

## TN02 – Further Information on Site Drainage

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### 1.0 Introduction

- 1.1 This Technical Note has been produced to provide further information on the effects of the existing site's drainage on the established soakaway system.
- 1.2 This follows Motion's previous technical note (TN01, dated 21<sup>st</sup> May 2026), which presented the approach to the drainage for the proposed development on site and was produced to discharge Conditions 6 and 7 of AWDM/0949/22. TN01 acknowledged that the site does not benefit from a positive outfall, and soakage testing in on-site trial puts suggested infiltration is not viable. These constraints materially limited the extent to which a drainage strategy could fully align with current national SuDS standards and the aspirations of the NPPF.
- 1.3 In response, the drainage strategy proposed reflected a pragmatic and proportionate approach to the known site constraints and looked to only serve the areas of the site that will undergo change and redevelopment, in line with the then-current 2025 NPPF, Paragraph 182 (Section F8, Paragraph 1 of the August 2026 NPPF). The proposed drainage solution utilised permeable paving with subbase attenuation, partial infiltration (when conditions allow), and controlled discharge to the existing soakaway system.
- 1.4 This approach was demonstrated to deliver significant betterment over the existing situation, and this directly satisfies Worthing and Adur's policy requirements on brownfield sites, which must provide at least 50% betterment. Discharge rates in the proposed development are significantly reduced compared to the runoff rates from the equivalent existing site areas, achieving up to 89% betterment, thereby reducing surface water runoff and associated flood risk.
- 1.5 The proposed development also reduces impermeable area overall and replaces poorly functioning drainage infrastructure with a modern, maintainable system.
- 1.6 It was this approach, which was discussed in TN01, supported by full discussion and evidence, that was submitted to Adur and Worthing Councils for their regulatory review, which would be carried out by their consulting partners, WSP.
- 1.7 WSP expressed concern over whether the existing soakaways were a suitable point of surface water discharge. WSP accepted that although the existing building and surrounds discharges to soakaways, it was unlikely that they were designed in accordance with current day standards. WSP also highlighted that the drainage calculations provided in TN01 only referred to the areas undergoing change and did not include the whole site area that was discharging to the soakaways. Finally, WSP asked for confirmation that FEH2022 data had been used and requested that small scale SuDS features such as water butts be indicated on the drainage plans.
- 1.8 With WSP's above queries outstanding, they recommended that Condition 6 was not discharged and, because the submitted drainage management and maintenance plan for Condition 7 pertained to the proposed drainage system, WSP were also unable to recommend discharge of Condition 7.
- 1.9 In response to this, dialogue was had between Motion and WSP. It was discussed that, following the approval of the Section 73 application, which consented demolition and enabling works to take place prior to condition discharge, the development already commencing to that extent. The existing garages and parking areas has been demolished, and Motion expressed concern that this part of Penstone Close would be in (and would remain in) a state of uncertainty until Condition 6 was discharged, but was unable to do so in the context of the New National Standards for SuDS.
- 1.10 WSP kindly responded by stating that *"we acknowledge the difficulties and limited options for this site but recognise that the proposed situation will be better than existing. On the basis that you are proposing water butts and tanked permeable paving which will provide storage on top of the existing soakaways, we are willing*

*to accept these principles and method of surface water discharge. As per the comments in our previous response, please could you provide updated calculations for the total contributing area (the existing and proposed roof areas) using FEH22 rainfall data. We understand that any excess surface water will be stored safely on site but any additional information you can provide on flood risk mitigation would be useful. Once we have received this, we will formally review and provide a response.”*

- 1.11 In response to this, this technical note will provide calculations for the total drained area (existing and unchanged as well as new and attenuated areas). We can confirm that these calculations have been developed using FEH2022 data.
- 1.12 The position of the proposed water butts will also be indicated on the drainage layout plan, and the drainage management and maintenance plan will be re-submitted to allow for the discharge of Condition 7.
- 1.13 This information is provided and discussed in the section, below.

## 2.0 Discussion

### FEH2022 Data use within the calculations

- 2.1 We can confirm that FEH2022 data has been used in the hydraulic calculations supporting TN01 and the current document, although the printed MicroDrainage results state that FEH2013 has been used. The reason for this apparent discrepancy is explained below.
- 2.2 The issue relates to the compatibility of FEH2022 data with MicroDrainage, and the FEH data import structure used by the software. Within MicroDrainage, two FEH data import structures are available for selection: FEH1999 and FEH2013. Different FEH datasets correspond to different import structures, with each structure utilising its own data processing protocol. Consequently, selecting FEH1999 or FEH2013 within MicroDrainage does not indicate which rainfall dataset is being used; rather, it refers to the import structure and associated data processing protocol that is being used to interpret the data.
- 2.3 The FEH1999 data processing protocol cannot be used with FEH2013 data, and vice versa. Although an FEH2022 import structure is not available as a selectable option within MicroDrainage, this does not present a problem because FEH2022 needs the same import structure and data processing protocol as FEH2013. As a result, FEH2022 data can be imported and used within MicroDrainage, but it will be reported as FEH2013 because this is the import structure and data processing protocol through which the data has been interpreted by the software.
- 2.4 This means that data that is listed in the printed MicroDrainage results (i.e. FEH2013) is not necessarily a representation of the exact FEH dataset that has been used. In the case of the calculations and MicroDrainage printouts submitted within TN01 and this document, it is listed as FEH2013 data, but we can confirm that FEH2022 has been used. The full dataset is available in [Appendix A](#) for review. As a result, we request that this aspect of the objection is reconsidered and withdrawn.

### MicroDrainage Network Hydraulic Model Calculations

- 2.5 In TN01, it was shown that surface water runoff from the 411m<sup>2</sup> of new impermeable and developed areas would be attenuated and restricted to a maximum runoff rate of 1.8 l/s in all rainfall events. The MicroDrainage Network Hydraulic modelling outputs for this that were supplied in TN01 have also been included in [Appendix B](#) for ease of reference.
- 2.6 WSP have requested that the existing areas of the site that will remain unchanged and have an existing surface water drainage connection to the soakaways also be included. Therefore, the MicroDrainage Network hydraulic model has been updated to include the extra 699m<sup>2</sup> of the existing site and apartment block that will remain unchanged and will continue to drain as it does currently. The outputs of this hydraulic model can be reviewed in [Appendix C](#).

- 2.7 These results show that total surface water runoff from the existing site areas plus the 1.8 l/s from the newly developed areas results is 54.7 l/s (32.9 l/s + 21.8 l/s) in the critical 1 in 100-year + 45% storm.
- 2.8 This is significant, because while the 411m<sup>2</sup> of newly developed areas make up 37% of the total impermeable areas on site, they only contribute 3.3% of the total surface water runoff entering the soakaways in the critical 1 in 100-year + 45% storm.
- 2.9 It can also be estimated that if 63% of the site's impermeable areas contribute 52.9 l/s to the total post-development surface water runoff (54.7 l/s minus 1.8 l/s), then without attenuation the 411m<sup>2</sup> and remaining 37% of the site's impermeable areas would provide surface water runoff rates of up to 31.1 l/s. It is within this light that the betterment and overall surface water runoff reduction on site can be appreciated; 1.8 l/s is just 5.8% of 31.1 l/s, which means that the proposals represent at 94.2% betterment over the unrestricted situation. This accords with Worthing and Adur's policy requirements on brownfield sites, which must provide at least 50% betterment.

### Soakaway Performance

- 2.10 The MicroDrainage Network model outputs in [Appendices B and C](#) that no outfall has been provided as part of the drainage system. The modelling has sought to solely provide calculations of total pipe flow and the substantial improvement that the proposals will bring to the overall surface water runoff rates on site.
- 2.11 It is known that the existing soakaways are brick built, square section structures that are 2.1m square and approximately 2.6m deep. While these metrics are known, there is no information on the infiltration coefficients of these structures.
- 2.12 This is the reason for not including the effect of the soakaways within the hydraulic modelling; any infiltration coefficients apportioned to them would be speculative, and not a true representation of their ability to discharge surface water to ground.
- 2.13 We do know that groundwater is not an issue in this area and, through winter-long groundwater monitoring, we know that groundwater did not rise above 4.53 mBGL. We also know that the soakaways are performing well and have done so since their installation more than 50 years ago. Their present-day performance will also be as a result of their established position and use, which could reasonably be expected to not be reflected in the site-specific BRE365 soakage tests undertaken on site on the 25th and 26th November 2025.
- 2.14 There are many reasons for this. The existing soakaways have been in operation for several decades, and the soakaways and the surrounding ground are likely to have become hydraulically conditioned through repeated wetting and drainage cycles. This process can establish and maintain preferential flow pathways, such as fissures, root channels and other natural voids within the surrounding strata, while also flushing fine particles from the infiltration interface that would otherwise impede infiltration. By comparison, a fresh trial pit exposes previously undisturbed soil and may be affected by excavation disturbance, fine particle smearing, and less well-developed flow pathways. Consequently, long-established soakaways can produce higher infiltration rates than those obtained from a new trial pit, reflecting the enhanced hydraulic connectivity that has developed around the existing feature over time.
- 2.15 We expect that this is the case for the existing soakaways. Noting that the proposed scheme delivers significant betterment (as shown above) there should be confidence that the development will reduce the burden on the existing soakaways and there will be an overall improvement in system performance due to blocked and poorly performing infrastructure being removed, and all infrastructure (new and existing) will be operated under the auspices of a management and maintenance plan.

## 3.0 Revisiting the NPPF and the New National Standards for SuDS

- 3.1 Section F8, Paragraph 1 of the August 2026 NPPF states that:

*“Development proposals which could affect drainage on or around the development site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, in ways which are proportionate to the nature and scale of the proposal.”*

3.2 Therefore, if a development scheme or part of it will not alter or increase surface water runoff, Paragraph 1 of Section F8 of the August 2026 NPPF is not engaged and a drainage/SuDS strategy does not need to be provided. This is the case for the upwards extension to the block of flats, which will be built upon the existing structure of the block of flats and will not increase or alter the footprint of this structure.

3.3 This principle is augmented by the advice of the New National Standards for SuDS. The National Standards for SuDS confirm that they are not designed to apply to retrofit schemes, noting that retrofit projects “often have different objectives and face broader constraints” and that full compliance may not be achievable. In retrofit contexts, the standards serve as a “starting point” only. Specifically, the National Standards for SuDS state:

*“It is important to acknowledge that constraints specific to retrofit projects may prevent the full application of the standards.”*

3.4 This means that the New National Standards for SuDS cannot be mandatorily applied to retrofit projects such as that of the upward extension to the block of flats.

3.5 Therefore, the drainage strategy only considering the area of the new outwards extension to the block of flats (138m<sup>2</sup>) and the areas of new parking (spaces 1 – 7, 8 – 20, and 21 – 24 and the visitor parking space on the development layout plan in [Appendix B](#), which total 273m<sup>2</sup>) is a laudable and policy compliant approach.

## 4.0 Drainage Strategy Amendments

4.1 As noted in Section 1.0, WSP broadly support the approach proposed by Motion. However, they have requested that the locations of the water butts are added to the plans so that they can be captured within the planning consent and any associated planning conditions or legal obligations relating to the development.

4.2 The location of the water butts has been added to the drainage strategy layout plan, and this updated drawing can be seen in [Appendix D](#) of this technical note.

## 5.0 Residual Risk and Infrastructure Maintenance

5.1 Condition 7 of planning consent AWDM/0949/22 requires details of the long-term maintenance and management strategy for the development’s surface water drainage.

5.2 A drainage management and maintenance plan designed to achieve this was submitted with TN01, but WSP were unable to discharge Condition 7 due to the outstanding questions on Condition 6 and the drainage strategy.

5.3 Now that these issues are moving to resolution, we have included the drainage management and maintenance plan in [Appendix E](#) for further review. The purpose of this document is to ensure that those responsible for site maintenance have a robust inspection and maintenance plan going forwards. This will help ensure the optimum operation of the surface water drainage system and that it will be regularly maintained for the lifetime of the development. This will contribute to reducing the risk of surface water flooding both on- and off-site.

## 6.0 Mitigation of Residual Flood Risk

6.1 WSP have acknowledged that any excess surface water will be stored safely on site but requested that any additional information that can be provided on flood risk mitigation would be useful.

6.2 In this regard, it is considered that a ‘do minimum’ approach is appropriate. This is based on local topographic levels and infrastructure that will be in place.

- 6.3 Topographic levels on and around the site were investigated using LiDAR data, and the outputs of this can be seen in the topographic heat map in [Appendix F](#). This map shows that the lowest levels on site are around the access road and its northern extent where it joins Penstone Close. Levels here are 8.1 metres Above Ordnance Datum (mAOD).
- 6.4 Ground levels rise from here in all directions so that St John's Court and the block of flats opposite are at ground levels of 8.3 to 8.4 mAOD. Penstone Close to the north is higher still at 8.6 mAOD or higher. Similarly, there is an area of high ground to the south at 8.5 mAOD that would restrict surface water flow in this direction.
- 6.5 The vehicle access and parking spaces will be bounded by HB2 kerbs with 125mm faces, and these will contain surface water ponding within these areas. This confirms that excess surface water would be retained on site and would accumulate in existing highway areas.
- 6.6 Therefore, between the topography and the HB2 kerbs, there is negligible risk of surface water impacting either existing or new residential accommodation. As such, no further mitigation is needed in terms of flood risk.

## 7.0 Conclusion

- 7.1 This Technical Note has been prepared in response to WSP's review comments on the surface water drainage strategy submitted under Conditions 6 and 7 of planning permission AWD/0949/22. It provides further clarification regarding the use of FEH2022 rainfall data, the contribution of existing and proposed site areas to runoff, the performance of the existing soakaway system, and the long-term management of the proposed drainage infrastructure.
- 7.2 The site is subject to significant drainage constraints. It does not benefit from a positive point of discharge and site-specific BRE365 testing indicated that infiltration drainage would not be viable if assessed solely against contemporary standards. In response, the drainage strategy has been developed as a pragmatic and proportionate solution focused on the areas of the site undergoing redevelopment, in accordance with Paragraph 182 of the NPPF. The proposed approach utilises permeable paving with sub-base attenuation storage, limited infiltration where conditions permit, water butts, and controlled discharge to the existing soakaway system.
- 7.3 It is confirmed that FEH2022 rainfall data has been used in all hydraulic calculations supporting both TN01 and this Technical Note. Although the MicroDrainage outputs identify FEH2013 within the model printouts, this relates only to the software's import structure and data processing protocol and is not representative of the rainfall dataset used. The calculations have therefore been undertaken using the correct FEH2022 rainfall information.
- 7.4 The hydraulic model has been updated to include both the proposed drainage system and the existing areas of the site that will remain unchanged and continue to discharge to the established soakaway network. The results demonstrate that the newly developed areas contribute only 1.8 l/s to the total runoff entering the soakaways during the critical 1 in 100-year plus 45% climate change event, despite representing approximately 37% of the site's impermeable area. Compared with the equivalent unrestricted runoff rate, this represents approximately 94.2% betterment and significantly exceeds the minimum 50% betterment requirement for brownfield development within Adur and Worthing.
- 7.5 Although the infiltration capacity of the existing soakaways cannot be quantified with certainty, there is clear evidence that they have operated successfully for more than fifty years without known flooding issues. It is also reasonable to conclude that their long-term performance is likely to exceed that indicated by recent trial pit testing due to decades of hydraulic conditioning and the development of preferential subsurface flow pathways within the surrounding ground. Importantly, the proposed development will reduce the hydraulic burden placed upon these structures through substantial runoff attenuation and the replacement of ageing drainage infrastructure with a modern, maintainable system.

- 7.6 The locations of the proposed water butts have now been incorporated into the drainage layout, and the drainage management and maintenance plan has been re-submitted in support of Condition 7. Overall, the proposed drainage strategy represents a proportionate, policy-compliant and deliverable response to the site's constraints, provides significant betterment over the existing situation, and is considered sufficient to support the discharge of Conditions 6 and 7.
- 7.7 WSP has acknowledged that any excess surface water generated by the development will be safely stored on site and requested additional information on flood risk mitigation. A proportionate 'do minimum' approach is considered appropriate, based on the site's existing topography and proposed infrastructure. LiDAR topographic analysis shows that the lowest part of the site is along the access road and at its junction with Penstone Close, where levels are approximately 8.1m AOD. Ground levels rise away from this location in all directions, with St John's Court and neighbouring flats situated at approximately 8.3 to 8.4m AOD.
- 7.8 Further containment is provided by site infrastructure. Penstone Close lies at 8.6m AOD or above, while higher ground to the south restricts surface water flow in that direction. Vehicle access and parking areas will be bounded by HB2 kerbs with 125mm upstands, ensuring any temporary ponding remains contained within highway areas on site. Consequently, surface water presents a negligible risk to existing or proposed residential properties, and no additional flood mitigation measures are considered necessary.

## Appendix A

FEH2022 Full Dataset

| VERSION               | Parameters      | "TEH Web Service (2.13.9615.22806)" Version | 1.0.0                | exported at           | 10:35:58 GMT          | Thu                   | 21-May-26             |                       |                        |                        |                        |                        |                         |                          |
|-----------------------|-----------------|---------------------------------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|--------------------------|
| Rainfall model:       | Design rainfall | Typical point in catchment                  | GB                   | 518400                | 104350 TQ 18400 04350 |                       |                       |                       |                        |                        |                        |                        |                         |                          |
| Calculation type:     | Design rainfall | Typical point in catchment                  | GB                   | 518400                | 104350 TQ 18400 04350 |                       |                       |                       |                        |                        |                        |                        |                         |                          |
| Calculation mode:     | Design rainfall | Typical point in catchment                  | GB                   | 518400                | 104350 TQ 18400 04350 |                       |                       |                       |                        |                        |                        |                        |                         |                          |
| Calculation location: | Design rainfall | Typical point in catchment                  | GB                   | 518400                | 104350 TQ 18400 04350 |                       |                       |                       |                        |                        |                        |                        |                         |                          |
| Catchment area:       | Design rainfall | Typical point in catchment                  | GB                   | 518400                | 104350 TQ 18400 04350 |                       |                       |                       |                        |                        |                        |                        |                         |                          |
| Fixed duration:       | Design rainfall | Typical point in catchment                  | GB                   | 518400                | 104350 TQ 18400 04350 |                       |                       |                       |                        |                        |                        |                        |                         |                          |
| Annual maximum:       | Design rainfall | Typical point in catchment                  | GB                   | 518400                | 104350 TQ 18400 04350 |                       |                       |                       |                        |                        |                        |                        |                         |                          |
| Duration hours        | Duration days   | 2 year rainfall (mm)                        | 5 year rainfall (mm) | 10 year rainfall (mm) | 20 year rainfall (mm) | 30 year rainfall (mm) | 50 year rainfall (mm) | 75 year rainfall (mm) | 100 year rainfall (mm) | 150 year rainfall (mm) | 200 year rainfall (mm) | 500 year rainfall (mm) | 1000 year rainfall (mm) | 10000 year rainfall (mm) |
| 0.25                  | 0.01            | 7.44                                        | 11.88                | 14.88                 | 21.77                 | 23.91                 | 29.62                 | 31.77                 | 34.63                  | 36.15                  | 37.68                  | 41.81                  | 46.12                   | 50.30                    |
| 0.50                  | 0.02            | 9.94                                        | 15.89                | 19.87                 | 29.63                 | 32.53                 | 39.59                 | 41.97                 | 43.65                  | 45.15                  | 46.68                  | 50.81                  | 55.12                   | 59.30                    |
| 0.75                  | 0.03            | 11.44                                       | 18.39                | 22.37                 | 33.14                 | 36.06                 | 43.12                 | 45.50                 | 47.18                  | 48.68                  | 50.18                  | 54.31                  | 58.62                   | 62.80                    |
| 1.00                  | 0.04            | 12.75                                       | 20.30                | 24.28                 | 35.29                 | 38.20                 | 45.26                 | 47.64                 | 49.32                  | 50.82                  | 52.32                  | 56.45                  | 60.76                   | 65.07                    |
| 1.25                  | 0.05            | 14.23                                       | 22.37                | 26.35                 | 37.39                 | 40.30                 | 47.36                 | 49.74                 | 51.42                  | 52.92                  | 54.42                  | 58.55                  | 62.86                   | 67.17                    |
| 1.50                  | 0.06            | 15.70                                       | 24.44                | 28.42                 | 39.48                 | 42.39                 | 49.54                 | 51.92                 | 53.60                  | 55.10                  | 56.60                  | 60.73                  | 65.04                   | 69.35                    |
| 1.75                  | 0.07            | 17.10                                       | 26.57                | 30.55                 | 41.57                 | 44.58                 | 51.64                 | 54.02                 | 55.70                  | 57.20                  | 58.70                  | 62.83                  | 67.14                   | 71.45                    |
| 2.00                  | 0.08            | 18.38                                       | 27.96                | 31.83                 | 42.83                 | 45.83                 | 52.87                 | 55.25                 | 56.93                  | 58.43                  | 59.93                  | 64.06                  | 68.37                   | 72.68                    |
| 2.25                  | 0.09            | 19.39                                       | 28.98                | 32.84                 | 43.84                 | 46.84                 | 53.88                 | 56.26                 | 57.94                  | 59.44                  | 60.94                  | 65.07                  | 69.38                   | 73.69                    |
| 2.50                  | 0.10            | 20.30                                       | 29.67                | 33.53                 | 44.53                 | 47.53                 | 54.57                 | 56.95                 | 58.63                  | 60.13                  | 61.63                  | 65.76                  | 70.00                   | 74.31                    |
| 2.75                  | 0.11            | 21.12                                       | 30.66                | 34.52                 | 45.52                 | 48.52                 | 55.56                 | 58.04                 | 59.72                  | 61.22                  | 62.72                  | 66.85                  | 71.16                   | 75.47                    |
| 3.00                  | 0.13            | 21.88                                       | 31.01                | 34.86                 | 45.86                 | 48.86                 | 55.90                 | 58.24                 | 59.92                  | 61.42                  | 62.92                  | 67.00                  | 71.31                   | 75.62                    |
| 3.25                  | 0.14            | 22.57                                       | 32.38                | 35.82                 | 46.85                 | 49.85                 | 56.89                 | 59.23                 | 60.91                  | 62.41                  | 63.91                  | 68.00                  | 72.16                   | 76.47                    |
| 3.50                  | 0.15            | 23.22                                       | 33.14                | 36.76                 | 47.76                 | 50.76                 | 57.88                 | 60.12                 | 61.80                  | 63.30                  | 64.80                  | 68.89                  | 73.01                   | 77.32                    |
| 3.75                  | 0.16            | 23.81                                       | 33.94                | 37.54                 | 48.54                 | 51.54                 | 58.67                 | 60.91                 | 62.59                  | 64.09                  | 65.59                  | 69.68                  | 73.86                   | 78.17                    |
| 4.00                  | 0.17            | 24.37                                       | 34.69                | 38.29                 | 49.29                 | 52.29                 | 59.41                 | 61.64                 | 63.32                  | 64.82                  | 66.32                  | 70.41                  | 74.61                   | 78.98                    |
| 4.25                  | 0.18            | 24.89                                       | 35.09                | 38.69                 | 49.69                 | 52.69                 | 59.81                 | 62.04                 | 63.72                  | 65.22                  | 66.72                  | 70.81                  | 75.01                   | 79.38                    |
| 4.50                  | 0.19            | 25.38                                       | 35.49                | 39.09                 | 49.99                 | 53.09                 | 60.21                 | 62.44                 | 64.12                  | 65.62                  | 67.12                  | 71.21                  | 75.41                   | 79.78                    |
| 4.75                  | 0.20            | 25.83                                       | 36.17                | 39.77                 | 50.17                 | 53.27                 | 60.56                 | 62.79                 | 64.47                  | 65.97                  | 67.47                  | 71.56                  | 75.76                   | 80.18                    |
| 5.00                  | 0.21            | 26.27                                       | 36.67                | 40.27                 | 50.71                 | 53.81                 | 61.06                 | 63.27                 | 64.97                  | 66.47                  | 67.97                  | 71.96                  | 76.16                   | 80.58                    |
| 5.25                  | 0.22            | 26.68                                       | 37.14                | 40.76                 | 51.29                 | 54.39                 | 61.64                 | 63.85                 | 65.55                  | 67.05                  | 68.55                  | 72.36                  | 76.56                   | 80.98                    |
| 5.50                  | 0.23            | 27.07                                       | 37.59                | 41.19                 | 51.88                 | 54.98                 | 62.23                 | 64.43                 | 66.13                  | 67.63                  | 69.13                  | 72.76                  | 76.96                   | 81.38                    |
| 5.75                  | 0.24            | 27.44                                       | 38.02                | 41.62                 | 52.47                 | 55.57                 | 62.81                 | 65.01                 | 66.71                  | 68.21                  | 69.71                  | 73.16                  | 77.36                   | 81.78                    |
| 6.00                  | 0.25            | 27.79                                       | 38.42                | 42.05                 | 53.06                 | 56.16                 | 63.39                 | 65.59                 | 67.29                  | 68.79                  | 70.29                  | 73.56                  | 77.76                   | 82.18                    |
| 6.25                  | 0.26            | 28.12                                       | 38.81                | 42.48                 | 53.65                 | 56.75                 | 63.97                 | 66.17                 | 67.87                  | 69.37                  | 70.87                  | 73.96                  | 78.16                   | 82.58                    |
| 6.50                  | 0.27            | 28.44                                       | 39.19                | 42.91                 | 54.24                 | 57.34                 | 64.56                 | 66.76                 | 68.46                  | 69.96                  | 71.46                  | 74.35                  | 78.56                   | 82.98                    |
| 6.75                  | 0.28            | 28.74                                       | 39.54                | 43.34                 | 54.83                 | 57.93                 | 65.15                 | 67.35                 | 69.05                  | 70.55                  | 71.95                  | 74.74                  | 78.94                   | 83.38                    |
| 7.00                  | 0.29            | 29.04                                       | 39.89                | 43.77                 | 55.42                 | 58.52                 | 65.74                 | 67.94                 | 69.64                  | 71.14                  | 72.54                  | 75.33                  | 79.33                   | 83.78                    |
| 7.25                  | 0.30            | 29.32                                       | 40.23                | 44.20                 | 56.01                 | 59.11                 | 66.33                 | 68.53                 | 70.23                  | 71.73                  | 73.13                  | 75.92                  | 79.72                   | 84.18                    |
| 7.50                  | 0.31            | 29.59                                       | 40.54                | 44.63                 | 56.60                 | 59.70                 | 66.92                 | 69.12                 | 70.82                  | 72.32                  | 73.72                  | 76.51                  | 80.12                   | 84.58                    |
| 7.75                  | 0.32            | 29.85                                       | 40.85                | 45.06                 | 57.19                 | 60.29                 | 67.51                 | 69.71                 | 71.41                  | 72.91                  | 74.31                  | 77.10                  | 80.51                   | 84.98                    |
| 8.00                  | 0.33            | 30.11                                       | 41.15                | 45.49                 | 57.78                 | 60.88                 | 68.10                 | 70.30                 | 71.80                  | 73.30                  | 74.70                  | 77.49                  | 80.90                   | 85.38                    |
| 8.25                  | 0.34            | 30.36                                       | 41.44                | 45.92                 | 58.37                 | 61.47                 | 68.69                 | 70.89                 | 72.39                  | 73.89                  | 75.29                  | 78.08                  | 81.30                   | 85.78                    |
| 8.50                  | 0.35            | 30.59                                       | 41.73                | 46.35                 | 58.96                 | 62.06                 | 69.28                 | 71.48                 | 72.98                  | 74.48                  | 75.88                  | 78.67                  | 81.69                   | 86.18                    |
| 8.75                  | 0.36            | 30.82                                       | 42.02                | 46.78                 | 59.55                 | 62.65                 | 69.87                 | 72.07                 | 73.57                  | 75.07                  | 76.47                  | 79.26                  | 82.09                   | 86.58                    |
| 9.00                  | 0.38            | 31.05                                       | 42.27                | 47.21                 | 60.14                 | 63.24                 | 70.46                 | 72.66                 | 74.16                  | 75.66                  | 77.06                  | 79.85                  | 82.49                   | 86.98                    |
| 9.25                  | 0.39            | 31.27                                       | 42.52                | 47.64                 | 60.73                 | 63.83                 | 71.05                 | 73.25                 | 74.75                  | 76.25                  | 77.65                  | 80.44                  | 82.89                   | 87.38                    |
| 9.50                  | 0.40            | 31.49                                       | 42.81                | 48.07                 | 61.32                 | 64.42                 | 71.64                 | 73.84                 | 75.34                  | 76.84                  | 78.24                  | 81.03                  | 83.29                   | 87.78                    |
| 9.75                  | 0.41            | 31.69                                       | 43.01                | 48.49                 | 61.91                 | 65.01                 | 72.23                 | 74.43                 | 75.93                  | 77.43                  | 78.83                  | 81.62                  | 83.69                   | 88.18                    |
| 10.00                 | 0.42            | 31.89                                       | 43.26                | 48.92                 | 62.50                 | 65.60                 | 72.82                 | 75.02                 | 76.52                  | 78.02                  | 79.42                  | 82.21                  | 84.09                   | 88.58                    |
| 10.25                 | 0.43            | 32.09                                       | 43.51                | 49.35                 | 63.09                 | 66.19                 | 73.41                 | 75.61                 | 77.11                  | 78.61                  | 80.01                  | 82.80                  | 84.49                   | 88.98                    |
| 10.50                 | 0.44            | 32.28                                       | 43.74                | 49.78                 | 63.68                 | 66.78                 | 73.99                 | 76.20                 | 77.70                  | 79.20                  | 80.60                  | 83.39                  | 84.89                   | 89.38                    |
| 10.75                 | 0.45            | 32.46                                       | 43.98                | 50.21                 | 64.27                 | 67.37                 | 74.58                 | 76.79                 | 78.29                  | 79.79                  | 81.19                  | 83.98                  | 85.29                   | 89.78                    |
| 11.00                 | 0.46            | 32.65                                       | 44.16                | 50.64                 | 64.86                 | 67.96                 | 75.17                 | 77.38                 | 78.88                  | 80.38                  | 81.78                  | 84.57                  | 85.69                   | 90.18                    |
| 11.25                 | 0.47            | 32.83                                       | 44.37                | 51.07                 | 65.45                 | 68.55                 | 75.76                 | 77.97                 | 79.47                  | 80.97                  | 82.37                  | 85.16                  | 86.09                   | 90.58                    |
| 11.50                 | 0.48            | 33.01                                       | 44.58                | 51.50                 | 66.04                 | 69.14                 | 76.35                 | 78.56                 | 80.06                  | 81.56                  | 82.96                  | 85.75                  | 86.49                   | 90.98                    |
| 11.75                 | 0.49            | 33.18                                       | 44.79                | 51.93                 | 66.63                 | 69.73                 | 76.94                 | 79.15                 | 80.65                  | 82.15                  | 83.55                  | 86.34                  | 86.89                   | 91.38                    |
| 12.00                 | 0.50            | 33.35                                       | 44.98                | 52.36                 | 67.22                 | 70.32                 | 77.53                 | 79.74                 | 81.24                  | 82.74                  | 84.14                  | 86.93                  | 87.29                   | 91.78                    |
| 12.25                 | 0.51            | 33.51                                       | 45.17                | 52.79                 | 67.81                 | 70.91                 | 78.12                 | 80.33                 | 81.83                  | 83.33                  | 84.73                  | 87.52                  | 87.69                   | 92.18                    |
| 12.50                 | 0.52            | 33.67                                       | 45.36                | 53.22                 | 68.40                 | 71.50                 | 78.71                 | 80.92                 | 82.42                  | 83.92                  | 85.32                  | 88.11                  | 88.09                   | 92.58                    |
| 12.75                 | 0.53            | 33.84                                       | 45.55                | 53.65                 | 68.99                 | 72.09                 | 79.30                 | 81.51                 | 83.01                  | 84.51                  | 85.91                  | 88.70                  | 88.49                   | 92.98                    |
| 13.00                 | 0.54            | 33.99                                       | 45.74                | 54.04                 | 69.58                 | 72.68                 | 79.89                 | 82.10                 | 83.60                  | 85.10                  | 86.50                  | 89.29                  | 88.89                   | 93.38                    |
| 13.25                 | 0.55            | 34.15                                       | 45.91                | 54.43                 | 70.17                 | 73.27                 | 80.48                 | 82.69                 | 84.19                  | 85.79                  | 87.19                  | 89.88                  | 89.29                   | 93.78                    |
| 13.50                 | 0.56            | 34.30                                       | 46.09                | 54.82                 | 70.76                 | 73.86                 | 81.07                 | 83.28                 | 84.78                  | 86.38                  | 87.78                  | 90.47                  | 89.69                   | 94.18                    |
| 13.75                 | 0.57            | 34.45                                       | 46.28                | 55.21                 | 71.35                 | 74.45                 | 81.66                 | 83.87                 | 85.37                  | 86.97                  | 88.37                  | 91.06                  | 89.99                   | 94.58                    |
| 14.00                 | 0.58            | 34.60                                       | 46.43                | 55.60                 | 71.94                 | 75.04                 | 82.25                 | 84.46                 | 85.96                  | 87.56                  | 88.96                  | 91.65                  | 90.29                   | 94.98                    |
| 14.25                 | 0.59            | 34.74                                       | 46.60                | 55.99                 | 72.53                 | 75.63                 | 82.84                 | 85.05                 | 86.55                  | 88.15                  | 89.55                  | 92.24                  | 90.59                   | 95.38                    |
| 14.50                 | 0.60            | 34.88                                       | 46.77                | 56.38                 | 73.12                 | 76.22                 | 83.43                 | 85.64                 | 87.14                  | 88.74                  | 90.14                  | 92.83                  | 90.89                   | 95.78                    |
| 14.75                 | 0.61            | 35.02                                       | 46.93                | 56.77                 | 73.71                 | 76.81                 | 84.02                 | 86.23                 | 87.73                  | 89.33                  | 90.73                  | 93.42                  | 91.19                   | 96.18                    |
| 15.00                 | 0.62            | 35.16                                       | 47.09                | 57.16                 | 74.30                 | 77.40                 | 84.61                 | 86.82                 | 88.32                  | 89.92                  | 91.32                  | 94.01                  | 91.49                   | 96.58                    |
| 15.25                 | 0.63            | 35.30                                       | 47.26                | 57.55                 | 74.89                 | 77.99                 | 85.20                 | 87.41                 | 88.93                  | 90.53                  | 91.93                  | 94.60                  | 91.79                   | 96.98                    |
| 15.50                 | 0.64            | 35.43                                       | 47.40                | 57.94                 | 75.48                 | 78.58                 | 85.79                 | 88.02                 | 89.54                  | 91.54                  | 92.54                  | 95.19                  | 92.09                   | 97.38                    |
| 15.75                 | 0.65            | 35.57                                       | 47.55                | 58.33                 | 76.07                 | 79.17                 | 86.38                 | 88.61                 | 90.13                  | 92.13                  | 93.13                  | 95.78                  | 92.39                   | 97.78                    |
| 16.00                 | 0.66            | 35.70                                       | 47.70                | 58.72                 | 76.66                 | 79.76                 | 86.97                 | 89.20                 | 90.72                  | 92.72                  | 93.72                  | 96.37                  | 92.69                   | 98.18                    |
| 16.25                 | 0.67            | 35.82                                       | 47.85                | 59.11                 | 77.25                 | 80.35                 | 87.56                 | 89.79                 | 91.31                  | 93.33                  | 94.33                  | 96.96                  | 92.99                   | 98.58                    |
| 16.50                 | 0.68            | 35.95                                       | 48.00                | 59.50                 | 77.84                 | 80.94                 | 88.15                 | 90.38                 | 91.90                  | 93.92                  | 94.92                  | 97.55                  | 93.29                   | 98.98                    |
| 16.75                 | 0.69            | 36.08                                       | 48.14                | 59.89                 | 78.43                 | 81.53                 | 88.74                 | 90.97                 | 92.49                  | 94.51                  | 95.51                  | 98.14                  | 93.59                   | 99.38                    |
| 17.00                 | 0.70            | 36.20                                       | 48.29                | 60.28                 | 79.02                 | 82.12                 | 89.33                 | 91.56                 | 93.08                  | 95.10                  | 96.10                  | 98.73                  | 93.89                   | 99.78                    |
| 17.25                 | 0.71            | 36.32                                       | 48.43                | 60.67                 | 79.61                 | 82.71                 | 89.92                 | 92.15                 | 93.67                  | 95.69                  | 96.69                  | 99.32                  | 94.19                   | 100.18                   |
| 17.50                 | 0.72            | 36.44                                       | 48.57                | 61.06                 | 80.20                 | 83.30                 | 90.51                 | 92.74                 | 94.26                  | 96.28                  | 97.28                  | 99.91                  | 94.49                   | 100.58                   |
| 17.75                 | 0.73            | 36.56                                       | 48.70                | 61.45                 | 80.79                 | 83.89                 | 91.10                 | 93.33                 | 94.85                  | 96.87                  | 97.87                  | 100.50                 | 94.79                   | 100.98                   |
| 18.00                 | 0.74            | 36.68                                       | 48.84                | 61.84                 | 81.38                 | 84.48                 | 91.69                 | 93.92                 | 95.44                  | 97.46                  | 98.46                  | 101.09                 | 95.09                   | 101.38                   |
| 18.25                 | 0.75            | 36.80                                       | 48.97                | 62.23                 | 81.97                 | 85.07                 | 92.28                 | 94.51                 | 96.03                  | 98.05                  | 99.05                  | 101.68                 | 95.39                   | 101.78                   |
| 18.50                 | 0.76            | 36.91                                       | 49.10                | 62.62                 | 82.56                 | 85.66                 | 92.87                 | 95.10                 | 96.62                  | 98.64                  | 99.64                  | 102.27                 | 95.69                   | 102.18                   |
| 18.75                 | 0.77            | 37.03                                       | 49.23                | 63.01                 | 83.15                 | 86.25                 | 93.46                 | 95.69                 | 97.21                  | 99.23                  | 100.23                 | 102.86                 | 95.99                   | 102.58                   |

|       |      |       |       |       |       |       |        |        |        |        |        |        |        |        |
|-------|------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| 64.50 | 2.69 | 52.42 | 66.47 | 75.93 | 85.56 | 91.47 | 99.98  | 106.85 | 112.63 | 121.32 | 128.04 | 151.25 | 169.38 | 227.77 |
| 64.75 | 2.70 | 52.48 | 66.55 | 76.02 | 85.65 | 91.54 | 99.98  | 106.94 | 112.67 | 121.41 | 128.13 | 151.25 | 169.48 | 227.90 |
| 65.00 | 2.71 | 52.56 | 66.63 | 76.11 | 85.73 | 91.65 | 99.77  | 107.04 | 112.71 | 121.51 | 128.23 | 151.46 | 169.60 | 228.02 |
| 65.25 | 2.72 | 52.64 | 66.72 | 76.19 | 85.82 | 91.74 | 99.86  | 107.13 | 112.81 | 121.60 | 128.32 | 151.56 | 169.71 | 228.15 |
| 65.50 | 2.73 | 52.71 | 66.80 | 76.28 | 85.91 | 91.83 | 99.95  | 107.22 | 112.90 | 121.70 | 128.42 | 151.66 | 169.82 | 228.28 |
| 65.75 | 2.74 | 52.78 | 66.88 | 76.36 | 86.00 | 91.92 | 100.04 | 107.31 | 112.99 | 121.79 | 128.52 | 151.76 | 169.92 | 228.40 |
| 66.00 | 2.75 | 52.86 | 66.96 | 76.45 | 86.09 | 92.01 | 100.14 | 107.41 | 113.08 | 121.89 | 128.61 | 151.86 | 170.03 | 228.53 |
| 66.25 | 2.76 | 52.93 | 67.04 | 76.53 | 86.18 | 92.10 | 100.23 | 107.50 | 113.18 | 121.98 | 128.71 | 151.97 | 170.14 | 228.65 |
| 66.50 | 2.77 | 53.00 | 67.12 | 76.62 | 86.26 | 92.19 | 100.32 | 107.59 | 113.27 | 122.07 | 128.80 | 152.07 | 170.25 | 228.78 |
| 66.75 | 2.78 | 53.07 | 67.20 | 76.70 | 86.35 | 92.28 | 100.41 | 107.68 | 113.36 | 122.17 | 128.90 | 152.17 | 170.35 | 228.90 |
| 67.00 | 2.79 | 53.14 | 67.28 | 76.79 | 86.44 | 92.37 | 100.50 | 107.77 | 113.45 | 122.26 | 129.00 | 152.27 | 170.46 | 229.03 |
| 67.25 | 2.80 | 53.22 | 67.36 | 76.87 | 86.53 | 92.46 | 100.59 | 107.87 | 113.55 | 122.35 | 129.09 | 152.37 | 170.57 | 229.15 |
| 67.50 | 2.81 | 53.29 | 67.44 | 76.95 | 86.62 | 92.55 | 100.68 | 107.96 | 113.64 | 122.45 | 129.18 | 152.47 | 170.67 | 229.26 |
| 67.75 | 2.82 | 53.36 | 67.52 | 77.04 | 86.70 | 92.64 | 100.77 | 108.05 | 113.73 | 122.54 | 129.28 | 152.57 | 170.78 | 229.40 |
| 68.00 | 2.83 | 53.43 | 67.60 | 77.12 | 86.79 | 92.73 | 100.86 | 108.14 | 113.82 | 122.63 | 129.37 | 152.67 | 170.89 | 229.53 |
| 68.25 | 2.84 | 53.51 | 67.68 | 77.21 | 86.88 | 92.82 | 100.95 | 108.23 | 113.91 | 122.73 | 129.46 | 152.77 | 171.00 | 229.65 |
| 68.50 | 2.85 | 53.58 | 67.76 | 77.29 | 86.97 | 92.91 | 101.05 | 108.32 | 114.00 | 122.82 | 129.56 | 152.87 | 171.10 | 229.77 |
| 68.75 | 2.86 | 53.65 | 67.84 | 77.38 | 87.05 | 93.00 | 101.14 | 108.41 | 114.10 | 122.91 | 129.66 | 152.97 | 171.21 | 229.90 |
| 69.00 | 2.88 | 53.72 | 67.92 | 77.46 | 87.14 | 93.08 | 101.23 | 108.50 | 114.19 | 123.01 | 129.75 | 153.07 | 171.31 | 230.02 |
| 69.25 | 2.89 | 53.79 | 68.00 | 77.54 | 87.23 | 93.17 | 101.32 | 108.59 | 114.28 | 123.10 | 129.84 | 153.17 | 171.42 | 230.14 |
| 69.50 | 2.90 | 53.86 | 68.07 | 77.63 | 87.31 | 93.26 | 101.41 | 108.69 | 114.37 | 123.19 | 129.94 | 153.26 | 171.52 | 230.26 |
| 69.75 | 2.91 | 53.94 | 68.15 | 77.71 | 87.40 | 93.35 | 101.50 | 108.78 | 114.46 | 123.28 | 130.03 | 153.36 | 171.63 | 230.39 |
| 70.00 | 2.92 | 54.01 | 68.23 | 77.80 | 87.49 | 93.44 | 101.59 | 108.87 | 114.55 | 123.37 | 130.12 | 153.46 | 171.73 | 230.51 |
| 70.25 | 2.93 | 54.08 | 68.31 | 77.88 | 87.58 | 93.53 | 101.68 | 108.96 | 114.64 | 123.47 | 130.22 | 153.56 | 171.83 | 230.63 |
| 70.50 | 2.94 | 54.15 | 68.39 | 77.96 | 87.66 | 93.62 | 101.77 | 109.05 | 114.73 | 123.56 | 130.31 | 153.66 | 171.94 | 230.75 |
| 70.75 | 2.95 | 54.22 | 68.47 | 78.05 | 87.75 | 93.70 | 101.86 | 109.14 | 114.82 | 123.65 | 130.40 | 153.76 | 172.04 | 230.87 |
| 71.00 | 2.96 | 54.29 | 68.55 | 78.13 | 87.84 | 93.79 | 101.95 | 109.23 | 114.91 | 123.74 | 130.49 | 153.85 | 172.15 | 230.99 |
| 71.25 | 2.97 | 54.37 | 68.63 | 78.21 | 87.92 | 93.88 | 102.04 | 109.32 | 115.00 | 123.83 | 130.59 | 153.95 | 172.25 | 231.11 |
| 71.50 | 2.98 | 54.44 | 68.71 | 78.30 | 88.01 | 93.97 | 102.12 | 109.41 | 115.09 | 123.92 | 130.68 | 154.05 | 172.35 | 231.23 |
| 71.75 | 2.99 | 54.51 | 68.79 | 78.38 | 88.09 | 94.06 | 102.21 | 109.50 | 115.18 | 124.01 | 130.77 | 154.15 | 172.46 | 231.35 |
| 72.00 | 3.00 | 54.58 | 68.87 | 78.46 | 88.18 | 94.14 | 102.30 | 109.59 | 115.27 | 124.11 | 130.86 | 154.24 | 172.56 | 231.47 |
| 72.25 | 3.01 | 54.65 | 68.94 | 78.55 | 88.27 | 94.23 | 102.39 | 109.68 | 115.36 | 124.20 | 130.96 | 154.34 | 172.66 | 231.59 |
| 72.50 | 3.02 | 54.72 | 69.02 | 78.63 | 88.35 | 94.32 | 102.48 | 109.76 | 115.45 | 124.29 | 131.05 | 154.44 | 172.77 | 231.71 |
| 72.75 | 3.03 | 54.79 | 69.10 | 78.71 | 88.44 | 94.41 | 102.57 | 109.85 | 115.54 | 124.38 | 131.14 | 154.53 | 172.87 | 231.82 |
| 73.00 | 3.04 | 54.86 | 69.18 | 78.80 | 88.53 | 94.49 | 102.66 | 109.94 | 115.63 | 124.47 | 131.23 | 154.63 | 172.97 | 231.95 |
| 73.25 | 3.05 | 54.93 | 69.26 | 78.88 | 88.62 | 94.58 | 102.75 | 110.03 | 115.72 | 124.56 | 131.32 | 154.73 | 173.07 | 232.07 |
| 73.50 | 3.06 | 55.01 | 69.34 | 78.96 | 88.70 | 94.67 | 102.84 | 110.12 | 115.81 | 124.65 | 131.41 | 154.82 | 173.17 | 232.19 |
| 73.75 | 3.07 | 55.08 | 69.42 | 79.04 | 88.78 | 94.76 | 102.93 | 110.21 | 115.90 | 124.74 | 131.51 | 154.92 | 173.28 | 232.30 |
| 74.00 | 3.08 | 55.16 | 69.51 | 79.13 | 88.87 | 94.84 | 103.02 | 110.30 | 115.99 | 124.83 | 131.60 | 155.02 | 173.38 | 232.42 |
| 74.25 | 3.09 | 55.22 | 69.57 | 79.21 | 88.95 | 94.93 | 103.10 | 110.39 | 116.07 | 124.92 | 131.69 | 155.11 | 173.48 | 232.54 |
| 74.50 | 3.10 | 55.29 | 69.65 | 79.29 | 89.04 | 95.02 | 103.19 | 110.48 | 116.16 | 125.01 | 131.78 | 155.20 | 173.58 | 232.66 |
| 74.75 | 3.11 | 55.36 | 69.73 | 79.38 | 89.13 | 95.10 | 103.28 | 110.57 | 116.25 | 125.10 | 131.87 | 155.30 | 173.68 | 232.78 |
| 75.00 | 3.13 | 55.43 | 69.81 | 79.46 | 89.21 | 95.19 | 103.37 | 110.65 | 116.34 | 125.19 | 131.96 | 155.39 | 173.78 | 232.89 |
| 75.25 | 3.14 | 55.50 | 69.89 | 79.54 | 89.30 | 95.28 | 103.45 | 110.74 | 116.43 | 125.28 | 132.05 | 155.49 | 173.88 | 233.01 |
| 75.50 | 3.15 | 55.57 | 69.96 | 79.62 | 89.38 | 95.36 | 103.54 | 110.83 | 116.52 | 125.37 | 132.14 | 155.58 | 173.98 | 233.13 |
| 75.75 | 3.16 | 55.64 | 70.04 | 79.71 | 89.47 | 95.45 | 103.63 | 110.92 | 116.60 | 125.45 | 132.23 | 155.68 | 174.08 | 233.24 |
| 76.00 | 3.17 | 55.71 | 70.12 | 79.79 | 89.55 | 95.54 | 103.72 | 111.01 | 116.69 | 125.54 | 132.32 | 155.77 | 174.19 | 233.36 |
| 76.25 | 3.18 | 55.78 | 70.20 | 79.87 | 89.64 | 95.62 | 103.81 | 111.09 | 116.78 | 125.63 | 132.41 | 155.87 | 174.29 | 233.48 |
| 76.50 | 3.19 | 55.85 | 70.28 | 79.95 | 89.72 | 95.71 | 103.89 | 111.18 | 116.87 | 125.72 | 132.50 | 155.96 | 174.39 | 233.59 |
| 76.75 | 3.20 | 55.92 | 70.35 | 80.03 | 89.81 | 95.80 | 103.98 | 111.27 | 116.96 | 125.81 | 132.59 | 156.06 | 174.49 | 233.71 |
| 77.00 | 3.21 | 55.99 | 70.43 | 80.12 | 89.89 | 95.89 | 104.07 | 111.36 | 117.04 | 125.90 | 132.68 | 156.15 | 174.58 | 233.82 |
| 77.25 | 3.22 | 56.06 | 70.51 | 80.20 | 89.98 | 95.97 | 111.45 | 117.13 | 117.13 | 125.99 | 132.77 | 156.24 | 174.68 | 233.94 |
| 77.50 | 3.23 | 56.14 | 70.59 | 80.28 | 90.06 | 96.06 | 111.54 | 117.22 | 117.22 | 126.08 | 132.86 | 156.34 | 174.78 | 234.05 |
| 77.75 | 3.24 | 56.21 | 70.66 | 80.35 | 90.15 | 96.14 | 104.33 | 111.62 | 117.31 | 126.16 | 132.95 | 156.43 | 174.88 | 234.17 |
| 78.00 | 3.25 | 56.28 | 70.74 | 80.44 | 90.23 | 96.23 | 104.42 | 111.71 | 117.39 | 126.25 | 133.04 | 156.52 | 174.98 | 234.28 |
| 78.25 | 3.26 | 56.35 | 70.82 | 80.51 | 90.32 | 96.31 | 104.51 | 111.79 | 117.48 | 126.34 | 133.13 | 156.62 | 175.08 | 234.39 |
| 78.50 | 3.27 | 56.42 | 70.90 | 80.61 | 90.40 | 96.40 | 104.59 | 111.88 | 117.57 | 126.43 | 133.22 | 156.71 | 175.18 | 234.51 |
| 78.75 | 3.28 | 56.49 | 70.98 | 80.69 | 90.48 | 96.49 | 104.68 | 111.97 | 117.66 | 126.52 | 133.30 | 156.80 | 175.28 | 234.63 |
| 79.00 | 3.29 | 56.56 | 71.06 | 80.77 | 90.57 | 96.57 | 104.77 | 112.05 | 117.74 | 126.60 | 133.39 | 156.89 | 175.38 | 234.74 |
| 79.25 | 3.30 | 56.63 | 71.13 | 80.85 | 90.65 | 96.66 | 104.85 | 112.14 | 117.83 | 126.69 | 133.48 | 156.99 | 175.47 | 234.85 |
| 79.50 | 3.31 | 56.70 | 71.21 | 80.94 | 90.74 | 96.74 | 104.94 | 112.23 | 117.92 | 126.78 | 133.57 | 157.08 | 175.57 | 234.97 |
| 79.75 | 3.32 | 56.77 | 71.28 | 81.02 | 90.83 | 96.83 | 105.03 | 112.32 | 118.00 | 126.87 | 133.66 | 157.17 | 175.67 | 235.08 |
| 80.00 | 3.33 | 56.84 | 71.36 | 81.10 | 90.91 | 96.91 | 105.11 | 112.40 | 118.09 | 126.95 | 133.75 | 157.27 | 175.77 | 235.19 |
| 80.25 | 3.34 | 56.91 | 71.44 | 81.18 | 90.99 | 97.00 | 105.20 | 112.49 | 118.18 | 127.04 | 133.83 | 157.36 | 175.87 | 235.31 |
| 80.50 | 3.35 | 56.98 | 71.52 | 81.26 | 91.07 | 97.08 | 105.29 | 112.58 | 118.26 | 127.13 | 133.92 | 157.45 | 175.97 | 235.42 |
| 80.75 | 3.36 | 57.05 | 71.59 | 81.34 | 91.16 | 97.17 | 105.37 | 112.66 | 118.35 | 127.22 | 134.01 | 157.54 | 176.06 | 235.53 |
| 81.00 | 3.38 | 57.12 | 71.67 | 81.42 | 91.24 | 97.25 | 105.46 | 112.75 | 118.43 | 127.30 | 134.10 | 157.63 | 176.16 | 235.65 |
| 81.25 | 3.39 | 57.19 | 71.75 | 81.50 | 91.33 | 97.34 | 105.55 | 112.84 | 118.52 | 127.39 | 134.19 | 157.72 | 176.26 | 235.76 |
| 81.50 | 3.40 | 57.25 | 71.82 | 81.59 | 91.41 | 97.42 | 105.63 | 112.92 | 118.61 | 127.48 | 134.28 | 157.81 | 176.35 | 235.87 |
| 81.75 | 3.41 | 57.32 | 71.90 | 81.67 | 91.49 | 97.51 | 105.72 | 113.01 | 118.69 | 127.56 | 134.36 | 157.91 | 176.45 | 235.98 |
| 82.00 | 3.42 | 57.39 | 71.98 | 81.75 | 91.58 | 97.59 | 105.80 | 113.10 | 118.78 | 127.65 | 134.45 | 158.00 | 176.54 | 236.09 |
| 82.25 | 3.43 | 57.46 | 72.06 | 81.83 | 91.66 | 97.68 | 105.89 | 113.18 | 118.87 | 127.74 | 134.54 | 158.09 | 176.64 | 236.21 |
| 82.50 | 3.44 | 57.53 | 72.13 | 81.91 | 91.74 | 97.76 | 105.98 | 113.27 | 118.95 | 127.83 | 134.63 | 158.18 | 176.74 | 236.32 |
| 82.75 | 3.45 | 57.60 | 72.21 | 81.99 | 91.83 | 97.85 | 106.06 | 113.35 | 119.04 | 127.91 | 134.71 | 158.27 | 176.83 | 236.43 |
| 83.00 | 3.46 | 57.67 | 72.29 | 82.07 | 91.91 | 97.93 | 106.15 | 113.44 | 119.12 | 128.00 | 134.80 | 158.36 | 176.93 | 236.54 |
| 83.25 | 3.47 | 57.74 | 72.36 | 82.15 | 91.99 | 98.02 | 106.23 | 113.52 | 119.21 | 128.09 | 134.89 | 158.45 | 177.03 | 236.65 |
| 83.50 | 3.48 | 57.81 | 72.44 | 82.23 | 92.08 | 98.10 | 106.32 | 113.61 | 119.29 | 128.17 | 134.97 |        |        |        |

## Appendix B

### Proposed Impermeable Areas MicroDrainage Model Outputs

Motion

84 North Street  
Guildford  
Surrey GU1 4AU

Date 21/05/2026 17:33  
File 1lestj-MD-NW-Model-21.05.2026.MDX

Innovyze

Designed by CommonUser  
Checked by

Network 2020.1.3

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

|                                      |                                 |                                       |       |
|--------------------------------------|---------------------------------|---------------------------------------|-------|
| Return Period (years)                | 100                             | Volumetric Runoff Coeff.              | 1.000 |
|                                      |                                 | PIMP (%)                              | 100   |
| FEH Rainfall Version                 | 2013                            | Add Flow / Climate Change (%)         | 0     |
| Site Location                        | GB 518400 104350 TQ 18400 04350 | Minimum Backdrop Height (m)           | 0.200 |
| Data Type                            | Catchment                       | Maximum Backdrop Height (m)           | 1.500 |
| Maximum Rainfall (mm/hr)             | 550                             | Min Design Depth for Optimisation (m) | 0.400 |
| Maximum Time of Concentration (mins) | 30                              | Min Vel for Auto Design only (m/s)    | 1.00  |
| Foul Sewage (l/s/ha)                 | 0.000                           | Min Slope for Optimisation (1:X)      | 500   |

Designed with Level Soffits

Time Area Diagram for Storm at outfall Existing Soakaway SA1 (pipe 1.004)

| Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| 0-4         | 0.028     | 4-8         | 0.004     | 8-12        | 0.004     | 12-16       | 0.003     |

Total Area Contributing (ha) = 0.039

Total Pipe Volume (m³) = 0.345

Time Area Diagram at outfall Existing Soakaway SA2 (pipe 6.002)

| Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|
| 0-4         | 0.002     | 4-8         | 0.000     |

Total Area Contributing (ha) = 0.002

Total Pipe Volume (m³) = 0.060

Network Design Table for Storm

# - Indicates pipe length does not match coordinates

| PN    | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design                                                                           |
|-------|------------|----------|-------------|-------------|-------------|-----------------|--------|----------|----------|--------------|---------------------------------------------------------------------------------------|
| 1.000 | 1.000#     | 0.064    | 15.6        | 0.005       | 15.00       | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 1.001 | 1.065      | 0.010    | 102.5       | 0.002       | 0.00        | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 1.002 | 9.287      | 0.094    | 99.2        | 0.000       | 0.00        | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 2.000 | 1.054      | 0.011    | 100.0       | 0.000       | 15.00       | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 3.000 | 5.536      | 0.041    | 133.6       | 0.009       | 15.00       | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 3.001 | 0.500#     | 0.005    | 100.0       | 0.000       | 0.00        | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |

Network Results Table

| PN    | Rain (mm/hr) | T.C. (mins) | US/IL (m) | E I.Area (ha) | E Base Flow (l/s) | Foul (l/s) | Add Flow (l/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|-------|--------------|-------------|-----------|---------------|-------------------|------------|----------------|-----------|-----------|------------|
| 1.000 | 98.49        | 15.01       | 7.934     | 0.005         | 0.0               | 0.0        | 0.0            | 1.96      | 15.4      | 1.6        |
| 1.001 | 98.40        | 15.03       | 7.880     | 0.007         | 0.0               | 0.0        | 0.0            | 0.76      | 6.0       | 2.4        |
| 1.002 | 97.70        | 15.23       | 7.870     | 0.007         | 0.0               | 0.0        | 0.0            | 0.77      | 6.1       | 2.4        |
| 2.000 | 98.44        | 15.02       | 7.881     | 0.000         | 0.0               | 0.0        | 0.0            | 0.77      | 6.0       | 0.0        |
| 3.000 | 98.02        | 15.14       | 7.916     | 0.009         | 0.0               | 0.0        | 0.0            | 0.66      | 5.2       | 3.3        |
| 3.001 | 97.99        | 15.15       | 7.875     | 0.009         | 0.0               | 0.0        | 0.0            | 0.77      | 6.0       | 3.3        |

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|                                                |                        |                                                                                     |
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Network Design Table for Storm

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                      |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|-------------------------------------------------------------------------------------|
| 2.001 | 5.719         | 0.104       | 55.0           | 0.014          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.003 | 3.645         | 0.061       | 59.5           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |
| 4.000 | 0.894         | 0.008       | 109.0          | 0.000          | 15.00          | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 4.001 | 3.612         | 0.165       | 21.9           | 0.003          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 5.000 | 0.742         | 0.007       | 106.6          | 0.000          | 15.00          | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 5.001 | 3.037         | 0.165       | 18.4           | 0.006          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.004 | 1.463         | 0.017       | 88.4           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |
| 6.000 | 0.990         | 0.010       | 100.0          | 0.000          | 15.00          | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 6.001 | 3.334         | 0.062       | 53.7           | 0.002          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 6.002 | 3.320         | 0.041       | 80.0           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |

Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | E I.Area<br>(ha) | E Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 2.001 | 97.67           | 15.24          | 7.880        | 0.023            | 0.0                  | 0.0           | 0.0               | 1.04         | 8.2          | 8.1           |
| 1.003 | 97.51           | 15.29          | 7.726        | 0.030            | 0.0                  | 0.0           | 0.0               | 1.31         | 23.1         | 10.4          |
| 4.000 | 98.45           | 15.02          | 7.878        | 0.000            | 0.0                  | 0.0           | 0.0               | 0.74         | 5.8          | 0.0           |
| 4.001 | 98.31           | 15.06          | 7.880        | 0.003            | 0.0                  | 0.0           | 0.0               | 1.66         | 13.0         | 1.2           |
| 5.000 | 98.46           | 15.02          | 7.877        | 0.000            | 0.0                  | 0.0           | 0.0               | 0.74         | 5.8          | 0.0           |
| 5.001 | 98.36           | 15.04          | 7.880        | 0.006            | 0.0                  | 0.0           | 0.0               | 1.81         | 14.2         | 2.1           |
| 1.004 | 97.43           | 15.31          | 7.665        | 0.039            | 0.0                  | 0.0           | 0.0               | 1.07         | 18.9         | 13.7          |
| 6.000 | 98.44           | 15.02          | 7.880        | 0.000            | 0.0                  | 0.0           | 0.0               | 0.77         | 6.0          | 0.0           |
| 6.001 | 98.25           | 15.07          | 7.880        | 0.002            | 0.0                  | 0.0           | 0.0               | 1.05         | 8.3          | 0.8           |
| 6.002 | 98.03           | 15.14          | 7.818        | 0.002            | 0.0                  | 0.0           | 0.0               | 0.86         | 6.8          | 0.8           |

|                                                |                        |                                                                                     |
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### Manhole Schedules for Storm

| MH Name               | MH CL (m) | MH Depth (m) | MH Connection | MH Diam., L*W (mm) | PN    | Pipe Out Invert Level (m) | Pipe Out Diameter (mm) | PN    | Pipes In Invert Level (m) | Pipes In Diameter (mm) | Backdrop (mm) |
|-----------------------|-----------|--------------|---------------|--------------------|-------|---------------------------|------------------------|-------|---------------------------|------------------------|---------------|
| 4 - Silt Trap         | 8.500     | 0.566        | Open Manhole  | 1200               | 1.000 | 7.934                     | 100                    |       |                           |                        |               |
| PP2                   | 8.500     | 0.630        | Open Manhole  | 1200               | 1.001 | 7.880                     | 100                    | 1.000 | 7.870                     | 100                    |               |
| 5                     | 8.500     | 0.630        | Open Manhole  | 1200               | 1.002 | 7.870                     | 100                    | 1.001 | 7.870                     | 100                    |               |
| 3                     | 8.500     | 0.619        | Junction      |                    | 2.000 | 7.881                     | 100                    |       |                           |                        |               |
| 1                     | 8.500     | 0.584        | Open Manhole  | 1200               | 3.000 | 7.916                     | 100                    |       |                           |                        |               |
| 2 - Silt Trap         | 8.500     | 0.625        | Open Manhole  | 1200               | 3.001 | 7.875                     | 100                    | 3.000 | 7.875                     | 100                    |               |
| PP1                   | 8.500     | 0.630        | Open Manhole  | 1200               | 2.001 | 7.880                     | 100                    | 2.000 | 7.870                     | 100                    |               |
|                       |           |              |               |                    |       |                           |                        | 3.001 | 7.870                     | 100                    |               |
| 6                     | 8.500     | 0.774        | Open Manhole  | 1200               | 1.003 | 7.726                     | 150                    | 1.002 | 7.776                     | 100                    |               |
|                       |           |              |               |                    |       |                           |                        | 2.001 | 7.776                     | 100                    |               |
| 7                     | 8.500     | 0.622        | Junction      |                    | 4.000 | 7.878                     | 100                    |       |                           |                        |               |
| PP3                   | 8.500     | 0.630        | Open Manhole  | 1200               | 4.001 | 7.880                     | 100                    | 4.000 | 7.870                     | 100                    |               |
| 8                     | 8.500     | 0.623        | Junction      |                    | 5.000 | 7.877                     | 100                    |       |                           |                        |               |
| PP4                   | 8.500     | 0.630        | Open Manhole  | 1200               | 5.001 | 7.880                     | 100                    | 5.000 | 7.870                     | 100                    |               |
| 9 - Silt Trap         | 8.500     | 0.835        | Open Manhole  | 1200               | 1.004 | 7.665                     | 150                    | 1.003 | 7.665                     | 150                    |               |
|                       |           |              |               |                    |       |                           |                        | 4.001 | 7.715                     | 100                    |               |
|                       |           |              |               |                    |       |                           |                        | 5.001 | 7.715                     | 100                    |               |
| Existing Soakaway SA1 | 8.500     | 0.852        | Open Manhole  | 0                  |       | OUTFALL                   |                        | 1.004 | 7.648                     | 150                    |               |
| 10                    | 8.500     | 0.620        | Junction      |                    | 6.000 | 7.880                     | 100                    |       |                           |                        |               |
| PP5                   | 8.500     | 0.630        | Open Manhole  | 1200               | 6.001 | 7.880                     | 100                    | 6.000 | 7.870                     | 100                    |               |
| 11 - Silt Trap        | 8.500     | 0.682        | Open Manhole  | 1200               | 6.002 | 7.818                     | 100                    | 6.001 | 7.818                     | 100                    |               |
| Existing Soakaway SA2 | 8.500     | 0.723        | Open Manhole  | 0                  |       | OUTFALL                   |                        | 6.002 | 7.777                     | 100                    |               |

| MH Name       | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)                                                                        |
|---------------|---------------------|----------------------|--------------------------|---------------------------|----------------|---------------------------------------------------------------------------------------|
| 4 - Silt Trap | 308890.042          | -19015.593           | 308890.042               | -19015.593                | Required       |  |
| PP2           | 308896.321          | -19016.878           | 308896.321               | -19016.878                | Required       |  |
| 5             | 308896.207          | -19017.936           | 308896.207               | -19017.936                | Required       |  |
| 3             | 308904.557          | -19025.920           |                          |                           | No Entry       |  |
| 1             | 308889.042          | -19021.738           | 308889.042               | -19021.738                | Required       |  |
| 2 - Silt Trap | 308894.520          | -19022.534           | 308894.520               | -19022.534                | Required       |  |
| PP1           | 308904.781          | -19024.890           | 308904.781               | -19024.890                | Required       |  |
| 6             | 308905.408          | -19019.205           | 308905.408               | -19019.205                | Required       |  |
| 7             | 308901.542          | -19014.930           |                          |                           | No Entry       |  |
| PP3           | 308902.422          | -19015.086           | 308902.422               | -19015.086                | Required       |  |
| 8             | 308909.718          | -19016.257           |                          |                           | No Entry       |  |
| PP4           | 308908.986          | -19016.138           | 308908.986               | -19016.138                | Required       |  |

|                                                |                        |                                                                                     |
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#### Manhole Schedules for Storm

| MH Name               | Manhole Easting (m) | Manhole Northing (m) | Intersection Easting (m) | Intersection Northing (m) | Manhole Access | Layout (North)                                                                      |
|-----------------------|---------------------|----------------------|--------------------------|---------------------------|----------------|-------------------------------------------------------------------------------------|
| 9 - Silt Trap         | 308905.996          | -19015.608           | 308905.996               | -19015.608                | Required       |  |
| Existing Soakaway SA1 | 308906.216          | -19014.162           |                          |                           | No Entry       |  |
| 10                    | 308904.469          | -18998.015           |                          |                           | No Entry       |  |
| PP5                   | 308905.454          | -18998.113           | 308905.454               | -18998.113                | Required       |  |
| 11 - Silt Trap        | 308908.741          | -18998.675           | 308908.741               | -18998.675                | Required       |  |
| Existing Soakaway SA2 | 308908.270          | -19001.961           |                          |                           | No Entry       |  |

|                                                |                                                                                     |
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#### Area Summary for Storm

| Pipe Number | PIMP Type | PIMP Name | PIMP (%) | Gross Area (ha) | Imp. Area (ha) | Pipe Total (ha) |
|-------------|-----------|-----------|----------|-----------------|----------------|-----------------|
| 1.000       | User      | -         | 100      | 0.005           | 0.005          | 0.005           |
| 1.001       | User      | -         | 100      | 0.002           | 0.002          | 0.002           |
| 1.002       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 2.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 3.000       | User      | -         | 100      | 0.009           | 0.009          | 0.009           |
| 3.001       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 2.001       | User      | -         | 100      | 0.014           | 0.014          | 0.014           |
| 1.003       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 4.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 4.001       | User      | -         | 100      | 0.003           | 0.003          | 0.003           |
| 5.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 5.001       | User      | -         | 100      | 0.006           | 0.006          | 0.006           |
| 1.004       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 6.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 6.001       | User      | -         | 100      | 0.002           | 0.002          | 0.002           |
| 6.002       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
|             |           |           |          | Total           | Total          | Total           |
|             |           |           |          | 0.041           | 0.041          | 0.041           |

#### Free Flowing Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

|       |                       |       |       |       |   |   |
|-------|-----------------------|-------|-------|-------|---|---|
| 1.004 | Existing Soakaway SA1 | 8.500 | 7.648 | 0.000 | 0 | 0 |
|-------|-----------------------|-------|-------|-------|---|---|

#### Free Flowing Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

|       |                       |       |       |       |   |   |
|-------|-----------------------|-------|-------|-------|---|---|
| 6.002 | Existing Soakaway SA2 | 8.500 | 7.777 | 0.000 | 0 | 0 |
|-------|-----------------------|-------|-------|-------|---|---|

#### Simulation Criteria for Storm

|                             |       |                                   |       |                                     |       |
|-----------------------------|-------|-----------------------------------|-------|-------------------------------------|-------|
| Volumetric Runoff Coeff     | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | Inlet Coefficient                   | 0.800 |
| Areal Reduction Factor      | 1.000 | Foul Sewage per hectare (l/s)     | 0.000 | Flow per Person per Day (l/per/day) | 0.000 |
| Hot Start (mins)            | 0     | Additional Flow - % of Total Flow | 0.000 | Run Time (mins)                     | 60    |
| Hot Start Level (mm)        | 0     | MADD Factor * 10m³/ha Storage     | 0.000 | Output Interval (mins)              | 1     |
| Number of Input Hydrographs | 0     | Number of Offline Controls        | 0     | Number of Time/Area Diagrams        | 0     |
| Number of Online Controls   | 5     | Number of Storage Structures      | 5     | Number of Real Time Controls        | 0     |

#### Synthetic Rainfall Details

|                       |                                 |                       |       |
|-----------------------|---------------------------------|-----------------------|-------|
| Rainfall Model        | FEH                             | Summer Storms         | Yes   |
| Return Period (years) | 100                             | Winter Storms         | No    |
| FEH Rainfall Version  | 2013                            | Cv (Summer)           | 1.000 |
| Site Location         | GB 518400 104350 TQ 18400 04350 | Cv (Winter)           | 1.000 |
| Data Type             | Catchment                       | Storm Duration (mins) | 30    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                        | Page 6                                                                              |
| 84 North Street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |  |
| Guildford                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |                                                                                     |
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| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Network 2020.1.3       |                                                                                     |
| <p align="center"><u>Online Controls for Storm</u></p> <p><u>Orifice Manhole: PP2, DS/PN: 1.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.021 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP1, DS/PN: 2.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.021 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP3, DS/PN: 4.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.018 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP4, DS/PN: 5.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.018 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP5, DS/PN: 6.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.018 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> |                        |                                                                                     |
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### Storage Structures for Storm

#### Porous Car Park Manhole: PP2, DS/PN: 1.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 5.6     | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 4.0   | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP1, DS/PN: 2.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 38.9    | Width (m)        | 28.0  | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 5.0   | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP3, DS/PN: 4.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 8.3     | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 6.0   | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP4, DS/PN: 5.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 16.7    | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 12.0  | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP5, DS/PN: 6.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 5.6     | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 4.0   | Cap Volume Depth (m)    | 0.500 |

|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 8                                                                              |
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| Date 21/05/2026 17:33                          | Designed by CommonUser |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### Volume Summary (Static)

Length Calculations based on Centre-Centre

| Pipe<br>Number | USMH<br>Name   | Manhole<br>Volume (m³) | Pipe<br>Volume (m³) | Storage                  | Total  |        |
|----------------|----------------|------------------------|---------------------|--------------------------|--------|--------|
|                |                |                        |                     | Structure<br>Volume (m³) |        |        |
| 1.000          | 4 - Silt Trap  | 0.640                  | 0.008               | 0.000                    | 0.648  |        |
| 1.001          |                | 0.701                  | 0.008               | 3.000                    | 3.710  |        |
| 1.002          |                | 5                      | 0.713               | 0.073                    | 0.000  | 0.786  |
| 2.000          |                | 3                      | 0.000               | 0.008                    | 0.000  | 0.008  |
| 3.000          | 2 - Silt Trap  | 1                      | 0.660               | 0.043                    | 0.000  | 0.704  |
| 3.001          |                | 0.707                  | 0.004               | 0.000                    | 0.711  |        |
| 2.001          |                | 6                      | 0.701               | 0.045                    | 21.000 | 21.746 |
| 1.003          |                | 6                      | 0.875               | 0.064                    | 0.000  | 0.940  |
| 4.000          | 9 - Silt Trap  | 7                      | 0.000               | 0.007                    | 0.000  | 0.007  |
| 4.001          |                | 0.701                  | 0.028               | 4.500                    | 5.230  |        |
| 5.000          |                | 8                      | 0.000               | 0.006                    | 0.000  | 0.006  |
| 5.001          |                | 0.701                  | 0.024               | 9.000                    | 9.725  |        |
| 1.004          | 11 - Silt Trap | 0.944                  | 0.026               | 0.000                    | 0.970  |        |
| 6.000          |                | 10                     | 0.000               | 0.008                    | 0.000  | 0.008  |
| 6.001          |                | PP5                    | 0.701               | 0.026                    | 3.000  | 3.727  |
| 6.002          |                | 11 - Silt Trap         | 0.771               | 0.026                    | 0.000  | 0.797  |
| Total          |                | 8.818                  | 0.405               | 40.500                   | 49.723 |        |

|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 9                                                                              |
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| Date 21/05/2026 17:33                          | Designed by CommonUser |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

## 2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

|                        |       |                                   |       |                                            |       |
|------------------------|-------|-----------------------------------|-------|--------------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day)        | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

|                                    |                                 |             |           |
|------------------------------------|---------------------------------|-------------|-----------|
| Rainfall Model                     | FEH                             | Data Type   | Catchment |
| FEH Rainfall Version               | 2013                            | Cv (Summer) | 1.000     |
| Site Location                      | GB 518400 104350 TQ 18400 04350 | Cv (Winter) | 1.000     |
| Margin for Flood Risk Warning (mm) | 300.0                           | DTS Status  | OFF       |
| Analysis Timestep                  | Fine                            | DVD Status  | ON        |
| Inertia Status                     | ON                              |             |           |

|                          |                                                                                  |                   |  |
|--------------------------|----------------------------------------------------------------------------------|-------------------|--|
| Profile(s)               |                                                                                  | Summer and Winter |  |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |                   |  |
| Return Period(s) (years) |                                                                                  | 2, 10, 30, 100    |  |
| Climate Change (%)       |                                                                                  | 0, 40, 40, 45     |  |

| PN    | US/MH Name     | Event              | Duration (mins)    | US/CL (m) | Water Surcharged Flooded |           |                          |       | Overflow Vol (m <sup>3</sup> ) | Infil. Vol (m <sup>3</sup> ) | Maximum Vol (m <sup>3</sup> ) | Discharge Vol (m <sup>3</sup> ) |
|-------|----------------|--------------------|--------------------|-----------|--------------------------|-----------|--------------------------|-------|--------------------------------|------------------------------|-------------------------------|---------------------------------|
|       |                |                    |                    |           | Level (m)                | Depth (m) | Volume (m <sup>3</sup> ) |       |                                |                              |                               |                                 |
| 1.000 | 4 - Silt Trap  | 180 minute         | 2 year Summer I+0% | 180       | 8.500                    | 7.983     | -0.051                   | 0.000 |                                |                              | 0.049                         | 1.116                           |
| 1.001 |                | PP2 180 minute     | 2 year Summer I+0% | 180       | 8.500                    | 7.983     | 0.003                    | 0.000 |                                | 0.000                        | 0.797                         | 1.459                           |
| 1.002 |                | 5 180 minute       | 2 year Summer I+0% | 180       | 8.500                    | 7.881     | -0.088                   | 0.000 |                                |                              | 0.008                         | 1.458                           |
| 2.000 | 3 - Silt Trap  | 480 minute         | 2 year Summer I+0% | 480       | 8.500                    | 7.964     | -0.017                   | 0.000 |                                |                              | 0.078                         | -0.002                          |
| 3.000 |                | 1 480 minute       | 2 year Summer I+0% | 480       | 8.500                    | 7.964     | -0.052                   | 0.000 |                                |                              | 0.049                         | 3.059                           |
| 3.001 |                | 2 480 minute       | 2 year Summer I+0% | 480       | 8.500                    | 7.964     | -0.011                   | 0.000 |                                |                              | 0.119                         | 3.044                           |
| 2.001 | PP1 480 minute | 2 year Summer I+0% | 480                | 8.500     | 7.964                    | -0.016    | 0.000                    |       | 0.000                          |                              | 4.032                         | 6.119                           |
| 1.003 |                | 6 360 minute       | 2 year Summer I+0% | 360       | 8.500                    | 7.742     | -0.134                   | 0.000 |                                |                              | 0.014                         | 7.219                           |
| 4.000 |                | 7 240 minute       | 2 year Summer I+0% | 240       | 8.500                    | 7.909     | -0.069                   | 0.000 |                                |                              | 0.026                         | 0.000                           |
| 4.001 | PP3 240 minute | 2 year Summer I+0% | 240                | 8.500     | 7.909                    | -0.071    | 0.000                    |       | 0.000                          |                              | 0.393                         | 0.650                           |
| 5.000 |                | 8 480 minute       | 2 year Summer I+0% | 480       | 8.500                    | 7.913     | -0.064                   | 0.000 |                                |                              | 0.032                         | -0.001                          |
| 5.001 |                | PP4 480 minute     | 2 year Summer I+0% | 480       | 8.500                    | 7.914     | -0.066                   | 0.000 |                                | 0.000                        | 0.827                         | 1.403                           |
| 1.004 | 9 - Silt Trap  | 360 minute         | 2 year Summer I+0% | 360       | 8.500                    | 7.687     | -0.128                   | 0.000 |                                |                              | 0.024                         | 9.237                           |
| 6.000 |                | 10 240 minute      | 2 year Summer I+0% | 240       | 8.500                    | 7.904     | -0.076                   | 0.000 |                                |                              | 0.019                         | 0.000                           |
| 6.001 |                | PP5 240 minute     | 2 year Summer I+0% | 240       | 8.500                    | 7.904     | -0.076                   | 0.000 |                                | 0.000                        | 0.237                         | 0.436                           |
| 6.002 | 11 - Silt Trap | 240 minute         | 2 year Summer I+0% | 240       | 8.500                    | 7.825     | -0.093                   | 0.000 |                                |                              | 0.002                         | 0.436                           |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status     |
|-------|----------------|------------------------|-----------------|------------|
|       |                |                        |                 |            |
| 1.000 | 4 - Silt Trap  |                        | 0.3             | OK         |
| 1.001 | PP2            | 93                     | 0.2             | SURCHARGED |
| 1.002 | 5              |                        | 0.1             | OK         |
| 2.000 | 3              |                        | 0.0             | OK*        |
| 3.000 | 1              |                        | 0.4             | OK         |
| 3.001 | 2 - Silt Trap  |                        | 0.4             | OK         |
| 2.001 | PP1            | 288                    | 0.2             | OK         |
| 1.003 | 6              |                        | 0.4             | OK         |
| 4.000 | 7              |                        | 0.0             | OK*        |
| 4.001 | PP3            | 132                    | 0.1             | OK         |
| 5.000 | 8              |                        | 0.0             | OK*        |
| 5.001 | PP4            | 232                    | 0.1             | OK         |
| 1.004 | 9 - Silt Trap  |                        | 0.6             | OK         |
| 6.000 | 10             |                        | 0.0             | OK*        |
| 6.001 | PP5            | 132                    | 0.1             | OK         |
| 6.002 | 11 - Silt Trap |                        | 0.1             | OK         |

|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 10                                                                             |
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| Date 21/05/2026 17:33                          | Designed by CommonUser |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### 10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

|                        |       |                                   |       |                                            |       |
|------------------------|-------|-----------------------------------|-------|--------------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day)        | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

|                                    |                                 |             |           |
|------------------------------------|---------------------------------|-------------|-----------|
| Rainfall Model                     | FEH                             | Data Type   | Catchment |
| FEH Rainfall Version               | 2013                            | Cv (Summer) | 1.000     |
| Site Location                      | GB 518400 104350 TQ 18400 04350 | Cv (Winter) | 1.000     |
| Margin for Flood Risk Warning (mm) | 300.0                           | DTS Status  | OFF       |
| Analysis Timestep                  | Fine                            | DVD Status  | ON        |
| Inertia Status                     | ON                              |             |           |

|                          |                                                                                  |                   |  |
|--------------------------|----------------------------------------------------------------------------------|-------------------|--|
| Profile(s)               |                                                                                  | Summer and Winter |  |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |                   |  |
| Return Period(s) (years) |                                                                                  | 2, 10, 30, 100    |  |
| Climate Change (%)       |                                                                                  | 0, 40, 40, 45     |  |

| PN    | US/MH Name     | Event                            | Duration (mins) | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Overflow Vol (m <sup>3</sup> ) | Infil. Vol (m <sup>3</sup> ) | Maximum Vol (m <sup>3</sup> ) | Discharge Vol (m <sup>3</sup> ) |
|-------|----------------|----------------------------------|-----------------|-----------|-----------------|----------------------|----------------------------------|--------------------------------|------------------------------|-------------------------------|---------------------------------|
|       |                |                                  |                 |           |                 |                      |                                  |                                |                              |                               |                                 |
| 1.000 | 4 - Silt Trap  | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 8.116           | 0.082                | 0.000                            |                                |                              | 0.201                         | 2.402                           |
| 1.001 | PP2            | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 8.116           | 0.136                | 0.000                            |                                | 0.000                        | 1.749                         | 3.308                           |
| 1.002 | 5              | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.885           | -0.084               | 0.000                            |                                |                              | 0.012                         | 3.307                           |
| 2.000 | 3              | 2160 minute 10 year Winter I+40% | 2160            | 8.500     | 7.981           | 0.000                | 0.000                            |                                |                              | 0.106                         | 0.000                           |
| 3.000 | 1              | 360 minute 10 year Summer I+40%  | 360             | 8.500     | 8.081           | 0.065                | 0.000                            |                                |                              | 0.181                         | 5.874                           |
| 3.001 | 2 - Silt Trap  | 360 minute 10 year Summer I+40%  | 360             | 8.500     | 8.080           | 0.105                | 0.000                            |                                |                              | 0.261                         | 5.797                           |
| 2.001 | PP1            | 360 minute 10 year Summer I+40%  | 360             | 8.500     | 8.080           | 0.100                | 0.000                            |                                | 0.000                        | 9.046                         | 11.116                          |
| 1.003 | 6              | 240 minute 10 year Summer I+40%  | 240             | 8.500     | 7.747           | -0.129               | 0.000                            |                                |                              | 0.019                         | 11.509                          |
| 4.000 | 7              | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.959           | -0.019               | 0.000                            |                                |                              | 0.076                         | -0.003                          |
| 4.001 | PP3            | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.959           | -0.021               | 0.000                            |                                | 0.000                        | 0.894                         | 1.499                           |
| 5.000 | 8              | 240 minute 10 year Summer I+40%  | 240             | 8.500     | 7.969           | -0.008               | 0.000                            |                                |                              | 0.087                         | -0.008                          |
| 5.001 | PP4            | 240 minute 10 year Summer I+40%  | 240             | 8.500     | 7.969           | -0.011               | 0.000                            |                                | 0.000                        | 1.895                         | 2.692                           |
| 1.004 | 9 - Silt Trap  | 240 minute 10 year Summer I+40%  | 240             | 8.500     | 7.697           | -0.118               | 0.000                            |                                |                              | 0.036                         | 15.859                          |
| 6.000 | 10             | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.942           | -0.038               | 0.000                            |                                |                              | 0.057                         | 0.000                           |
| 6.001 | PP5            | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.942           | -0.038               | 0.000                            |                                | 0.000                        | 0.513                         | 1.012                           |
| 6.002 | 11 - Silt Trap | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.829           | -0.089               | 0.000                            |                                |                              | 0.008                         | 1.012                           |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status      |
|-------|----------------|------------------------|-----------------|-------------|
|       |                |                        |                 |             |
| 1.000 | 4 - Silt Trap  |                        | 0.6             | SURCHARGED  |
| 1.001 | PP2            | 120                    | 0.3             | SURCHARGED  |
| 1.002 | 5              |                        | 0.3             | OK          |
| 2.000 | 3              |                        | 0.0             | SURCHARGED* |
| 3.000 | 1              |                        | 0.9             | SURCHARGED  |
| 3.001 | 2 - Silt Trap  |                        | 0.9             | SURCHARGED  |
| 2.001 | PP1            | 324                    | 0.4             | SURCHARGED  |
| 1.003 | 6              |                        | 0.7             | OK          |
| 4.000 | 7              |                        | 0.0             | OK*         |
| 4.001 | PP3            | 93                     | 0.2             | OK          |
| 5.000 | 8              |                        | 0.0             | OK*         |
| 5.001 | PP4            | 160                    | 0.2             | OK          |
| 1.004 | 9 - Silt Trap  |                        | 1.1             | OK          |
| 6.000 | 10             |                        | 0.0             | OK*         |
| 6.001 | PP5            | 75                     | 0.2             | OK          |
| 6.002 | 11 - Silt Trap |                        | 0.2             | OK          |

|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 11                                                                             |
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| Date 21/05/2026 17:33                          | Designed by CommonUser |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

|                        |       |                                   |       |                                     |       |
|------------------------|-------|-----------------------------------|-------|-------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m³/ha Storage       | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                   | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day) | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

|                                    |                                 |             |           |
|------------------------------------|---------------------------------|-------------|-----------|
| Rainfall Model                     | FEH                             | Data Type   | Catchment |
| FEH Rainfall Version               | 2013                            | Cv (Summer) | 1.000     |
| Site Location                      | GB 518400 104350 TQ 18400 04350 | Cv (Winter) | 1.000     |
| Margin for Flood Risk Warning (mm) | 300.0                           | DTS Status  | OFF       |
| Analysis Timestep                  | Fine                            | DVD Status  | ON        |
| Inertia Status                     | ON                              |             |           |

|                          |                                                                                  |                   |  |
|--------------------------|----------------------------------------------------------------------------------|-------------------|--|
| Profile(s)               |                                                                                  | Summer and Winter |  |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |                   |  |
| Return Period(s) (years) |                                                                                  | 2, 10, 30, 100    |  |
| Climate Change (%)       |                                                                                  | 0, 40, 40, 45     |  |

| PN    | US/MH Name     | Event                           | Duration (mins) | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Overflow Vol (m³) | Infil. Vol (m³) | Maximum Vol (m³) | Discharge Vol (m³) |
|-------|----------------|---------------------------------|-----------------|-----------|-----------------|----------------------|---------------------|-------------------|-----------------|------------------|--------------------|
|       |                |                                 |                 |           |                 |                      |                     |                   |                 |                  |                    |
| 1.000 | 4 - Silt Trap  | 180 minute 30 year Summer I+40% | 180             | 8.500     | 8.182           | 0.148                | 0.000               |                   |                 | 0.275            | 3.048              |
| 1.001 | PP2            | 180 minute 30 year Summer I+40% | 180             | 8.500     | 8.182           | 0.202                | 0.000               |                   | 0.000           | 2.218            | 4.218              |
| 1.002 | 5              | 180 minute 30 year Summer I+40% | 180             | 8.500     | 7.888           | -0.082               | 0.000               |                   |                 | 0.015            | 4.214              |
| 2.000 | 3              | 15 minute 30 year Summer I+40%  | 15              | 8.500     | 7.981           | 0.000                | 0.000               |                   |                 | 0.100            | -0.088             |
| 3.000 | 1              | 360 minute 30 year Summer I+40% | 360             | 8.500     | 8.140           | 0.124                | 0.000               |                   |                 | 0.248            | 7.310              |
| 3.001 | 2 - Silt Trap  | 360 minute 30 year Summer I+40% | 360             | 8.500     | 8.139           | 0.164                | 0.000               |                   |                 | 0.328            | 7.188              |
| 2.001 | PP1            | 360 minute 30 year Summer I+40% | 360             | 8.500     | 8.139           | 0.159                | 0.000               |                   | 0.000           | 11.604           | 13.295             |
| 1.003 | 6              | 240 minute 30 year Summer I+40% | 240             | 8.500     | 7.749           | -0.127               | 0.000               |                   |                 | 0.022            | 13.955             |
| 4.000 | 7              | 120 minute 30 year Winter I+40% | 120             | 8.500     | 7.978           | 0.000                | 0.000               |                   |                 | 0.098            | -0.011             |
| 4.001 | PP3            | 180 minute 30 year Summer I+40% | 180             | 8.500     | 7.986           | 0.006                | 0.000               |                   | 0.000           | 1.168            | 1.972              |
| 5.000 | 8              | 180 minute 30 year Winter I+40% | 180             | 8.500     | 7.977           | 0.000                | 0.000               |                   |                 | 0.114            | -0.025             |
| 5.001 | PP4            | 240 minute 30 year Summer I+40% | 240             | 8.500     | 7.999           | 0.019                | 0.000               |                   | 0.000           | 2.464            | 3.488              |
| 1.004 | 9 - Silt Trap  | 240 minute 30 year Summer I+40% | 240             | 8.500     | 7.699           | -0.116               | 0.000               |                   |                 | 0.040            | 19.603             |
| 6.000 | 10             | 120 minute 30 year Summer I+40% | 120             | 8.500     | 7.965           | -0.015               | 0.000               |                   |                 | 0.080            | -0.002             |
| 6.001 | PP5            | 120 minute 30 year Summer I+40% | 120             | 8.500     | 7.965           | -0.015               | 0.000               |                   | 0.000           | 0.673            | 1.141              |
| 6.002 | 11 - Silt Trap | 120 minute 30 year Summer I+40% | 120             | 8.500     | 7.830           | -0.088               | 0.000               |                   |                 | 0.009            | 1.140              |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status      |
|-------|----------------|------------------------|-----------------|-------------|
|       |                |                        |                 |             |
| 1.000 | 4 - Silt Trap  |                        | 0.8             | SURCHARGED  |
| 1.001 | PP2            | 111                    | 0.4             | SURCHARGED  |
| 1.002 | 5              |                        | 0.4             | OK          |
| 2.000 | 3              |                        | 0.0             | SURCHARGED* |
| 3.000 | 1              |                        | 1.2             | SURCHARGED  |
| 3.001 | 2 - Silt Trap  |                        | 1.1             | SURCHARGED  |
| 2.001 | PP1            | 348                    | 0.5             | SURCHARGED  |
| 1.003 | 6              |                        | 0.9             | OK          |
| 4.000 | 7              |                        | 0.0             | SURCHARGED* |
| 4.001 | PP3            | 99                     | 0.2             | SURCHARGED  |
| 5.000 | 8              |                        | 0.0             | SURCHARGED* |
| 5.001 | PP4            | 168                    | 0.2             | SURCHARGED  |
| 1.004 | 9 - Silt Trap  |                        | 1.3             | OK          |
| 6.000 | 10             |                        | 0.0             | OK*         |
| 6.001 | PP5            | 72                     | 0.2             | OK          |
| 6.002 | 11 - Silt Trap |                        | 0.2             | OK          |

|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 12                                                                             |
| 84 North Street<br>Guildford<br>Surrey GU1 4AU |                        |  |
| Date 21/05/2026 17:33                          | Designed by CommonUser |                                                                                     |
| File 1lestj-MD-NW-Model-21.05.2026.MDX         | Checked by             |                                                                                     |
| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### 100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

| Simulation Criteria    |       |                                   |       |                                            |       |
|------------------------|-------|-----------------------------------|-------|--------------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day)        | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

| Synthetic Rainfall Details         |                                 |            |             |                |    |
|------------------------------------|---------------------------------|------------|-------------|----------------|----|
| Rainfall Model                     | FEH                             |            | Data Type   | Catchment      |    |
| FEH Rainfall Version               | 2013                            |            | Cv (Summer) | 1.000          |    |
| Site Location                      | GB 518400 104350 TQ 18400 04350 |            | Cv (Winter) | 1.000          |    |
| Margin for Flood Risk Warning (mm) | 300.0                           | DTS Status | OFF         | Inertia Status | ON |
| Analysis Timestep                  | Fine                            | DVD Status | ON          |                |    |

|                          |                                                                                  |  |  |  |  |
|--------------------------|----------------------------------------------------------------------------------|--|--|--|--|
| Profile(s)               | Summer and Winter                                                                |  |  |  |  |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |  |  |  |  |
| Return Period(s) (years) | 2, 10, 30, 100                                                                   |  |  |  |  |
| Climate Change (%)       | 0, 40, 40, 45                                                                    |  |  |  |  |

| PN    | US/MH Name     | Event                            | Duration (mins) | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Overflow Vol (m <sup>3</sup> ) | Infil. Vol (m <sup>3</sup> ) | Maximum Vol (m <sup>3</sup> ) | Discharge Vol (m <sup>3</sup> ) |
|-------|----------------|----------------------------------|-----------------|-----------|-----------------|----------------------|----------------------------------|--------------------------------|------------------------------|-------------------------------|---------------------------------|
| 1.000 | 4 - Silt Trap  | 120 minute 100 year Summer I+45% | 120             | 8.500     | 8.280           | 0.246                | 0.000                            |                                |                              | 0.385                         | 3.455                           |
| 1.001 | PP2            | 120 minute 100 year Summer I+45% | 120             | 8.500     | 8.279           | 0.299                | 0.000                            |                                | 0.000                        | 2.912                         | 4.135                           |
| 1.002 | 5              | 120 minute 100 year Summer I+45% | 120             | 8.500     | 7.890           | -0.080               | 0.000                            |                                |                              | 0.018                         | 4.122                           |
| 2.000 | 3              | 15 minute 100 year Summer I+45%  | 15              | 8.500     | 7.981           | 0.000                | 0.000                            |                                |                              | 0.139                         | -0.125                          |
| 3.000 | 1              | 360 minute 100 year Summer I+45% | 360             | 8.500     | 8.228           | 0.212                | 0.000                            |                                |                              | 0.347                         | 9.363                           |
| 3.001 | 2 - Silt Trap  | 360 minute 100 year Summer I+45% | 360             | 8.500     | 8.227           | 0.252                | 0.000                            |                                |                              | 0.427                         | 9.173                           |
| 2.001 | PP1            | 360 minute 100 year Summer I+45% | 360             | 8.500     | 8.227           | 0.247                | 0.000                            |                                | 0.000                        | 15.379                        | 16.076                          |
| 1.003 | 6              | 180 minute 100 year Summer I+45% | 180             | 8.500     | 7.751           | -0.125               | 0.000                            |                                |                              | 0.025                         | 13.624                          |
| 4.000 | 7              | 720 minute 100 year Summer I+45% | 720             | 8.500     | 7.978           | 0.000                | 0.000                            |                                |                              | 0.097                         | 0.000                           |
| 4.001 | PP3            | 180 minute 100 year Summer I+45% | 180             | 8.500     | 8.024           | 0.044                | 0.000                            |                                | 0.000                        | 1.552                         | 2.611                           |
| 5.000 | 8              | 720 minute 100 year Winter I+45% | 720             | 8.500     | 7.977           | 0.000                | 0.000                            |                                |                              | 0.122                         | 0.000                           |
| 5.001 | PP4            | 240 minute 100 year Summer I+45% | 240             | 8.500     | 8.041           | 0.061                | 0.000                            |                                | 0.000                        | 3.272                         | 4.506                           |
| 1.004 | 9 - Silt Trap  | 180 minute 100 year Summer I+45% | 180             | 8.500     | 7.702           | -0.113               | 0.000                            |                                |                              | 0.044                         | 19.848                          |
| 6.000 | 10             | 120 minute 100 year Winter I+45% | 120             | 8.500     | 7.980           | 0.000                | 0.000                            |                                |                              | 0.107                         | -0.004                          |
| 6.001 | PP5            | 120 minute 100 year Summer I+45% | 120             | 8.500     | 7.997           | 0.017                | 0.000                            |                                | 0.000                        | 0.900                         | 1.530                           |
| 6.002 | 11 - Silt Trap | 120 minute 100 year Summer I+45% | 120             | 8.500     | 7.831           | -0.087               | 0.000                            |                                |                              | 0.010                         | 1.529                           |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status      |
|-------|----------------|------------------------|-----------------|-------------|
| 1.000 | 4 - Silt Trap  |                        | 1.3             | FLOOD RISK  |
| 1.001 | PP2            | 100                    | 0.5             | FLOOD RISK  |
| 1.002 | 5              |                        | 0.5             | OK          |
| 2.000 | 3              |                        | 0.0             | SURCHARGED* |
| 3.000 | 1              |                        | 1.5             | FLOOD RISK  |
| 3.001 | 2 - Silt Trap  |                        | 1.4             | FLOOD RISK  |
| 2.001 | PP1            | 378                    | 0.5             | FLOOD RISK  |
| 1.003 | 6              |                        | 1.0             | OK          |
| 4.000 | 7              |                        | 0.0             | SURCHARGED* |
| 4.001 | PP3            | 108                    | 0.2             | SURCHARGED  |
| 5.000 | 8              |                        | 0.0             | SURCHARGED* |
| 5.001 | PP4            | 184                    | 0.3             | SURCHARGED  |
| 1.004 | 9 - Silt Trap  |                        | 1.5             | OK          |
| 6.000 | 10             |                        | 0.0             | SURCHARGED* |
| 6.001 | PP5            | 76                     | 0.2             | SURCHARGED  |
| 6.002 | 11 - Silt Trap |                        | 0.2             | OK          |

## Appendix C

### Proposed and Existing Impermeable Areas MicroDrainage Model Outputs

Motion

84 North Street  
Guildford  
Surrey GU1 4AU

Date 17/08/2026 13:39  
File 1lestj-MD-NW-Model-13.08.2026.MDX

Innovyze

Page 1



Designed by commonuser  
Checked by

Network 2020.1.3

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)

FEH Rainfall Version

Site Location

Data Type

Maximum Rainfall (mm/hr)

Maximum Time of Concentration (mins)

Foul Sewage (l/s/ha)

100

2013

GB 518400 104350 TQ 18400 04350

Catchment

550

30

0.000

Volumetric Runoff Coeff.

PIMP (%)

Add Flow / Climate Change (%)

Minimum Backdrop Height (m)

Maximum Backdrop Height (m)

Min Design Depth for Optimisation (m)

Min Vel for Auto Design only (m/s)

Min Slope for Optimisation (1:X)

1.000

100

0

0.200

1.500

0.400

1.00

500

Designed with Level Soffits

Time Area Diagram for Storm at outfall Existing Soakaway SA1 (pipe 1.004)

| Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|
| 0-4         | 0.069     | 4-8         | 0.005     | 8-12        | 0.004     | 12-16       | 0.003     |

Total Area Contributing (ha) = 0.080

Total Pipe Volume (m³) = 0.345

Time Area Diagram at outfall Existing Soakaway SA2 (pipe 6.002)

| Time (mins) | Area (ha) | Time (mins) | Area (ha) |
|-------------|-----------|-------------|-----------|
| 0-4         | 0.030     | 4-8         | 0.001     |

Total Area Contributing (ha) = 0.031

Total Pipe Volume (m³) = 0.060

Network Design Table for Storm

# - Indicates pipe length does not match coordinates  
« - Indicates pipe capacity < flow

| PN    | Length (m) | Fall (m) | Slope (1:X) | I.Area (ha) | T.E. (mins) | Base Flow (l/s) | k (mm) | HYD SECT | DIA (mm) | Section Type | Auto Design                                                                           |
|-------|------------|----------|-------------|-------------|-------------|-----------------|--------|----------|----------|--------------|---------------------------------------------------------------------------------------|
| 1.000 | 1.000#     | 0.064    | 15.6        | 0.005       | 15.00       | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 1.001 | 1.065      | 0.010    | 102.5       | 0.002       | 0.00        | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 1.002 | 9.287      | 0.094    | 99.2        | 0.000       | 0.00        | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 2.000 | 1.054      | 0.011    | 100.0       | 0.000       | 15.00       | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |
| 3.000 | 5.536      | 0.041    | 133.6       | 0.009       | 15.00       | 0.0             | 0.600  | o        | 100      | Pipe/Conduit |  |

Network Results Table

| PN    | Rain (mm/hr) | T.C. (mins) | US/IL (m) | E I.Area (ha) | E Base Flow (l/s) | Foul (l/s) | Add Flow (l/s) | Vel (m/s) | Cap (l/s) | Flow (l/s) |
|-------|--------------|-------------|-----------|---------------|-------------------|------------|----------------|-----------|-----------|------------|
| 1.000 | 98.49        | 15.01       | 7.934     | 0.005         | 0.0               | 0.0        | 0.0            | 1.96      | 15.4      | 1.6        |
| 1.001 | 98.40        | 15.03       | 7.880     | 0.007         | 0.0               | 0.0        | 0.0            | 0.76      | 6.0       | 2.4        |
| 1.002 | 97.70        | 15.23       | 7.870     | 0.007         | 0.0               | 0.0        | 0.0            | 0.77      | 6.1       | 2.4        |
| 2.000 | 98.44        | 15.02       | 7.881     | 0.000         | 0.0               | 0.0        | 0.0            | 0.77      | 6.0       | 0.0        |
| 3.000 | 98.02        | 15.14       | 7.916     | 0.009         | 0.0               | 0.0        | 0.0            | 0.66      | 5.2       | 3.3        |

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|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 2                                                                              |
| 84 North Street<br>Guildford<br>Surrey GU1 4AU |                        |  |
| Date 17/08/2026 13:39                          | Designed by commonuser |                                                                                     |
| File 1lestj-MD-NW-Model-13.08.2026.MDX         | Checked by             |                                                                                     |
| Innovyze                                       | Network 2020.1.3       |                                                                                     |

Network Design Table for Storm

| PN    | Length<br>(m) | Fall<br>(m) | Slope<br>(1:X) | I.Area<br>(ha) | T.E.<br>(mins) | Base<br>Flow (l/s) | k<br>(mm) | HYD<br>SECT | DIA<br>(mm) | Section Type | Auto<br>Design                                                                      |
|-------|---------------|-------------|----------------|----------------|----------------|--------------------|-----------|-------------|-------------|--------------|-------------------------------------------------------------------------------------|
| 3.001 | 0.500#        | 0.005       | 100.0          | 0.000          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 2.001 | 5.719         | 0.104       | 55.0           | 0.014          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.003 | 3.645         | 0.061       | 59.5           | 0.042          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |
| 4.000 | 0.894         | 0.008       | 109.0          | 0.000          | 15.00          | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 4.001 | 3.612         | 0.165       | 21.9           | 0.003          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 5.000 | 0.742         | 0.007       | 106.6          | 0.000          | 15.00          | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 5.001 | 3.037         | 0.165       | 18.4           | 0.006          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 1.004 | 1.463         | 0.017       | 88.4           | 0.000          | 0.00           | 0.0                | 0.600     | o           | 150         | Pipe/Conduit |  |
| 6.000 | 0.990         | 0.010       | 100.0          | 0.000          | 15.00          | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 6.001 | 3.334         | 0.062       | 53.7           | 0.002          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |
| 6.002 | 3.320         | 0.041       | 80.0           | 0.028          | 0.00           | 0.0                | 0.600     | o           | 100         | Pipe/Conduit |  |

Network Results Table

| PN    | Rain<br>(mm/hr) | T.C.<br>(mins) | US/IL<br>(m) | E I.Area<br>(ha) | E Base<br>Flow (l/s) | Foul<br>(l/s) | Add Flow<br>(l/s) | Vel<br>(m/s) | Cap<br>(l/s) | Flow<br>(l/s) |
|-------|-----------------|----------------|--------------|------------------|----------------------|---------------|-------------------|--------------|--------------|---------------|
| 3.001 | 97.99           | 15.15          | 7.875        | 0.009            | 0.0                  | 0.0           | 0.0               | 0.77         | 6.0          | 3.3           |
| 2.001 | 97.67           | 15.24          | 7.880        | 0.023            | 0.0                  | 0.0           | 0.0               | 1.04         | 8.2          | 8.1           |
| 1.003 | 97.51           | 15.29          | 7.726        | 0.071            | 0.0                  | 0.0           | 0.0               | 1.31         | 23.1<        | 25.1          |
| 4.000 | 98.45           | 15.02          | 7.878        | 0.000            | 0.0                  | 0.0           | 0.0               | 0.74         | 5.8          | 0.0           |
| 4.001 | 98.31           | 15.06          | 7.880        | 0.003            | 0.0                  | 0.0           | 0.0               | 1.66         | 13.0         | 1.2           |
| 5.000 | 98.46           | 15.02          | 7.877        | 0.000            | 0.0                  | 0.0           | 0.0               | 0.74         | 5.8          | 0.0           |
| 5.001 | 98.36           | 15.04          | 7.880        | 0.006            | 0.0                  | 0.0           | 0.0               | 1.81         | 14.2         | 2.1           |
| 1.004 | 97.43           | 15.31          | 7.665        | 0.080            | 0.0                  | 0.0           | 0.0               | 1.07         | 18.9<        | 28.3          |
| 6.000 | 98.44           | 15.02          | 7.880        | 0.000            | 0.0                  | 0.0           | 0.0               | 0.77         | 6.0          | 0.0           |
| 6.001 | 98.25           | 15.07          | 7.880        | 0.002            | 0.0                  | 0.0           | 0.0               | 1.05         | 8.3          | 0.8           |
| 6.002 | 98.03           | 15.14          | 7.818        | 0.031            | 0.0                  | 0.0           | 0.0               | 0.86         | 6.8<         | 10.8          |

|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 3                                                                              |
| 84 North Street<br>Guildford<br>Surrey GU1 4AU |                        |  |
| Date 17/08/2026 13:39                          | Designed by commonuser |                                                                                     |
| File 1lestj-MD-NW-Model-13.08.2026.MDX         | Checked by             |                                                                                     |
| Innovyze                                       | Network 2020.1.3       |                                                                                     |

#### Area Summary for Storm

| Pipe Number | PIMP Type | PIMP Name | PIMP (%) | Gross Area (ha) | Imp. Area (ha) | Pipe Total (ha) |
|-------------|-----------|-----------|----------|-----------------|----------------|-----------------|
| 1.000       | User      | -         | 100      | 0.005           | 0.005          | 0.005           |
| 1.001       | User      | -         | 100      | 0.002           | 0.002          | 0.002           |
| 1.002       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 2.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 3.000       | User      | -         | 100      | 0.009           | 0.009          | 0.009           |
| 3.001       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 2.001       | User      | -         | 100      | 0.014           | 0.014          | 0.014           |
| 1.003       | User      | -         | 100      | 0.030           | 0.030          | 0.030           |
|             | User      | -         | 100      | 0.011           | 0.011          | 0.042           |
| 4.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 4.001       | User      | -         | 100      | 0.003           | 0.003          | 0.003           |
| 5.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 5.001       | User      | -         | 100      | 0.006           | 0.006          | 0.006           |
| 1.004       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 6.000       | -         | -         | 100      | 0.000           | 0.000          | 0.000           |
| 6.001       | User      | -         | 100      | 0.002           | 0.002          | 0.002           |
| 6.002       | User      | -         | 100      | 0.014           | 0.014          | 0.014           |
|             | User      | -         | 100      | 0.014           | 0.014          | 0.028           |
|             |           |           |          | Total           | Total          | Total           |
|             |           |           |          | 0.111           | 0.111          | 0.111           |

#### Free Flowing Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

|       |                       |       |       |       |   |   |
|-------|-----------------------|-------|-------|-------|---|---|
| 1.004 | Existing Soakaway SA1 | 8.500 | 7.648 | 0.000 | 0 | 0 |
|-------|-----------------------|-------|-------|-------|---|---|

#### Free Flowing Outfall Details for Storm

| Outfall Pipe Number | Outfall Name | C. Level (m) | I. Level (m) | Min I. Level (m) | D,L (mm) | W (mm) |
|---------------------|--------------|--------------|--------------|------------------|----------|--------|
|---------------------|--------------|--------------|--------------|------------------|----------|--------|

|       |                       |       |       |       |   |   |
|-------|-----------------------|-------|-------|-------|---|---|
| 6.002 | Existing Soakaway SA2 | 8.500 | 7.777 | 0.000 | 0 | 0 |
|-------|-----------------------|-------|-------|-------|---|---|

#### Simulation Criteria for Storm

|                             |       |                                   |       |                                     |       |
|-----------------------------|-------|-----------------------------------|-------|-------------------------------------|-------|
| Volumetric Runoff Coeff     | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | Inlet Coefficient                   | 0.800 |
| Areal Reduction Factor      | 1.000 | Foul Sewage per hectare (l/s)     | 0.000 | Flow per Person per Day (l/per/day) | 0.000 |
| Hot Start (mins)            | 0     | Additional Flow - % of Total Flow | 0.000 | Run Time (mins)                     | 60    |
| Hot Start Level (mm)        | 0     | MADD Factor * 10m³/ha Storage     | 0.000 | Output Interval (mins)              | 1     |
| Number of Input Hydrographs | 0     | Number of Offline Controls        | 0     | Number of Time/Area Diagrams        | 0     |
| Number of Online Controls   | 5     | Number of Storage Structures      | 5     | Number of Real Time Controls        | 0     |

#### Synthetic Rainfall Details

|                       |                                 |                       |       |
|-----------------------|---------------------------------|-----------------------|-------|
| Rainfall Model        | FEH                             | Summer Storms         | Yes   |
| Return Period (years) | 100                             | Winter Storms         | No    |
| FEH Rainfall Version  | 2013                            | Cv (Summer)           | 1.000 |
| Site Location         | GB 518400 104350 TQ 18400 04350 | Cv (Winter)           | 1.000 |
| Data Type             | Catchment                       | Storm Duration (mins) | 30    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                        | Page 4                                                                              |
| 84 North Street                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |  |
| Guildford                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                        |                                                                                     |
| Surrey GU1 4AU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                        |                                                                                     |
| Date 17/08/2026 13:39                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Designed by commonuser |                                                                                     |
| File 1lestj-MD-NW-Model-13.08.2026.MDX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Checked by             |                                                                                     |
| Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Network 2020.1.3       |                                                                                     |
| <p align="center"><u>Online Controls for Storm</u></p> <p><u>Orifice Manhole: PP2, DS/PN: 1.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.021 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP1, DS/PN: 2.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.021 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP3, DS/PN: 4.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.018 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP4, DS/PN: 5.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.018 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> <p><u>Orifice Manhole: PP5, DS/PN: 6.001, Volume (m³): 0.7</u></p> <p align="center">Diameter (m) 0.018 Discharge Coefficient 0.600 Invert Level (m) 7.880</p> |                        |                                                                                     |
| ©1982-2020 Innovyze                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                        |                                                                                     |

|                                                |                        |                                                                                     |
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| Motion                                         |                        | Page 5                                                                              |
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| Date 17/08/2026 13:39                          | Designed by commonuser |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### Storage Structures for Storm

#### Porous Car Park Manhole: PP2, DS/PN: 1.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 5.6     | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 4.0   | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP1, DS/PN: 2.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 38.9    | Width (m)        | 28.0  | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 5.0   | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP3, DS/PN: 4.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 8.3     | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 6.0   | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP4, DS/PN: 5.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 16.7    | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 12.0  | Cap Volume Depth (m)    | 0.500 |

#### Porous Car Park Manhole: PP5, DS/PN: 6.001

|                                      |         |                  |       |                         |       |
|--------------------------------------|---------|------------------|-------|-------------------------|-------|
| Infiltration Coefficient Base (m/hr) | 0.00000 | Porosity         | 0.30  | Slope (1:X)             | 0.0   |
| Membrane Percolation (mm/hr)         | 1000    | Invert Level (m) | 7.870 | Depression Storage (mm) | 5     |
| Max Percolation (l/s)                | 5.6     | Width (m)        | 5.0   | Evaporation (mm/day)    | 3     |
| Safety Factor                        | 2.0     | Length (m)       | 4.0   | Cap Volume Depth (m)    | 0.500 |

|                                                |                        |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### Volume Summary (Static)

Length Calculations based on Centre-Centre

| Pipe<br>Number | USMH<br>Name   | Manhole<br>Volume (m³) | Pipe<br>Volume (m³) | Storage                  | Total  |        |
|----------------|----------------|------------------------|---------------------|--------------------------|--------|--------|
|                |                |                        |                     | Structure<br>Volume (m³) |        |        |
| 1.000          | 4 - Silt Trap  | 0.640                  | 0.008               | 0.000                    | 0.648  |        |
| 1.001          |                | 0.701                  | 0.008               | 3.000                    | 3.710  |        |
| 1.002          |                | 5                      | 0.713               | 0.073                    | 0.000  | 0.786  |
| 2.000          |                | 3                      | 0.000               | 0.008                    | 0.000  | 0.008  |
| 3.000          | 2 - Silt Trap  | 1                      | 0.660               | 0.043                    | 0.000  | 0.704  |
| 3.001          |                | 0.707                  | 0.004               | 0.000                    | 0.711  |        |
| 2.001          |                | 6                      | 0.701               | 0.045                    | 21.000 | 21.746 |
| 1.003          |                | 6                      | 0.875               | 0.064                    | 0.000  | 0.940  |
| 4.000          | 9 - Silt Trap  | 7                      | 0.000               | 0.007                    | 0.000  | 0.007  |
| 4.001          |                | 0.701                  | 0.028               | 4.500                    | 5.230  |        |
| 5.000          |                | 8                      | 0.000               | 0.006                    | 0.000  | 0.006  |
| 5.001          |                | 0.701                  | 0.024               | 9.000                    | 9.725  |        |
| 1.004          | 11 - Silt Trap | 0.944                  | 0.026               | 0.000                    | 0.970  |        |
| 6.000          |                | 10                     | 0.000               | 0.008                    | 0.000  | 0.008  |
| 6.001          |                | PP5                    | 0.701               | 0.026                    | 3.000  | 3.727  |
| 6.002          |                | 11 - Silt Trap         | 0.771               | 0.026                    | 0.000  | 0.797  |
| Total          |                | 8.818                  | 0.405               | 40.500                   | 49.723 |        |

|                                                |                                                                                     |
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| Innovyze                                       | Network 2020.1.3                                                                    |

## 2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

|                        |       |                                   |       |                                            |       |
|------------------------|-------|-----------------------------------|-------|--------------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day)        | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

|                                    |                                 |             |           |
|------------------------------------|---------------------------------|-------------|-----------|
| Rainfall Model                     | FEH                             | Data Type   | Catchment |
| FEH Rainfall Version               | 2013                            | Cv (Summer) | 1.000     |
| Site Location                      | GB 518400 104350 TQ 18400 04350 | Cv (Winter) | 1.000     |
| Margin for Flood Risk Warning (mm) | 300.0                           | DTS Status  | OFF       |
| Analysis Timestep                  | Fine                            | DVD Status  | ON        |
| Inertia Status                     | ON                              |             |           |

|                          |                                                                                  |                   |  |
|--------------------------|----------------------------------------------------------------------------------|-------------------|--|
| Profile(s)               |                                                                                  | Summer and Winter |  |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |                   |  |
| Return Period(s) (years) |                                                                                  | 2, 10, 30, 100    |  |
| Climate Change (%)       |                                                                                  | 0, 40, 40, 45     |  |

| PN    | US/MH Name     | Event      | Duration (mins)    | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Overflow Vol (m <sup>3</sup> ) | Infil. Vol (m <sup>3</sup> ) | Maximum Vol (m <sup>3</sup> ) | Discharge Vol (m <sup>3</sup> ) |
|-------|----------------|------------|--------------------|-----------|-----------------|----------------------|----------------------------------|--------------------------------|------------------------------|-------------------------------|---------------------------------|
|       |                |            |                    |           |                 |                      |                                  |                                |                              |                               |                                 |
| 1.000 | 4 - Silt Trap  | 180 minute | 2 year Summer I+0% | 180       | 8.500           | 7.983                | -0.051                           | 0.000                          |                              | 0.049                         | 1.116                           |
| 1.001 | PP2            | 180 minute | 2 year Summer I+0% | 180       | 8.500           | 7.983                | 0.003                            | 0.000                          | 0.000                        | 0.797                         | 1.459                           |
| 1.002 | 5              | 180 minute | 2 year Summer I+0% | 180       | 8.500           | 7.881                | -0.088                           | 0.000                          |                              | 0.008                         | 1.458                           |
| 2.000 | 3              | 480 minute | 2 year Summer I+0% | 480       | 8.500           | 7.964                | -0.017                           | 0.000                          |                              | 0.078                         | -0.002                          |
| 3.000 | 1              | 480 minute | 2 year Summer I+0% | 480       | 8.500           | 7.964                | -0.052                           | 0.000                          |                              | 0.049                         | 3.059                           |
| 3.001 | 2 - Silt Trap  | 480 minute | 2 year Summer I+0% | 480       | 8.500           | 7.964                | -0.011                           | 0.000                          |                              | 0.119                         | 3.044                           |
| 2.001 | PP1            | 480 minute | 2 year Summer I+0% | 480       | 8.500           | 7.964                | -0.016                           | 0.000                          | 0.000                        | 4.032                         | 6.119                           |
| 1.003 | 6              | 15 minute  | 2 year Summer I+0% | 15        | 8.500           | 7.797                | -0.079                           | 0.000                          |                              | 0.082                         | 4.033                           |
| 4.000 | 7              | 240 minute | 2 year Summer I+0% | 240       | 8.500           | 7.909                | -0.069                           | 0.000                          |                              | 0.026                         | 0.000                           |
| 4.001 | PP3            | 240 minute | 2 year Summer I+0% | 240       | 8.500           | 7.909                | -0.071                           | 0.000                          | 0.000                        | 0.393                         | 0.650                           |
| 5.000 | 8              | 480 minute | 2 year Summer I+0% | 480       | 8.500           | 7.913                | -0.064                           | 0.000                          |                              | 0.032                         | -0.001                          |
| 5.001 | PP4            | 480 minute | 2 year Summer I+0% | 480       | 8.500           | 7.914                | -0.066                           | 0.000                          | 0.000                        | 0.827                         | 1.403                           |
| 1.004 | 9 - Silt Trap  | 15 minute  | 2 year Summer I+0% | 15        | 8.500           | 7.753                | -0.062                           | 0.000                          |                              | 0.113                         | 4.039                           |
| 6.000 | 10             | 240 minute | 2 year Summer I+0% | 240       | 8.500           | 7.904                | -0.076                           | 0.000                          |                              | 0.019                         | 0.000                           |
| 6.001 | PP5            | 240 minute | 2 year Summer I+0% | 240       | 8.500           | 7.904                | -0.076                           | 0.000                          | 0.000                        | 0.237                         | 0.436                           |
| 6.002 | 11 - Silt Trap | 15 minute  | 2 year Summer I+0% | 15        | 8.500           | 7.889                | -0.029                           | 0.000                          |                              | 0.083                         | 2.453                           |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status     |
|-------|----------------|------------------------|-----------------|------------|
|       |                |                        |                 |            |
| 1.000 | 4 - Silt Trap  |                        | 0.3             | OK         |
| 1.001 | PP2            | 93                     | 0.2             | SURCHARGED |
| 1.002 | 5              |                        | 0.1             | OK         |
| 2.000 | 3              |                        | 0.0             | OK*        |
| 3.000 | 1              |                        | 0.4             | OK         |
| 3.001 | 2 - Silt Trap  |                        | 0.4             | OK         |
| 2.001 | PP1            | 288                    | 0.2             | OK         |
| 1.003 | 6              |                        | 7.0             | OK         |
| 4.000 | 7              |                        | 0.0             | OK*        |
| 4.001 | PP3            | 132                    | 0.1             | OK         |
| 5.000 | 8              |                        | 0.0             | OK*        |
| 5.001 | PP4            | 232                    | 0.1             | OK         |
| 1.004 | 9 - Silt Trap  |                        | 6.9             | OK         |
| 6.000 | 10             |                        | 0.0             | OK*        |
| 6.001 | PP5            | 132                    | 0.1             | OK         |
| 6.002 | 11 - Silt Trap |                        | 4.7             | OK         |

|                                                |                        |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### 10 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

|                        |       |                                   |       |                                     |       |
|------------------------|-------|-----------------------------------|-------|-------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m³/ha Storage       | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                   | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day) | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

|                                    |                                 |                |           |
|------------------------------------|---------------------------------|----------------|-----------|
| Rainfall Model                     | FEH                             | Data Type      | Catchment |
| FEH Rainfall Version               | 2013                            | Cv (Summer)    | 1.000     |
| Site Location                      | GB 518400 104350 TQ 18400 04350 | Cv (Winter)    | 1.000     |
| Margin for Flood Risk Warning (mm) | 300.0                           | DTS Status     | OFF       |
| Analysis Timestep                  | Fine                            | DVD Status     | ON        |
|                                    |                                 | Inertia Status | ON        |

|                          |                                                                                  |                   |  |
|--------------------------|----------------------------------------------------------------------------------|-------------------|--|
| Profile(s)               |                                                                                  | Summer and Winter |  |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |                   |  |
| Return Period(s) (years) |                                                                                  | 2, 10, 30, 100    |  |
| Climate Change (%)       |                                                                                  | 0, 40, 40, 45     |  |

| PN    | US/MH Name     | Event                            | Duration (mins) | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m³) | Overflow Vol (m³) | Infil. Vol (m³) | Maximum Vol (m³) | Discharge Vol (m³) |
|-------|----------------|----------------------------------|-----------------|-----------|-----------------|----------------------|---------------------|-------------------|-----------------|------------------|--------------------|
|       |                |                                  |                 |           |                 |                      |                     |                   |                 |                  |                    |
| 1.000 | 4 - Silt Trap  | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 8.116           | 0.082                | 0.000               |                   |                 | 0.201            | 2.402              |
| 1.001 | PP2            | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 8.116           | 0.136                | 0.000               |                   | 0.000           | 1.749            | 3.308              |
| 1.002 | 5              | 15 minute 10 year Summer I+40%   | 15              | 8.500     | 8.008           | 0.038                | 0.000               |                   |                 | 0.151            | 0.378              |
| 2.000 | 3              | 2880 minute 10 year Summer I+40% | 2880            | 8.500     | 7.981           | 0.000                | 0.000               |                   |                 | 0.113            | 0.000              |
| 3.000 | 1              | 360 minute 10 year Summer I+40%  | 360             | 8.500     | 8.081           | 0.065                | 0.000               |                   |                 | 0.181            | 5.874              |
| 3.001 | 2 - Silt Trap  | 360 minute 10 year Summer I+40%  | 360             | 8.500     | 8.080           | 0.105                | 0.000               |                   |                 | 0.261            | 5.797              |
| 2.001 | PP1            | 360 minute 10 year Summer I+40%  | 360             | 8.500     | 8.080           | 0.100                | 0.000               |                   | 0.000           | 9.046            | 11.116             |
| 1.003 | 6              | 15 minute 10 year Summer I+40%   | 15              | 8.500     | 8.016           | 0.140                | 0.000               |                   |                 | 0.419            | 9.694              |
| 4.000 | 7              | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.959           | -0.019               | 0.000               |                   |                 | 0.076            | -0.003             |
| 4.001 | PP3            | 180 minute 10 year Summer I+40%  | 180             | 8.500     | 7.959           | -0.021               | 0.000               |                   | 0.000           | 0.894            | 1.499              |
| 5.000 | 8              | 240 minute 10 year Summer I+40%  | 240             | 8.500     | 7.969           | -0.008               | 0.000               |                   |                 | 0.087            | -0.008             |
| 5.001 | PP4            | 240 minute 10 year Summer I+40%  | 240             | 8.500     | 7.969           | -0.011               | 0.000               |                   | 0.000           | 1.895            | 2.692              |
| 1.004 | 9 - Silt Trap  | 15 minute 10 year Summer I+40%   | 15              | 8.500     | 7.901           | 0.086                | 0.000               |                   |                 | 0.329            | 10.209             |
| 6.000 | 10             | 120 minute 10 year Summer I+40%  | 120             | 8.500     | 7.952           | -0.028               | 0.000               |                   |                 | 0.067            | -0.001             |
| 6.001 | PP5            | 120 minute 10 year Summer I+40%  | 120             | 8.500     | 7.952           | -0.028               | 0.000               |                   | 0.000           | 0.581            | 0.845              |
| 6.002 | 11 - Silt Trap | 15 minute 10 year Summer I+40%   | 15              | 8.500     | 8.161           | 0.243                | 0.000               |                   |                 | 0.400            | 6.101              |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status      |
|-------|----------------|------------------------|-----------------|-------------|
|       |                |                        |                 |             |
| 1.000 | 4 - Silt Trap  |                        | 0.6             | SURCHARGED  |
| 1.001 | PP2            | 120                    | 0.3             | SURCHARGED  |
| 1.002 | 5              |                        | 1.5             | SURCHARGED  |
| 2.000 | 3              |                        | 0.0             | SURCHARGED* |
| 3.000 | 1              |                        | 0.9             | SURCHARGED  |
| 3.001 | 2 - Silt Trap  |                        | 0.9             | SURCHARGED  |
| 2.001 | PP1            | 324                    | 0.4             | SURCHARGED  |
| 1.003 | 6              |                        | 20.4            | SURCHARGED  |
| 4.000 | 7              |                        | 0.0             | OK*         |
| 4.001 | PP3            | 93                     | 0.2             | OK          |
| 5.000 | 8              |                        | 0.0             | OK*         |
| 5.001 | PP4            | 160                    | 0.2             | OK          |
| 1.004 | 9 - Silt Trap  |                        | 20.3            | SURCHARGED  |
| 6.000 | 10             |                        | 0.0             | OK*         |
| 6.001 | PP5            | 68                     | 0.2             | OK          |
| 6.002 | 11 - Silt Trap |                        | 14.4            | SURCHARGED  |

|                                                |                        |                                                                                     |
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| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### 30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

|                        |       |                                   |       |                                            |       |
|------------------------|-------|-----------------------------------|-------|--------------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m <sup>3</sup> /ha Storage | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                          | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day)        | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

Synthetic Rainfall Details

|                                    |                                 |             |           |
|------------------------------------|---------------------------------|-------------|-----------|
| Rainfall Model                     | FEH                             | Data Type   | Catchment |
| FEH Rainfall Version               | 2013                            | Cv (Summer) | 1.000     |
| Site Location                      | GB 518400 104350 TQ 18400 04350 | Cv (Winter) | 1.000     |
| Margin for Flood Risk Warning (mm) | 300.0                           | DTS Status  | OFF       |
| Analysis Timestep                  | Fine                            | DVD Status  | ON        |
| Inertia Status                     | ON                              |             |           |

|                          |                                                                                  |                   |
|--------------------------|----------------------------------------------------------------------------------|-------------------|
| Profile(s)               |                                                                                  | Summer and Winter |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |                   |
| Return Period(s) (years) |                                                                                  | 2, 10, 30, 100    |
| Climate Change (%)       |                                                                                  | 0, 40, 40, 45     |

| PN    | US/MH Name     | Event                           | Duration (mins) | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Overflow Vol (m <sup>3</sup> ) | Infil. Vol (m <sup>3</sup> ) | Maximum Vol (m <sup>3</sup> ) | Discharge Vol (m <sup>3</sup> ) |
|-------|----------------|---------------------------------|-----------------|-----------|-----------------|----------------------|----------------------------------|--------------------------------|------------------------------|-------------------------------|---------------------------------|
|       |                |                                 |                 |           |                 |                      |                                  |                                |                              |                               |                                 |
| 1.000 | 4 - Silt Trap  | 180 minute 30 year Summer I+40% | 180             | 8.500     | 8.182           | 0.148                | 0.000                            |                                |                              | 0.275                         | 3.048                           |
| 1.001 | PP2            | 180 minute 30 year Summer I+40% | 180             | 8.500     | 8.182           | 0.202                | 0.000                            |                                | 0.000                        | 2.218                         | 4.218                           |
| 1.002 | 5              | 15 minute 30 year Summer I+40%  | 15              | 8.500     | 8.143           | 0.173                | 0.000                            |                                |                              | 0.304                         | 0.543                           |
| 2.000 | 3              | 15 minute 30 year Summer I+40%  | 15              | 8.500     | 7.981           | 0.000                | 0.000                            |                                |                              | 0.102                         | -0.091                          |
| 3.000 | 1              | 360 minute 30 year Summer I+40% | 360             | 8.500     | 8.140           | 0.124                | 0.000                            |                                |                              | 0.248                         | 7.310                           |
| 3.001 | 2 - Silt Trap  | 360 minute 30 year Summer I+40% | 360             | 8.500     | 8.139           | 0.164                | 0.000                            |                                |                              | 0.328                         | 7.188                           |
| 2.001 | PP1            | 360 minute 30 year Summer I+40% | 360             | 8.500     | 8.139           | 0.159                | 0.000                            |                                | 0.000                        | 11.604                        | 13.295                          |
| 1.003 | 6              | 15 minute 30 year Summer I+40%  | 15              | 8.500     | 8.162           | 0.286                | 0.000                            |                                |                              | 0.586                         | 12.650                          |
| 4.000 | 7              | 120 minute 30 year Winter I+40% | 120             | 8.500     | 7.978           | 0.000                | 0.000                            |                                |                              | 0.098                         | -0.011                          |
| 4.001 | PP3            | 180 minute 30 year Summer I+40% | 180             | 8.500     | 7.986           | 0.006                | 0.000                            |                                | 0.000                        | 1.168                         | 1.972                           |
| 5.000 | 8              | 180 minute 30 year Winter I+40% | 180             | 8.500     | 7.977           | 0.000                | 0.000                            |                                |                              | 0.114                         | -0.025                          |
| 5.001 | PP4            | 240 minute 30 year Summer I+40% | 240             | 8.500     | 7.999           | 0.019                | 0.000                            |                                | 0.000                        | 2.464                         | 3.488                           |
| 1.004 | 9 - Silt Trap  | 15 minute 30 year Summer I+40%  | 15              | 8.500     | 7.972           | 0.157                | 0.000                            |                                |                              | 0.418                         | 13.339                          |
| 6.000 | 10             | 120 minute 30 year Summer I+40% | 120             | 8.500     | 7.980           | 0.000                | 0.000                            |                                |                              | 0.098                         | -0.002                          |
| 6.001 | PP5            | 120 minute 30 year Summer I+40% | 120             | 8.500     | 7.983           | 0.003                | 0.000                            |                                | 0.000                        | 0.806                         | 1.134                           |
| 6.002 | 11 - Silt Trap | 15 minute 30 year Summer I+40%  | 15              | 8.500     | 8.353           | 0.435                | 0.000                            |                                |                              | 0.616                         | 7.994                           |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status      |
|-------|----------------|------------------------|-----------------|-------------|
|       |                |                        |                 |             |
| 1.000 | 4 - Silt Trap  |                        | 0.8             | SURCHARGED  |
| 1.001 | PP2            | 111                    | 0.4             | SURCHARGED  |
| 1.002 | 5              |                        | 2.2             | SURCHARGED  |
| 2.000 | 3              |                        | 0.0             | SURCHARGED* |
| 3.000 | 1              |                        | 1.2             | SURCHARGED  |
| 3.001 | 2 - Silt Trap  |                        | 1.1             | SURCHARGED  |
| 2.001 | PP1            | 348                    | 0.5             | SURCHARGED  |
| 1.003 | 6              |                        | 26.1            | SURCHARGED  |
| 4.000 | 7              |                        | 0.0             | SURCHARGED* |
| 4.001 | PP3            | 99                     | 0.2             | SURCHARGED  |
| 5.000 | 8              |                        | 0.0             | SURCHARGED* |
| 5.001 | PP4            | 168                    | 0.2             | SURCHARGED  |
| 1.004 | 9 - Silt Trap  |                        | 26.1            | SURCHARGED  |
| 6.000 | 10             |                        | 0.0             | SURCHARGED* |
| 6.001 | PP5            | 72                     | 0.2             | SURCHARGED  |
| 6.002 | 11 - Silt Trap |                        | 18.3            | FLOOD RISK  |

|                                                |                        |                                                                                     |
|------------------------------------------------|------------------------|-------------------------------------------------------------------------------------|
| Motion                                         |                        | Page 10                                                                             |
| 84 North Street<br>Guildford<br>Surrey GU1 4AU |                        |  |
| Date 17/08/2026 13:39                          | Designed by commonuser |                                                                                     |
| File 1lestj-MD-NW-Model-13.08.2026.MDX         | Checked by             |                                                                                     |
| Innovyze                                       | Network 2020.1.3       |                                                                                     |

### 100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

| Simulation Criteria    |       |                                   |       |                                     |       |
|------------------------|-------|-----------------------------------|-------|-------------------------------------|-------|
| Areal Reduction Factor | 1.000 | Manhole Headloss Coeff (Global)   | 0.500 | MADD Factor * 10m³/ha Storage       | 0.000 |
| Hot Start (mins)       | 0     | Foul Sewage per hectare (l/s)     | 0.000 | Inlet Coefficient                   | 0.800 |
| Hot Start Level (mm)   | 0     | Additional Flow - % of Total Flow | 0.000 | Flow per Person per Day (l/per/day) | 0.000 |

|                             |   |                              |   |                              |   |
|-----------------------------|---|------------------------------|---|------------------------------|---|
| Number of Input Hydrographs | 0 | Number of Offline Controls   | 0 | Number of Time/Area Diagrams | 0 |
| Number of Online Controls   | 5 | Number of Storage Structures | 5 | Number of Real Time Controls | 0 |

| Synthetic Rainfall Details         |  |                                 |  |             |  |           |  |                |  |    |
|------------------------------------|--|---------------------------------|--|-------------|--|-----------|--|----------------|--|----|
| Rainfall Model                     |  | FEH                             |  | Data Type   |  | Catchment |  |                |  |    |
| FEH Rainfall Version               |  | 2013                            |  | Cv (Summer) |  | 1.000     |  |                |  |    |
| Site Location                      |  | GB 518400 104350 TQ 18400 04350 |  | Cv (Winter) |  | 1.000     |  |                |  |    |
| Margin for Flood Risk Warning (mm) |  | 300.0                           |  | DTS Status  |  | OFF       |  | Inertia Status |  | ON |
| Analysis Timestep                  |  | Fine                            |  | DVD Status  |  | ON        |  |                |  |    |

|                          |                                                                                  |                   |
|--------------------------|----------------------------------------------------------------------------------|-------------------|
| Profile(s)               |                                                                                  | Summer and Winter |
| Duration(s) (mins)       | 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760 |                   |
| Return Period(s) (years) | 2, 10, 30, 100                                                                   |                   |
| Climate Change (%)       | 0, 40, 40, 45                                                                    |                   |

| PN    | US/MH Name     | Event                            | Duration (mins) | US/CL (m) | Water Level (m) | Surcharged Depth (m) | Flooded Volume (m <sup>3</sup> ) | Overflow Vol (m <sup>3</sup> ) | Infil. Vol (m <sup>3</sup> ) | Maximum Vol (m <sup>3</sup> ) | Discharge Vol (m <sup>3</sup> ) |
|-------|----------------|----------------------------------|-----------------|-----------|-----------------|----------------------|----------------------------------|--------------------------------|------------------------------|-------------------------------|---------------------------------|
| 1.000 | 4 - Silt Trap  | 120 minute 100 year Summer I+45% | 120             | 8.500     | 8.280           | 0.246                | 0.000                            |                                |                              | 0.386                         | 3.455                           |
| 1.001 | PP2            | 120 minute 100 year Summer I+45% | 120             | 8.500     | 8.279           | 0.299                | 0.000                            |                                | 0.000                        | 2.914                         | 4.135                           |
| 1.002 | 5              | 15 minute 100 year Summer I+45%  | 15              | 8.500     | 8.346           | 0.377                | 0.000                            |                                |                              | 0.534                         | 0.756                           |
| 2.000 | 3              | 15 minute 100 year Summer I+45%  | 15              | 8.500     | 7.981           | 0.000                | 0.000                            |                                |                              | 0.143                         | -0.129                          |
| 3.000 | 1              | 360 minute 100 year Summer I+45% | 360             | 8.500     | 8.228           | 0.212                | 0.000                            |                                |                              | 0.347                         | 9.363                           |
| 3.001 | 2 - Silt Trap  | 360 minute 100 year Summer I+45% | 360             | 8.500     | 8.227           | 0.252                | 0.000                            |                                |                              | 0.427                         | 9.173                           |
| 2.001 | PP1            | 360 minute 100 year Summer I+45% | 360             | 8.500     | 8.227           | 0.247                | 0.000                            |                                | 0.000                        | 15.379                        | 16.076                          |
| 1.003 | 6              | 15 minute 100 year Summer I+45%  | 15              | 8.500     | 8.379           | 0.503                | 0.000                            |                                |                              | 0.832                         | 16.382                          |
| 4.000 | 7              | 720 minute 100 year Summer I+45% | 720             | 8.500     | 7.978           | 0.000                | 0.000                            |                                |                              | 0.097                         | 0.000                           |
| 4.001 | PP3            | 180 minute 100 year Summer I+45% | 180             | 8.500     | 8.024           | 0.044                | 0.000                            |                                | 0.000                        | 1.552                         | 2.611                           |
| 5.000 | 8              | 720 minute 100 year Winter I+45% | 720             | 8.500     | 7.977           | 0.000                | 0.000                            |                                |                              | 0.122                         | 0.000                           |
| 5.001 | PP4            | 240 minute 100 year Summer I+45% | 240             | 8.500     | 8.041           | 0.061                | 0.000                            |                                | 0.000                        | 3.272                         | 4.506                           |
| 1.004 | 9 - Silt Trap  | 15 minute 100 year Summer I+45%  | 15              | 8.500     | 8.074           | 0.259                | 0.000                            |                                |                              | 0.534                         | 17.204                          |
| 6.000 | 10             | 120 minute 100 year Winter I+45% | 120             | 8.500     | 7.980           | 0.000                | 0.000                            |                                |                              | 0.131                         | -0.005                          |
| 6.001 | PP5            | 120 minute 100 year Summer I+45% | 120             | 8.500     | 8.026           | 0.046                | 0.000                            |                                | 0.000                        | 1.113                         | 1.513                           |
| 6.002 | 11 - Silt Trap | 15 minute 100 year Summer I+45%  | 15              | 8.500     | 8.500           | 0.582                | 0.299                            |                                |                              | 1.078                         | 10.363                          |

| PN    | US/MH Name     | Half Drain Time (mins) | Pipe Flow (l/s) | Status      |
|-------|----------------|------------------------|-----------------|-------------|
| 1.000 | 4 - Silt Trap  |                        | 1.3             | FLOOD RISK  |
| 1.001 | PP2            | 100                    | 0.5             | FLOOD RISK  |
| 1.002 | 5              |                        | 3.5             | FLOOD RISK  |
| 2.000 | 3              |                        | 0.0             | SURCHARGED* |
| 3.000 | 1              |                        | 1.5             | FLOOD RISK  |
| 3.001 | 2 - Silt Trap  |                        | 1.4             | FLOOD RISK  |
| 2.001 | PP1            | 378                    | 0.5             | FLOOD RISK  |
| 1.003 | 6              |                        | 32.9            | FLOOD RISK  |
| 4.000 | 7              |                        | 0.0             | SURCHARGED* |
| 4.001 | PP3            | 108                    | 0.2             | SURCHARGED* |
| 5.000 | 8              |                        | 0.0             | SURCHARGED* |
| 5.001 | PP4            | 184                    | 0.3             | SURCHARGED* |
| 1.004 | 9 - Silt Trap  |                        | 32.9            | SURCHARGED  |
| 6.000 | 10             |                        | 0.0             | SURCHARGED* |
| 6.001 | PP5            | 80                     | 0.2             | SURCHARGED  |
| 6.002 | 11 - Silt Trap |                        | 21.8            | FLOOD       |

## Appendix D

Updated Drainage Strategy Layout



- Notes
- Any discrepancies shall be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
  - All levels and dimensions are approximate and not for construction purposes
  - This drawing shall be read in conjunction with all other relevant engineering details, drawings and specification.
  - The exact location of all private rainwater pipes & internal foul soil pipes are to be confirmed with the architect details prior to works commencing.
  - 350mm min cover to be provided for private pipes laid in soft/paved areas. 900mm min cover to be provided for private pipes laid beneath roads/driveways unless not practicable. Where unachievable, shallow private drains may require protection using concrete surround or paving slabs bridging the trench, subject to the NHBC inspector's requirements.
  - All pipes shall be laid soffit to soffit with outgoing pipes unless otherwise stated.
  - Manholes situated within areas accessible to motor vehicles are to be fitted with suitable strength covers and frames. Please refer to the manhole schedule for guidance on this.

Legend

- New Surface Water Gravity Pipe
- Surface Water Manhole
- Polystorm Diffuser Crate
- Silt Trap 6000
- Permeable Paviments (see drawing for details)
- Orifice Flow Control (see drawing for discharge rate)
- Rainwater Pipe
- 210 Litre Water Butt

|      |                   |     |     |     |            |
|------|-------------------|-----|-----|-----|------------|
| P2   | Water Butts Added | PA  | PA  | N3  | 18.08.2026 |
| P1   | First Issue       | PA  | PA  | N3  | 21.05.2026 |
| Rev. | Description       | Drm | Chk | App | Date       |

Drawing Status: **FOR PLANNING**  
NOT FOR CONSTRUCTION

**motion**  
Guldford - Reading - London  
[www.motion.co.uk](http://www.motion.co.uk)

Client:  
Lincoln Estates Ltd

Project:  
St John's Court  
Penstone Close, Lancing  
Title:  
Drainage Strategy Drawing

Scale: 1:200 (@ A1)  
Drawing:  
2510016-0500  
Revision:  
P2

C:\Users\jallen\Motion\Barfleur - 11541 2510016\Drawings\0500-Orange Strategy-P2.dwg

## Appendix E

### Drainage Management and Maintenance Plan



St John's Court, Penstone Close, Lancing

Drainage Management & Maintenance Plan

For

Lincoln Estates Ltd

## Document Control Sheet

St John's Court, Penstone Close, Lancing

Lincoln Estates Ltd

This document has been issued and amended as follows:

| Date                      | Issue | Prepared by             | Approved by |
|---------------------------|-------|-------------------------|-------------|
| 21 <sup>st</sup> May 2026 | FINAL | Phil Allen MCIWEM C.WEM | Neil Jaques |
|                           |       |                         |             |

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2.0 Maintenance Categories ..... 2

3.0 The Surface Water Drainage System ..... 3

4.0 General Maintenance Principles ..... 4

5.0 Inspection and Maintenance Frequency of Components..... 6

## 1.0 Introduction

- 1.1 This document sets out the suggested principles for the long-term management and maintenance of the surface water drainage system on the proposed development at St John's Court, Penstone Close, Lancing, West Sussex.
- 1.2 The purpose of this document is to ensure that the adopting site management company has a robust inspection and maintenance plan in place for the lifetime of the development. This ensures the optimum operation of the surface water drainage system and that it will be maintained in perpetuity. This will contribute to reducing the risk of surface water flooding both on- and off-site.
- 1.3 All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant). Method statements and risk assessments should always be undertaken and made available, if requested.
- 1.4 This document has been produced by Motion on behalf of their client, Lincoln Estates Ltd. This document describes the typical management and maintenance tasks that are known at the design stage (maintenance frequencies and typical tasks, for example). These have been drawn from industry guidance such as CIRIA C753 - The SuDS Manual – and manufacturer's own guidance.
- 1.5 Maintenance is considered as a construction activity under the CDM Regulations 2015. Under the CDM Regulations, it is a requirement that a competent person be appointed to carry out a required role. CDM defines a competent person as an individual with sufficient knowledge of the specific tasks to be undertaken, as well as sufficient experience and ability to carry out their duties in relation to the task in a way that secures health and safety on site.
- 1.6 In recognition of the requirements of the CDM Regulations 2015, this drainage management and maintenance plan expects that the maintenance work will be carried out by a competent person who must have prior knowledge of the drainage components and SuDS systems on site.
- 1.7 There are limitations on what this document can prescribe at the planning stage. At this stage this document cannot name the specific individuals who will carry out the maintenance and what equipment is to be used. Related to this, this document is unable to provide method statements for exactly how maintenance practices will be carried out. These can only be determined at the time of the maintenance being carried out and the exact maintenance need. Therefore, this is to be the responsibility of the adopting site management company and/or the individuals carrying out the work. We urge those who are carrying out the maintenance to record this information and make it available to the Local Planning Authority (LPA), if required to do so. This drainage management and maintenance plan needs to be a living document that is owned and maintained by the adopting site management company and should be adhered to for the lifetime of the development.

## 2.0 Maintenance Categories

2.1 There are three categories of maintenance activities referred to in this report. These are:

### Inspection and Monitoring

- „ Inspection and monitoring tasks should be carried out frequently, nominally once a month, and should include a visual inspection of all components including all inlets and outlets.

### Regular Maintenance (Monthly)

- „ Regular maintenance consists of basic tasks done on a frequent and predictable schedule, including vegetation management and litter removal.

### Seasonal Maintenance (Quarterly)

- „ Seasonal maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (leaf litter and sediment removal is an example).

### Remedial Maintenance

- „ Remedial maintenance comprises of intermittent tasks that may be required to rectify faults associated with the system that have been identified through visual inspections. The likelihood of faults can be minimised by correct installation, regular inspection and timely maintenance. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events and, as such, timings are difficult to predict.

### 3.0 The Surface Water Drainage System

- 3.1 The proposed surface water drainage system is made up of a number of components/structures. These include:
- ” Permeable paving
  - ” Catchpit manholes/silt traps
  - ” Manholes
  - ” Pipes
  - ” Orifice Plate flow controls
- 3.2 Water All components should be installed in accordance with the manufacturer's instructions and to the levels/arrangement as defined on the designer's drawings. Not doing so will invalidate any warranty provided by the manufacturer.
- 3.3 All maintenance and cleaning must be carried out in accordance with manufacturer's recommendations and by competent and suitably qualified staff, as defined in the CDM regulations 2015.
- 3.4 This document should be read in conjunction with the design drawings of the drainage system, so that the location and type of each feature can be recognised and understood.
- 3.5 Manufacturer's instructions are to be added to this document once specific products have been selected and installed as part of the detailed design. This document will subsequently form the basis for a drainage maintenance regime.

## 4.0 General Maintenance Principles

- 4.1 All surface water drainage systems, whether piped gravity systems, Sustainable Drainage Systems (SuDS), or flow control devices and pumps, require regular maintenance to keep them working at optimum efficiency and capacity. The maintenance of the surface water drainage system on the St John's Court development should be carried out alongside other regular maintenance tasks on site.
- 4.2 Timely and adequate maintenance will increase the lifespan of all the drainage components. Inadequate maintenance will do the reverse. Therefore, the projected lifespan and anticipated replacement date of each drainage component cannot be forecast at the time of this document being produced.
- 4.3 The site management company (or their agents) are responsible for the maintenance of the surface water drainage system for the lifetime of the development.
- 4.4 Construction activities can create and discharge significant quantities of sediment that will quickly clog the surface water drainage system. Therefore, construction-stage sediment removal is required immediately post-construction. The construction site manager should assess this and carry out cleaning as necessary.
- 4.5 Catchpit manholes/silt traps will be specified upstream of the permeable surfacing and its associated subbase. They will remove gross solids and the majority of silts. It is important that any debris build-up in the catchpit manholes/silt traps is removed at regular intervals. This will reduce the risk of the permeable paved areas becoming silted up. It will maintain the design capacity and function of this part of the drainage system.
- 4.6 Cleaning should also take place after large storms when there have been increased surface water flows and visible entrainment and deposition of debris.
- 4.7 An increased frequency of inspection and maintenance should be programmed into the autumn and winter months in acknowledgement that:
  - „ Leaf fall from deciduous trees in autumn will result in an increased amount of leaf litter and an elevated blockage risk of drainage infrastructure.
  - „ Increased rainfall during winter months will result in greater quantities of water moving through the drainage system and a greater input of silt and other debris.
- 4.8 Table 4.1, below, gives an overview of required maintenance tasks and the frequency with which they need to be undertaken. Section 5 – Inspection and Maintenance Frequency of Components – will assign typical maintenance frequencies and tasks to the specific components used within the surface water drainage system proposed for the development at St John's Court.

Table 4.1: Typical maintenance tasks and frequencies

| Activity                  | Indicative Frequency                                                         | Typical Tasks                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inspection and Monitoring | Monthly                                                                      | <ul style="list-style-type: none"> <li>Inspection of all inlets, outlets and control structures</li> </ul>                                                                                                                                                                                                                                        |
| Regular Maintenance       | Monthly, for the lifetime of the development                                 | <ul style="list-style-type: none"> <li>Litter picking and debris removal</li> <li>Weed removal and invasive plant control</li> </ul>                                                                                                                                                                                                              |
| Seasonal Maintenance      | Quarterly, for the lifetime of the development                               | <ul style="list-style-type: none"> <li>Vegetation management around components</li> <li>Sweeping of pavement areas to remove surface silt</li> <li>Silt removal from system, including catchpits, cellular storage structures and control structures</li> </ul>                                                                                   |
| Remedial maintenance      | As required as a result of inspections, for the lifetime of the development. | <ul style="list-style-type: none"> <li>Inlet/outlet repairs</li> <li>Erosion repairs</li> <li>Reinstatement of edgings</li> <li>Reinstatement following pollution incidents</li> <li>Removal of silt build-up and leaf litter after storms</li> <li>Repair of vandalism</li> <li>Replacement of any blocked filter membranes/materials</li> </ul> |

## 5.0 Inspection and Maintenance Frequency of Components

- 5.1 Table 5.1 below lists each of the components used within the site's surface water drainage system. It suggests an indicative maintenance frequency for each component and ascribes typical maintenance tasks to them.
- 5.2 This list is not exhaustive, nor is it prescriptive. As mentioned in Section 3, additional, unscheduled maintenance may be required following adverse weather conditions or after autumn leaf falls. Additional maintenance tasks may be required to adequately clean and maintain individual components.
- 5.3 The list of components should be cross-referenced with the designer's drawings so that the location of each component can be identified.
- 5.4 It is the responsibility of the adopting site management company (or their agents) to ensure that all necessary maintenance activities are carried out in a timely manner and that the design performance of each drainage component is preserved.
- 5.5 If there is any uncertainty regarding the correct and safe methods of cleaning, or what equipment should be used, the manufacturer should be consulted.

*Table 5.1: Maintenance Frequency and Task for Drainage Components*

| Activity                     | Indicative Frequency                                           | Anticipated Tasks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pipes                        | As required                                                    | <ul style="list-style-type: none"> <li>Identify any pipes that may not be operating properly and employ a competent, qualified contractor to inspect using CCTV.</li> <li>If the pipe is blocked with silt or debris, the pipe should be jetted clean from an upstream access point. All silt and debris should be captured and removed at a downstream access point.</li> <li>Inspect once clean.</li> <li>If any other defects are encountered (cracks, displaced joints, root ingress), appropriate solutions should be discussed with a competent and qualified contractor. These services are usually provided by the same companies that offer CCTV surveys and pipe jetting services.</li> </ul> |
| Manholes                     | Annually and as required, for the lifetime of the development. | <ul style="list-style-type: none"> <li>Inspect/identify any damage or areas that are not operating correctly</li> <li>Remove silt, litter, leaves and other detritus.</li> <li>Inspect once clean.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Catchpit Manholes/Silt Traps | Annually and as required, for the lifetime of the development. | <ul style="list-style-type: none"> <li>Inspect/identify any damage or areas that are not operating correctly</li> <li>Remove silt, litter, leaves and other detritus.</li> <li>Inspect once clean.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Water Butts                  | Annually in Autumn to Winter                                   | <ul style="list-style-type: none"> <li>Remove falling leaves and seeds from guttering or those that have found their way into the water butt.</li> <li>Water may stagnate slightly. If so, use a water butt cleaning disc into the tank.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|                             |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |                                                                                                                                                          | <ul style="list-style-type: none"> <li>” In autumn and winter, drain water off every 10 days (or less) to make sure that water butts don't overflow, and that water is kept moving. This will stop larvae and flies from using the water butt.</li> <li>” Use safe products such as vinegar to clean the outside of the tank and the inside of the lid and be careful not to contaminate water with chemicals.</li> <li>” At least once a year, completely empty the water butt and scrub it out with warm soapy water and then rinse thoroughly. This is best done at a time when the water butt is already nearly empty (end of summer) or when it can readily refill (winter).</li> </ul>                                                                                                                                                                                                                                       |
| Permeable pavements         | Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations. | <ul style="list-style-type: none"> <li>” Remove any vegetation or moss that has been allowed to establish and grow in the Golpla.</li> <li>” Refilling any sections with the correct aggregate need only be carried out at intervals of 5 years or so. It should be borne in mind that Golpla should have 15mm or so of 'overfill'.</li> <li>” Remove weeds from the surface through the application of glyphosate-based weed killers</li> <li>” Stabilise and mow contributing and adjacent areas.</li> <li>” Inspect once clean.</li> <li>” When subjected to low level oil drips permeable pavements can continue to biodegrade hydrocarbons indefinitely.</li> <li>” Major oil spills have the potential to contaminate the surface and the underlying crushed stone. In the event of a major oil spill, the area of block pavements and crushed stone that is affected should be removed, cleaned and reinstalled.</li> </ul> |
| Orifice Plates and Chambers | Inspections at regular intervals (every 3 – 6 months).                                                                                                   | <ul style="list-style-type: none"> <li>” Orifice plates have no moving parts to fail and quality units are made of stainless steel to resist scour, degradation and chemical attack.</li> <li>” The orifice plates in this scheme are to be downstream of the permeable pavements, so all contributing flows should be heavily filtered and free of any debris.</li> <li>” Debris and silt should be removed if present</li> <li>” Check wear on orifice to ensure no enlargement is taking place.</li> <li>” Any visible fixing bolts should be checked.</li> <li>” If there is a suspected blockage, the housing chamber can be inspected internally, the</li> </ul>                                                                                                                                                                                                                                                             |

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|--|--|--------------------------------------------------------------------|
|  |  | blockage cleared and the orifice returned to its working position. |
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- 5.6 Upon completion of maintenance activities, a record should be kept of the work carried out. This should be retained, and an annual maintenance report should be compiled, which should include the following:
- ” Observations resulting from inspections
  - ” Maintenance and operation activities undertaken during the year
  - ” Recommendations for inspections and maintenance programmes for the following year
- 5.7 On the next page is a table with suggested information should be recorded and included with the maintenance plan. As mentioned in the introduction to this document, this should be a living document and regularly updated, as required and should be kept for the lifetime of the development.
- 5.8 The Local Planning Authority (Worthing and Adur District Council) may request to check and sign off any maintenance activities. Therefore, it is the recommendation that the LPA is contacted prior to any scheduled routine maintenance. The table mentioned above and on the next page, as well as the annual maintenance report, should be offered to the LPA for their records and approval.

| Date | Component requiring maintenance | Issues prompting maintenance | Scheduled maintenance (Y/N) | Maintenance carried out | Additional works required (Y/N). If yes, please detail | Next scheduled date of inspection and maintenance |
|------|---------------------------------|------------------------------|-----------------------------|-------------------------|--------------------------------------------------------|---------------------------------------------------|
|      |                                 |                              |                             |                         |                                                        |                                                   |
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|      |                                 |                              |                             |                         |                                                        |                                                   |

## Appendix F

### LiDAR Contour and Topographic Heat Map

