



**192 – 194 Leigh Road, Eastleigh,  
Hampshire SO50 9DX**

**Surface & Foul Water Drainage Strategy  
dated November 2022**

## **1.0 Background Information**

- 1.1 The site known as 192 – 194 Leigh Road, Eastleigh SO50 9DX is shown by the Google map image included within Appendix A.
- 1.2 The land within the site boundary currently consists of 3 no. two storey brick built residential units with associated car parking and garden as shown by the google image and the existing site layout plans included within Appendix B.
- 1.3 The proposed development comprises the demolition of the existing buildings and construction of a new three storey apartment block with associated car parking and garden as shown by the architectural drawings included within Appendix C.
- 1.4 The existing hardstanding and building areas currently discharge to existing soakaways on the site.
- 1.5 The existing foul drainage discharges to an existing foul drainage manhole on the site as shown on HDL drawing no. 22-3982-511 included within Appendix F.
- 1.6 This drainage strategy has been formed in accordance with the requirements of the Flood & Water Management Template included within Appendix I.

## **2.0 Sensitivity of Discharge Points**

- 2.1 The Code of Practice for Sustainable Drainage Systems provides a flexible approach to drainage systems with a wide range of components and includes a hierarchy of techniques. These are:-
  1. Prevention - The use of good site design and housekeeping measures on site to prevent run-off and pollution.
  2. Source Control - Control of run off at or very near to its source.
  3. Site Control - Management of water from several sub catchment areas.
  4. Regional Control - Management of run off from several sites, typically in a detention pond or wetland.
- 2.2 With the above in mind surface water disposal will respect the hierarchy of techniques outlined above.

- 2.3 Source control is to be introduced in the following ways:-

Surface water will be discharged to soakaway in a similar manner to that which exists on the site.

- 2.4 Rainfall within soft landscaped areas will be allowed to permeate through the ground in order to mimic as closely as possible the natural drainage from the site before development.
- 2.5 The extract from the British Geological Society map, included within Appendix D, shows that the prevailing superficial deposits are sand and gravel; thus indicating that soakaways will be feasible on the site.

### **3.0 Existing Surface Water Flows**

- 3.1 The site is a brownfield site with existing surface water flows discharging to soakaways. HDL drawing no. 22-3982-901, included within Appendix E, shows that the extents of impermeable roofs and hardstanding areas are to be marginally increased by the redevelopment of the site.

### **4.0 Existing Drainage Network**

- 4.1 Existing surface water flows discharge to soakaways.

### **5.0 Failures of the Existing Drainage Regime**

- 5.1 There are no records of failures of the existing drainage regime.

### **6.0 Proposed Drainage Patterns**

- 6.1 The Hamill Davies drainage drawings, included within Appendix F, show that the site is to be laid out in a similar manner to that of the existing with surface water patterns following existing ground levels.
- 6.2 The proposed soakaways are shown on the HDL drawings, included within Appendix F, with sufficient storage to contain the 1 in 100 year storm with a 40% climate change allowance to store surface water run off from proposed roofs and hardstanding areas together with a 10% allowance for urban creep. HDL drawing no. 22-3982-901, included within Appendix E, shows pre and post development roof and hardstanding areas. The impermeable areas will increase marginally as a result of the development.

### **7.0 Surface Water Treatment**

- 7.1 Surface water treatment is to be achieved, in accordance with Ciria SuDS Manual C753, with a catchpit installed to catch silt deposits prior to discharge of surface water to the adjacent soakaways.

## **8.0 Infiltration**

- 8.1 Discharge of surface water via infiltration, as shown by the British Geological map included within Appendix C, is feasible on this site.
- 8.2 The assumed soil infiltration rate, contained within Appendix G, is to be confirmed by future site investigation works.

## **9.0 Storage**

- 9.1 The calculations included within Appendix D & E demonstrate that sufficient storage will be provided for the proposed soakaways to accept the 1 in 100 year storm with 40% climate change allowance during periods of high rainfall.
- 9.2 HDL drawing no. 22-3982-511 within Appendix F includes for a soakaway in the garden to collect roof drainage and a soakaway below the car park hardstanding to accept the surface water discharge from the car park.

## **10.0 Run off Exceedance Design Criteria**

- 10.1 The run off exceedance design criteria has been considered and hardstanding areas will be formed with falls as per the existing ground levels. Building finished floor levels will be set at sufficient height to ensure that the buildings are not at risk from run off in times of exceedance.

## **11.0 Maintenance Regimes**

- 11.1 The inspection chambers directly upstream of the soakaways will be formed as catchpit manholes. These manholes will be inspected on an annual basis and cleaned out to remove silt by the management company who will be responsible for the maintenance of drainage elements within the overall property boundary.
- 11.6 The residential management company will be responsible for areas of the site including external areas and on-site foul and surface water drainage. Gullies will be inspected and cleaned out after heavy periods of rainfall and during the autumn fall.

## **12.0 Urban Creep**

- 12.1 The drainage calculations, included within Appendices G & H, include for a 10% allowance for urban creep; even though the site is to be developed to its full extent as dictated by the planning authority with no scope for expansion.

### **13.0 Construction Phase**

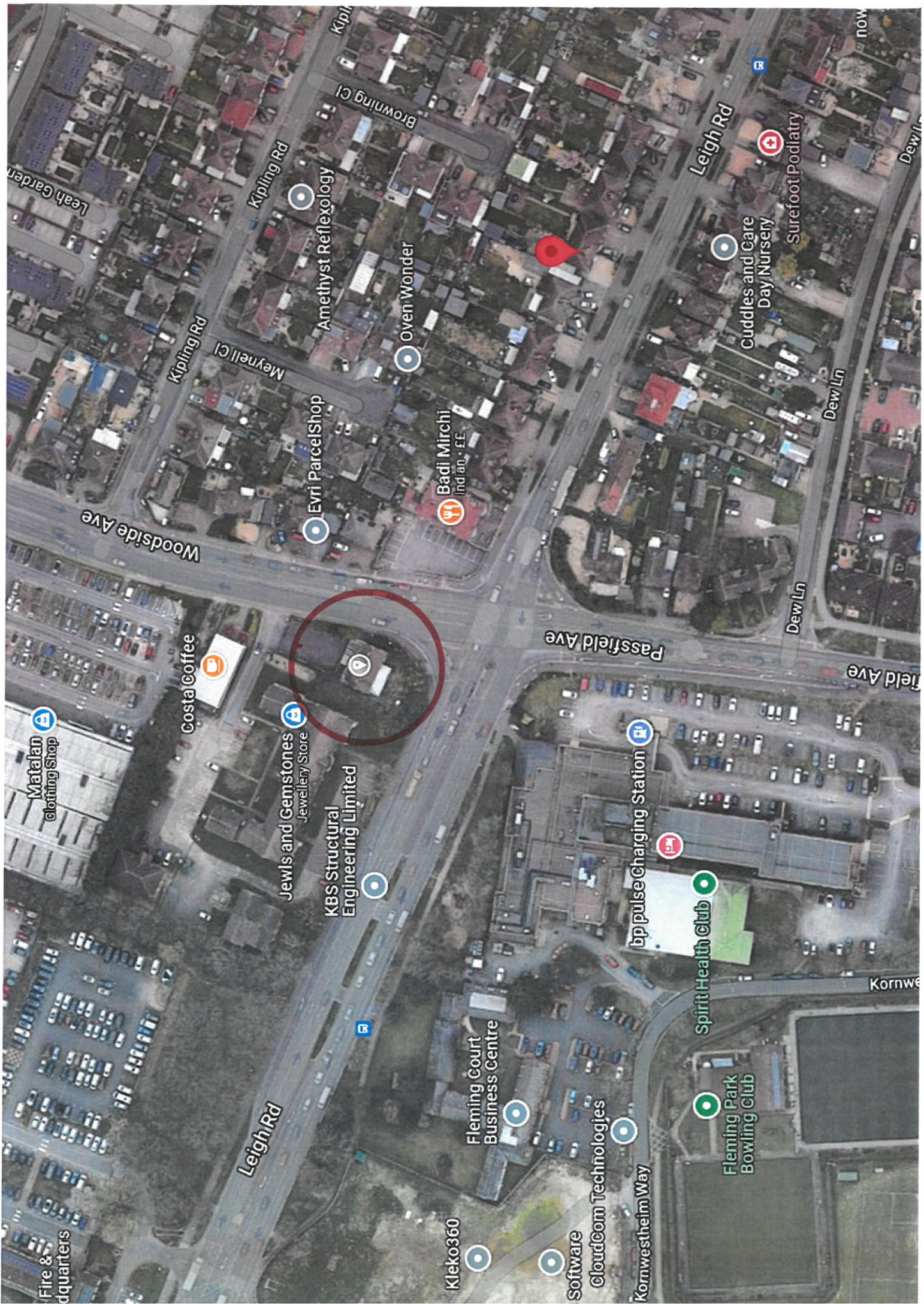
- 13.1 The soakaways are to be installed as the first phase of the development to deal with surface water run off during the construction period.

### **14.0 Foul Drainage**

- 14.1 The existing foul drainage system discharges to the Southern Water public sewer system below Woodside Avenue and Leigh Road as shown by HDL drawing no. 22-3982-511 included within Appendix F.
- 14.2 The redevelopment proposals allow for the new properties to be connected to the public sewer system via an existing manhole, as shown by the HDL drainage layout plan no. 22-3981-511, included within Appendix F.
- 14.3 A section 106 application will be made to Southern Water for the connection of the foul drainage to the existing foul sewer in the public highway.

## **Appendix A**

**Location Plan  
Google Images**



Leah Garden

Kipling Rd

Woodside Ave

Costa Coffee

Matalan Clothing Shop

Fire & quarters

Leigh Rd

Kleko360

Browning Cl

Amethyst Reflexology

Evri ParcelShop

Jewels and Gemstones Jewellery Store

KBS Structural Engineering Limited

Fleming Court Business Centre

Software CloudCom Technologies

Kornwestheim Way

Kipling Rd

Oven Wonder

Badi Mirchi Indian Food

bp pulse Charging Station

Spirit Health Club

Fleming Park Bowling Club

CloudCom Technologies

Kornwestheim Way

Leigh Rd

Cuddles and Care Day Nursery

Surefoot Podiatry

Passfield Ave

Dew Ln

Kornwestheim Way

Passfield Ave

Dew Ln

Leigh Rd

Cuddles and Care Day Nursery

Surefoot Podiatry

Passfield Ave

Dew Ln

Kornwestheim Way

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Surefoot Podiatry

Passfield Ave

Dew Ln

Kornwestheim Way

Passfield Ave

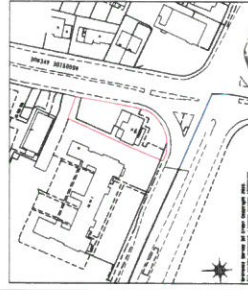
Dew Ln

## **Appendix B**

### **Existing Site Layout Plans**



- SITE BOUNDARY
- SUN PATH
- GRAVESED AREA
- EXISTING BUILT FORM
- NOISE AND AIR POLLUTION
- COMMERCIAL USE
- BLOCK PAVING
- PRIVACY/SHADOWING/OVERHEARING/EXISTING COMMERCIAL/RESIDENTIAL USE
- EXISTING TARMAC SURFACE
- EXISTING 1.6-2M HIGH BRICK WALL



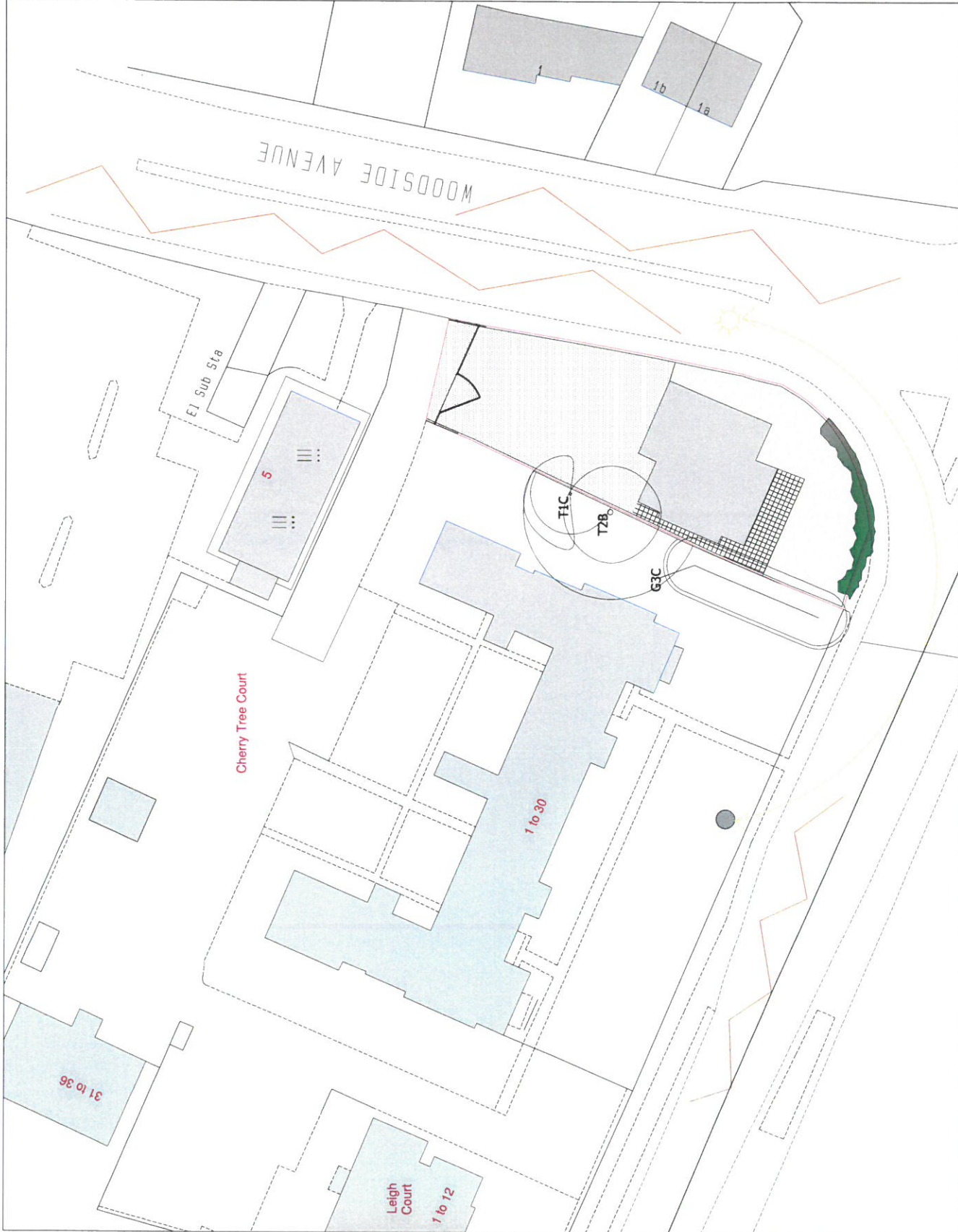
**ACA ARCHITECTURAL DESIGN LTD**  
 9 WOODSIDE AVENUE  
 EASTLEIGH, SOUTH AUST  
 5060 DES  
 TEL: 0813761623 or Email: [acaarchitectural@gmail.com](mailto:acaarchitectural@gmail.com)

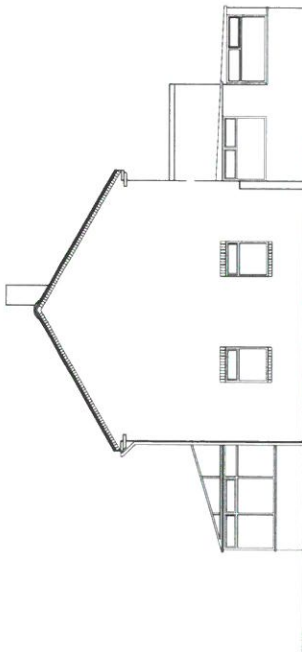
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 Project Title: 192-194 Leigh Road, Eastleigh, 5060 90X

Drawing Title: Existing Block And Location Plans

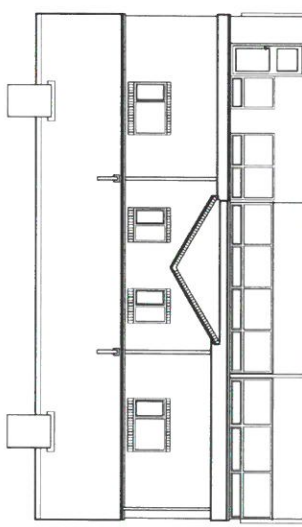
Drawn by: AC  
 Scale: 1:200 & 1:1250 On A1 Paper

Drawing No: 2021/01  
 Date: 2021/01

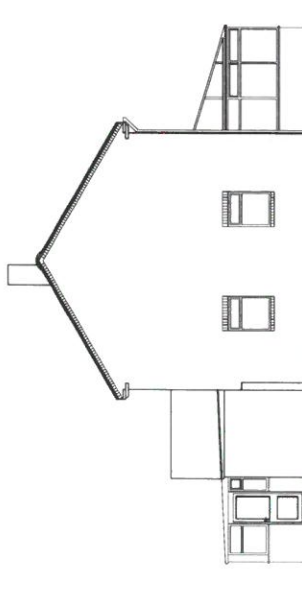




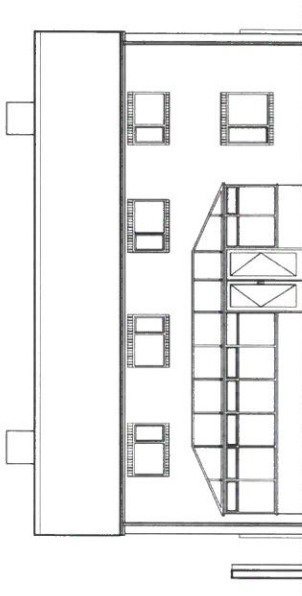
EXISTING EAST ELEVATION



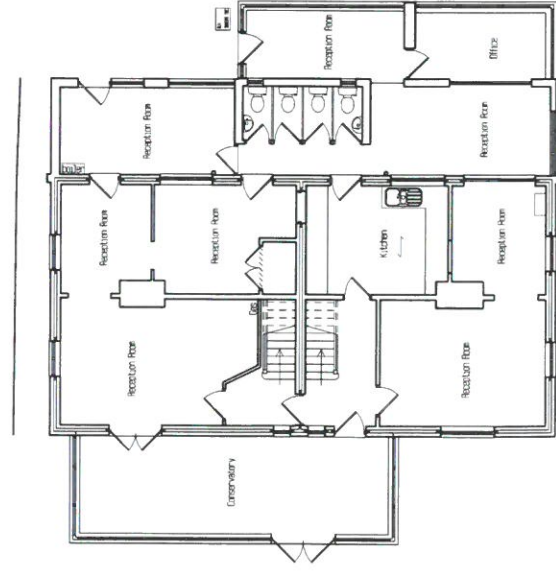
EXISTING NORTH ELEVATION



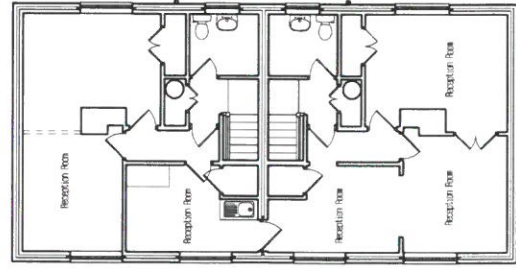
EXISTING WEST ELEVATION



EXISTING SOUTH ELEVATION



EXISTING GROUND FLOOR PLAN



EXISTING FIRST FLOOR PLAN

|                                                                                                                                                                              |                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>ACA ARCHITECTURAL DESIGN LTD</b><br>9 WOODSIDE AVENUE<br>EASTLEIGH<br>S050 9ES<br>Tel: 07817616023 or Email: <a href="mailto:acadesign@gmail.com">acadesign@gmail.com</a> |                       |
| <b>Client</b><br>1 Connection Holdings Ltd                                                                                                                                   |                       |
| <b>Project Title</b><br>192-194 Leigh Road,<br>Eastleigh, S050 9DX                                                                                                           |                       |
| <b>Drawing Title</b><br>EXISTING PLANS AND ELEVATIONS                                                                                                                        |                       |
| <b>Scale</b><br>1:100 On A2 Paper                                                                                                                                            | <b>Drawn By</b><br>AC |
| 0 2m 4m 6m 8m 10m                                                                                                                                                            |                       |
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| <b>Drawing No.</b><br>2021/02                                                                                                                                                | <b>Rev.</b>           |

## **Appendix C**

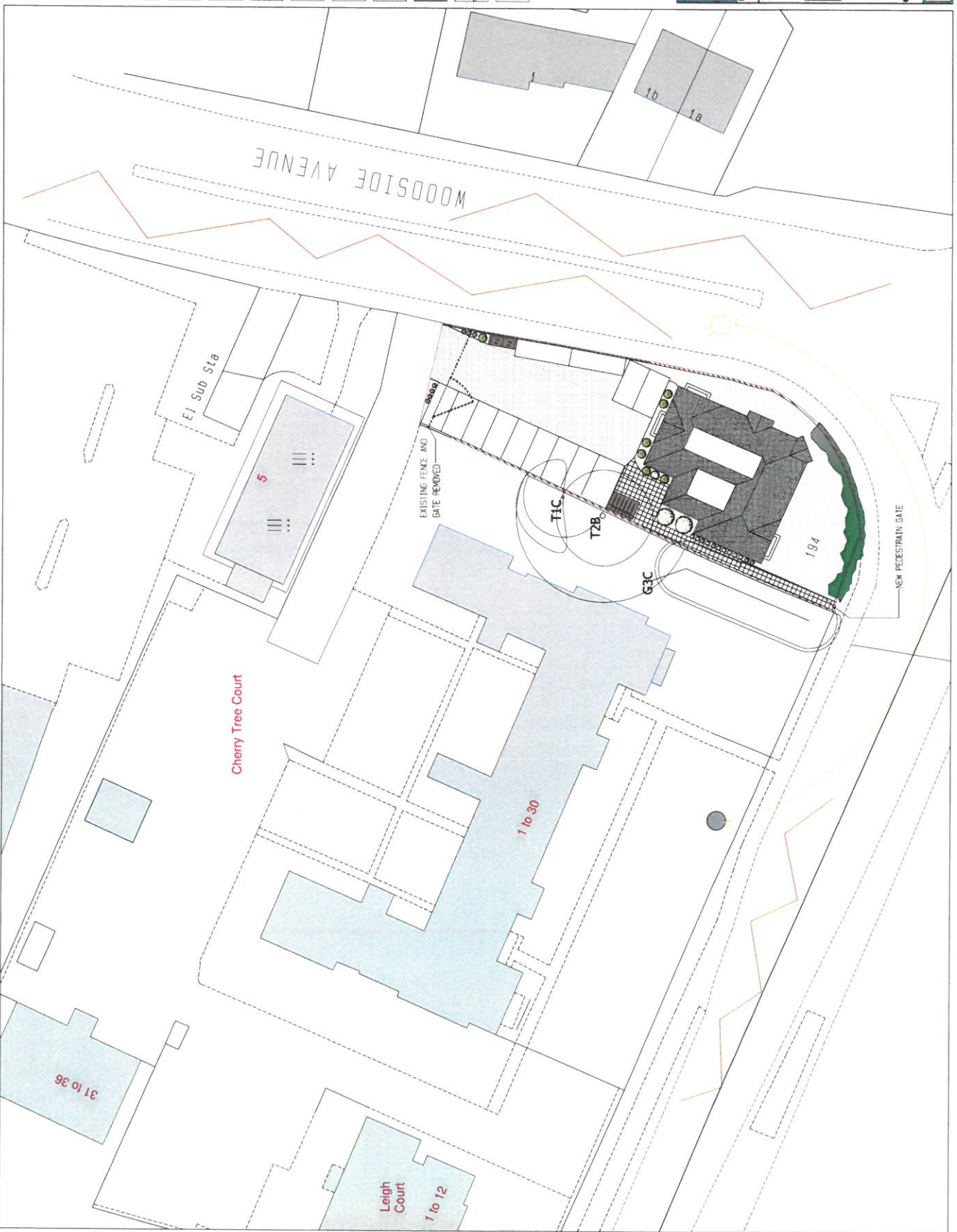
### **Proposed Site Layout Plans**

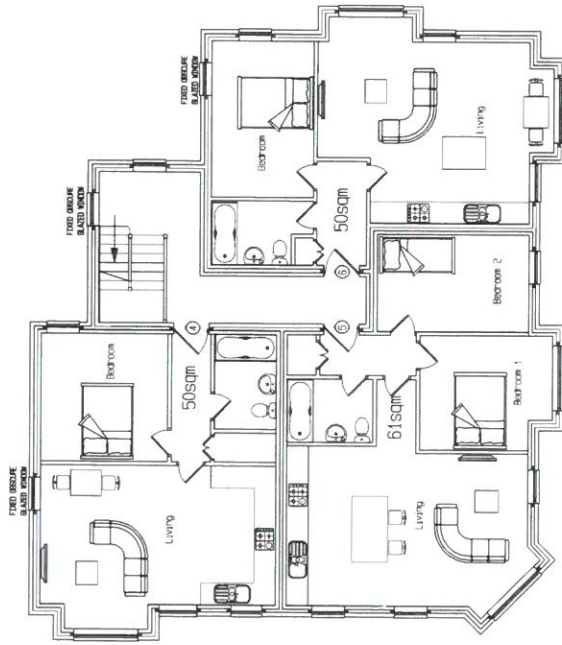
- SITE BOUNDARY
- SEA PATH
- GRASED AREA
- EXISTING BUILT FORM
- NOISE AND AIR POLLUTION
- COMMERCIAL USE
- PERMEABLE BLOCK PAVING
- PRIVACY/OVERSHADOWING/OVERBEARING/EXISTING COMMERCIAL/RESIDENTIAL USE
- 13 CAR PARK SPACES
- EXISTING TARMAC SURFACE
- BIN STORE 2 x 1100 LITRE & CYCLE STORE
- EXISTING 1.5-2M HIGH BRICK WALL
- LOW LEVEL PLANTING

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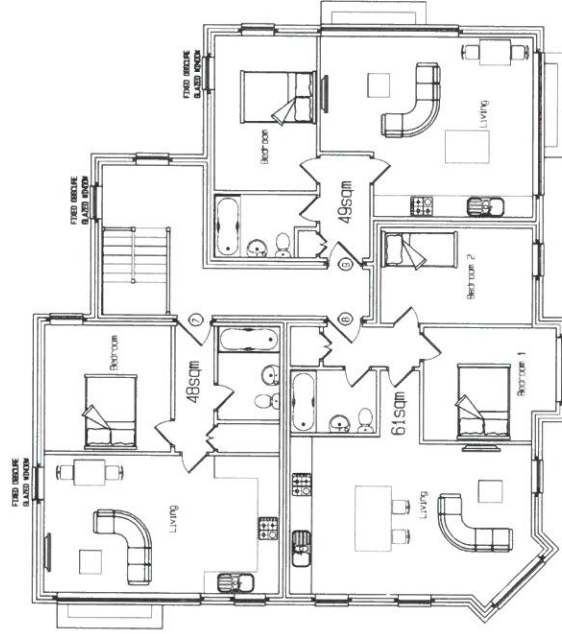
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**Project Title:** 192-194 Leigh Road, Eastleigh, 5020 SES  
**Drawing Title:** Proposed Plan Site Plan  
**Scale:** 1:200 On A1 Paper  
**Drawn By:** AC  
**Check:**  
**Rev:**

**Drawing No:** 2021/03  
**Date:** 2021/03

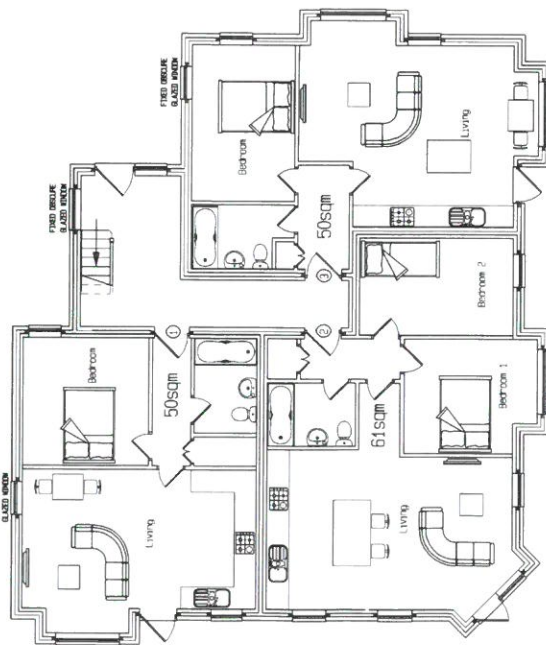




PROPOSED FIRST FLOOR PLAN



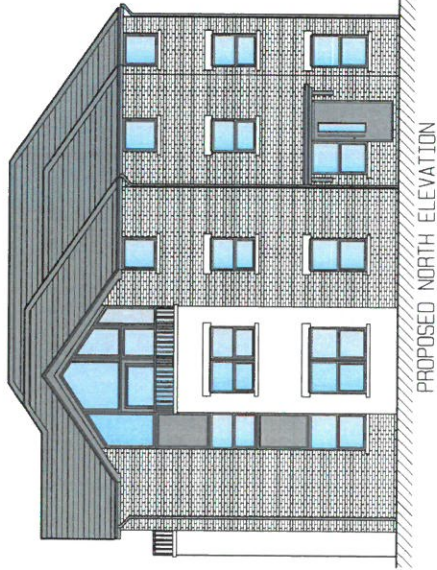
PROPOSED SECOND FLOOR PLAN



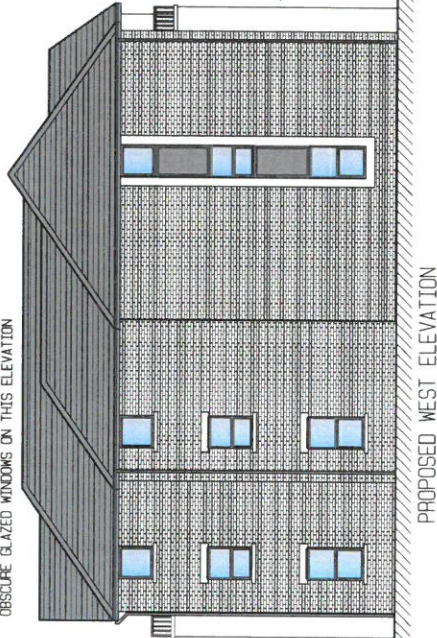
PROPOSED GROUND FLOOR PLAN

|                                                                                                                                                                                |  |                                                                                                                                                            |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
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| Project Title<br><b>192-194 Leigh Road,<br/>         Eastleigh, S050 9DX</b>                                                                                                   |  | Drawing Title<br><b>Proposed Plans And Elevations</b>                                                                                                      |  |
| Scale<br><b>1:100 On A2 Paper</b>                                                                                                                                              |  | Drawn By<br><b>AC</b>                                                                                                                                      |  |
| 0 2m 4m 6m 8m 10m                                                                                                                                                              |  | © This drawing is the copyright of ACA Design Limited. It may not be copied, altered or reproduced without their written authority.<br>IF IN DOUBT ASK !!! |  |
| Drawing No.<br><b>2021/04</b>                                                                                                                                                  |  | Rev.                                                                                                                                                       |  |

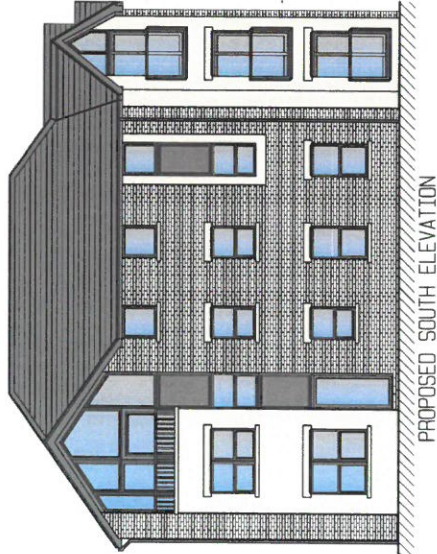
NOTE:  
OBSCURE GLAZED WINDOWS ON THIS ELEVATION



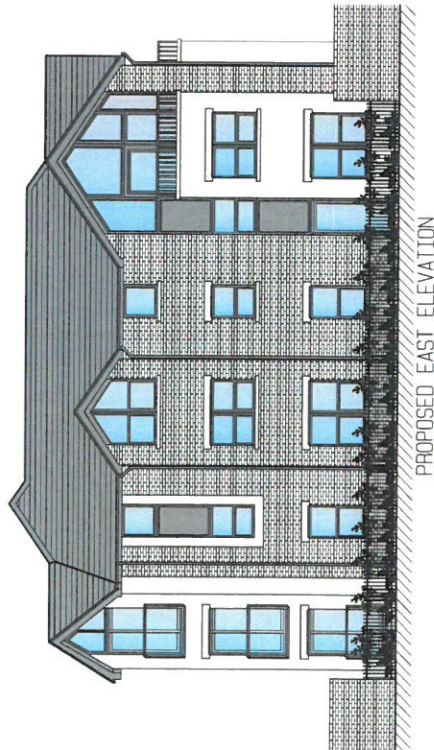
PROPOSED NORTH ELEVATION



PROPOSED WEST ELEVATION

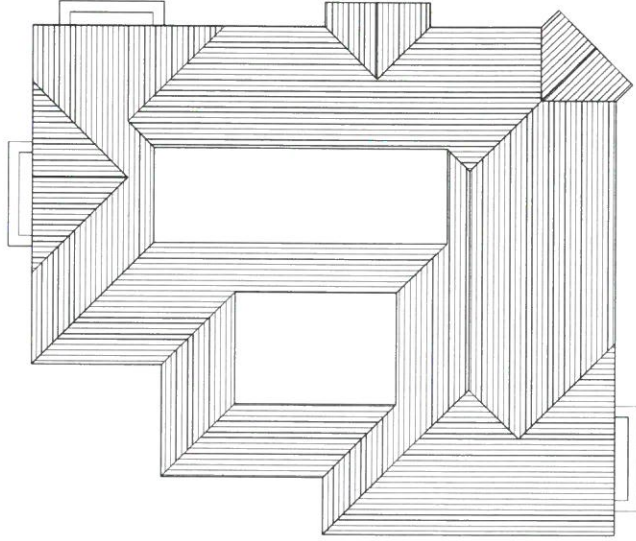


PROPOSED SOUTH ELEVATION



PROPOSED EAST ELEVATION

- WIENERBERGER HERITAGE BLEND  
STOCK FACING BRICK
- ETERNIT GARSDALE 600X300 SLATE
- ANTHRACITE GREY WINDOWS/DOORS  
WITH STONE HEADERS AND CILLS

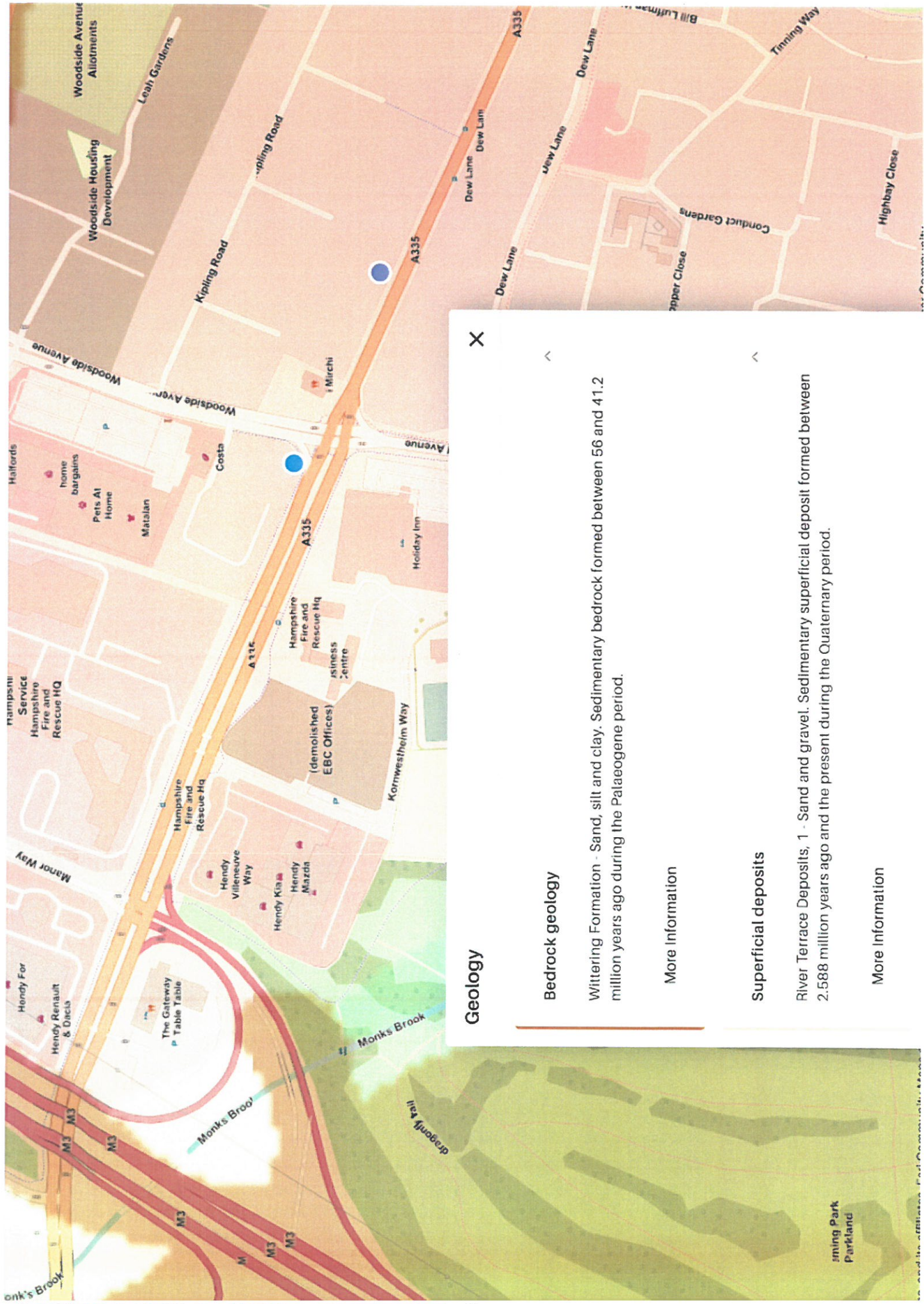


PROPOSED ROOF PLAN

|                                                                                                                                                                              |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
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| Client<br>1 Connection Holdings Ltd                                                                                                                                          |      |
| Project Title<br>192-194 Leigh Road,<br>Eastleigh, S050 9DX                                                                                                                  |      |
| Drawing Title<br>Proposed Elevations & Roof Plan                                                                                                                             |      |
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| Drawn By<br>AC                                                                                                                                                               |      |
| 0 2m 4m 6m 8m 10m                                                                                                                                                            |      |
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**Appendix D**

**Geological Map Extract**



## Geology

### Bedrock geology

Wittering Formation - Sand, silt and clay. Sedimentary bedrock formed between 56 and 41.2 million years ago during the Palaeogene period.

[More Information](#)

### Superficial deposits

River Terrace Deposits, 1 - Sand and gravel. Sedimentary superficial deposit formed between 2.588 million years ago and the present during the Quaternary period.

[More Information](#)

## **Appendix E**

### **Pre & Post Development Areas**

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3. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF BOTH PARTIES IMMEDIATELY.

4. ANY DIMENSIONS/LEVELS INDICATED "W/" REFER TO ASSUMED/EXISTING DIMENSIONS WHICH ARE TO BE SITE CHECKED PRIOR TO THE COMMENCEMENT OF ANY WORK.

## PRELIMINARY

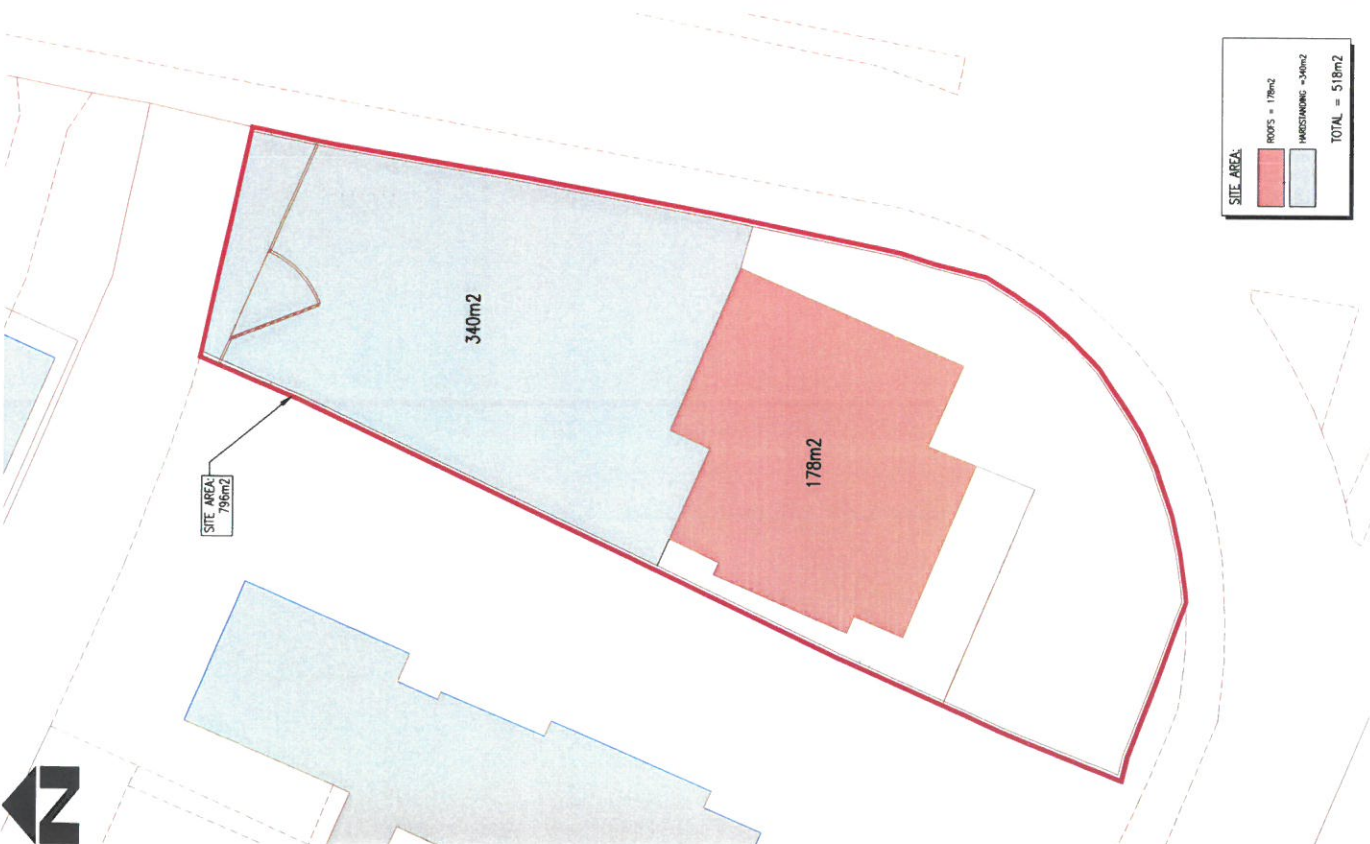
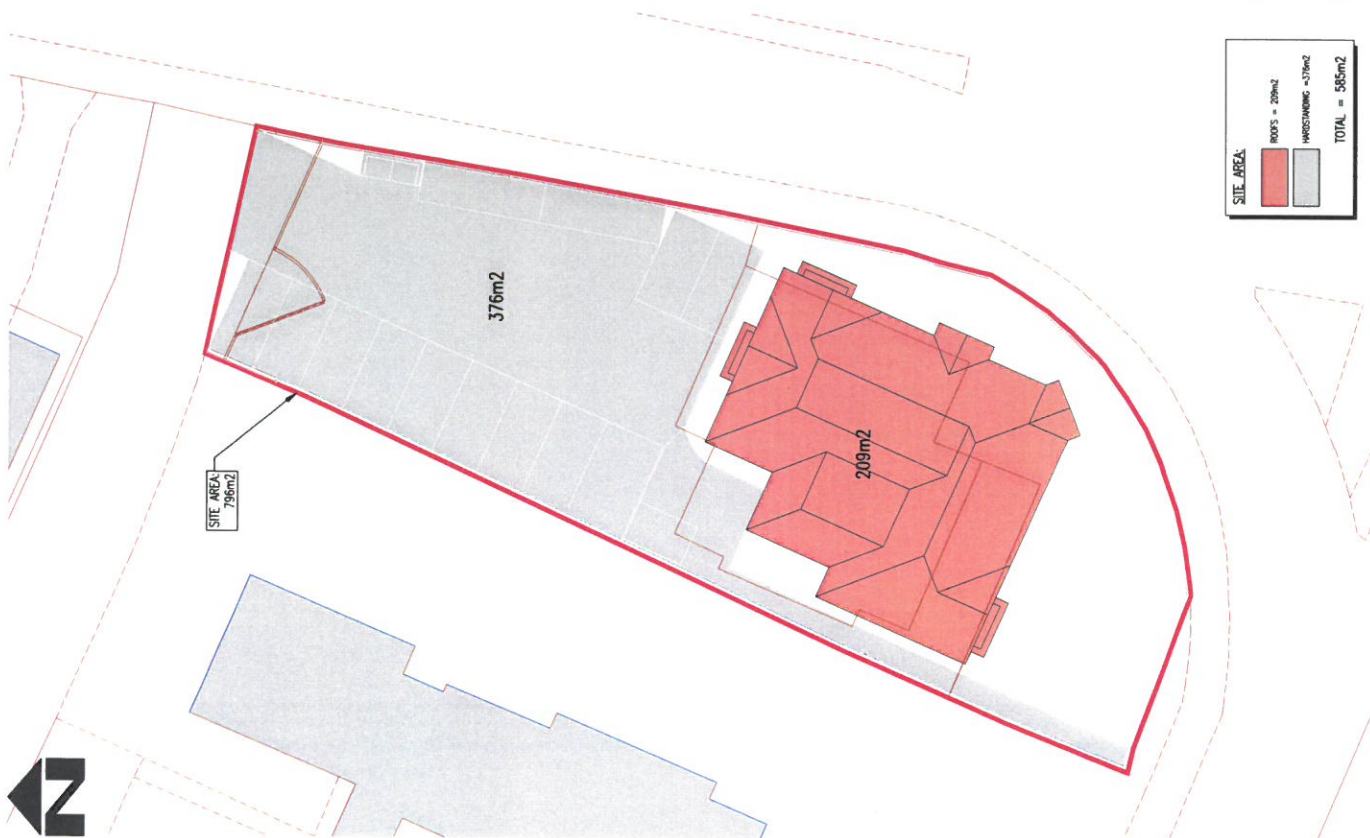
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| Revised: | Issued:     |  | Checked by<br>and date | Reviewed by<br>and date | Approved by<br>and date |

X-REFS: .  
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ORIGINAL DRAWING SIZE - A1

CAD REF.

|                                                                                                                                                     |  |                                                                                        |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------|--|
| <br><b>HAMIL DAVIES LIMITED</b><br>Consulting Civil<br>Engineers |  | Date: 1 CONNECTION HOLDINGS LIMITED<br>Tel: 192-194 LEIGH ROAD, EASTLEIGH<br>Basing St |  |
| Project: <b>IMPERMEABLE AREAS</b>                                                                                                                   |  | Drawn: HCL Date: 1:125 @ A1                                                            |  |
| Title: <b>PRELIMINARY</b>                                                                                                                           |  | Designed:                                                                              |  |
| Made At: <b>SINGAPORE</b>                                                                                                                           |  | Checked:                                                                               |  |
| Revision: <b>22-3982-801</b>                                                                                                                        |  | Date:                                                                                  |  |
| P1                                                                                                                                                  |  | P1                                                                                     |  |



## PRE-DEVELOPMENT IMPERMEABLE AREAS

## POST-DEVELOPMENT IMPERMEABLE AREAS

# **Appendix F**

## **Drainage Plans**

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21. INVERT LEVELS AND POSITIONS OF EXISTING DRAINS /CHAMBERS /SEWERS WHERE NEW CONNECTIONS ARE TO BE MADE MUST BE CHECKED AND CONFIRMED TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY WORKS.

- [illegible]

 COSTING FILL WATER MANHOLE / WYANAGE.  
 COSTING SURFACE WATER MANHOLE / WYANAGE.  
 SOIL & VEGET PIPE (100mm) / INSPECTION CHAMBER  
 RAINWATER PIPE (100mm) / INSPECTION CHAMBER  
 DUCTY.  
 IRONING EYE (100mm)  
 CATCHPIT MANHOLE.

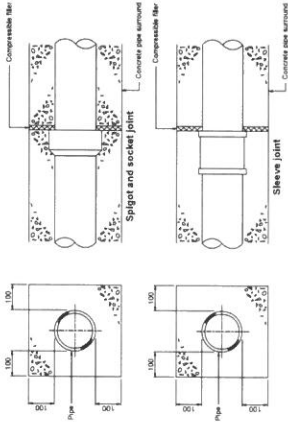
SOAKBAY S&I:  
SOAKBAY S&I:  
SOAKBAY S&I:  
SOAKBAY S&I: TO BE CONFIRMED ON COMPLETION  
OF PERCOLATION TESTING.

[illegible]

|                                                                                                                                                                    |  |                                                                                                                                                                                                 |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  <b>HAMIL DAVIES LIMITED</b><br>Consulting Civil<br>and<br>Structural Engineers |  | Project: <b>1 CONNECTION HOLDINGS LIMITED</b><br>Address: <b>197-199 LEIGH ROAD, EASTLEIGH</b><br>Drawing No.: <b>22-3982-S11</b><br>Scale: <b>1:125 @ A1</b><br>Date: <b>22-3982-S11</b><br>P1 |  |
| <b>PROPOSED DRAINAGE LAYOUT</b>                                                                                                                                    |  | Project: <b>PRELIMINARY</b><br>Drawing No.: <b>22-3982-S11</b><br>Scale: <b>1:125 @ A1</b><br>Date: <b>22-3982-S11</b><br>P1                                                                    |  |

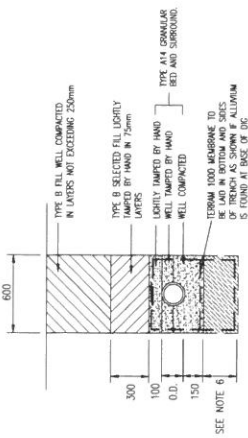
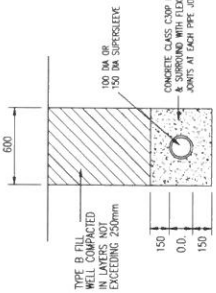
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3. ANY DIMENSIONS (UNLESS INDICATED "AS SHOWN") REFER TO ASSUMED EXISTING DIMENSIONS WHICH ARE TO BE CHECKED PRIOR TO THE COMMENCEMENT OF ANY WORK.



| PIPE SIZE | TRENCH WIDTH |
|-----------|--------------|
| 150 DIA.  | 600mm        |
| 225 DIA.  | 700mm        |
| 300 DIA.  | 800mm        |
| 375 DIA.  | 1000mm       |
| 450 DIA.  | 1100mm       |

**PIPE TRENCH TABLE**



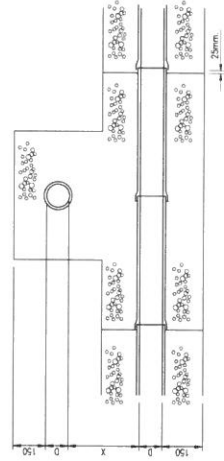
**PIPE BEDDING DETAIL - TYPE 2**

PIPE BEDDING DETAIL TYPE 2 (LESS THAN 900 COVER)

**PIPE BEDDING DETAIL - TYPE 1**

PIPE BEDDING DETAIL TYPE 1 (LESS THAN 900 COVER)

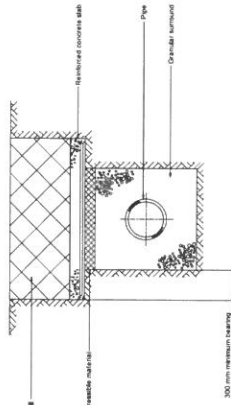
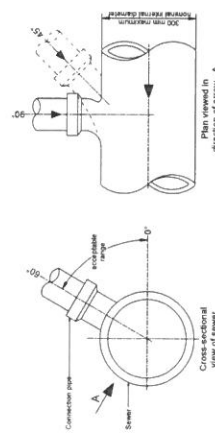
**JOINTS FOR CONCRETE ENCASED PIPES (LESS THAN 900 COVER)**



THIS DETAIL TO BE USED WHEN DIMENSION "X" BETWEEN OUTSIDE OF PIPE BARRELS IS LESS THAN 300mm OR THE DIAMETER OF THE LARGER PIPE

**PIPE CROSSING DETAIL**

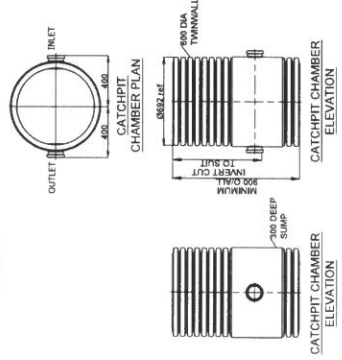
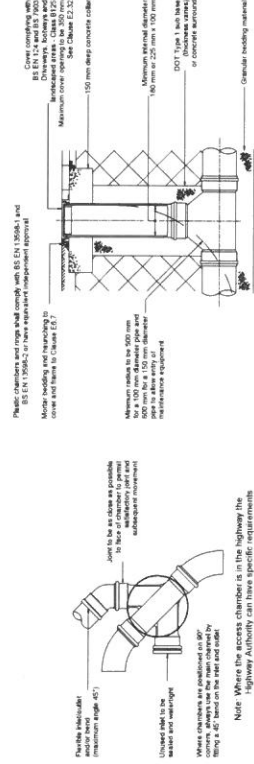
**SECTION X-X**



**TYPICAL INSPECTION CHAMBER DETAIL TYPE 4 (Rigid material detail)**

Maximum depth from cover level to soffit of pipe 1 m, non-entry

**PROTECTION OF PIPES LAID AT SHALLOW DEPTHS**



**TYPICAL INSPECTION CHAMBER DETAIL TYPE 4 (Alternative construction detail)**

Maximum depth from cover level to soffit of pipe 2 m, non-entry

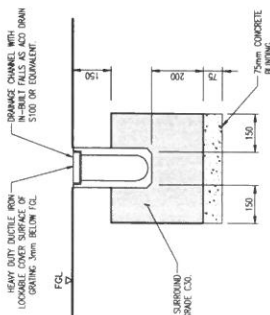
**TYPICAL INSPECTION CHAMBER DETAIL TYPE 4 (Flexible material detail)**

Maximum depth from cover level to soffit of pipe 2 m, non-entry

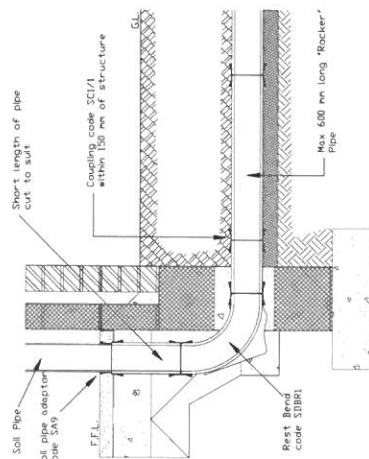
**PRELIMINARY**

|                                |                      |
|--------------------------------|----------------------|
| 1. CONNECTION HOLDINGS LIMITED |                      |
| 192-194 LEIGH ROAD, EASTLEIGH  |                      |
| Project No.                    | 22-3992-551          |
| Client                         | AS SHOWN             |
| Design                         | PRELIMINARY          |
| Drawn                          | AS SHOWN             |
| Checked                        | AS SHOWN             |
| Approved                       | AS SHOWN             |
| Scale                          | 1:100                |
| Sheet No.                      | 22-3992-551          |
| Sheet Title                    | Structural Engineers |

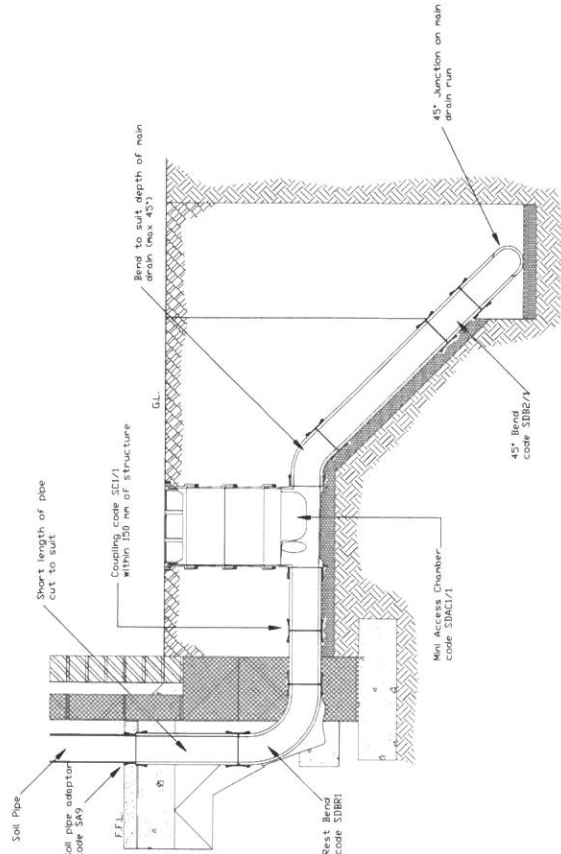
- NOTES:
1. THIS DRAWING IS COPYRIGHT AND SHOULD NOT BE REPRODUCED WITHOUT APPROVAL.
  2. THIS DRAWING IS TO BE USED IN CONJUNCTION WITH THE APPROPRIATE DRAWINGS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ATTENTION OF BOTH PARTIES IMMEDIATELY.
  3. ANY DIMENSIONS (LEVELS) INDICATED 'M' REFER TO ASSUMED FINISHING DIMENSIONS WHICH ARE TO BE CHECKED PRIOR TO THE COMMENCEMENT OF ANY WORK.



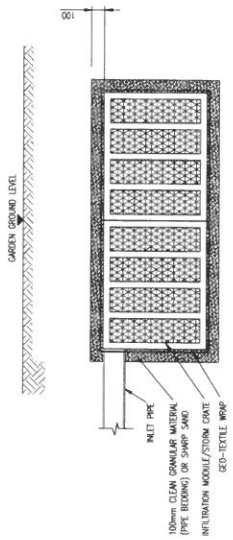
ACO DRAIN DETAIL 1.  
TYPICAL UNCOVERED OVERHEAD.  
SCALE 1:10



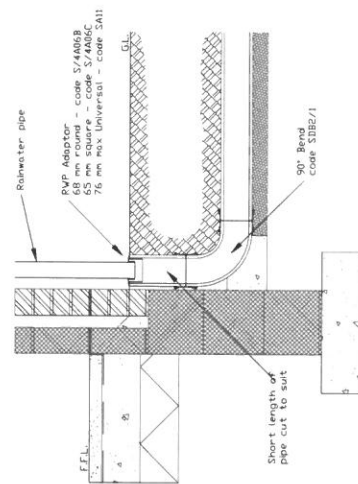
SOIL & VENT PIPE / STUB STACK / W.C. CONNECTION DETAIL.  
SCALE 1:10



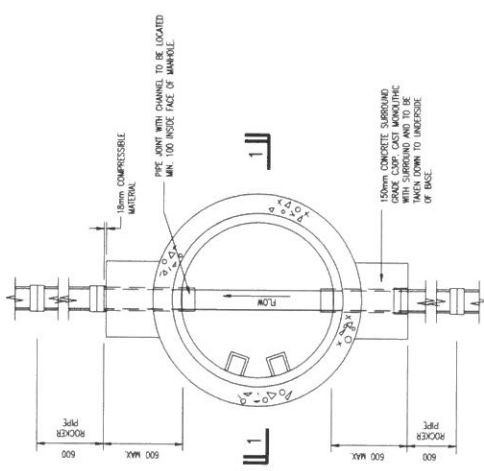
INSPECTION CHAMBER POSITIONED OFF MAIN DRAIN RUN APPLICATION DETAIL.  
SCALE 1:10



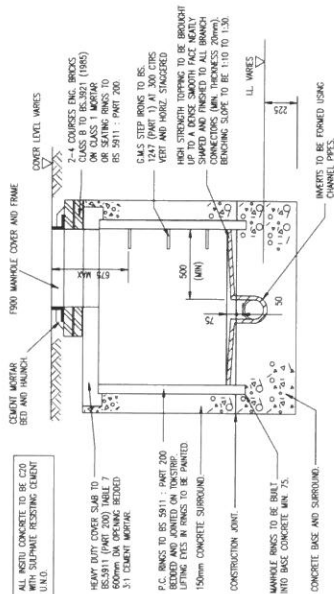
GARDEN SOAKAWAY DETAIL  
SCALE 1:10



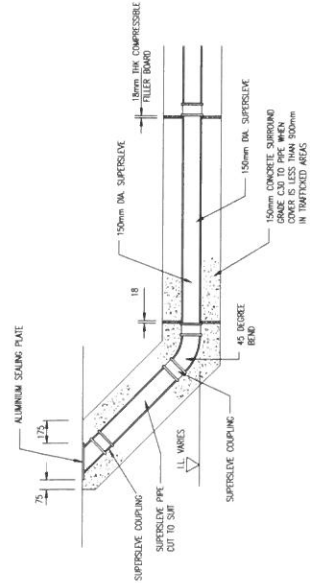
EXTERNAL RWP CONNECTION DETAIL.  
SCALE 1:10



PLAN ON MANHOLE TYPE B  
SCALE 1:20



SECTION 1-1  
SCALE 1:20



LIGHT DUTY RODDING EYE DETAIL  
SCALE 1:20

PRELIMINARY

|                               |                               |
|-------------------------------|-------------------------------|
| 1. CONNECTION HOLINGS LIMITED |                               |
| Project No.                   | 192-194 LEIGH ROAD, EASTLEIGH |
| Drawing No.                   | DRAINAGE DETAILS - SHEET 2    |
| Client                        | PRELIMINARY                   |
| Design                        | AS SHOWN                      |
| Check                         | Mr. MANMARE                   |
| Issue                         | 22-3982-552                   |
| Scale                         | 21.68 833.586                 |
| Sheet                         | P1                            |

## **Appendix G**

### **Percolation Test Results**

**Assumed Soil Infiltration Rate**

**$3.0 \times 10^{-5} \text{ m/s}$**

## **Appendix H**

### **Soakaway Calculations**

|                                                                                                                                                                                                |                                            |                          |            |              |                              |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|------------|--------------|------------------------------|---------------|
|  <b>Tekla Tedds</b><br>Hamill Davies Limited<br>Ivydale<br>Lower Chase Road<br>Swanmore, Southampton SO32 2PB | Project<br>192 - 194 Leigh Road, Eastleigh |                          |            |              | Job no.<br>22-3982           |               |
|                                                                                                                                                                                                | Calcs for<br>SA1                           |                          |            |              | Start page no./Revision<br>1 |               |
|                                                                                                                                                                                                | Calcs by<br>B.H.                           | Calcs date<br>07/11/2022 | Checked by | Checked date | Approved by                  | Approved date |

## SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.04

### Design rainfall intensity

|                                                      |                               |
|------------------------------------------------------|-------------------------------|
| Location of catchment area                           | Other                         |
| Impermeable area drained to the system               | A = 209.0 m <sup>2</sup> ✓    |
| Return period                                        | Period = 100 yr ✓             |
| Ratio 60 min to 2 day rainfall of 5 yr return period | r = 0.350 ✓                   |
| 5-year return period rainfall of 60 minutes duration | M5_60min = 20.0 mm ✓          |
| Increase of rainfall intensity due to global warming | p <sub>climate</sub> = 50 % ✓ |

### Soakaway / infiltration trench details

|                                              |                                                            |
|----------------------------------------------|------------------------------------------------------------|
| Soakaway type                                | Rectangular                                                |
| Minimum depth of pit (below incoming invert) | d = 741 mm                                                 |
| Width of pit                                 | w = 2500 mm                                                |
| Length of pit                                | l = 8000 mm                                                |
| Percentage free volume                       | V <sub>free</sub> = 95 %                                   |
| Soil infiltration rate                       | f = 30.0×10 <sup>-6</sup> m/s                              |
| Wetted area of pit 50% full                  | a <sub>s50</sub> = l × d + w × d = 7783796 mm <sup>2</sup> |

### Table equations

|                    |                              |
|--------------------|------------------------------|
| Inflow (cl.3.3.1)  | I = M100 × A                 |
| Outflow (cl.3.3.2) | O = a <sub>s50</sub> × f × D |
| Storage (cl.3.3.3) | S = I - O                    |

| Duration, D (min) | Growth factor Z1 | M5 rainfalls (mm) | Growth factor Z2 | 100 year rainfall, M100 (mm) | Inflow (m <sup>3</sup> ) | Outflow (m <sup>3</sup> ) | Storage required (m <sup>3</sup> ) |
|-------------------|------------------|-------------------|------------------|------------------------------|--------------------------|---------------------------|------------------------------------|
| 5                 | 0.36;            | 10.7;             | 1.92;            | 20.6;                        | 4.30;                    | 0.07;                     | 4.23                               |
| 10                | 0.51;            | 15.2;             | 1.99;            | 30.3;                        | 6.33;                    | 0.14;                     | 6.19                               |
| 15                | 0.62;            | 18.5;             | 2.02;            | 37.3;                        | 7.80;                    | 0.21;                     | 7.59                               |
| 30                | 0.79;            | 23.6;             | 2.02;            | 47.6;                        | 9.94;                    | 0.42;                     | 9.52                               |
| 60                | 1.00;            | 30.0;             | 1.97;            | 59.1;                        | 12.35;                   | 0.84;                     | 11.51                              |
| 120               | 1.22;            | 36.7;             | 1.92;            | 70.3;                        | 14.70;                   | 1.68;                     | 13.02                              |
| 240               | 1.50;            | 44.9;             | 1.85;            | 83.1;                        | 17.37;                   | 3.36;                     | 14.01                              |
| 360               | 1.69;            | 50.7;             | 1.81;            | 91.5;                        | 19.13;                   | 5.04;                     | 14.08                              |
| 600               | 1.95;            | 58.4;             | 1.75;            | 102.4;                       | 21.39;                   | 8.41;                     | 12.99                              |
| 1440              | 2.48;            | 74.4;             | 1.64;            | 122.3;                       | 25.56;                   | 20.18;                    | 5.39                               |

Required storage volume S<sub>req</sub> = 14.08 m<sup>3</sup>

Soakaway storage volume S<sub>act</sub> = l × d × w × V<sub>free</sub> = 14.08 m<sup>3</sup>

**PASS - Soakaway storage volume**

Time for emptying soakaway to half volume t<sub>s50</sub> = S<sub>req</sub> × 0.5 / (a<sub>s50</sub> × f) = 8hr 22min 29s

**PASS - Soakaway discharge time less than or equal to 24 hours**



|                                                                                                                                                                                                |                                            |                          |            |              |                              |               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|------------|--------------|------------------------------|---------------|
|  <b>Tekla Tedds</b><br>Hamill Davies Limited<br>Ivydale<br>Lower Chase Road<br>Swanmore, Southampton SO32 2PB | Project<br>192 - 194 Leigh Road, Eastleigh |                          |            |              | Job no.<br>22-3982           |               |
|                                                                                                                                                                                                | Calcs for<br>SA2                           |                          |            |              | Start page no./Revision<br>1 |               |
|                                                                                                                                                                                                | Calcs by<br>B.H.                           | Calcs date<br>07/11/2022 | Checked by | Checked date | Approved by                  | Approved date |

## SOAKAWAY DESIGN

In accordance with BRE Digest 365 - Soakaway design

Tedds calculation version 2.0.04

### Design rainfall intensity

Location of catchment area Other  
 Impermeable area drained to the system  $A = 376.0 \text{ m}^2$  ✓  
 Return period Period = 100 yr ✓  
 Ratio 60 min to 2 day rainfall of 5 yr return period  $r = 0.350$  ✓  
 5-year return period rainfall of 60 minutes duration  $M5_{60\text{min}} = 20.0 \text{ mm}$  ✓  
 Increase of rainfall intensity due to global warming  $p_{\text{climate}} = 50\%$  ✓

### Soakaway / infiltration trench details

Soakaway type Rectangular  
 Minimum depth of pit (below incoming invert)  $d = 1150 \text{ mm}$   
 Width of pit  $w = 3000 \text{ mm}$   
 Length of pit  $l = 8000 \text{ mm}$   
 Percentage free volume  $V_{\text{free}} = 95\%$  ✓  
 Soil infiltration rate  $f = 30.0 \times 10^{-6} \text{ m/s}$  ✓  
 Wetted area of pit 50% full  $a_{s50} = l \times d + w \times d = 12648696 \text{ mm}^2$

### Table equations

Inflow (cl.3.3.1)  $I = M100 \times A$   
 Outflow (cl.3.3.2)  $O = a_{s50} \times f \times D$   
 Storage (cl.3.3.3)  $S = I - O$

| Duration, D (min) | Growth factor Z1 | M5 rainfalls (mm) | Growth factor Z2 | 100 year rainfall, M100 (mm) | Inflow (m³) | Outflow (m³) | Storage required (m³) |
|-------------------|------------------|-------------------|------------------|------------------------------|-------------|--------------|-----------------------|
| 5                 | 0.36;            | 10.7;             | 1.92;            | 20.6;                        | 7.73;       | 0.11;        | 7.62                  |
| 10                | 0.51;            | 15.2;             | 1.99;            | 30.3;                        | 11.38;      | 0.23;        | 11.15                 |
| 15                | 0.62;            | 18.5;             | 2.02;            | 37.3;                        | 14.04;      | 0.34;        | 13.70                 |
| 30                | 0.79;            | 23.6;             | 2.02;            | 47.6;                        | 17.89;      | 0.68;        | 17.20                 |
| 60                | 1.00;            | 30.0;             | 1.97;            | 59.1;                        | 22.22;      | 1.37;        | 20.86                 |
| 120               | 1.22;            | 36.7;             | 1.92;            | 70.3;                        | 26.44;      | 2.73;        | 23.71                 |
| 240               | 1.50;            | 44.9;             | 1.85;            | 83.1;                        | 31.25;      | 5.46;        | 25.78                 |
| 360               | 1.69;            | 50.7;             | 1.81;            | 91.5;                        | 34.41;      | 8.20;        | 26.22                 |
| 600               | 1.95;            | 58.4;             | 1.75;            | 102.4;                       | 38.49;      | 13.66;       | 24.83                 |
| 1440              | 2.48;            | 74.4;             | 1.64;            | 122.3;                       | 45.99;      | 32.79;       | 13.21                 |

Required storage volume  $S_{\text{req}} = 26.22 \text{ m}^3$

Soakaway storage volume  $S_{\text{act}} = l \times d \times w \times V_{\text{free}} = 26.22 \text{ m}^3$

**PASS - Soakaway storage volume**

Time for emptying soakaway to half volume  $t_{s50} = S_{\text{req}} \times 0.5 / (a_{s50} \times f) = 9\text{hr } 35\text{min } 50\text{s}$

**PASS - Soakaway discharge time less than or equal to 24 hours**

## **Appendix I**

### **Flood & Water Management Template**

## Information required:

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>Background information</b> on the proposed design. Including proposal; site; plans of surface water drainage and any SuDS featured in the scheme                                                                                                                                                                                                                                                                                                                           |
| 2  | Evidence that the applicant understands the <b>sensitivity of discharge points</b> relating to the receiving water body. Where this is main river or discharging through contaminated land the LPA may have to consult the Environment Agency (EA)                                                                                                                                                                                                                            |
| 3  | Evidence of and information on the <b>existing surface water flow paths</b> of undeveloped (greenfield) sites                                                                                                                                                                                                                                                                                                                                                                 |
| 4  | Evidence of and information on the <b>existing drainage network</b> for previously developed (brownfield) sites                                                                                                                                                                                                                                                                                                                                                               |
| 5  | Identification of and information on areas that may have been affected by <b>failures in the existing drainage regime</b>                                                                                                                                                                                                                                                                                                                                                     |
| 6  | Evidence that the <b>proposed drainage will follow the same pattern as the existing</b> . This avoids directing flow to other locations.                                                                                                                                                                                                                                                                                                                                      |
| 7  | Information evidencing that the <b>correct level of water treatment exists</b> in the system in accordance with the Ciria SuDS Manual C753                                                                                                                                                                                                                                                                                                                                    |
| 8  | <b>Where infiltration is used for drainage</b> , evidence that a <b>suitable number of infiltration tests</b> have been completed. These need to be across the whole site; within different geologies and to a similar depth to the proposed infiltration devices. Tests must be completed according to the BRE 365 method or another recognised method including British Standard BS 5930: 2015                                                                              |
| 9  | <b>If not using infiltration for drainage</b> - Existing and proposed <b>run-off rate calculations</b> completed according to a suitable method such as IH124 or FEH. Information is available from UK Sustainable Drainage: Guidance and Tools. Calculations must show that the proposed run off rates do not exceed the existing run-off rates. This must be shown for a one in one year event plus climate change and a one in one hundred year event plus climate change. |
| 10 | <b>If not using infiltration for drainage</b> - Existing and proposed <b>run-off volume calculations</b> completed according to a suitable method such as IH124 or FEH. Calculations must show that, where reasonably practical, runoff volume should not exceed the greenfield runoff volume for the same event. This must be shown for a 1 in 100 year, 6 hour rainfall event                                                                                               |
| 11 | Evidence that <b>enough storage/attenuation</b> has been provided without increasing the runoff rate or volume. This must be shown for a 1 in 100 year plus climate change event                                                                                                                                                                                                                                                                                              |
| 12 | Evidence that <b>runoff exceeding design criteria has been considered</b> . Calculations and exceedance flow diagram/plans must show where above ground flooding might occur and where this would pool and flow.                                                                                                                                                                                                                                                              |
| 13 | <b>Maintenance regimes</b> of entire surface water drainage system including individual SuDS features, including a plan illustrating the organisation responsible for each element. <b>Evidence</b> that those responsible/adopting bodies are in discussion with the developer. For larger/phased sites, we need to see evidence of measures taken to protect and ensure continued operation of drainage features during construction.                                       |
| 14 | Evidence that <b>Urban Creep</b> has been considered in the application and that a <b>10% increase</b> in impermeable area has been used in calculations to account for this.                                                                                                                                                                                                                                                                                                 |