



Land off Long Drive, South Ruislip, HA4 0HG

Flood Risk Assessment and Drainage Strategy

For Hotel Top Limited

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Land off Long Drive, South Ruislip, HA4 0HG

Project	Flood Risk Assessment
Client	Hotel Top Limited
Status	Final
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EXECUTIVE SUMMARY

The Site would be expected to remain dry in all but the most extreme conditions. The consequences of flooding are acceptable, and the development would be in accordance with the requirements of the National Planning Policy Framework (NPPF). The Proposed Development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF.

The Proposed Development should not therefore be precluded on the grounds of flood risk or drainage.

1.0 INTRODUCTION

1.1 Background

This Flood Risk Assessment (FRA) has been prepared by KRS Enviro at the request of Top Hotel Limited to support a planning application for proposed extension of an existing hotel building, alongside the construction of four new residential apartment buildings (“the Proposed Development”) at land off Long Drive, South Ruislip, HA4 0HG (“the Site”).

This FRA has been carried out in accordance with guidance contained in the National Planning Policy Framework (NPPF)¹, associated Planning Practice Guidance on flood risk and coastal change² (PPG) and the PPG ‘Site-specific flood risk assessment checklist’. This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

It is recognised that developments which are designed without regard to flood risk may endanger lives, damage property, cause disruption to the wider community, damage the environment, be difficult to insure and require additional expense on remedial works. The development design should be such that future users will not have difficulty obtaining insurance or mortgage finance, or in selling all or part of the development, as a result of flood risk issues.

1.2 National Planning Policy Framework (NPPF)

One of the key aims of the NPPF is to ensure that flood risk is taken into account at all stages of the planning process; to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk.

It advises that where new development is exceptionally necessary in areas of higher risk, this should be safe, without increasing flood risk elsewhere, and where possible, reduce flood risk overall. A risk-based approach is adopted at stages of the planning process, applying a source pathway receptor model to planning and flood risk. To demonstrate this, an FRA is required and should include:

- whether a proposed development is likely to be affected by current or future flooding from all sources;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate;
- if necessary, provide the evidence to the Local Planning Authority (LPA) that the Sequential Test can be applied; and
- whether the development will be safe and pass part c) of the Exception Test if this is appropriate.

The report findings are based upon professional judgement and are summarised below with detailed recommendations provided at the end of the report. The report includes rainfall data from

¹ Ministry for Housing, Communities and Local Government (2025) National Planning Policy Framework: <https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf>

² Communities and Local Government (2022) Planning Practice Guidance - Flood Risk and Coastal Change: <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

the Flood Estimation Handbook (FEH) and hydrogeological information from the British Geological Survey (BGS). The assessment will summarise and refer to these datasets in the text.

1.3 Report Structure

This FRA has the following report structure:

- Section 2 describes the location of the existing and Proposed Development;
- Section 3 outlines the flood risk to the existing and Proposed Development;
- Section 4 outlines the SuDS Strategy for the Proposed Development;
- Section 5 outlines the mitigation measures used to manage the overall level of flood risk; and
- Section 6 presents a summary and conclusions

2.1 Site Location

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Figure 1 - Site Location

2.2 Existing Development

The front of the Site is occupied by the Ramada hotel (Use Class C1), a four-storey building which forms part of the South Ruislip Local Centre. To the rear of the hotel is a two-storey building comprising a conference centre (associated with the hotel operator) and a cash and carry (both Sui Generis uses). Another two-storey building relating to the cash and carry is located further rearwards and a further single-storey raised vacant building is sited at the most western part of the Site (the last known use of which was as an office (Use Class E(g)(i)).

2.3 Proposed Development

The Proposed Development is for partial demolition of existing buildings and erection of three buildings comprising 114no. residential apartments, plus extension to existing hotel, along with access, car parking, servicing, landscaping, and other associated works (see Appendix 1). Further details with regard to the Proposed Development can be found in the accompanying information submitted with the planning application.

2.4 Catchment Hydrology/Drainage

The Yeading Brook is located approximately 700m to the west of the Site. It is understood that the existing hotel drains to the public surface water sewer within Long Drive.

2.5 Ground Levels

A topographical survey of the Site has recently been undertaken (see Appendix 2). The Site falls from west to east with a ground level of 41.44 metres Above Ordnance Datum (mAOD) on the western boundary, a ground level of 37.10mAOD on the eastern boundary.

2.6 Ground Conditions

The British Geological Survey (BGS) map³ shows that the bedrock deposits at the Site consist of London Clay Formation - Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.80 million years ago during the Palaeogene period. No superficial deposits are recorded. Information from the National Soil Resources Institute⁴ details the Site area as being situated on slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.

³ https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.14476159.932338379.1655890995-1831306757.1655472887

⁴ <http://www.landis.org.uk/soilscapes/>

3.0 FLOOD RISK

3.1 Sources of Flooding

All sources of flooding have been considered, these are; fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial drainage systems/infrastructure failure.

3.2 Environment Agency

Information regarding the current flood risk at the application Site and local flood defences has been obtained from the Environment Agency.

3.3 Climate Change

Projections of future climate change, in the UK, indicate more frequent, short-duration, high intensity rainfall and more frequent periods of long duration rainfall. Guidance included within the NPPF recommends that the effects of climate change are incorporated into FRA's. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the flood risk assessments: climate change allowances guidance⁵. Table 1 shows the peak river flow allowances by river management catchment.

The flood risk assessments: climate change allowances guidance recommends that the central allowances are used to assess climate change throughout the lifetime of the development which is 100 years. Therefore, the fluvial design event for the Site is the 1 in 100 year (+17%) event

Table 1 - Peak River Flow Allowances by River Catchment

River Catchment	Allowance Category	2020s	2050s	2080s
London Management Catchment	Upper	+26%	+30%	+54%
	Higher	+14%	+14%	+27%
	Central	+10%	+7%	+17%

3.4 Environment Agency Flood Zones

A review of the Environment Agency's Flood Zones indicates that the Site is located within Flood Zone 1 and therefore has a 'low probability' of flooding with less than a 1 in 1000 annual probability of river flooding in any year (<0.1%), as shown in Figures 2 and 3.

The Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development. They show the worst case scenario.

The Environment Agency Flood Zones and acceptable development types are explained in Table 2. Table 2 shows that all development types are generally acceptable in Flood Zone 1.

⁵ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#high-allowances>

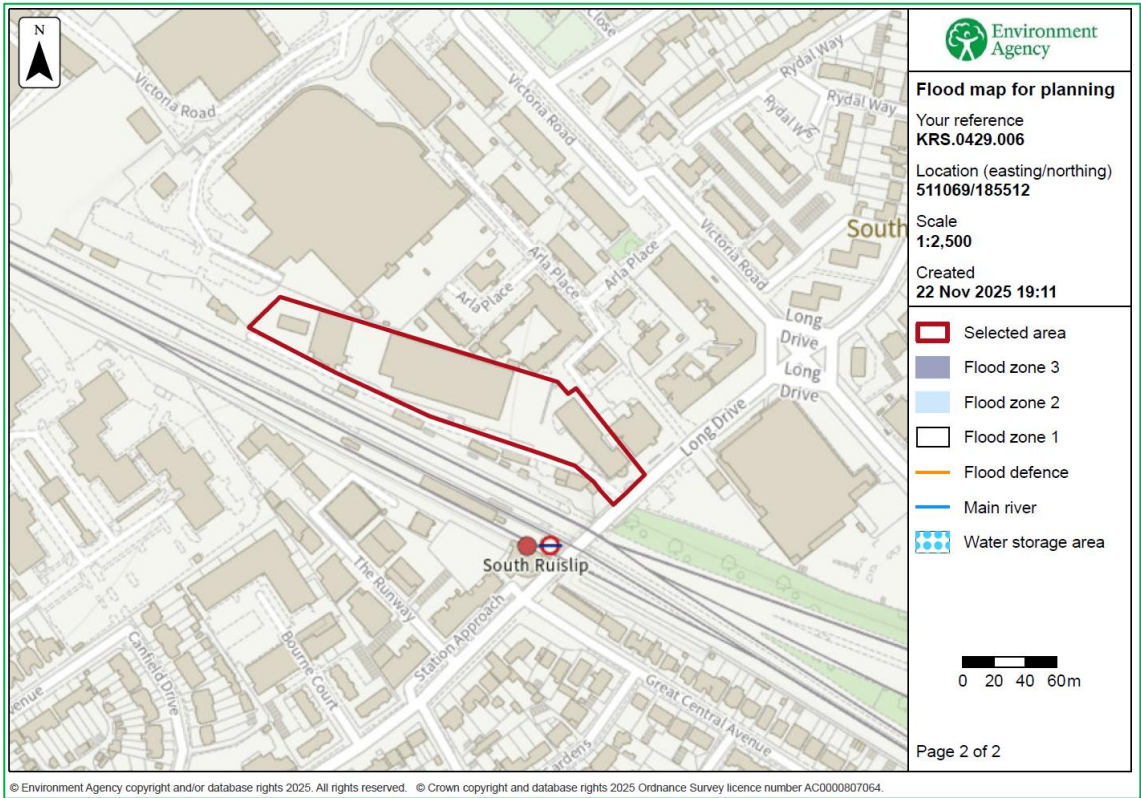


Figure 2 - Environment Agency Flood Zones

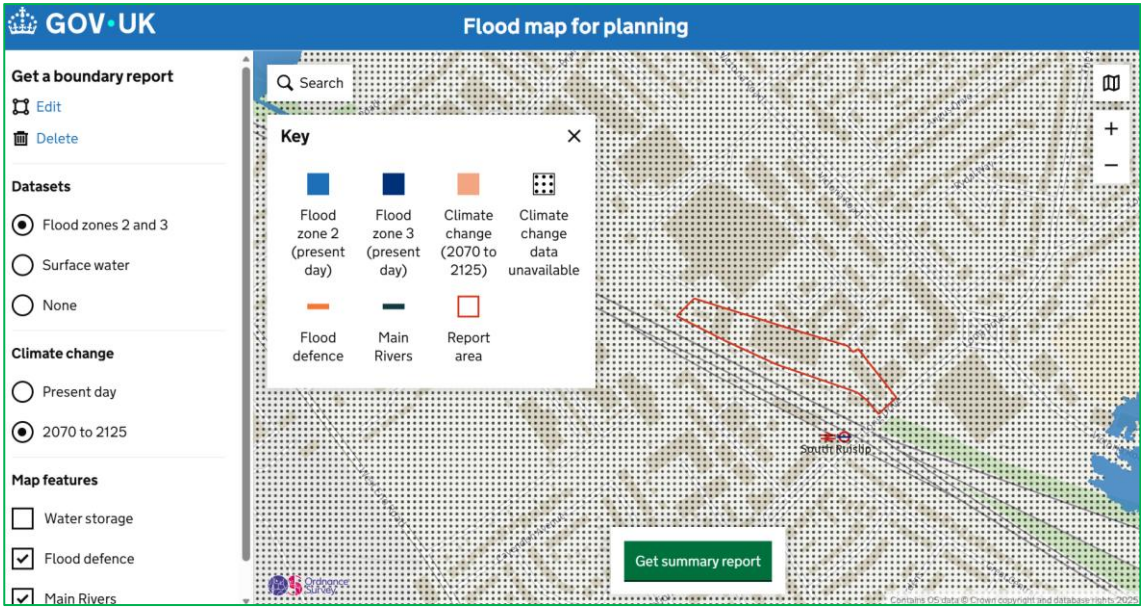


Figure 3 - Environment Agency Flood Zones 2070-2125

Table 2 - Environment Agency Flood Zones and Appropriate Land Use

Flood Zone	Probability	Explanation	Appropriate Land Use
Zone 1	Low	Less than a 1 in 1000 annual probability of river or sea flooding in any year (<0.1%)	All development types generally acceptable
Zone 2	Medium	Between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% 0.1%) in any year	Most development type are generally acceptable
Zone 3a	High	A 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year	Some development types not acceptable
Zone 3b	'Functional Floodplain'	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: - land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or - land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)	Some development types not acceptable

3.5 Flood Vulnerability

In the PPG, appropriate uses have been identified for the Flood Zones. Applying the Flood Risk Vulnerability Classification in the PPG, the proposed use is classified as 'more vulnerable'. Table 3 of this report and the PPG states that 'more vulnerable' is appropriate within Flood Zone 1 after the completion of a satisfactory FRA.

Table 3 - Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception test required	✓	✓
Zone 3a	Exception test required	✓	✗	Exception test required	✓

Zone 3b 'Functional Floodplain'	Exception test required	✓	✗	✗	✗
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Key: ✓: Development is appropriate, ✗: Development should not be permitted.

3.6 Sequential and Exception Tests

The NPPF requires that the Sequential and Exception Tests should be applied when choosing the location of new development and the layout of the development site. The Sequential Test aims to promote development in low flood risk areas. The Exception Test is used where no suitable development areas can be found in low-risk zones.

The Sequential Test should be applied to identify suitable sites which are at low risk from all sources of flooding, avoiding medium and high-risk areas where possible. If no suitable areas can be identified in low-risk areas, then sites with the lowest flood risk should be considered next. If development is necessary within a medium or high-risk zone, an Exception Test may be required to demonstrate the need for the development in that location and plans to mitigate the flood risk.

As the Site is located within Flood Zone 1, the Sequential Test is considered met by virtue of location, consistent with NPPF and PPG practice. The proposed use is classified as 'more vulnerable'. Table 3 of this report and the PPG state that 'more vulnerable' uses within Flood Zone 1 do not require the Exception Test to be passed.

3.7 Historic Flooding

Environment Agency data shows that the Site has not historically flooded. There are no records of anecdotal information of flooding at the Site including within the British Hydrological Society "Chronology of British Hydrological Events".

3.8 Existing and Planned Flood Defence Measures

The Environment Agency data shows that the Site is not protected against flooding by existing Environment Agency flood defence measures.

3.9 Fluvial (River) Flooding

The Site will not be inundated with floodwater for all events up to and including the 1 in 100 year (+17%) and 1 in 1000 year events. The Site will be flood free during the 1 in 100 year (+17%) and 1 in 1000 year events. The Site is not located within the vicinity of fluvial flooding sources and the risk of fluvial flooding is considered to be **not significant**.

3.10 Tidal (Coastal) Flooding

The Site is not located within the vicinity of tidal flooding sources and the risk of tidal flooding is considered to be **not significant**.

3.11 Groundwater Flooding

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers).

The Environment Agency data shows that flooding from groundwater is unlikely in this area. Site ground conditions suggest a low potential for groundwater flooding. The Site is not located within an area of elevated groundwater emergence potential, and the bedrock geology does not suggest susceptibility to groundwater flooding. The risk of flooding from groundwater flooding is considered to be **not significant**.

3.12 Surface Water (Pluvial) Flooding

The local catchment is relatively small, and surface water flow pathways are shallow and limited in extent. The Site surroundings are relatively flat and there are no large catchments that would tend to generate surface water runoff towards the Site. Surface water flow flooding tends to occur sporadically in both location and time such surface water flows would tend to be confined to the streets around the development.

The Environment Agency Surface Water flood map shows that the majority of the Site has a very low risk of surface water flooding with an annual probability of flooding of less than 1 in 1000 (0.1%) (see Figures 4 to 6).

During the high risk scenario (1 in 30 year event) there is shown to be a small area of surface water flooding to the east of the Site (see Figure 4). During the medium risk scenario (1 in 100 year event), the surface water flooding is shown in the same location and also a small area to the west (see Figure 5). In the low risk scenario (1 in 1000 year event), the surface water flooding is shown in a larger area in the same location of the Site (see Figure 6).

The surface water depths maps show that the Site may experience water depths of less than 0.20m during the 1 in 100 year (plus climate change) event (see Figures 7 to 8). The flood risk from surface water flooding will only affect a proportion of the Site. This area is associated with the existing building on the Site, with a maximum level of 9.25mAOD and is constrained by the local topography.

Using a conservative estimate of water velocity of 0.30m/s and a maximum water depth of 0.20m any flooding would result in a maximum hazard rating of less than 0.75 which would not pose a significant flood risk with a very low hazard (caution - "Flood zone with shallow flowing water or deep standing water") during the 1 in 100 year (+30%) event, as per the Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose - Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD/2321/TR1⁶. The debris will be limited due to the low water depths being less than 0.50m, as per the guidance in Flood Risks to People, FD2321/TR1.

Surface water flood maps are generated by routing rainfall over a Digital Terrain Model (DTM). DTM data is gathered using aerial survey techniques and then filtered to remove buildings and trees to generate ground levels. This filtering process can generate artificial dips in the landscape, especially where there is dense vegetation and buildings. These flood extents are, therefore, considered to be excessive in this instance due to the removal of the existing building during the filtering process.

It can be concluded that the predicted flood risk has been exaggerated due to DTM filtering on the Environment Agency Surface Water flood map, any resulting flooding would be expected to be very infrequent or have a very low predicted extent and depth.

⁶ SUPPLEMENTARY NOTE ON FLOOD HAZARD RATINGS AND THRESHOLDS FOR DEVELOPMENT PLANNING AND CONTROL PURPOSE – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1.

The flooding will only inundate the Site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases. The Site has no history of flooding and mapping indicates that any surface water flooding is shallow, short-duration and limited to extreme events.

The Site is at such a ground level that it would only flood in the most extreme flood events; the Site will remain flood free for the vast majority of flood events during the lifetime of the Proposed Development. A SuDS Strategy has been developed which will reduce the surface water runoff post development due to the improved attenuation capacity that a new drainage system will provide.

Given the scale and nature of the Proposed Development and the size and location of the surface water flooding sources it has been concluded that surface water flooding poses a low flood risk to the Site and the risk of surface water flooding is considered to be of **low significance**. The risk from surface water sources will be further managed and mitigated by using a number of mitigation measures to manage and reduce the overall flood risk at the Site (see Section 5.0).

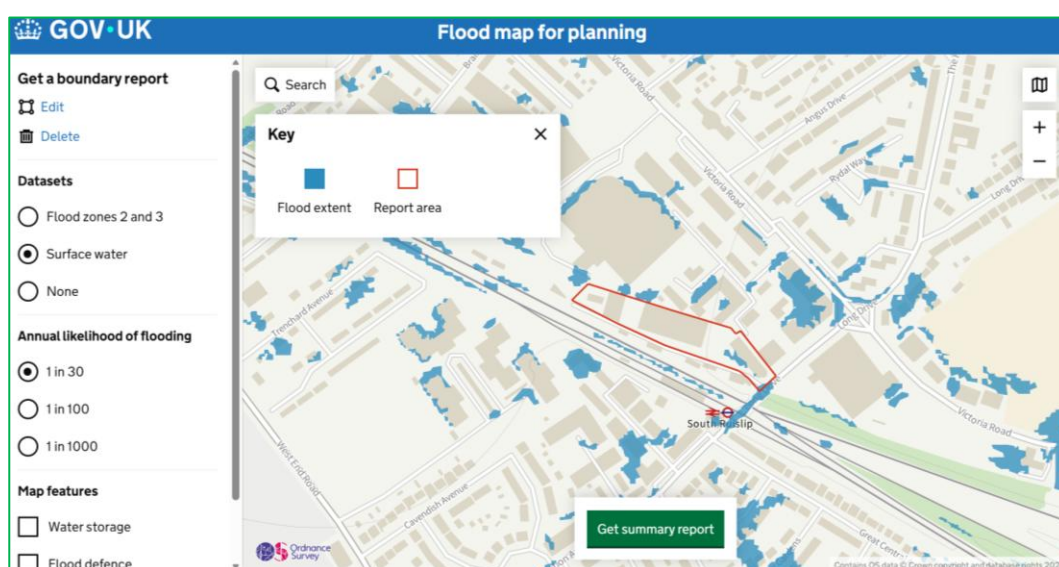


Figure 4 - Environment Agency Surface Water Flood Map: High Risk 1 in 30 Year Event

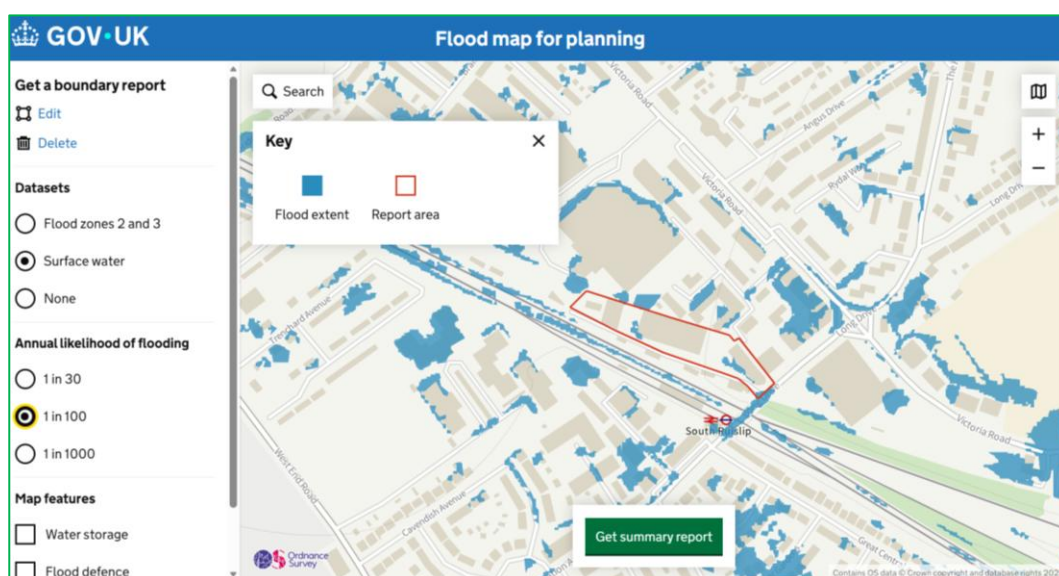


Figure 5 - Environment Agency Surface Water Flood Map: Medium Risk 1 in 100 Year Event

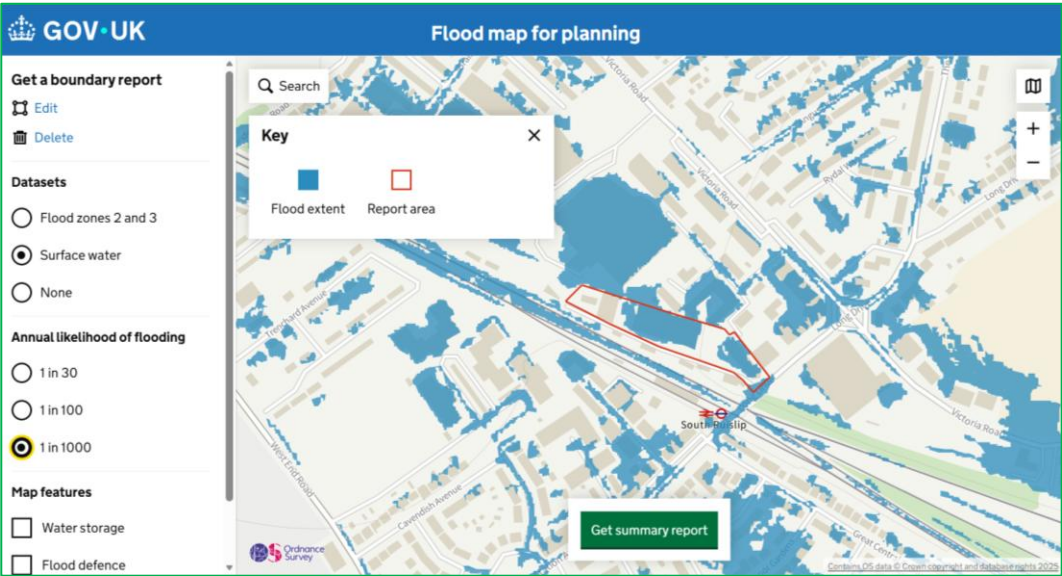


Figure 6 - Environment Agency Surface Water Flood Map: Low Risk 1 in 1000 Year Event

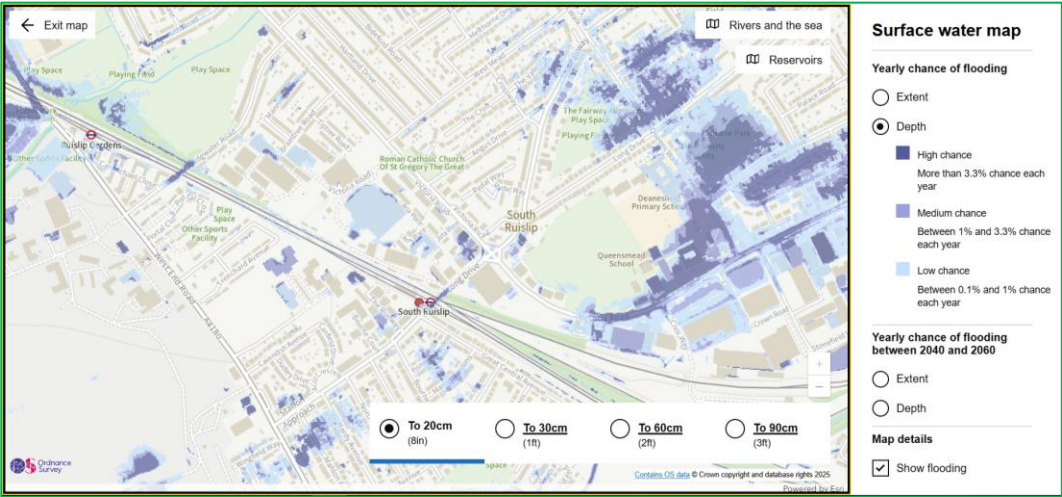


Figure 7 - Environment Agency Surface Water Flood Map: Present Day Water Depths



Figure 8 - Environment Agency Surface Water Flood Map: Climate Change Water Depths

3.13 Sewer Flooding

Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. Sewer flooding tends to occur sporadically in both location and time such flood flows would tend to be confined to the streets around the development.

It is assumed there are existing sewers located within the vicinity of the Site and these will inevitably have a limited capacity so in extreme conditions there would be surcharges, which may in turn cause flooding. Flood flows could also be generated by burst water mains, but these would tend to be of a restricted and much lower volume than weather generated events and so can be discounted for the purposes of this assessment.

Given the design parameters normally used for drainage design in recent times and allowing for some deterioration in the performance of the installed systems, which are likely to have been in place for many years, an appropriate flood risk probability from this source could be assumed to have a return period in the order of 1 in 10 to 1 in 20 years. The provision of adequate level difference between the ground floors and adjacent ground level would reduce the annual probability of damage to property from this source to 1 in 100 years or less. There are no records of sewer flooding in the vicinity of the Site, and in the absence of confirmed DG5 entries, sewer flood risk is considered. Therefore, the risk of flooding from sewer flooding is considered to be **not significant**.

3.14 Flooding from Artificial Drainage Systems/Infrastructure Failure

There are no other nearby artificial water bodies, reservoirs, water channels and artificial drainage systems that could be considered a flood risk to the Site. The Environment Agency Reservoir flood map shows that the Site is not at risk of reservoir flooding (see Figure 9). The risk of flooding from artificial drainage systems/infrastructure failure is considered to be **not significant**.

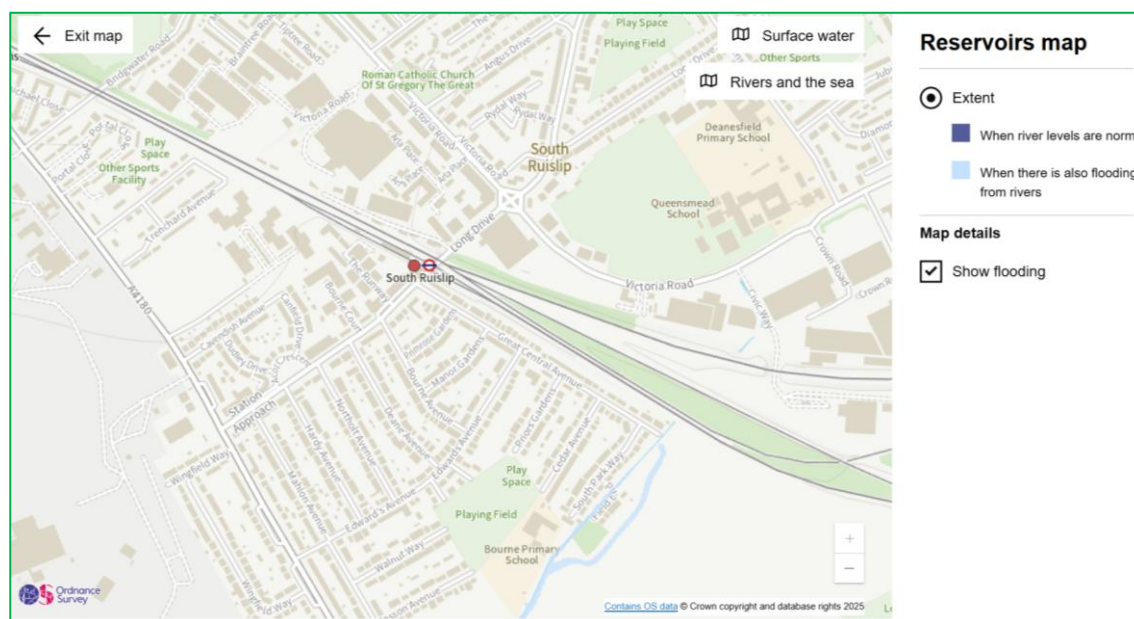


Figure 9 - Environment Agency Reservoir Flood Map

3.15 The Effect of the Development on Flood Risk

The Site is already occupied by existing buildings and the Proposed Development will have a similar footprint therefore, the Proposed Development will not increase flood risk elsewhere. Existing overland flow paths through and around the Site will be preserved, and the layout does not introduce any barriers to conveyance. There will be no net loss of floodplain storage, and ground levels will remain broadly consistent with the existing topography. The SuDS Strategy provides attenuation storage that reduces post-development peak runoff rates compared with the existing situation. Accordingly, the Proposed Development will have no adverse impact on flood risk within the Site or the wider area.

3.16 Summary of Site Specific Flood Risk

A summary of the sources of flooding and a review of the risk posed by each source at the Site is shown in Table 4.

The Site is not at risk of flooding from a major source (e.g. fluvial and/or tidal). The Site has a 'low probability' of fluvial/tidal flooding as the Site is located within Flood Zone 1 with less than a 1 in 1000 annual probability of river or sea flooding in any year (<0.1%). The Environment Agency data shows that the Site has not historically flooded. The proposed use of the Site is 'more vulnerable', 'more vulnerable' uses are appropriate within Flood Zone 1 after the completion of a satisfactory FRA. A secondary flooding source has been identified which may pose a **low significant** risk to the Site. This is:

- Surface Water Flooding

The Environment Agency Surface Water flood map shows that the Site has a low to high risk of surface water flooding with annual probability of flooding of 1 in 1000 (0.1%) to greater than 1 in 30 (3.3%) years. The surface water depths maps show that the Site may experience water depths of less than 0.20m during the 1 in 100 year (plus climate change) event. With a maximum water velocity of 0.30m/s, this would result in a maximum hazard rating of less than 0.75 which would not pose a significant flood risk with a very low – caution flood hazard rating.

The flooding will only inundate the Site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases. The Site has no history of flooding and mapping indicates that any surface water flooding is shallow, short-duration and limited to extreme events.

The risk from this source will be further mitigated by using a number of property level protection measures to manage and reduce the overall flood risk at the Site (see Section 5.0).

The Proposed Development will not increase flood risk. Overland flow routes will remain unobstructed, flood storage capacity will be maintained, and attenuated discharge from the new drainage system will reduce runoff rates. As a result, the development will have no detrimental effect on flood risk within or beyond the Site.

In conclusion, the flood risk to the Site can be considered to be limited; the Site is situated in Flood Zone 1, with a low or less annual probability of flooding and from all sources. The Site is unlikely to flood except in very extreme conditions.

Table 4 - Risk Posed by Flooding Sources

Sources of Flooding	Potential Flood Risk	Potential Source	Probability/Significance
Fluvial Flooding	No	None Reported	None
Tidal Flooding	No	None Reported	None
Groundwater Flooding	No	None Reported	None
Surface Water Flooding	Yes	Low Spots	Low
Sewer Flooding	No	None Reported	None
Flooding from Artificial Drainage Systems/Infrastructure Failure	No	None Reported	None

4.0 SURFACE WATER DRAINAGE

4.1 Surface Water Management Overview

It is recognised that consideration of flood issues should not be confined to the floodplain. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in the catchment, particularly flooding downstream. For example, replacing vegetated areas with roofs, roads and other paved areas can increase both the total and the peak flow of surface water runoff from the development site. Changes of land use on previously developed land can also have significant downstream impacts where the existing drainage system may not have sufficient capacity for the additional drainage.

An assessment of the surface water runoff rates has been undertaken, in order to determine the surface water options and attenuation requirements for the Site. The assessment considers the impact of the Proposed Development compared to current conditions. Therefore, the surface water attenuation requirement for the developed site can be determined and reviewed against existing arrangements.

The requirement for managing surface water runoff from developments depends on the predeveloped nature of the site. If it is an undeveloped Greenfield site, then the impact of the development will need to be mitigated so that the runoff from the site replicates the natural drainage characteristics of the pre-developed site. The surface water drainage arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the proposed development, unless specific off-site arrangements are made and result in the same net effect.

It should be acknowledged that the satisfactory collection, control and discharge of surface water runoff are now a principle planning and design consideration. This is reflected in recently implemented guidance as well as the Defra non-statutory technical standards for SuDS.

4.2 Climate Change

Projections of future climate change in the UK indicate more frequent, short-duration, high intensity rainfall and more frequent periods of long duration rainfall. Guidance included within the NPPF recommends that the effects of climate change are incorporated into FRAs. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the flood risk assessments: climate change allowances guidance⁷.

The recommended national precautionary sensitivity range for peak rainfall intensity are summarised in Table 5. The proposals will take into account a 40% increase in rainfall intensity due to climate change.

Table 5 - Peak Rainfall Intensity Allowance

River Catchment	Return Period (yrs)	Allowance Category	2050s	2070s
London Management Catchment	30	Upper end	+35%	+35%
		Central	+20%	+20%
	100	Upper end	+40%	+40%
		Central	+20%	+25%

⁷ <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#high-allowances>

4.3 Opportunities for Discharge of Surface Water

There are three possible options to discharge the surface water runoff in accordance with requirement H3 of the Building Regulations, this hierarchy is also promoted within the NPPF. Rainwater shall discharge to one of the following, listed in order of priority:

- an adequate soakaway or some other adequate infiltration system; or, where that is not reasonably practicable;
- a watercourse; or where that is not reasonably practicable;
- a sewer.

It is necessary to identify the most appropriate method of controlling and discharging surface water.

4.3.1 Collect for Re-use

The reuse of water from roofed areas to provide grey (non-potable) water for flushing WCs within buildings can reduce storm runoff without the need for treatment or oil separators since the risk of spillage or contamination is low. Such a system would require one or more tanks at roof level and under optimum conditions these would be kept as near as full as possible to ensure a reliable water supply. For the purposes of a worst case design scenario it is assumed that the tanks would be full at the start of an extreme rainfall event and hence all storm rainfall would enter the surface water drainage system rather than grey water storage.

Whilst the first priority is to collect rainwater for re-use, rainwater harvesting was considered and deemed not suitable. A shared communal system was considered but deemed inappropriate with regard to management and maintenance.

Therefore, rainwater harvesting is not proposed for the Site as the use of rainwater harvesting is not a viable / cost-effective part of the solution for managing surface water runoff on the Site, taking account of the potential water supply benefits of such a system. The costs of rainwater harvesting systems (unit costs, installation costs, running costs and maintenance costs) outweigh the water saving costs.

Therefore, the use of large scale rainwater harvesting is not a viable / cost effective approach for the management of surface water runoff at the site, taking into account the potential water supply benefits of such systems. However, rainwater harvesting water butts will be incorporated for landscape irrigation purposes.

With regards to blue roofs, these have been discounted due to the additional structural loading and the constraints below ground, particularly as a substructure design has not yet been developed.

4.3.2 Soakaway/Infiltration System

In determining the future surface runoff from the Site, the potential of using infiltration has been considered. Whilst the permeability and infiltration rate of the Site would be confirmed by a site investigation into the hydrogeology prior to construction, the ground conditions suggest that infiltration would provide inception storage but not provide a viable option for discharge of large volumes of surface water runoff from the Site. At this stage, it is not proposed that the surface water runoff from the Site be discharged via infiltration SuDS methods.

4.3.3 Watercourse

Should infiltration be found to be unsuitable, the next option is discharge to a watercourse. The nearest watercourse to the Site is the Yeading Brook located approximately 700m to the west of the Site. Therefore, there are no watercourses within the vicinity of the Site and it would not be possible to discharge surface water runoff from the Site into a watercourse.

4.3.4 Sewer

Should discharge to a watercourse be found to be unsuitable, the next option is discharge to a sewer. There is a public surface water sewer located adjacent to the site in Long Drive. It is understood that the existing hotel drains to the public surface water sewer within Long Drive. Therefore, it is proposed that the Proposed Development would discharge the surface water runoff from the Site to the public surface water sewer within Long Drive. It is proposed that, if possible, the existing connection from the Site to the public surface water sewer will be used. Otherwise, a new connection to the existing chamber in Long Drive will be constructed.

4.4 Surface Water Runoff Rates

The proposed impermeable areas of the proposed development will be 7,810m². An estimation of surface water runoff is required to permit effective Site surface water management and prevent any increase in flood risk to off-site receptors. The SuDS Manual states the Flood Estimation Handbook (FEH) Revitalised Flood Hydrograph rainfall-runoff method version 2 (ReFH2) is a suitable method to assess peak runoff rates and volumes for the Greenfield scenarios. ReFH2 is considered as an appropriate method for estimating plot-scale runoff and is primarily the preferred approach to the Institute of Hydrology 124 (IoH124).

The QBAR has been calculated to be 5.70 litres/second. The calculated runoff rates and volumes from the site are shown in Table 6 and the calculations attached in Appendix 3.

Table 6 - Runoff Rates (l/s) and Volume (m³)

Rainfall Event	Greenfield	Existing	Proposed
1 in 1 yr	4.80	98.70	3.60
1 in 30 yr	13.70	448.70	11.40
1 in 100yr	18.20	563.90	14.70
1 in 100 year 6hr volume	352	613	348

4.5 SuDS Strategy

One of the aims of the NPPF is to provide not only flood risk mitigation but also to maximise additional gains such as improvements in runoff quality and provision of amenity and biodiversity. Systems incorporating these features are often termed SuDS and it is the requirement of NPPF that these are considered as the primary means of collection, control and disposal for storm water as close to source as possible.

The objective of this SuDS Strategy is to ensure that a sustainable drainage solution can be achieved which reduces the peak discharge rate to manage and reduce the flood risk posed by the surface water runoff from the Site. The SuDS Strategy takes into account the following principles:

- No increase in the volume or runoff rate of surface water runoff from the Site.

- No increase in flooding to people or property off-site as a result of the Proposed Development.
- No surface water flooding of the Site.
- The proposals take into account a 40% increase in rainfall intensity due to climate change during the lifetime of the development.

In line with adopting a 'management train' it is recommended that water is managed as close to source as possible. This will reduce the size and cost of infrastructure further downstream and also shares the maintenance burden more equitably. The proposed SuDS Strategy will take the form of:

- Permeable surfaces and landscaping
- Surface water attenuation storage in the form of an underground crate system attenuation tanks. Runoff rates would be restricted to Greenfield Runoff Rates to the public surface water sewer.

The principle applied in the design of storage is to limit the discharge rate of surface water runoff from the developed site for events of similar frequency of occurrence to the same peak rate of runoff as that which takes place from a site prior to development and to provide betterment where possible. To provide betterment compared to the existing situation the surface water runoff from the site will be attenuated to reduce the risk of flooding to the site and off-site locations.

The size of the storage has been calculated such that the proposed development has the capacity to accommodate the 1 in 100 year rainfall event including a 40% increase in rainfall intensity that is predicted to occur as a result of climate change. Consequently, all areas drained have been designed to accommodate a 100 year (+40% climate change) storm event.

The remainder of the Site that is not formally drained, i.e. landscaped areas, will be permeable (grass). The majority of rainwater falling on these areas will soak into the ground. Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the buildings and through contouring of the hardstanding areas. Additional storage would be provided within the manholes, pipes and drainage gullies which will provide betterment over and above the 1 in 100 year (+40%) event.

The SuDS design is shown in Appendix 4 and Appendix 3 shows the supporting drainage calculations with the Greenfield Runoff Rate used as the limiting discharge rate before discharge to the public surface water sewer.

At this stage, it is proposed that an underground crate storage tank and oversized drainage networks will be used to provide the required effective attenuation storage volume. Additional storage would be provided within the manholes, pipes and drainage gullies which will provide betterment over and above the 1 in 100 year (+40%) event.

These methods will reduce peak flows, the volume of runoff, and slow down flows and will provide a suitable SUDS solution for this Site. The adoption of a SuDS Strategy for the Site represents an enhancement from the current conditions as the current surface water runoff from the Site is uncontrolled, untreated, unmanaged and unmitigated. The SuDS Strategy will reduce the risk of flooding to the Site and off-site locations. In adopting these principles, it has been demonstrated that a scheme can be developed that does not increase the risk of flooding to adjacent properties and development further downstream.

4.6 Designing for Local Drainage System Failure/Exceedance Events

When considering residual risk, it is necessary to make predictions as to the impacts of a storm event that exceeds the design event, or the impact of a failure of the local drainage system. The SuDS Strategy applies a safe and sustainable approach to discharging rainfall runoff from the Site and this reduces the risk of flooding however, it is not possible to completely remove the risk.

As part of the SuDS Strategy, it must be demonstrated that the flooding of property would not occur in the event of local drainage system failure and/or design exceedance. It is not economically viable or sustainable to build a drainage system that can accommodate the most extreme events. Consequently, the capacity of the drainage system may be exceeded on rare occasions, with excess water flowing above ground. However, this is considered unlikely in the immediate future due to the 40% allowance for climate change used in the calculations.

The design of the Proposed Development provides an opportunity to manage this local drainage system failure/exceedance flow and ensure that indiscriminate flooding of property does not occur. There will not be an extensive sewerage network on the proposed development and therefore any potential exceedance flooding would be from the sewers and lateral drains connecting the impermeable areas to the storage areas. It is very unlikely that a catastrophic failure would occur. An exceedance or blockage event of the sewers would not affect the proposed buildings as exceedance flows would be contained within the permeable areas within the Site and would flow to the lower ground levels. It is not considered that there is an increased risk to the Site or properties located adjacent to the Site.

Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the buildings and through contouring of the hardstanding areas. When considering the impacts of a storm event that exceeds the design event, there is safety factor, even under the design event conditions. Consequently, if this event were to be exceeded there is additional capacity with the system to accommodate this (i.e. within the manholes, pipes etc.). If this freeboard was to be exceeded the consequences would be similar, if not less than for the local drainage system failure. Consequently, the impact of an exceedance event is not considered to represent any significant flood hazard.

The above manages and mitigates the flood risk from surface water runoff to the adjacent premises and Site infrastructure from surface water runoff generated by the Proposed Development.

5.0 RISK MANAGEMENT

5.1 Introduction

The flood risk at this location is considered suitable for ‘more vulnerable’ developments within the NPPF. In this flood zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the use of flood mitigation measures.

The flooding sources will be mitigated on the Site by using a number of techniques, and mitigation strategies to manage and reduce the overall flood risk at the Site. This will ensure the development will be safe and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property;
- Minimal impact of the Proposed Development on flood risk generally; and;
- Minimal disruption to natural heritage.

The flood risk at the Site will be reduced by mitigation measures; these are discussed in more detail below.

5.2 Proposed Site Layout

The finished floor levels of the building will be set above the existing ground levels to allow to enable the full capacity of any secondary flood conveyance to be utilised. Overland exceedance routes will be directed away from the buildings.

Accommodation will be located on the first floor and above. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor will be located well above any floodwater levels. This provides a ‘safe haven’ above any floodwater levels. This will enable rapid escape should flooding occur which is unlikely. The upper floors are accessed via internal stairs and are sufficient in size to safely house all occupants of the buildings.

It is recognised however that owing to limited headroom constraints, massing, planning policy and Building Regulations it is considered impractical to raise the finished floor levels further than those shown in Appendix 3. Therefore, in order to mitigate against this, a Flood Warning and Evacuation Plan should be developed. A combination of resistance (proofing) and resilience measures will be included to provide further protection. This is discussed below.

5.3 Flood Resilience and Resistance Measures

The development of the layout should always consider that the Site is potentially at risk from an extreme event and as such the implementation of flood resilience and resistance methods should be assessed.

To make the buildings more resistant to seepage the following measures will be incorporated. Sealant will be used around external doors and windows. All external doors and windows will be constructed from durable materials and the walls of the building will be thick.

To improve the buildings resilience to flooding the following measures will be incorporated. All electrical wiring, switches, sockets, socket outlets, electrical, and gas meters etc. will be located a minimum of 450mm above the finished floor levels.

5.4 Flood Warning and Evacuation Plan

A Flood Warning and Evacuation Plan (FWEP) outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may cause will be developed. Sensible precautions would include raising electrical items, irreplaceable items and sentimental items off the ground or where possible moving them to a higher floor, rolling up carpets and rugs and turning off utilities. In addition, consider what actions you would take should the building/s need to be evacuated including access and egress routes and preparing a flood kit in advance containing warm clothing, medication, a torch, food and wellingtons.

The FWEP is a 'living' document and therefore should be periodically reviewed and updated to provide advice and guidance to occupants in the event of an extreme flood. The FWEP will therefore reduce the vulnerability of the occupants to flooding and makes them aware of the mechanisms of flooding at the Site.

5.5 SuDS Strategy

The SuDS Strategy provides attenuation storage that reduces post-development peak runoff rates compared with the existing situation.

5.6 Access and Egress Route

The Site lies within Flood Zone 1 and is not at risk of fluvial or tidal flooding. Surface water mapping shows shallow and localised areas of ponding within parts of the wider Site, but these areas do not coincide with access routes and do not present hazardous depths or velocities.

During extreme rainfall events, safe pedestrian and vehicular access is maintained via Long Drive. Safe access and egress are therefore achievable in accordance with the NPPF and PPG.

5.7 Residual Risk

The mitigation measures detailed above show that the flood risk can be effectively managed and therefore the consequences of flooding are acceptable.

6.0 SUMMARY AND CONCLUSION

6.1 Conclusion

This report presents a FRA in accordance with the NPPF for the Proposed Development at land off Long Drive, South Ruislip, HA4 0HG

This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

6.2 Flood Risk

The Site is not at risk of flooding from a major source (e.g. fluvial and/or tidal). The Site has a 'low probability' of fluvial/tidal flooding as the Site is located within Flood Zone 1 with less than a 1 in 1000 annual probability of river or sea flooding in any year (<0.1%). The Environment Agency data shows that the Site has not historically flooded. The proposed use of the Site is 'more vulnerable', 'more vulnerable' uses are appropriate within Flood Zone 1 after the completion of a satisfactory FRA. A secondary flooding source has been identified which may pose a **low significant** risk to the Site. This is:

- Surface Water Flooding

The Environment Agency Surface Water flood map shows that the Site has a low to high risk of surface water flooding with annual probability of flooding of 1 in 1000 (0.1%) to greater than 1 in 30 (3.3%) years. The surface water depths maps show that the Site may experience water depths of less than 0.20m during the 1 in 100 year (plus climate change) event. With a maximum water velocity of 0.30m/s, this would result in a maximum hazard rating of less than 0.75 which would not pose a significant flood risk with a very low – caution flood hazard rating.

The flooding will only inundate the Site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases. The Site has no history of flooding and mapping indicates that any surface water flooding is shallow, short-duration and limited to extreme events.

The risk from this source will be further mitigated by using a number of property level protection measures to manage and reduce the overall flood risk at the Site.

The Proposed Development will not increase flood risk. Overland flow routes will remain unobstructed, flood storage capacity will be maintained, and attenuated discharge from the new drainage system will reduce runoff rates. As a result, the development will have no detrimental effect on flood risk within or beyond the Site.

In conclusion, the flood risk to the Site can be considered to be limited; the Site is situated in Flood Zone 1, with a low or less annual probability of flooding and from all sources. The Site is unlikely to flood except in very extreme conditions.

6.3 SuDS Strategy

The SuDS Strategy ensures that a sustainable drainage solution can be achieved which reduces the peak discharge rate to manage and reduce the flood risk posed by the surface water runoff from the Site. The SuDS Strategy takes into account the following principles:

- No increase in the volume or runoff rate of surface water runoff from the Site.

- No increase in flooding to people or property off-site as a result of the Proposed Development.
- No surface water flooding of the Site.
- The proposals take into account a 40% increase in rainfall intensity due to climate change during the lifetime of the development.

In line with adopting a 'management train' it is recommended that water is managed as close to source as possible. This will reduce the size and cost of infrastructure further downstream and also shares the maintenance burden more equitably. The proposed SuDS Strategy will take the form of:

- Permeable surfaces and landscaping
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The principle applied in the design of storage is to limit the discharge rate of surface water runoff from the developed site for events of similar frequency of occurrence to the same peak rate of runoff as that which takes place from a site prior to development and to provide betterment where possible. To provide betterment compared to the existing situation the surface water runoff from the site will be attenuated to reduce the risk of flooding to the site and off-site locations.

The size of the storage has been calculated such that the proposed development has the capacity to accommodate the 1 in 100 year rainfall event including a 40% increase in rainfall intensity that is predicted to occur as a result of climate change. Consequently, all areas drained have been designed to accommodate a 100 year (+40% climate change) storm event.

The remainder of the Site that is not formally drained, i.e. landscaped areas, will be permeable (grass). The majority of rainwater falling on these areas will soak into the ground. Surface water runoff would be directed to the drainage system through drainage gullies located around the perimeter of the buildings and through contouring of the hardstanding areas. Additional storage would be provided within the manholes, pipes and drainage gullies which will provide betterment over and above the 1 in 100 year (+40%) event.

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At this stage, it is proposed that an underground crate storage tank and oversized drainage networks will be used to provide the required effective attenuation storage volume. Additional storage would be provided within the manholes, pipes and drainage gullies which will provide betterment over and above the 1 in 100 year (+40%) event.

These methods will reduce peak flows, the volume of runoff, and slow down flows and will provide a suitable SUDS solution for this Site. The adoption of a SuDS Strategy for the Site represents an enhancement from the current conditions as the current surface water runoff from the Site is uncontrolled, untreated, unmanaged and unmitigated. The SuDS Strategy will reduce the risk of flooding to the Site and off-site locations. In adopting these principles, it has been demonstrated that a scheme can be developed that does not increase the risk of flooding to adjacent properties and development further downstream.

6.4 Risk Management

The flood risk at the Site will be reduced by mitigation measures, discussed below.

Proposed Site Layout: The finished floor levels of the building will be set above the existing ground levels to allow to enable the full capacity of any secondary flood conveyance to be utilised. Overland exceedance routes will be directed away from the buildings.

Accommodation will be located on the first floor and above. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor will be located well above any floodwater levels. This provides a 'safe haven' above any floodwater levels. This will enable rapid escape should flooding occur which is unlikely. The upper floors are accessed via internal stairs and are sufficient in size to safely house all occupants of the buildings.

It is recognised however that owing to limited headroom constraints, massing, planning policy and Building Regulations it is considered impractical to raise the finished floor levels further than those shown in Appendix 3. Therefore, in order to mitigate against this, a Flood Warning and Evacuation Plan should be developed. A combination of resistance (proofing) and resilience measures will be included to provide further protection. This is discussed below.

First Floor Accommodation: Accommodation will be located on the first floor and above as well as the ground floor of the buildings. This will allow occupants to retreat to higher floor levels if needed. The levels of the first floor will be well above any floodwater levels. This provides a 'safe haven' above any floodwater levels.

This will enable rapid escape should flooding occur which is unlikely. The upper floors are accessed via internal stairs and are sufficient in size to safely house all occupants of the building. The 'safe haven' will only be required in very extreme events or if a flood warning has not been received.

Flood Resilience and Resistance Measures: To make the buildings more resistant to seepage the following measures will be incorporated. Sealant will be used around external doors and windows. All external doors and windows will be constructed from durable materials and the walls of the building will be thick.

To improve the buildings resilience to flooding the following measures will be incorporated. All electrical wiring, switches, sockets, socket outlets, electrical, and gas meters etc. will be located a minimum of 450mm above the finished floor levels.

Flood Warning and Evacuation Plan: A FWEP outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may cause will be developed.

SuDS Strategy: The SuDS Strategy provides attenuation storage that reduces post-development peak runoff rates compared with the existing situation.

Access and Egress Route: The Site lies within Flood Zone 1 and is not at risk of fluvial or tidal flooding. Surface water mapping shows shallow and localised areas of ponding within parts of the wider Site, but these areas do not coincide with access routes and do not present hazardous depths or velocities.

During extreme rainfall events, safe pedestrian and vehicular access is maintained via Long Drive. Safe access and egress are therefore achievable in accordance with the NPPF and PPG.

6.5 Conclusion

In conclusion, the Proposed Development, would be expected to remain dry in all but the most extreme conditions. Providing the recommendations made in this FRA are instigated, flood risk from all sources would be minimised, the consequences of flooding are acceptable and the development would be in accordance with the requirements of the NPPF.

This FRA demonstrates that the Proposed Development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF. The development should not therefore be precluded on the grounds of flood risk.

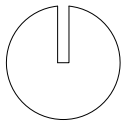
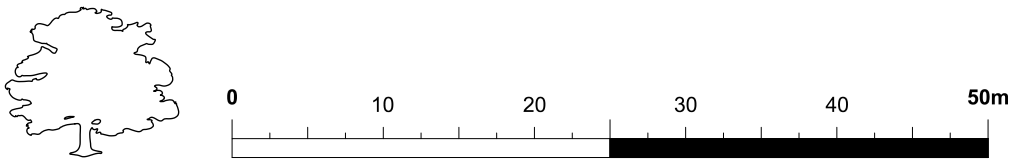
APPENDICES

APPENDIX 1 – Existing and Proposed Site Layout



Project	
Ramada South Ruislip	
Long Drive / Station Approach / HA4 0HG	
Johal	
Drawing Title	
Existing	
Site Plan	
Scale	
1:500 @ A2	
Date	
September 2025	
Purpose	
Planning	
Job No.	
302021	
Drawing Ref.	
302021.OP.FS.ZZ.DR.A.21.105	
Revision	
P2	

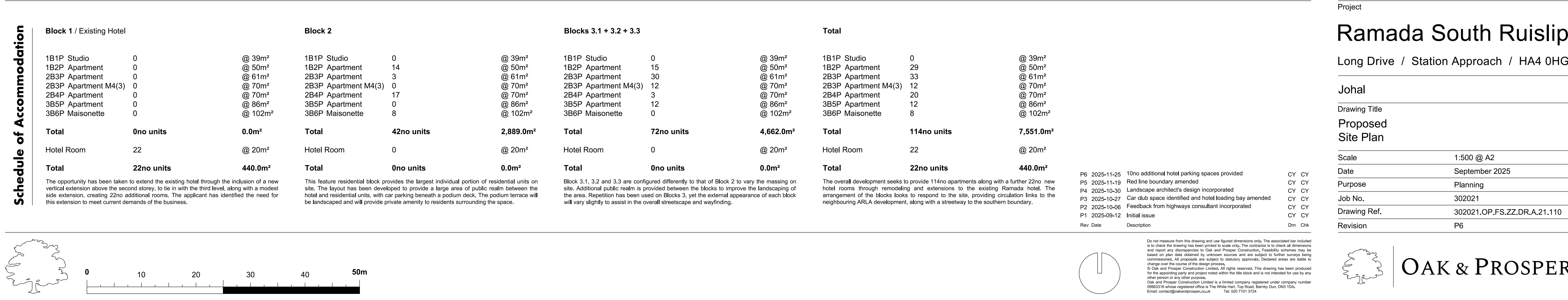
P2	2025-11-19	Red line boundary amended	CY	CY
P1	2025-01-20	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

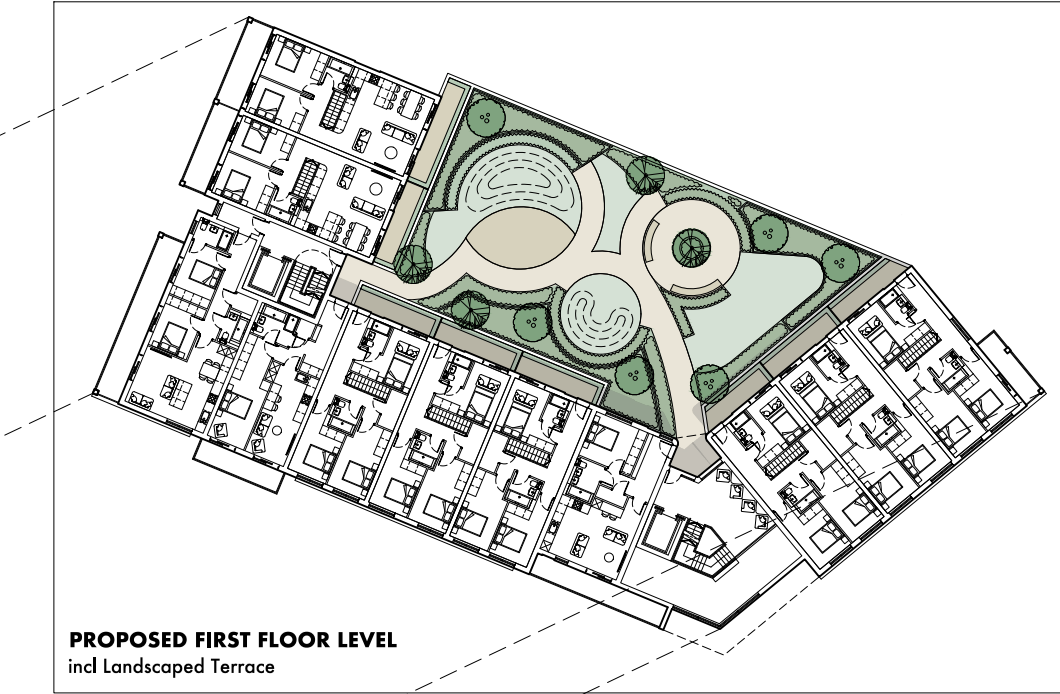


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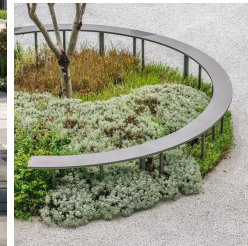
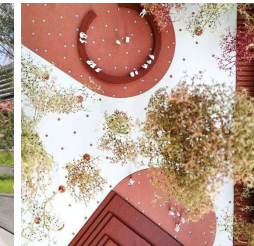
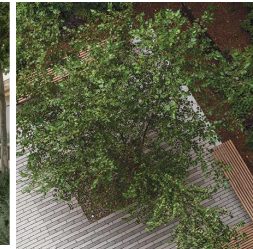
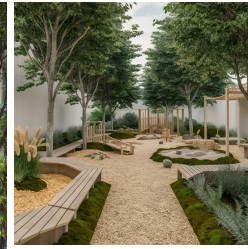
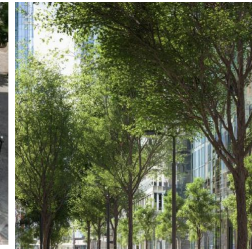
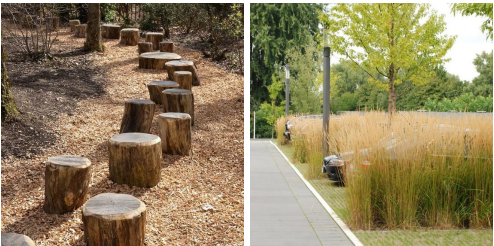




PROPOSED FIRST FLOOR LEVEL
incl Landscaped Terrace



The proposed landscape strategy to the development has been developed by EnPlan, with a series of drawings included in support of this application. The above drawing has been prepared to identify the relationship between the internal plan form of the proposed buildings and that of the immediate external spaces. The external areas have been sub-divided into private and public spaces and as such provide a variety of functions to both residents and visitors alike. The interface between these external spaces and the building varies dependent upon the uses. . The surrounding images provide examples and precedent studies of similar spaces as a guide.



P6	2025-11-25	10no additional hotel parking spaces provided	CY	CY
P5	2025-11-19	Mezzanine level included	CY	CY
P4	2025-11-18	Colour added to landscape plan	CY	CY
P3	2025-10-27	Car club space identified and hotel loading bay amended	CY	CY
P2	2025-10-06	Feedback from highways consultant incorporated	CY	CY
P1	2025-09-12	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Project

Ramada South Ruislip

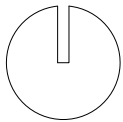
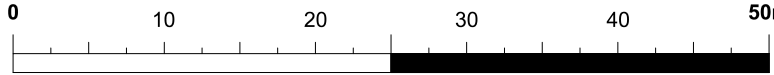
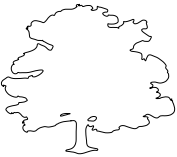
Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Proposed Site Plan

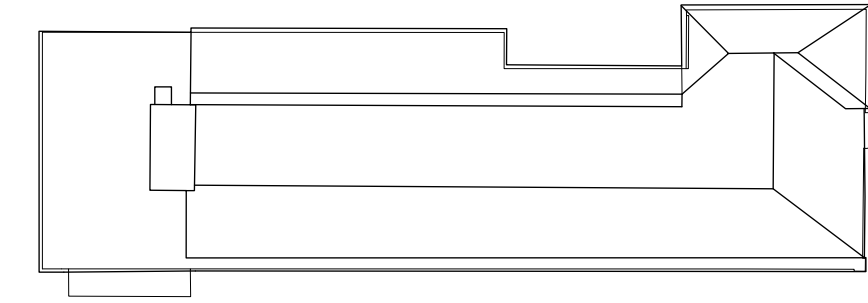
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Revision	P6



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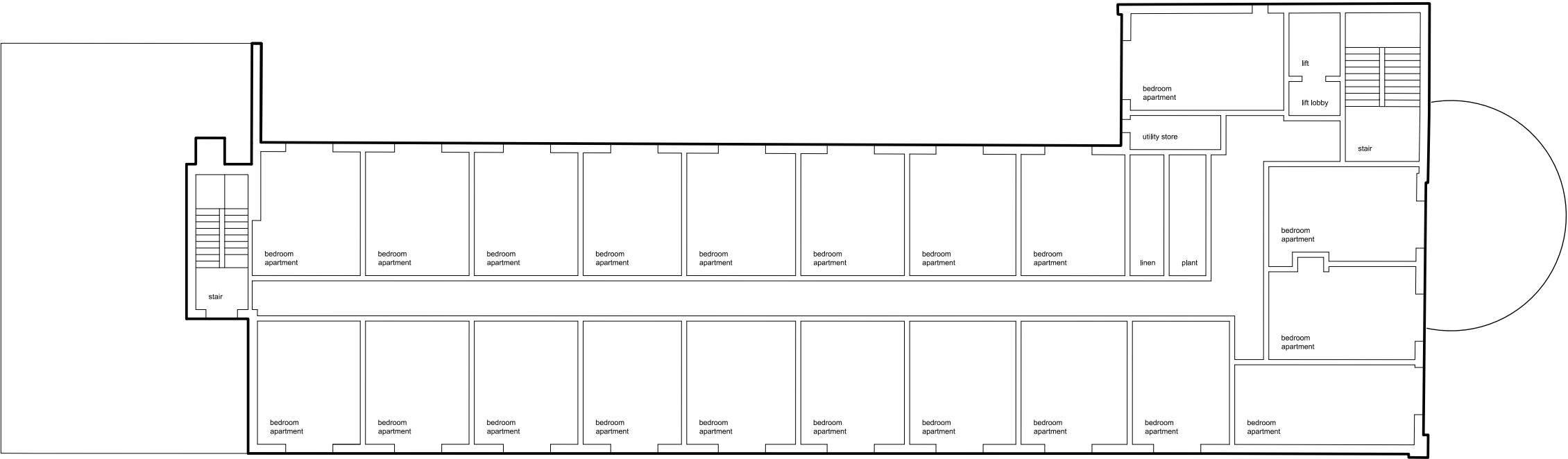
BLOCK 1

Existing Hotel

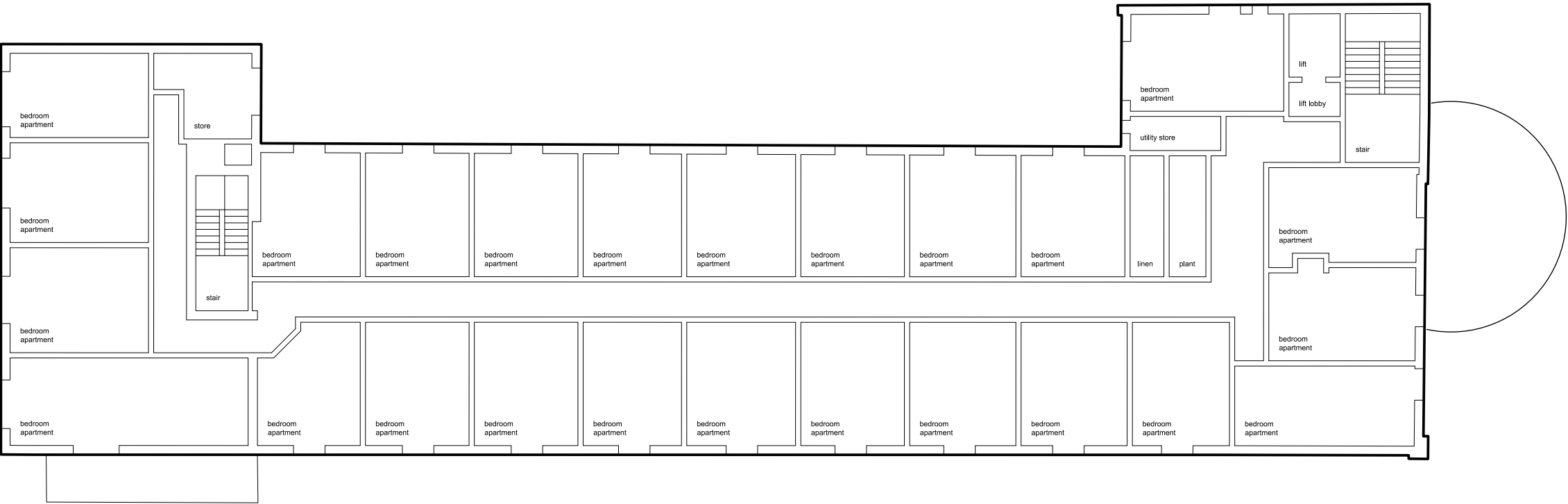


EXISTING Roof Plan

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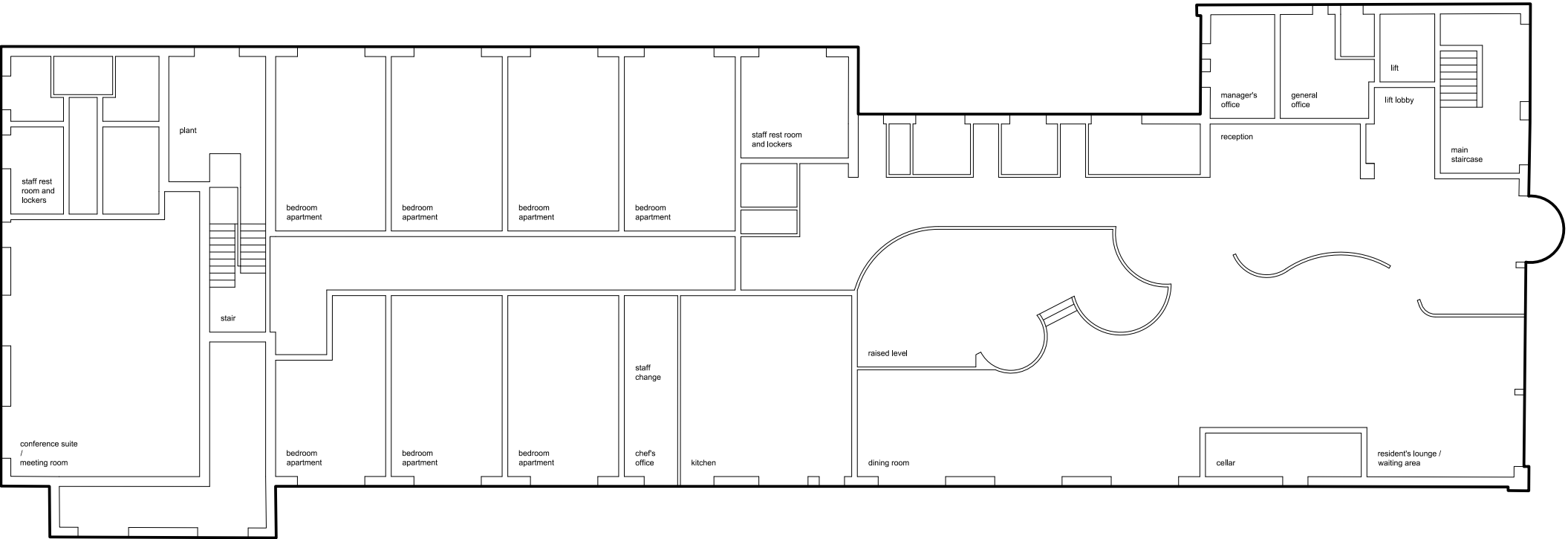


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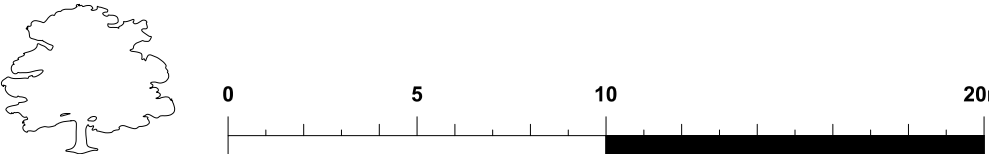


x 2no Levels

EXISTING First + Second Floor Plan



EXISTING Ground Floor Plan



P3	2025-10-28	Drawing number amended	CY	CY
P2	2025-10-02	Layout amended to account for fire consultant feedback	CY	CY
P1	2025-09-12	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Project

Ramada South Ruislip

Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Existing
Block 1 Floor Plans

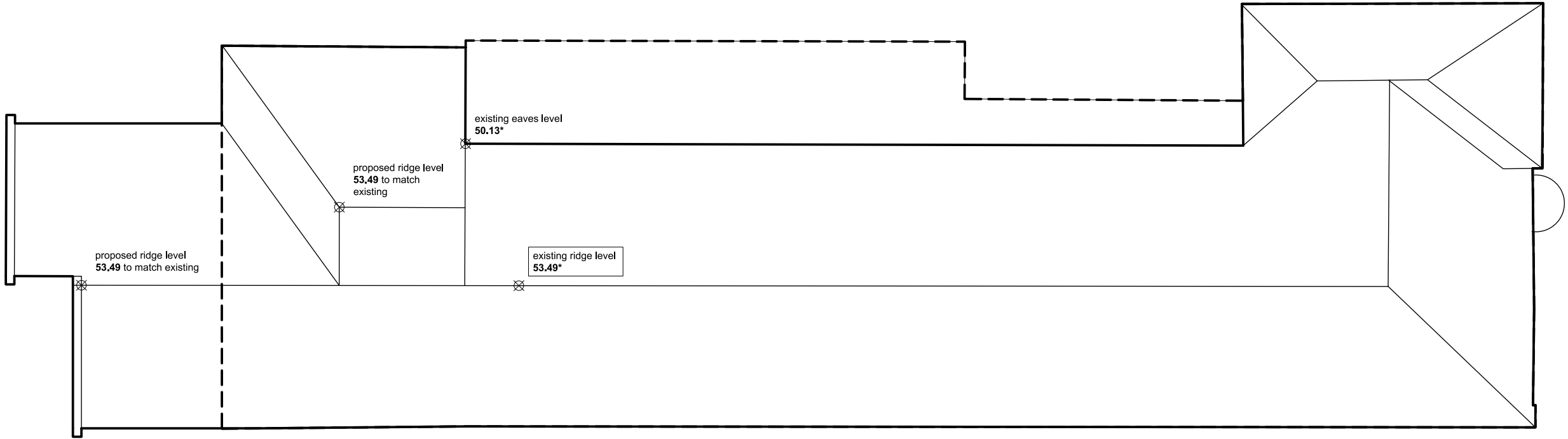
Scale	1:200 @ A2
Date	October 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.120
Revision	P3

OAK & PROSPER

BLOCK 1

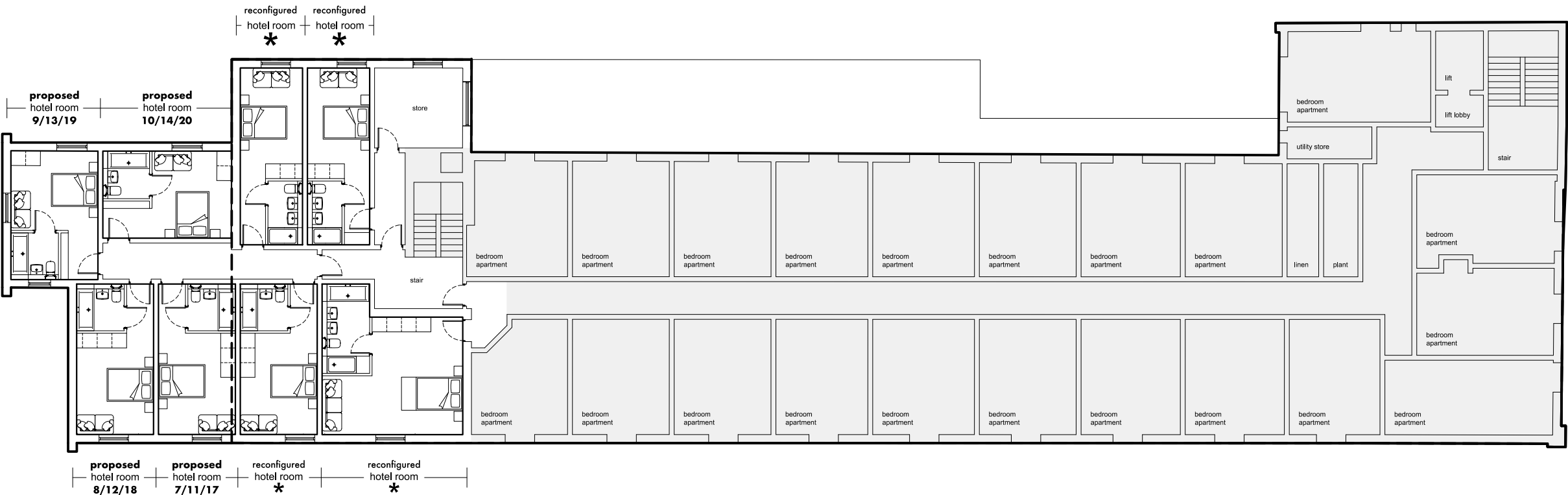
Proposed Extension to Existing Hotel

- 53.49' denotes existing survey level as taken from drawing 3766-1001-P1 by Structa level 53.49 AOD has been used as the limiting height across the proposed development so as not to exceed the existing and retained hotel structure on site
- denotes line of existing building footprint



PROPOSED Roof Plan

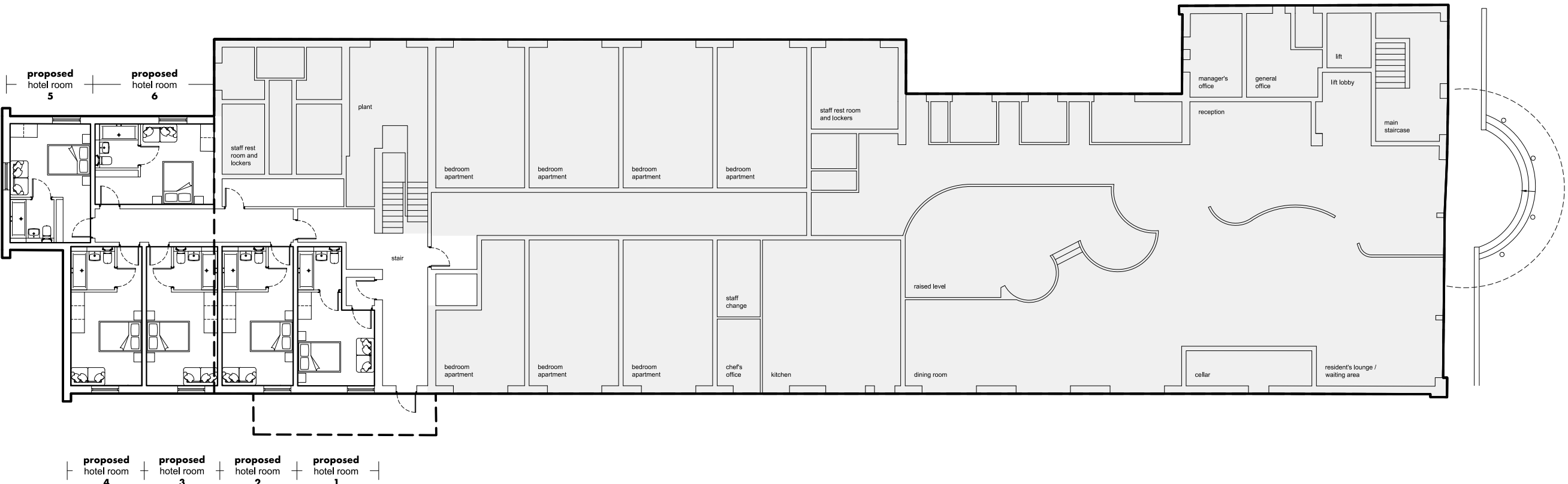
- * denotes corresponding hotel room that has been identified as 'reconfigured' is to be replicated as a new build and proposed hotel room on the third and uppermost storey, this arrangement will provide 4no additional hotel rooms to the building
- denotes line of existing building footprint
- denotes extent of existing building to be retained as part of the proposed scheme



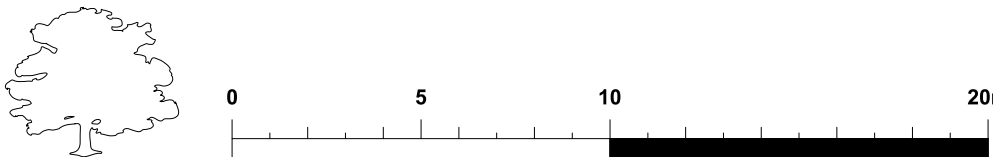
x 3no Levels

PROPOSED Upper Floor Plan

- denotes line of existing building footprint
- denotes extent of existing building to be retained as part of the proposed scheme



PROPOSED Ground Floor Plan



P3	2025-12-03	Window added to hotel rooms 5, 9, 13 and 19	CY	CY
P2	2025-11-13	Layout updated following feedback from LPA	CY	CY
P1	2025-10-29	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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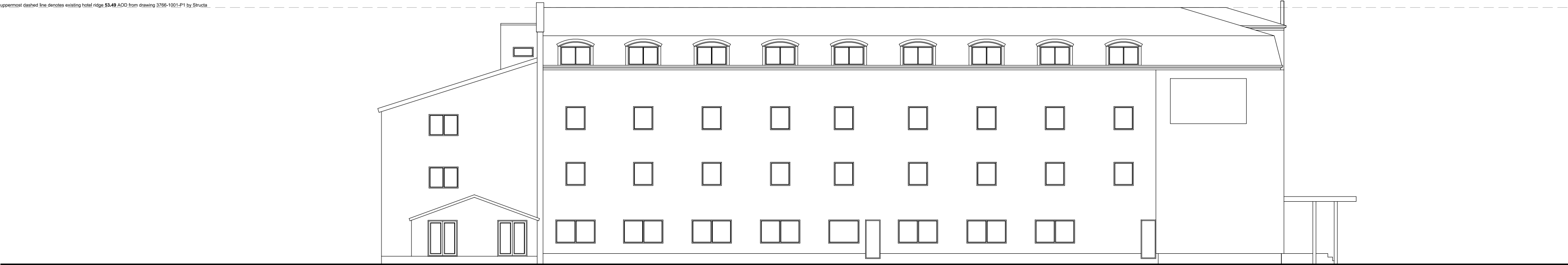
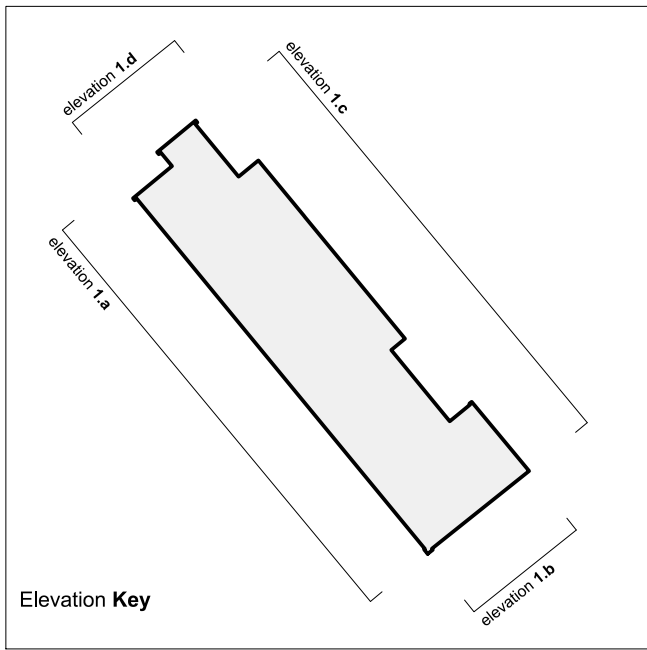
Project	Ramada South Ruislip
Long Drive / Station Approach / HA4 0HG	
Johal	
Drawing Title	Proposed Block 1 Floor Plans
Scale	1:200 @ A2
Date	September 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.121
Revision	P3



OAK & PROSPER

BLOCK 1

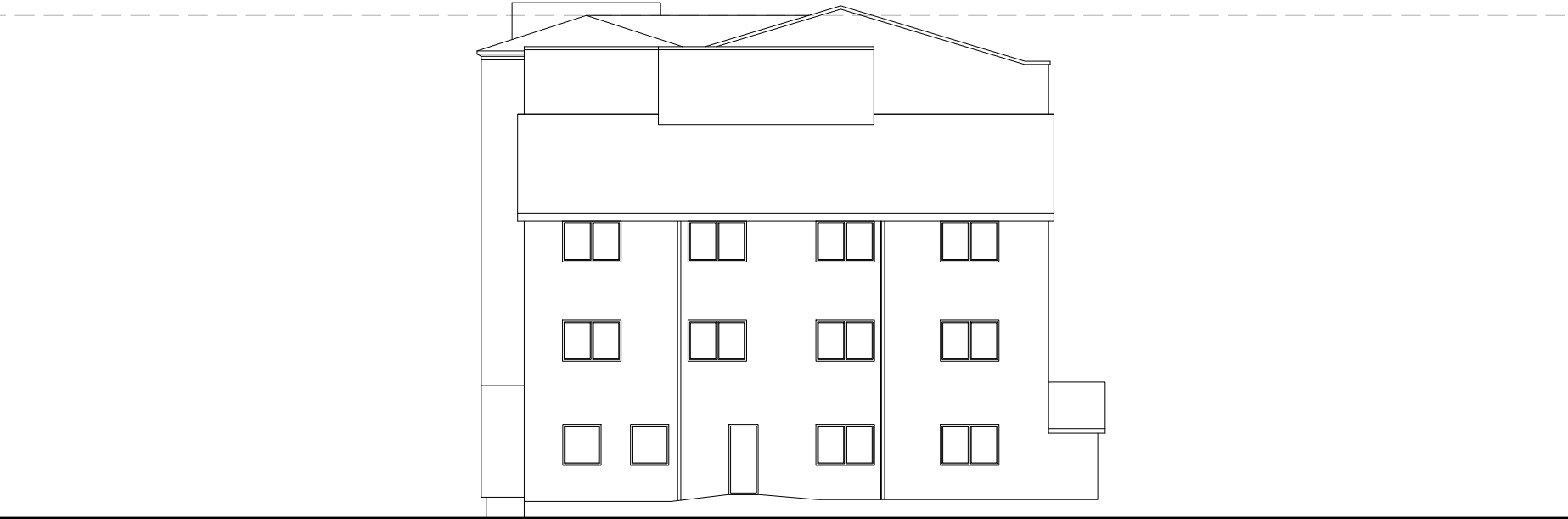
Existing Hotel



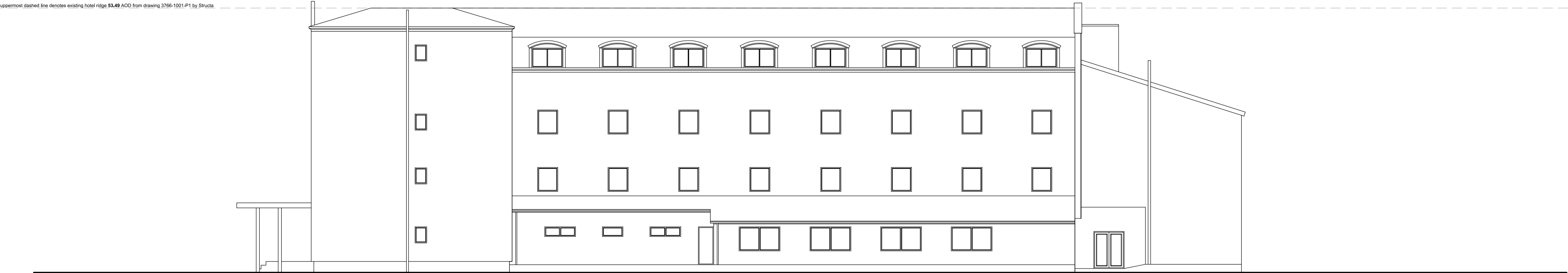
elevation 1.a
EXISTING **Side Elevation**



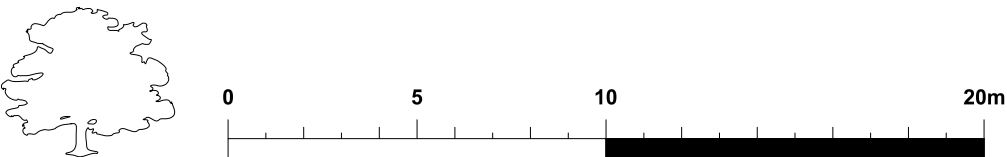
elevation 1.b
EXISTING **Front Elevation**



elevation 1.d
EXISTING **Rear Elevation**



elevation 1.c
EXISTING **Side Elevation**



P1	2025-10-28	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Project
Ramada South Ruislip
Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title
**Existing
Block 1 Elevations**

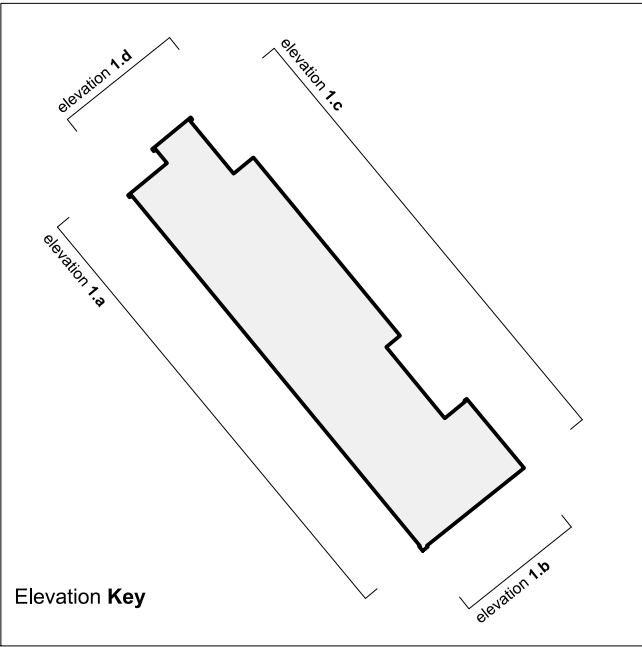
Scale	1:200 @ A2
Date	October 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.122
Revision	P1



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BLOCK 1

Proposed Extension to Existing Hotel



Material Key

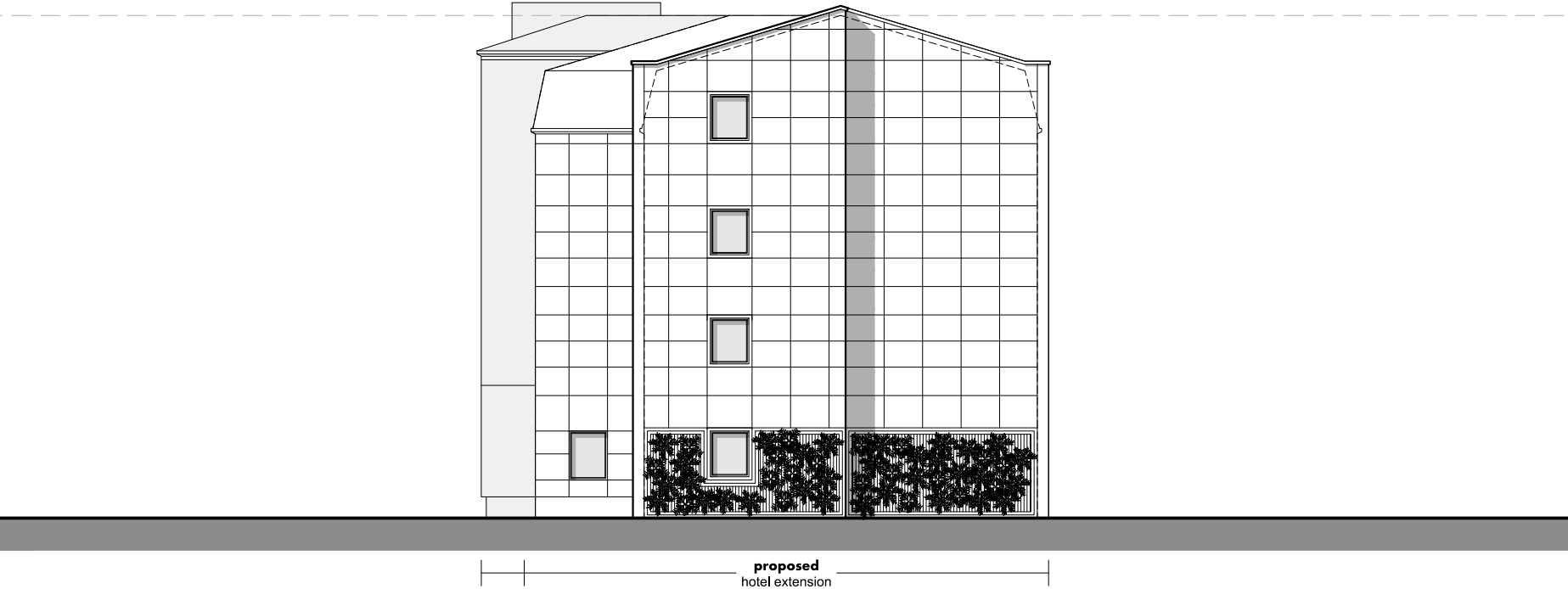
1. Stone effect cladding panel to match existing
2. Roof finish to match existing (Bitumen shingles to mansard)
3. Metal flashing to gable wall
4. Dormer window unit to match existing
5. Aluminium framed double glazed window to match existing
6. Planting trellis to ground floor level



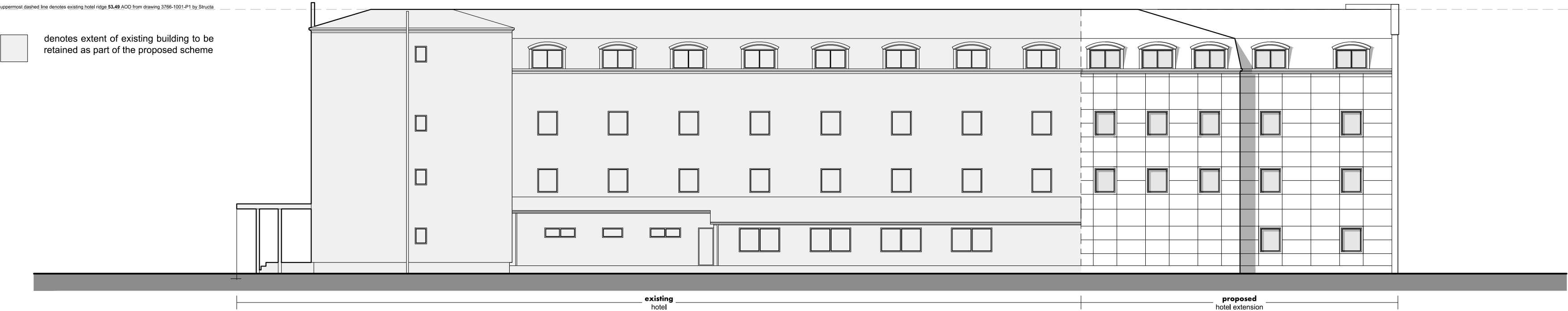
elevation 1.a
PROPOSED Side Elevation (Access Road)



elevation 1.b
PROPOSED Front Elevation (Entrance)



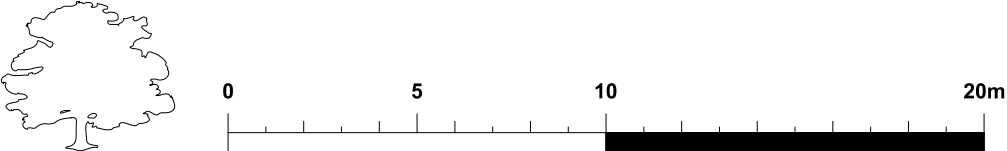
elevation 1.d
PROPOSED Rear Elevation



elevation 1.c
PROPOSED Side Elevation

P4	2025-12-03	Additional windows added to correspond with proposed plans	CY	CY
P3	2025-11-18	Material key added	CY	CY
P2	2025-11-13	Elevations updated following feedback from LPA	CY	CY
P1	2025-10-28	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Project

Ramada South Ruislip

Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Proposed
Block 1 Elevations

Scale	1:200 @ A2
Date	October 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.123
Revision	P4



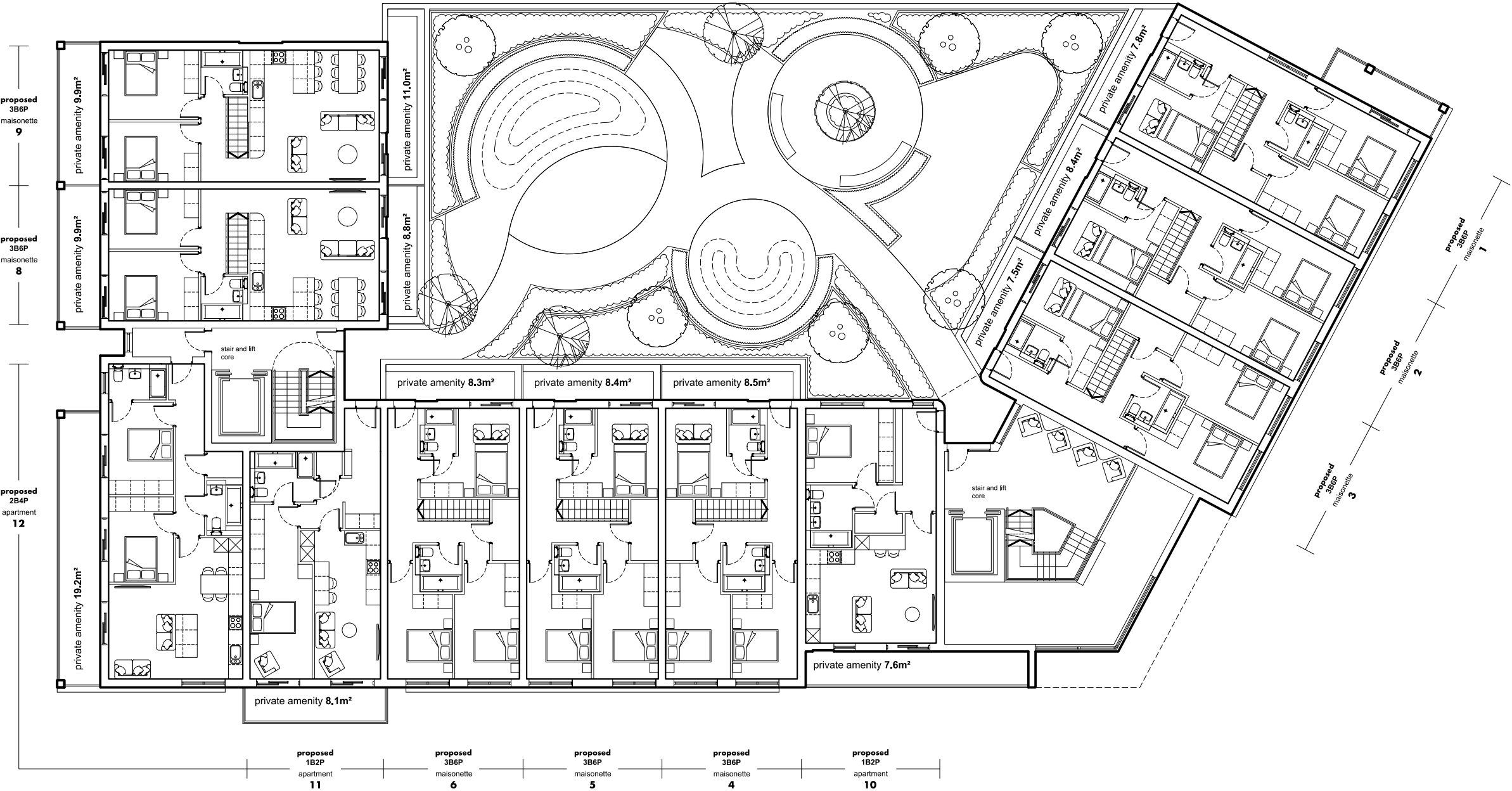
OAK & PROSPER

BLOCK 2

Proposed New Build Residential Block

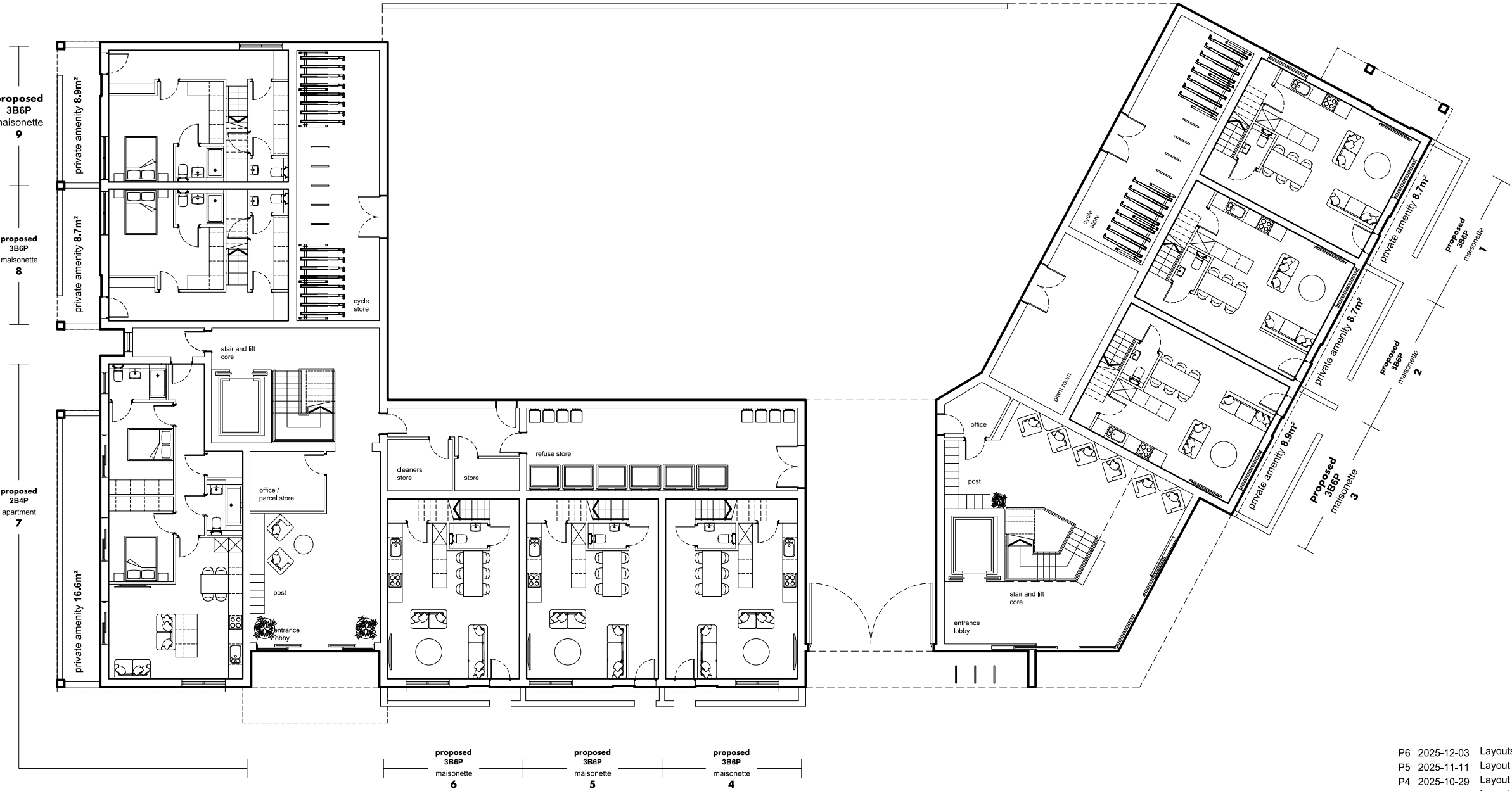
proposed finished floor level of 40.500 AOD to Block 2 First Level

PROPOSED First Floor Plan



proposed finished floor level of 37.575 AOD to Block 2 Ground Level

PROPOSED Ground Floor Plan



P6	2025-12-03	Layouts to maisonettes 8 and 9 amended	CY	CY
P5	2025-11-11	Layout updated following feedback from LPA	CY	CY
P4	2025-10-29	Layout amended following design team feedback	CY	CY
P3	2025-10-20	Layout amended to correspond with elevations rev P3	CY	CY
P2	2025-10-03	Layout amended to account for fire consultant feedback	CY	CY
P1	2025-09-12	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Project

Ramada South Ruislip

Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Proposed
Block 2 Floor Plans

Scale	1:200 @ A2
Date	September 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.125
Revision	P6



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BLOCK 2

Proposed New Build Residential Block

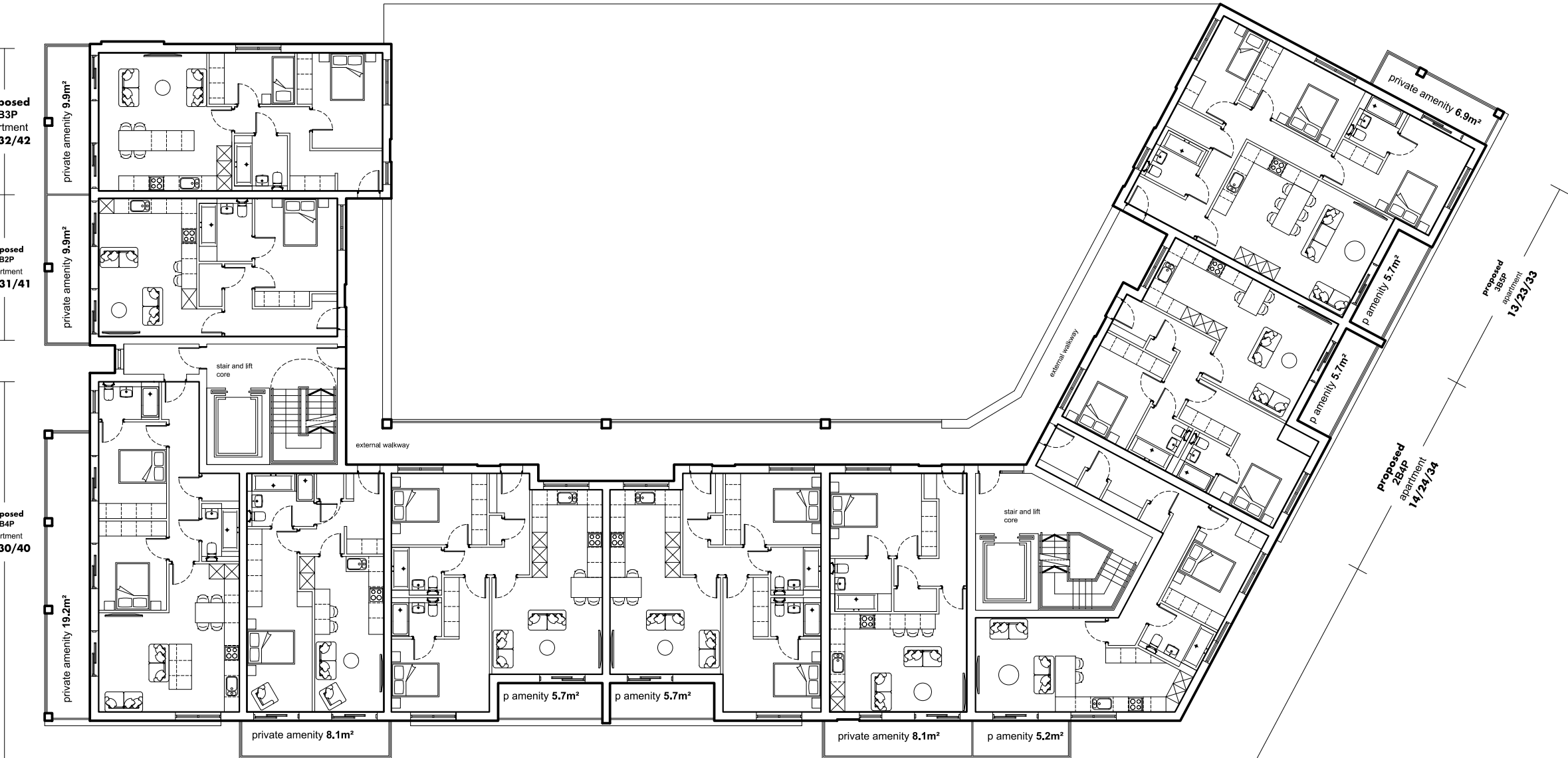
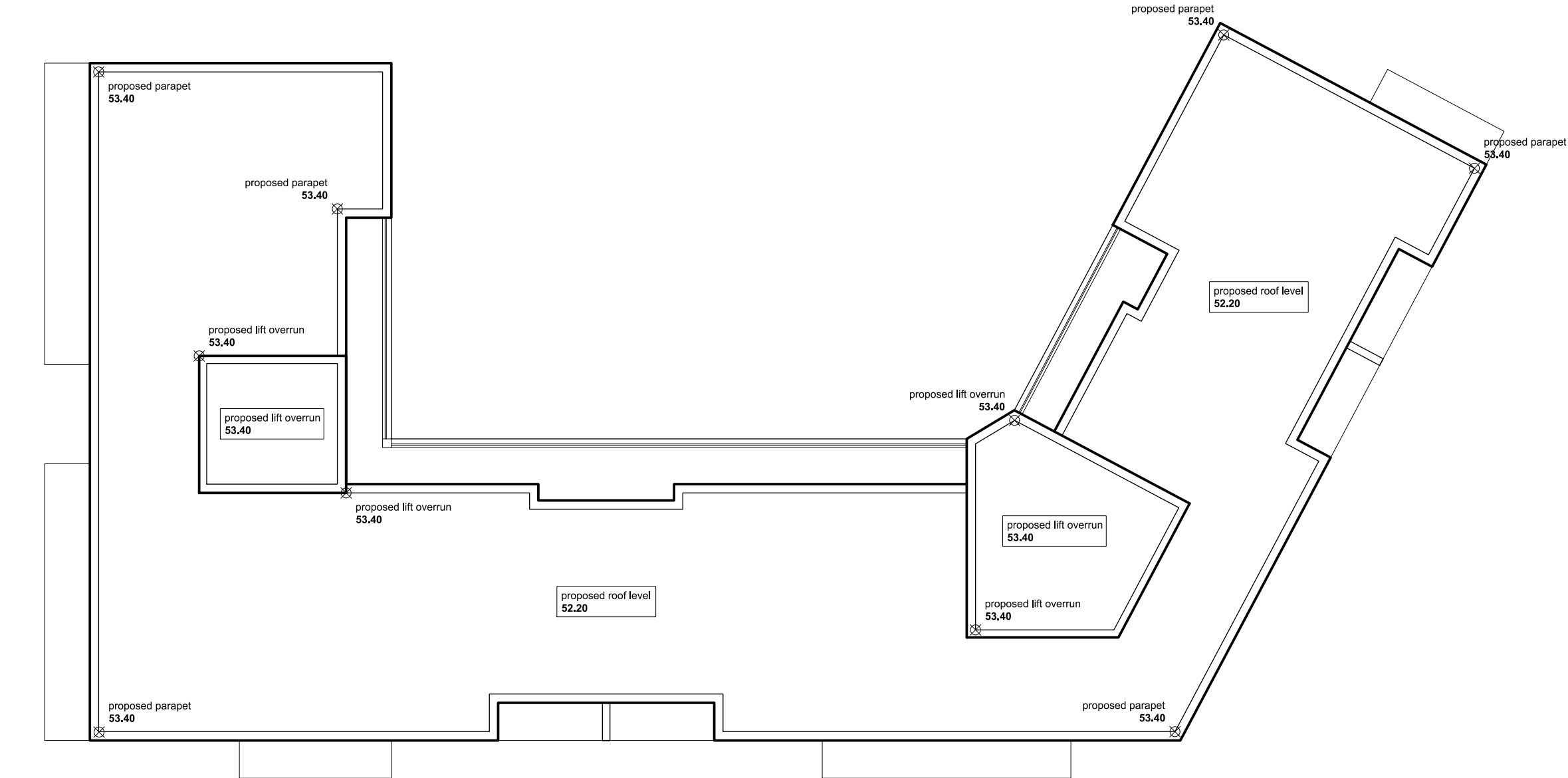
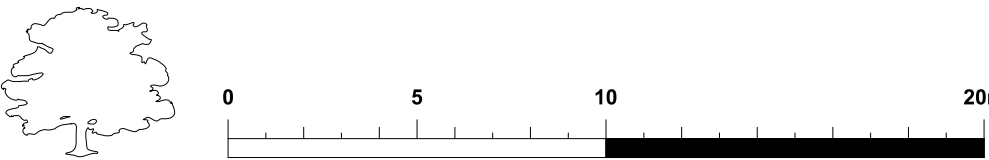
proposed finished floor level of 52.200 AOD to Block 2 Roof Level

PROPOSED Roof Plan

proposed finished floor level of 49.275 AOD to Block 2 Fourth Level
proposed finished floor level of 46.350 AOD to Block 2 Third Level
proposed finished floor level of 43.425 AOD to Block 2 Second Level

x 3no Levels

PROPOSED Upper Floor Plan



P5	2025-11-11	Layout updated following feedback from LPA	CY	CY
P4	2025-10-29	Layout amended following design team feedback	CY	CY
P3	2025-10-20	Layout amended to correspond with elevations rev P3	CY	CY
P2	2025-10-03	Layout amended to account for fire consultant feedback	CY	CY
P1	2025-09-12	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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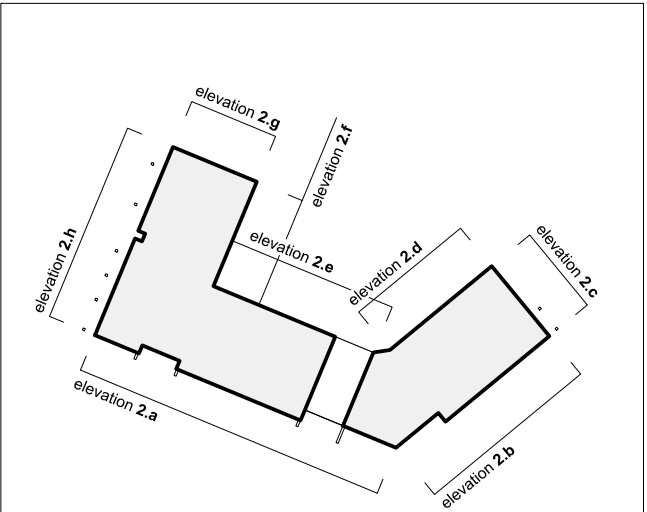
Project	Ramada South Ruislip			
	Long Drive / Station Approach / HA4 0HG			
Johal				
Drawing Title	Proposed Block 2 Floor Plans			
Scale	1:200 @ A2			
Date	September 2025			
Purpose	Planning			
Job No.	302021			
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.126			
Revision	P5			



OAK & PROSPER

BLOCK 2

Proposed New Build Residential Block



Elevation Key

Material Key

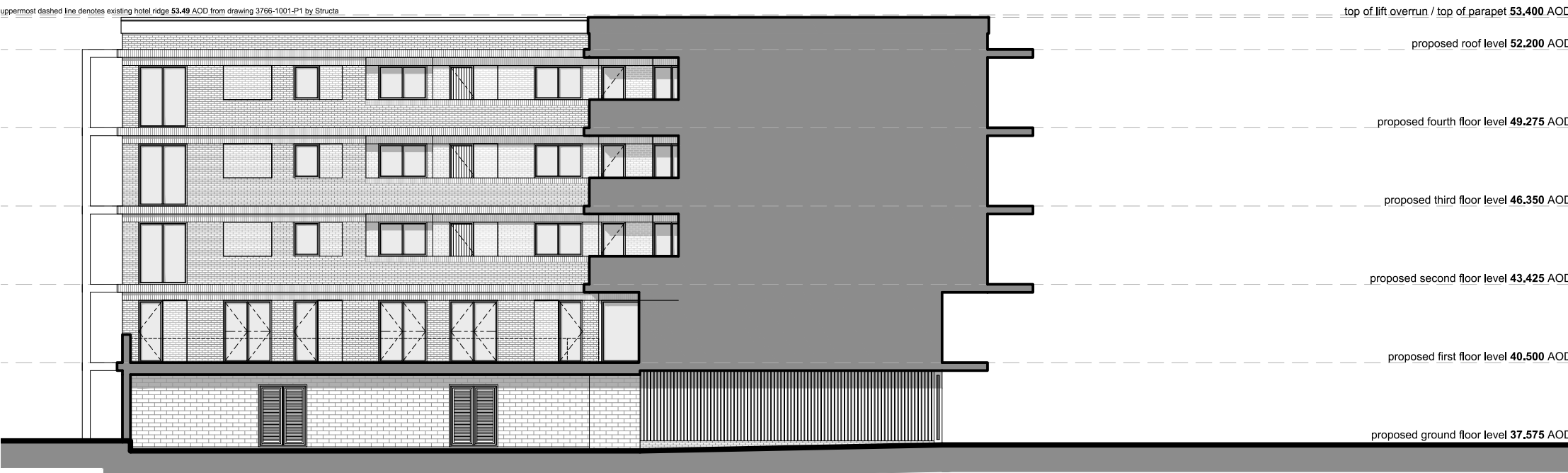
1. Facing brickwork in stretcher bond arrangement
2. Facing brickwork in soldier course banding
3. Balcony clad in brick slips to match facing brickwork
4. Decorative artstone banding
5. Metal railings to balcony edging
6. Aluminium framed double glazed window
7. Aluminium framed double glazed doorset
8. Treated wood cladding (Accoya or alternative)
9. Composite doorset
10. Aluminium framed curtain walling



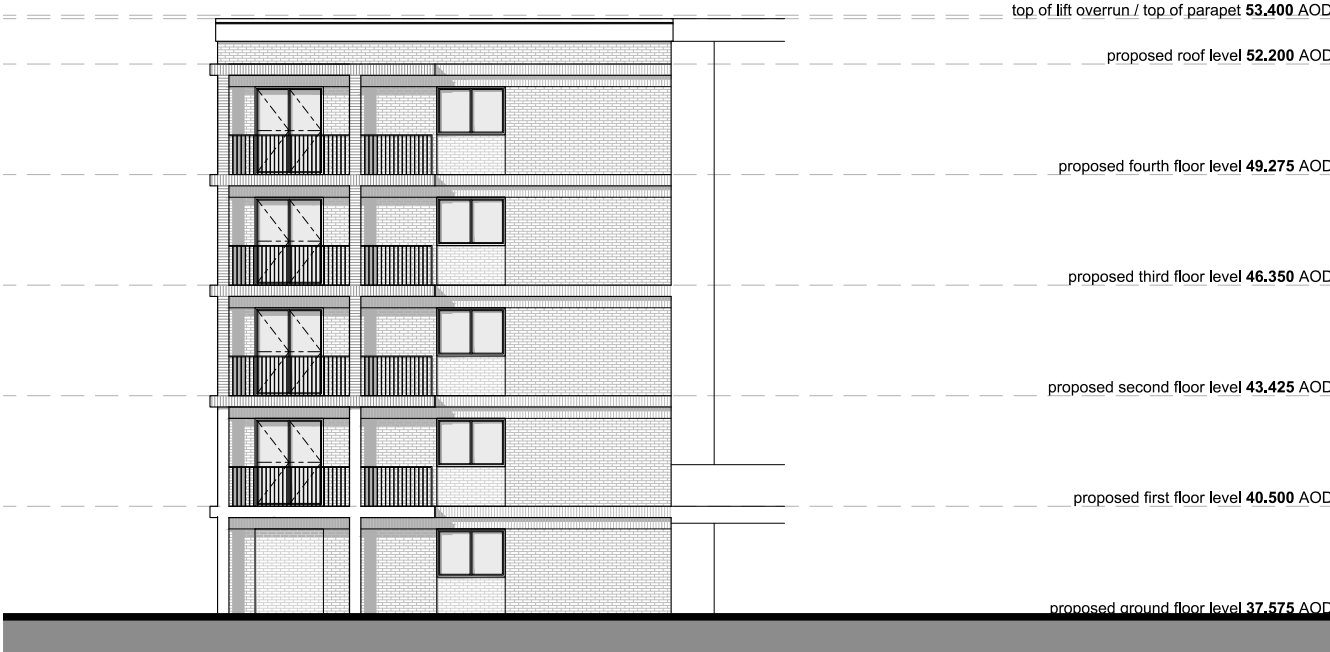
elevation 2.a
PROPOSED Front Elevation (Access Road)



elevation 2.b
PROPOSED Front Elevation (Entrance)



elevation 2.d
PROPOSED Internal Courtyard Elevation

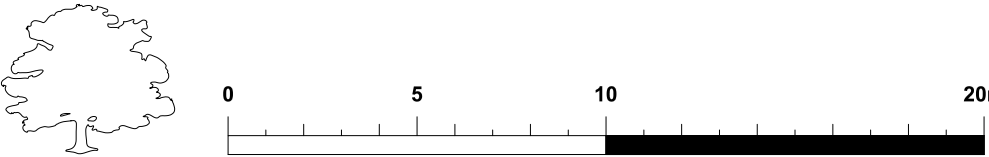


elevation 2.c
PROPOSED Side Elevation

The largest of the proposed new build residential buildings is that of Block 2, which provides a total of 42no units. The proposed brick facade is broken through a series of regimented window and door openings, allowing the larger extents of glass to provide a direct contrast with the solid brick walls. The regimented fenestration is further enhanced through the grid form balconies. The projecting amenity space to the upper floor levels is broken through a series of columns, with this architectural feature being used on the wider new build blocks, providing a sync along the full length of the development site. Within the courtyard, the expansive amenity space on the podium deck provides both functional and aesthetic benefits to the block. Across the upper floor levels, a series of external circulation routes connect the residential units to the stair and lift cores, with a further benefit of these spaces allowing the corresponding apartments to make use of dual aspects through the block. The building entrances to Block 2 are designed as a focal points on the site, further assisting with placemaking and wayfinding.

P6	2025-11-18	Material key added	CY	CY
P5	2025-11-11	Elevations updated following feedback from LPA	CY	CY
P4	2025-10-29	Elevations updated following design team feedback	CY	CY
P3	2025-10-20	Elevations updated following design team feedback	CY	CY
P2	2025-10-03	Elevations amended to account for fire consultant feedback	CY	CY
P1	2025-09-12	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Project

Ramada South Ruislip

Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Proposed Block 2 Elevations

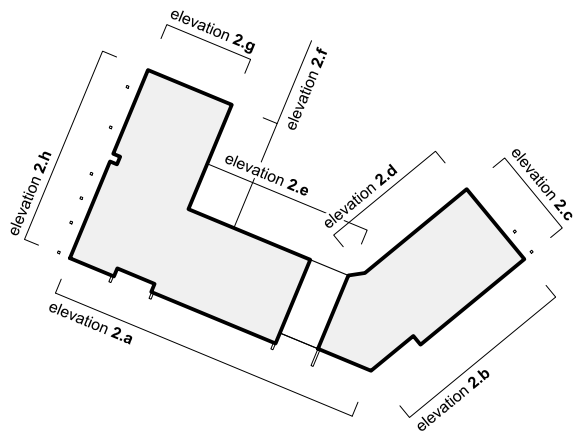
Scale	1:200 @ A2
Date	September 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.127
Revision	P6



OAK & PROSPER

BLOCK 2

Proposed New Build Residential Block



Elevation Key

Material Key

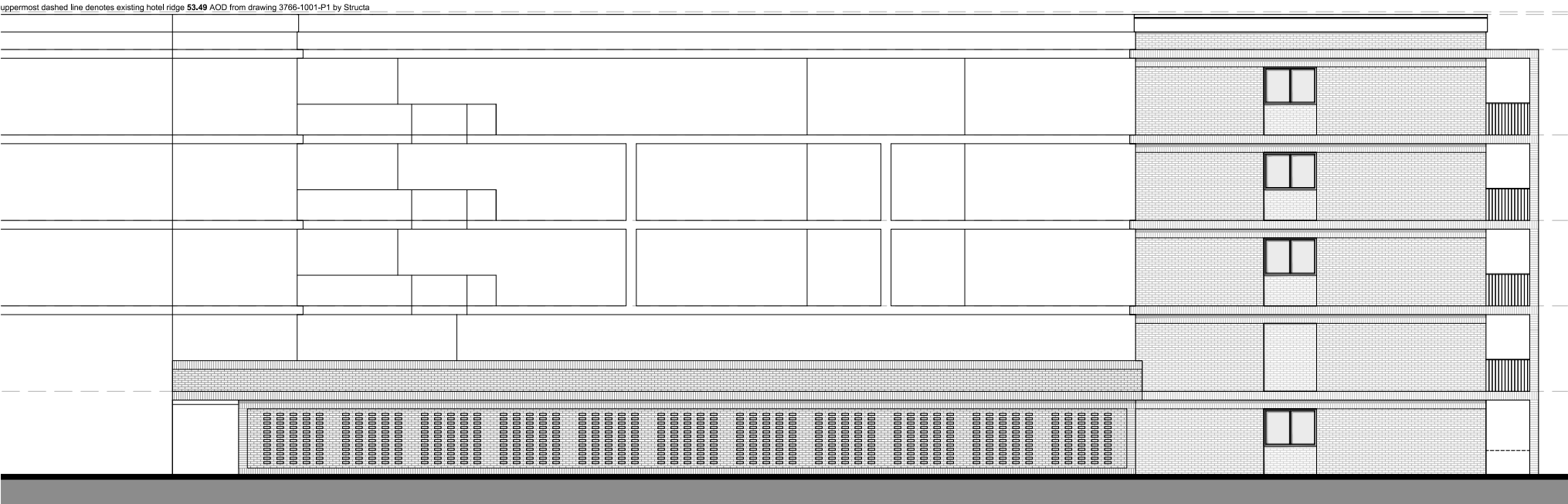
1. Facing brickwork in stretcher bond arrangement
2. Facing brickwork in soldier course banding
3. Balcony clad in brick slips to match facing brickwork
4. Decorative artstone banding
5. Metal railings to balcony edging
6. Aluminium framed double glazed window
7. Aluminium framed double glazed doorset
8. Treated wood cladding (Accoya or alternative)
9. Composite doorset
10. Aluminium framed curtain walling



elevation 2.e
PROPOSED Internal Courtyard Elevation



elevation 2.f
PROPOSED Internal Courtyard Elevation



elevation 2.g
PROPOSED Side Elevation

20m² free area provided across the ground floor car park to Block 2 to correspond with the supporting fire strategy for the development
6m² free area provided through opening
3m² free area provided through opening
11m² free area provided through hit-and-miss brickwork along the length of the north elevation



elevation 2.h
PROPOSED Rear Elevation



The full extent of elevations to the proposed Block 2 have been shown across this drawing 21.128 and 21.127, which demonstrates a clear design narrative, yet includes a series of breaks and features to emphasise certain aspects of the building, such as entrance, landscape amenity and circulation. The proposed elevational treatment has been developed to correspond with the practical aspects of the building, ensuring a balance is provided between form and function.

Rev	Date	Description	CY	Chk
P6	2025-11-18	Material key added	CY	CY
P5	2025-11-11	Elevations updated following feedback from LPA	CY	CY
P4	2025-10-29	Elevations updated following design team feedback	CY	CY
P3	2025-10-20	Elevations updated following design team feedback	CY	CY
P2	2025-10-03	Elevations amended to account for fire consultant feedback	CY	CY
P1	2025-09-12	Initial issue	CY	CY

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Project

Ramada South Ruislip

Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Proposed Block 2 Elevations

Scale	1:200 @ A2
Date	September 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.128
Revision	P6



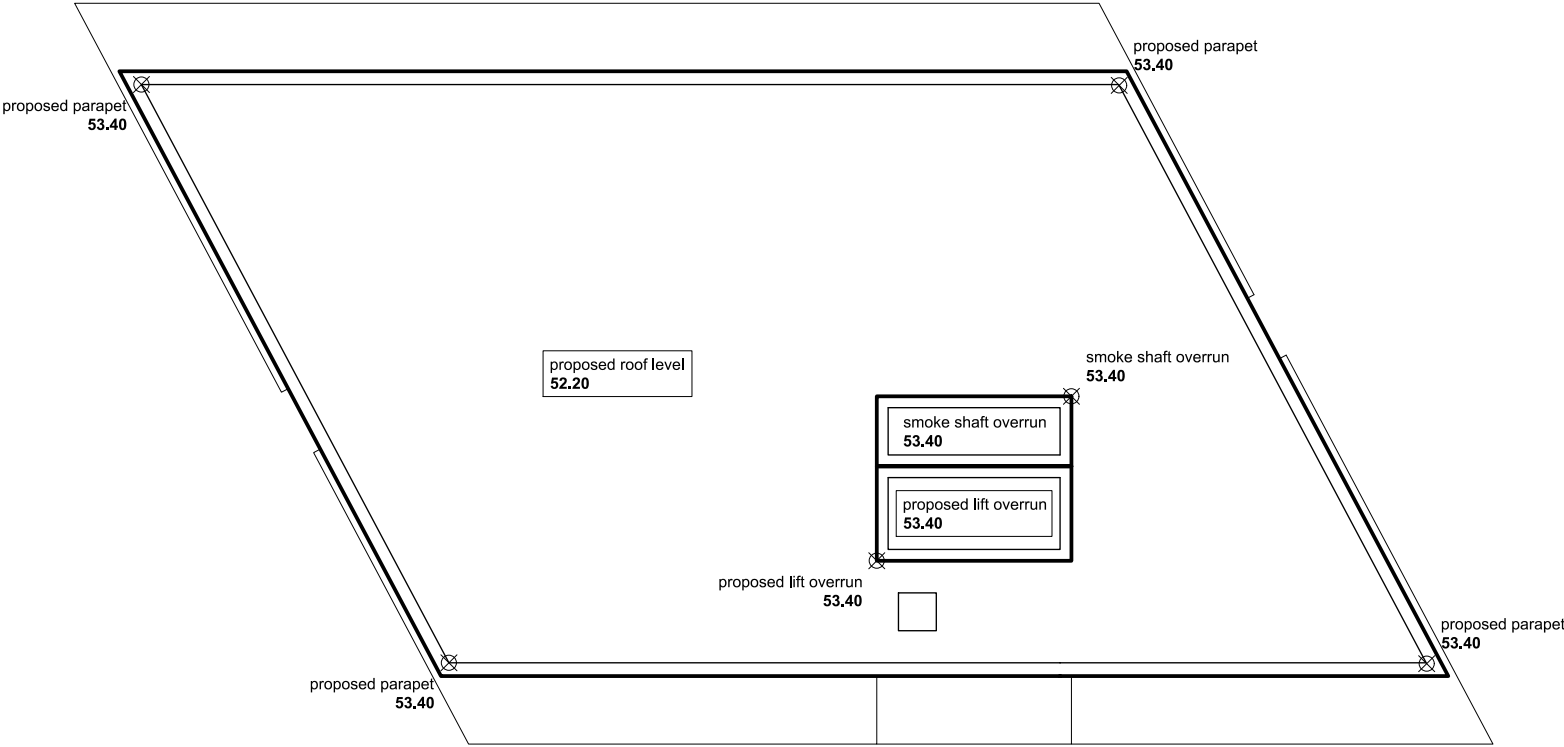
OAK & PROSPER

BLOCK 3

Proposed New Build Residential Block x3

proposed finished floor level of 52.200 AOD to Block 3.1 + 3.2 + 3.3 Roof Level

PROPOSED Roof Plan

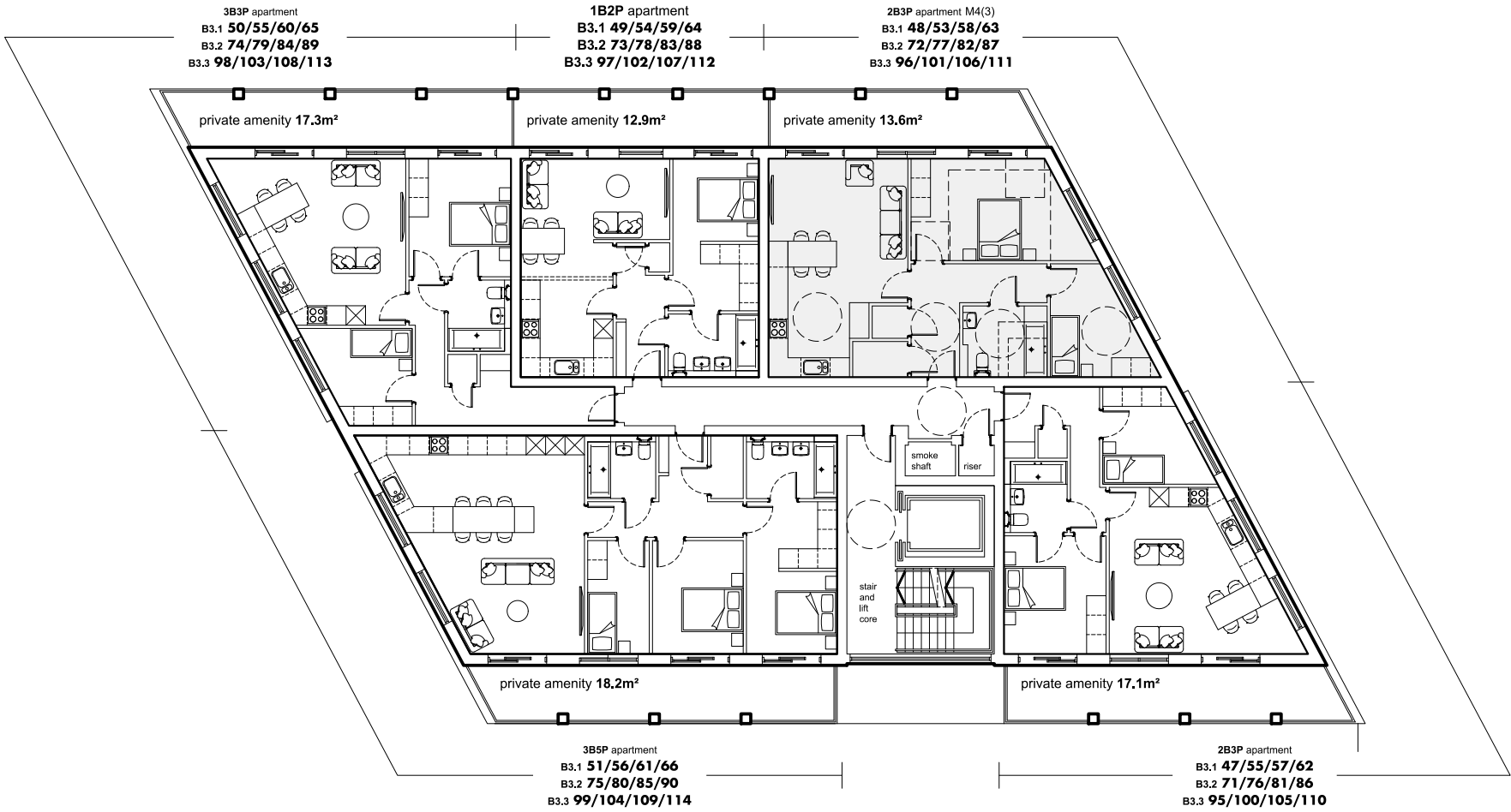


denotes corresponding to be designed to meet M4(3) standards

proposed finished floor level of 49.275 AOD to Block 3.1 + 3.2 + 3.3 Fourth Level
proposed finished floor level of 46.350 AOD to Block 3.1 + 3.2 + 3.3 Third Level
proposed finished floor level of 43.425 AOD to Block 3.1 + 3.2 + 3.3 Second Level
proposed finished floor level of 40.500 AOD to Block 3.1 + 3.2 + 3.3 Second Level

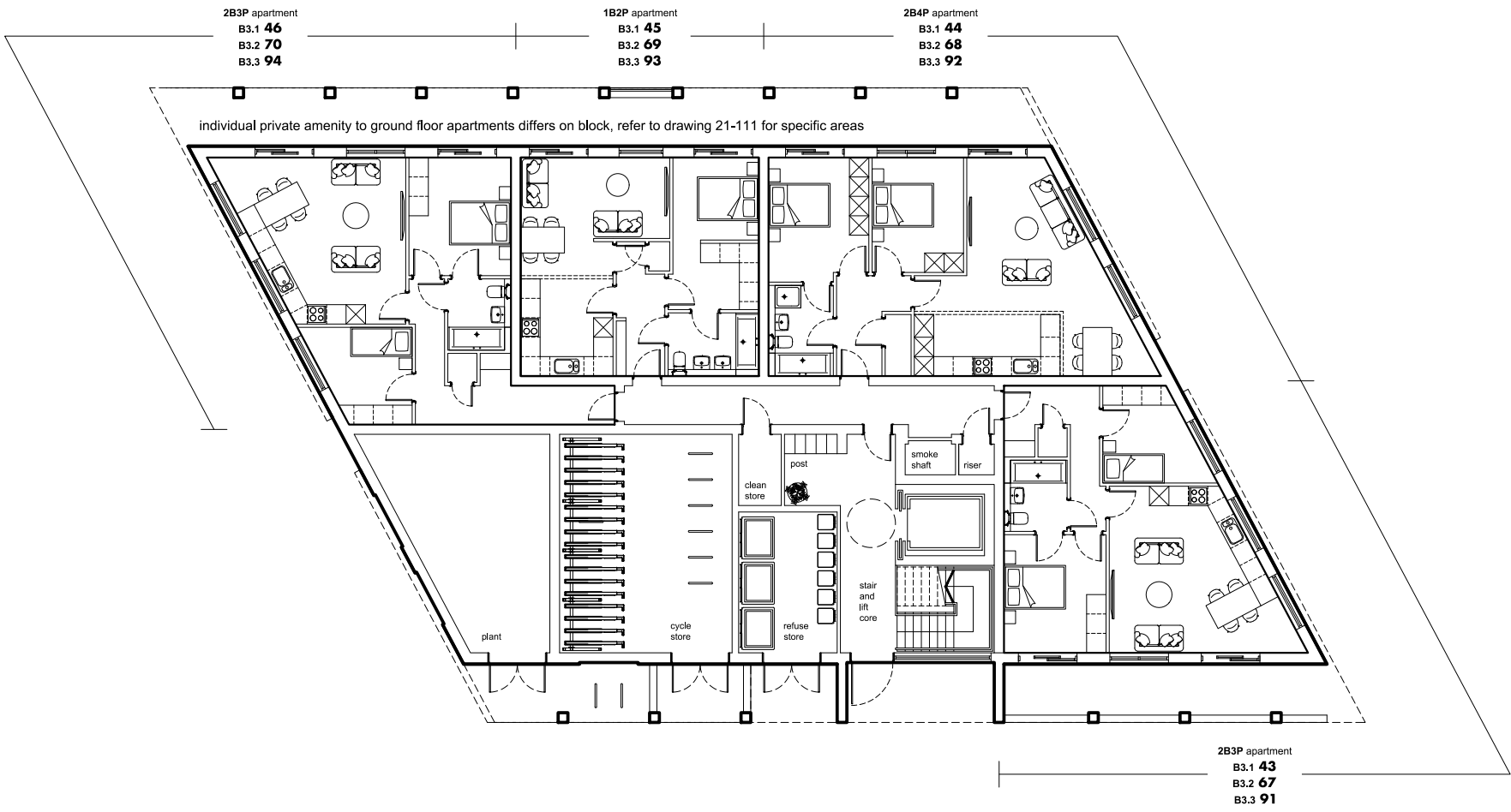
x 4no Levels

PROPOSED Upper Floor Plan



proposed finished floor level of 37.575 AOD to Block 3.1 + 3.2 + 3.3 Ground Level

PROPOSED Ground Floor Plan



P6	2025-12-03	1B2P and 2B4P unit on ground floor layout amended	CY	CY
P5	2025-11-07	Layout updated following feedback from LPA	CY	CY
P4	2025-10-29	Layout amended following design team feedback	CY	CY
P3	2025-10-20	Layout amended to correspond with elevations rev P3	CY	CY
P2	2025-10-03	Layout amended to account for fire consultant feedback	CY	CY
P1	2025-09-12	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Project

Ramada South Ruislip

Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Proposed
Block 3 Floor Plans

Scale 1:200 @ A2

Date September 2025

Purpose Planning

Job No. 302021

Drawing Ref. 302021.OP.FS.ZZ.DR.A.21.130

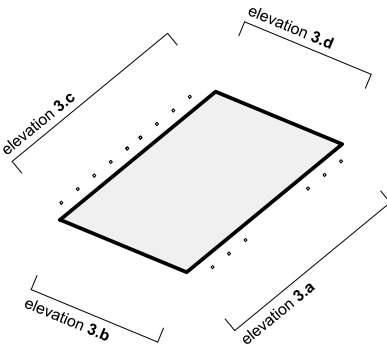
Revision P6



OAK & PROSPER

BLOCK 3

Proposed New Build Residential Block x3



Elevation Key

Material Key

1. Facing brickwork in stretcher bond arrangement
2. Facing brickwork in soldier course banding
3. Balcony clad in brick slips to match facing brickwork
4. Decorative artstone banding
5. Metal railings to balcony edging
6. Aluminium framed double glazed window
7. Aluminium framed double glazed doorset
8. Treated wood cladding (Accoya or alternative)
9. Composite doorset
10. Aluminium framed curtain walling



elevation 3.a
PROPOSED Front Elevation (Entrance)



elevation 3.b
PROPOSED Side Elevation



elevation 3.c
PROPOSED Rear Elevation



elevation 3.d
PROPOSED Side Elevation



The proposed design development of the Block 3 buildings across the site have been influenced by the land constraints, proposed streetscape generated and ensuring that a refined and clear narrative is generated for the external appearance. The focal point of the building is the grid-like form that projects from the primary facade that creates the private amenity space for the upper floor levels. As can be seen from the 2-dimensional elevations above, there is a regimented form and set out for the balcony arrangement and the door / window openings across the facades. The gable ends of the blocks incorporate more standardised openings, allowing for fitted furniture to be installed beneath. These smaller window openings also correspond with the acoustic design of the building, ensuring that penetrations along the southwestern elevation, abutting the railway line are kept to a minimum.



As is evident from the surrounding drawings, the facade is to be made up of facing brickwork using a range of tones and colours, with the varying blocks using a different palette to distinguish between and assist with wayfinding. To contrast with the use of brick, extents of glass are to be used to ensure large amounts of natural light can flood the internal spaces. The facade design has been developed to minimise the amount of materials used, whilst maximising the impact through form and interest.

P7	2025-12-03	Fenestration design amended to reflect changes to floor plan	CY	CY
P6	2025-11-18	Material key added	CY	CY
P5	2025-11-07	Elevations updated following feedback from LPA	CY	CY
P4	2025-10-29	Elevations updated following design team feedback	CY	CY
P3	2025-10-20	Elevations updated following design team feedback	CY	CY
P2	2025-10-03	Elevations amended to account for fire consultant feedback	CY	CY
P1	2025-09-12	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk

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Email: contact@oakandprosper.co.uk Tel: 020 7101 3724

Project

Ramada South Ruislip

Long Drive / Station Approach / HA4 0HG

Johal

Drawing Title

Proposed Block 3 Elevations

Scale	1:200 @ A2
Date	September 2025
Purpose	Planning
Job No.	302021
Drawing Ref.	302021.OP.FS.ZZ.DR.A.21.131
Revision	P7



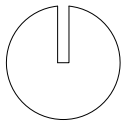
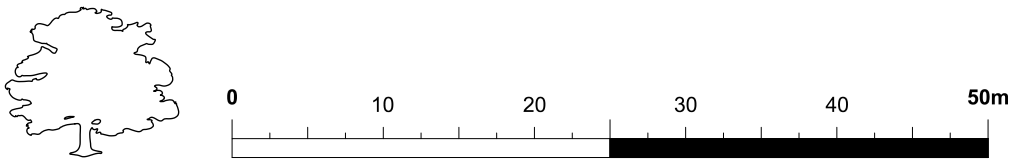
OAK & PROSPER

APPENDIX 2 – Topographical Survey



Project	
Ramada South Ruislip	
Long Drive / Station Approach / HA4 0HG	
Johal	
Drawing Title	
Existing	
Site Plan	
Scale	
1:500 @ A2	
Date	
September 2025	
Purpose	
Planning	
Job No.	
302021	
Drawing Ref.	
302021.OP.FS.ZZ.DR.A.21.105	
Revision	
P2	

P2	2025-11-19	Red line boundary amended	CY	CY
P1	2025-01-20	Initial issue	CY	CY
Rev	Date	Description	Dm	Chk



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APPENDIX 3 – Greenfield Runoff Rates, Volumes and Drainage Calculations

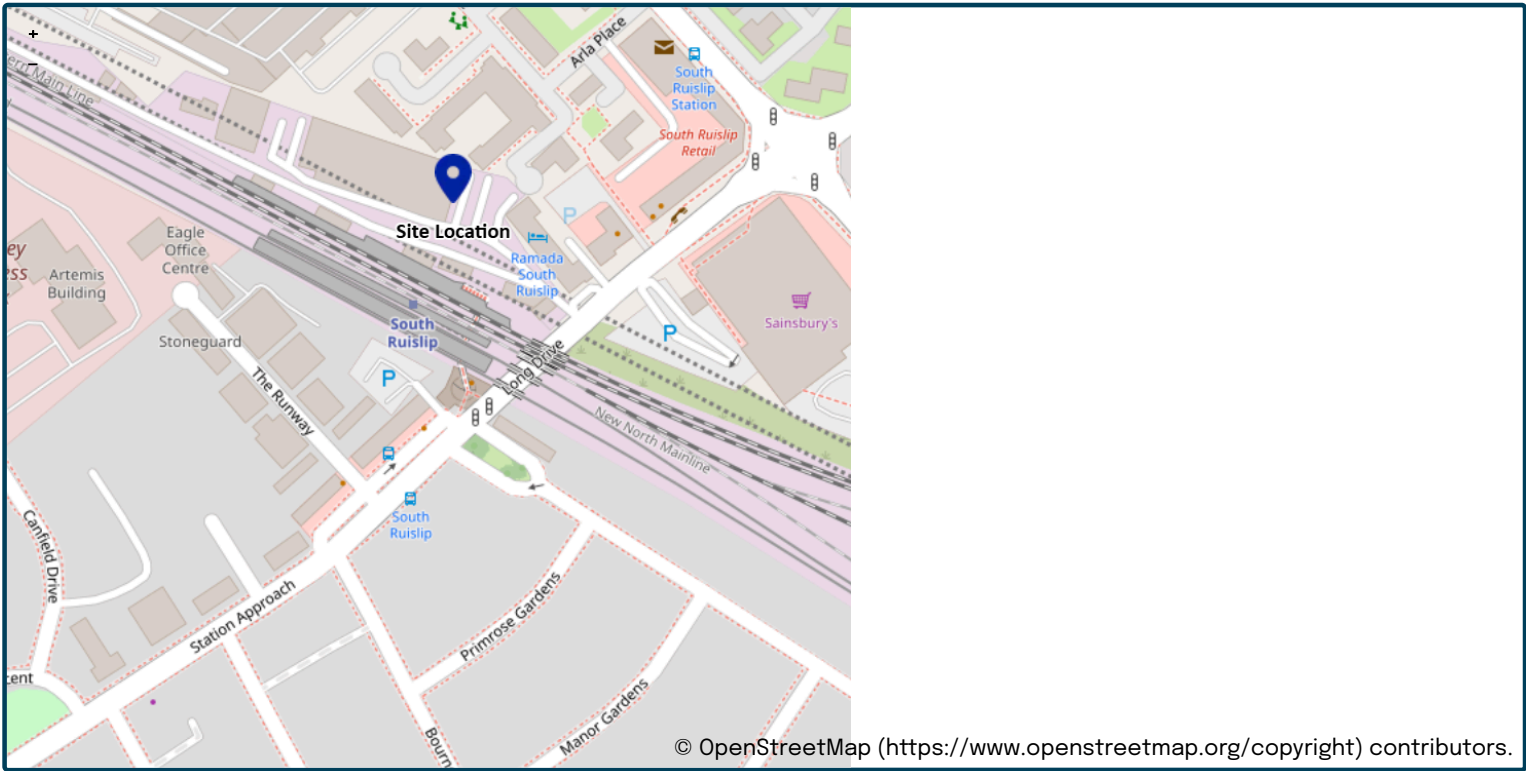
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	21/08/2026
Calculated by	es
Reference	KRS,0429.006
Model version	2.2.3

Location

Site name	Long Drive
Site location	Ruislip



Site easting (British National Grid)	511104
Site northing (British National Grid)	185491

Site details

Total site area (ha)	1	ha
----------------------	--------------------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	------------------------

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	676	mm
BFIHOST19scaled	0.217	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	5	l/s
QBar (FEH statistical 2025) (l/s)	5.7	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	6	6
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	4.8
Flow rate 2 year (l/s)	5.0
Flow rate 10 years (l/s)	9.2
Flow rate 30 years (l/s)	13.1
Flow rate 100 years (l/s)	18.2
Flow rate 200 years (l/s)	21.3

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Surface Water Drainage Assessment for Long Drive Existing Flows

Site Area: 1.006 ha | **Location:** Long Drive, Ruislip, London, UK
Calculations Basis: FEH 2022 Greenfield Data & Modified Rational Method (Wallingford Winter $C_v = 0.84$)

1. Site Area Breakdown

Based on the updated topographical survey verification, the historical site conditions are split into two hydrological catchments:

- Existing Brownfield Area (Roof & Hardstanding): 0.966 ha (96.02%)
- Existing Remaining Permeable Area (Green space): 0.040 ha (3.98%)

2. Peak Flow Runoff Matrix

Return Period	Brownfield Flow (0.966 ha)	Scaled Greenfield (0.040 ha)	Total Existing Site Flow	Proposed Target Flow (Greenfield)
1 in 1 Year	98.50 l/s	0.19 l/s	98.69 l/s	4.80 l/s
1 in 30 Year	448.20 l/s	0.54 l/s	448.74 l/s	13.70 l/s
1 in 100 Year	563.20 l/s	0.72 l/s	563.92 l/s	18.20 l/s

3. LLFA Compliance Notes

- Note 1: Peak Flow Reduction & Flood Mitigation**
For the critical 1 in 100-year storm event, the existing uncontrolled site discharges a peak of **563.92 l/s** due to the expansive historical hardstanding. The proposed system restricts this to a maximum of **18.20 l/s**, yielding an exceptional **96.8% reduction in peak flow**. This provides major downstream flood alleviation benefits for local infrastructure.
- Note 2: Policy SI 13 & Attenuation Defence**
In full compliance with **London Plan Policy SI 13**, this assessment establishes an evidence-backed baseline for existing runoff. The model pairs the exact 0.966 ha tarmac and concrete footprint (verified via topographical survey) with standard Wallingford winter volumetric coefficients ($C_v = 0.84$). This transparent methodology validates the high historical baseline flow, proving why substantial on-site attenuation volumes are required to store and throttle runoff back down to natural FEH 2022 greenfield rates.

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Rate(s)	✓	100 year (l/s)	18.2
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0	1 year (l/s)	4.8	Check Discharge Volume	✓
Summer CV	1.000	Skip Steady State	x	Starting Level (m)		30 year (l/s)	13.7	100 year 360 minute (m³)	352

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	25	0	0	30	40	0	0	100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	BFIHost	0.217	Growth Factor 100 year	3.19	Q 30 year (l/s)	13.7
Greenfield Method	FEH	Region	6	Betterment (%)	0	Q 100 year (l/s)	18.2
Positively Drained Area (ha)	1.006	QBar/QMed conversion factor	1.136	QMed	5.0		
SAAR (mm)	676	Growth Factor 1 year	0.85	QBar	5.7		
Host	1	Growth Factor 30 year	2.40	Q 1 year (l/s)	4.8		

Pre-development Discharge Volume

Site Makeup	Greenfield	Soil Index	4	Return Period (years)	100	Betterment (%)	0
Greenfield Method	FSR/FEH	SPR	0.47	Climate Change (%)	0	PR	0.466
Positively Drained Area (ha)	1.006	CWI	101.630	Storm Duration (mins)	360	Runoff Volume (m³)	352

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	0.900
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	1.000	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	18.708	101.1	225	1 SLS-1	37.425	36.300	0.900	37.425	36.115	1.085
1.001	27.787	169.4	225	1 SLS-1	37.425	36.115	1.085	37.425	35.951	1.249
2.000	18.697	101.1	225	1 SLS-1	37.425	36.300	0.900	37.425	36.115	1.085
1.002	8.221	167.8	300	1 SLS-1	37.425	35.876	1.249	37.425	35.827	1.298
3.000	18.963	100.9	225	1 SLS-1	37.425	36.300	0.900	37.425	36.112	1.088
1.003	13.914	167.6	375	1 SLS-1	37.425	35.752	1.298	38.300	35.669	2.256
4.000	27.367	101.0	225	1 SLS-1	37.425	36.300	0.900	37.425	36.029	1.171
4.001	4.582	21.8	225	1 SLS-1	37.425	36.029	1.171	38.300	35.819	2.256
1.004	21.122	325.0	375	1 SLS-1	38.300	35.669	2.256	38.300	35.604	2.321
5.000	27.651	100.9	225	1 SLS-1	37.425	36.300	0.900	37.425	36.026	1.174
5.001	4.055	169.0	225	1 SLS-1	37.425	36.026	1.174	38.300	36.002	2.073
1.005	19.463	324.4	375	1 SLS-1	38.300	35.604	2.321	38.500	35.544	2.581
6.000	5.917	59.2	150	1 SLS-1	37.600	36.550	0.900	37.500	36.450	0.900

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	600	Manhole	1 600mm +	2	600	Manhole	1 600mm +
1.001	2	600	Manhole	1 600mm +	4	1050	Manhole	1 600mm +
2.000	3	600	Manhole	1 600mm +	4	1050	Manhole	1 600mm +
1.002	4	1050	Manhole	1 600mm +	6	1200	Manhole	1 600mm +
3.000	5	600	Manhole	1 600mm +	6	1200	Manhole	1 600mm +
1.003	6	1200	Manhole	1 600mm +	9	1200	Manhole	1 600mm +
4.000	7	600	Manhole	1 600mm +	8	600	Manhole	1 600mm +
4.001	8	600	Manhole	1 600mm +	9	1200	Manhole	1 600mm +
1.004	9	1200	Manhole	1 600mm +	12	1200	Manhole	1 600mm +
5.000	10	600	Manhole	1 600mm +	11	600	Manhole	1 600mm +
5.001	11	600	Manhole	1 600mm +	12	1200	Manhole	1 600mm +
1.005	12	1200	Manhole	1 600mm +	21	1200	Manhole	1 600mm +
6.000	13	450	Manhole	1 600mm +	14	450	Manhole	1 600mm +

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
6.001	10.714	75.5	150	1 SLS-1	37.500	36.450	0.900	37.400	36.308	0.942
7.000	6.731	100.5	150	1 SLS-1	37.425	36.375	0.900	37.400	36.308	0.942
6.002	9.284	100.9	225	1 SLS-1	37.400	36.233	0.942	37.425	36.141	1.059
8.000	10.029	63.1	150	1 SLS-1	37.425	36.375	0.900	37.425	36.216	1.059
6.003	8.045	167.6	225	1 SLS-1	37.425	36.141	1.059	38.500	36.093	2.182
9.000	26.899	100.7	225	1 SLS-1	37.425	36.300	0.900	37.425	36.033	1.167
9.001	6.643	170.3	225	1 SLS-1	37.425	36.033	1.167	38.500	35.994	2.281
1.006	19.278	321.3	375	1 SLS-1	38.500	35.544	2.581	38.500	35.484	2.641
10.000	27.223	100.8	150	1 SLS-1	37.425	36.375	0.900	37.425	36.105	1.170
10.001	6.213	100.2	150	1 SLS-1	37.425	36.105	1.170	38.500	36.043	2.307
1.007	13.598	242.8	450	1 SLS-1	38.500	35.409	2.641	38.800	35.353	2.997
11.000	5.677	56.8	150	1 SLS-1	37.800	36.750	0.900	37.700	36.650	0.900
11.001	6.513	65.1	150	1 SLS-1	37.700	36.650	0.900	37.600	36.550	0.900
11.002	13.311	55.9	150	1 SLS-1	37.600	36.550	0.900	37.425	36.312	0.963
12.000	6.310	100.2	150	1 SLS-1	37.425	36.375	0.900	37.425	36.312	0.963
11.003	8.203	101.3	150	1 SLS-1	37.425	36.312	0.963	37.425	36.231	1.044
13.000	9.062	62.9	150	1 SLS-1	37.425	36.375	0.900	37.425	36.231	1.044

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
6.001	14	450	Manhole	1 600mm +	16	600	Manhole	1 600mm +
7.000	15	450	Manhole	1 600mm +	16	600	Manhole	1 600mm +
6.002	16	600	Manhole	1 600mm +	18	600	Manhole	1 600mm +
8.000	17	450	Manhole	1 600mm +	18	600	Manhole	1 600mm +
6.003	18	600	Manhole	1 600mm +	21	1200	Manhole	1 600mm +
9.000	19	600	Manhole	1 600mm +	20	600	Manhole	1 600mm +
9.001	20	600	Manhole	1 600mm +	21	1200	Manhole	1 600mm +
1.006	21	1200	Manhole	1 600mm +	24	1200	Manhole	1 600mm +
10.000	22	450	Manhole	1 600mm +	23	450	Manhole	1 600mm +
10.001	23	450	Manhole	1 600mm +	24	1200	Manhole	1 600mm +
1.007	24	1200	Manhole	1 600mm +	32	1200	Manhole	1 600mm +
11.000	25	450	Manhole	1 600mm +	26	450	Manhole	1 600mm +
11.001	26	450	Manhole	1 600mm +	27	450	Manhole	1 600mm +
11.002	27	450	Manhole	1 600mm +	29	450	Manhole	1 600mm +
12.000	28	450	Manhole	1 600mm +	29	450	Manhole	1 600mm +
11.003	29	450	Manhole	1 600mm +	31	450	Manhole	1 600mm +
13.000	30	450	Manhole	1 600mm +	31	450	Manhole	1 600mm +

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
11.004	5.614	100.3	150	1 SLS-1	37.425	36.231	1.044	38.800	36.175	2.475
1.008	17.359	403.7	450	1 SLS-1	38.800	35.353	2.997	38.700	35.310	2.940
14.000	27.857	100.9	150	1 SLS-1	37.425	36.375	0.900	37.425	36.099	1.176
15.000	6.476	86.3	150	1 SLS-1	37.500	36.450	0.900	37.425	36.375	0.900
15.001	2.515	86.7	150	1 SLS-1	37.425	36.375	0.900	37.425	36.346	0.929
15.002	6.451	26.1	150	1 SLS-1	37.425	36.346	0.929	37.425	36.099	1.176
14.001	7.028	86.8	150	1 SLS-1	37.425	36.099	1.176	38.700	36.018	2.532
1.009	33.456	403.1	450	1 SLS-1	38.700	35.310	2.940	38.500	35.227	2.823
16.000	14.448	101.0	150	1 SLS-1	37.425	36.375	0.900	37.425	36.232	1.043
16.001	16.868	101.0	225	1 SLS-1	37.425	36.157	1.043	37.425	35.990	1.210
16.002	13.910	167.6	225	1 SLS-1	37.425	35.990	1.210	37.425	35.907	1.293
16.003	7.246	168.5	225	1 SLS-1	37.425	35.906	1.294	38.500	35.863	2.412
17.000	17.169	101.0	225	1 SLS-1	37.425	36.375	0.825	37.425	36.205	0.995
17.001	22.667	91.4	225	1 SLS-1	37.425	36.205	0.995	37.425	35.957	1.243
18.000	17.205	101.2	150	1 SLS-1	37.425	36.375	0.900	37.425	36.205	1.070
18.001	2.690	99.6	150	1 SLS-1	37.425	36.205	1.070	37.425	36.178	1.097
18.002	10.672	100.7	150	1 SLS-1	37.425	36.178	1.097	37.425	36.072	1.203

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
11.004	31	450	Manhole	1 600mm +	32	1200	Manhole	1 600mm +
1.008	32	1200	Manhole	1 600mm +	38	1200	Manhole	1 600mm +
14.000	33	450	Manhole	1 600mm +	37	450	Manhole	1 600mm +
15.000	34	450	Manhole	1 600mm +	35	450	Manhole	1 600mm +
15.001	35	450	Manhole	1 600mm +	36	450	Manhole	1 600mm +
15.002	36	450	Manhole	1 600mm +	37	450	Manhole	1 600mm +
14.001	37	450	Manhole	1 600mm +	38	1200	Manhole	1 600mm +
1.009	38	1200	Manhole	1 600mm +	50	1500	Manhole	1 600mm +
16.000	39	450	Manhole	1 600mm +	40	600	Manhole	1 600mm +
16.001	40	600	Manhole	1 600mm +	41	600	Manhole	1 600mm +
16.002	41	600	Manhole	1 600mm +	42	600	Manhole	1 600mm +
16.003	42	600	Manhole	1 600mm +	50	1500	Manhole	1 600mm +
17.000	43	600	Manhole	1 600mm +	44	600	Manhole	1 600mm +
17.001	44	600	Manhole	1 600mm +	49	600	Manhole	1 600mm +
18.000	45	450	Manhole	1 600mm +	46	450	Manhole	1 600mm +
18.001	46	450	Manhole	1 600mm +	47	450	Manhole	1 600mm +
18.002	47	450	Manhole	1 600mm +	48	600	Manhole	1 600mm +

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
18.003	4.089	99.7	150	1 SLS-1	37.425	36.072	1.203	37.425	36.031	1.244
17.002	4.749	169.6	225	1 SLS-1	37.425	35.957	1.243	38.500	35.929	2.346
1.010	8.942	235.3	600	1 SLS-1	38.500	35.078	2.822	38.400	35.040	2.760
19.000	6.114	61.1	150	1 SLS-1	37.600	36.550	0.900	37.500	36.450	0.900
19.001	14.653	101.1	150	1 SLS-1	37.500	36.450	0.900	37.425	36.305	0.970
19.002	9.266	100.7	225	1 SLS-1	37.425	36.230	0.970	37.425	36.138	1.062
19.003	8.538	167.4	225	1 SLS-1	37.425	36.138	1.062	38.163	36.087	1.851
19.004	7.788	67.1	225	1 SLS-1	38.163	36.086	1.852	38.900	35.970	2.705
20.000	12.457	101.3	225	1 SLS-1	38.290	37.165	0.900	38.290	37.042	1.023
20.001	18.158	169.7	225	1 SLS-1	38.290	37.042	1.023	38.290	36.935	1.130
20.002	29.467	169.4	225	1 SLS-1	38.290	36.935	1.130	38.290	36.761	1.304
20.003	13.085	45.6	225	1 SLS-1	38.290	36.762	1.303	37.600	36.475	0.900
21.000	31.540	100.8	225	1 SLS-1	38.290	37.165	0.900	38.290	36.852	1.213
21.001	3.369	168.5	300	1 SLS-1	38.290	36.777	1.213	38.290	36.757	1.233
21.002	9.241	243.2	300	1 SLS-1	38.290	36.757	1.233	38.290	36.719	1.271
21.003	7.044	242.9	300	1 SLS-1	38.290	36.719	1.271	38.290	36.690	1.300
21.004	2.374	237.4	300	1 SLS-1	38.290	36.691	1.299	38.290	36.681	1.309

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
18.003	48	600	Manhole	1 600mm +	49	600	Manhole	1 600mm +
17.002	49	600	Manhole	1 600mm +	50	1500	Manhole	1 600mm +
1.010	50	1500	Manhole	1 600mm +	76	1500	Manhole	1 600mm +
19.000	51	450	Manhole	1 600mm +	52	450	Manhole	1 600mm +
19.001	52	450	Manhole	1 600mm +	53	600	Manhole	1 600mm +
19.002	53	600	Manhole	1 600mm +	54	600	Manhole	1 600mm +
19.003	54	600	Manhole	1 600mm +	55	1050	Manhole	1 600mm +
19.004	55	1050	Manhole	1 600mm +	75	1200	Manhole	1 600mm +
20.000	56	600	Manhole	1 600mm +	57	600	Manhole	1 600mm +
20.001	57	600	Manhole	1 600mm +	58	600	Manhole	1 600mm +
20.002	58	600	Manhole	1 600mm +	59	600	Manhole	1 600mm +
20.003	59	600	Manhole	1 600mm +	68	1200	Manhole	1 600mm +
21.000	60	600	Manhole	1 600mm +	61	1050	Manhole	1 600mm +
21.001	61	1050	Manhole	1 600mm +	62	1050	Manhole	1 600mm +
21.002	62	1050	Manhole	1 600mm +	63	1050	Manhole	1 600mm +
21.003	63	1050	Manhole	1 600mm +	64	1050	Manhole	1 600mm +
21.004	64	1050	Manhole	1 600mm +	65	1050	Manhole	1 600mm +

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
21.005	6.214	248.6	300	1 SLS-1	38.290	36.681	1.309	38.290	36.656	1.334
21.006	19.098	244.8	300	1 SLS-1	38.290	36.655	1.335	38.290	36.577	1.413
21.007	11.835	66.5	300	1 SLS-1	38.290	36.578	1.412	37.600	36.400	0.900
20.004	14.781	168.0	375	1 SLS-1	37.600	36.325	0.900	38.300	36.237	1.688
22.000	4.789	23.9	225	1 SLS-1	38.500	37.375	0.900	38.300	37.175	0.900
20.005	21.376	323.9	375	1 SLS-1	38.300	36.237	1.688	38.900	36.171	2.354
23.000	18.135	100.8	150	1 SLS-1	37.425	36.375	0.900	37.425	36.195	1.080
23.001	3.286	99.6	150	1 SLS-1	37.425	36.195	1.080	37.425	36.162	1.113
23.002	7.226	100.4	150	1 SLS-1	37.425	36.163	1.112	37.425	36.091	1.184
23.003	4.600	100.0	150	1 SLS-1	37.425	36.091	1.184	38.900	36.045	2.705
19.005	3.324	332.4	375	1 SLS-1	38.900	35.821	2.704	38.400	35.811	2.214
1.011	50.675	501.7	600	1 SLS-1	38.400	35.040	2.760	38.400	34.939	2.861
24.000	5.822	36.4	150	1 SLS-1	37.500	36.450	0.900	37.600	36.290	1.160
25.000	9.468	100.7	150	1 SLS-1	37.500	36.450	0.900	37.700	36.356	1.194
25.001	6.705	101.6	150	1 SLS-1	37.700	36.356	1.194	37.600	36.290	1.160
24.001	17.231	100.8	150	1 SLS-1	37.600	36.290	1.160	38.200	36.119	1.931
24.002	8.210	101.4	150	1 SLS-1	38.200	36.119	1.931	38.290	36.038	2.102

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
21.005	65	1050	Manhole	1 600mm +	66	1050	Manhole	1 600mm +
21.006	66	1050	Manhole	1 600mm +	67	1050	Manhole	1 600mm +
21.007	67	1050	Manhole	1 600mm +	68	1200	Manhole	1 600mm +
20.004	68	1200	Manhole	1 600mm +	70	1200	Manhole	1 600mm +
22.000	69	600	Manhole	1 600mm +	70	1200	Manhole	1 600mm +
20.005	70	1200	Manhole	1 600mm +	75	1200	Manhole	1 600mm +
23.000	71	450	Manhole	1 600mm +	72	450	Manhole	1 600mm +
23.001	72	450	Manhole	1 600mm +	73	450	Manhole	1 600mm +
23.002	73	450	Manhole	1 600mm +	74	450	Manhole	1 600mm +
23.003	74	450	Manhole	1 600mm +	75	1200	Manhole	1 600mm +
19.005	75	1200	Manhole	1 600mm +	76	1500	Manhole	1 600mm +
1.011	76	1500	Manhole	1 600mm +	83	1800	Manhole	1 600mm +
24.000	77	450	Manhole	1 600mm +	80	450	Manhole	1 600mm +
25.000	78	450	Manhole	1 600mm +	79	450	Manhole	1 600mm +
25.001	79	450	Manhole	1 600mm +	80	450	Manhole	1 600mm +
24.001	80	450	Manhole	1 600mm +	81	1050	Manhole	1 600mm +
24.002	81	1050	Manhole	1 600mm +	82	1050	Manhole	1 600mm +

Pipeline Schedule

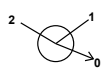
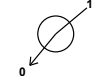
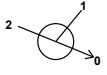
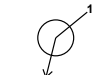
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
24.003	3.799	100.0	150	1 SLS-1	38.290	36.038	2.102	38.400	36.000	2.250
1.012	32.591	150.2	300	1 SLS-1	38.400	34.938	3.162	37.800	34.721	2.779
1.013	17.207	149.6	300	1 SLS-1	37.800	34.721	2.779	37.200	34.606	2.294

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
24.003	82	1050	Manhole	1 600mm +	83	1800	Manhole	1 600mm +
1.012	83	1800	Manhole	1 600mm +	84	1200	Manhole	1 600mm +
1.013	84	1200	Manhole	1 600mm +	84_OUT	1000	Manhole	1 600mm +

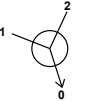
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
1	510960.119	185571.322	37.425	1.125	600	Manhole	1 600mm +		0	1.000	36.300	225 1 SLS-1
2	510977.393	185564.138	37.425	1.310	600	Manhole	1 600mm +		1	1.000	36.115	225 1 SLS-1
3	510938.812	185553.492	37.425	1.125	600	Manhole	1 600mm +		0	1.001	36.115	225 1 SLS-1
4	510956.076	185546.314	37.425	1.549	1050	Manhole	1 600mm +		1	2.000	36.115	225 1 SLS-1
5	510978.474	185553.273	37.425	1.125	600	Manhole	1 600mm +		2	1.001	35.951	225 1 SLS-1
									0	1.002	35.876	300 1 SLS-1
									0	3.000	36.300	225 1 SLS-1

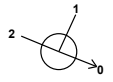
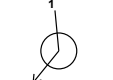
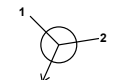
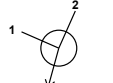
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
6	510963.142	185542.114	37.425	1.673	1200	Manhole	1 600mm +		1	3.000	36.112	225 1 SLS-1
									2	1.002	35.827	300 1 SLS-1
									0	1.003	35.752	375 1 SLS-1
7	510999.950	185557.973	37.425	1.125	600	Manhole	1 600mm +		0	4.000	36.300	225 1 SLS-1
8	510978.950	185540.423	37.425	1.396	600	Manhole	1 600mm +		1	4.000	36.029	225 1 SLS-1
									0	4.001	36.029	225 1 SLS-1
9	510976.037	185536.887	38.300	2.631	1200	Manhole	1 600mm +		1	4.001	35.819	225 1 SLS-1
									2	1.003	35.669	375 1 SLS-1
									0	1.004	35.669	375 1 SLS-1
10	511017.975	185550.299	37.425	1.125	600	Manhole	1 600mm +		0	5.000	36.300	225 1 SLS-1
11	510996.559	185532.809	37.425	1.399	600	Manhole	1 600mm +		1	5.000	36.026	225 1 SLS-1
									0	5.001	36.026	225 1 SLS-1
12	510995.580	185528.874	38.300	2.696	1200	Manhole	1 600mm +		1	5.001	36.002	225 1 SLS-1
									2	1.004	35.604	375 1 SLS-1
									0	1.005	35.604	375 1 SLS-1
13	511028.564	185545.123	37.600	1.050	450	Manhole	1 600mm +		0	6.000	36.550	150 1 SLS-1
14	511025.352	185540.154	37.500	1.050	450	Manhole	1 600mm +		1	6.000	36.450	150 1 SLS-1
									0	6.001	36.450	150 1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
15	511008.992	185540.423	37.425	1.050	450	Manhole	1 600mm +		0	7.000	36.375	150 1 SLS-1
16	511015.001	185537.389	37.400	1.167	600	Manhole	1 600mm +		1 2 0	7.000 6.001 6.002	36.308 36.308 36.233	150 1 SLS-1 150 1 SLS-1 225 1 SLS-1
17	511001.735	185532.630	37.425	1.050	450	Manhole	1 600mm +		0	8.000	36.375	150 1 SLS-1
18	511011.074	185528.977	37.425	1.284	600	Manhole	1 600mm +		1 2 0	8.000 6.002 6.003	36.216 36.141 36.141	150 1 SLS-1 225 1 SLS-1 225 1 SLS-1
19	511037.167	185544.322	37.425	1.125	600	Manhole	1 600mm +		0	9.000	36.300	225 1 SLS-1
20	511016.309	185527.336	37.425	1.392	600	Manhole	1 600mm +		1 0	9.000 9.001	36.033 36.033	225 1 SLS-1 225 1 SLS-1
21	511013.513	185521.310	38.500	2.956	1200	Manhole	1 600mm +		1 2 3 0	9.001 6.003 1.005 1.006	35.994 36.093 35.544 35.544	225 1 SLS-1 225 1 SLS-1 375 1 SLS-1 375 1 SLS-1
22	511054.846	185537.013	37.425	1.050	450	Manhole	1 600mm +		0	10.000	36.375	150 1 SLS-1
23	511033.918	185519.602	37.425	1.320	450	Manhole	1 600mm +		1 0	10.000 10.001	36.105 36.105	150 1 SLS-1 150 1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
24	511031.332	185513.953	38.500	3.091	1200	Manhole	1 600mm +		1	10.001	36.043	150	1 SLS-1
									2	1.006	35.484	375	1 SLS-1
									0	1.007	35.409	450	1 SLS-1
25	511065.507	185534.653	37.800	1.050	450	Manhole	1 600mm +		0	11.000	36.750	150	1 SLS-1
26	511066.043	185529.001	37.700	1.050	450	Manhole	1 600mm +		1	11.000	36.650	150	1 SLS-1
									0	11.001	36.650	150	1 SLS-1
27	511061.938	185523.945	37.600	1.050	450	Manhole	1 600mm +		1	11.001	36.550	150	1 SLS-1
									0	11.002	36.550	150	1 SLS-1
28	511044.329	185526.324	37.425	1.050	450	Manhole	1 600mm +		0	12.000	36.375	150	1 SLS-1
29	511048.791	185521.863	37.425	1.113	450	Manhole	1 600mm +		1	12.000	36.312	150	1 SLS-1
									2	11.002	36.312	150	1 SLS-1
									0	11.003	36.312	150	1 SLS-1
30	511037.156	185517.996	37.425	1.050	450	Manhole	1 600mm +		0	13.000	36.375	150	1 SLS-1
31	511045.459	185514.367	37.425	1.194	450	Manhole	1 600mm +		1	13.000	36.231	150	1 SLS-1
									2	11.003	36.231	150	1 SLS-1
									0	11.004	36.231	150	1 SLS-1
32	511043.977	185508.952	38.800	3.447	1200	Manhole	1 600mm +		1	11.004	36.175	150	1 SLS-1
									2	1.007	35.353	450	1 SLS-1
									0	1.008	35.353	450	1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
33	511072.077	185534.736	37.425	1.050	450	Manhole	1 600mm +		0	14.000	36.375	150 1 SLS-1
34	511056.379	185520.269	37.500	1.050	450	Manhole	1 600mm +		0	15.000	36.450	150 1 SLS-1
35	511055.940	185513.807	37.425	1.050	450	Manhole	1 600mm +		1	15.000	36.375	150 1 SLS-1
									0	15.001	36.375	150 1 SLS-1
36	511055.195	185511.405	37.425	1.079	450	Manhole	1 600mm +		1	15.001	36.346	150 1 SLS-1
									1	15.002	36.346	150 1 SLS-1
37	511061.214	185509.084	37.425	1.326	450	Manhole	1 600mm +		2	14.000	36.099	150 1 SLS-1
									0	14.001	36.099	150 1 SLS-1
38	511059.956	185502.170	38.700	3.390	1200	Manhole	1 600mm +		1	14.001	36.018	150 1 SLS-1
									2	1.008	35.310	450 1 SLS-1
									0	1.009	35.310	450 1 SLS-1
39	511084.314	185529.632	37.425	1.050	450	Manhole	1 600mm +		0	16.000	36.375	150 1 SLS-1
40	511078.948	185516.217	37.425	1.268	600	Manhole	1 600mm +		1	16.000	36.232	150 1 SLS-1
									0	16.001	36.157	225 1 SLS-1
41	511094.523	185509.739	37.425	1.435	600	Manhole	1 600mm +		1	16.001	35.990	225 1 SLS-1
									0	16.002	35.990	225 1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
42	511089.749	185496.674	37.425	1.519	600	Manhole	1 600mm +		1	16.002	35.907	225 1 SLS-1
43	511084.707	185522.041	37.425	1.050	600	Manhole	1 600mm +		0	16.003	35.906	225 1 SLS-1
44	511100.412	185515.105	37.425	1.220	600	Manhole	1 600mm +		1	17.000	36.375	225 1 SLS-1
45	511114.317	185518.852	37.425	1.050	450	Manhole	1 600mm +		0	17.000	36.205	225 1 SLS-1
46	511100.936	185508.037	37.425	1.220	450	Manhole	1 600mm +		1	17.001	36.205	225 1 SLS-1
47	511098.384	185507.187	37.425	1.247	450	Manhole	1 600mm +		0	18.000	36.375	150 1 SLS-1
48	511094.195	185497.371	37.425	1.353	600	Manhole	1 600mm +		1	18.000	36.205	150 1 SLS-1
49	511091.578	185494.230	37.425	1.468	600	Manhole	1 600mm +		0	18.001	36.205	150 1 SLS-1
50	511090.931	185489.525	38.500	3.422	1500	Manhole	1 600mm +		1	18.001	36.178	150 1 SLS-1
									0	18.002	36.178	150 1 SLS-1
									1	18.002	36.072	150 1 SLS-1
									0	18.003	36.072	150 1 SLS-1
									1	18.003	36.031	150 1 SLS-1
									2	17.001	35.957	225 1 SLS-1
									0	17.002	35.957	225 1 SLS-1
									1	17.002	35.929	225 1 SLS-1
									2	16.003	35.863	225 1 SLS-1
									3	1.009	35.227	450 1 SLS-1
									0	1.010	35.078	600 1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
51	511129.859	185515.432	37.600	1.050	450	Manhole	1 600mm +		0	19.000	36.550	150 1 SLS-1
52	511125.737	185510.917	37.500	1.050	450	Manhole	1 600mm +		1	19.000	36.450	150 1 SLS-1
53	511123.381	185496.455	37.425	1.195	600	Manhole	1 600mm +		1	19.001	36.450	150 1 SLS-1
54	511114.285	185494.688	37.425	1.287	600	Manhole	1 600mm +		0	19.001	36.305	150 1 SLS-1
55	511108.114	185488.788	38.163	2.077	1050	Manhole	1 600mm +		0	19.002	36.230	225 1 SLS-1
56	511172.062	185474.897	38.290	1.125	600	Manhole	1 600mm +		1	19.002	36.138	225 1 SLS-1
57	511179.865	185465.186	38.290	1.248	600	Manhole	1 600mm +		0	19.003	36.138	225 1 SLS-1
58	511165.773	185453.735	38.290	1.355	600	Manhole	1 600mm +		1	19.003	36.087	225 1 SLS-1
59	511147.062	185476.499	38.290	1.529	600	Manhole	1 600mm +		0	19.004	36.086	225 1 SLS-1
56	511172.062	185474.897	38.290	1.125	600	Manhole	1 600mm +		0	20.000	37.165	225 1 SLS-1
57	511179.865	185465.186	38.290	1.248	600	Manhole	1 600mm +		1	20.000	37.042	225 1 SLS-1
58	511165.773	185453.735	38.290	1.355	600	Manhole	1 600mm +		0	20.001	37.042	225 1 SLS-1
59	511147.062	185476.499	38.290	1.529	600	Manhole	1 600mm +		1	20.001	36.935	225 1 SLS-1
									0	20.002	36.935	225 1 SLS-1
									1	20.002	36.761	225 1 SLS-1
									0	20.003	36.762	225 1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
60	511163.733	185482.880	38.290	1.125	600	Manhole	1 600mm +					
								0	21.000	37.165	225	1 SLS-1
61	511143.620	185507.175	38.290	1.513	1050	Manhole	1 600mm +		1	21.000	36.852	225 1 SLS-1
								0	21.001	36.777	300	1 SLS-1
62	511140.937	185505.137	38.290	1.533	1050	Manhole	1 600mm +		1	21.001	36.757	300 1 SLS-1
								0	21.002	36.757	300	1 SLS-1
63	511134.924	185512.154	38.290	1.571	1050	Manhole	1 600mm +		1	21.002	36.719	300 1 SLS-1
								0	21.003	36.719	300	1 SLS-1
64	511129.556	185507.593	38.290	1.600	1050	Manhole	1 600mm +		1	21.003	36.690	300 1 SLS-1
								0	21.004	36.691	300	1 SLS-1
65	511131.008	185505.715	38.290	1.609	1050	Manhole	1 600mm +		1	21.004	36.681	300 1 SLS-1
								0	21.005	36.681	300	1 SLS-1
66	511126.295	185501.666	38.290	1.635	1050	Manhole	1 600mm +		1	21.005	36.656	300 1 SLS-1
								0	21.006	36.655	300	1 SLS-1
67	511138.443	185486.929	38.290	1.713	1050	Manhole	1 600mm +		1	21.006	36.577	300 1 SLS-1
								0	21.007	36.578	300	1 SLS-1
68	511133.987	185475.965	37.600	1.275	1200	Manhole	1 600mm +		1	21.007	36.400	300 1 SLS-1
								2	20.003	36.475	225	1 SLS-1
								0	20.004	36.325	375	1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
69	511122.255	185485.730	38.500	1.125	600	Manhole	1 600mm +					
								0	22.000	37.375	225	1 SLS-1
70	511120.237	185481.387	38.300	2.063	1200	Manhole	1 600mm +		1	22.000	37.175	225 1 SLS-1
								2	20.004	36.237	375	1 SLS-1
								0	20.005	36.237	375	1 SLS-1
71	511123.711	185507.335	37.425	1.050	450	Manhole	1 600mm +		0	23.000	36.375	150 1 SLS-1
72	511109.770	185495.735	37.425	1.230	450	Manhole	1 600mm +		1	23.000	36.195	150 1 SLS-1
								0	23.001	36.195	150	1 SLS-1
73	511107.414	185498.025	37.425	1.263	450	Manhole	1 600mm +		1	23.001	36.162	150 1 SLS-1
								0	23.002	36.163	150	1 SLS-1
74	511101.721	185493.575	37.425	1.334	450	Manhole	1 600mm +		1	23.002	36.091	150 1 SLS-1
								0	23.003	36.091	150	1 SLS-1
75	511100.336	185489.189	38.900	3.079	1200	Manhole	1 600mm +		1	23.003	36.045	150 1 SLS-1
								2	20.005	36.171	375	1 SLS-1
								3	19.004	35.970	225	1 SLS-1
								0	19.005	35.821	375	1 SLS-1
76	511099.180	185486.073	38.400	3.360	1500	Manhole	1 600mm +		1	19.005	35.811	375 1 SLS-1
								2	1.010	35.040	600	1 SLS-1
								0	1.011	35.040	600	1 SLS-1
77	511170.210	185447.407	37.500	1.050	450	Manhole	1 600mm +		0	24.000	36.450	150 1 SLS-1

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
78	511180.366	185455.711	37.500	1.050	450	Manhole	1 600mm +		0	25.000	36.450	150	1 SLS-1
79	511172.148	185451.009	37.700	1.344	450	Manhole	1 600mm +		1	25.000	36.356	150	1 SLS-1
80	511165.448	185450.756	37.600	1.310	450	Manhole	1 600mm +		0	25.001	36.356	150	1 SLS-1
									1	25.001	36.290	150	1 SLS-1
									2	24.000	36.290	150	1 SLS-1
81	511153.830	185463.481	38.200	2.081	1050	Manhole	1 600mm +		0	24.001	36.290	150	1 SLS-1
									1	24.001	36.119	150	1 SLS-1
82	511148.070	185469.332	38.290	2.252	1050	Manhole	1 600mm +		0	24.002	36.119	150	1 SLS-1
									1	24.002	36.038	150	1 SLS-1
83	511145.824	185466.268	38.400	3.462	1800	Manhole	1 600mm +		0	24.003	36.038	150	1 SLS-1
									1	24.003	36.000	150	1 SLS-1
									2	1.011	34.939	600	1 SLS-1
84	511170.258	185444.699	37.800	3.079	1200	Manhole	1 600mm +		0	1.012	34.938	300	1 SLS-1
									1	1.012	34.721	300	1 SLS-1
84_OUT	511185.789	185452.107	37.200	2.594	1000	Manhole	1 600mm +		0	1.013	34.721	300	1 SLS-1
									1	1.013	34.606	300	1 SLS-1

Node 83 Online Pump Control

Flap Valve	x	Invert Level (m)	34.938	Design Flow (l/s)	15.0	Switch off depth (m)	0.200
Replaces Downstream Link	x	Design Depth (m)	2.400	Switch on depth (m)	0.300		

Depth Flow
(m) (l/s)
2.400 15.000

Node 83 Offline Weir Control

Flap Valve x | Loop to Node 84 | Invert Level (m) 37.338 | Width (m) 1.000 | Discharge Coefficient 0.544

Node 83 Depth/Area Storage Structure

Base Inf Coefficient (m/hr) 0.00000 | Safety Factor 2.0 | Invert Level (m) 34.938
Side Inf Coefficient (m/hr) 0.00000 | Porosity 1.00 | Time to half empty (mins)

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	180.0	0.0	2.400	180.0	0.0	2.500	0.0	0.0

Results for 1 year +25% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	36.328	0.028	1.8	0.0151	0.0000	OK
15 minute summer	2	11	36.160	0.045	3.5	0.0214	0.0000	OK
15 minute summer	3	10	36.328	0.028	1.7	0.0143	0.0000	OK
15 minute summer	4	11	35.936	0.060	6.7	0.0625	0.0000	OK
15 minute summer	5	10	36.338	0.038	3.1	0.0267	0.0000	OK
15 minute summer	6	11	35.819	0.067	11.0	0.0838	0.0000	OK
15 minute summer	7	10	36.328	0.028	1.7	0.0144	0.0000	OK
15 minute summer	8	11	36.056	0.027	3.1	0.0118	0.0000	OK
15 minute summer	9	11	35.768	0.099	16.0	0.1233	0.0000	OK
15 minute summer	10	10	36.328	0.028	1.8	0.0151	0.0000	OK
15 minute summer	11	11	36.073	0.047	3.4	0.0211	0.0000	OK
15 minute summer	12	11	35.720	0.116	20.8	0.1420	0.0000	OK
15 minute summer	13	11	36.564	0.014	0.4	0.0030	0.0000	OK
15 minute summer	14	11	36.466	0.016	0.5	0.0029	0.0000	OK
15 minute summer	15	11	36.391	0.016	0.4	0.0034	0.0000	OK
15 minute summer	16	11	36.258	0.025	1.4	0.0089	0.0000	OK
15 minute summer	17	11	36.391	0.016	0.5	0.0037	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	1.8	0.442	0.034	0.0786	
15 minute summer	2	1.001	4	3.4	0.611	0.084	0.1527	
15 minute summer	3	2.000	4	1.6	0.592	0.032	0.0520	
15 minute summer	4	1.002	6	6.7	0.705	0.079	0.0785	
15 minute summer	5	3.000	6	3.0	0.710	0.059	0.0814	
15 minute summer	6	1.003	9	11.0	0.609	0.071	0.2540	
15 minute summer	7	4.000	8	1.7	0.605	0.032	0.0751	
15 minute summer	8	4.001	9	3.1	1.187	0.027	0.0118	
15 minute summer	9	1.004	12	15.9	0.613	0.144	0.5499	
15 minute summer	10	5.000	11	1.8	0.409	0.034	0.1212	
15 minute summer	11	5.001	12	3.3	0.585	0.083	0.0229	
15 minute summer	12	1.005	21	20.5	0.647	0.185	0.6166	
15 minute summer	13	6.000	14	0.4	0.439	0.017	0.0054	
15 minute summer	14	6.001	16	0.5	0.485	0.024	0.0110	
15 minute summer	15	7.000	16	0.4	0.409	0.023	0.0066	
15 minute summer	16	6.002	18	1.4	0.428	0.027	0.0306	
15 minute summer	17	8.000	18	0.5	0.516	0.022	0.0097	

Results for 1 year +25% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	18	10	36.177	0.036	2.2	0.0114	0.0000	OK
15 minute summer	19	10	36.328	0.028	1.8	0.0151	0.0000	OK
15 minute summer	20	11	36.079	0.046	3.4	0.0208	0.0000	OK
15 minute summer	21	12	35.676	0.132	27.9	0.1633	0.0000	OK
15 minute summer	22	10	36.410	0.035	2.2	0.0171	0.0000	OK
15 minute summer	23	11	36.151	0.046	3.4	0.0137	0.0000	OK
15 minute summer	24	12	35.544	0.135	32.0	0.1646	0.0000	OK
15 minute summer	25	11	36.764	0.014	0.4	0.0029	0.0000	OK
15 minute summer	26	11	36.666	0.016	0.5	0.0028	0.0000	OK
15 minute summer	27	11	36.567	0.017	0.6	0.0029	0.0000	OK
15 minute summer	28	11	36.391	0.016	0.4	0.0034	0.0000	OK
15 minute summer	29	11	36.341	0.029	1.4	0.0062	0.0000	OK
15 minute summer	30	10	36.387	0.012	0.3	0.0023	0.0000	OK
15 minute summer	31	11	36.263	0.032	1.6	0.0051	0.0000	OK
15 minute summer	32	12	35.511	0.158	35.5	0.1942	0.0000	OK
15 minute summer	33	10	36.405	0.030	1.6	0.0117	0.0000	OK
15 minute summer	34	10	36.467	0.017	0.5	0.0040	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	18	6.003	21	2.1	0.529	0.053	0.0324	
15 minute summer	19	9.000	20	1.8	0.416	0.034	0.1160	
15 minute summer	20	9.001	21	3.3	0.591	0.083	0.0370	
15 minute summer	21	1.006	24	27.6	0.856	0.249	0.6219	
15 minute summer	22	10.000	23	2.2	0.559	0.122	0.1058	
15 minute summer	23	10.001	24	3.3	0.742	0.186	0.0276	
15 minute summer	24	1.007	32	32.2	0.725	0.156	0.6078	
15 minute summer	25	11.000	26	0.4	0.450	0.017	0.0050	
15 minute summer	26	11.001	27	0.5	0.493	0.023	0.0066	
15 minute summer	27	11.002	29	0.6	0.361	0.025	0.0228	
15 minute summer	28	12.000	29	0.4	0.246	0.023	0.0106	
15 minute summer	29	11.003	31	1.4	0.543	0.079	0.0212	
15 minute summer	30	13.000	31	0.3	0.202	0.012	0.0151	
15 minute summer	31	11.004	32	1.6	0.613	0.093	0.0151	
15 minute summer	32	1.008	38	35.7	0.705	0.223	0.8797	
15 minute summer	33	14.000	37	1.6	0.433	0.088	0.1019	
15 minute summer	34	15.000	35	0.5	0.442	0.026	0.0073	

Results for 1 year +25% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	35	11	36.393	0.018	0.5	0.0028	0.0000	OK
15 minute winter	36	11	36.359	0.013	0.5	0.0020	0.0000	OK
15 minute summer	37	11	36.147	0.048	3.9	0.0177	0.0000	OK
480 minute summer	38	368	35.507	0.197	12.0	0.2664	0.0000	OK
15 minute summer	39	11	36.404	0.029	1.4	0.0107	0.0000	OK
15 minute summer	40	11	36.189	0.032	2.3	0.0127	0.0000	OK
15 minute summer	41	11	36.029	0.039	2.7	0.0128	0.0000	OK
15 minute summer	42	11	35.957	0.051	4.1	0.0218	0.0000	OK
15 minute summer	43	10	36.408	0.033	2.5	0.0215	0.0000	OK
15 minute summer	44	10	36.249	0.044	4.8	0.0257	0.0000	OK
15 minute summer	45	10	36.404	0.029	1.4	0.0105	0.0000	OK
15 minute summer	46	11	36.236	0.031	1.4	0.0050	0.0000	OK
15 minute summer	47	10	36.214	0.036	2.2	0.0093	0.0000	OK
15 minute summer	48	10	36.110	0.038	2.2	0.0106	0.0000	OK
15 minute summer	49	11	36.025	0.068	6.8	0.0194	0.0000	OK
480 minute summer	50	368	35.507	0.429	15.2	0.7691	0.0000	OK
15 minute summer	51	10	36.561	0.011	0.3	0.0023	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	35	15.001	36	0.5	0.537	0.026	0.0024	
15 minute winter	36	15.002	37	0.5	0.208	0.014	0.0173	
15 minute summer	37	14.001	38	3.8	0.814	0.199	0.0327	
480 minute summer	38	1.009	50	12.2	0.631	0.076	2.8566	
15 minute summer	39	16.000	40	1.4	0.594	0.079	0.0341	
15 minute summer	40	16.001	41	2.3	0.572	0.044	0.0684	
15 minute summer	41	16.002	42	2.7	0.484	0.067	0.0778	
15 minute summer	42	16.003	50	4.1	0.631	0.102	0.0470	
15 minute summer	43	17.000	44	2.5	0.542	0.048	0.0788	
15 minute summer	44	17.001	49	4.7	0.613	0.086	0.1779	
15 minute summer	45	18.000	46	1.4	0.562	0.079	0.0430	
15 minute summer	46	18.001	47	1.4	0.477	0.079	0.0080	
15 minute summer	47	18.002	48	2.2	0.646	0.123	0.0360	
15 minute summer	48	18.003	49	2.1	0.654	0.121	0.0134	
15 minute summer	49	17.002	50	6.9	0.716	0.173	0.0456	
480 minute summer	50	1.010	76	14.3	0.416	0.032	2.0183	
15 minute summer	51	19.000	52	0.3	0.277	0.012	0.0060	

Results for 1 year +25% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	52	11	36.470	0.020	0.7	0.0043	0.0000	OK
15 minute summer	53	11	36.253	0.023	1.2	0.0081	0.0000	OK
15 minute summer	54	11	36.166	0.028	1.3	0.0083	0.0000	OK
15 minute summer	55	11	36.108	0.022	1.2	0.0192	0.0000	OK
15 minute summer	56	10	37.193	0.028	1.7	0.0143	0.0000	OK
15 minute summer	57	11	37.087	0.045	3.6	0.0236	0.0000	OK
15 minute summer	58	11	36.991	0.056	5.1	0.0256	0.0000	OK
15 minute summer	59	11	36.810	0.049	7.1	0.0240	0.0000	OK
15 minute summer	60	11	37.203	0.038	3.2	0.0275	0.0000	OK
15 minute summer	61	11	36.829	0.052	4.4	0.0518	0.0000	OK
15 minute summer	62	11	36.811	0.054	4.6	0.0481	0.0000	OK
15 minute summer	63	11	36.778	0.059	5.1	0.0537	0.0000	OK
15 minute summer	64	11	36.755	0.065	5.1	0.0565	0.0000	OK
15 minute summer	65	11	36.745	0.064	5.8	0.0598	0.0000	OK
15 minute summer	66	11	36.723	0.068	7.7	0.0715	0.0000	OK
15 minute summer	67	12	36.629	0.052	8.2	0.0483	0.0000	OK
15 minute summer	68	11	36.416	0.091	18.1	0.1366	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	52	19.001	53	0.7	0.477	0.037	0.0201	
15 minute summer	53	19.002	54	1.2	0.469	0.022	0.0230	
15 minute summer	54	19.003	55	1.2	0.452	0.031	0.0235	
15 minute summer	55	19.004	75	1.2	0.620	0.019	0.0154	
15 minute summer	56	20.000	57	1.7	0.405	0.032	0.0525	
15 minute summer	57	20.001	58	3.5	0.539	0.089	0.1206	
15 minute summer	58	20.002	59	5.1	0.733	0.128	0.2055	
15 minute summer	59	20.003	68	7.1	1.193	0.092	0.0782	
15 minute summer	60	21.000	61	3.1	0.721	0.061	0.1372	
15 minute summer	61	21.001	62	4.4	0.522	0.051	0.0281	
15 minute summer	62	21.002	63	4.6	0.507	0.065	0.0843	
15 minute summer	63	21.003	64	5.1	0.491	0.072	0.0737	
15 minute summer	64	21.004	65	5.1	0.466	0.071	0.0260	
15 minute summer	65	21.005	66	5.8	0.514	0.082	0.0703	
15 minute summer	66	21.006	67	7.6	0.755	0.107	0.1925	
15 minute summer	67	21.007	68	8.1	1.042	0.059	0.0916	
15 minute summer	68	20.004	70	17.9	0.733	0.116	0.3629	

Results for 1 year +25% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	69	10	37.399	0.024	2.3	0.0144	0.0000	OK
15 minute summer	70	11	36.352	0.115	21.8	0.1446	0.0000	OK
15 minute summer	71	10	36.411	0.036	2.2	0.0173	0.0000	OK
15 minute summer	72	10	36.234	0.039	2.2	0.0061	0.0000	OK
15 minute summer	73	11	36.203	0.041	2.6	0.0085	0.0000	OK
15 minute summer	74	11	36.132	0.041	2.6	0.0065	0.0000	OK
15 minute summer	75	12	35.951	0.130	25.0	0.1476	0.0000	OK
480 minute summer	76	368	35.507	0.467	21.6	0.8704	0.0000	OK
15 minute summer	77	10	36.467	0.017	0.8	0.0046	0.0000	OK
15 minute summer	78	10	36.476	0.026	1.2	0.0087	0.0000	OK
15 minute summer	79	10	36.388	0.032	1.7	0.0070	0.0000	OK
15 minute summer	80	11	36.327	0.037	2.4	0.0059	0.0000	OK
15 minute summer	81	11	36.169	0.050	3.8	0.0484	0.0000	OK
15 minute summer	82	11	36.090	0.052	3.8	0.0447	0.0000	OK
480 minute summer	83	368	35.507	0.569	20.4	103.9476	0.0000	SURCHARGED
480 minute summer	84	368	34.762	0.041	3.6	0.0466	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	69	22.000	70	2.3	1.059	0.021	0.0103	
15 minute summer	70	20.005	75	21.4	0.800	0.194	0.5727	
15 minute summer	71	23.000	72	2.2	0.640	0.123	0.0617	
15 minute summer	72	23.001	73	2.2	0.574	0.121	0.0123	
15 minute summer	73	23.002	74	2.6	0.666	0.145	0.0278	
15 minute summer	74	23.003	75	2.6	0.688	0.145	0.0172	
15 minute summer	75	19.005	76	25.1	0.810	0.230	0.1033	
480 minute summer	76	1.011	83	19.4	0.350	0.064	12.9658	
15 minute summer	77	24.000	80	0.8	0.510	0.026	0.0130	
15 minute summer	78	25.000	79	1.2	0.490	0.067	0.0228	
15 minute summer	79	25.001	80	1.7	0.541	0.094	0.0206	
15 minute summer	80	24.001	81	2.4	0.571	0.136	0.0734	
15 minute summer	81	24.002	82	3.8	0.732	0.217	0.0430	
15 minute summer	82	24.003	83	3.8	0.757	0.215	0.0192	
480 minute summer	83	1.012	84	3.6	0.618	0.039	0.1876	
480 minute summer	83	Weir	84	0.0				0.0
480 minute summer	84	1.013	84_OUT	3.6	0.623	0.039	0.0983	88.0

Results for 1 year +25% CC Critical Storm Duration. Lowest mass balance: 99.77%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute summer	84_OUT	368	34.646	0.040	3.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
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Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	1	232	36.759	0.459	1.8	0.2443	0.0000	SURCHARGED
240 minute winter	2	232	36.759	0.644	3.5	0.3099	0.0000	SURCHARGED
240 minute winter	3	232	36.759	0.459	1.7	0.2360	0.0000	SURCHARGED
240 minute winter	4	232	36.759	0.883	7.0	0.9248	0.0000	SURCHARGED
240 minute winter	5	232	36.759	0.459	3.1	0.3256	0.0000	SURCHARGED
240 minute winter	6	232	36.759	1.007	10.6	1.2601	0.0000	SURCHARGED
240 minute winter	7	232	36.759	0.459	1.7	0.2361	0.0000	SURCHARGED
240 minute winter	8	232	36.759	0.730	3.1	0.3213	0.0000	SURCHARGED
240 minute winter	9	232	36.759	1.090	14.6	1.3574	0.0000	SURCHARGED
240 minute winter	10	232	36.759	0.459	1.8	0.2443	0.0000	SURCHARGED
240 minute winter	11	232	36.759	0.733	3.3	0.3329	0.0000	SURCHARGED
240 minute winter	12	232	36.759	1.155	17.6	1.4175	0.0000	SURCHARGED
240 minute winter	13	232	36.759	0.209	0.4	0.0452	0.0000	SURCHARGED
240 minute winter	14	232	36.759	0.309	0.6	0.0550	0.0000	SURCHARGED
240 minute winter	15	232	36.759	0.384	0.4	0.0830	0.0000	SURCHARGED
240 minute winter	16	232	36.759	0.526	1.5	0.1847	0.0000	SURCHARGED
240 minute winter	17	232	36.759	0.384	0.5	0.0903	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	1	1.000	2	1.8	0.428	0.035	0.7440	
240 minute winter	2	1.001	4	3.5	0.616	0.088	1.1051	
240 minute winter	3	2.000	4	1.7	0.598	0.033	0.7436	
240 minute winter	4	1.002	6	6.5	0.698	0.076	0.5789	
240 minute winter	5	3.000	6	3.1	0.713	0.060	0.7542	
240 minute winter	6	1.003	9	10.1	0.587	0.065	1.5347	
240 minute winter	7	4.000	8	1.7	0.628	0.033	1.0884	
240 minute winter	8	4.001	9	3.1	1.156	0.028	0.1822	
240 minute winter	9	1.004	12	13.4	0.591	0.122	2.3297	
240 minute winter	10	5.000	11	1.8	0.413	0.035	1.0997	
240 minute winter	11	5.001	12	3.3	0.585	0.083	0.1613	
240 minute winter	12	1.005	21	17.4	0.606	0.158	2.1467	
240 minute winter	13	6.000	14	0.6	0.434	0.024	0.1042	
240 minute winter	14	6.001	16	0.9	0.485	0.046	0.1886	
240 minute winter	15	7.000	16	0.5	0.409	0.030	0.1185	
240 minute winter	16	6.002	18	1.8	0.431	0.034	0.3692	
240 minute winter	17	8.000	18	0.5	0.516	0.022	0.1766	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	18	232	36.759	0.618	2.2	0.1941	0.0000	SURCHARGED
240 minute winter	19	232	36.759	0.459	1.8	0.2443	0.0000	SURCHARGED
240 minute winter	20	232	36.759	0.726	3.3	0.3305	0.0000	SURCHARGED
240 minute winter	21	232	36.759	1.215	23.7	1.5057	0.0000	SURCHARGED
240 minute winter	22	232	36.759	0.384	2.2	0.1857	0.0000	SURCHARGED
240 minute winter	23	232	36.759	0.654	3.4	0.1930	0.0000	SURCHARGED
240 minute winter	24	232	36.759	1.350	27.8	1.6500	0.0000	SURCHARGED
15 minute summer	25	10	36.781	0.031	2.1	0.0067	0.0000	OK
240 minute winter	26	232	36.760	0.110	0.5	0.0195	0.0000	OK
240 minute winter	27	232	36.759	0.209	0.6	0.0373	0.0000	SURCHARGED
240 minute winter	28	232	36.759	0.384	0.4	0.0830	0.0000	SURCHARGED
240 minute winter	29	232	36.759	0.447	1.4	0.0953	0.0000	SURCHARGED
240 minute winter	30	232	36.759	0.384	0.4	0.0757	0.0000	SURCHARGED
240 minute winter	31	232	36.759	0.528	1.7	0.0840	0.0000	SURCHARGED
240 minute winter	32	232	36.759	1.406	31.3	1.7297	0.0000	SURCHARGED
240 minute winter	33	232	36.759	0.384	1.5	0.1491	0.0000	SURCHARGED
240 minute winter	34	232	36.759	0.309	0.5	0.0727	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	18	6.003	21	2.5	0.533	0.062	0.3200	
240 minute winter	19	9.000	20	1.8	0.419	0.035	1.0698	
240 minute winter	20	9.001	21	3.3	0.590	0.083	0.2642	
240 minute winter	21	1.006	24	22.6	0.783	0.204	2.1263	
240 minute winter	22	10.000	23	2.2	0.584	0.124	0.4793	
240 minute winter	23	10.001	24	3.4	0.747	0.192	0.1094	
240 minute winter	24	1.007	32	27.4	0.654	0.132	2.1545	
15 minute summer	25	11.000	26	2.1	0.692	0.088	0.0171	
240 minute winter	26	11.001	27	0.5	0.492	0.023	0.1022	
240 minute winter	27	11.002	29	1.4	0.360	0.057	0.2343	
240 minute winter	28	12.000	29	0.4	0.247	0.023	0.1111	
240 minute winter	29	11.003	31	1.7	0.548	0.097	0.1444	
240 minute winter	30	13.000	31	0.5	0.182	0.023	0.1595	
240 minute winter	31	11.004	32	1.7	0.618	0.096	0.0988	
240 minute winter	32	1.008	38	30.9	0.613	0.193	2.7504	
240 minute winter	33	14.000	37	1.5	0.438	0.085	0.4904	
240 minute winter	34	15.000	35	0.5	0.442	0.026	0.1140	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	35	232	36.759	0.384	0.5	0.0611	0.0000	SURCHARGED
240 minute winter	36	232	36.759	0.413	0.6	0.0657	0.0000	SURCHARGED
240 minute winter	37	232	36.759	0.660	3.8	0.2443	0.0000	SURCHARGED
240 minute winter	38	232	36.759	1.449	39.5	1.9550	0.0000	SURCHARGED
240 minute winter	39	232	36.759	0.384	1.4	0.1418	0.0000	SURCHARGED
240 minute winter	40	232	36.759	0.602	2.3	0.2367	0.0000	SURCHARGED
240 minute winter	41	232	36.759	0.769	2.7	0.2500	0.0000	SURCHARGED
240 minute winter	42	232	36.759	0.853	4.9	0.3652	0.0000	SURCHARGED
240 minute winter	43	232	36.759	0.384	2.4	0.2479	0.0000	SURCHARGED
240 minute winter	44	232	36.759	0.554	4.7	0.3204	0.0000	SURCHARGED
240 minute winter	45	232	36.759	0.384	1.4	0.1418	0.0000	SURCHARGED
240 minute winter	46	232	36.759	0.554	1.4	0.0881	0.0000	SURCHARGED
240 minute winter	47	232	36.759	0.581	2.2	0.1482	0.0000	SURCHARGED
240 minute winter	48	232	36.759	0.687	2.4	0.1945	0.0000	SURCHARGED
240 minute winter	49	232	36.759	0.802	11.9	0.2270	0.0000	SURCHARGED
240 minute winter	50	232	36.759	1.681	49.0	3.0110	0.0000	SURCHARGED
240 minute winter	51	232	36.759	0.209	0.4	0.0412	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	35	15.001	36	0.6	0.536	0.031	0.0443	
240 minute winter	36	15.002	37	0.8	0.210	0.022	0.1136	
240 minute winter	37	14.001	38	3.8	0.814	0.200	0.1237	
240 minute winter	38	1.009	50	38.9	0.713	0.243	5.3009	
240 minute winter	39	16.000	40	1.4	0.594	0.079	0.2544	
240 minute winter	40	16.001	41	2.3	0.569	0.044	0.6709	
240 minute winter	41	16.002	42	4.9	0.485	0.121	0.5532	
240 minute winter	42	16.003	50	4.2	0.629	0.105	0.2882	
240 minute winter	43	17.000	44	2.4	0.530	0.046	0.6828	
240 minute winter	44	17.001	49	4.9	0.603	0.090	0.9015	
240 minute winter	45	18.000	46	1.4	0.562	0.079	0.3029	
240 minute winter	46	18.001	47	1.4	0.487	0.079	0.0474	
240 minute winter	47	18.002	48	2.4	0.646	0.138	0.1879	
240 minute winter	48	18.003	49	6.9	0.657	0.390	0.0720	
240 minute winter	49	17.002	50	6.8	0.715	0.172	0.1889	
240 minute winter	50	1.010	76	47.7	0.484	0.107	2.5188	
240 minute winter	51	19.000	52	-0.4	0.290	-0.016	0.1076	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	52	232	36.759	0.309	0.7	0.0668	0.0000	SURCHARGED
240 minute winter	53	232	36.759	0.529	4.0	0.1852	0.0000	SURCHARGED
240 minute winter	54	232	36.759	0.621	3.7	0.1851	0.0000	SURCHARGED
240 minute winter	55	232	36.759	0.673	2.5	0.5830	0.0000	SURCHARGED
15 minute summer	56	10	37.229	0.064	9.2	0.0328	0.0000	OK
15 minute summer	57	10	37.160	0.118	19.7	0.0615	0.0000	OK
15 minute summer	58	10	37.079	0.144	28.0	0.0661	0.0000	OK
15 minute summer	59	10	36.885	0.124	38.9	0.0610	0.0000	OK
15 minute summer	60	10	37.258	0.092	17.7	0.0672	0.0000	OK
15 minute summer	61	11	36.927	0.150	24.5	0.1498	0.0000	OK
15 minute summer	62	11	36.911	0.154	25.7	0.1373	0.0000	OK
15 minute summer	63	11	36.890	0.171	28.3	0.1570	0.0000	OK
15 minute summer	64	11	36.871	0.181	28.4	0.1571	0.0000	OK
15 minute summer	65	11	36.855	0.174	32.5	0.1640	0.0000	OK
15 minute summer	66	11	36.826	0.171	42.7	0.1790	0.0000	OK
240 minute winter	67	232	36.759	0.182	8.6	0.1684	0.0000	OK
240 minute winter	68	232	36.759	0.434	18.9	0.6545	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	52	19.001	53	0.8	0.485	0.043	0.2580	
240 minute winter	53	19.002	54	-4.0	0.472	-0.077	0.3685	
240 minute winter	54	19.003	55	-3.7	0.458	-0.091	0.3396	
240 minute winter	55	19.004	75	1.4	0.625	0.022	0.3097	
15 minute summer	56	20.000	57	9.2	0.612	0.177	0.1882	
15 minute summer	57	20.001	58	19.5	0.817	0.491	0.4336	
15 minute summer	58	20.002	59	27.7	1.136	0.696	0.7244	
15 minute summer	59	20.003	68	38.8	1.764	0.503	0.3208	
15 minute summer	60	21.000	61	17.4	1.161	0.335	0.4728	
15 minute summer	61	21.001	62	24.3	0.700	0.284	0.1207	
15 minute summer	62	21.002	63	25.6	0.673	0.361	0.3600	
15 minute summer	63	21.003	64	28.4	0.659	0.400	0.3032	
15 minute summer	64	21.004	65	28.4	0.655	0.396	0.1030	
15 minute summer	65	21.005	66	32.6	0.779	0.464	0.2597	
15 minute summer	66	21.006	67	42.8	1.184	0.605	0.6900	
240 minute winter	67	21.007	68	8.6	1.060	0.063	0.6801	
240 minute winter	68	20.004	70	18.9	0.737	0.123	1.6303	

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	69	10	37.434	0.059	12.8	0.0353	0.0000	OK
240 minute winter	70	232	36.759	0.522	22.9	0.6565	0.0000	SURCHARGED
240 minute winter	71	232	36.759	0.384	2.2	0.1857	0.0000	SURCHARGED
240 minute winter	72	232	36.759	0.564	2.2	0.0897	0.0000	SURCHARGED
240 minute winter	73	232	36.759	0.597	4.3	0.1236	0.0000	SURCHARGED
240 minute winter	74	232	36.759	0.668	2.6	0.1063	0.0000	SURCHARGED
240 minute winter	75	232	36.759	0.938	26.8	1.0611	0.0000	SURCHARGED
240 minute winter	76	268	36.815	1.775	75.6	3.3053	0.0000	SURCHARGED
240 minute winter	77	232	36.759	0.309	0.8	0.0845	0.0000	SURCHARGED
240 minute winter	78	232	36.759	0.309	1.2	0.1021	0.0000	SURCHARGED
240 minute winter	79	232	36.759	0.403	1.7	0.0884	0.0000	SURCHARGED
240 minute winter	80	232	36.759	0.469	2.5	0.0746	0.0000	SURCHARGED
240 minute winter	81	232	36.759	0.640	3.9	0.6224	0.0000	SURCHARGED
240 minute winter	82	232	36.759	0.721	3.9	0.6245	0.0000	SURCHARGED
240 minute winter	83	232	36.759	1.821	78.5	332.4319	0.0000	SURCHARGED
240 minute winter	84	236	34.795	0.074	11.4	0.0840	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	69	22.000	70	12.8	1.682	0.119	0.0363	
240 minute winter	70	20.005	75	22.9	0.812	0.207	2.3577	
240 minute winter	71	23.000	72	2.2	0.641	0.124	0.3193	
240 minute winter	72	23.001	73	2.2	0.591	0.124	0.0578	
240 minute winter	73	23.002	74	-4.3	0.695	-0.242	0.1272	
240 minute winter	74	23.003	75	2.6	0.690	0.149	0.0810	
240 minute winter	75	19.005	76	25.8	0.809	0.236	0.3666	
240 minute winter	76	1.011	83	74.6	0.623	0.244	14.2740	
240 minute winter	77	24.000	80	0.8	0.368	0.027	0.1025	
240 minute winter	78	25.000	79	1.2	0.493	0.068	0.1667	
240 minute winter	79	25.001	80	1.7	0.540	0.096	0.1180	
240 minute winter	80	24.001	81	2.5	0.577	0.140	0.3033	
240 minute winter	81	24.002	82	3.9	0.733	0.223	0.1445	
240 minute winter	82	24.003	83	3.9	0.760	0.218	0.0669	
240 minute winter	83	1.012	84	11.4	0.853	0.126	0.4351	
240 minute winter	83	Weir	84	0.0				0.0
240 minute winter	84	1.013	84_OUT	11.4	0.866	0.126	0.2263	222.1

Results for 30 year +40% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	84_OUT	236	34.677	0.071	11.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	328	37.313	1.013	1.7	0.5387	0.0000	FLOOD RISK
360 minute winter	2	328	37.311	1.196	3.3	0.5755	0.0000	FLOOD RISK
360 minute winter	3	328	37.311	1.011	1.6	0.5198	0.0000	FLOOD RISK
360 minute winter	4	328	37.308	1.432	6.2	1.4993	0.0000	FLOOD RISK
360 minute winter	5	328	37.309	1.009	3.0	0.7156	0.0000	FLOOD RISK
360 minute winter	6	328	37.307	1.555	9.3	1.9457	0.0000	FLOOD RISK
360 minute winter	7	328	37.308	1.008	1.6	0.5182	0.0000	FLOOD RISK
360 minute winter	8	328	37.306	1.277	2.9	0.5618	0.0000	FLOOD RISK
360 minute winter	9	328	37.306	1.637	13.3	2.0377	0.0000	SURCHARGED
360 minute winter	10	328	37.306	1.006	1.7	0.5352	0.0000	FLOOD RISK
360 minute winter	11	328	37.302	1.276	3.1	0.5795	0.0000	FLOOD RISK
360 minute winter	12	328	37.301	1.697	17.1	2.0818	0.0000	SURCHARGED
360 minute winter	13	328	37.303	0.753	0.6	0.1626	0.0000	FLOOD RISK
360 minute winter	14	328	37.302	0.852	1.1	0.1517	0.0000	FLOOD RISK
360 minute winter	15	328	37.301	0.926	0.6	0.2001	0.0000	FLOOD RISK
360 minute winter	16	328	37.300	1.067	3.2	0.3744	0.0000	FLOOD RISK
360 minute winter	17	328	37.300	0.925	0.6	0.2174	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	1	1.000	2	1.7	0.415	0.033	0.7440	
360 minute winter	2	1.001	4	3.1	0.582	0.077	1.1051	
360 minute winter	3	2.000	4	1.6	0.576	0.031	0.7436	
360 minute winter	4	1.002	6	5.4	0.647	0.063	0.5789	
360 minute winter	5	3.000	6	2.9	0.686	0.056	0.7542	
360 minute winter	6	1.003	9	9.0	0.561	0.058	1.5347	
360 minute winter	7	4.000	8	1.6	0.596	0.031	1.0884	
360 minute winter	8	4.001	9	2.5	1.080	0.022	0.1822	
360 minute winter	9	1.004	12	13.0	0.539	0.118	2.3297	
360 minute winter	10	5.000	11	1.7	0.390	0.033	1.0997	
360 minute winter	11	5.001	12	2.8	0.556	0.069	0.1613	
360 minute winter	12	1.005	21	16.7	0.562	0.152	2.1467	
360 minute winter	13	6.000	14	1.1	0.439	0.046	0.1042	
360 minute winter	14	6.001	16	2.0	0.482	0.099	0.1886	
360 minute winter	15	7.000	16	1.1	0.407	0.061	0.1185	
360 minute winter	16	6.002	18	3.9	0.410	0.075	0.3692	
360 minute winter	17	8.000	18	0.9	0.515	0.038	0.1766	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	18	328	37.299	1.158	4.7	0.3637	0.0000	FLOOD RISK
360 minute winter	19	328	37.300	1.000	1.7	0.5321	0.0000	FLOOD RISK
360 minute winter	20	328	37.298	1.265	3.1	0.5756	0.0000	FLOOD RISK
360 minute winter	21	328	37.299	1.755	21.9	2.1745	0.0000	SURCHARGED
360 minute winter	22	328	37.301	0.926	2.1	0.4472	0.0000	FLOOD RISK
360 minute winter	23	328	37.291	1.186	3.1	0.3498	0.0000	FLOOD RISK
360 minute winter	24	328	37.292	1.883	25.8	2.3009	0.0000	SURCHARGED
360 minute winter	25	328	37.303	0.553	0.5	0.1194	0.0000	SURCHARGED
360 minute winter	26	328	37.302	0.652	0.8	0.1161	0.0000	SURCHARGED
360 minute winter	27	328	37.301	0.751	1.4	0.1337	0.0000	FLOOD RISK
360 minute winter	28	328	37.300	0.925	0.5	0.1997	0.0000	FLOOD RISK
360 minute winter	29	328	37.299	0.987	2.6	0.2103	0.0000	FLOOD RISK
360 minute winter	30	328	37.293	0.918	1.1	0.1808	0.0000	FLOOD RISK
360 minute winter	31	328	37.295	1.064	3.6	0.1692	0.0000	FLOOD RISK
360 minute winter	32	328	37.288	1.935	28.1	2.3801	0.0000	SURCHARGED
360 minute winter	33	328	37.291	0.916	1.5	0.3552	0.0000	FLOOD RISK
360 minute winter	34	328	37.290	0.840	0.5	0.1975	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	18	6.003	21	5.3	0.495	0.133	0.3200	
360 minute winter	19	9.000	20	1.7	0.396	0.033	1.0698	
360 minute winter	20	9.001	21	2.8	0.562	0.070	0.2642	
360 minute winter	21	1.006	24	21.6	0.705	0.194	2.1263	
360 minute winter	22	10.000	23	2.0	0.562	0.113	0.4793	
360 minute winter	23	10.001	24	2.9	0.701	0.163	0.1094	
360 minute winter	24	1.007	32	25.4	0.584	0.123	2.1545	
360 minute winter	25	11.000	26	0.8	0.450	0.033	0.0999	
360 minute winter	26	11.001	27	1.4	0.492	0.066	0.1147	
360 minute winter	27	11.002	29	2.0	0.359	0.085	0.2343	
360 minute winter	28	12.000	29	0.8	0.248	0.046	0.1111	
360 minute winter	29	11.003	31	2.9	0.508	0.164	0.1444	
360 minute winter	30	13.000	31	1.3	0.160	0.059	0.1595	
360 minute winter	31	11.004	32	4.1	0.573	0.232	0.0988	
360 minute winter	32	1.008	38	27.4	0.550	0.172	2.7504	
360 minute winter	33	14.000	37	1.4	0.432	0.079	0.4904	
360 minute winter	34	15.000	35	1.4	0.442	0.072	0.1140	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	35	328	37.292	0.917	1.4	0.1458	0.0000	FLOOD RISK
360 minute winter	36	328	37.292	0.946	1.9	0.1504	0.0000	FLOOD RISK
360 minute winter	37	328	37.291	1.192	3.6	0.4411	0.0000	FLOOD RISK
360 minute winter	38	328	37.288	1.978	34.1	2.6680	0.0000	SURCHARGED
360 minute summer	39	288	37.292	0.917	2.1	0.3385	0.0000	FLOOD RISK
360 minute summer	40	288	37.298	1.141	4.3	0.4482	0.0000	FLOOD RISK
360 minute summer	41	288	37.299	1.309	4.7	0.4253	0.0000	FLOOD RISK
480 minute winter	42	384	37.302	1.396	3.2	0.5973	0.0000	FLOOD RISK
360 minute summer	43	288	37.299	0.924	3.6	0.5960	0.0000	FLOOD RISK
360 minute summer	44	288	37.295	1.090	6.6	0.6303	0.0000	FLOOD RISK
360 minute summer	45	336	37.311	0.936	2.1	0.3455	0.0000	FLOOD RISK
360 minute summer	46	288	37.297	1.091	2.2	0.1735	0.0000	FLOOD RISK
360 minute summer	47	288	37.296	1.118	3.2	0.2850	0.0000	FLOOD RISK
360 minute winter	48	320	37.296	1.224	3.0	0.3465	0.0000	FLOOD RISK
480 minute winter	49	384	37.297	1.340	4.5	0.3794	0.0000	FLOOD RISK
480 minute winter	50	376	37.394	2.316	96.8	4.1476	0.0000	SURCHARGED
480 minute winter	51	376	37.304	0.754	2.4	0.1485	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	35	15.001	36	1.9	0.536	0.101	0.0443	
360 minute winter	36	15.002	37	2.2	0.218	0.062	0.1136	
360 minute winter	37	14.001	38	3.5	0.776	0.182	0.1237	
360 minute winter	38	1.009	50	33.7	0.621	0.211	5.3009	
360 minute summer	39	16.000	40	4.2	0.637	0.240	0.2544	
360 minute summer	40	16.001	41	4.6	0.577	0.089	0.6709	
360 minute summer	41	16.002	42	4.7	0.461	0.117	0.5532	
480 minute winter	42	16.003	50	8.1	0.535	0.203	0.2882	
360 minute summer	43	17.000	44	3.2	0.574	0.061	0.6828	
360 minute summer	44	17.001	49	5.9	0.612	0.109	0.9015	
360 minute summer	45	18.000	46	2.2	0.597	0.124	0.3029	
360 minute summer	46	18.001	47	2.2	0.509	0.124	0.0474	
360 minute summer	47	18.002	48	3.4	0.651	0.194	0.1879	
360 minute winter	48	18.003	49	3.5	0.612	0.195	0.0720	
480 minute winter	49	17.002	50	12.5	0.628	0.314	0.1889	
480 minute winter	50	1.010	76	-57.4	0.447	-0.128	2.5188	
480 minute winter	51	19.000	52	3.1	0.272	0.135	0.1076	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	52	376	37.296	0.846	4.6	0.1828	0.0000	FLOOD RISK
240 minute winter	53	240	37.312	1.082	4.4	0.3786	0.0000	FLOOD RISK
360 minute winter	54	352	37.319	1.181	7.7	0.3518	0.0000	FLOOD RISK
360 minute winter	55	320	37.315	1.229	12.3	1.0640	0.0000	SURCHARGED
240 minute winter	56	224	37.330	0.165	5.7	0.0849	0.0000	OK
240 minute winter	57	224	37.320	0.278	9.6	0.1455	0.0000	SURCHARGED
360 minute winter	58	352	37.316	0.381	9.5	0.1755	0.0000	SURCHARGED
360 minute winter	59	320	37.333	0.572	8.7	0.2814	0.0000	SURCHARGED
360 minute summer	60	336	37.413	0.248	10.3	0.1805	0.0000	SURCHARGED
360 minute summer	61	336	37.372	0.595	18.7	0.5938	0.0000	SURCHARGED
360 minute summer	62	336	37.352	0.595	25.6	0.5311	0.0000	SURCHARGED
480 minute winter	63	384	37.380	0.661	46.1	0.6063	0.0000	SURCHARGED
360 minute winter	64	296	37.614	0.924	220.2	0.8003	0.0000	SURCHARGED
240 minute winter	65	252	37.502	0.821	288.0	0.7721	0.0000	SURCHARGED
480 minute summer	66	360	37.343	0.688	76.7	0.7213	0.0000	SURCHARGED
240 minute winter	67	240	37.336	0.759	18.3	0.7011	0.0000	SURCHARGED
360 minute winter	68	288	37.328	1.003	22.2	1.5112	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	52	19.001	53	4.7	0.439	0.264	0.2580	
240 minute winter	53	19.002	54	5.6	0.485	0.108	0.3685	
360 minute winter	54	19.003	55	-7.7	0.425	-0.193	0.3396	
360 minute winter	55	19.004	75	-12.3	0.586	-0.193	0.3097	
240 minute winter	56	20.000	57	-5.6	0.435	-0.108	0.4427	
240 minute winter	57	20.001	58	-9.5	0.582	-0.239	0.7222	
360 minute winter	58	20.002	59	-9.5	0.734	-0.238	1.1719	
360 minute winter	59	20.003	68	9.9	1.182	0.129	0.5204	
360 minute summer	60	21.000	61	-10.3	0.808	-0.200	1.2544	
360 minute summer	61	21.001	62	-18.4	0.567	-0.216	0.2372	
360 minute summer	62	21.002	63	-25.5	0.549	-0.359	0.6507	
480 minute winter	63	21.003	64	-38.8	-0.551	-0.546	0.4960	
360 minute winter	64	21.004	65	130.1	1.848	1.812	0.1672	
240 minute winter	65	21.005	66	63.5	0.902	0.905	0.4376	
480 minute summer	66	21.006	67	22.0	0.816	0.311	1.3449	
240 minute winter	67	21.007	68	23.2	1.141	0.170	0.8334	
360 minute winter	68	20.004	70	-19.8	0.723	-0.128	1.6303	

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	69	10	37.443	0.068	16.5	0.0408	0.0000	OK
360 minute winter	70	320	37.341	1.104	21.3	1.3883	0.0000	SURCHARGED
480 minute winter	71	376	37.309	0.934	3.1	0.4510	0.0000	FLOOD RISK
240 minute winter	72	240	37.301	1.106	3.7	0.1759	0.0000	FLOOD RISK
360 minute winter	73	288	37.304	1.142	4.5	0.2365	0.0000	FLOOD RISK
360 minute winter	74	352	37.312	1.221	10.0	0.1942	0.0000	FLOOD RISK
480 minute winter	75	376	37.386	1.565	90.3	1.7705	0.0000	SURCHARGED
360 minute summer	76	288	37.375	2.335	87.5	4.3483	0.0000	SURCHARGED
360 minute winter	77	336	37.284	0.834	0.7	0.2277	0.0000	FLOOD RISK
360 minute winter	78	336	37.284	0.834	1.1	0.2753	0.0000	FLOOD RISK
360 minute winter	79	336	37.284	0.928	1.6	0.2033	0.0000	SURCHARGED
360 minute winter	80	336	37.284	0.994	2.3	0.1580	0.0000	SURCHARGED
360 minute winter	81	336	37.283	1.164	3.6	1.1318	0.0000	SURCHARGED
360 minute winter	82	336	37.283	1.245	3.4	1.0778	0.0000	SURCHARGED
360 minute winter	83	336	37.282	2.344	63.6	427.8490	0.0000	SURCHARGED
360 minute winter	84	336	34.806	0.085	14.7	0.0960	0.0000	OK

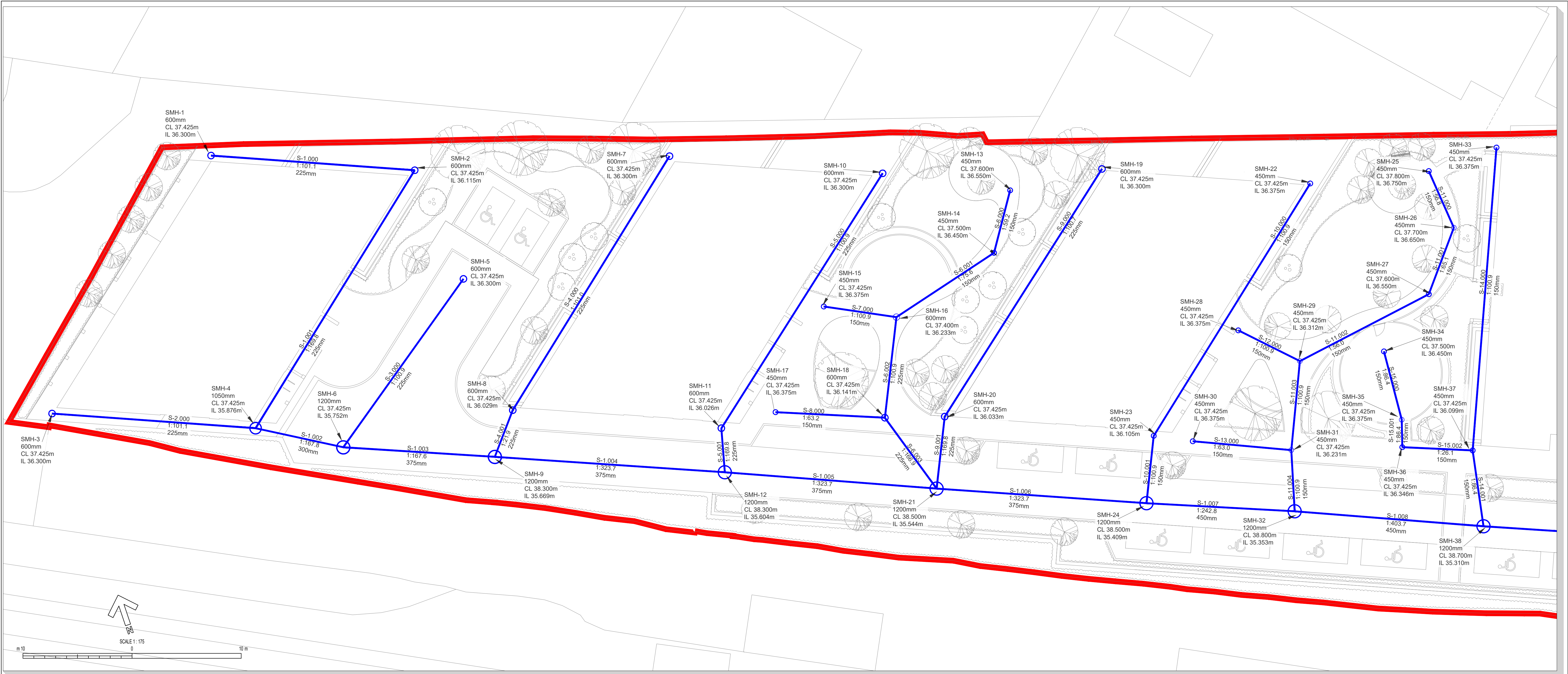
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	69	22.000	70	16.4	1.790	0.154	0.0440	
360 minute winter	70	20.005	75	21.2	0.795	0.191	2.3577	
480 minute winter	71	23.000	72	3.2	0.583	0.179	0.3193	
240 minute winter	72	23.001	73	-3.7	0.605	-0.209	0.0578	
360 minute winter	73	23.002	74	-4.4	0.667	-0.251	0.1272	
360 minute winter	74	23.003	75	-10.0	0.649	-0.566	0.0810	
480 minute winter	75	19.005	76	-61.1	0.705	-0.560	0.3666	
360 minute summer	76	1.011	83	86.7	0.586	0.284	14.2740	
360 minute winter	77	24.000	80	0.7	0.348	0.024	0.1025	
360 minute winter	78	25.000	79	1.1	0.476	0.062	0.1667	
360 minute winter	79	25.001	80	1.6	0.536	0.091	0.1180	
360 minute winter	80	24.001	81	2.3	0.580	0.130	0.3033	
360 minute winter	81	24.002	82	3.4	0.689	0.191	0.1445	
360 minute winter	82	24.003	83	3.1	0.710	0.172	0.0669	
360 minute winter	83	1.012	84	14.7	0.911	0.162	0.5243	
360 minute winter	83	Weir	84	0.0				0.0
360 minute winter	84	1.013	84_OUT	14.7	0.928	0.162	0.2720	348.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.65%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	84_OUT	336	34.687	0.081	14.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
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APPENDIX 4 – SuDS Strategy



KEY	
	Proposed Surface Water Drain
	MH
	Attenuation Tank
	Catchment - Impermeable 100% run off
	Catchment - Permeable surfacing 70% run off
	Catchment - Landscaping - at Greenfield run-off rate

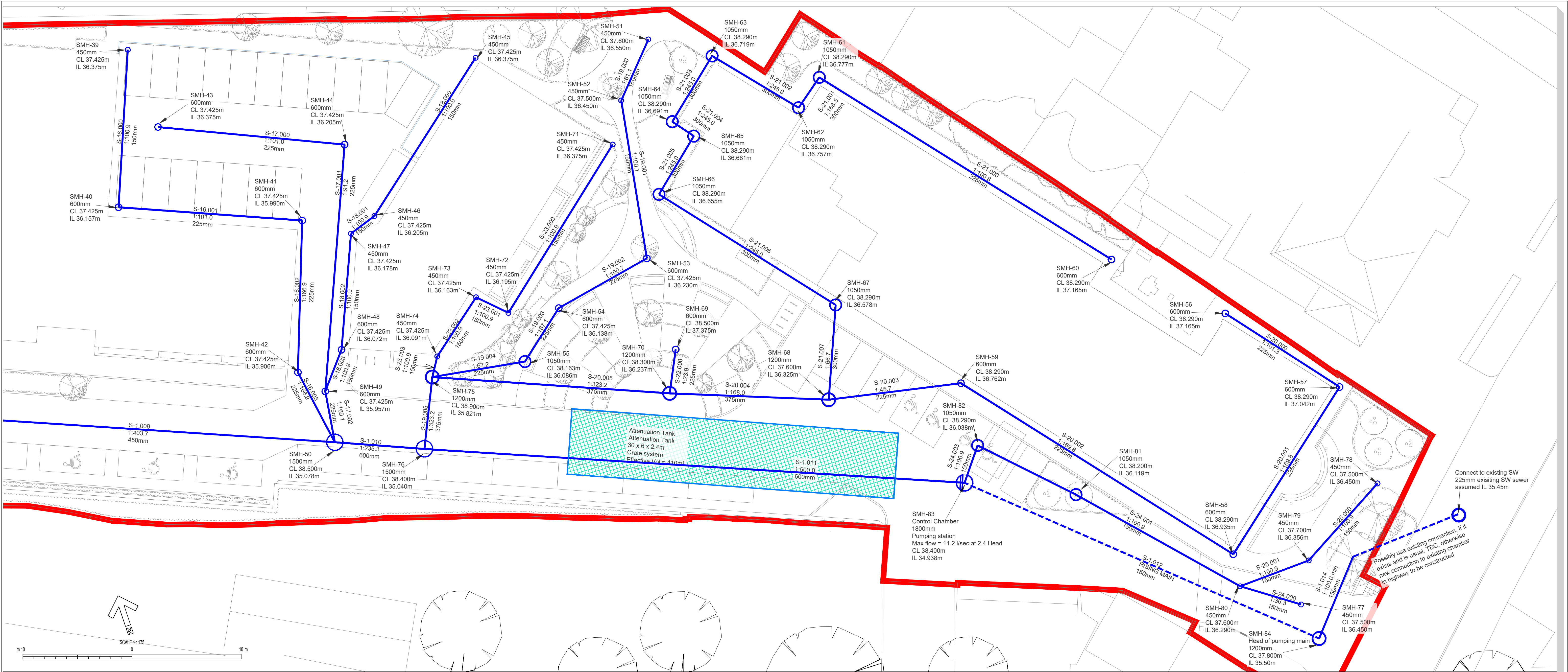
- NOTES:
- 1) All works and materials to conform to standards in latest edition of Sewers for Adoption or any relevant design guides by the overseeing Local Authorities
 - 2) All covers and gratings to be class C in Highway, Class B where in access or can be class A where away from access and any vehicle paths
 - 3) Outfall to connect to existing sewer, however lack of clarity of existing sewer and ILs. Recommended IL of existing sewer to connect into is surveys prior to any construction design, however as design has a pumping station there will not be any issue connecting in from top of pumping main, just clarify the level it will need to be prior to construction as this will gravity feed into existing sewer and need appropriate cover or protection suitable for going in public highway (min of 1.2m without pipe protection). It's anticipate it should be fine.
 - 4) Advise detail design allows for possibility of power failure in a storm when pump might stop working. One recommend is a large lockable 'torrent' grating fitted to chamber SMH-84 (at junction to highway) to make sure any flood flows exit here rather than anywhere upstream of here. Design to then make sure exceedance flood flows at and around junction with highway fall into highway



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Job:	Long Drive, South Ruislip		
Client:	ROK Planning		
Drawing Title:	Proposed Surface Water Drainage (1 of 2)		
Date:	August 2026		
Drawing No:	KRS.0429.006.001	Revision: D	Status:
Scale:	1:400 @ A1	Drawn:	PM



KEY	
	Proposed Surface Water Drain
	MH
	Attenuation Tank
	Catchment - Impermeable 100% run off
	Catchment - Permeable surfacing 70% run off
	Catchment - Landscaping - at Greenfield run-off rate

- NOTES:
- 1) All works and materials to conform to standards in latest edition of Sewers for Adoption or any relevant design guides by the overseeing Local Authorities
 - 2) All covers and gratings to be class C in Highway, Class B where in access or can be class A where away from access and any vehicle paths
 - 3) Outfall to connect to existing sewer, however lack of clarity of existing sewer and I.Ls. Recommended I.L. of existing sewer to connect into is surveys prior to any construction design, however as design has a pumping station there will not be any issue connecting in from top of pumping main, just clarify the level it will need to be prior to construction as this will gravity feed into existing sewer and need appropriate cover or protection suitable for going in public highway (min of 1.2m without pipe protection). It's anticipate it should be fine.
 - 4) Advise detail design allows for possibility of power failure in a storm when pump might stop working. One recommend is a large lockable 'torrent' grating fitted to chamber SMH-84 (at junction to highway) to make sure any flood flows exit here rather than anywhere upstream of here. Design to then make sure exceedance flood flows at and around junction with highway fall into highway



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Job:	Long Drive, South Ruislip	
Client:	ROK Planning	
Drawing Title:	Proposed Surface Water Drainage (2 of 2)	
Date:	August 2026	
Drawing No:	KRS.0429.006.002	Revision: D Status:
Scale:	1:400 @ A1	Drawn: PM

