



Outline Planning Application – LLFA Consultation Response

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|-----------------|--|-------------------------|------------|
| DATE: | 02 December 2022 | CONFIDENTIALITY: | Public |
| SUBJECT: | Consultation Response – S62A/2022/0012 - Land East of Station Road, Elsenham | | |
| PROJECT: | Our Reference: 70084697 - Elsenham Stage 2 | AUTHOR: | [REDACTED] |
| CHECKED: | [REDACTED] | APPROVED: | [REDACTED] |

OBJECTIVES

WSP is appointed by *Bloor Homes Ltd and Gillian Smith, John Robert Carmichael Smith, Robert Giles Russell Smith and Andrew James Smith* to produce an Outline Flood Risk Assessment and Drainage Strategy for the Land East of Station Road, Elsenham.

Essex County Council Lead Local Flood Authority have reviewed the FRA reference *4697-WSP-00-XX-RP-DR-0001-2.0* and produced a consultation response dated 24/11/2022, posing a holding objection to the planning application.

This technical note addresses the points raised by the LLFA as set out within their consultation response.

TECHNICAL RESPONSE

LLFA comment: Provide an allowance for urban creep. Please provide revised surface water design calculations indicating the 10% allowance for urban creep. Please also include the network design table.

An allowance for urban creep is included in the Micro Drainage Source Control calculations shown in the FRA Appendix H. This is accounted for as an additional 10% of the impermeable surface area in accordance with BS 8582:2013.

As per Table 1 below, the overall contributing area totals 4.95 Ha. This is inclusive of carriageway, private drives, permeable pavement and roofs plus an additional 10% urban creep.

As detailed in the FRA (refer to paragraph 7.3.8 and Appendix H), the proposed basin allows for a maximum of 5.05 Ha impermeable area which is in excess of the total calculated area summarised below.

Detailed network calculations and associated schedules are not required for an Outline Planning Application. This approach is in full accordance with the LLFA guidance checklist. Detailed calculations will be undertaken during post planning to satisfy appropriate planning conditions and technical approvals.

Table 1 – Impermeable Area summary

| Category | Area [m ²] |
|--|------------------------|
| Adoptable carriageway | 7,610 |
| Other paved areas (including private driveways, parking bays and footways) | 14,530 |
| Private permeable paving (shared driveways not offered for adoption) | 4,120 |
| Roof (including houses and garages) | 13,740 |
| 10% Urban Creep of impermeable areas | 4,000 |
| Detention basin | 5,530 |
| Total contributing area | 49,530 |



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LLFA comment: Clarify the discharge location for permeable paving on site. Whilst permeable paving has been detailed within the FRA, the areas have not been input within the surface water design calcs.

As detailed in Note 10 of Drainage Strategy drawing 4697-WSP-00-XX-SK-D-0902-P01 shown in Appendix G of the FRA, the permeable pavement will be lined and discharge, via perforated pipework, to the proposed surface water system.

Proposed permeable paved areas are included in calculations in Appendix H of the FRA, as summarised on Table 1 of this Technical Note. The permeable pavement is included for conveyance and sediment control only and will not be used for attenuation storage. Therefore, calculations for the permeable pavement have not been included in the FRA.

To assist, a typical detail setting out the design intent of the lined permeable paving has now been added to the Drainage Strategy drawing 4697-WSP-00-XX-SK-D-0902-P02. Refer to Appendix A for details.

LLFA comment: The geotechnical site investigation report suggests that there are reasonable infiltration rates recorded beneath the central/southern portion of the site. This may lead to the possibility of shallow soakaways being possible and that further investigation will be required. Please clarify the reasons as to why this has not been proposed on site in line with the surface water hierarchy?

The Ground Investigation report reference 1921748-R02 (00) by RSK in Appendix B of the FRA shows four soakage tests in various locations across the site noted as SA101, SA102, SA103 and SA104. Results are summarised in Table 2 below.

Table 2 – Infiltration Tests Results

| Trial pit | Geological unit | Test result (m/s) |
|-----------|-----------------------------|---|
| SA101 | Head Deposits | Not determined |
| SA102 | Kesgrave Catchment Subgroup | Not determined |
| SA103 | Kesgrave Catchment Subgroup | Test 1: 8.02 E-05 Test 2: 5.47 E-05 Test 3: 5.41 E-05 |
| SA104 | Lowestoft Formation | Not determined |

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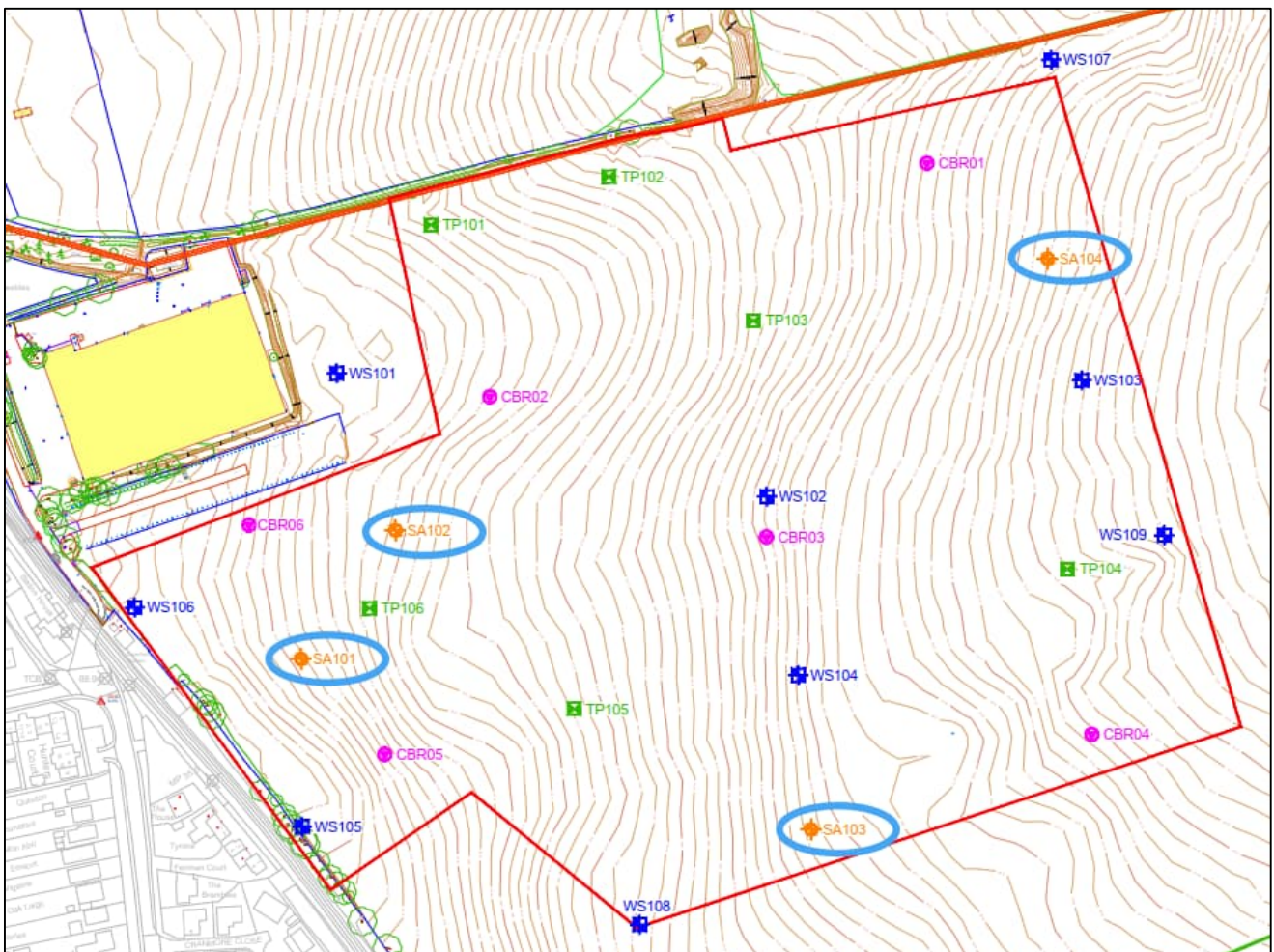
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Results show that three out of four of the soakaway locations failed the test in accordance with BRE 365, which indicates that infiltration would not be viable across most of the site. Only a small, isolated area within the Kesgrave Catchment Group along the southern boundary may be suitable for infiltration.

Due to limited viability of infiltration to ground, in accordance with precautionary principle set out within the NPPF, the outline surface water drainage strategy is based upon the principle of surface water disposal to an existing watercourse only.

Further limited testing will be undertaken post planning to refine the current baseline information, however with the information available to date, it should be noted that this will not change the over-arching drainage principles set out within the outline application, i.e. for any paved areas located within sufficient soakage zones, the proposed lined permeable pavement could be changed to un-lined to enable a quantum of water to discharge directly into the receiving sub-soil.

Figure 1 – Soakage testing location plan





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LLFA comment: In line with the Simple Index Approach for water quality the pollution hazard indices is incorrect in that due to the amount of dwellings proposed on site the traffic movements will be above 300 and as a result the hazard level will be classed as medium. As such there are not enough treatment stages proposed. I am aware that permeable paving is proposed in areas however this does not look to have been detailed with the SuDS mitigation indices.

With reference to Table 3 below, extracted from CIRIA C753 Table 26.2, this assigns pollution hazard indices to different land use classifications.

Table 3 – CIRIA pollution mitigation indices

| Land use | Pollution hazard level | Total suspended solids (TSS) | Metals | Hydro-carbons |
|--|------------------------|------------------------------|--|---------------|
| Residential roofs | Very low | 0.2 | 0.2 | 0.05 |
| Other roofs (typically commercial/ industrial roofs) | Low | 0.3 | 0.2 (up to 0.8 where there is potential for metals to leach from the roof) | 0.05 |
| Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day | Low | 0.5 | 0.4 | 0.4 |
| Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹ | Medium | 0.7 | 0.6 | 0.7 |

The Low category of the table applies to:

- Individual property driveways
- Residential car parks
- Low traffic roads (e.g. cul de sacs, homezones and general access roads)
- Non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day

Most of the items above are present within the site and are descriptive of the Elsenham development.

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The Medium category of the table applies to:

- Commercial yard
- Delivery areas
- Non-residential car parking with frequent change (e.g. hospitals, retail)
- All roads except low traffic roads
- Trunk roads/motorways

The items listed above in the Medium Category are generally not descriptive of the site. There are no through roads and only one vehicular access from Phase 1, located south of the development.

We have analysed the pollution prevention based on the “Low” category as shown in the FRA. However, in this Technical Note, we have also analysed for the “Medium” category as shown below.

The attenuation basin discharges into an existing swale already delivered as part of Phase 1 which is approved under a previous planning application.

Therefore, the combination of the detention basin which will accommodate low flow ‘rills’ and sediment forebays in conjunction with the swale (which provides additional passive treatment) demonstrates that the selected SUDS mitigates the “medium” pollution hazard level. Refer to Table 4 below for details:

Table 4 – Revised Simple Index approach

| Type of SuDS component | TSS | Metals | Hydrocarbons |
|---|-------------|-------------|--------------|
| Detention basin | 0.5 | 0.5 | 0.6 |
| Swale (0.5 coefficient as downstream element of the SuDS train) | 0.25 | 0.3 | 0.3 |
| Total | 0.75 | 0.8 | 0.9 |
| Medium Category Pollution Hazard | 0.7 | 0.6 | 0.7 |
| Result | Pass | Pass | Pass |

As stated in the FRA paragraph 7.3.11 permeable paving will provide additional levels of treatment for the impermeable areas they drain, however they have not been accounted for in the above assessment as not all surface runoff will pass through the arrangement(s).

For clarity, further detail has been added to the detention basin setting out the design intent of the low flow ‘rills’ and sediment forebays as shown on Drainage Strategy drawing 4697-WSP-00-XX-SK-D-0902-P02. Refer to Appendix A for details.



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SUMMARY

The FRA, drainage strategy and associated design intent meets national and local planning policy requirements and is considered robust for the purposes of Outline Planning.

Furthermore, it is also considered that this technical note provides suitable clarification to enable the LLFA to lift their holding objection.

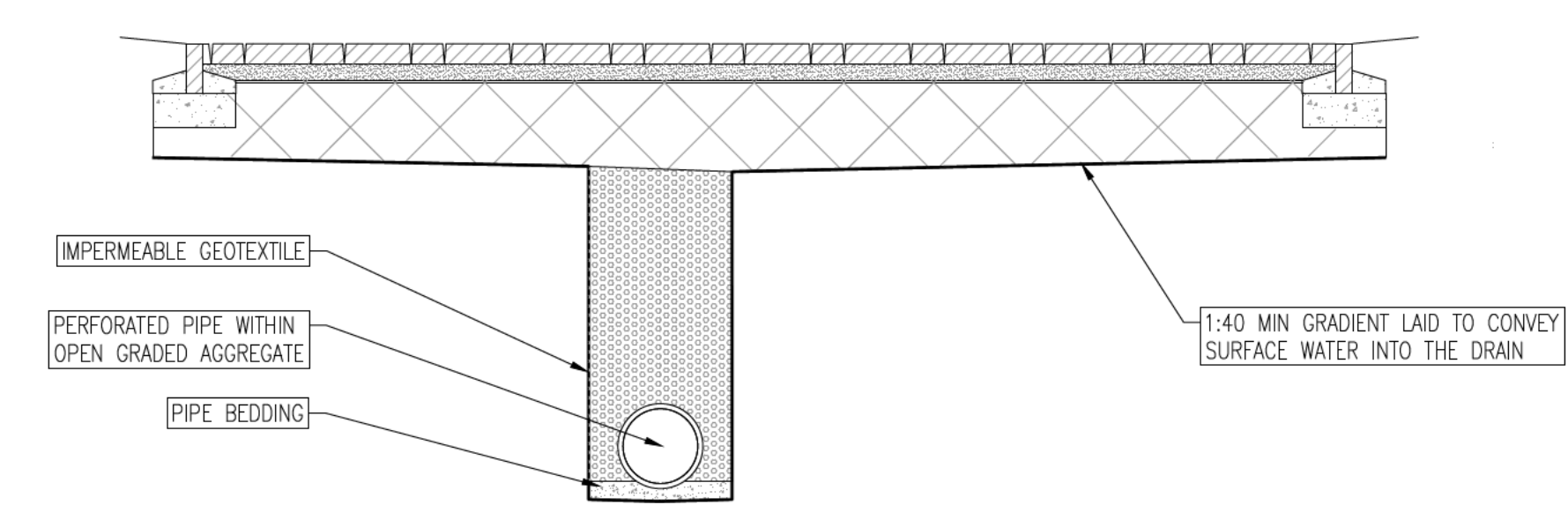


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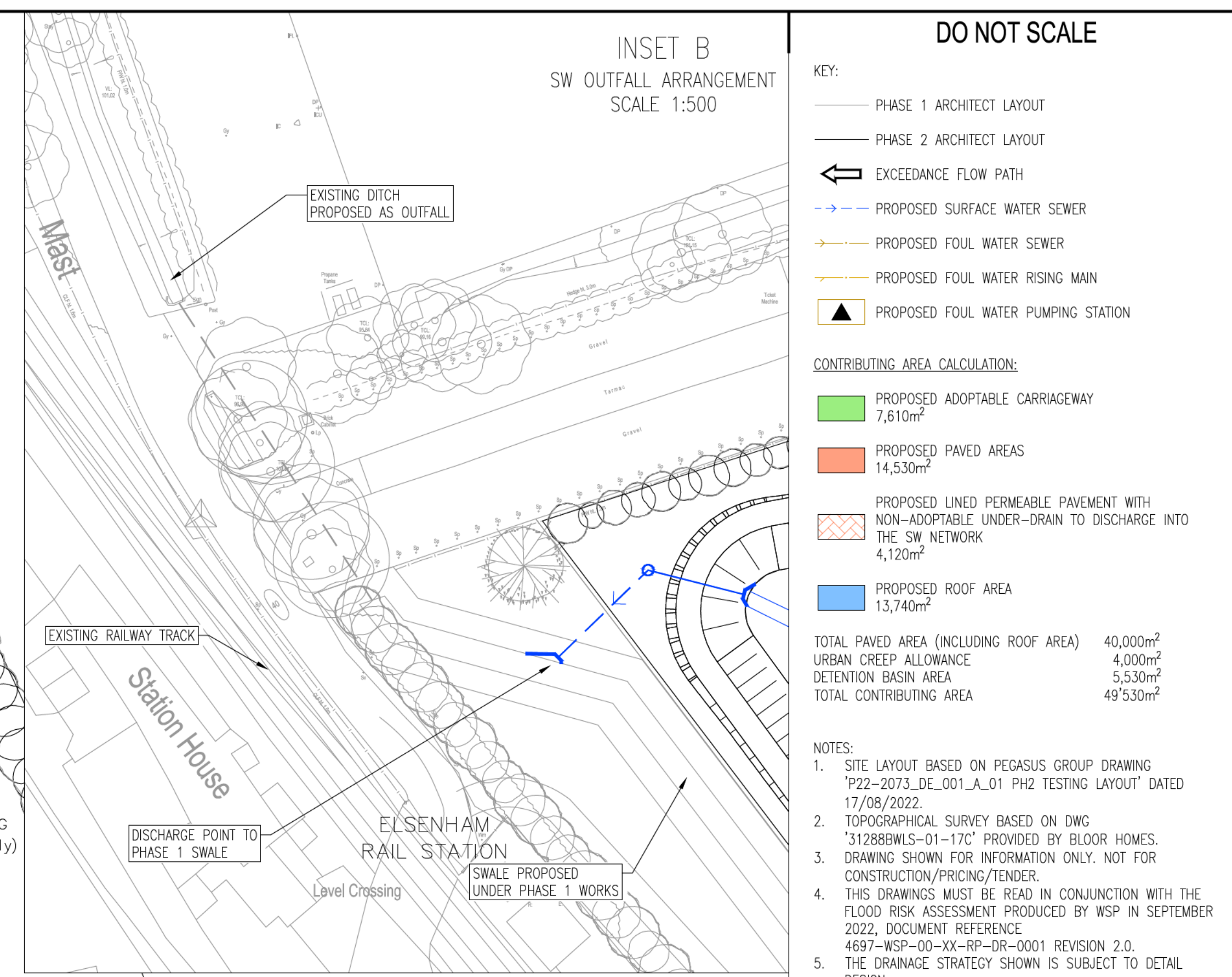
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APPENDIX A

INSET A
TYPICAL PERMEABLE PAVING ARRANGEMENT
NOT TO SCALE



INSET B
SW OUTFALL ARRANGEMENT
SCALE 1:500



DO NOT SCALE

KEY:

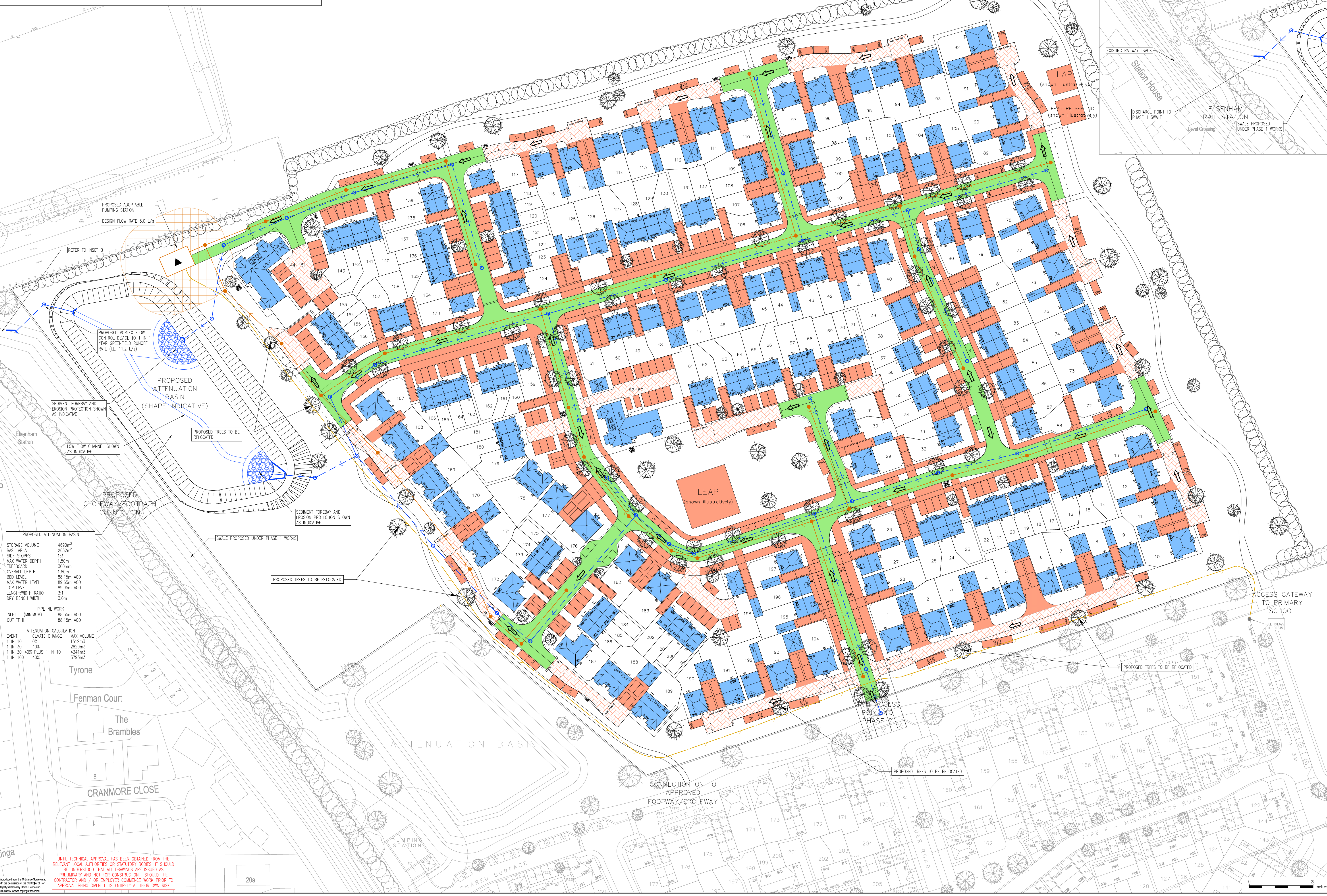
- PHASE 1 ARCHITECT LAYOUT
- PHASE 2 ARCHITECT LAYOUT
- EXCESSANCE FLOW PATH
- PROPOSED SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL WATER RISING MAIN
- PROPOSED FOUL WATER PUMPING STATION

CONTRIBUTING AREA CALCULATION:

- PROPOSED ADAPTABLE CARRIAGEWAY 7.610m²
- PROPOSED PAVED AREAS 14.530m²
- PROPOSED LINED PERMEABLE PAVEMENT WITH NON-ADAPTABLE UNDER-DRAIN TO DISCHARGE INTO THE SW NETWORK 4.120m²
- PROPOSED ROOF AREA 13.740m²

TOTAL PAVED AREA (INCLUDING ROOF AREA) 40.000m²
 URBAN CREEP ALLOWANCE 4.000m²
 DETENTION BASIN AREA 5.530m²
 TOTAL CONTRIBUTING AREA 49.530m²

- NOTES:
- SITE LAYOUT BASED ON PEGASUS GROUP DRAWING 'P22-2073_DE_001_A_01 PH2 TESTING LAYOUT' DATED 17/08/2022.
 - TOPOGRAPHICAL SURVEY BASED ON DWG '312888ULS-01-17C' PROVIDED BY BLOOR HOMES.
 - DRAWING SHOWN FOR INFORMATION ONLY. NOT FOR CONSTRUCTION/PRICING/TENDER.
 - THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE FLOOD RISK ASSESSMENT PRODUCED BY WSP IN SEPTEMBER 2022. DOCUMENT REFERENCE: 4697-WSP-00-XX-SK-001 REVISION 2.0.
 - THE DRAINAGE STRATEGY SHOWN IS SUBJECT TO DETAIL DESIGN.
 - ONLY SEWER MAINS ARE SHOWN.
 - ALL SEWER MAINS TO BE DESIGNED TO ADAPTABLE STANDARDS.
 - FOUL PUMPING STATION TO BE DESIGNED TO ADAPTABLE STANDARDS. PROPOSED DESIGN PUMPING FLOW 5.0 L/S.
 - DISCHARGE POINT TO BE LOCATED WITHIN PROPOSED PHASE 1 GRAVITY NETWORK. PHASE 1 NETWORK TO DISCHARGE INTO EXISTING THAMES WATER FOUL NETWORK.
 - LINSON WITH THAMES WATER ONGOING TO CONFIRM AVAILABLE CAPACITY WITHIN THEIR NETWORK.
 - PROPOSED PERMEABLE PAVEMENT TO BE LINED AND TO DISCHARGE VIA PERFORATED PIPE TO THE PROPOSED SW SYSTEM.
 - PROPOSED ATTENUATION BASIN SHAPE IS INDICATIVE. SUBJECT TO DETAIL DESIGN AND INPUT FROM OTHER DISCIPLINES.
 - EASEMENTS REQUIRED WHERE SEWER MAINS ARE NOT RUNNING UNDER PUBLIC HIGHWAY.
 - LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS STATED OTHERWISE. DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.



PROPOSED ATTENUATION BASIN

| | |
|--------------------|--------------------|
| STORAGE VOLUME | 4690m ³ |
| BASE AREA | 2652m ² |
| SIDE SLOPES | 1:3 |
| MAX WATER DEPTH | 1.50m |
| FREEBOARD | 300mm |
| OVERALL DEPTH | 1.80m |
| RFD LEVEL | 89.15m AOD |
| MAX WATER LEVEL | 89.65m AOD |
| TOP LEVEL | 89.95m AOD |
| LENGTH:WIDTH RATIO | 3:1 |
| DRY BENCH WIDTH | 3.0m |

PPE NETWORK

| | |
|---------------------|------------|
| INLET I/L (MINIMUM) | 88.35m AOD |
| OUTLET I/L | 88.15m AOD |

ATTENUATION CALCULATION

| EVENT | CLIMATE CHANGE | MAX VOLUME |
|--------------------------|----------------|--------------------|
| 1 IN 10 | 0% | 1512m ³ |
| 1 IN 30 | 40% | 2829m ³ |
| 1 IN 50+40% PLUS 1 IN 10 | | 4341m ³ |
| 1 IN 100 | 40% | 3793m ³ |

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|-----|------------|-----|-------------------------|
| P02 | 02/12/2022 | AS | UPDATED TO LFA COMMENTS |
| P01 | 23/09/2022 | MSF | FIRST ISSUE |
| REV | DATE | BY | DESCRIPTION |
| | | | |
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|-------------|---|-----------|-----|-----------|-------------|
| CUSTOMER: | BLOOR HOMES | | | | |
| ARCHITECT: | PEGASUS GROUP | | | | |
| PROJECT: | ELSENHAM PHASE 2 | | | | |
| TITLE: | FLOOD RISK ASSESSMENT APPENDIX G PROPOSED DRAINAGE STRATEGY | | | | |
| SCALE: A0 | 1:500 | CHECKED: | MSF | APPROVED: | JG |
| PROJECT NO: | 70084697 | DESIGNED: | MSF | DATE: | December 22 |
| DRAWING NO: | 4697-WSP-00-XX-SK-D-0902 | REV: | P02 | | |

UNLESS TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK.