	NA													
6.4	Maintain drainage associated with parking area	1													As required
7	**SEAT, BOLLARD, TREE GRILLE ETC**														
7.1	Inspect	4	1	-	-	1	-	-	1			1	-		Allowance of 10% of area annually
7.2	Minor repairs	1	-	-	-	-	-	-	-	-	-	1	-		Once a year when necessary
7.3	Replace	1										1			Allowance of 5% annually average failure of 20 years
8	**LEAP**														
8.1	Inspect	12	1	1	1	1	1	1	1	1	1	1	1	1	

REF	OPERATION	NR /YR	TIMING (MONTH)												NOTES
			J	F	M	A	M	J	J	A	S	O	N	D	
8.2	Minor repairs	4	-	-	-	-	-	-	-	-	-	-	-	-	As required
8.3	Replace	NA													Replace every 10 years
9	**CLEANING OPERATIONS**														
9.1	Weekly scavenge to all areas	52	4	5	4	4	5	4	4	5	4	4	5	4	
9.2	Remove fly tipping and make good any vandalism	10	-		-		-				-			-	As required

SCHEDULE

Part 3
SUDS Design Schedule and Maintenance Manual

THIS IS THE SUDS DESIGN SCHEDULE AND MAINTENANCE MANUAL FORMING PART 3 OF THE SCHEDULE IN THE PREVIOUS MINUTE OF AGREEMENT BETWEEN THE RUNNYMEDE COUNCIL AND BAE SYSTEMS (PROPERTY INVESTMENTS) LIMITED

ROF Bishopton

SuDS Design and Maintenance Manual

On behalf of **BAE Systems Ltd**

BAE SYSTEMS

Project Ref: 30119/2079 | Rev: C | Date: December 2016

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Document Control Sheet

Project Name: ROF Bishopton

Project Ref: 30119/2079

Report Title: SuDS Design and Maintenance Manual

Doc Ref: Rev C

Date: December 2016

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Prepared by:	Stephen McGinnity	Assistant Engineer		20.12.2016
Reviewed by:	Andrew Johns	Associate		20.12.2016
Approved by:	Paul Swindale	Equity Director		20.12.2016

For and on behalf of Peter Brett Associates LLP

Revision	Date	Description	Prepared	Reviewed	Approved
A	24.08.2016	First issue	SM	AJ	PS
B	11.11.2016	Minor amendments following comments	SM	AJ	PS
C	20.12.2016	Updated following Client comments	SM	AJ	PS

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1 Introduction

1.1. This manual has been produced as a requirement of the Section 75 Agreement with Renfrewshire Council for the redevelopment of the former Royal Ordnance Factory site at Bishopton, Renfrewshire.

1.2. The purpose is to advise on standards and criteria adopted in the design of SuDS features with the primary aim being to provide a design schedule for each of the SuDS ponds located in the site and advise on operation and maintenance requirements and frequencies.

1.3. This document should be considered a *'live'* document and should be updated regularly as the detailed design and approval of the various SuDS ponds are progressed.

1.4. A copy of this document should be made freely available to the appointed pond maintenance and monitoring operatives.

2 Design Standards

2.1 Introduction

2.1.1 Prior to Peter Brett Associates LLP (PBA) involvement in the project, a design workshop was held with Renfrewshire Council, Scottish Environmental Protection Agency (SEPA), Scottish Water and British Airports Authority (BAA) and the principles of the strategic surface water drainage strategy established and agreed.

2.1.2 Design of the SuDS ponds which have already been built (S3A/S3B, S4, S5, S7, S8 and S9) have been predominantly in accordance with Sewers for Scotland 2nd Edition (SfS 2nd Ed) and CIRIA C697, The SuDS Manual.

2.1.3 Design of the SuDS ponds, which are yet to be built (S1, S6, S7 and S10), will be predominantly in accordance with Sewers for Scotland 3rd Edition and CIRIA C753, The SuDS Manual.

2.1.4 Due to the proximity of the development to Glasgow Airport, it has been necessary to implement a number of departures from SfS 2nd Ed and CIRIA C697. These departures are based on guidance documents produced by the Civil Aviation Authority and by the Ecological Restoration Consultants (ERC) 2007 entitled '*Royal Ordnance Factory Bishopton – Design of SuDS ponds to reduce the attractiveness to water birds*', a copy of which is included in **Appendix A**.

2.1.5 PBA understands that both Renfrewshire Council and Scottish Water, as the adopting authorities, have agreed to the use of SfS 2nd Ed. and CIRIA C697 as the design guides and have also agreed to the necessary departures required by BAA. It is also understood that both Renfrewshire Council and Scottish Water have agreed that any SuDS ponds designed as part of any future development will be designed in accordance with Sewer for Scotland 3rd Edition (SfS 3rd Ed.) and the new SuDS manual, CIRIA C753.

2.2 Adoption and Transfer

2.2.1 Through discussions, it was agreed that Scottish Water would be the adopting authority for all spine surface water sewerage infrastructure upstream of SuDS ponds which connects development plots to the strategic SuDS network.

2.2.2 Adoption and maintenance of the SuDS ponds, and associated drainage pipework, control structures and outlets, has been divided between Scottish Water and Renfrewshire Council, with the intention that ponds in series would be adopted by a single authority. **Table 2-1** below shows the agreed adopting authority for the relevant SuDS ponds.

SuDS Pond Reference	Adopting Authority
S1	Scottish Water
S3a, S3b	Renfrewshire Council
S4	Renfrewshire Council
S5	Renfrewshire Council
S6	Scottish Water
S7	Scottish Water
S8, S9	Scottish Water
S10	Scottish Water

Table 2-1: SuDS Pond Adopting Authority

2.2.3 Where ponds are yet to be constructed they will be designed to comply with the applicable standards from the adopting authority as well as those set out in this document. Where these standards conflict these will be referred to the adopting authority for approval.

3 Design Philosophy

3.1 Design

3.1.1 Each SuDS pond within the Bishopton site has been designed with the same key operating principles. The following information details these principles and their mechanisms.

3.2 Sediment Forebay

3.2.1 Each pond has a sediment forebay located at the inlet to the pond. The forebay consists of a concrete based pre-treatment area for sediment / silt collection before flows enter the main pond. Each sediment forebay size has been calculated to the requirement of Sewers for Scotland 2nd Edition which states for residential areas '*Pond forebays serving residential areas should be sized to allow 25 years of sediment storage based upon 0.3m³/ha/year*' and '*For pond forebays serving industrial and commercial areas should be sized to allow 25 year of sediment storage based on 0.8m³/ha/year*'.

3.2.2 As outlined previously, all future ponds are to be designed to SfS 3rd Ed., which has the same sediment forebay requirements as SfS 2nd Ed.

3.2.3 Each forebay is separated from the permanent pond by an aquatic berm, constructed of gabion basket walls which stretch the width of the forebay. This aquatic berm is submerged with the crest being approximately 150mm below the permanent water level of the pond.

3.3 Pond Treatment Volumes

3.3.1 Each SuDS pond has been sized to accommodate defined contributing areas and to provide treatment volumes at required levels.

3.3.2 Contributing runoff from the development plots has been taken as 40% impermeable for residential plots (H), 85% impermeable for employment plots (E & C) and 85% impermeable for mixed use areas (M).

3.3.3 **Table 3-1** below details the treatment volume within each pond, based on providing a treatment volume of 141.3 m³ per impermeable hectare of development.

Pond Ref	Contributing Plots	Total Catchment Area (Ha)	Total Impermeable Area (Ha)	Treatment Levels Required	Treatment Volume (m³)
S1	H13, H14, H15 (50%) H16 (50%), H17, H18, H19	29.77	12.98	1 Stage	1,835
S3A/ S3B	H2, H3, H6, H7 (50%), H8, H9, H10 (50%)	46.72	16.34	1 Stage	2,310
S4	H1, H4B, H11, M1, M2, M3, M4, H7 (50%), H10 (50%), H12, Worship	28.08	15.42	H: 1 Stage M: 2 Stage	2,180
S5	H5	6.64	2.66	1 Stage	375
S6	H15 (50%) H16 (50%), E3	23.31	16.61	H: 1 Stage E: 3 Stage	2,345
S7	E1	8.99	7.64	3 Stage	1,080
S8/S9	LRC, H4A, H4C, M5, E4	9.20	8.09	H: 1 Stage M: 2 Stage E: 3 Stage	1,145
S10	C1, E2	16.59	14.40	3 Stage	2,035

Notes:

a) The catchment areas shown above include of onsite road allowance.
b) Total catchment for ponds S3A/S3B includes existing incoming flows from Roseland Crescent, Ingliston Drive and Mrs Jacks Field.
c) Roads on site will require 2 levels of treatment generally.
d) Ponds S3A/S3B provide a combined single level of treatment.
e) Ponds S8 and S9 provide a combined single level of treatment.

Table 3-1: SuDS Pond Catchment Areas and Treatment Volumes

3.4 Pond Attenuation and Flow Control

3.4.1 Each SuDS pond has been sized to attenuate up to and including a 1 in 200 year storm event. Flow control devices are in place at the outlet structure of each pond. This is to reduce discharge flow rate from the ponds to a calculated Greenfield runoff rate to mirror discharge rates previously seen prior to site development and manage the impact of development on the receiving watercourses.

3.4.2 These rates have been determined in accordance with methods set out in CIRIA C697 / CIRIA C753 and the Institute of Hydrology Report No.124.

3.4.3 Modelled discharge rates from each SuDS pond are given in **Table 3-2** below.

Pond Ref	Calculated Greenfield Runoff Rate (l/s)	Actual Runoff Rate Achieved (l/s)
S1	311.59	266.00*
S3A/S3B	342.70	335.00
S4	268.77	268.00
S5	57.00	57.00
S6	512.91	423.00*
S7	83.73	83.12
S8 / S9	77.42	59.00
S10	238.50	228.00*

* Figures based on preliminary design work – actual figures may vary but shall be no higher than the calculated Greenfield rate.

Table 3-2: SuDS Pond Discharge Rates

3.5 Pond By-pass System

Ponds Constructed in Accordance with Sewers for Scotland 2nd Edition

3.5.1 Each SuDS pond has a bypass facility which can be used in times of maintenance or failure within the pond system. The system comprises of a piped bypass, with associated manholes and is activated by opening a penstock situated at a manhole upstream of the pond inlet. A penstock is also provided within this manhole to shut off flows into the receiving pond.

Ponds Constructed in Accordance with Sewers for Scotland 3rd Edition

3.5.2 For those ponds yet to be constructed, penstocks and a bypass sewer will be provided to enable flows for the inlet sewer to be diverted from entering the sediment forebay, with the penstocks operational from outside of the inlet structure.

3.6 Emergency Drawdown

3.6.1 In the event a SuDS pond is required to be totally drawn down, an emergency draw down feature is to be provided. This consists of a catchpit manhole located within the pond maintenance access track; this is connected to a drainage pipe connected to the base of the pond. A removable pump can be placed within the catchpit manhole to empty the pond. It is advised that when this drawdown is required to be activated, the pond by-pass system is open to reduce the volume of water entering the pond. The incoming pipe to the emergency drawdown manhole has a penstock installed which must be opened before use. The opening mechanism is through the detachable hand wheel socket located adjacent to the manhole cover at ground level.

4 Design Schedule: S1

4.1 Pond Design Schedule: S1

4.1.1 Pond S1 has yet to be designed in detail, therefore the majority of the information below is to be confirmed as the design is developed, with the section below updated when the design is sufficiently progressed. The design will be carried out in accordance with the standards outlined in **Sections 2 and 3** of this report. Concept design information is included in the tables below and in **Appendix B**.

Pond Details

Pond Reference	S1
Location	N242328, E670129
Adopting Authority	Scottish Water

Table 4-1: S1 Pond Details

Pond Inflow

Manhole Reference Number	S5-11
Manhole Location	242248, 670232
Receiving Catchment Area	29.77ha
Flow Rate (2 Year Return Period)	1052 l/s

Table 4-2: S1 Pond Inflow

Sediment Forebay

Forebay Base Material	200mm thick C40 grade concrete
Normal Water Depth	1.3m
Berm Material	Submerged gabion berm, top of berm below permanent water level

Table 4-3: S1 Sediment Forebay

Main Pond

4.1.2 The main pool of Pond S1 will not contain any reed planting. As part of the detailed design process, a Microdrainage model of the network draining to Pond S1 will be produced. On completion of this, the table of water levels for the permanent water and the 1, 30 and 200 year events will be updated accordingly.

Design Water Condition	Water Level (mAOD)	Water Depth (m)
Permanent Pool	7.431	1.6
1 Year Water Level	7.711	1.88
30 Year Water Level	7.931	2.1
200 Year Water Level	8.081	2.25

Table 4-4: Water Depths

Pond Outflow

4.1.3 The outflow from the pond will be restricted by a flow control device, located in the manhole downstream of the SuDS Pond. The exact location and nature of the manhole and flow control device should be updated as the design of the pond is progressed.

4.1.4 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum Flow Rate (l/s)
Orifice Plate	500mm Diameter	12mm Thick Stainless Steel	266

Table 4-5: S1 Pond Outflow

Pond By-Pass System

4.1.5 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

4.1.6 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S5-11	E242448, N670232	2No. spindle caps located next to manhole for operation with detachable hand wheel.	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 4-6: S1 Pond By-Pass System

Emergency Draw Down

4.1.7 An emergency draw down facility is provided within the pond, this consists of pipework and catchpit manhole connected to the lowest point of the pond bed. A removable pump should be placed within the manhole for draw down.

OS Co-ordinates	Description
E242328, N670107	Location of manhole to be within maintenance track, exact location to be confirmed as detailed design progresses.

Table 4-7: S1 Location of Drawdown Manhole

Pond Discharge Point

4.1.8 The outfall route for Pond S1 will be confirmed as the detailed design is progressed, but it will ultimately outfall to the Craigton Burn which flows through the development.

Receiving Watercourse	Outfall Headwall Location
Craigton Burn	E243019, N669617

Table 4-8: S1 Pond Discharge Point

4.2 Maintenance Schedule: S1

4.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS pond as designed. The maintenance responsibility for Pond S1 and its surrounding area is to be placed with a responsible organisation; for this pond the adopting authority will be Scottish Water.

4.2.2 The following table details the maintenance requirements and frequencies for SuDS Pond S1.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting - meadow grass	Half yearly (spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/rehabilitate of inlet, outlet and overflow	As required
Monitoring	Inspect structures for evidence of poor operation	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect water body for signs of eutrophication	Monthly (May–October)
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 4-9: Pond S1 Maintenance Requirements

4.2.3 Sediment excavated from the sediment forebay which receives residential or standard roads and roof runoff is generally considered non-toxic and can therefore be safely disposed of by landfilling/disposing on land; however, consultation should be considered with the relevant authorities to ensure its safe disposal. Sediment testing may be required, prior to excavation, to determine its waste classification and appropriate disposal methods.

5 Design Schedule S3A/S3B

5.1 Pond Design Schedule: S3A/S3B

5.1.1 This schedule provides the key elements of the SuDS ponds and includes location of inflow and outflow points, operating equipment for by-pass mechanisms, flow controls and location of outfall headwalls to receiving watercourses. The schedule should be read in conjunction with the relevant accompanying drawings included in **Appendix C**.

Pond Details

Pond Reference	S3A/S3B
Location	E242777, N607582
Adopting Authority	Renfrewshire Council

Table 5-1: Pond S3A/S3B Details

Pond Inflow

	S3A	S3B
Manhole Reference Number	S1-27	S1-28
Manhole Location	E242699, N670651	E242848, N670573
Receiving Catchment Area	46.72ha	
Flow Rate (2yr return period)	1249 l/s	

Table 5-2: Pond S3A/S3B Inflow

Sediment Forebay

Forebay Base Material	200mm Thick C40 Grade Concrete
Normal Water Depth	1.3m
Berm Material	Submerged gabion berm, top of berm set below permanent water level

Table 5-3: Pond S3A/S3B Sediment Forebay

Main Pond

5.1.2 The pool for Pond S3A/S3B does not contain any reed planting.

Design Water Condition	S3A Level (mAOD)	S3A Depth (m)	S3B Level (mAOD)	S3B Depth (m)
Permanent Pool	8.01	1.6	7.85	1.6
1 Year Water Level	8.37	1.96	8.03	1.78
30 Year Water Level	8.59	2.18	8.17	1.92
200 Year Water Level	8.81	2.4	8.32	2.07

Table 5-4: Pond S3A/S3B Water Depths (based upon calculated available storage volume and flow restriction at outlet)

Pond Outflow

5.1.3 The pond outflow will have an outflow manhole reference number S1-29, with the manhole location at E243058, N670411.

5.1.4 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum Flow Rate (l/s)
Orifice Plate	550mm diameter	12mm Thick Stainless Steel	335

Table 5-5: Pond S3A/S3B Outflow

Pond By-pass System

5.1.5 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

5.1.6 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S1-27	E242699 N670651	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.
S1-28	E242848 N 670573	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 5-6: Pond S3A/S3B By-Pass System

Emergency Draw Down

5.1.7 An emergency draw down facility is provided within the pond, this consists of pipework and catchpit manhole connected to the lowest point of the pond bed. A removable pump should be placed within the manhole for draw down.

	OS Co-ordinates	Description
S3A	E242806, N670557	Within maintenance access track north west of Pond S3a outlet headwall
S3B	E243037, N670413	Within maintenance access track north west of Pond S3b outlet headwall

Table 5-7: Pond S3A/S3BLocation of Drawdown Manhole

Pond Discharge Point

Receiving Watercourse	Outfall Headwall Location
Craigton Burn	E243285, N670128

Table 5-8: Pond S3A/S3B Discharge Point

5.2 Maintenance Schedule S3A/S3B

5.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS ponds as designed. For Pond S3A/S3B, the adopting authority will be Renfrewshire Council.

5.2.2 The following table details the maintenance requirements and frequencies for SuDS ponds S3A/S3B.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting – meadow grass	Half yearly (spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/rehabilitate of inlet, outlet and overflow	As required
Monitoring	Inspect structures for evidence of poor operation	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect water body for signs of eutrophication	Monthly (May–October)
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 5-9: Pond S3A/S3B Maintenance Requirements

5.2.3 Sediment excavated from the sediment forebay which receives residential or standard roads and roof runoff is generally considered non-toxic and can therefore be safely disposed of by landfilling/disposing on land; however, consultation should be considered with the relevant authorities to ensure its safe disposal. Sediment testing may be required, prior to excavation, to determine its waste classification and appropriate disposal methods.

6 Design Schedule: S4

6.1 Pond Design Schedule: S4

6.1.1 This schedule provides the key elements of the SuDS ponds and includes location of inflow and outflow points, operating equipment for by-pass mechanisms, flow controls and location of outfall headwalls to receiving watercourses. The schedule should be read in conjunction with the relevant accompanying drawings included in **Appendix D**, which shows the initial design for Pond S4 which was submitted for Technical Approval.

Pond Details

Pond Reference	S4
Location	E243214, N670298
Adopting Authority	Renfrewshire Council

Table 6-1: Pond S4 Details

Pond Inflow

	S4
Manhole Reference Number	S6-50
Manhole Location	E243059, N670359
Receiving Catchment Area	28.08ha
Flow Rate (2yr return period)	738.3 l/s

Table 6-2: Pond S4 Inflows

Sediment Forebay

Forebay Base Material	200mm thick C40 grade concrete
Normal Water Depth	1.3m
Berm Material	Submerged gabion berm, top of berm set below permanent water level

Table 6-3: Pond S4 Sediment Forebay 1

Main Pond

6.1.2 The pool will not contain any reed planting.

Design Water Condition	Water Level (mAOD)	Water Depth (m)
Permanent Pool	7.202	1.6
1 Year Water Level	7.382	1.78
30 Year Water Level	7.552	1.95
200 Year Water Level	7.752	2.15

Table 6-5: Pond S4 Water Depths (based upon calculated available storage volume and flow restriction at outlet)

Pond Outflow

6.1.3 The pond outflow will have an outflow Manhole reference number S6-32, with the manhole location at E243304, N670152.

6.1.4 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum Flow Rate (l/s)
Orifice Plate	490mm diameter	12mm Thick Stainless Steel	268

Table 6-6: Pond S4 Outflow

Pond By-pass System

6.1.5 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

6.1.6 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S6-50	E243059 N670359	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 6-6: Pond S4 By-pass System

Emergency Draw Down

6.1.1 The location of the drawdown manhole is identified within the table below.

OS Co-ordinates	Description
E243292, N670156	Within maintenance access track immediately adjacent to Pond S4 outlet headwall

Table 6-7: Pond S4 Location of Drawdown Manhole

Pond Discharge Point

Receiving Watercourse	Outfall Headwall Location
Craigton Burn	E243285, N670128

Table 6-8: Pond S4 Discharge Point

6.2 Maintenance Schedule: S4

6.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS pond as designed. For Pond S4, the adopting authority will be Renfrewshire Council.

6.2.2 The following table details the maintenance requirements and frequencies for SuDS Pond S4.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting – meadow grass	Half yearly (spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/rehabilitate of inlet, outlet and overflow	As required
Monitoring	Inspect structures for evidence of poor operation	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect water body for signs of eutrophication	Monthly (May–October)
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 6-9: Pond S4 Maintenance Requirements

6.2.1 Sediment excavated from ponds of forebays that receive runoff from residential or standard roads and roof areas are generally non-toxic and can therefore be safely disposed of by landfilling/disposing on land. Consultation should be undertaken with SEPA to confirm appropriate protocol. Sediment testing may be required, prior to excavation, to determine its waste classification and appropriate disposal methods.

7 Design Schedule: S5

7.1 Pond Design Schedule: S5

This schedule provides the key elements of the SuDS ponds and includes location of inflow and outflow points, operating equipment for by-pass mechanisms, flow controls and location of outfall headwalls to receiving watercourses. The schedule should be read in conjunction with the relevant accompanying drawings included within **Appendix E**.

Pond Details

Pond Reference	S5
Location	E243747, N670139
Adopting Authority	Renfrewshire Council

Table 7-1: Pond S5 Details

Pond Inflow

	S5
Manhole Reference Number	S5-BP1
Manhole Location	E243764, N670124
Receiving Catchment Area	6.64ha
Flow Rate (2 Year Return Period)	218 l/s

Table 7-2: Pond S5 Inflow

Sediment Forebay

Forebay Base Material	200mm thick C40 grade concrete
Normal Water Depth	1.3m
Berm Material	Submerged gabion berm, top of berm set below permanent water level

Table 7-3: Pond S5 Sediment Forebay

Main Pond

7.1.1 The pool will not contain any reed planting.

Design Water Condition	Water Level (mAOD)	Water Depth (m)
Permanent Pool	7.824	1.6
1 Year Water Level	7.98	1.76
30 Year Water Level	8.124	1.9
200 Year Water Level	8.243	2.02

Table 7-4: Pond S5 Water Depths (based upon calculated available storage volume and flow restriction at outlet)

Pond Outflow

7.1.2 The pond outflow will have an outflow Manhole reference number S5-BP5, with the manhole location at E243709, N670117.

7.1.3 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum Flow Rate (l/s)
Orifice Plate	215mm diameter	12mm Thick Stainless Steel	57

Table 7-5: Pond S5 Outflow

Pond By-pass System

7.1.4 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

7.1.5 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S5-BP1	E243764 N670124	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 7-6: Pond S5 By-pass System

Emergency Draw Down

7.1.6 The location of the drawdown manhole is identified within the table below.

OS Co-ordinates	Description
E244717, N670104	Within maintenance access track east of Pond S5 outlet headwall

Table 7-7: Pond S5 Location of Drawdown manhole

Pond Discharge Point

Receiving Watercourse	Outfall Headwall Location
Craigton Burn	E243696, N670119

Table 7-8: Pond S5 Discharge Point

7.2 Maintenance Schedule: S5

7.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS pond as designed. For Pond S5, the adopting authority will be Renfrewshire Council.

7.2.2 The following table details the maintenance requirements and frequencies for SuDS Pond S5.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting – meadow grass	Half yearly spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/rehabilitate of inlet, outlet and overflow	As required
Monitoring	Inspect structures for evidence of poor operation	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect water body for signs of eutrophication	Monthly (May–October)
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 7-9: Pond S5 Maintenance Requirements

7.2.3 Sediment excavated from the sediment forebay which receives residential or standard roads and roof runoff is generally considered non-toxic and can therefore be safely disposed of by landfilling/disposing on land; however, consultation should be considered with the relevant authorities to ensure its safe disposal. Sediment testing may be required, prior to excavation, to determine its waste classification and appropriate disposal methods.

8 Design Schedule: S6

8.1 Pond Design Schedule: S6

8.1.1 Pond S6 has yet to be designed in detail, therefore the majority of the information below is to be confirmed as the design is developed, with the section updated when the design is sufficiently progressed. The design is to be carried out in accordance with the standards outlined in **Sections 2 and 3** of this report. Concept design information is included in the tables below and in **Appendix F**.

Pond Details

Pond Reference	S6
Location	E242661, N669781
Adopting Authority	Scottish Water

Table 8-1: Pond S6 Details

Pond Inflow

	S6
Manhole Reference Number	S4-18
Manhole Location	E242580, N669887
Receiving Catchment Area	23.31ha
Flow Rate (2 Year Return Period)	1273.7 l/s

Table 8-2: Pond S6 Inflow

Sediment Forebay

Forebay Base Material	200mm thick C40 grade concrete
Normal Water Depth	0.9m
Berm Material	Submerged gabion berm, top of berm set below permanent water level

Table 8-3: Pond S6 Sediment Forebay

Main Pond

8.1.2 As part of the detailed design process, a Microdrainage model of the network draining to Pond S6 will be produced. On completion of this, the below table of water levels for the permanent water and the 1, 30 and 200 year events will be updated accordingly.

Design Water Condition	Water Level (mAOD)	Water Depth (m)
Permanent Pool	5.964	1.3
1 Year Water Level	6.22	1.56
30 Year Water Level	6.332	1.67
200 Year Water Level	6.365	1.7

Table 8-4: Pond S6 Water Depths (based upon calculated available storage volume and flow restriction at outlet)

Pond Outflow

8.1.3 The outflow from the pond will be restricted by a flow control device, located in the manhole downstream of the SuDS Pond. The exact location and nature of the manhole and flow control device should be updated as the design of the pond is progressed.

8.1.4 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum flow rate (l/s)
Orifice Plate	650mm Diameter	12mm Thick Stainless Steel	423

Table 8-5: Pond S6 Outflow Control

Pond By-pass System

8.1.5 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are to be operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

8.1.6 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S4-18	242580, 669887	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 8-6: Pond By-pass System

Emergency Draw Down

8.1.7 The location of the drawdown manhole is identified within the table below.

OS Co-ordinates	Description
E242943, N669650	Manhole to be located within maintenance access track

Table 8-7: Pond S6 Location of Drawdown Manhole

Pond Discharge Point

Receiving Watercourse	Outfall Headwall Location
Craigton Burn	E243019, N669617

Table 8-8: Pond S6 Discharge Point

8.2 Maintenance Schedule: S6

8.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS pond as designed. For this pond, the adopting authority will be Scottish Water.

8.2.2 The following table details the maintenance requirements and their frequencies for SuDS Pond S6.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter/trash/debris removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting – meadow grass	Half yearly (spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level. This activity may require a boat	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/ rehabilitate of inlet, outlet and overflow	As required
	Supplement plants (to maintain at least 50% surface area coverage) if vegetation is not established after second growing season	
Monitoring	Inspect structures for evidence of poor operation. Take remedial action if required	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 8-9: Pond S6 Maintenance Requirements

8.2.3 Sediment excavated from the sediment forebay which receives residential or standard roads and roof runoff is generally considered non-toxic and can therefore be safely disposed of by landfilling/disposing on land. However, consultation should be considered with the relevant authorities to ensure its safe disposal.

8.2.4 The portion of runoff draining to Pond S6 will come from commercial plots and therefore sediment retained with the forebay will need to be tested to establish its nature before it is suitably disposed of.

9 Design Schedule: S7

9.1 Pond Design Schedule: S7

9.1.1 Pond S7 has yet to be designed in detail, therefore the majority of the information below is to be confirmed as the design is developed, with the section updated when the design is sufficiently progressed. The design is to be carried out in accordance with the standards outlined in **Sections 2 and 3** of this report. Concept design information is included in the tables below and in **Appendix G**.

Pond Details

Pond Reference	S7
Location	E243644, N669440
Adopting Authority	Scottish Water

Table 9-1: Pond S7 Details

Pond Inflow

	S7
Manhole Reference Number	S7-1
Manhole Location	E243690, N669512
Receiving Catchment Area	8.99ha
Flow Rate (2 Year Return Period)	324 l/s

Table 9-2: Pond S7 Inflow

Sediment Forebay

Forebay Base Material	200mm thick C40 grade concrete
Normal Water Depth	1.0m
Berm Material	Submerged gabion berm, top of berm set below permanent water level

Table 9-3: Pond S7 Sediment Forebay

Main Pond

9.1.2 As part of the detailed design process, a Microdrainage model of the network draining to Pond S7 will be produced. On completion of this, the below table of water levels for the permanent water and the 1, 30, and 200 year events will be updated accordingly.

Design Water Condition	Water Level (mAOD)	Water Depth (m)
Permanent Pool	6.35	1.3
1 Year Water Level	6.65	1.6
30 Year Water Level	6.87	1.82
200 Year Water Level	7.06	2.01

Table 9-4: Pond S7 Water Depths (based upon calculated available storage volume and flow restriction at outlet)

Pond Outflow

9.1.3 The outflow from the pond will be restricted by a flow control device, located in the manhole downstream of the SuDS Pond. The exact location and nature of the manhole and flow control device should be updated as the design of the pond is progressed.

9.1.4 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum Flow Rate (l/s)
Orifice Plate	340mm Diameter	12mm Thick Stainless Steel	83.12

Table 9-5: Pond S7 Outflow Control

Pond By-pass System

9.1.5 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

9.1.6 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S7-1	E243690, N669512	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 9-6: Pond S7 By-pass System

Emergency Draw Down

9.1.7 An emergency draw down facility is provided within the pond, this consists of pipework and catchpit manhole connected to the lowest point of the pond bed. A removable pump should be placed within the manhole for draw down.

OS Co-ordinates	Description
E243605, N669448	Location of manhole to be within maintenance track, exact location to be confirmed as detailed design progresses

Table 9-7: Pond S7 Location of Drawdown Manhole

Pond Discharge Point

9.1.8 The outfall route for Pond S7 will be confirmed as the detailed design is progressed, but it will ultimately outfall to the Craigton Burn which flows through the development.

Receiving Watercourse	Outfall Headwall Location
Dargavel Burn	E243340, N669130

Table 9-8: Pond S7 Discharge Point

9.2 Maintenance Schedule: S7

9.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS pond as designed. The maintenance responsibility for Pond S7 and its surrounding area is to be placed with a responsible organisation; for this pond the adopting authority will be Scottish Water.

9.2.2 The following table details the maintenance requirements and their frequencies for SuDS Pond S7.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter/trash/debris removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting – meadow grass	Half yearly (spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level. This activity may require a boat	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/rehabilitate of inlet, outlet and overflow	As required
	Supplement Plants (to maintain at least 50% surface area coverage) if vegetation is not established after second growing season	
Monitoring	Inspect structures for evidence of poor operation. Take remedial action if required	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 9-9: Pond S7 Maintenance Requirements

9.2.1 The proposed runoff draining to Pond S7 will come from commercial plots and therefore sediment retained with the forebay will need to be tested to establish its nature before it is suitably disposed of.

10 Design Schedule: S8/S9

10.1 Pond Design Schedule: S8/S9

10.1.1 This schedule provides the key elements of the SuDS ponds and includes location of inflow and outflow points, operating equipment for by-pass mechanisms, flow controls and location of outfall headwalls to receiving watercourses. The schedule should be read in conjunction with the relevant accompanying drawings included within **Appendix H and Appendix I.**

Pond Details

Pond Reference	S8/S9
Location	E243499, N669765
Adopting Authority	Scottish Water

Table 10-1: Pond S8/S9 Details

Pond Inflow

	S8/9
Manhole Reference Number	S2-14
Manhole Location	E243544, N669864
Receiving Catchment Area	9.20ha
Flow Rate (2 Year Return Period)	394 l/s

Table 10-2: Pond S8/S9 Inflow

Sediment Forebay

Forebay Base Material	200mm thick C40 grade concrete
Normal Water Depth	1.3m
Berm Material	Submerged gabion berm, top of berm set below permanent water level

Table 10-3: Pond S8/S9 Sediment Forebay

Main Pond

10.1.2 The pool will not contain any reed planting.

Design Water Condition	S8 Water Level (mAOD)	S8 Water Depth (m)	S9 Water Level (mAOD)	S9 Water Depth (m)
Permanent Pool	6.303	1.6	5.986	1.6
1 Year Water Level	6.414	1.71	6.096	1.71
30 Year Water Level	6.523	1.82	6.206	1.82
200 Year Water Level	6.653	1.95	6.336	1.95

Table 10-4: Pond S8/S9 Water Depths (based upon calculated available storage volume and flow restriction at outlet)

Pond Outflow

10.1.3 The pond outflow will have an outflow Manhole reference number S2-16, with the manhole location at E243398, N669543.

10.1.4 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum Flow Rate (l/s)
Orifice Plate	240mm diameter	12mm Thick Stainless Steel	59

Table 10-5: Pond S8/S9 Outflow Control

Pond By-pass System

10.1.5 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

10.1.6 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S2-14	E243544 N669864	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.
S2-15	E243468 N 669698	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 10-6: Pond S8/S9 By-pass System

Emergency Draw Down

10.1.7 An emergency draw down facility is provided within the pond, this consists of pipework and catchpit manhole connected to the lowest point of the pond bed. A removable pump should be placed within the manhole for draw down.

Pond	OS Co-ordinates	Description
S8	E243465, N669725	Manhole located within maintenance access track north east of outfall headwall from Pond S8
S9	E243397, N669576	Manhole located within maintenance access track north east of outfall headwall from Pond S9.

Table 10-7: Pond S8/S9 Location of Drawdown Manhole

Pond Discharge Point

Receiving Watercourse	Outfall Headwall Location
Dargavel Burn	E243002, N669396

Table 10-8: Pond S8/S9 Discharge Point

10.2 Maintenance Schedule: S8/S9

10.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS pond as designed. The maintenance responsibility for Pond S8/S9 and its surrounding area is to be placed with a responsible organisation; for this pond the adopting authority will be Scottish Water.

10.2.2 The following table details the maintenance requirements and their frequencies for SuDS Pond S8/S9.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter/trash/debris removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting – meadow grass	Half yearly (spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level. This activity may require a boat	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/rehabilitate of inlet, outlet and overflow	As required
Monitoring	Inspect structures for evidence of poor operation. Take remedial action if required	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect water body for signs of eutrophication	Monthly (May–October)
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 10-9: Pond S8/S9 Maintenance Requirements

10.2.3 A portion of the proposed runoff draining to Ponds S8 and S9 will come from commercial plots and therefore sediment retained with the forebay will need to be tested to establish its composition before it is suitably disposed of.

11 Design Schedule: S10

11.1 Pond Design Schedule: S10

11.1.1 Pond S10 has yet to be designed in detail, therefore the majority of the information below is to be confirmed as the design is developed, with the section below updated when the design is sufficiently progressed. The design will be carried out in accordance with the standards outlined in **Sections 2 and 3** of this report. Concept design information is included in the tables below and in **Appendix J**.

Pond Details

Pond Reference	S10
Location	E243499, N669765
Adopting Authority	Scottish Water

Table 11-1: Pond S10 Details

Pond Inflow

	S10
Manhole Reference Number	S3-12
Manhole Location	E243343, N669515
Receiving Catchment Area	16.59ha
Flow Rate (2 Year Return Period)	1841l/s

Table 11-2: Pond S10 Inflow

Sediment Forebay

Forebay Base Material	200mm thick C40 grade concrete
Normal Water Depth	1.0m
Berm Material	Submerged gabion berm, top of berm set below permanent water level

Table 11-3: Pond S10 Sediment Forebay

Main Pond

11.1.2 The main pool of Pond S10 will not contain any reed planting. As part of the detailed design process, a Microdrainage model of the network draining to Pond S10 will be produced. On completion of this, the below table of water levels for the permanent water and the 1, 30, and 200 year events will be updated accordingly.

Design Water Conditions	Water Level (mAOD)	Water Depth (m)
Permanent Pool	4.371	1.3
1 Year Water Level	4.709	1.64
30 Year Water Level	4.921	1.85
200 Year Water Level	5.071	2.0

Table 11-4: Pond S10 Water Depths (based upon calculated available storage volume and flow restriction at outlet)

Pond Outflow

11.1.3 The outflow from the pond will be restricted by a flow control device, located in the manhole downstream of the SuDS Pond. The exact location and nature of the manhole and flow control device should be updated as the design of the pond is progressed.

11.1.4 The outflow control will consist of the following criteria:

Type	Size (mm)	Material Type	Maximum Flow Rate (l/s)
Orifice Plate	400mm Diameter	12mm Thick Stainless Steel	228

Table 11-5: Pond S10 Outflow Control

Pond By-pass System

11.1.5 Each pond will have a by-pass sewer which will form part of the pond in terms of adoption. The bypass will be controlled by penstocks situated in the manhole upstream of the inlet, allowing flows to be diverted away from the pond if required. Penstocks are operated by detachable hand wheels connecting to in situ spindle ends located at surface level.

11.1.6 Operation keys for the penstocks will be held by the adopting authority.

Manhole Ref	Location (OS Co-ordinates)	Operation Type	Comments
S3-11A	E243382, N669506	2No. spindle caps located next to manhole for operation with detachable hand wheel	Bypass penstock should be opened before attempting to shut off flows to pond.

Table 11-6: Pond S10 By-pass System

Emergency Draw Down

11.1.7 An emergency draw down facility is provided within the pond, this consists of pipework and catchpit manhole connected to the lowest point of the pond bed. A removable pump should be placed within the manhole for draw down.

OS Co-ordinates	Description
E243098, N669454	Manhole located within pond maintenance access track. 65m east of pond outfall headwall.

Table 11-7: Pond S10 Location of Drawdown Manhole

Pond Discharge Point

Receiving Watercourse	Outfall Headwall Location
Dargavel Burn	E243002, N669396

Table 11-8: Pond S10 Discharge Point

11.2 Maintenance Schedule: S10

11.2.1 Regular inspection and maintenance is important for the effective operation of the SuDS pond as designed. The maintenance responsibility for Pond S10 and its surrounding area is to be

placed with a responsible organisation; for this pond the adopting authority will be Scottish Water.

11.2.2 The following table details the maintenance requirements and frequencies for SuDS Pond S10.

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Litter/trash/debris removal	As required
	Grass cutting – public area	Monthly (during growing season)
	Grass cutting – meadow grass	Half yearly (spring before nesting season, and autumn)
	Inspect vegetation to pond edge and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; including maximum 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level. This activity may require a boat	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from forebay	1-5 years or as required
Occasional	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	>25 years
Remedial Actions	Repair of erosion or other damage	As required
	Aerate pond when signs of eutrophication are detected	As required
	Repair/rehabilitate of inlet, outlet and overflow	As required
	Supplement plants (to maintain at least 50% surface area coverage) if vegetation is not established after second growing season	
Monitoring	Inspect structures for evidence of poor operation. Take remedial action if required	Monthly and after large storm events
	Inspect banksides, structures, pipework, manholes etc for evidence of physical damage	Monthly and after large storm events
	Inspect silk accumulation rate and establish appropriate removal frequency	Half yearly
	Check penstocks	Half yearly

Table 11-9: Pond S10 Maintenance Requirements

11.2.3 The proposed runoff draining to Pond S10 will come from commercial plots and therefore sediment retained with the forebay will need to be tested to establish its nature before it is suitably disposed of.

Appendix A Non Standard Documents

- The Design of SuDS ponds to reduce their attractiveness to water birds

ROYAL ORDNANCE BISHOPTON

The design of SUDS ponds

to reduce their attractiveness

to water birds

A report for CASS and BAE Systems
on behalf of Redrow

January 2008

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1. Introduction

1.1
The aim of this report is to describe proposals which will mitigate the possibility of increased bird strike risk to aircraft using Glasgow Airport due to the creation of SUDS retention ponds which are a part of the proposed development at Royal Ordnance Bishopton. Retention ponds are an important element for delivery of SUDS scheme for the development site.

1.2
As part of the safeguarding process for UK civil airports that is in place to protect flight safety, planning applications within 13 kilometres of an airfield which may affect birdstrike risk, are reviewed and assessed by the airport owner. Birdstrike experts advise the civil aviation industry whether a planning application may sufficiently increase birdstrike risk that an objection is lodged to the plans.

1.3
Our intention is to deliver proposals which do not compromise flight safety, mainly by designing out birdstrike risk but also by developing a bird management plan for the SUDS ponds and other areas of the Bishopton development which potentially could be part of an agreement which controls the way in which the site is managed.

2. Objectives of the Masterplan and the strategy for surface water drainage

2.1
The approach to the Masterplan has been to use the sustainable drainage infrastructure in a positive way so that it also makes a visible contribution to the open space infrastructure of the development and helps to create an attractive environment for residents and business users located within the development. The open space contains new open water (SUDS ponds) and in particular the retained historic ponds which are linked with the core village park providing a special identity to the development and a high quality of environmental experience. There is also emphasis in the Masterplan approach to make the best possible use of the new habitat creation and to enhance ecological diversity.

2.2
The vision outlined in 2.1 has to take into consideration not only how surface water drainage is accommodated and constructed as part of the engineering works but also the safeguarding of aircraft using nearby Glasgow Airport and to address the need to minimise the bird attractant features of the landscape proposals.

2.3
The SUDS scheme developed for Royal Ordnance Bishopton has identified a viable SUDS option based on the constraints of ground water level criteria and local topography which requires the use of retention ponds as an important element for delivery of the SUDS management train for the site. Therefore the possibility of increased bird strike risk to aircraft using Glasgow Airport has to be considered and acted on.

3. Legal and regulatory background to the management of birdstrike risk

3.1
It is crucial that there is an understanding of the legal and regulatory context of birdstrike risk management and the safeguarding measures which arise from implementation of policies designed to reduce birdstrike risk to the lowest practical probability when a new major development is proposed in the vicinity of an airfield. The following paragraphs contain the key elements of the legal and regulatory framework.

3.2
The UK is a signatory to the Convention on International Civil Aviation, Chicago 1944. The UK has adopted many of the provisions specified in Annex 14 to the Convention which is published by the International Civil Aviation Organisation. Recommended practices address the risk of birdstrikes due to the presence or development of bird attractant features on, or in the vicinity (land or water within 13km of the aerodrome reference point) of an aerodrome.

3.3
It is stated in the CAA publication CAP 772 Birdstrike Risk Management for Aerodromes (CAA 2007) that 'In the UK, aerodrome licence holder shall take all reasonable steps to secure that the aerodrome and the airspace within its visual traffic pattern is normally contained are safe at all times for use by aircraft' (Article 128 (5) of the Air Navigation Order 2005): Development and implementation of birdstrike risk control measures is a responsibility of the licence holder. These measures are subject to audit by the CAA.

3.4
An aerodrome operator is required to develop a Bird Control Management Plan (BCMP) which will include the following elements.

a) assess the birdstrike risk,

b) design and implement the appropriate bird control measures,

c) develop and implement risk mitigation measures,

d) establish a safeguarding process with the local planning authority for consultation on developments that occur within 13km radius of the aerodrome reference point and which have the potential to act as a bird attractant,

e) use appropriate means to influence land use and development surrounding the aerodrome so that the birdstrike risk does not increase and, wherever possible, is reduced, (note: the term 'surrounding' is not specifically defined),

f) encourage landowners to adopt bird control measures and support landowners' efforts to reduce birdstrike risks,

g) implement procedures to conduct site monitoring visits and record the results of such visits.

4.0 Identification and assessment of birdstrike risk and its mitigation

4.1
In order to manage and reduce the risk of birdstrikes (on or close to an airfield) to the minimum possible probability, it is necessary to obtain a range of information which assists assessment of the risk. The CAA publication CAP 772 describes the basic principles which inform and structure the assessment of birdstrike risk (Chapter 3). In the context of the proposed development at Royal Ordnance Bishopton and birdstrike risk at Glasgow Airport the following information will be valuable in helping to formulate the risk assessment.

a) Pattern of aircraft activity and flight paths into and out of the airfield.

b) A review of existing birdstrike records which provide information about the number of collisions with the time and date of each incident plus identification of the species struck,

c) A review of bird species observed on the airfield over several years, in the local vicinity of the airfield and at the Royal Ordnance Bishopton proposed development site,

d) Utilising records obtained under b) and c) above, targeting those bird species which pose an important risk to aircraft and which are likely to cause significant damage in the event of an impact, such as larger species and species which occur in flocks or fly high in skeins,

e) Where it is necessary for a new development to utilise retention ponds as a component of the SUDS options, to design in features which make the water body as unattractive as possible to water birds so that the mitigation measures help to reduce the birdstrike risk to an acceptable level,

f) Any features designed to mitigate birdstrike risk nevertheless would have to adhere to human Health and Safety requirements and necessary engineering requirements.

5.0 Water bird populations at Royal Ordnance Bishopton and in the vicinity of Glasgow Airport at Black Cart Water and White Cart Water

The aim of section 5 is to present data for water bird populations which occur very close to Glasgow Airport at Black Cart Water and White Cart Water where there is ideal habitat for feeding and roosting and to contrast with evidence of the use of the existing fire ponds (P1, P2 and P3) at Royal Ordnance Bishopton. This will enable an assessment to be made of the probable attractiveness of the proposed new SUDS ponds for the Bishopton development and the possible use of the new ponds by water birds and potential movement to and from the Bishopton site by particular species.

5.1 Record of water birds at Black Cart Water and White Cart Water

Records of water birds at Black Cart Water and White Cart Water are shown in Appendix 2 for the period 2002 to June 2007 for Black Cart Water and from 2003 for White Cart Water.

5.1.2

Relatively large numbers of water birds congregate at Black Cart Water whilst White Cart Water supports smaller populations and fewer species. At Black Cart Water there are substantial autumn and winter populations in most years of larger water fowl including Whooper Swan (*Cygnus Cygnus*), Mute Swan (*Cygnus olor*), and Greylag Goose (*Anser anser*) whilst Canada Goose (*Branta canadensis*) is an intermittent visitor in late summer and autumn whilst Pink-footed Goose (*Anser brachyrhynchus*) and Barnacle Goose (*Branta lencopsis*) are rare visitors.

5.1.3

Populations of dabbling ducks are very substantial with Mallard (*Anas platyrhynchos*) present throughout the year and a substantial population of Teal (*Anas crecca*) present mainly in autumn and winter. Wigeon (*Anas penelope*) and Gadwall (*Anas strepera*) also occur in smaller populations.

5.1.4

Two other species of water bird, Cormorant (*Phalacrocorax carbo*) and the Grey Heron (*Ardea cinerea*) are present throughout the year with over 20 Cormorant recorded in any single month period and from 1 to 23 Heron.

5.1.5

At White Cart Water Teal and Mallard are the only species recorded in significant numbers during autumn and winter.

5.1.6

On Black Cart Water the autumn/winter population size in any one month, of some species (e.g. Whooper Swan >100; Mute Swan up to 50; Greylag Goose up to 500) and the overall concentration of water birds presents a continuous high risk of a bird strike incident due to the very close proximity to Glasgow Airport (less then 0.5 kilometre in places).

5.2 Record of water birds at Royal Ordnance Bishopton

5.2.1
The existing fire ponds (P1, P2, and P3) were monitored by JDC Ecology Ltd on a monthly basis between November 2004 and March 2005. The purpose of the visits was to identify the species present, population size and use of the water bodies and adjacent areas. Table 1 lists the combined list of bird species recorded at the three ponds (P1, P2, and P3) between November 2004 and March 2005. Greater detail of dawn and dusk counts and a breakdown of the numbers of males and females are given in Appendix 1.

Table 1. Bird Records Winter 2004/5

Common Name	Scientific Name	Pond Number	Month Recorded	Largest Number Recorded on a Single Occasion (dawn or dusk)
Cormorant	*Phalacrocorax carbo*	PI	Nov, Dec, Jan	1
Dipper	*Cinclus cinclus*	P2	Feb	1
Goldeneye	*Bucephala cangula*	P1,P2, P3	Nov, Dec, Jan, Feb, Mar	9
Grey Heron	*Ardea cinerea*	P3	Nov, Dec	1
Little Grebe	*Tachybaptus ruficollis*	PI	Nov, Dec	1
Mallard	*Anas platyrhyncos*	P1.P2, P3	Nov, Dec, Feb, Mar	11
Moorhen	*Gallinula chloropus*	P1.P2, P3	Nov, Dec, Feb, Mar	2
Mute Swan	*Cygnus olor*	P1,P3	Nov, Dec, Feb, Mar	2
Snipe	*Gallinago gallinago*	PI	Feb	1
Tufted Duck	*Aythya fuligula*	P1,P2	Jan, Feb, Mar	14

5.2.2
Both the range of species and the recorded number of any species at the time of the censuses were relatively low given that the combined surface area of the water bodies (3.98ha) was sufficiently large to support a wider range of species of water fowl. At Black Cart Water a significant number of water fowl species occur approximately 3.5 kilometres from the ponds P1, P2 and P3 but many of these species were not recorded at Royal Ordnance Bishopton. For example, Canada Geese, Teal, Goosander and Wigeon occur commonly at Black Cart Water but were not recorded at the Bishopton ponds. Species known to breed at the fire ponds include Mute Swan, Coot and Moorhen. Other species that potentially might breed (because they have been recorded at the site) are Goldeneye, Mallard and Tufted Duck. However, based on existing evidence the population size for any particular breeding species would be very small.

5.2.3
The relatively low numbers of water fowl at the existing ponds P1, P2 and P3 probably reflects the impact of existing well developed vegetation which surrounds much of the perimeter of the ponds including native willows and a range of unmanaged emergent and bankside vegetation.

5.2.4
It is the intention to create green landscape features around the perimeter (or part of the perimeter depending upon location of the pond) of the new SUDS ponds which will fulfil a similar role to the existing vegetation surrounding P1, P2 and P3 although the SUDS ponds will mainly be in a more formal setting (except S6, S6B, S7 and S10).

5.2.5
An independent ornithological baseline survey of the entire Royal Ordnance Factory site was undertaken by Starling Learning during the autumn and winter 2004/2005 and some observations were made in years previous to this. The results of this survey for fire ponds P1, P2 and P3 were consistent with data collected by JDC Ecology Ltd. A single bird of Little Grebe and Cormorant was recorded feeding at the fire ponds and a pair of Mute Swans was present on most visits. These swans are known to have reproduced in most years and did so in 2007. Grey Heron were regularly recorded feeding at the ponds with a maximum count of 26 birds. It is most probable that these heron were from the heronry which is present in a conifer plantation on the site. The species of duck recorded were the same as those recoded by JDC Ecology Ltd; Mallard feeding in small numbers but up to 28 birds in winter 2004/2005 and up to 11 birds of Goldeneye recorded feeding on the ponds.

5.2.6
Other species of water bird recorded were Moorhen (one adult and one juvenile in 2002), Coot (a few sightings) plus Herring Gull (*Larus argentatus*), Lesser Black-backed Gull (*Larus fuscus*) and Black-headed Gull (*Larus ridibundus*) which were occasionally seen in low numbers on the ponds.

5.2.7
The two ornithological surveys provide no direct evidence of the extent of possible transfer of water birds between the existing Bishopton ponds and the Black/White Cart Waters, the river Clyde estuary or other water bodies located in a direction away from Glasgow Airport such as Whitemoss Dam (north-western direction).

6. Bird species that are hazardous to aircraft

Many species of bird pose a potential risk to aircraft but some species are more hazardous than others. The extent of risk created by a bird species is related to the size and density (mass) of a bird and whether the species has a tendency to form flocks (i.e. a number of birds that fly in tight formation). Civil Aviation Authority records demonstrate that larger flocks (11-100 birds) cause damage in 40% of aircraft strike incidents in comparison to small flocks (2-10 birds; 14%) or single birds (8%).

6.2
The species of water birds which occur at Royal Ordnance Bishopton and in the general vicinity of Glasgow Airport which are of sufficient size to cause a serious risk to aircraft and which also may occur in small or large flocks are listed in Table 2.

Table 2. Priority species likely to cause a hazard to aircraft with mean weight (g) based on RSPB data

Bird species	Mean weight(g)
Black-headed gull	300
Canada goose	4540
Coot	800
Cormorant	2350
Goldeneye	925
Great black-backed gull	1500
Greylag goose	3300
Heron	1750
Mallard	1125
Moorhen	335
Mute Swan	11000
Tufted duck	725
Common gull	390
Teal	300
Wigeon	700

6.3
Other species of birds which occur at Royal Ordnance Bishopton and which are a potential hazard to aircraft are mainly woodland species such as wood pigeon, stock dove, Corvids and starling. There will be a very substantial reduction in woodland cover within the proposed development area which will cause a significant reduction in bird species populations. Thus the bird strike hazard for woodland species will be reduced rather than increased. Using the principle of 'no net detriment' it is clear that post-development in comparison with the current situation, there will be zero increase in bird strike risk. Therefore woodland bird species are not considered in this report.

7.0 Identification of priority species which pose a significant bird strike risk to aircraft using Glasgow Airport

7.1 Recorded bird strikes at Glasgow Airport

7.1.1
A list of bird strike records for Glasgow Airport which cover the period 1997 to 2006 is shown in Appendix 3. Various species of gulls are by far the most common cause of a bird strike incident. A total of 83 strikes by gulls have been recorded. Often the particular species has not been identified but in cases where identification was possible, Herring Gull (*Larus argentatus*), Lesser Black-backed Gull (*Larus fuscus*), Black-headed Gull (*Larus ridibundus*) and Common Gull *Larus canus*) were recorded. Strikes by duck involved two Mallard and one Goldeneye. There was a single strike by Cormorant and a total of six strikes by wading bird species.

7.1.2
There were no strikes recorded for Goose, Swan, Heron or ducks other than Mallard and Goldeneye. However, although there were no recorded bird strikes the large flocking water birds and the smaller flocking water fowl present a serious bird strike risk to aircraft particularly when sites for feeding, roosting or loafing are located close to any airport runway. We were unable to refine the estimate of risk from existing bird species due to a lack of available data.

8.0 Design of ponds: general principles

8.1
The key principle is to design out water birds, as far as possible, at the master planning stage of a new development. In order to discourage wildfowl and other species of water bird, easily accessible grazing at the edges and adjacent to the water body should be minimised and ideally completely excluded.

8.2
The attractions of a site can be reduced by planting trees around the water body (but not necessarily at the water edge) and areas of shrubs to disrupt sight lines and prevent birds from gaining easy access to grassland feeding areas. Open water bodies should be small in total surface area and relatively narrow. There should be no islands because these would be used as breeding sites because they are protected from predators.

8.3
Water birds are an inevitable component of wetland ecosystems and it is impossible to exclude all water birds, even in a residential and business development setting. However a range of options are available which would make open water sites less attractive to waterfowl.

8.4
Appropriate habitat design and management will help to exclude large birds and flocking birds which are particularly hazardous to aircraft. Geese in particular require unrestricted 360 degree views in order to remain alert to possible predators and obstructions to sight lines can reduce their feeling of safety and thus reduce the attractiveness of a site.

8.5
The basic measures to reduce the attractiveness of a water body are as follows:

a) Using dense areas of adjacent shrub vegetation and planting appropriate species of tree (e.g. willow species, alder species, field maple or birch) around the water body to restrict the bird's view of the water or view out of the water.

b) Planting trees in a position adjacent to the water body in such a way that this will deter species that prefer to use a shallow angle (i.e. 13-14°) to fly out of a water body (e.g. swans and several species of geese including Canada geese).

c) Plant vegetation that is not palatable to waterfowl (e.g. ivy and dwarf gorse) and is very difficult to walk through (e.g. hydrangea, St John's wort, dwarf gorse). There should be no open loafing areas around the pond perimeter where water fowl might congregate.

d) Make water bodies linear and no wider than 30m (WWT Wetland Advisory Service). Linear water bodies are much less attractive to gulls, swans and geese particularly if relatively small and enclosed. A water body with adjacent trees >7m in height combined with a width of <30m will restrict geese which attempt to fly out.

e) Create a hard edge to the water body with an overhang and a minimum of 300mm of vertical wall which will deter waterfowl from moving easily to adjacent areas of land. If birds are forced to fly out on every occasion that they move to adjacent

land, this will cause the pond to be less attractive. In public areas Health and Safety considerations will preclude this feature.

f) If Health and Safety concerns allow, the water body should have a water depth >2.0m, although a more shallow depth is inevitable around the perimeter. A water depth > 2.0m will deter the establishment of submerged aquatic plants.

g) The perimeter of the water body should not have bays, indentations or promontories which would provide sheltered refuges for water birds.

h) Water bodies should be maintained without fish populations which might attract herons or cormorant.

i) Any areas of grassland in the vicinity of the ponds (e.g. around areas of tree planting) should be managed as areas of long meadow grassland left uncut (except twice a year) and containing attractive wildflowers. This will reduce the attractiveness of these areas for feeding for swans, geese and ducks such as widgeon.

j) All parts of the water body should be accessible by predators such as foxes or mink which will further deter water birds.

8.6
Not all the above measures can be implemented for any particular waterbody. The particular location and function of each SUDS pond will determine which combination of measures can be implemented for that particular SUDS pond. Landscape design, engineering requirements for SUDS ponds, human Health and Safety risk assessment, consideration of birdstrike risk and ecological quality and biodiversity are competing interests with different primary agendas which have to be accommodated in the final design of the SUDS ponds and SUDS reed beds. The proposed designs fulfil engineering requirements which are the primary objective whilst accommodating the other requirements to the maximum possible. Reduction of birdstrike risk (to the minimum practicable level of probability) to aircraft using Glasgow Airport is an important element in the SUDS equation and as part of a compromise solution which is the Best Practicable Option. This is the main issue addressed in this report.

8.7
A combination of the measures outlined above should make each pond less attractive to swans, geese and gulls but other species such as Teal, Mallard, Moorhen and Coot are unlikely to be completely excluded. However a small number of these species would not pose a significantly increased risk to aircraft using Glasgow Airport. The design of the SUDS ponds has been undertaken with due regard to Advice Note 3 and Advice Note 6, Safeguarding of Aerodromes, issued by the Airport Operators Association and the General Aviation Awareness Council.

8.8
Figure 1 depicts a generic design of pond which will be unattractive to water birds and which can be varied in size and shape (but within the constraint that a linear shape with a width <30m is a basic requirement) and which is appropriate for the design of waterbodies S1, S3a, S3b, S4 and S5. The generic design depicted in Figure 1 incorporates a continuous linear dense prickly shrub cover which separates areas of grassland and the water body. This will be repellent to water birds. A fence 1.0m in

height could be embedded within the shrub cover to act as an additional barrier to geese, swans and ducks. The fringe of the SUDS pond is planted with a mix of dense emergent aquatic plants which could include branched bur-reed (*Sparganium erectum*), soft rush (*Juncus* effusus), yellow iris (*Iris pseudacorus*), common clubrush (*Scirpus lacustris*) and greater tussock sedge (*Carex paniculata*) and lesser pond sedge (*Carex acutiformis*). These species are generally inedible for water birds although the foliage of branched-burr-reed may be eaten. The other species have spiky tough leaves but could provide nesting cover for dabbling ducks. This issue is addressed in the Bird Management Plan (section 11.3.2.3). Figure 2 depicts a design appropriate for the waterbodies S8 and S9 which is a version of the Figure 1 design adapted for the site and situation of S8 and S9 whilst Figure 3 provides a schematic design for the reedbed sites S6, S7 and S10. The design for the SUDS ponds with reedbeds involves creation of a continuous cover of common reed (*Phragmites australis*) over the entire water body. Maximum depth should not exceed 1.0m. The reedbeds will all be situated in the Community Woodland Park area and public access would be an optional feature. New planting of willow/alder carr would merge with the reedbeds extending into the margins of the ponds by up to 2.0m (but not continuously 2.0m) and would merge with terrestrial woodland within the Community Woodland Park area (either existing or new planting).

9.0 Design of SUDS ponds and reed beds: specific measures to reduce attractiveness to waterfowl

9.1 POND S1

This will be created with a narrow shape and a hard edge (plus fringe emergent vegetation) on the north eastern perimeter adjacent to housing development where there will be intensive public uses: There is dense existing woodland on the western boundary. The pond edge and planting design will be as shown in Figure 1 on the northern perimeter, which will be adjacent to an intensively used public amenity area where dog-walking and recreational activity will be daily events. In areas such as these human Health and Safety is an important consideration and therefore there will be planting and establishment of a fringe vegetation of emergent aquatic plants which will create a dense band of vegetation around the perimeter of the pond. The proposed vegetation will grow to a height of 1.0-1.5m above the water surface during the summer months but some of the species proposed (section 8.8) will die back during the autumn and winter but leave persistent stems. The combination of the physical design features and disturbance will deter target bird species and thus pond S1 creates no new significant bird strike risk.

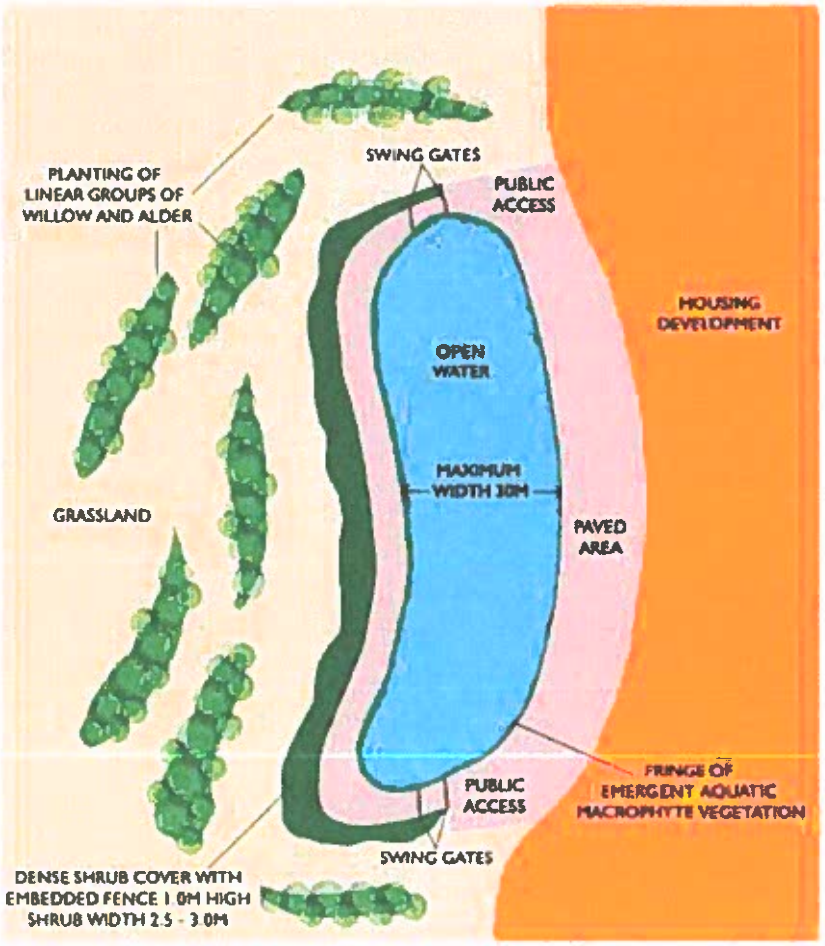
9.2 POND S2

This small isolated pond will be hard-edged (plus fringe emergent vegetation) and entirely enclosed by housing development and roads. Amenity shrub planting and some tree planting will fringe part of the perimeter. Human activity will be considerable in the vicinity of S2 and this water body with a very small surface area will be highly unattractive to the target bird species. Pond S2 poses a negligible impact on potential bird strike risk.

9.3 POND S3A and S3B

These water bodies are linear canals with hard edges (plus fringe emergent vegetation) and a curved shape which will restrict bird sight lines. There will be continuous residential housing development along the eastern boundary with considerable public activity along paved areas. Figure 1 illustrates the generic design which would be applied to S3 and S3B. There will be public parkland on the south and south western boundaries which will be safe guarded against larger water fowl through plantings of dense shrubs preventing direct access to park grassland plus an outer area of linear groups of trees such as willow, alder, birch and field maple which will grow relatively rapidly to a height of 6-7metres and thus restrict bird sight lines. If necessary an additional protection will include a fence of 1.0m in height embedded within the shrub plantings (Figure 1). The basic design features coupled with high levels of human activity and dog walking will reinforce the unattractiveness of these ponds for water birds presenting minimal new bird strike risk.

Figure 1. Generic design of SUDS pond appropriate for ponds S1, S2, S3, S3B and S4



9.4 POND S4

The context of S4 and its design will be almost identical to S3 and S3B. The description in the paragraph above applies to S4 without exception. Proximity to the village centre will result in even more intensive public use of the area adjacent to S4. Tree and shrub planting on the southern and western perimeters will be further enhanced including

taller specimen trees such as larger maples and ash to provide sufficient buffer zone between S4 and the Central Park area. It is concluded that S4 will combine a suite of features which make it unattractive to gulls and larger flocking waterfowl. S4 will present a negligible increase in bird strike risk for target species.

9.5 POND S5

This is a small linear pond surrounded by built development with a hard edge (plus fringe emergent vegetation) and paved area on the eastern and south eastern boundary, adjacent to residential housing. The north western perimeter will be planted with shrubs and groups of willow, alder and birch plus other non-berry bearing smaller ornamental trees similar to the design shown in Figure 1. The small size and linear shape coupled with considerable human and domestic animal disturbance will cause S5 to be a very unattractive site for water birds. This pond creates no new bird strike risk for Glasgow Airport.

9.6 POND S6A and S6B

This water body will be developed as a reed bed, common reed (*Phragmites australis*) will be the dominant plant species, using a planting technique designed to achieve rapid cover. The open water will become colonised by reeds quite rapidly unless the water depth is > 1.0m. On the northern perimeter there is an almost continuous linear belt of woodland and large mature trees close to the water body plus a significant area of woodland close to the western edge of S6. The southern and south western perimeter of the reed bed adjacent to the Community Woodland Park area will be planted with willow, alder and other amenity tree species. Willow and alder will be situated immediately adjacent to or just within the reed bed to create some alder/willow carr which merges with the terrestrial planting. The context of S6 is a significant amenity area with good ecological value which will be enhanced by the reed bed. This will potentially attract small passerine bird species such as reed warbler, sedge warbler, grasshopper warbler, reed bunting and water rail which are relatively unusual species in the Bishopton locality. These species are not a bird strike risk (virtually zero risk). Reed bunting is a Red List species of conservation concern. The SUDS function of this and other reedbeds (S7 and S10) will be to further enhance water quality through reduction in suspended solids, capture of nitrogen and phosphorus and capture of any Potentially Toxic Elements (metal contaminants) which may be present in run-off water plus natural attenuation of any organic contaminants. S6B is a narrow meander of open water which connects S6 and S10. This open water will be planted on both banks with alder and willow with a shrub and long grass under and around the trees which will prevent water birds from gaining access to any potential areas of grazing. S6B is situated within the Community Woodland Park area and thus there will not be any area of managed short grassland near to this water body.

The creation of S6 will produce a valuable aquatic habitat which will also make a considerable contribution to biodiversity. The site should attract water vole (which are known to occur at Royal Ordnance Bishopton) and possibly otter. The created habitat will be valuable for amphibians such as common frog and common toad and also palmate newt and common (smooth) newt. The value of the new water bodies with reed beds will be considerable for invertebrates, dragonflies and damselflies in particular but also water beetles and molluscs. The design of S6 (see Figure 3) will virtually eliminate roosting gulls and occupation by swans and geese. The potential enhanced bird strike risk from these species will be extremely small and not a significantly increased risk. There is the potential for starling roosts to form in new areas of reedbed and it will be

necessary to prepare and introduce a Bird Management Plan for starling as soon as the water body has been engineered and planted. This issue is further discussed under section 10 Bird Management Plan.

9.7 POND S7

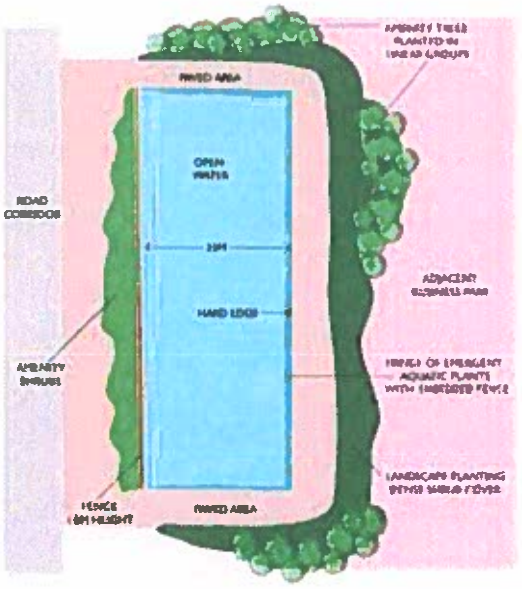
This water body is designed as predominantly reedbed. The northern boundary will be adjacent to a paved area with built development nearby. Emergent aquatic macrophytes vegetation will be placed adjacent to the boundary edge and will merge with the reed bed. On the south eastern boundary the adjacent vegetation is mainly existing native woodland which will provide an effective barrier for water fowl. A short section of the south eastern perimeter is currently open habitat but this will be planted with trees to provide complete woodland cover on this side of S7. The reedbed habitat will provide a significant addition to ecological diversity within an existing high quality ecological context as described for Pond S6. The water body will be unattractive to gulls and large water fowl although coot, moorhen a few dabbling ducks and the occasional heron or little grebe might occupy S7 periodically. It is concluded that the additional bird strike risk created by S7 would be very small and not a significant risk.

9.8 PONDS S8 and S9

Ponds S8 and S9 are narrow canal-like structures which will be created immediately adjacent to commercial buildings in the business park area on the north western boundary and here will be contiguous with paved areas and beds planted with amenity shrubs. There will be a main road on the south eastern boundary and the bank sides of S8 and S9 will have adjacent contiguous planting of shrubs unfriendly to water fowl which will create an uncomfortable environment (see Figure 2).

Also there will be a retained strip of existing woodland on the south eastern boundary of S9 which will provide a substantial screen. This feature coupled with general disturbance at this road side location will deter larger water fowl but might attract a few duck, coot or moorhen. It is unlikely that there would be any significant increase in bird strike risk for Glasgow Airport.

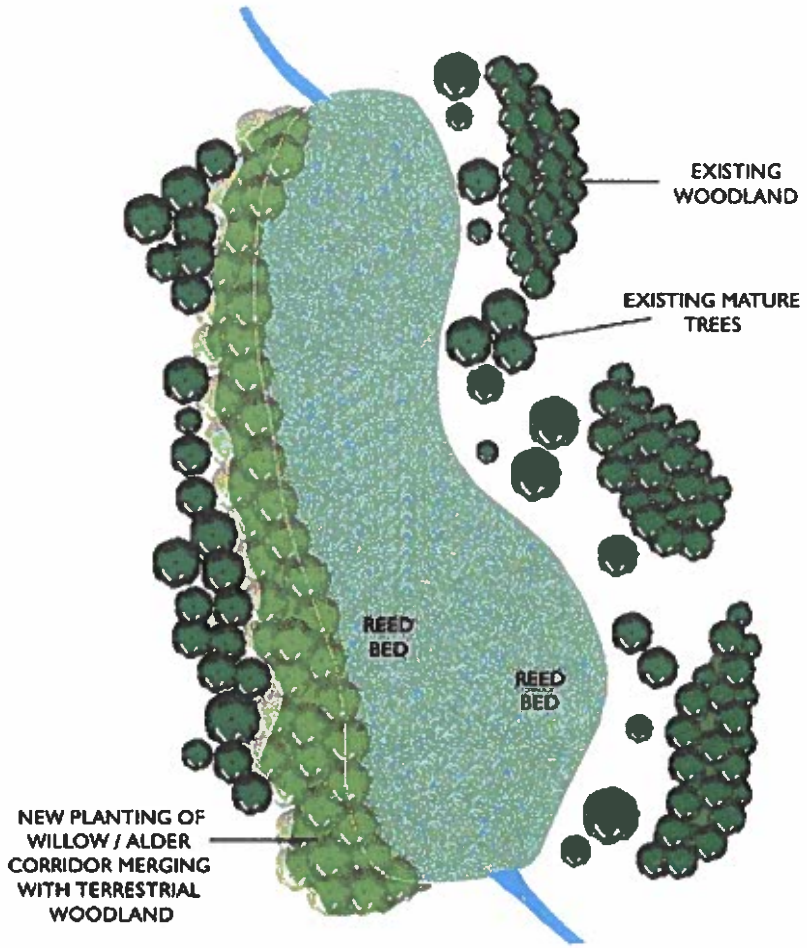
Figure 2. Generic design of SUDS pond appropriate for S8 and S9



9.10 POND S10

S10 is designed as reed bed to fulfil the function described under S6A. S10 is situated within the Community Woodland Park area and will be a wildlife conservation habitat in addition to a SUDS pond. On the entire length of the northern boundary there is a solid block of good quality broadleaved woodland which will be retained because it is outwith the boundary of the new development. The open areas between the woodland and reed bed will be planted with low density willow and alder and any damp grassland will be unmanaged once the period of establishment is completed (2 - 3 years). There is another block of good quality mature broadleaved woodland on the southern boundary. On the south western, western and north western boundaries there is currently more open habitat. The landscaping approach for these areas will be similar to the scheme illustrated in Figure 3 for the soft boundary. Mainly willow and alder and some shrubs will be planted in linear groups close to the pond edge. Some of this planting will encroach into the pond to provide a willow/alder carr habitat. As described for S6 and S7 the intention is to create new valuable aquatic habitat which will enhance the biodiversity of the site to include small passerine birds, amphibians and aquatic invertebrates and to provide new habitat for water vole and otter. Pond S10 will be included in the Bird Management Plan for starling. This water body will not attract gulls, swans or geese although moorhen and coot and the occasional heron may use this habitat. The bird strike risk is judged to be extremely small.

Figure 3. Generic design of SUDS ponds with reed beds



9.11 EXISTING PONDS P1, P2 and P3

The existing fire ponds (P1, P2 and P3) appear to be stable aquatic ecosystems which have developed an emergent fringing aquatic vegetation which merges with bankside shrub and long grassland vegetation. There are a considerable number of trees including willow (*Salix spp*) which are growing adjacent to the ponds, some of which overhang the ponds.

The Landuse Master Plan (Drawing 715/268D 30/10/07) depicts a hard edge to the north western, northern and north eastern boundary of P1 with adjacent business and retail areas. The perimeter here would have a fringing emergent macrophytes vegetation and a paved hinterland which would be intensively used by the public. The rest of the pond boundary on the southern and western sections of the perimeter would remain undisturbed with existing vegetation and edge features intact.

The northern boundary of P2 will be adjacent to an area of housing with an adjacent main road on the eastern boundary. The section of boundary adjacent to the housing development will have a fringing emergent macrophytes vegetation and an adjacent paved area. The remaining boundary will remain undisturbed with existing vegetation intact. The southern and south western boundaries of ponds P1 and P2 adjacent to open public greenspace will be planted with additional trees (e.g. willow, alder, birch) and shrubs (non-berry bearing species). The planting scheme would be similar to that shown in Figure 1.

Pond P3 will be entirely surrounded by public amenity greenspace. The existing pond edges and fringing vegetation will remain intact and additional planting will be undertaken as described for P1and P2 according to the generic scheme shown in Figure 1. The intention would be to prevent water fowl gaining access to areas of mown grassland in the public amenity areas. Grassland in and around tree and shrub planting would be managed as wildflower meadow with mown paths where appropriate.

Given the combined size of the existing ponds P1, P2 and P3 the records of water birds using these ponds during the period November 2004 to March 2005, suggest that there are fewer numbers of water birds using these ponds than would normally be expected given their size and favourable habitat condition (refer to section 5.2 "Record of Water Birds at Royal Ordnance Bishopton). The increased disturbance by public use of the adjacent areas, disturbance by dogs and the close proximity of business and retail areas is likely to reduce rather than increase bird use of P1, P2 and P3 water bodies.

It is concluded that there will be no increase in bird strike risk from the presence of Ponds P1, P2 and P3 and the risk may become reduced in comparison with the pre-development status. Note that the existing ponds will remain as three separate entities with no change to the terrestrial topography which separates the ponds.

10.0 Conclusions concerning SUDS pond design

The design of the open water SUDS ponds has utilised an appropriate combination of all the possible measures to reduce attractiveness to water birds. The location and function of each SUDS pond determined which combination of measures (as set out in section 8) was used. We consider that feral Canada Geese and Greylag Geese (which are possible colonisers from the Clyde estuary area and Black Cart Water) will be virtually excluded by the design measures. These species have not been recorded using the existing fire ponds P1, P2 and P3 which have a larger area than any of the proposed SUDS ponds. It is possible that an occasional Mute Swan or pair of swans may become resident on some SUDS ponds given that a pair has used the fire ponds for several years. Whooper Swan would not use the SUDS ponds. Dabbling ducks (Mallard, Goldeneye and Tufted Duck in particular) may use the ponds in relatively small numbers and may attempt to breed. The proposed Bird Management Plan would deal with this issue.

10.1
Of other species likely to utilise the ponds, Grey Heron may move from the nearby heronry but this is most unlikely to create an increased bird strike risk and the occasional Cormorant may be attracted but would find little food. The major bird strike hazard at Glasgow Airport, gulls, would not roost in large populations on the SUDS ponds which are too small in surface area. It is possible that a few gulls would use the water bodies but in such small numbers that increased bird strike risk would be negligible. There are likely to be a few Moorhen and Coot utilising the ponds but breeding will be constrained as far as possible through active management.

10.2
The SUDS ponds which will be developed as reedbed will eliminate possible risks from Mute Swan, goose, Cormorant and gulls. The intention will be to manage the reedbeds with predominant vegetation cover (once it has developed). This will help to keep numbers of dabbling duck species to the minimum. There is the potential for starling roosts to become established on the reedbed sites. Therefore an important element of the Bird Management Plan will be to maintain a close check on starling and to implement measures to prevent a roost establishing before the population size builds up.

A Bird Management Plan for Royal Ordnance Bishopton SUDS ponds and adjacent areas

11.1 Background

11.1.1
The design of SUDS ponds and adjacent areas within the Royal Ordnance Bishopton Master plan has very substantially reduced the risk to aircraft operating out of Glasgow Airport but has not completely eliminated the risk. The Bird management Plan (BMP) set out in the following paragraphs will further reduce the risk to a level which is extremely small and therefore acceptable.

11.1.2
The BMP for the Royal Ordnance Bishopton development site is focussed mainly on the SUDS water bodies and has both strategic and objective-based components. The overall strategy has been to design SUDS ponds and adjacent landscaped areas so that they are as unattractive as possible to hazardous species of birds that threaten flight safety. The approach was described in section 8.0 of this report. Existing semi-natural aquatic habitats should be maintained and managed without undue change. This is particularly important when the habitat is occupied by a protected species such as otter.

11.1.3
Specific objectives are proposed which focus on bird species that must be excluded from the SUDS ponds (the 'target group' listed under 11.2.1). In order to achieve the objectives a suite of prescriptive actions are proposed which would be undertaken in particular circumstances to deter a particular species or a group of closely related species. Threshold criteria are set out which require management action when the trigger population size for a particular species (or group of species) has been exceeded.

11.1.4
The main strategic approach has been to 'design out' unwanted birds that cause a high risk to aircraft operating out of Glasgow Airport. This has been achieved using appropriate habitat modification, but using this approach alone will not completely deter high risk 'target group' species and therefore it will be necessary to implement the following procedures. First, to harass and scare away unwanted birds using regular and intensive disturbance, second to prevent the breeding of high risk species and as a final resort to kill high risk birds by shooting.

11.2 Objectives of the Bird Management Plan

11.2.1

A suite of water bird species were identified based on local records and observations and consultation with CSL (advisor to the BAA) which are regarded as having the potential to present a hazard to aircraft operating in and out of Glasgow Airport. The suite of species 'the water bird target group' are listed below.

Gulls	*Larus spp*
Canada Goose	*Branta canadensis*
Greylag Goose	*Anser anser*
Mute Swan	*Cygnus olar*
Cormorant	*Phalacrocorax cinerea*
Grey Heron	*Ardea cinerea*
Mallard	*Anas platyrhyncos*
Tufted duck	*Aythya fuligula*
Goldeneye	*Bucephala cangula*

11.2.2
Other species of dabbling and diving ducks, Coot and Moorhen may also present a less significant hazard although they are less numerous at Royal Ordnance Bishopton, or in the case of diving ducks Coot and Moorhen are more sedentary, and thus are less likely to cause an unacceptable risk. However, the main objective is to keep the number of water birds to the minimum wherever possible and because small numbers of less hazardous birds may attract other more hazardous species, the overall objective is to minimise the populations of all species of water bird.

11.2.3
Starlings (*Sturnus vulgaris*) flock and form roosts which can be measured in tens of thousands, which are a distinct potential hazard to aircraft because the birds form large roaming flocks just before dusk. The formation of starling roosts on reed bed SUDS ponds would create a serious new hazard and must be prevented as an absolute requirement using appropriate techniques described under section 11.3.2.

11.2.4
The specific objectives of the Bird Management Plan are therefore, as follows:

1. to minimise the population and where reasonably possible exclude birds belonging to the 'water bird target group' from the SUDS ponds and adjacent areas of landscaped public amenity,

2. to minimise the numbers of other less hazardous species of water bird,

3. to prevent the formation of starling roosts at the reed bed SUDS retention ponds,

4. to conduct any other bird management operations which may be agreed with the BAA and the local management of Glasgow Airport, if any new hazard were to arise, not encompassed by the present BMP,

5. to regularly monitor bird populations, keep detailed records, provide a quarterly report and undertake an annual review and consequently amend the management strategy drawing on advice provided by the site owner's (or site operator's) consultant and the BAA.

11.2.5
A key principle of the Bird Management Plan is that there should be no increase in the background population of the 'target group' species. Existing semi-natural aquatic habitats will not compromise this principle providing that they are kept mainly in their present condition. Failure criteria for each species (or group of species) are specified trigger level population numbers coupled with failure to reduce the population by normal dispersal procedures. A specific objective is to implement remedial action in the event of a failure and to deploy additional resources when required. Thus the BMP is adaptive and flexible so that new or intractable bird problems can be managed successfully. Likewise birds that are shown to present a negligible risk over a period of time can be dropped from the species target group. A successful BMP combined with bird unfriendly landscape design features should result in a gradually reduced commitment in succeeding years.

11.3 The water bird management strategy

11.3.1 Bird management at different stages of site development

Three phases of site development are recognised where the overall strategy and the tactics of bird dispersal will evolve as the physical characteristics of the site change and the bird habitats change. The three phases are described in the following paragraphs and the selection and application of bird deterrent techniques are described under section 11.3.2.

a) bird management during site clearance, site decontamination and creation of landforms

b) bird management during construction of residential areas and commercial buildings and following construction of SUDS ponds and reed beds in the period until the ponds are at hydrological equilibrium (full) and the reed beds have become fully vegetated with > 95% vegetation cover

c) bird management post-completion, encompassing residential, commercial and public amenity areas including parkland and sports pitches

11.3.2 Bird deterrent techniques and their application at various phases of site development

11.3.2.1 Site clearance, decontamination and creation of landforms

A variety of bird deterrent techniques will be selected depending on the bird species to be dispersed and the phase of site development (section 11.3.2.2). During site clearance, site decontamination and site formation including the creation of the new land forms, there will be substantial regular disturbance which will deter most species of birds from using the site although gulls may be attracted to transient flashes and pools and open wet areas.

11.3.2.2 Construction phase and creation of SUDS ponds

In collaboration with the site main contractor and sub-contractors, bird dispersal would concentrate on the 'target group' species and any less hazardous species that were present. Most of the available bird dispersal and harassment techniques would be used (see 11.3.3). Once SUDS ponds have been completed and have filled with water they will be immediately attractive to the 'target group' of water birds. This will be particularly relevant for the reed bed SUDS ponds during the period when the cover of common reed is less than 100%. This could be a time period of 2 years at least and probably longer. During this period the future reed bed ponds will attract gulls, geese, dabbling and diving ducks and Grey heron and possibly cormorant. The full spectrum of dispersal techniques should be undertaken according to which techniques are most appropriate for the water birds which are present.

When the reed beds have become fully established and have developed a dense cover over the SUDS ponds they can provide excellent roosting sites for Starling. It is important that a Starling roost does not become established at any time, because once established they can become stable and long-term. Therefore weekly observation of the reed bed ponds should be undertaken and when no more than 1000 Starlings are using the development site as a roost, aggressive measures should be used to shift the roosting population before the birds become too well established. The full range of harassment and disturbance tactics should be used including laser guns, gas cannons and pyrotechnics. It is much easier to prevent a roost from developing than attempting to move it once a large population has become well-established.

A fishery management policy will be necessary and will have to be agreed and undertaken in collaboration with SEPA. The objective will be to ensure that fish populations do not build up so that they attract Heron, Cormorant and Grebe. Heron are likely to be attracted from the nearby heronry and any increase in flights would be an increased hazard. Liaison and formal agreement with local fishing clubs will be required to ensure that deliberate stocking does not occur. If fish do colonise any of the SUDS ponds they will have to be removed, either by draining the ponds or using electric fishing.

Public education about the need not to feed waterfowl will be essential. Feeding encourages a population of ducks and geese to be maintained at a higher density than would occur naturally. Appropriate interpretative signs which explain the problems caused by feeding geese and other water fowl could mention that human food is not good for waterfowl because it is nutritionally inappropriate; that droppings can harbour parasites such as *E.coli* and *Salmonella.*

All public waste facilities should encompass lidded bins and the site maintenance teams will be required as a contractual responsibility assiduously to collect any discarded food waste and to provide public education reinforcement by advising the public about reasons for not feeding birds and the rationale for vegetation management in the public amenity areas.

11.3.2.3 Post-completion residential, commercial and public amenity areas

On-going management of water birds requires a different approach when new housing areas and commercial properties have started to be occupied and residents are using

local shops and amenities. It will not be possible to use shotguns, noisemaking devices or loud distress calls as a means of dispersal. Measures will be required to prevent breeding of water birds at the SUDS ponds. A specific spring survey will be undertaken to detect nesting birds. Target species will be feral geese, swans and dabbling ducks. Eggs can be coated in liquid paraffin oil or given a lethal injection. This is preferable to destruction of nests because birds will often rebuild nests and lay another clutch of eggs. Physical removal of some birds such as feral geese can also be undertaken although public perception would be an issue.

Hand held laser equipment would be used to disperse water birds at dusk. Public perception could be a problem in the use of this technique and laser dispersal would need to be undertaken when members of the public were not in the vicinity of a target SUDS pond or the area would have to be temporarily closed to public access.

11.3.3 Available techniques for bird harassment and dispersal

A range of harassment and dispersal techniques should be utilised which are appropriate to the current phase of site development at particular locations (see 11.3.2). Harassment and dispersal techniques rely mainly on visual or acoustic devices.

Techniques which can be used by subcontractors are listed below. Appropriate advice on the correct use of the technique should be sought where necessary from experts (CSL York).

- Portable (hand held or vehicle mounted) distress call broadcasting units which are equipped with a standard set of calls (as used routinely at airports) will assist in the dispersal of Gulls, Corvids, Starlings and Ducks.

- Eyespot balloons flutter tape, flags and streamers will give threatening visual stimuli over small areas. Birds such as geese quickly learn to ignore these devices so that their use is very temporary. The devices should be moved daily to maintain their effectiveness.

- Noisemaking devices such as propane gas cannons, pyrotechnic pistols which fire shell crackers, whistle bombs or blanks will disperse geese, swan, ducks and gulls. However if these devices are used regularly birds become accustomed to the fear-provoking stimuli.

- Low-power long wavelength lasers (hand-held models are available) may be used for dispersing roosting birds in low light (dusk).The spot of laser light is disliked by birds and elicits an avoidance response. Although the use of lasers is a relatively new technique which requires additional research, there is sufficient evidence available to demonstrate that the equipment is capable of dispersing gulls, Canada Geese, Mallard and Cormorant.

- If available, properly trained dogs directed by a handler are an effective method of bird dispersal in large open areas and would be appropriate to use at Royal Ordnance Bishopton at least during the construction phase. Border collie is a useful breed for effective bird dispersal and regular harassment several times a day for one or two weeks causes water birds to move elsewhere.

- A shotgun with cartridges carrying shot suitable for humanely killing large birds such as Canada Geese and Greylag Geese, ducks or cormorant can be used during the construction phase or outside the development area (e.g. at reedbeds) outside operational hours (e.g. dawn/dusk) but during operational hours the firing of blank cartridges could be undertaken to reinforce lethal control measures.

- At certain times of year it would be possible to catch feral geese and remove them from the site. Canada geese moult every year during July and early August and at this stage have lost their flight feathers and thus will be easier to catch. Once caught the birds can be taken a substantial distance (>200km) before release or can be given a lethal injection by a qualified veterinary practitioner.

No single technique of bird dispersal will remain effective indefinitely. A combination of appropriate techniques which are rotated or varied in duration and timing will be required to prevent birds becoming habituated and then not responding to the harassment stimuli. It is recognised that static and automated delivery of dispersal mechanisms will only be effective for limited periods of time to disperse birds from relatively small areas and that the most effective bird dispersal and management will be achieved by human intervention.

11.3.4 Patrolling and monitoring bird presence and activity

As soon as development commences involving site clearance and decontamination a competent ornithologist will be employed to undertake regular patrolling and monitoring of the residential, amenity landscape and commercial sectors of development area and the reedbed SUDS ponds. From the start of operations, through the construction phase and full completion of the site and thereafter whilst birdstrike risk is significant (see 11.2.5) observations of adult birds will be undertaken regularly once per week. During the breeding season for each species in the 'target group' a check will be made at all SUDS ponds to determine if breeding is occurring (nest building and egg laying). The monitoring ornithologist will inform the site operator and bird control contractors in order to undertake measures to prevent breeding of water birds or if the monitoring ornithologist possesses the relevant license he/she can undertake the appropriate control measures.

The frequency of patrolling may be reviewed formally following an annual report and adjusted to lesser or greater frequency depending on the evidence of bird occupancy, roosting, breeding or feeding activity and the assessment of significant bird strike risk.

11.3.5 Monitoring, recording and reporting bird numbers

The numbers of each species or group (e.g. gulls) should be recorded on each bird patrol. The species included will be the 'water bird target group' listed under 11.2.1 plus other less hazardous dabbling and diving ducks, Coot and Moorhen (11.2.2). Notes on direction of movement of birds which fly in or out of the site should be made. Attempts to breed by target group species will be recorded and notified to the site

operator so that action to prevent breeding (e.g. coating eggs in paraffin oil) can be undertaken by the bird management contractor. Starling roosts at the reed bed ponds will also be recorded. Also recorded on each bird patrol will be date, time and duration, weather conditions including wind speed and direction. Management actions to disperse birds will be recorded with details of bird species present, dispersal technique(s) used, success or failure of the bird dispersal action and action to prevent breeding plus number and location of nests. All bird count and other data will be regularly updated and available to Renfrewshire Council (on request) and an annual summary report should be produced for Renfrewshire Council showing bird counts, dispersal activities undertaken and other bird management actions undertaken. These obligations should be implemented as a planning condition and implemented accordingly.

11.3.6 Licensing of control operations

All of the bird species that may require dispersal action (the 'target group' are fully protected under the Wildlife and Countryside Act 1981, with the exception of water-fowl during the open season. For the purpose of protecting air safety, providing that they are not nesting or rearing young, they can be harassed by non-lethal methods at all times. However when it is necessary to undertake lethal control, destruction of nests and the taking or destruction of eggs, a special license is required. The relevant license, General License NO SEGEN/10, is granted by the Scottish Executive (after consultation with the Scottish Natural Heritage). The appropriate license(s) should be obtained before any new water bodies are created. It is expected that BAE Systems would be the licensee and would delegate to a subcontractor. Alternatively an appointed subcontractor can apply directly to the Scottish Executive. It will be necessary to obtain written evidence from any contracted bird control company that their staff have the necessary expertise to accurately identify the relevant specific bird species, have the necessary skill in the use of firearms and also full certification for their usage and have the appropriate Health and Safety policy.

11.3.7 Threshold criteria which trigger management action and the application of failure criteria

11.3.7.1
Criteria are defined against which achievement of the objectives of the BMP can be judged. Threshold criteria are defined for particular species or species group covered by the 'target group' of water birds. Threshold criteria include bird numbers which will trigger a dispersal and deterrence response and commencement of breeding (nest building and egg laying) which will trigger actions to prevent breeding (11.3.2.2). Failure criteria are defined as a failure to disperse or remove birds belonging to the 'target group' or failure to prevent breeding.

11.3.7.2 Species criteria

Note: the term' development site' in the paragraphs below refer to the residential, commercial, amenity landscape sectors and the reedbed SUDS ponds.

a) Gulls

There will be zero tolerance of roosting, feeding or loafing by gulls (all species) on SUDS ponds or playing field areas. A group of more than 20 should be dispersed.

b) Cormorant

If more than 5 Cormorants are observed during a single patrolling episode on the SUDS ponds they will be dispersed.

c) Canada geese, Greylag geese and Mute swan

There will be zero tolerance of breeding by feral geese and Mute swan. Eggs will be oiled and/or nests destroyed. When the number of geese on the development site exceeds 20, action will be taken to remove them from the site or to disperse them. This is particularly relevant to winter flocks which may arrive at the development site suddenly and without warning, as well as sedentary geese which potentially occupy the site throughout the year.

d) Grey Heron

If more than 8 Grey Herons are observed during a patrol, action will be taken to disperse them.

e) Starling

There should be zero tolerance of Starling roosts particularly in relation to the reed beds. Monitoring patrols should concentrate on dusk visits from early autumn and through the winter months. When more than 1000 Starling are observed on the development site action will be taken to disperse them. If dispersal action fails, greater resources will be allocated to ensure that Starling flocks are eliminated from the site (see Failure Criteria - 11.3.8.3).

f) Dabbling ducks

Based on existing knowledge these will be mainly Mallard, Tufted duck and Goldeneye but may include other species. There should be zero tolerance of breeding by all species of dabbling ducks which are present on the SUDS ponds. Dispersal would be necessary if the total number on the development site were observed to exceed 50 during a patrol episode.

11.3.7.3 Failure criteria and remedial action

Efforts to disperse birds may not always be effective using a single technique or a single (or several) attempt to disperse birds. Therefore criteria are given below which define when a failure occurs and when remedial action is required.

The suggested failure criteria are:

- Any failure to disperse or remove 'target group' birds when a period of 4 hours has elapsed after commencement of actions to disperse the birds.

- When an average of more than 5 separate dispersal actions have been required against any particular 'target group' species (or species group) per period of 24 hours in any month.

In the event of a 'failure' as defined above, Renfrewshire Council will be informed in writing within 7 days.

Remedial action in the event of a 'failure' will depend on the individual circumstances of the failure event. This might involve investment in additional deterrent effort or if a particular SUDS pond was so attractive to water birds, then additional modification and management may be required.

11.3.8.4 Liaison and inspection

The site owner/operator will allow access to nominated representatives of Renfrewshire Council and BAA to inspect bird management operations. During the construction phase an agreement will be required with BAE Systems, Redrow Homes and their main contractor (or contractors) that whilst the site is open, no notice will be required for visits. At other times, when the site is closed an agreed period of appropriate notice will be provided, to allow access.

The site owner/operator will meet with Renfrewshire Council per annum to review the efficacy of the BMP and to make necessary changes. Renfrewshire Council may invite represetatives of BAA/Glasgow Airport to attend the annual meeting. The BMP is adaptable and flexible and changes in target species, trigger thresholds, habitat management or use of deterrent techniques are all possible following assessment and annual review (or more frequently if required by the planning authority).

12. Conclusion

The SUDS ponds and SUDS reed beds have been designed to reduce their attractiveness to water birds to the maximum possible extent taking into consideration engineering requirements and human Health and Safety issues. The total area of open water has been substantially reduced in comparison with the earlier SUDS scheme. It has not been possible to completely design out attractiveness to water birds and therefore a Bird management Plan is proposed which will be implemented as soon as work commences on the development site and construction of the SUDS ponds is underway. The combination of the SUDS pond design and the Bird Management Plan will ensure that there is no additional risk of birdstrikes at Glasgow Airport created by the Royal Ordnance Bishopton development.

APPENDIX 1

Bird Data Jan-March

Tuesday 25 January 2005

Weather conditions: cold and dry

	Dawn Count		*Dusk Count*	
P1	Goldeneye	2 (F)	Cormorant	1 (flew northwards pre-dark)
	Tufted	5 (4F + 1M)	Moorhen	2
	Mallard	11(7M + 4F)		
P2	Mallard	2 (1M + 1F)	Goldeneye	5 (4F + 1M)
			Tufted Duck	4 (2F + 2M)
			Mallard	3 (2F + 1M)
			Moorhen	1
P3	Mute Swan	2	Mute Swan	2
	Goldeneye	3 (1F + 2M)	Goldeneye	3 (2F + 1M)
	Moorhen	1	Mallard	2 (1F + 1M)
	Mallard	9 (5M + 4F)		
	Heron	1		

Ice over P1 and P2. P1 approximately 50% cover, P2 approximately 94%.

P3 clear of ice.

Two herons were seen flying east over the ponds towards the reported heronry.

Several hundred geese (species unknown) flying east to south towards the airport.

Corvid (dusk) roost (ETF area) – approximately 2000 – 3000 birds

Wednesday 23 February 2005

Weather conditions: freezing cold, with light snow flurries

	Dawn Count		*Dusk Count*	
P1	Goldeneye	2 (M)	Goldeneye	9 (5M + 4F)
	Tufted duck	1 (M)	Tufted duck	1 (M)
	Mute Swan	2	Moorhen	1
			Snipe	1 (on fallen tree in pond)
P2	Mallard	4 (2M + 2F)	Goldeneye	7 (4F + 3M)
	Tufted duck	4 (2M + 2F)	Tufted Duck	4 (2F + 2M)
	Goldeneye	4 (1M + 3F)	Mallard	2 (1F + 1M)
	Moorhen	2	Dipper	1 (flew into scrub)
P3	Goldeneye	8 (4F + 4M)	Goldeneye	3 (2M + 1F)
			Mute Swan	2

Ice on P2 (small amount)

P1 and P3 clear of ice

Heron (1) seen flying south to north over P2 and (1) on the burn east of the ponds (dusk count)

Approximately three hundred geese (species unknown) flying north to south towards the airport (dusk count)

Corvid (dusk) roost (ETF area) reduced in number – approximately 500 – 800 birds

Fox hunting around the margins of P2

Tuesday 15 March 2005

Weather conditions: cold, with light rain

	Dawn Count		***Dusk Count***	
P1	Goldeneye	3 (1M + 2F)	Goldeneye	1 (M)
P2	Goldeneye	1 (M)	Goldeneye	6 (3M + 3F)
	Tufted duck	14 (9M + 5F)	Tufted Duck	14 (9M + 5F)
	Moorhen	1	Moorhen	1
			Mallard	1 (M)
			Mute Swan	2
P3	Goldeneye	6 (4M + 2F)	Goldeneye	2 (M + 1F)
	Mute Swan	2		

Corvid (dusk) roost (ETF area) – approximately 400 – 500

A group of corvids – approximately 100 appeared to be roosting on the trees close to the site entrance, where the rookery is sited

Appendix 2

BLACK CART WATER	SPEC		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2002														
Black Cart Water	LG	Little Grebe	1	1										
Black Cart Water	GG	Great Crested Grebe									1			
Black Cart Water	CA	Cormorant	10	2	1						5			2
Black Cart Water	H.	Heron	2											1
Black Cart Water	MS	Mute Swan									42	50		2
Black Cart Water	WS	Whooper Swan	102	117	135							10	96	
Black Cart Water	PG	Pink footed Goose									1			
Black Cart Water	GJ	Grey Lag Goose	3	40	150								60	
Black Cart Water	CG	Canada Goose									205	160		
Black Cart Water	WN	Widgeon	54								6	60	1	24
Black Cart Water	T.	Teal	41	9							2		79	100
Black Cart Water	MA	Mallard	29	4	19						380	22		100
Black Cart Water	PO	Pochard											3	
Black Cart Water	TU	Tufted duck	14		4									
Black Cart Water	GN	Golden Eye duck	17	4	7								46	40
Black Cart Water	RM	Red Breasted Marganser		1										
Black Cart Water	GD	Goosander		2	3								1	3
Black Cart Water	MH	Moorhen												2
2003														
Black Cart Water	LG	Little Grebe	6	2							1	1	3	1
Black Cart Water	CA	Cormorant	14	9	14	5	10		1	6	12	10	21	15
Black Cart Water	H.	Heron	5	1	1	2	1	3	5	9	8	8	5	5
Black Cart Water	MS	Mute Swan	11	2	4	6	6	14	10	24	51	26	2	2
Black Cart Water	WS	Whooper Swan	100	100	170	10						21	2	3
Black Cart Water	GJ	Grey Lag Goose	500	350	1									107
Black Cart Water	CG	Canada Goose								220	13			
Black Cart Water	BY	Barnacle Goose		1										
Black Cart Water	SU	Sheld duck			1	3	2	1						
Black Cart Water	WN	Widgeon	6								4	10	25	30
Black Cart Water	T.	Teal	84	76	144	46				25	70	52	117	105
Black Cart Water	MA	Mallard	52	57	42	34	28	65	34	168	181	87	58	73
Black Cart Water	PT	Pintail										1		
Black Cart Water	TU	Tufted duck				2			6		2	8	11	8
Black Cart Water	SP	Scaup									1			
Black Cart Water	GN	Golden Eye duck	37	50	47								45	62
Black Cart Water	RM	Red-breasted Maerganer	3	4	2								2	2
Black Cart Water	GD	Goosander	4	3	5	9	1		3		6			
Black Cart Water	MH	Moorhen		1	2			2		3	4	1		
2004		2004												
Black Cart Water	LG	Little Grebe	2			1								
Black Cart Water	CA	Cormorant	6	8	2	8	7	8	3	8	12	8	23	15
Black Cart Water	H.	Heron	4	3	3	4	5	5	6	4	6	4	4	7
Black Cart Water	MS	Mute Swan	2	2	2	5	21	36	6	9	8	12	3	
Black Cart Water	WS	Whooper Swan	38	72	57	2						7	39	112
Black Cart Water	PG	Pink-footed Goose				1								
Black Cart Water	GJ	Grey Lag Goose	500		113									28
Black Cart Water	CG	Canada Goose								43		36	16	26
Black Cart Water	SU	Sheld duck		2	2	6								
Black Cart Water	WN	Widgeon	21	72	40								104	117
Black Cart Water	T.	Teal	106	101	82	2					40	164	134	136
Black Cart Water	MA	Mallard	41	47	44	19	27	39	98	132	80	87	80	94
Black Cart Water	TU	Tufted Duck										6	6	
Black Cart Water	GN	Golden Eye duck	37	25	12	8						15	11	71
Black Cart Water	RM	Red-breasted Maerganer	2	2	1			1						
Black Cart Water	GD	Goosander	2	5		9	5	19	8	8		5	2	
Black Cart Water	MH	Moorhen	1	1	1							1		5

2005														
Black Cart Water	LG	Little Grebe	1											2
Black Cart Water	CA	Cormorant	2	3	7	11	9	5	3	10	18	21	18	22
Black Cart Water	H.	Heron	1	2	3	1	4	3	10	16	6	5	3	4
Black Cart Water	MS	Mute Swan	5	6	2	6	10	13	2	14	14	5	6	3
Black Cart Water	WS	Whooper Swan	105	59	82	25					2	5	70	112
Black Cart Water	GJ	Grey lag Goose	60	150	400						40		15	
Black Cart Water	CG	Canada Goose	15							185	17	10	24	
Black Cart Water	BY	Barnacle Goose											6	
Black Cart Water	SU	Sheld duck				8	2							
Black Cart Water	WN	Widgeon	70	65	95					1	10	3	52	75
Black Cart Water	T.	Teal	145	105	71	31			2	3	20	150	99	160
Black Cart Water	MA	Mallard	152	79	36	42	31	51	106	191	254	98	102	64
Black Cart Water	SV	Shoveler	2											
Black Cart Water	TU	Tufted Duck	2		3									1
Black Cart Water	GN	Golden Eye duck	68	65	14								24	42
Black Cart Water	RM	Red-breasted Maerganer	2		1		1			7				2
Black Cart Water	GD	Goosander			1	11	5	5	14		2	5	6	4
Black Cart Water	MH	Moorhen	1	2	1					1		1		
2006														
Black Cart Water	LG	Little Grebe		2	1					1	3	3		
Black Cart Water	CA	Cormorant	8	12	10	9	9	8	3	7	20	11	18	8
Black Cart Water	SA	Shag									2		1	
Black Cart Water	H.	Heron	5	1	1	7	2	3	21	23	9	7	2	4
Black Cart Water	MS	Mute Swan	3	3	2	3	4	30	26	43	7	2	2	2
Black Cart Water	WS	Whooper Swan	70	63	70	11						2	78	75
Black Cart Water	GJ	Grey lag Goose	86	150	11	58						3		
Black Cart Water	CG	Canada Goose								372				
Black Cart Water	SU	Sheld duck		2	10	1	1	2						
Black Cart Water	WN	Widgeon	70	152	60	8	2					3	13	57
Black Cart Water	T.	Teal	238	188	136	83	40				28	115	88	122
Black Cart Water	MA	Mallard	94	61	20	16		73	89	184	175	120	59	75
Black Cart Water	TU	Tufted duck	6	5		1								
Black Cart Water	GN	Golden Eye duck	45	20	8								15	13
Black Cart Water	RM	Red-breasted Maerganer	1	1	4					1		1	1	3
Black Cart Water	GD	Goosander				3	2	18	1	5	1	1	4	1
Black Cart Water	MH	Moorhen	2	1		1	7			4	1		1	1
2007														
Black Cart Water	LG	Little Grebe		1										
Black Cart Water	CA	Cormorant	9	19	6	12	16	6						
Black Cart Water	H.	Heron	9	7	1	2	4	3						
Black Cart Water	MS	Mute Swan	2	6	14	5	43	28						
Black Cart Water	WS	Whooper Swan	49	40	25	2								
Black Cart Water	GJ	Grey Lag goose	60	26	150									
Black Cart Water	SU	Sheld duck						1						
Black Cart Water	WN	Widgeon	86	63	2									
Black Cart Water	T.	Teal	214	162	102	24								
Black Cart Water	MA	Mallard	76	67	14	20	25	109						
Black Cart Water	TU	Tufted duck		7				2						
Black Cart Water	GN	Golden Eye duck	21	13	6		1							
Black Cart Water	RM	Red-breasted Maerganer	1	1	5									
Black Cart Water	GD	Goosander	3	4	2	8	9	15						
Black Cart Water	MH	Moorhen	1	1		3		1						

WHITE CART WATER	.SPEC		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2003														
White Cart Water (Netherton)	CA	Cormorant	3	1	1						1	1	1	3
White Cart Water (Netherton)	H.	Heron	1								1	1	1	3
White Cart Water (Netherton)	MS	Mute swan			5									
White Cart Water (Netherton)	GJ	Grey lag goose										7		
White Cart Water (Netherton)	T.	Teal	40	33	12							1	11	41
White Cart Water (Netherton)	MA	Mallard	25	12	2							12	6	4
White Cart Water (Netherton)	GN	Goldeneye		2										
White Cart Water (Netherton)	RM	Red breasted merganser	1	2										1
2004														
White Cart Water (Netherton)	LG	Little grebe		1										
White Cart Water (Netherton)	CA	Cormorant		1							1	1	1	1
White Cart Water (Netherton)	H.	Heron	7	1	1						1	2	1	1
White Cart Water (Netherton)	T.	Teal	30	30	37						4		80	48
White Cart Water (Netherton)	MA	Mallard	11	8	5						3	2	8	7
White Cart Water (Netherton)	RM	Red breasted merganser	1											
White Cart Water (Netherton)	GD	Goosander										1		
2005														
White Cart Water (Netherton)	CA	Cormorant	1	1	1						1	2	1	1
White Cart Water (Netherton)	H.	Heron	1		1						1	3		
White Cart Water (Netherton)	MS	Mute swan									4	3	3	3
White Cart Water (Netherton)	T.	Teal	68	65	264						8	60	128	70
White Cart Water (Netherton)	MA	Mallard	4	4	3						6	6	12	15
White Cart Water (Netherton)	GN	Goldeneye		2										
White Cart Water (Netherton)	RM	Red breasted merganser		1										3
White Cart Water (Netherton)	GD	Goosander											1	
2006														
White Cart Water (Netherton)	CA	Cormorant		2		1	1				2	1		3
White Cart Water (Netherton)	H.	Heron	1			1	2				3	1	2	
White Cart Water (Netherton)	T.	Teal	290	242		91					4	13	32	74
White Cart Water (Netherton)	TG					1								
White Cart Water (Netherton)	MA	Mallard	4	7		2	2				7	11	2	3
White Cart Water (Netherton)	GN	Goldeneye	6											
White Cart Water (Netherton)	RM	Red breasted merganser										1		1
White Cart Water (Netherton)	GD	Goosander											1	2
2007														
White Cart Water (Netherton)	LG	Little grebe		1										
White Cart Water (Netherton)	CA	Cormorant	1											
White Cart Water (Netherton)	H.	Heron	1											
White Cart Water (Netherton)	MS	Mute swan		3										
White Cart Water (Netherton)	WS	Whooper swan	8											
White Cart Water (Netherton)	T.	Teal	56	83										
White Cart Water (Netherton)	MA	Mallard	4	4										
White Cart Water (Netherton)	GN	Goldeneye	2											
White Cart Water (Netherton)	RM	Red breasted merganser	3	1										
White Cart Water (Netherton)	GD	Goosander	2											

Appendix 3

Date of strike	Airline	Location	Species
02/09/1998	NK	Glasgow	Black-headed Gull
01/10/1998	Airtours	Glasgow	Black-headed Gull
26/07/2000	NK	Glasgow	Black-headed Gull
07/09/2000	Easy Jet	Glasgow	Black-headed Gull
02/12/2000	Air France	Glasgow	Black-headed Gull
09/01/2002	BA / Loganair	Glasgow	Black-headed Gull
11/06/2003	Air 2000	Glasgow	Black-headed Gull
28/07/2003	Streamline	Glasgow	Black-headed Gull
10/10/2003	Logan air	Glasgow	Black-headed Gull
12/11/2003	BA	Glasgow	Black-headed Gull
19/11/2003	nk	Glasgow	Black-headed Gull
19/11/2003	British Midland	Glasgow	Black-headed Gull
13/10/2004	British Airways	Glasgow	Black-headed Gull
29/08/2005	BA	Glasgow	Black-headed Gull
03/09/2005	BMI	Glasgow	Black-headed Gull
31/12/2005	Loganair	Glasgow	Black-headed Gull
30/07/2001	Britannia	Glasgow	Common Gull
13/08/2003	British Midland	Glasgow	Common Gull
15/03/2004	Easyjet	Glasgow	Common Gull
04/08/2004	BA	Glasgow	Common Gull
15/09/2006	Globsepan	Glasgow	Cormorant
18/09/2003	NK	Glasgow	Golden Plover
22/11/2004	My Travel	Glasgow	Golden Plover
04/11/2004	BA	Glasgow	Goldeneye
17/04/2006	Easyjet	Glasgow	Gull spp
25/07/1997	Flying Colours	Glasgow	Gull spp
21/08/1997	AirTours	Glasgow	Gull spp
09/08/1998	British Airways	Glasgow	Gull spp
21/08/1998	British Airways	Glasgow	Gull spp
30/08/1999	British Midland	Glasgow	Gull spp
23/11/1999	Airtours	Glasgow	Gull spp
26/11/1999	Easy Jet	Glasgow	Gull spp
30/06/2000	Jersey European	Glasgow	Gull spp
08/08/2000	NK	Glasgow	Gull spp
31/01/2002	NK	Glasgow	Gull spp
19/02/2002	Loganair	Glasgow	Gull spp
22/02/2002	JMC	Glasgow	Gull spp
21/03/2002	NK	Glasgow	Gull spp
05/08/2002	JMC	Glasgow	Gull spp
26/10/2004	British Airways	Glasgow	Gull spp
21/01/2005	BA	Glasgow	Gull spp
17/04/2006	Easyjet	Glasgow	Gull spp
17/04/2006	Easyjet	Glasgow	Gull spp
05/08/1998	British Midland	Glasgow	Gull spp.
06/08/1998	Air 2000	Glasgow	Gull spp.
29/08/1998	Airtours?	Glasgow	Gull spp.
29/08/1999	NK	Glasgow	Gull spp.
05/04/2000	NK	Glasgow	Gull spp.
31/08/2000	NK	Glasgow	Gull spp.
06/09/2001	British Regional	Glasgow	Gull spp.
03/03/2003	Easyjet	Glasgow	Gull spp.
17/03/2003	NK	Glasgow	Gull spp.
19/08/2003	BMI	Glasgow	Gull spp.
19/12/2003	nk	Glasgow	Gull spp.

02/08/2004	nk	Glasgow	Gull spp.
31/12/1997	Jersey European Airlines	Glasgow	Herring Gull
21/05/1998	KLM	Glasgow	Herring Gull
26/06/1998	British Midlands	Glasgow	Herring Gull
21/08/1998	British Airways	Glasgow	Herring Gull
29/07/1999	British Airways	Glasgow	Herring Gull
27/07/2000	NK	Glasgow	Herring Gull
20/09/2000	Air Holland	Glasgow	Herring Gull
22/09/2000	NK	Glasgow	Herring Gull
27/09/2000	Easy Jet	Glasgow	Herring Gull
14/10/2000	BA	Glasgow	Herring Gull
21/11/2000	UGAS	Glasgow	Herring Gull
31/05/2001	NK	Glasgow	Herring Gull
09/07/2001	British Midland	Glasgow	Herring Gull
08/08/2002	Easy jet	Glasgow	Herring Gull
10/02/2003	Saltire	Glasgow	Herring Gull
07/10/2003	nk	Glasgow	Herring Gull
15/11/2003	British Midland	Glasgow	Herring Gull
24/08/2004	BMI	Glasgow	Herring Gull
13/09/2004	British Midland	Glasgow	Herring Gull
25/09/2004	Thomas Cook	Glasgow	Herring Gull
06/02/2005	Flybe	Glasgow	Herring Gull
03/08/2006	Gamma	Glasgow	Herring Gull
30/08/2006	British Midland	Glasgow	Herring Gull
14/11/2001	British Midland	Glasgow	Lapwing
01/04/2002	BA	Glasgow	Lesser Black-backed Gull
25/03/2003	British Airways	Glasgow	Lesser Black-backed Gull
23/04/2003	BMA	Glasgow	Lesser Black-backed Gull
09/08/2003	Logan Air	Glasgow	Lesser Black-backed Gull
01/06/2004	First Choice	Glasgow	Lesser Black-backed Gull
09/06/2004	KLM	Glasgow	Lesser Black-backed Gull
27/07/2004	Easyjet	Glasgow	Lesser Black-backed Gull
07/10/2004	BMI Baby	Glasgow	Lesser Black-backed Gull
26/06/2005	British Midland	Glasgow	Lesser Black-backed Gull
28/06/2005	Loganair	Glasgow	Lesser Black-backed Gull
18/07/2005	nk	Glasgow	Lesser Black-backed Gull
14/05/2006	British Midland	Glasgow	Lesser Black-backed Gull
24/04/2000	NK	Glasgow	Mallard
17/05/2006	BMI	Glasgow	Mallard
11/02/2003	NK	Glasgow	Redshank
04/03/2003	MyTravel	Glasgow	Ringed Plover
18/07/2005	nk	Glasgow	Snipe

Since 1997		
Since 1998	Gulls	83
	Waders	6
	Waterfowl	4
	Total	93

Appendix B Pond S1

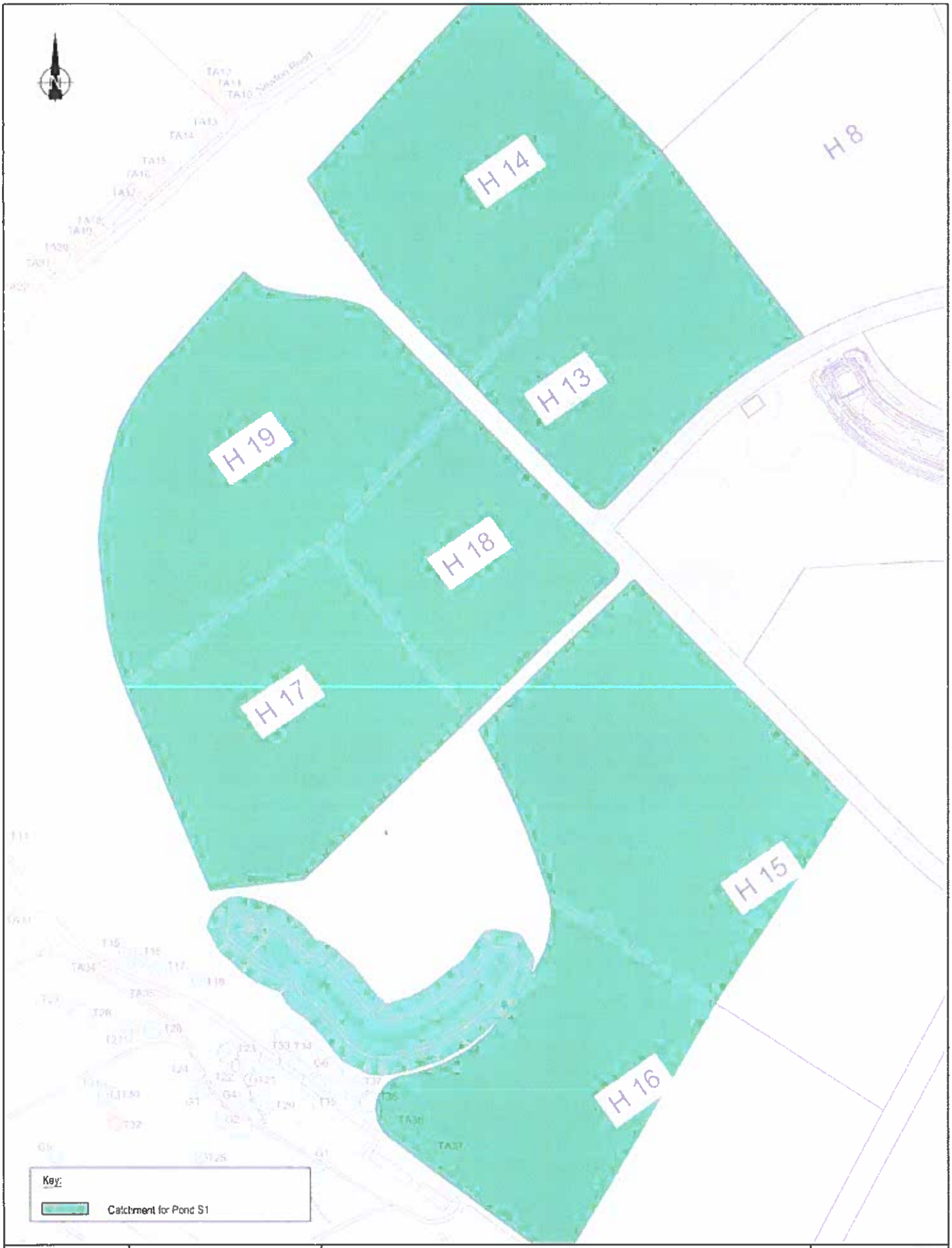
- Figure 1 - Overall Catchment Plan
- Figure 2 – Pond S1 Catchment Plan
- SuDS Pond S1 - 30119-2079-001_Rev A Pond S1

Client: BAE SYSTEMS Ltd

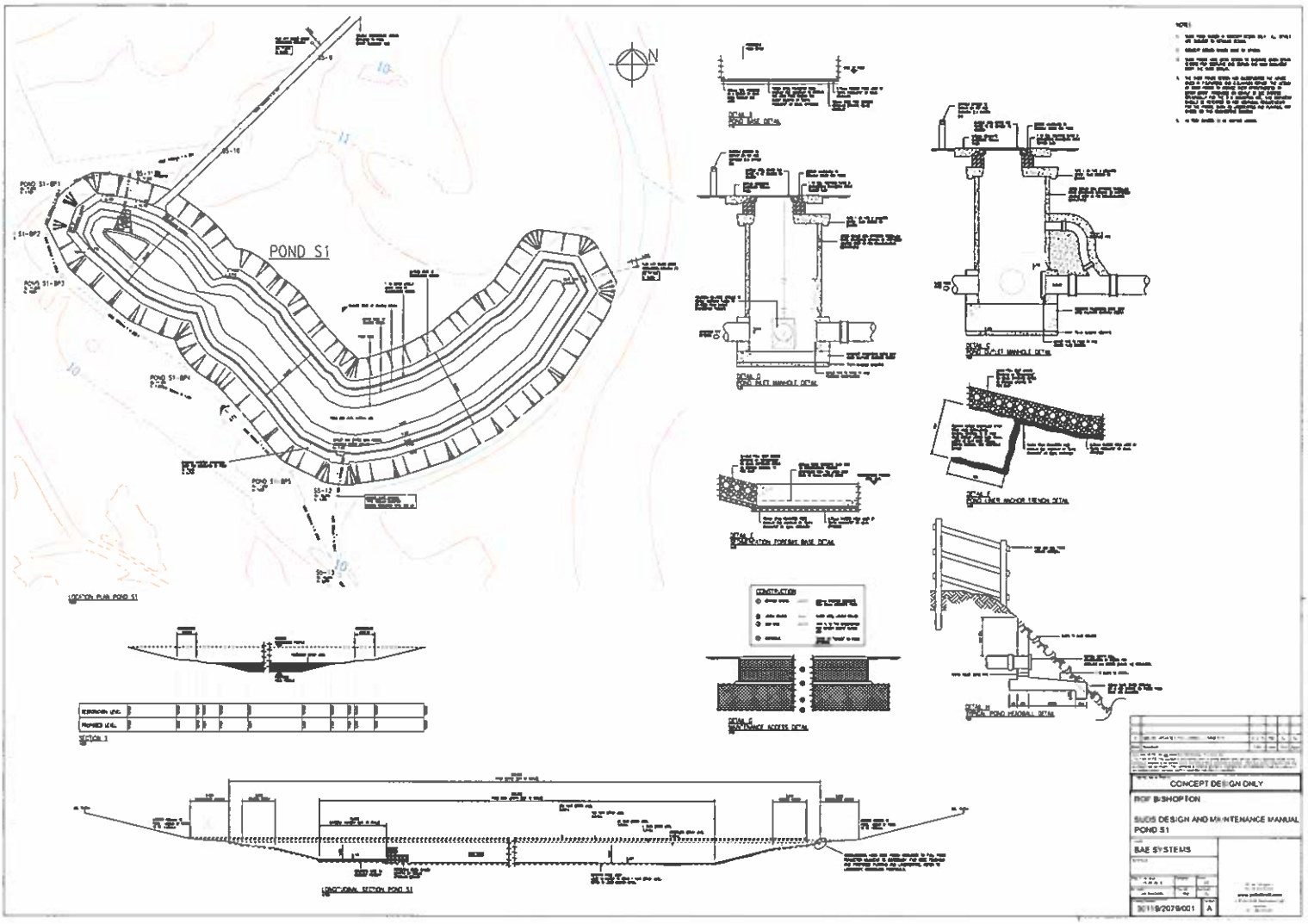
ROF BISHOPTON

SUDS DESIGN AND MAINTENANCE MANUAL
OVERALL CATCHMENT PLAN

Date	19.12.16
A3 Scale	N.T.S
Drawn by	SM
Checked by	AJ
Figure Number	FIGURE 1



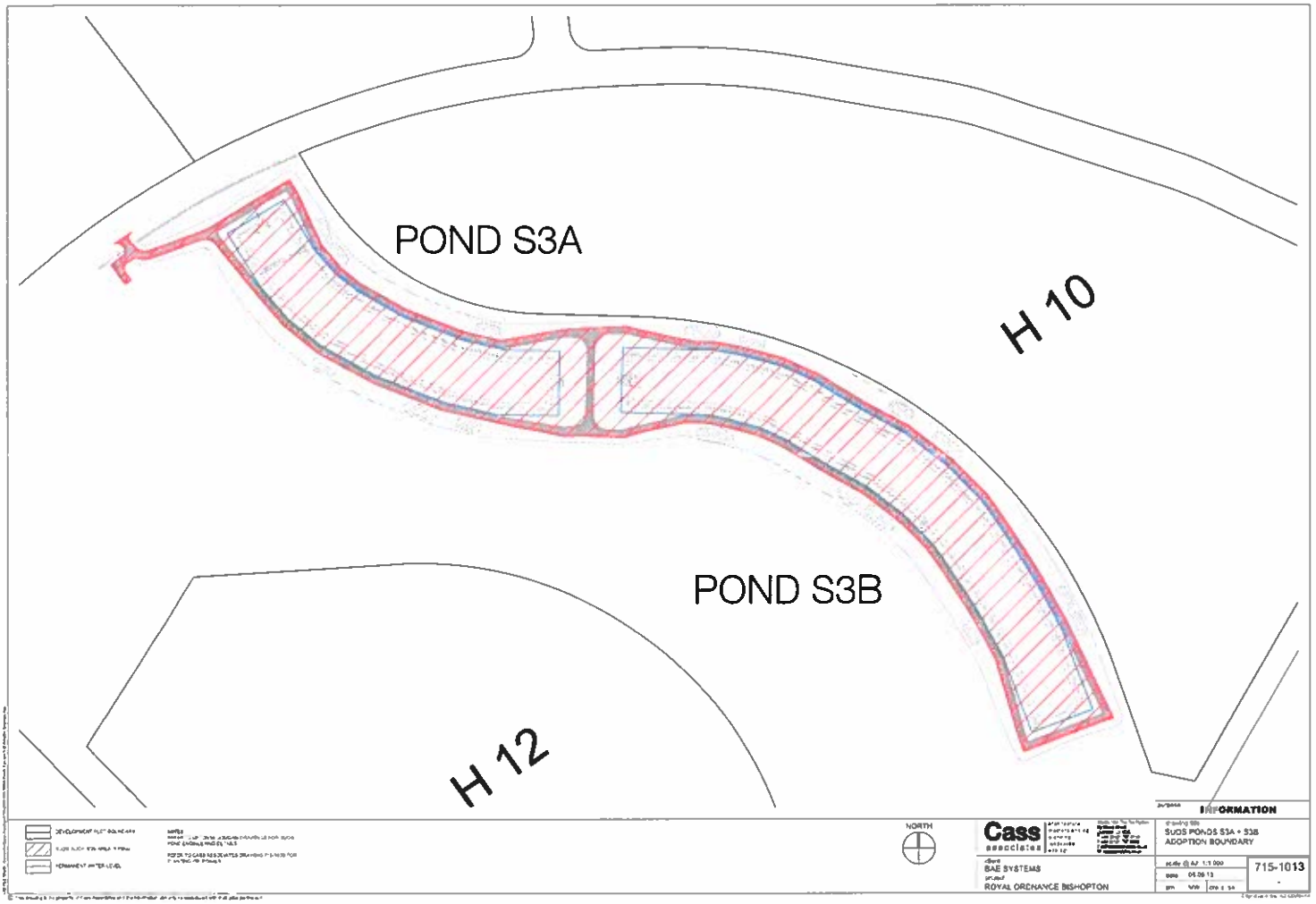
peterbrett	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S1 CATCHMENT PLAN	Date: 19.12.16 A3 Scale: NTS Drawn by: SM Checked by: AJ Figure Number: FIGURE 2


POND S1
N
CONCEPT DESIGN ONLY
ROF BISHOPTON
SUDS DESIGN AND MAINTENANCE MANUAL
POND S1
BAE SYSTEMS
3011/9/2079/001
A

Appendix C Pond S3A/S3B

- Figure 3 – Pond S3A/S3B Catchment Plan
- SuDS Ponds S3A and S3B Adoption Boundary
- SuDS Pond S3A - 185.0003 – 473 H
- SuDS Pond S3B - 185.0003 – 474 H

pba peterbrett	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S3A/S3B CATCHMENT PLAN	Date: 19.12.16 A3 Scale: NTS Drawn By: ZM Checked By: AJ Figure Number: FIGURE 3



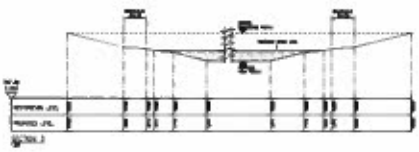
INFORMATION

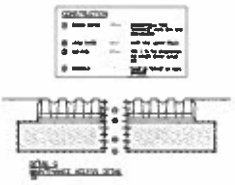
SUDS PONDS S3A + S3B
ADOPTION BOUNDARY

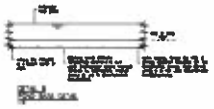
Cass associates

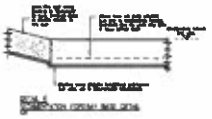
BAE SYSTEMS
ROYAL ORDNANCE BISHOPTON

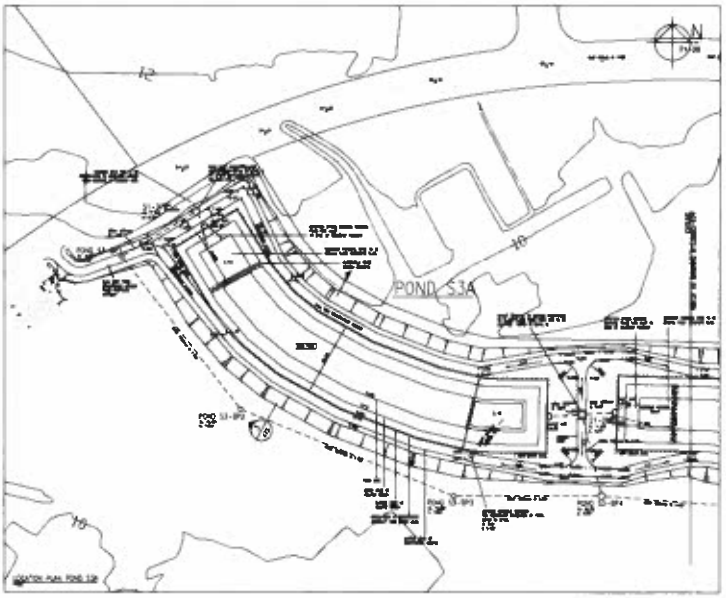
715-1013

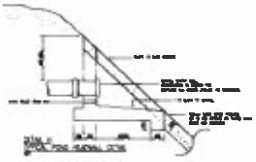


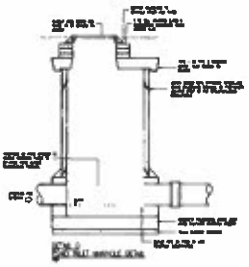


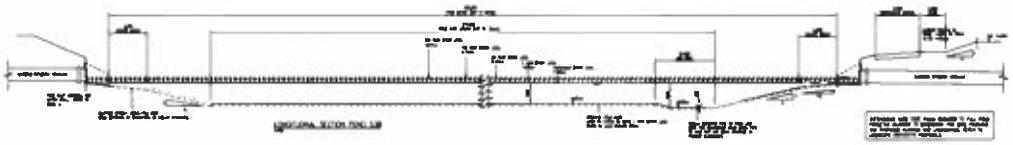


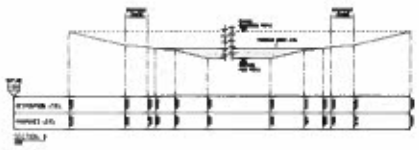


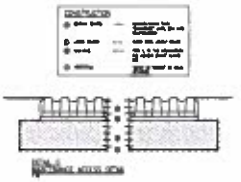

POND S3A

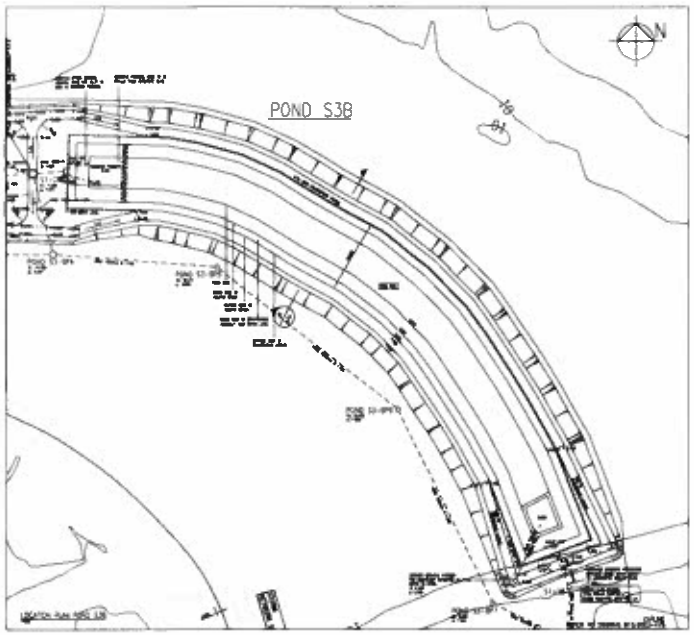











POND S3B
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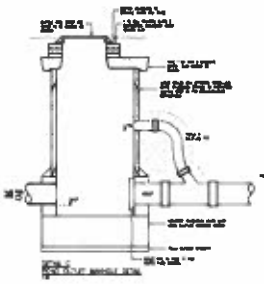
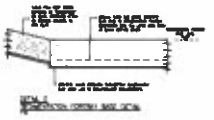
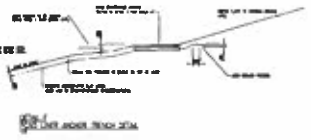
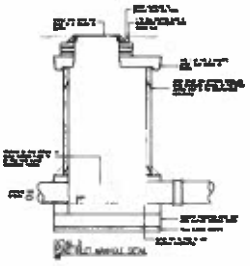
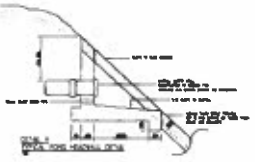




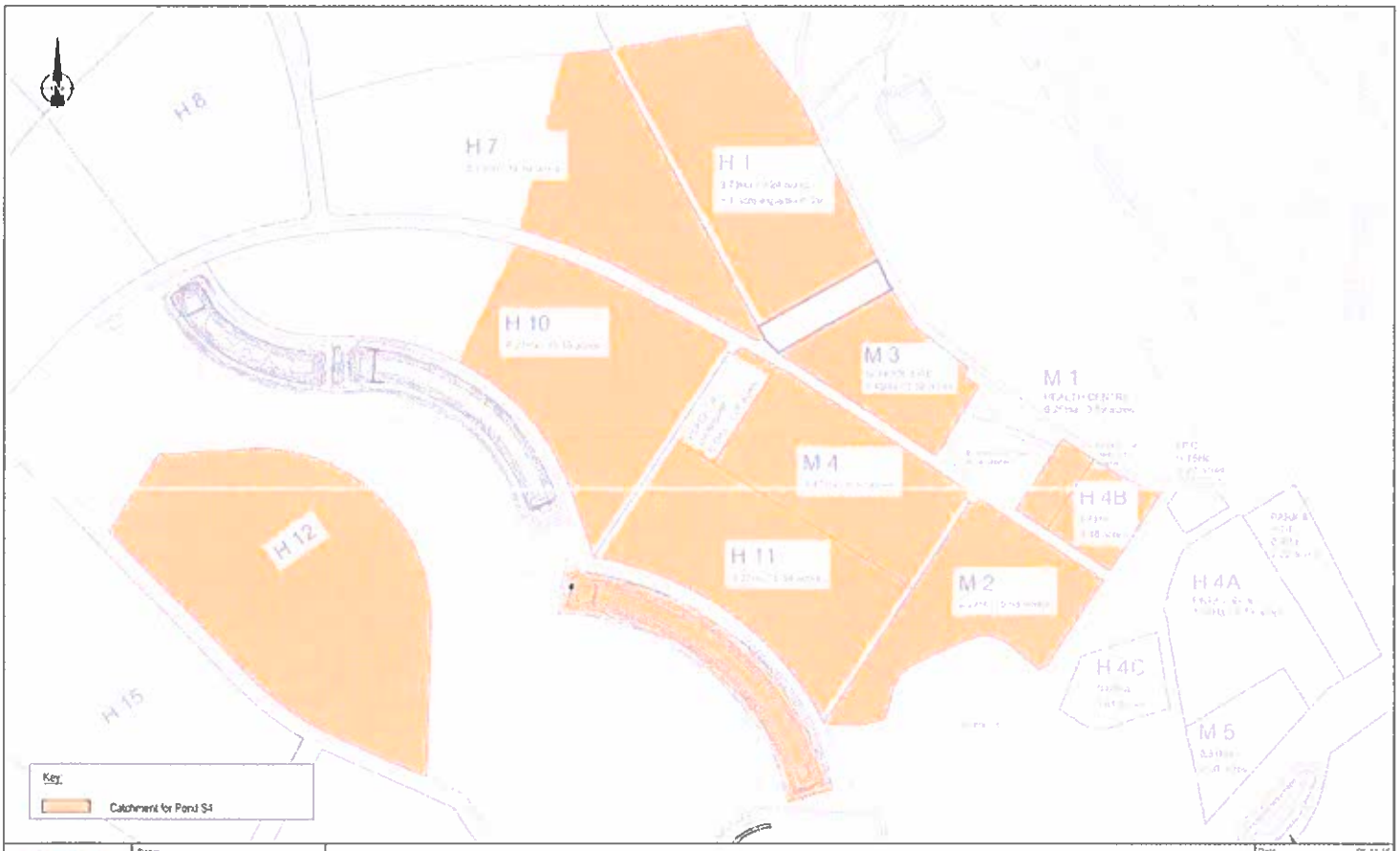




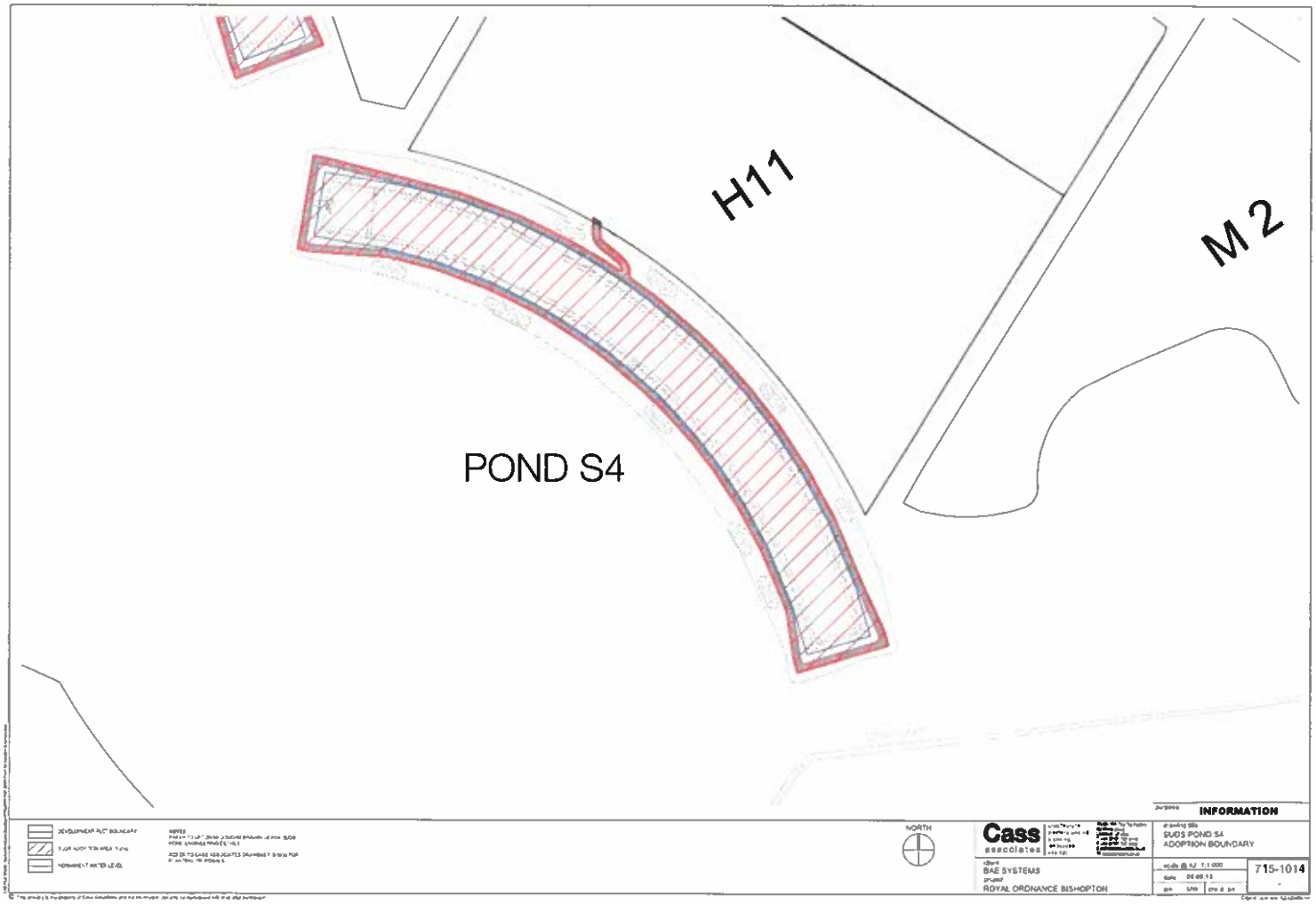


Appendix D Pond S4

- Figure 4 – Pond S4 Catchment Plan
- SuDS Pond S4 Adoption Boundary
- SuDS Pond S4 - 185.0003 – 475 J



pba peterbrett	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S4 CATCHMENT PLAN	Date: 09.11.16 A3 Scale: NTS Drawn By: SJJ Checked By: AJ Figure Number: FIGURE 4



INFORMATION

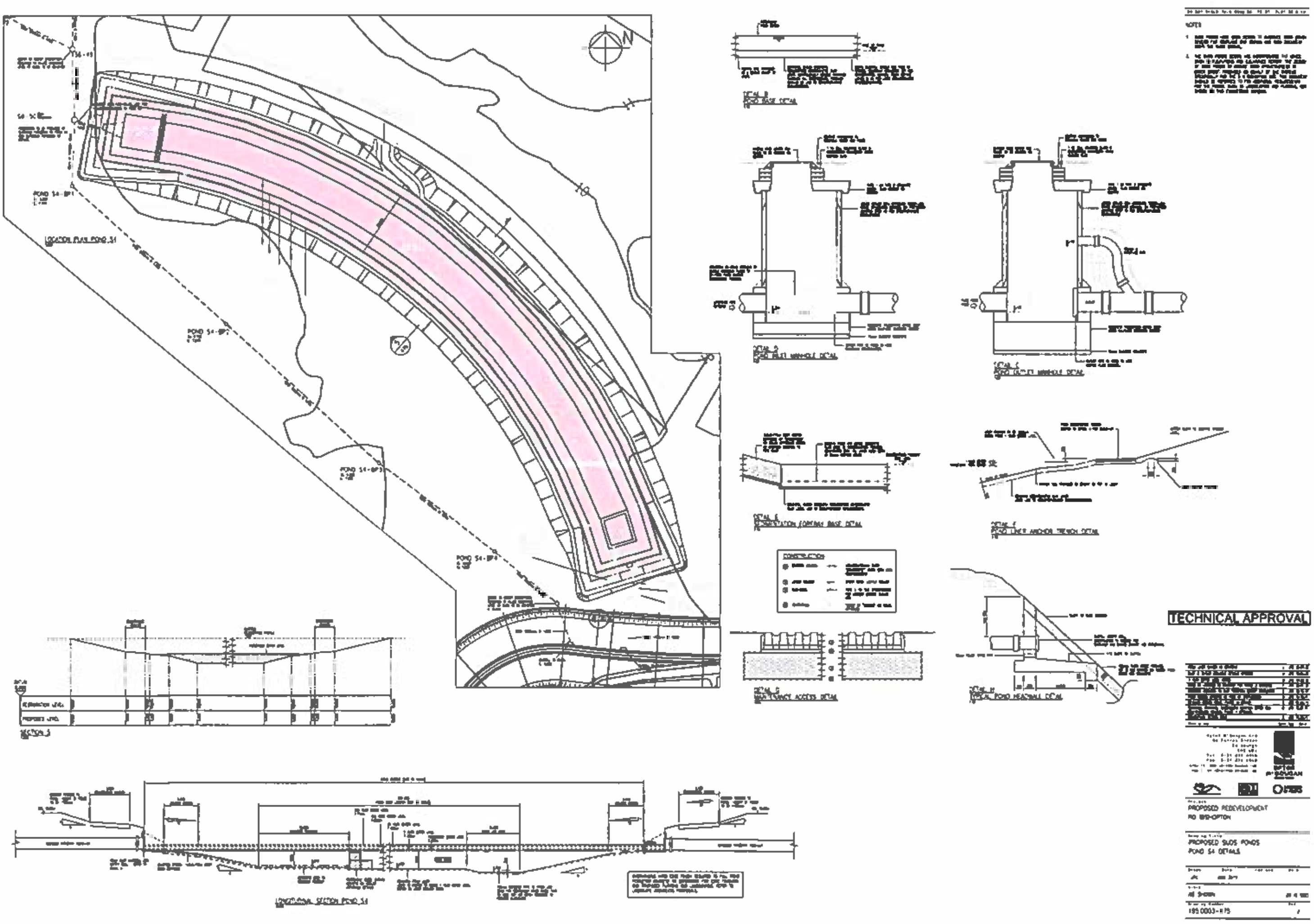
NORTH

Cass associates

BAE SYSTEMS
ROYAL ORDNANCE BISHOPTON

SUDS POND S4
ADOPTION BOUNDARY

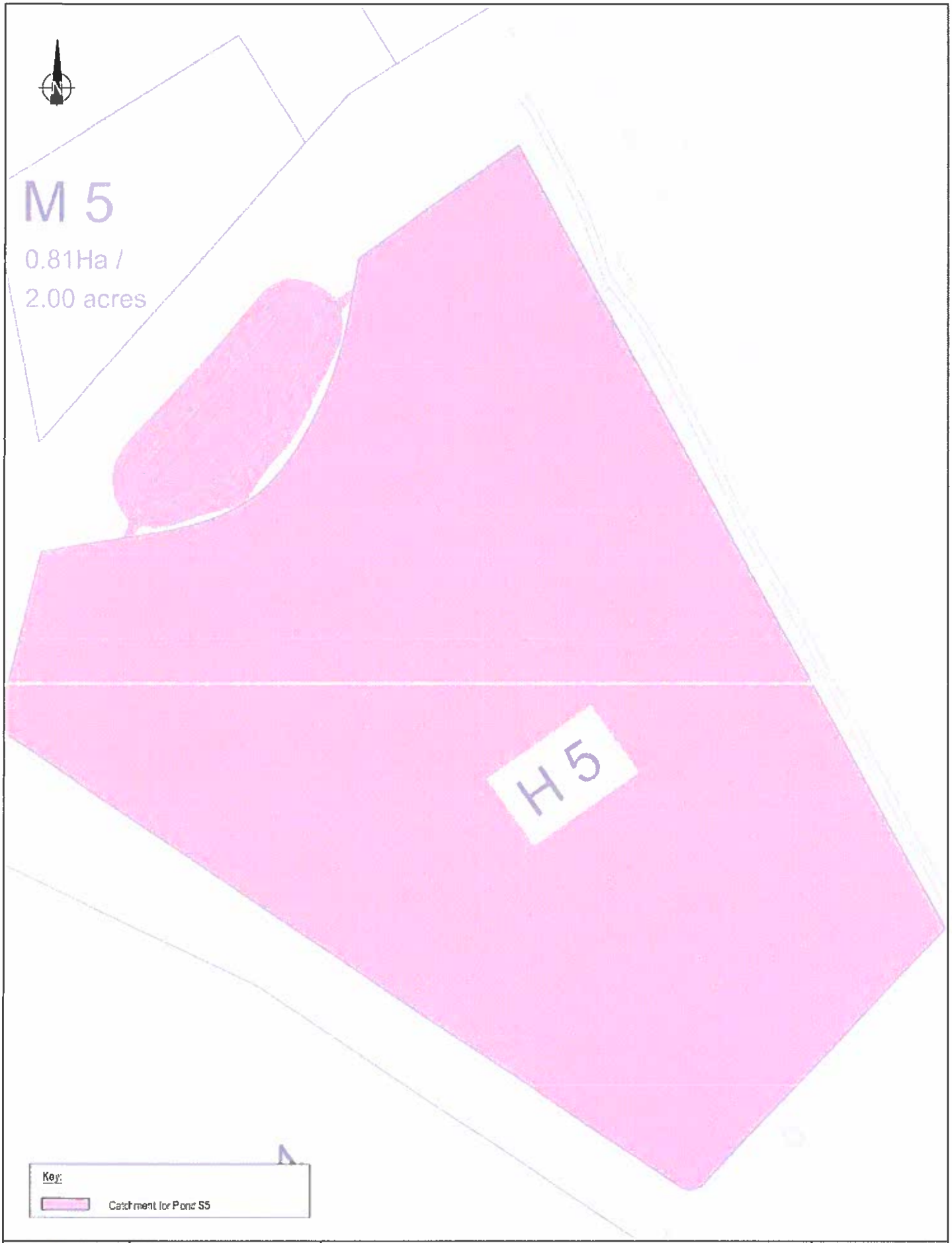
715-1014



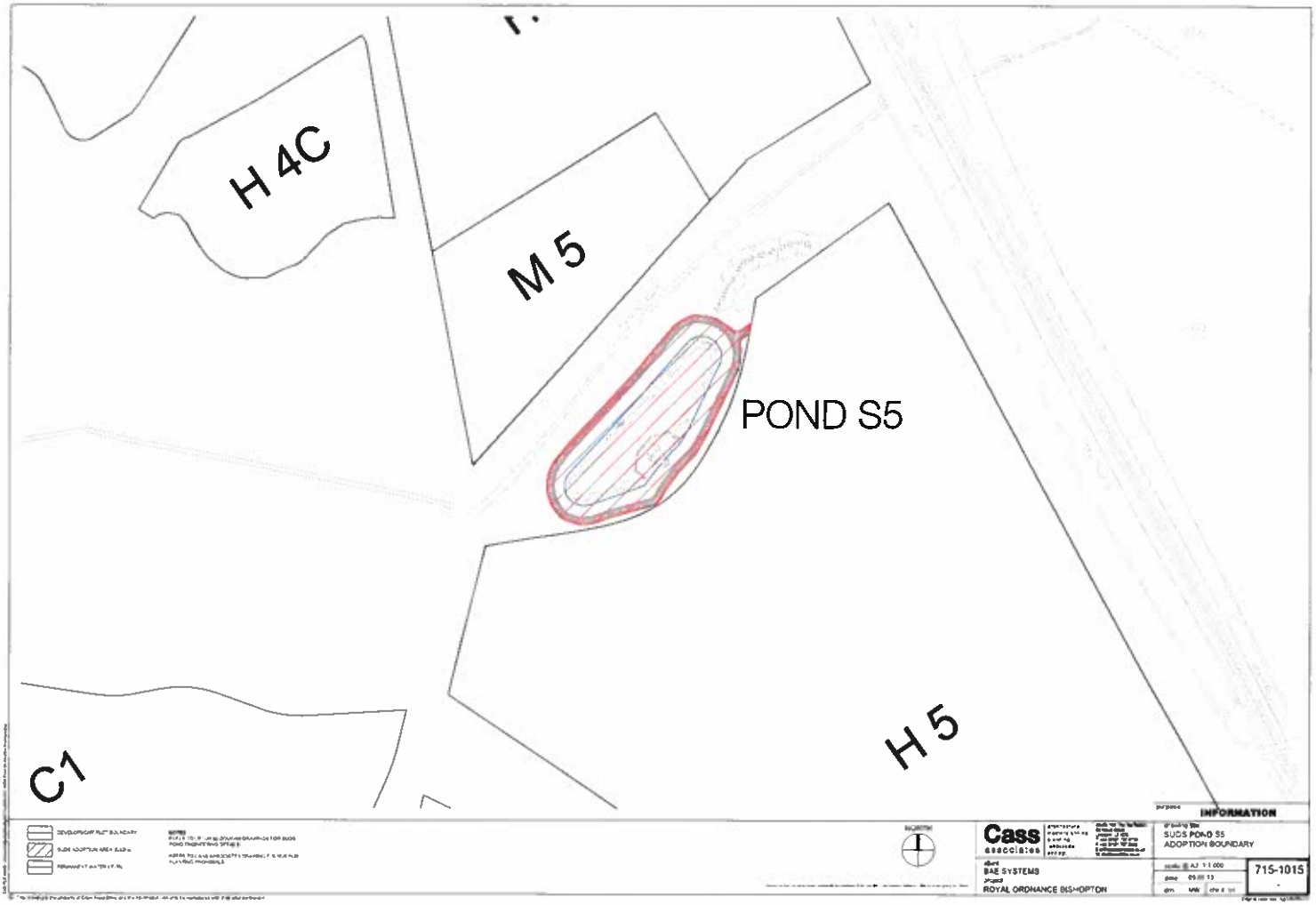
LOCATION PLAN POND S4
SECTION 1
LONGITUDINAL SECTION POND S4
TECHNICAL APPROVAL
PROPOSED REDEVELOPMENT
PROPOSED SUDS PONDS
POND S4 DETAILS
AS SHOWN

Appendix E Pond S5

- Figure 5 – Pond S5 Catchment Plan
- SuDS Pond S5 Adoption Boundary
- SuDS Pond S5 - 185.003 – 476 F



pba peterbrett	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S5 CATCHMENT PLAN	Date: 08.11.16 A3 Scale: 1:1250 Drawn by: SM Checked by: AJ Figure Number: FIGURE 5



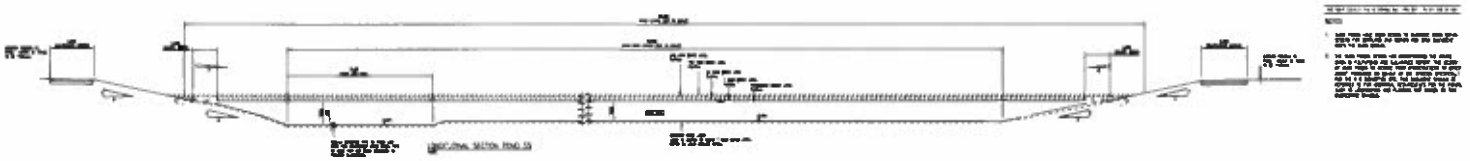
INFORMATION

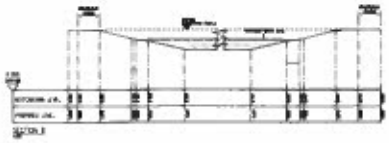
Cass associates

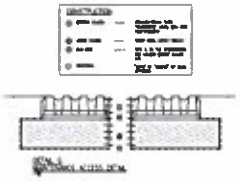
BAE SYSTEMS
ROYAL ORDNANCE BISHOPTON

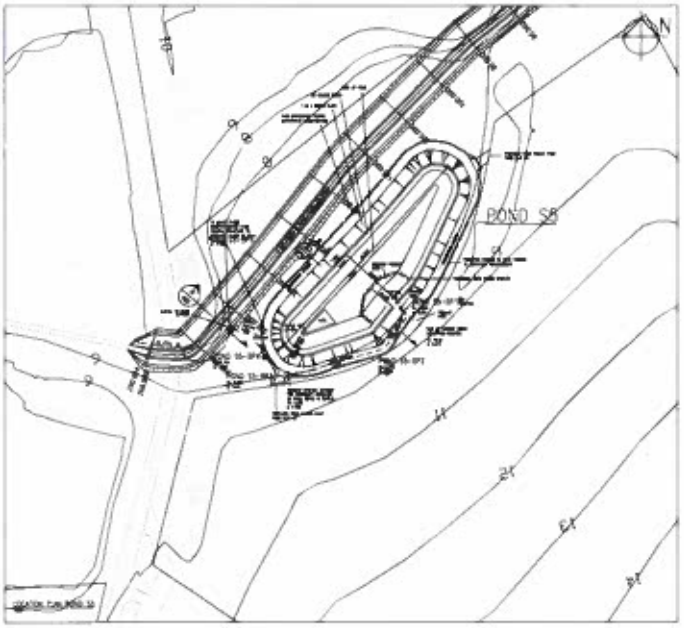
SUDS POND S5
ADOPTION BOUNDARY

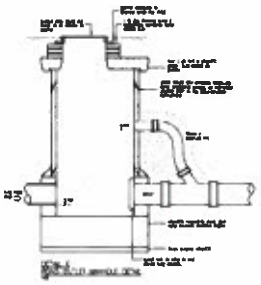
715-1015

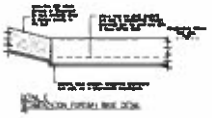


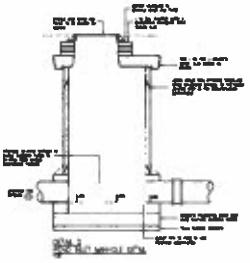


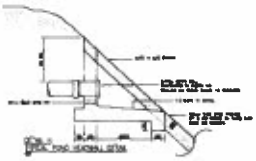



POND 5B





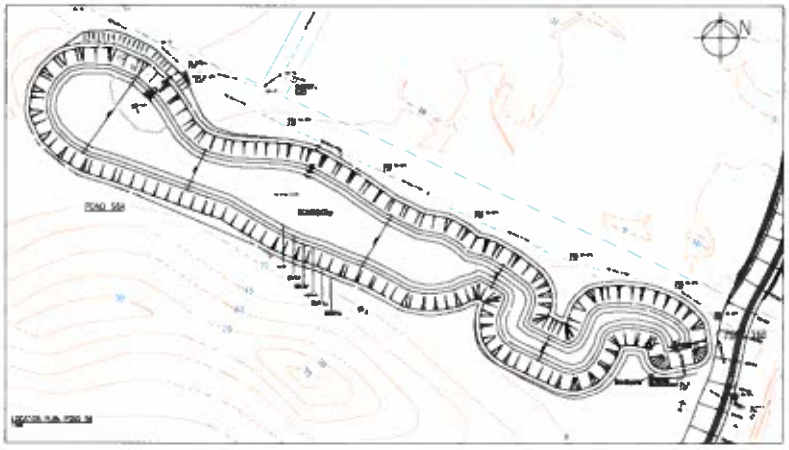


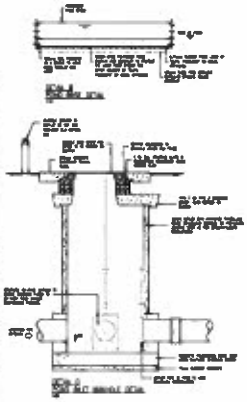


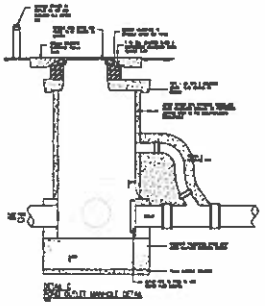
Appendix F Pond S6

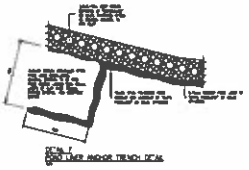
- Figure 6 – Pond S6 Catchment Plan
- SuDS Pond S6 - 30119-2079-002_Rev A_Pond S6

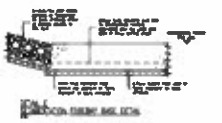
pba peterbrett	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S6 CATCHMENT PLAN	Date: 06.11.16 A3 Scale: NTS Drawn by: SM Checked by: AJ Figure Number: FIGURE 6

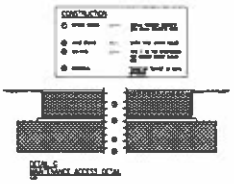


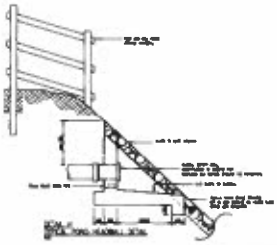


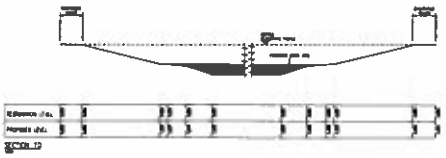


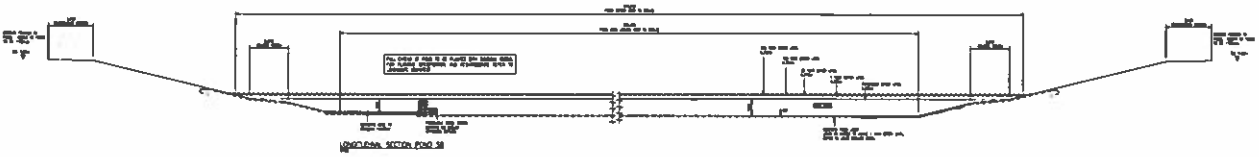












CONCEPT DESIGN ONLY

RAF B-SHOPTON

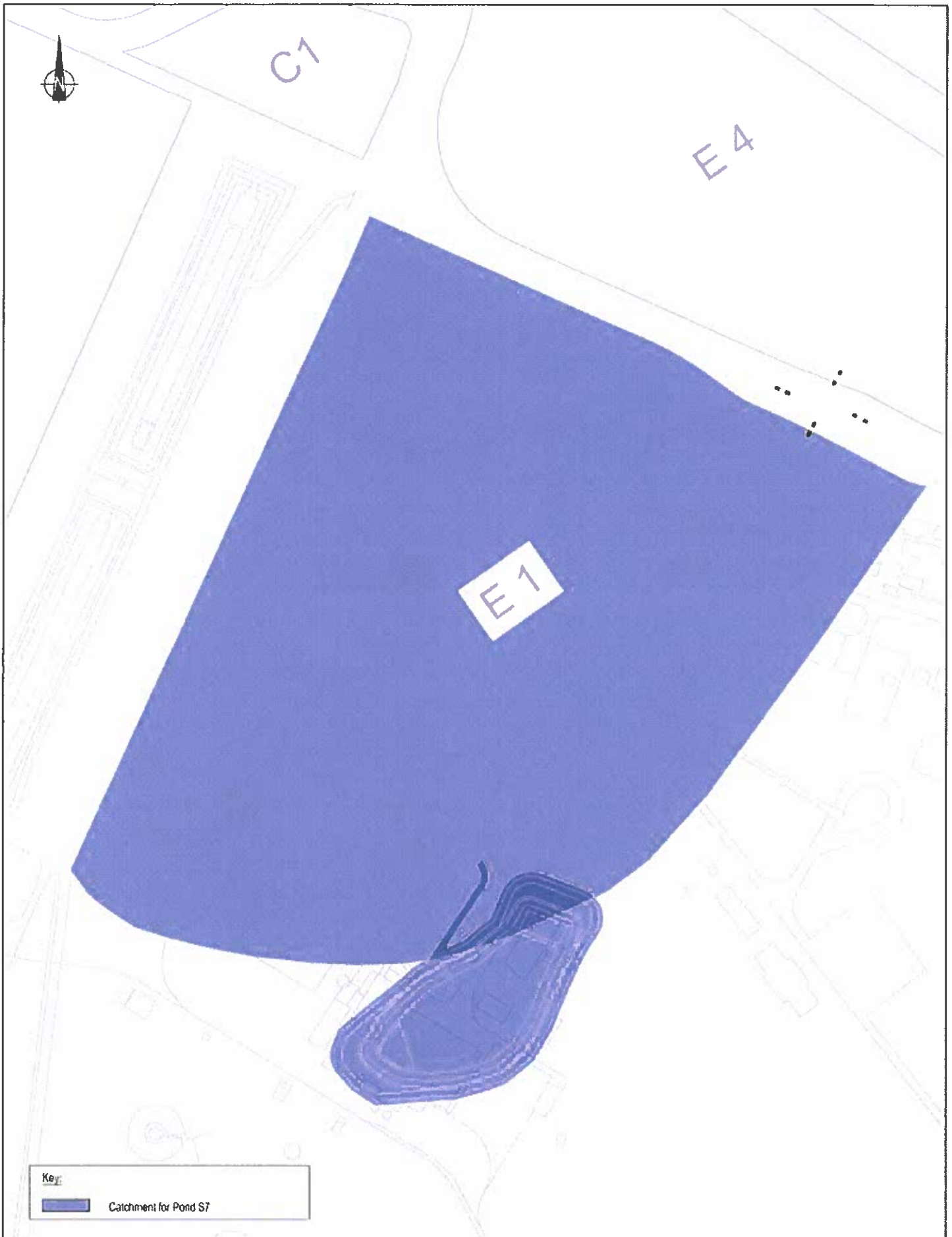
SUDS DESIGN AND MAINTENANCE MANUAL
POND 5B

BAE SYSTEMS

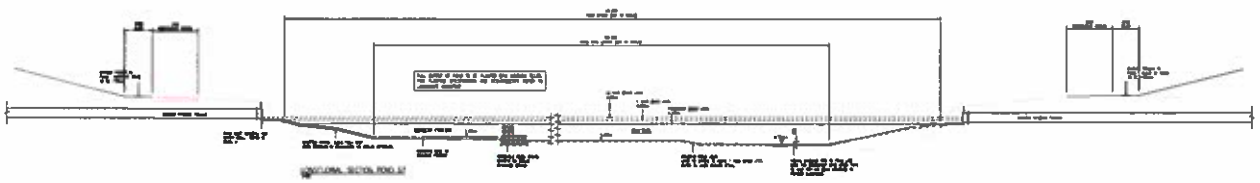
30115/2075/002 A

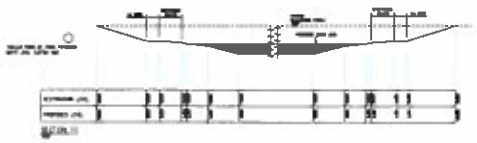
Appendix G Pond S7

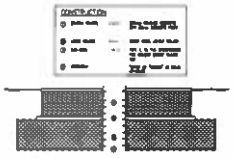
- Figure 7 – Pond S7 Catchment Plan
- SuDS Pond S7 - 3011-2079-003_Rev A_Pond S7

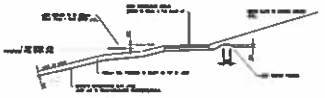


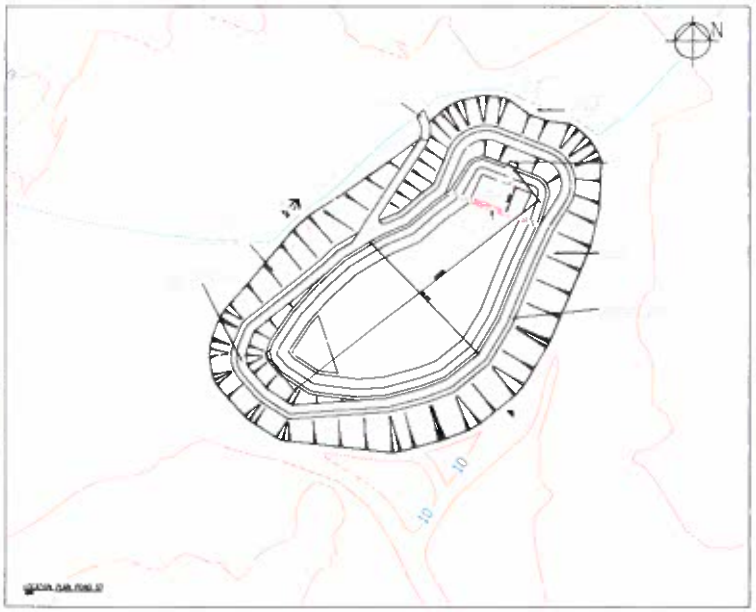
pba peterbrett www.peterbrett.com	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S7 CATCHMENT PLAN	Date 08.11.16 A3 Scale NTS Drawn by SM Checked by AJ Figure Number FIGURE 7

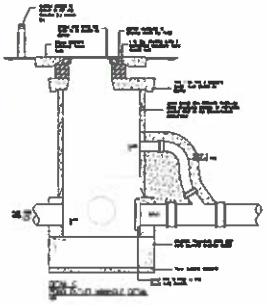


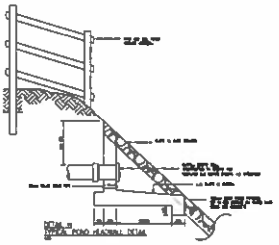


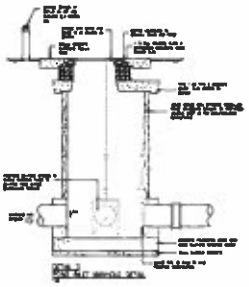


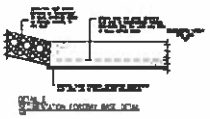


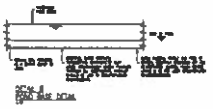












CONCEPT DESIGN ONLY

ROF B SHOPTON

SUDS DESIGN AND MAINTENANCE MANUAL
POND S7

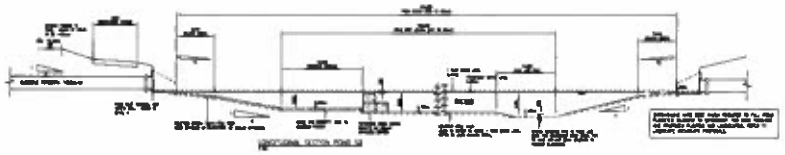
BAE SYSTEMS

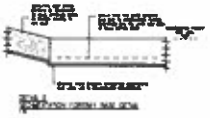
30115/2075/003 A

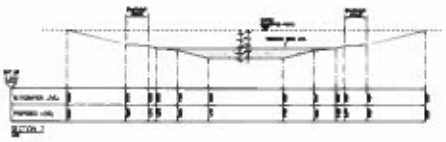
Appendix H Pond S8

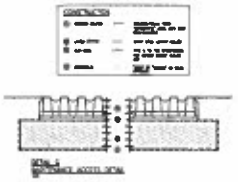
- Figure 8 – Pond S8/S9 Catchment Plan
- SuDS Pond S8 - 185.0003 – 479 F

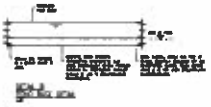
pba peterborett	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S8/S9 CATCHMENT PLAN	Date 08.11.16 A3 Scale NTS Drawn by SM Checked by AJ Figure Number FIGURE 8

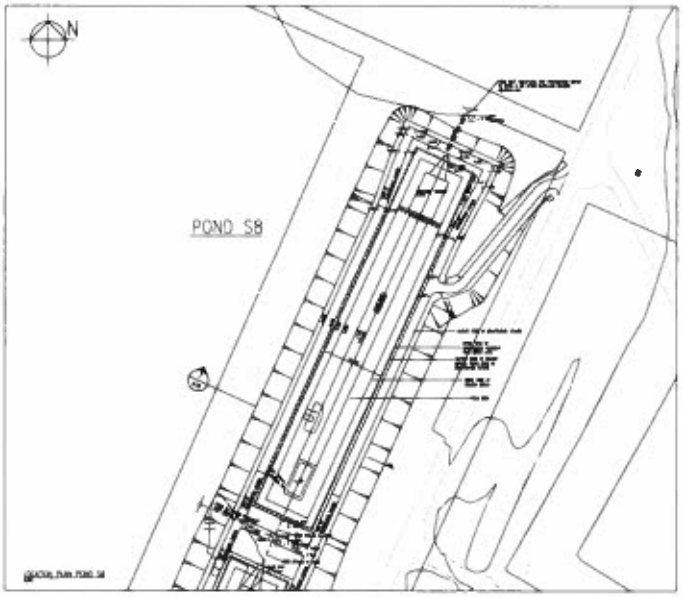


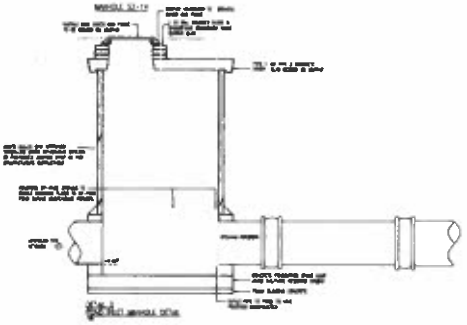


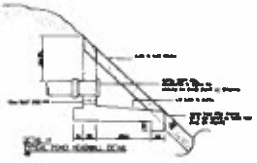








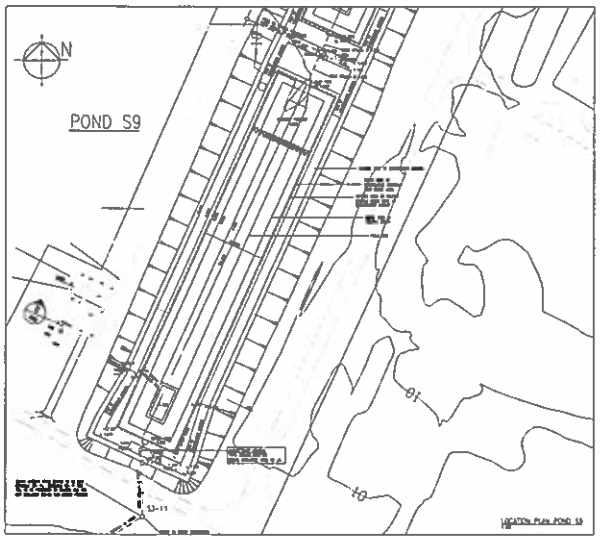


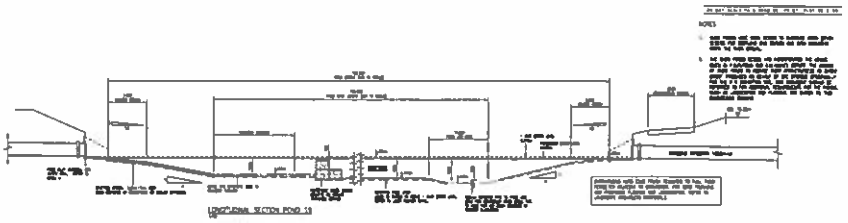


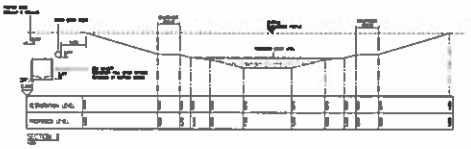
CONSTRUCTION

Appendix I Pond S9

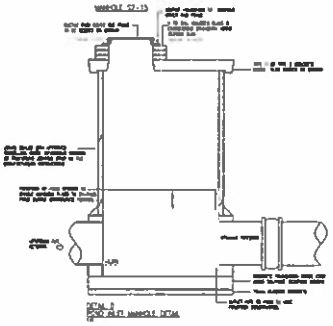
- SuDS Pond S9 - 185.0003 – 480 G

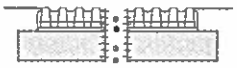

N
POND S9

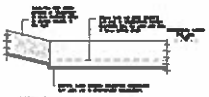


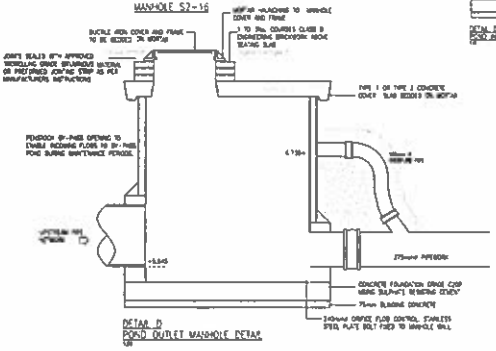


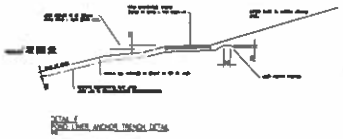

CONSTRUCTION

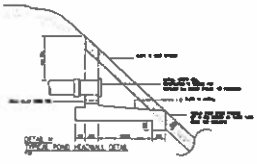







MANHOLE S2-16
DETAIL D
POND OUTLET MANHOLE DETAIL

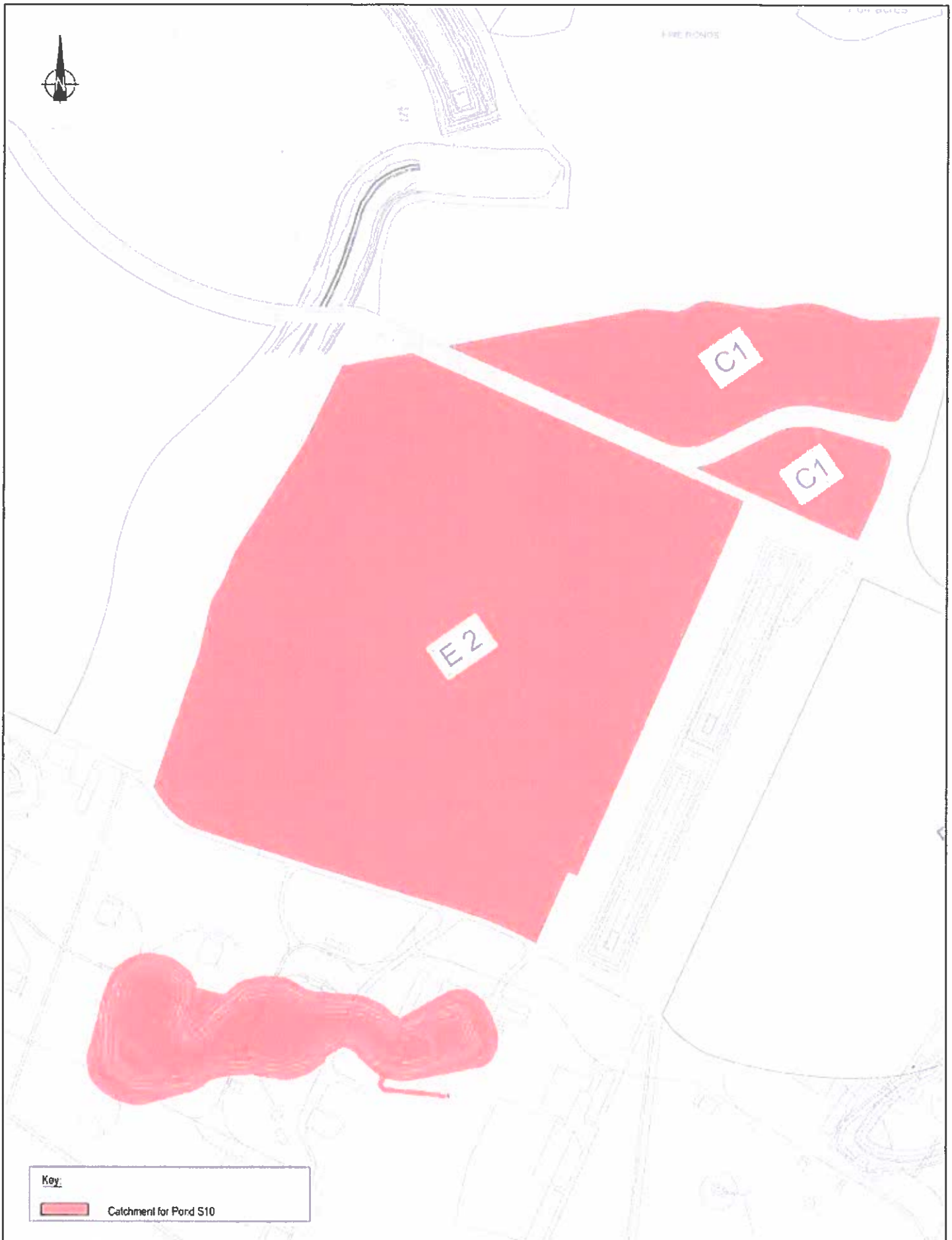




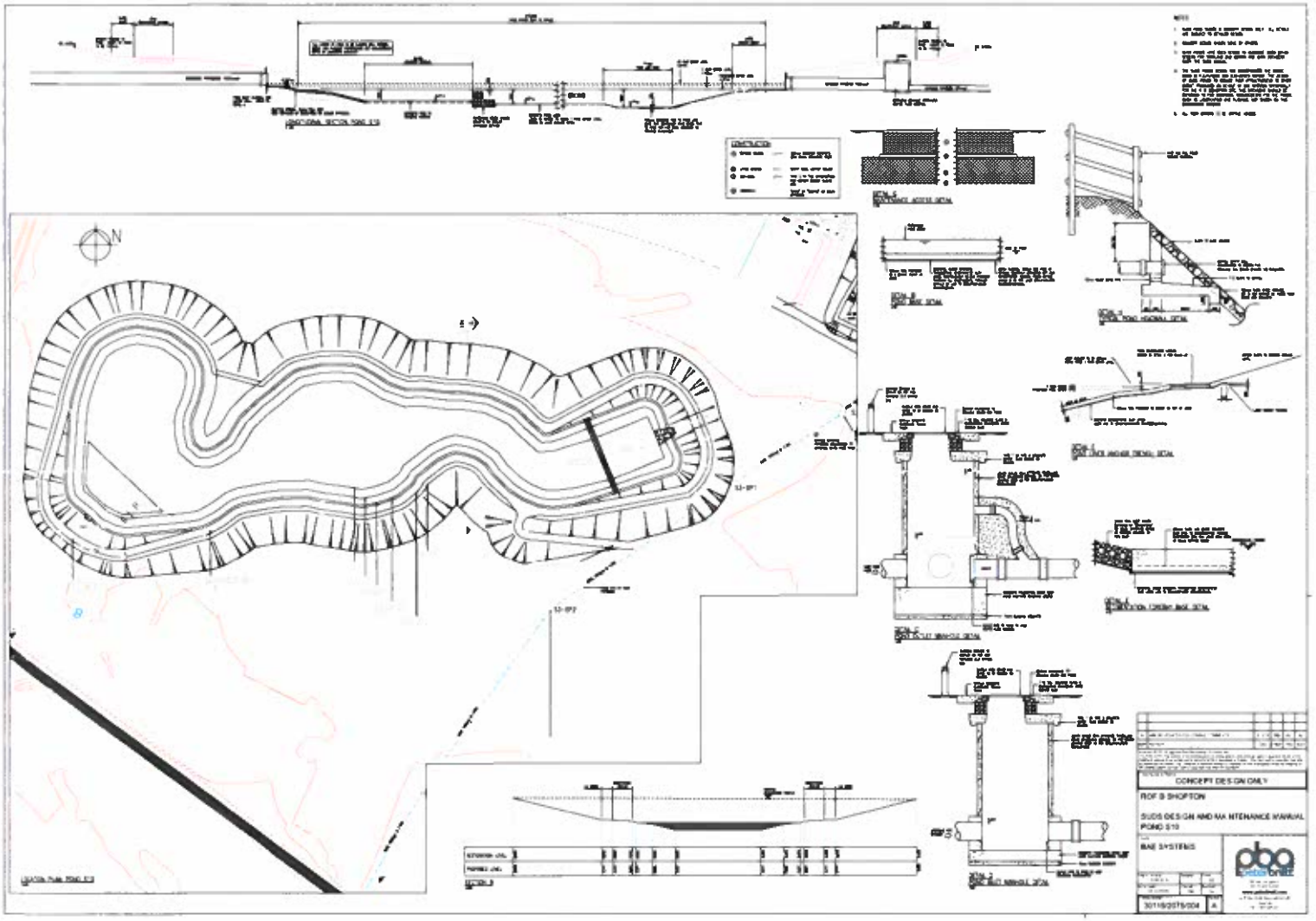

CONSTRUCTION
PROPOSED REDEVELOPMENT
NO BRIDGTON
PROPOSED SUDS PONDS
POND S8 DETAILS
AS SHOWN
185 3003- 480

Appendix J Pond S10

- Figure 9 – Pond S10 Catchment Plan
- SuDS Pond S10 - 30119-2079-004_Rev A_Pond S10



pba peterbrett	Client: BAE SYSTEMS Ltd	ROF BISHOPTON SUDS DESIGN AND MAINTENANCE MANUAL POND S10 CATCHMENT PLAN	Date: 08 11 16 A3 Scale: 1 2 500 Drawn by: SM Checked by: AJ Figure Number: FIGURE 9


CONCEPT DESIGN ONLY
ROF 3 SHOPTON
SUDS DESIGN AND MAINTENANCE MANUAL
POND 010
BAE SYSTEMS

SHEPHERD+WEDDERBURN

OUR REF B2804.102-45/EXM
YOUR REF
16 October 2018

Renfrewshire Council
Renfrewshire House
Cotton Street
Paisley
PA1 1AN

Dear Sirs

BAE Systems (Property Investments) Limited
Section 75 Agreement dated October 2018 in respect of Planning Permission Ref: 17/0393/PP and Planning Permission Ref: 17/0394/PP (the "Section 75 Agreement")
Royal Ordnance, Station Road, Bishopton

On behalf of and as instructed by our client, BAE Systems (Property Investments) Limited (No. 03653604), we hereby ask that the Council approves the following in terms of the Section 75 Agreement:

Matter	Clause	Details
Education and Community Facilities Land	5	That land shaded grey and marked "S" on Plan 1 annexed and signed as relative hereto.
Second Phase Park and Ride Location	11	That land which is indicatively marked "Phase 2 Park and Ride" on Plan 1 annexed and signed as relative hereto.
Primary Healthcare Facility Site	12	That land, being not less than 0.4 hectares in area, and which land is indicatively marked "Health Centre" on Plan 1 annexed and signed as relative hereto.
Central Park	15	That land which is indicatively marked "Central Park" on Plan 1 annexed and signed as relative hereto.
Community Woodland	17	Those six areas respectively shaded blue, purple, light green, orange, light orange and turquoise and each individually delineated in

5th Floor, 1 Exchange Crescent
Conference Square
Edinburgh EH3 8UL
DX 551970 Edinburgh 53
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G2 1RW
DX GW409 Glasgow
T +44 (0)141 566 9900
F +44 (0)141 565 1222

Condor House
10 St. Paul's Churchyard
London EC4M 8AL
DX 98945 Cheapside 2
T +44 (0)20 7429 4900
F +44 (0)20 7329 5939

Commercial House
2 Rubislaw Terrace
Aberdeen AB10 1XE
DX AB103 Aberdeen 1
T +44 (0)1224 621 166
F +44 (0)1224 623 103

shepwedd.com

Matter	Clause	Details
		black on Plan 2 annexed and signed as relative hereto.

Please confirm the Council's approval of the above matters by executing and returning to us a copy of this letter.

Yours faithfully

Ewan MacLeod
For and on behalf of Shepherd and Wedderburn LLP
ewan.macleod@shepwedd.co.uk
T 0131 473 5111

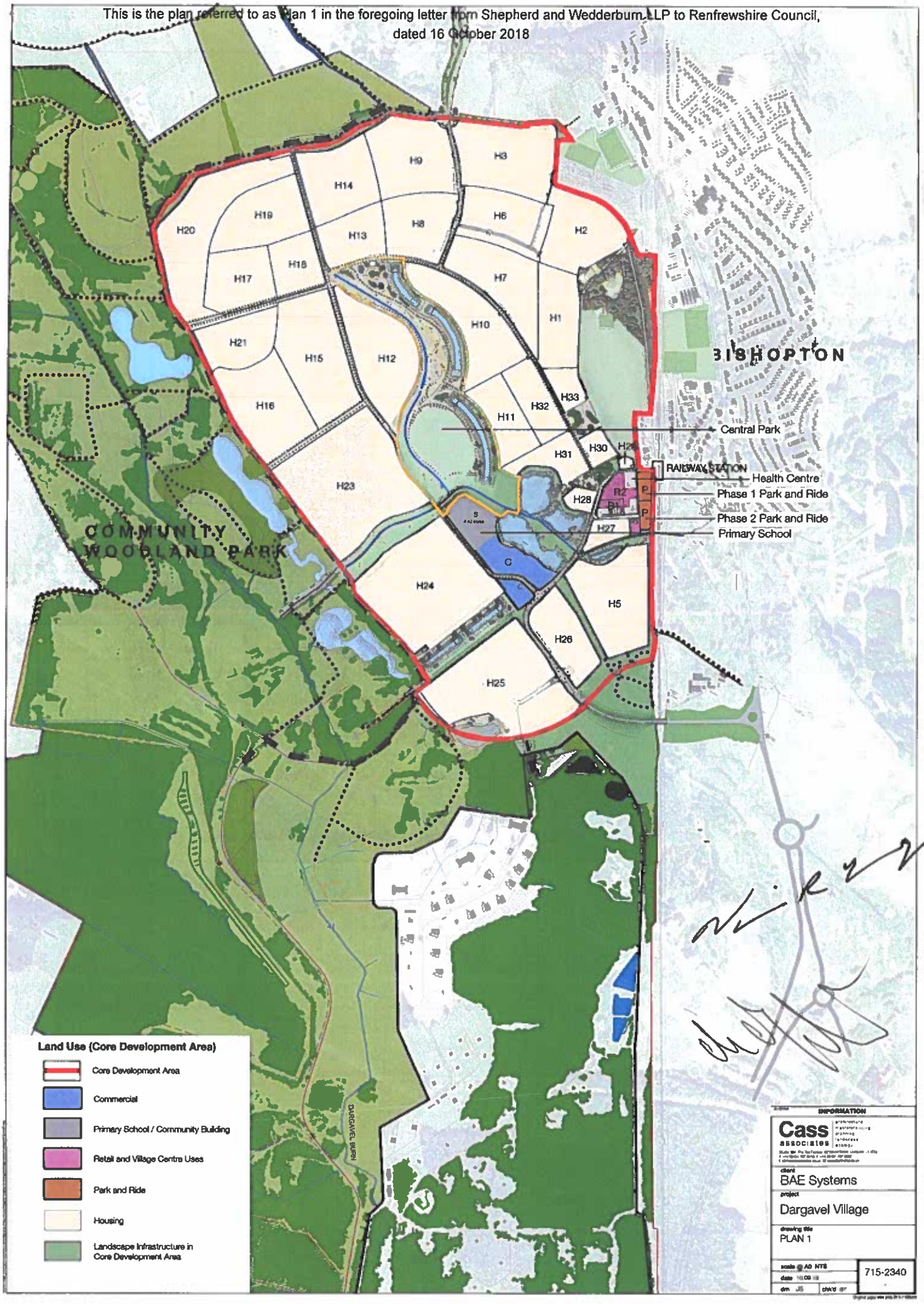
For and on behalf of Renfrewshire Council, the above matters (including Plan 1 and Plan 2) are hereby approved.

Sealed with the common seal and subscribed for and on behalf of Renfrewshire Council by:

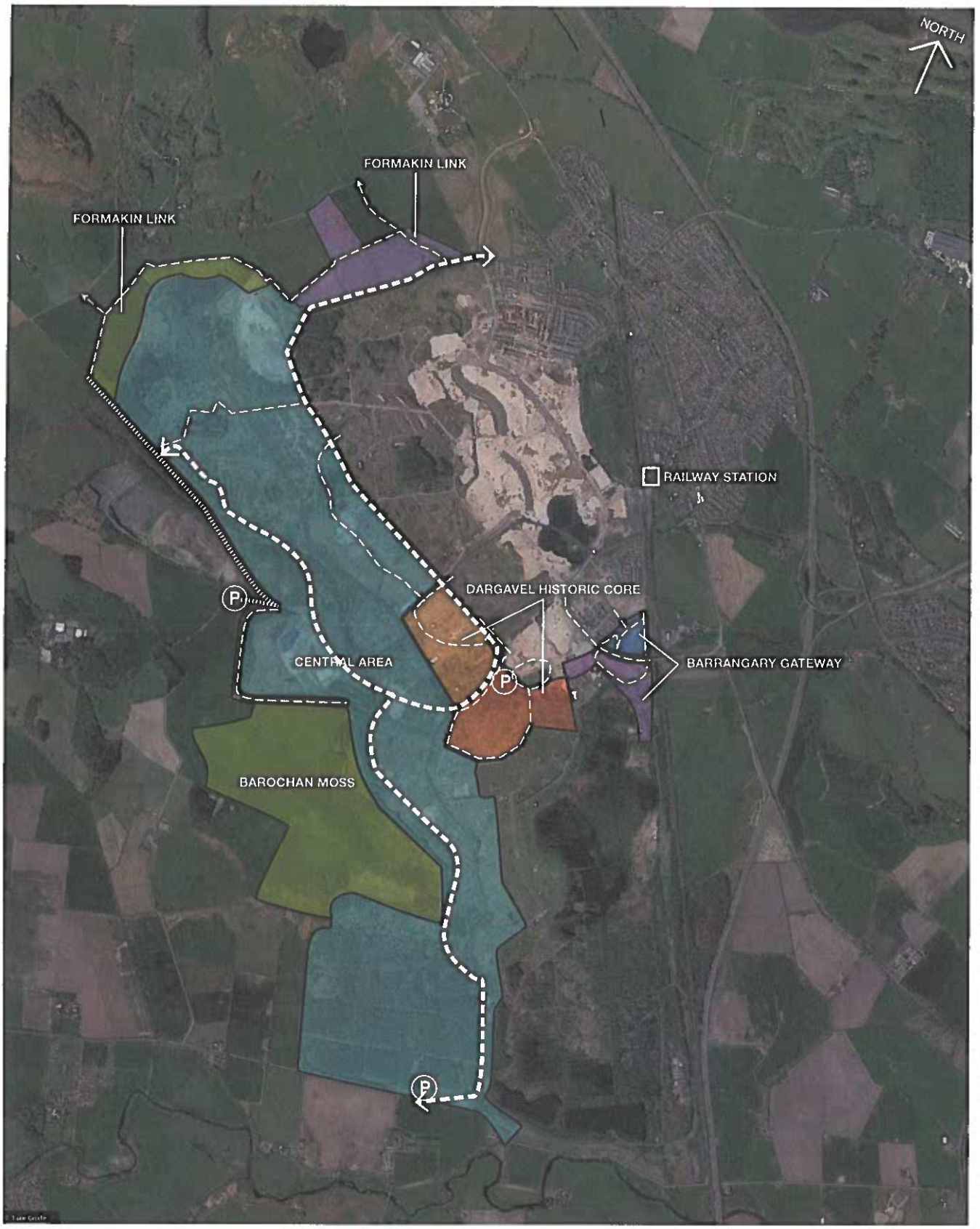
.....
Proper Officer

NAILN ROBERT YOUNG
.....
Print Name

This is the plan referred to as Plan 1 in the foregoing letter from Shepherd and Wedderburn LLP to Renfrewshire Council, dated 16 October 2018



This is the plan referred to as Plan 1 in the foregoing letter from Shepherd and Wedderburn LLP to Renfrewshire Council. dated 16 October 2018



Stage 1
Stage 2
Stage 3
Stage 4
Stage 5
Longer Term

Dedicated Cycle/ Pedestrian Route

Key Pedestrian Routes

P Parking

Cass associates

BAE Systems

Dargavel Village

PLAN 2

715-2341