



**PERSIMMON HOMES THAMES VALLEY
HAMPTON PARK
LITTLEHAMPTON**

**CENTRAL WETLAND AREA SURFACE WATER
DRAINAGE (DISCHARGE OF CONDITION 10)**

OCTOBER 2021



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Persimmon Homes Thames Valley
Hampton Park
Littlehampton
Central Wetland Area Surface Water Drainage (Discharge of Condition 10)

List of Contents

Sections

1 Introduction1

2 Surface Water Drainage Condition 102

3 Outline Approved and Updated Drainage Strategy.....3

4 Northern Crossing & BEBO Arch5

5 CWA Proposed Levels and Surface Water Drainage7

6 Condition 10 Conclusion 10

Appendices

- APPENDIX A: Hampton Park Site Location
- APPENDIX B: Central Wetland Area Location
- APPENDIX C: Central Wetland Area Landscape Strategy
- APPENDIX D: Outline Application - Surface Water Strategy & Illustrative Masterplan
- APPENDIX E: Updated Masterplan Drainage Strategy 2021
- APPENDIX F: Pre-Demolition Topographic Survey & Drainage Catchment
- APPENDIX G: CWA RM Application - Levels & Drainage Plan
- APPENDIX H: CWA RM Application - Surface Finishes Plan
- APPENDIX I: CWA RM Application - Footpath Levels
- APPENDIX J: CWA RM Application - Isopachyte Heights & Cross Sections
- APPENDIX K: CWA RM Application – Swale, Pond & Shared Path Sections
- APPENDIX L: CWA RM Application - Main Avenue Northern Crossing
- APPENDIX M: Northern Crossing Drainage - Phase 4 & Phase 2 Interface
- APPENDIX N: BEBO Arch under Northern Crossing
- APPENDIX O: Environment Agency Product 4 Flood Levels
- APPENDIX P: Stantec Flood Compensation Drawing

1 Introduction

- 1.1 Mayer Brown Ltd (MBL) has been commissioned by Persimmon Homes Thames Valley (PHTV) to compile this report to accompany their reserved matter application for the proposed Central Wetland Area (CWA) within the overall outlined approved development (**Arun DC reference LU/47/11/**) for up to 1,260 residential dwellings, B1 employment use, Class A facilities, a 100 bed hotel, 60 bed care home, primary school, plus many other facilities and improvements to the local infrastructure. Refer to Appendix A for the Site Location.

Outline Planning Consent

- 1.2 Outline Planning Consent was granted in 2011, under Arun District Council planning reference LU/47/11, which includes Condition 10 that relates to surface water drainage. This is covered in more detail within the report.

Proposed Reserved Matters CWA

- 1.3 The proposed Central Wetland Area (CWA) covers an area of approximately 4.88 hectares that forms a distinct divide between the adjacent development platforms to the east and to the west.
- 1.4 It is mostly comprised of soft landscaping apart from the main avenue and a number of shared pathways links between the development platforms. The proposed landscaped plan is contained in Appendix C

Purpose of this Drainage Report

- 1.5 The purpose of this report is to demonstrate the Central Wetland Area can be safely drained of surface water run-off and will not cause flooding to itself or increase the risk of flooding to adjacent / downstream areas.
- 1.6 This report is also produced to facilitate the discharge of outline planning condition 10, although in this instance most of condition 10 is not relevant because there is not surface water attenuation required within the CWA.

2 Surface Water Drainage Condition 10

Condition 10: No development shall begin until a fully detailed surface water drainage scheme for that phase of the development, based on sustainable drainage principles and designed in accordance with the SUDS strategy for the whole development, has been submitted to and approved in writing by the Local Planning Authority. It should be demonstrated how each detailed scheme will contribute to delivering, and link into, the surface water drainage strategy for the site as a whole.

- The SUDS shall be designed to attenuate the 1 in 100 year storm event (plus climate change allowance of 30% in accordance with DEFRA's National Standards for Sustainable Drainage Systems).
- No infiltration of surface water drainage shall occur within ground affected by contamination unless suitable remediation is undertaken.
- Each detailed scheme should include a timetable for its implementation; and provide a management and maintenance plan in the form of a site specific Maintenance Manual for the SUDS system for the lifetime of the development. This shall include the arrangements for adoption by any public authority or statutory undertaker or details of the financial management of the scheme throughout its lifetime.

Elements of the scheme serving any particular phase shall subsequently be implemented in accordance with the approved details (unless otherwise agreed with the Local Planning Authority) prior to the occupation of any dwellings in that phase and no building in that phase of the development shall be occupied until the surface water drainage scheme has been fully implemented in accordance with the approved details.

Reason: To ensure that the proposed development is satisfactorily drained to prevent the increased risk of flooding, and improve and protect water quality, habitat and amenity, and ensure future maintenance of these in accordance with national guidance and policies GEN7, GEN9 of the Arun District Local Plan.

3 Outline Approved and Updated Drainage Strategy

3.1 From a drainage perspective the outline approved masterplan can be viewed as two distinct areas that is divided by the Central Wetland Area (CWA):

- **West of Central Wetlands:** The west of CWA catchment covers a total area of 19 hectares that is subdivided into 18 land parcels. A large proportion of this catchment has already been constructed and the overall surface water strategy has been reviewed and approved by Arun DC. This approved strategy will continue to be used as the individual reserved matters applications come forward in the future.
- **South and East of Central Wetlands:** The south and east central wetlands catchment covers a total area of **24.3 hectares** that will also be subdivided into phases / land parcels. None of the phases / land parcels within this catchment have obtained reserved matters planning approval yet and, as such, none of it has been constructed.

Outline Approved Surface Water Strategy (2011)

- 3.2 Greencore obtained outlined planning consent for the scheme in 2011, using White Young Green (WYG) as their drainage consultants, and subsequently sold the site to PHTV.
- 3.3 The approved drainage strategy from 2011 is contained in Appendix D, which is titled “Proposed Surface Water Management Plan”. This is a high level drawing identifying a **Central Swale** (dark blue dashed line) that forms a distinct break running through the centre of the overall development. This central swale is fed by secondary swales from within the development parcels. The central swale discharges into **Toddington Ditch**, which is a tributary that eventually connects the Back Ditch
- 3.4 This high level WYG strategy is reflected in the approved masterplan, also in Appendix D, which makes space for these swales and pond.

Updated Surface Water Strategy (2021)

- 3.5 This updated surface water strategy retains the principles set out in the outlined approved drainage strategy by keeping the swales and pond in the same locations. Refer to the updated overall drainage strategy drawing in Appendix E.
- 3.6 This strategy covers a total area of approximately 24.3 hectares that has been progressed/engineered significantly where swale dimensions, bed levels, top of bank levels have all been established. The proposed ground levels in the development parcels have been engineered to ensure their drainage networks feed on a gravity basis into swales.

Pre-Demolition Drainage & Outfall Location

- 3.7 The pre-demolition site was heavily developed comprising large glasshouses with associated outbuildings and areas of hardstanding. Refer to the site location plan in Appendix A that shows the extent of the glasshouses covering the site to the east and west of the wetlands.
- 3.8 A plan illustrating the existing surface water regime, produced by Glanville in 2014, is contained in Appendix F. This plan shows the central east area discharged into Toddington Ditch to the north.
- 3.9 The CWA is almost entirely within this pre-demolition central east area and will **continue to use the same outfall into Toddington Ditch.**

Proposed Discharge Rates, Attenuation and Calculations

- 3.10 The new Central swale in the CWA is effectively acting as a conduit that will receive surface water run-off from the adjacent development parcels and convey it north via exiting Toddington Ditch into the Black Ditch.
- 3.11 The development parcels will discharge their restricted surface water run-off (@ 15 litres/sec/hectare) into the CWA via 5 new outfalls as shown on the drainage overview drawing in Appendix E.
- 3.12 The total combined discharges rates from the adjacent development parcels are as follows:
- ✦ Phase 5 & Main Avenue Reserved Matters Application (24.27 hectares)
 - Outfall 01: 75 litres /second
 - Outfall 02: 100 litres / second
 - Outfall 03: 64 litres / second
 - Outfall 04: 100 litres / second
 - ✦ Phase 4, Catchment 03 (0.857 hectares) – Approved
 - Catchment 03 Outfall: 13 litres/second.
- 3.13 The rainfall that falls on the 4.48 hectare CWA will not be restricted and will drain into the land and/or find its way into the new swale flowing north and discharge into Toddington Ditch, and eventually into the Black Ditch.
- 3.14 The new central swale flows through a number of ponds as it flows north. These ponds provide an amenity and water treatment value only.
- 3.15 With the above in mind there is no need for surface water attenuation and associated calculations within the CWA application

4 Northern Crossing & BEBO Arch

Main Avenue

- 4.1 The main avenue is the main road that loops through the entire Hampton Park development that partially passes through/above the CWA. MBL have undertaken a detailed civil engineering design of a large section of the main avenue from the edge of Phase 2 (already approved mostly constructed), over the CWA, through Phase 5 and back to the tie in with existing Toddington Lane. Refer to the Main Avenue drawings and longitudinal sections in Appendix L

Northern Crossing

- 4.2 The main avenue is referred to as the **Northern Crossing** as it passes through/over the CWA. The Northern Crossing is a 6.2 metre tree lined road with separate 3m shared path on one side and 2m footpath on the other side.
- 4.3 Approximately 80 metres of the main avenue falls within the CWA reserved matters application, runs from chainage 31.5m (edge of Phase 4) to chainage 110m just beyond the BEBO Arch. (BEBO Arch discussed below)
- 4.4 The finished road levels of the Northern Crossing climbs at a constant gradient of 1in150 across the entire CWA, rising from 4.2m at the east up to 5.00 to the west. These levels are considerably higher than the CWA level of 1.38m and will be constructed on an earthworks embankment that forms a barrier across the entire CWA. Refer to typical section on figure 4.1 below.

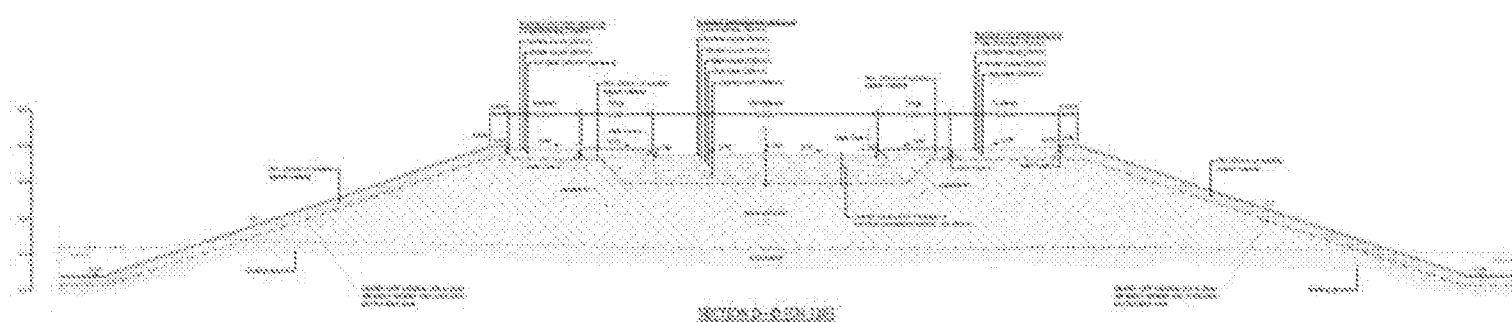


Figure 4.1 Cross Section Through Northern Crossing

BEBO Arch

- 4.5 As described above the Northern Crossing forms an earthworks embankment across the CWA so requires an opening to enable flood water from the Black Ditch to flow back and forth during an extreme flood event.
- 4.6 The outline approved decision notice suggested an open span bridge across the CWA but PHTV have subsequently agreed in principle with the EA and LPA that an alternative BEBO Arch can be used to form the opening.

- 4.7 The BEBO Arch is a proprietary system formed of precast concrete units that forms an elliptical shape arch that is

5 CWA Proposed Levels and Surface Water Drainage

Proposed Levels

- 5.1 The new development platforms are extending into the wetland areas to the north and the CWA. Therefore, the ground levels within the CWA need to be lowered where possible to facilitate a flood compensation balance. Stantec have undertaken a flood compensation analysis the summary drawing is contained in Appendix P.
- 5.2 MBL have created a ground model of the entire CWA using Civils 3d (ground modelling software) that has accurately modelled the proposed surfaces, including the development platforms, embankments, main avenue (northern crossing) and footpaths. Appendix J contains earthworks cross sections at key locations an Isopachyte Drawing (Isopachyte contours show the height difference between two surfaces areas that are colour coded to show areas in cut as red contours and areas of fill as green contours).
- 5.3 The proposed levels headlines are as follows:
- ✦ The ground levels will mostly be lowered to a constant level of 1.38m AOD north of the existing Southern Water large water main, apart from root protection areas where the existing levels will be retained. The ground levels will be lowered to 1.6m AOD south of the water main. (The pre demolition topographic survey in Appendix F show the existing ground levels within the application area range from 1.9m to 2.4m AOD)
 - ✦ The proposed shared 3m wide shared asphalt pathways crossing the CWA will drop from the higher development platforms down into the CWA at gradients no steeper than 1in20 where they level off through the CWA. Longitudinal sections of the proposed CWA footpaths are contained in Appendix I.
 - ✦ Most of the shared pathways are no lower than 2.1m AOD, which is approximately 300mm above the predicted 1in100yr flood level of 1.83m AOD. The EA modelled flood levels (Product 4) are contained in Appendix O that show the predicted 1in100yr+20%CC flood levels range from 1.77m to 1.83m AOD. This will enable pedestrian and cyclists to continue to safely use the CWA during extreme flood events.
 - It is necessary for footpath 03 to the north to be lower than 2.1m AOD, otherwise it would form a barrier for floodwater from the Black Ditch passing back up into the CWA. In the rare event that this footpath becomes inundated that are numerous alternative roads and footpath to the south that will enable the CWA to be crossed.
 - ✦ The earthworks embankments from the development platforms, footpaths and northern crossing down into the CWA are generally 1in3 (or shallower)