

TECHNICAL NOTE

Job Name: Land Parcels off Worsell Drive, Copthorne – Drainage and Flood Risk Strategy
Job No: 24205
Note No: Northern-Southern-Drainage-Strategy/001/ REV D
Date: 16/12/2025
Prepared By: Joe Meredith
Reviewed By: Paul Knight
Subject: Northern and Southern Plot –Drainage and Flood Risk Strategy REV D

Item	Subject
1.1	1. Introduction Description of development: Full planning application at two parcels of land one accessed from an existing bellmouth east of a bus gate on Worsell drive, and the other accessed from an existing bellmouth along Langridge Way, Copthorne, for the construction of new homes (use Class C3) including affordable homes, internal access road, landscaping, and associated infrastructure. Full planning application at two parcels of land adjacent to Worsell Drive, Copthorne, each accessed from existing bell-mouth junctions at Worsell Drive and Langridge Way, for the erection of new homes (Use Class C3) including affordable homes; internal access roads, landscaping, and associated infrastructure. For information only (to be included as a condition): Number of Homes: 69” Stantec have been commissioned by Miller Homes to provide a drainage and flood risk strategy technical note in support of the full planning application for this development.
1.2	2. Flood Risk Assessment As outlined in the Flood Risk Assessment conducted by Hydroland in November 2013 to support planning application, the Copthorne development demonstrated that it proposes wider sustainability benefits to the area that outweigh the flood risk. The report shows that there is no flood risk to the site or to the surround area. Please refer to this document in Appendix D.
1.3	3. Planning History The site benefits from Outline consent as part of the outline planning application (LPA ref. no. 13/04127/OUTES) which was approved in 2016 by Mid Sussex District Council (MSDC), in respect of the following: “Outline planning application for up to 500 homes, a primary school and doctors’ surgery, up to 15,500sqm employment floorspace (B1c light industry/B8 storage and distribution), public open space, allotments, associated landscaping, infrastructure

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	(including sub-stations and pumping station) and pedestrian and cycle access, with a principal vehicular access from the A264 and a secondary vehicular access from Shipley Bridge Lane with all matters reserved except for access.” The two parcels of land proposed for new homes sit within the existing Heathy Wood residential scheme. This benefitted from outline planning permission which was granted in May 2016 for 500 new homes. Various Reserved Matters applications have been approved to bring forward the detailed design of the Heathy Wood scheme at Copthorne. The parcels were previously considered for a school and doctors surgery. However, after extensive review, West Sussex County Council (WSCC) has confirmed that a new primary school is not required at this location as a new school could undermine the sustainability of existing schools. Instead, and in line with the obligations of the 2016 outline planning permission, significant financial contributions have been made towards education in the local area. The local medical group has advised it is not viable for it to bring forward a doctors surgery. Therefore, as required by the outline planning permission, financial contributions have been made to support local healthcare facilities. Accordingly, there are two sustainably located parcels of land at Heathy Wood that are vacant and unused. It is proposed to deliver new homes on these parcels to complement and integrate within the existing homes and wider Copthorne community. This report is prepared on the proposal of delivering 69 new homes at across the two parcels of land. The description of development for the application is: Description of Development: <i>Full planning application at two parcels of land adjacent to Worsell Drive, Copthorne, each accessed from existing bell-mouth junctions at Worsell Drive and Langridge Way, for the erection of new homes (Use Class C3) including affordable homes; internal access roads, landscaping and associated infrastructure.</i> For Information Only (to be included as a condition): <i>Number of homes: 69.</i> This Technical Note has been prepared to support the full planning application for the proposals for the residential use on these remaining plots.
1.4	4. The Site The site is situated to the west of Copthorne, in the area administered by Mid Sussex District Council (MSDC) as the Local Planning Authority and West Sussex County Council (WSCC) as the Local Highway Authority. Copthorne village centre is approximately 4.5km to the west. The site is directly bordered by the M23 to the west, the M23 junction 10 to the southwest, the A264 to the south, Copthorne to the east and Shipley Bridge Lane to the North as shown on Figure 1.1.

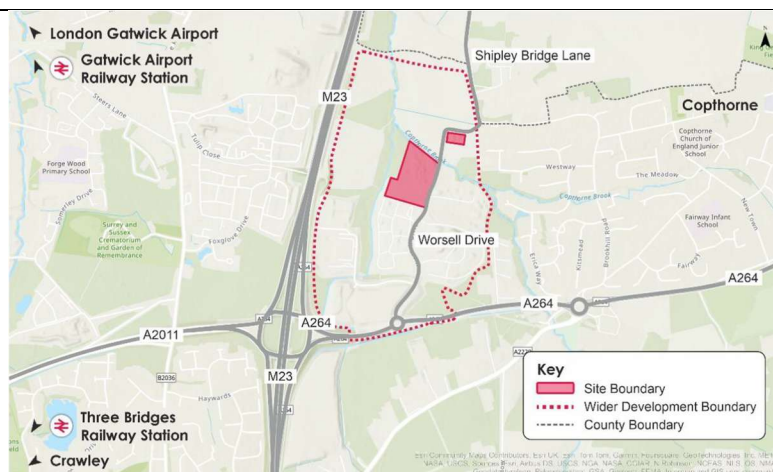


Figure 1.1. Site Location Plan

This technical note relates to the parcel of land previously intended for use as a doctors' surgery and primary school. These sites are located on the eastern and northwestern part of the wider development as illustrated on Figure 1.1.

1.5

This technical note has been provided to demonstrate that the proposed surface and foul water for the Northern and Southern Plot is in accordance with the site wide drainage strategy and contains hydraulic performance details for the proposed surface drainage scheme. This report should be read in conjunction with the following drainage drawings.

- 24205-2044-500: Northern Plot - Foul and Surface Water Drainage Strategy
- 24205-2044-501: Northern Plot - Impermeable Areas Plan
- 24205-2044-502: Northern Plot – Flood Exceedance Plan
- 24205-2045-500: Southern Plot – Foul and Surface Water Drainage Strategy
- 24205-2045-501: Southern Plot – Impermeable Areas Plan
- 24205-2045-502: Southern Plot – Flood Exceedance Plan

This report contains the following appendices:

- Appendix A: Drainage Strategy Summary Plan
 - 24205/SK030 Rev E
- Appendix B: Network Details and Hydraulic Calculations:
 - Southern Plot
 - 2 year return period
 - 30 year return period
 - 100 year return period (+40% climate change)
 - 2 year return period (+10% urban creep)
 - 30 year return period (+10% urban creep)
 - 100 year return period (+40% climate change) (+10% urban creep)
 - Northern Plot
 - 2 year return period
 - 30 year return period
 - 100 year return period (+40% climate change)
 - 2 year return period (+10% urban creep)
 - 30 year return period (+10% urban creep)
 - 100 year return period (+40% climate change) (+10% urban creep)
- Appendix C: Foul Sewer Calculations
- Appendix D: Flood Risk Assessment

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1.6	The surface and foul water drainage strategy for both Northern and Southern plots follow the principles established in the Site Wide Drainage Strategies prepared by Peter Brett Associates LLP now Stantec on behalf of St Modwen, dated October 2017. As noted in the Sitewide Surface and Foul Drainage Strategies, the sites were previously proposed to be served by one principal surface water and foul water outfall per plot. The Southern Plot was historically served by an outfall into the existing watercourse to the west of the site, and the Northern plot was to have a connection into the Spine Road (Worsell Drive) surface water infrastructure to the west of the site as shown on the Drainage Strategy Summary Plan (24205/SK030). Foul connections for both plots were via a spur connection from the Spine Road (Worsell Drive) drainage infrastructure. As part of the development of the site, the following changes have been made to the drainage design: - The total area of the Southern Plot has now been increased such that its extents reach the northern woodland area. This change has required the surface water outfall to be relocated from the western side of the site to the north of the site; now to be connected into the Copthorne Brook. This change was required to suit the topography of the site.
1.7	The Sitewide Surface Drainage Strategy outlined the allowable peak flows for each development parcel. Both the Northern and Southern plots had an allowance for 5.0l/s during a 100 year + 20% climate change storm event. This was based off the sites determined greenfield Qbar runoff rate of 4.8l/s/h (see drawing 24205-SK030 Rev E). The developed Northern and Southern plots have both design in accordance with these flow rates. However, in line with Environmental Agencies 2016 revised guidance regarding climate change peak rainfall events have been increased by a factor of 20% to 40% to allow for the "Total potential change anticipated for the 2080's (2070 to 2115)). The developed Southern Plot has a total plot area of 1.822ha, of which 1.102ha of this is impermeable, making up 60.5% of the site which is required to drain to the Copthorne Brook on the site's northern boundary. Noting the agreed discharge rates of 4.8 l/s/ha, the allowable greenfield runoff discharge rate for this site is 5.2 l/s. As such, on-site attenuation features have been incorporated to manage surcharged flows. SuDS features include a series of 825mmØ oversized pipes and attenuation tanks in addition to two HydroBrakes chambers which limit the flow rates across the site and a weird wall chamber. The developed Northern Plot has a total plot area of 0.225ha, 0.149ha of which is impermeable, making up 66.1% of this site which is required to outfall into the existing Spine Road drainage infrastructure. Noting the agreed sitewide greenfield runoff rates of 4.8 l/s/ha, the proposed discharge rate for this plot should theoretically be 1 l/s. However, due to risk of blockage in drainage systems discharging at 1 l/s the minimum flow rate has been increased to 5 l/s. Attenuation has been provided in the form of cellular storage underground and a volume of 30.4m³ has been allowed for Northern Plot and 672.7m³ across the Southern Plot. To allow for future increases in sitewide impermeable area, attenuating features have capacity to attenuate an additional 10% of impermeable area (urban creep).
1.8	The proposed on-site foul water drainage strategy is shown on the Stantec drawings 24205-2044-500 (Northern Plot) and 24205-2045-500 (Southern Plot).

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	As can be seen within the drawings mentioned above, the on-site foul drainage network for the Northern plot will drain by gravity to the western corner of the plot and connect into the Spine Road (Worsell drive) existing infrastructure. The on-site foul drainage network on the Southern Plot will drain by gravity to the east of the plot and then connect into the Spine Road (Worsell Drive) existing infrastructure. The foul connection point onto the spine road has been relocated further north than the initial design as shown on the 24205-2045-500 drawing. As previously stated in Peter Brett Associates LLP drawing 24205/SK030 Rev E, allowable maximum discharge rates for the foul were 0.5 l/s for Northern Plot and 5.1 l/s. The developed plots have been designed in accordance with these parameters achieving 0.5 l/s at the Northern Plot and 3.2 l/s at the connection for the Southern Plot.
1.9	5. Summary <u>Northern Plot</u> The Northern Plot has followed the same foul route as outlined in the previous foul water strategy, in which the route is to discharge into the existing infrastructure within Worsell Drive. The foul for this plot has a discharge rate of 0.5l/s, which has remained unchanged since the previous strategy. The surface water also follows the same route as outlined in the previous drainage strategy in which the connection breaks into an existing spur within Worsell Drive. The plot has a discharge rate of 5.0l/s which will be achieved by the use of SuDS features including permeable paving and cellular storage tanks, where the total storage within the tanks equates to 30.4m³. <u>Southern Plot</u> Foul routes within the plot are similar to previous strategies, in that the plot will discharge into Worsell Drives existing foul infrastructure, however the connection point has been moved further North to align with the sites topography which falls from South to North. The rate of discharge has also decreased from the previous strategies 5.1l/s rate to a new, lesser 3.2l/s. The Southern Plots surface water strategy has also been altered due to the plot extending further North. As previously stated within the foul section, the site has a natural fall from South to North. This now creates a new discharge point of the northmost ditch that borders the plot, as opposed to the original outfall ditch stated in the previous strategy, which was to the left of the plot and is subsequently bordered by ancient woodland. The discharge rate has remained as 5.0l/s and will be achieved through the use of SuDS features including permeable paving, hydrobreak chambers, oversized pipes, and tank storage which can hold 672.7m³. <u>Southern Plot Optioneering</u> An optioneering exercise was conducted to explore alternative discharge options for surface water from the southern plot into the local network. One option was identified but ultimately ruled out due to various constraints. This option involved connecting to an existing pipe running under Spine Road, which discharges into the Copthorne Brook via a headwall. The connection from the southern plot would be made via manhole S25, and a new chamber would need to be constructed within a root protection area, along with the connecting pipes. Given the sensitivity of the Brook, the existing network currently discharges at 13l/s, controlled by a HydroBrake upstream to limit the flow. Upstream of the HydroBrake, there is a series of attenuation measures to store and manage backflow. For the southern plot to

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connect to this existing network, a new HydroBrake chamber would be required to regulate the flow into the system. Additionally, to maintain the 13l/s discharge into the existing watercourse, the upstream attenuation for the current network would likely need to be upsized to accommodate the new discharge from the southern plot, effectively reducing the allowable discharge from the network to make room. Due to the sensitive nature of the root protection areas where the two new chambers are proposed, as well as the limited space available to upsize the upstream attenuation, this option was ultimately ruled out.

An investigation was conducted to explore the possibility of introducing a pond to attenuate surface water on the southern plot, as a replacement for the currently proposed attenuation crates. However, this option was ruled out due to the larger attenuation volume provided by the crates. The maximum freeboard level for a proposed pond would need to be determined based on the elevation of the lowest dwelling on the site. Since this level is relatively low and space is limited across the southern plot for a pond, it was concluded that attenuation crates would be the better option. This is because attenuation crates offer more flexibility in terms of construction. They can be installed closer to verges, do not require slopes like a pond, and provide higher overall attenuation capacity.

6. Appendix A

PHASE 1: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
P1FA	66.396	150	1 IN 150	2.0				
P1F-B	67.821	150	1 IN 150	1.2				
P1F-C	67.332	150	1 IN 150	1.0				
P1F-D	67.624	150	1 IN 100	0.3				
P1F-E	67.980	150	1 IN 80	8.3				
P1S-A	69.000	150	1 IN 80		5	9.5	16.2	11.6
P1S-B	69.400	150	1 IN 80		7.5	12.0	20.0	
P1S-C	69.500	150	1 IN 80		7.5	12.0	20.0	
P1S-D	68.100	150	1 IN 80		7.5	12.0	20.0	
P1S-E	68.200	150	1 IN 80		7.5	12.0	20.0	
P1S-F	64.780	300	1 IN 200		10.6	10.6	10.6	

PHASE 2: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
P2F-A	67.710	150	1 IN 40	1.2				
P2F-B	69.170	150	1 IN 14.3	0.9				
P2F-C	68.470	150	1 IN 15.3	1.5				
P2F-D	67.100	150	1 IN 150	2.5				
P2F-E	68.789	150	1 IN 80	0.4				
P2S-A	68.080	225	1 IN 80		5.0	5.0	5.0	6.9
P2S-B	68.700	225	1 IN 15.5		5.0	5.0	5.0	
P2S-C	69.187	225	1 IN 4.5		5.0	5.0	5.0	
P2S-D	69.850	225	1 IN 2.1		5.0	5.0	5.0	
P2S-E	69.280	225	1 IN 120		5.0	5.0	5.0	6.5
P2S-F	67.800	225	1 IN 120		5.0	5.0	5.0	
PS2-G	67.600	225	1 IN 120		5.0	5.0	5.0	

PHASE 3: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
P3F-A	64.150	150	1 IN 150	3.0				
P3F-B	63.717	150	1 IN 80	0.2				
P3S-A	64.890	225	1 IN 170		11.3	36.1	60.4	2.2
P3S-B	65.170	225	1 IN 46.1		5.0	5.0	5.0	
P3S-C	VARIES	150	MULTIPLE CONNECTIONS TO SWALE		4.4	11.8	17.0	
P3S-D	68.800	150	1 IN 85		14.2	38.0	55.0	12.0
P3S-E	68.300	225	1 IN 80		14.9	48.0	78.0	
P3S-F	VARIES	150	MULTIPLE CONNECTIONS TO PHASE 2 OUTFALL SEWER		17.7	57.1	92.8	
P3S-G	64.090	1200	1 IN 500		VOLUME TO BE PROVIDED BY PLOT/DEVELOPER AS PART OF REQUIREMENT TO MEET PEAK FLOW AT P3S-I			
P3S-H	64.100	1200	1 IN 500					
P3S-I	63.980	300	1 IN 200		12.0	12.0	12.0	

PHASE 4: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
P4F		150	1 IN 150	8.0				
P4FA	63.495	150	1 IN 150					
P4FB	64.550	150	1 IN 7					
P4FC	65.600	150	1 IN 14.5					
P4SA	64.484	300	1 IN 240		5.0	5.0	5.0	} 9.3
P4SB	64.800	150	1 IN 52		5.0	42.0	66.0	
P4SC	65.300	150	1 IN 35		5.0	21.0	33.0	
P4SD	63.300	300	1 IN 200		6.0	6.0	6.0	6.0

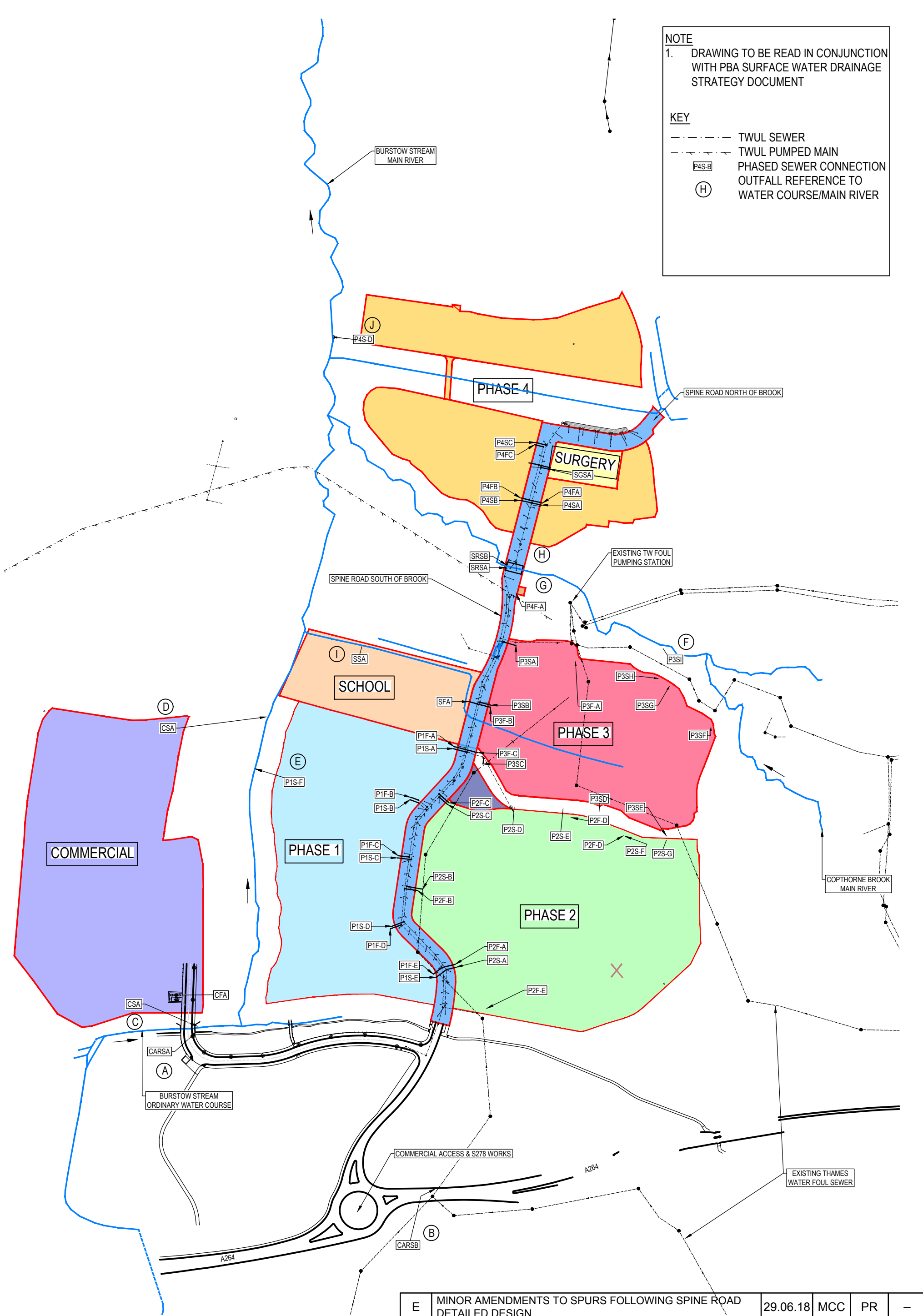
COMMERCIAL ACCESS & S278 WORKS: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
CARSA	66.400	300	1 IN 37	N/A	5.0	5.0	5.0	5.0 (WITHIN SITE)
CARSB	70.400	225	1 IN 7	N/A	14.1	44.4	72.0	72.0
CARSB (EXISTING FLOWS)					31.1	92.1	148.5	REDUCTION OF 76.5 L/S TO A264 DRAINAGE

COMMERCIAL AREA: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
CFA	63.400	150	1 IN 50	2.5				
CSA	66.400	300	1 IN 300		9.0	9.0	11.5	} 16.5
CSB	66.600	225	1 IN 100		5.0	5.0	5.0	

SCHOOL: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
SFA	64.300	150	1 IN 11.3	5.1				
SSA	66.250	150	1 IN 50		5.0	5.0	5.0	5.0

SURGERY: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
SGFA	65.500	150	1 IN 80	0.5 L/S				
SGSA	65.290	225	1 IN 24		5.0	5.0	5.0	INCLUDING PHASE 4 FLOWS

SPINE ROAD: CONNECTION POINTS								
				PEAK FLOWS FROM DEVELOPMENT PARCEL (l/s)				PEAK FLOW TOTAL OF ALL OUTFALLS TO WATER COURSE
REFERENCE	LEVEL	DIA	GRADIENT	FLOWS (FOUL)	1 YEAR STORM	30 YEAR STORM	100 YEAR STORM+20%	
SRSA	63.400	225	1 IN 45.5	N/A	13.0	13.0	13.0	13.0
SRSB	63.365	225	1 IN 170	N/A	5.0	5.0	5.0	5.0



GROSS AREAS (ha)	
COMMERCIAL	4.30
SCHOOL	1.2
SURGERY	0.22
RESIDENTIAL PHASE 1	3.461
RESIDENTIAL PHASE 2	4.597
RESIDENTIAL PHASE 3	2.721
RESIDENTIAL PHASE 4	3.033
SPINE ROAD SOUTH OF BROOK	0.72
SPINE ROAD NORTH OF BROOK	0.37

E	MINOR AMENDMENTS TO SPURS FOLLOWING SPINE ROAD DETAILED DESIGN	29.06.18	MCC	PR	-
D	SPINE ROAD AMENDED	12.06.18	RMLM	PR	PK
C	ANNOTATION ADDED, TABLE UPDATED	01.02.18	JHW	IJF	PK
B	PLAN & TABLE UPDATED TO SUIT SALES PLANS	25.01.18	RMLM	IJF	PK
A	PHASE 2 CONNECTION POINTS TABLE AMENDED	12.01.18	RMLM	PK	PK
Mark	Revision	Date	Drawn	Chkd	Appd

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

FOR INFORMATION

LAND WEST OF COPTHORNE

DRAINAGE STRATEGY SUMMARY PLAN

Client			 THE UK'S LEADING REGENERATION SPECIALIST			 Offices throughout the UK and Europe www.peterbrett.com © Peter Brett Associates LLP READING Tel: 01189 500 761		
Date of 1st Issue	10.01.2018	Designed	IJF	Drawn	RMLM			
A1 Scale	NTS	Checked	IJF	Approved	PK			
Drawing Number	24205/SK030			Revision	E			

7. Appendix B

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S1	Manhole	530569.775	139190.206	68.543	1.423	67.120	Circular	1.200
S2	Manhole	530597.909	139182.572	69.093	2.337	66.756	Circular	1.200
S3	Manhole	530606.426	139213.883	67.845	2.000	65.845	Circular	1.200
S5	Manhole	530610.381	139228.459	67.408	1.792	65.616	Circular	1.200
S6	Manhole	530603.220	139234.386	67.301	1.848	65.453	Circular	1.200
S7	Manhole	530569.741	139243.422	67.044	2.356	64.688	Circular	1.350
S14	Manhole	530564.746	139267.276	66.728	2.162	64.566	Circular	1.350
S15	Manhole	530571.267	139291.474	66.376	1.935	64.441	Circular	1.350
S16	Manhole	530575.792	139300.706	66.238	1.923	64.315	Circular	1.500
S27	Manhole	530581.628	139324.096	65.963	1.511	64.452	Circular	1.200
S28	Manhole	530583.162	139331.051	65.888	1.467	64.421	Circular	1.200
S29	Manhole	530583.159	139341.403	65.785	1.409	64.376	Circular	1.200
S30	Manhole	530588.878	139349.307	65.700	1.367	64.334	Circular	1.200
S31	Manhole	530614.246	139345.393	65.624	1.402	64.222	Circular	1.200
S26	Manhole	530627.758	139336.726	65.728	2.101	63.627	Circular	1.800
S32	Manhole	530632.909	139345.451	65.500	1.937	63.563	Circular	1.200
S33	Manhole	530633.527	139356.758	65.100	1.650	63.450	Circular	1.200
S4	Manhole	530636.508	139205.764	67.756	1.716	66.040	Circular	1.200
S8	Manhole	530559.348	139191.959	68.407	1.350	67.057	Circular	1.200
S9	Manhole	530534.950	139198.112	67.809	2.108	65.701	Circular	1.200
S11	Manhole	530539.501	139214.945	67.561	2.034	65.527	Circular	1.200
S12	Manhole	530542.881	139223.348	67.447	2.011	65.436	Circular	1.200
S13	Manhole	530548.854	139230.359	67.326	1.982	65.344	Circular	1.200
S10	Manhole	530515.854	139202.861	67.248	1.350	65.898	Circular	1.200
S19	Manhole	530649.327	139237.754	66.599	1.326	65.273	Circular	1.200
S20	Manhole	530654.135	139255.472	66.458	2.191	64.267	Circular	1.350
S21	Manhole	530654.997	139258.649	66.444	2.186	64.258	Circular	1.350
S22	Manhole	530649.378	139275.921	66.276	2.070	64.206	Circular	1.350
S18	Manhole	530651.024	139282.021	66.229	2.266	63.963	Circular	1.500
S23	Manhole	530655.203	139286.948	66.197	2.250	63.947	Circular	1.500
S24	Manhole	530661.560	139311.240	66.039	2.155	63.884	Circular	1.500
S25	Manhole	530656.992	139318.479	65.956	2.093	63.863	Circular	1.500
S17	Manhole	530585.048	139299.829	66.244	2.110	64.134	Circular	1.500

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Junctions Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Lock
S1	None
S2	None
S3	None
S5	None
S6	None
S7	None
S14	None
S15	None
S16	None
S27	None
S28	None
S29	None
S30	None
S31	None
S26	None
S32	None
S33	All
S4	None
S8	All
S9	All
S11	All
S12	All
S13	All
S10	All
S19	None
S20	None
S21	None
S22	None
S18	None
S23	None
S24	None
S25	None
S17	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S1	Inlet	Catchment Area (92) Catchment Area (156)	(None)	No Restriction
	Inlet (3)	Catchment Area (90) Catchment Area (74)	(None)	No Restriction
	Inlet (4)	Catchment Area (91)	(None)	No Restriction
S2	Inlet	S1.000 Catchment Area (94) Catchment Area (93)	(None)	No Restriction
S3	Inlet	S1.001 S2.000 Catchment Area (78) Catchment Area (108)	(None)	No Restriction
	Inlet (1)	Catchment Area (77)	(None)	No Restriction
S5	Inlet	S1.002	(None)	No Restriction
S6	Inlet	S1.003 Catchment Area (154) Catchment Area (125) Catchment Area (126)	(None)	No Restriction
	Inlet (1)	Catchment Area (127) Catchment Area (82)	(None)	No Restriction
	Inlet (3)	Catchment Area (80)	(None)	No Restriction
S7	Inlet	S1.004 S3.004 Catchment Area (6) Catchment Area (131)	(None)	No Restriction
	Inlet (1)	Catchment Area (129)	(None)	No Restriction

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S14	Inlet	S1.005 Catchment Area (133)	(None)	No Restriction
	Inlet (1)	Catchment Area (132)	(None)	No Restriction
S15	Inlet	S1.006	(None)	No Restriction
S16	Inlet	S1.007 Catchment Area (121) Catchment Area (119) Catchment Area (41)	(None)	No Restriction
	Inlet (1)	Catchment Area (7)	(None)	No Restriction
S27	Inlet	Catchment Area (145)	(None)	No Restriction
S28	Inlet	S7.000 Catchment Area (8)	(None)	No Restriction
S29	Inlet	S7.001	(None)	No Restriction
S30	Inlet	S7.002 Catchment Area (9)	(None)	No Restriction
S31	Inlet	S7.003	(None)	No Restriction
S26	Inlet	S7.004 S1.013	(None)	No Restriction
	Inlet (1)	Catchment Area (10)	(None)	No Restriction
S32	Inlet	S1.015	(None)	No Restriction
S33	Inlet	S1.016	(None)	No Restriction
S4	Inlet	Catchment Area (104) Catchment Area (106) Catchment Area (107)	(None)	No Restriction
	Inlet (1)	Catchment Area (105)	(None)	No Restriction
S8	Inlet	Catchment Area (4) Catchment Area (89)	(None)	No Restriction
	Inlet (1)	Catchment Area (86)	(None)	No Restriction
S9	Inlet	S3.000 S4.000 Catchment Area (99)	(None)	No Restriction
S11	Inlet	S3.001	(None)	No Restriction
S12	Inlet	S3.002 Catchment Area (95) Catchment Area (83)	(None)	No Restriction
S13	Inlet	S3.003 Catchment Area (60)	(None)	No Restriction
S10	Inlet	Catchment Area (5) Catchment Area (73) Catchment Area (103)	(None)	No Restriction
	Inlet (1)	Catchment Area (100)	(None)	No Restriction
	Inlet (2)	Catchment Area (101)	(None)	No Restriction
S19	Inlet (1)	Catchment Area (155) Catchment Area (109) Catchment Area (111) Catchment Area (112) Catchment Area (153)	(None)	No Restriction
S20	Inlet	S5.000 S6.000 Catchment Area (114) Catchment Area (115)	(None)	No Restriction
S21	Inlet	S5.001	(None)	No Restriction
S22	Inlet	S5.002	(None)	No Restriction
S18	Inlet	S5.003 S1.009	(None)	No Restriction
S23	Inlet	S1.010 Catchment Area (135)	(None)	No Restriction
S24	Inlet	S1.011 Catchment Area (11)	(None)	No Restriction
S25	Inlet	S1.012	(None)	No Restriction

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S17	Inlet	S1.008 Catchment Area (122) Catchment Area (144) Catchment Area (150)	(None)	No Restriction
	Inlet (1)	Catchment Area (141) Catchment Area (120)	(None)	No Restriction
	Inlet (2)	Catchment Area (139)	(None)	No Restriction

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
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Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S1	Outlet	S1.000	Free Discharge
S2	Outlet	S1.001	Free Discharge
S3	Outlet	S1.002	Free Discharge
S5	Outlet	S1.003	Free Discharge
S6	Outlet	S1.004	Free Discharge
S7	Outlet	S1.005	Free Discharge
S14	Outlet	S1.006	Free Discharge
S15	Outlet	S1.007	Free Discharge
S16	Outlet	S1.008	Free Discharge
S27	Outlet	S7.000	Free Discharge
S28	Outlet	S7.001	Free Discharge
S29	Outlet	S7.002	Free Discharge
S30	Outlet	S7.003	Free Discharge
S31	Outlet	S7.004	Free Discharge
S26	Outlet	S1.014	Free Discharge
S32	Outlet	S1.016	Free Discharge
S4	Outlet	S2.000	Free Discharge
S8	Outlet	S3.000	Free Discharge
S9	Outlet	S3.001	Free Discharge
S11	Outlet	S3.002	Free Discharge
S12	Outlet	S3.003	Free Discharge
S13	Outlet	S3.004	Free Discharge
S10	Outlet	S4.000	Free Discharge
S19	Outlet	S5.000	Free Discharge
S20	Outlet	S5.001	Free Discharge
S21	Outlet	S5.002	Free Discharge
S22	Outlet	S5.003	Free Discharge
S18	Outlet	S1.010	Free Discharge
S23	Outlet	(None)	Hydro-Brake®
	Invert Level (m)	63.947	
	Design Depth (m)	0.800	
	Design Flow (L/s)	4.5	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0099-4500-0800-4500	
	Depth (m) 1 0.8 0.6 0.4 0.2 0 0 1 2 3 4 Flow (L/s)		
	Outlet (1)	S1.011	Weir
S24	Width (m)	1.000	
	Coefficient of Discharge	0.544	
	Crest Level (m)	65.335	
S24	Outlet	S1.012	Free Discharge
S25	Outlet	S1.013	Free Discharge
S17	Outlet	S1.009	Free Discharge

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Stormwater Controls Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.510
Depth (m)	1.200
Base Level (m)	63.614
Number of Crates Long	8
Number of Crates Wide	8
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	37.176

Inlets

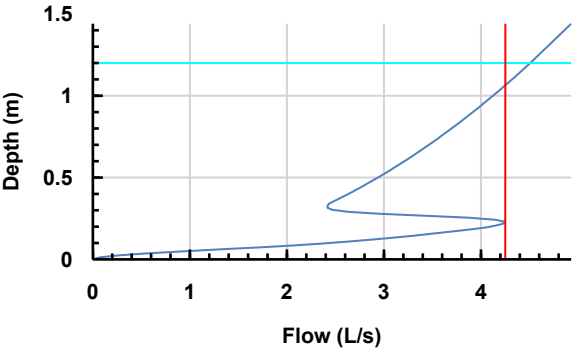
Inlet

Inlet Type	Point Inflow
Incoming Item(s)	S1.014
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	S1.015
Outlet Type	Hydro-Brake®
Invert Level (m)	63.614
Design Depth (m)	1.200
Design Flow (L/s)	4.5
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐
Unit Reference	CHE-0093-4500-1200-4500



Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Stormwater Controls Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		





Cellular Storage (1)

Type : Cellular Storage

Dimensions

Exceedance Level (m)	66.660
Depth (m)	2.000
Base Level (m)	64.319
Number of Crates Long	25
Number of Crates Wide	24
Number of Crates High	5
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	570.341

Inlets

Outlets

Outlet

Outgoing Connection	S6.000
Outlet Type	Free Discharge

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Connections Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
S1.000	29.152	Pipe	100.000		0.6	150	68.543	67.120
S1.001	32.449	Pipe	35.635		0.6	225	69.093	66.756
S1.002	15.102	Pipe	97.904		0.6	225	67.845	65.845
S1.003	9.296	Pipe	57.000		0.6	300	67.408	65.616
S1.004	34.678	Pipe	57.000		0.6	300	67.301	65.453
S1.005	24.371	Pipe	199.763		0.6	450	67.044	64.688
S1.006	25.061	Pipe	200.488		0.6	450	66.728	64.566
S1.007	10.282	Pipe	200.000		0.6	450	66.376	64.441
S7.000	7.122	Pipe	230.000		0.6	300	65.963	64.452
S7.001	10.352	Pipe	230.000		0.6	300	65.888	64.421
S7.002	9.756	Pipe	230.000		0.6	300	65.785	64.376
S7.003	25.668	Pipe	230.000		0.6	300	65.700	64.334
S7.004	16.053	Pipe	230.000		0.6	300	65.624	64.222
S2.000	31.159	Pipe	160.000		0.6	225	67.756	66.040
S3.000	25.162	Pipe	18.563		0.6	150	68.407	67.057
S3.001	17.437	Pipe	100.000		0.6	150	67.809	65.701
S3.002	9.058	Pipe	100.000		0.6	150	67.561	65.527
S3.003	9.211	Pipe	100.000		0.6	150	67.447	65.436
S3.004	24.635	Pipe	69.186		0.6	150	67.326	65.344
S4.000	19.678	Pipe	100.000		0.6	150	67.248	65.898
S5.000	18.359	Pipe	26.021		0.6	150	66.599	65.273
S5.002	18.163	Pipe	350.000		0.6	450	66.444	64.258
S5.003	6.318	Pipe	350.000		0.6	450	66.276	64.206
S1.010	6.461	Pipe	400.000		0.6	675	66.229	63.963
S1.011	25.110	Pipe	400.000		0.6	675	66.197	63.947
S1.012	8.560	Pipe	400.000		0.6	675	66.039	63.884
S1.013	34.461	Pipe	400.711		0.6	675	65.956	63.863
S1.014	6.182	Pipe	487.064		0.6	825	65.728	63.627
S6.000	17.382	Pipe	334.263		0.6	450	66.938	64.319
S1.016	11.323	Pipe	100.000		0.6	150	65.500	63.563
S1.015	3.951	Pipe	78.016		0.6	150	65.510	63.614
S5.001	3.292	Pipe	365.819		0.6	450	66.458	64.267
S1.008	9.297	Pipe	300.000		0.6	525	66.238	64.315
S1.009	68.337	Pipe	400.000		0.6	675	66.244	64.134

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Connections Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Min. Downstream Invert Level (m)	Flow Restriction (L/s)	Culvert Type	Culvert Entrance
S1.000	69.093	66.828	All	0.000		(None)	(None)
S1.001	67.845	65.845	All	0.000		(None)	(None)
S1.002	67.408	65.691	All	0.000		(None)	(None)
S1.003	67.301	65.453	All	0.000		(None)	(None)
S1.004	67.044	64.845	All	0.000		(None)	(None)
S1.005	66.728	64.566	All	0.000		(None)	(None)
S1.006	66.376	64.441	All	0.000		(None)	(None)
S1.007	66.238	64.390	All	0.000		(None)	(None)
S7.000	65.888	64.421	All	0.000		(None)	(None)
S7.001	65.785	64.376	All	0.000		(None)	(None)
S7.002	65.700	64.334	All	0.000		(None)	(None)
S7.003	65.624	64.222	All	0.000		(None)	(None)
S7.004	65.728	64.152	All	0.000		(None)	(None)
S2.000	67.845	65.845	All	0.000		(None)	(None)
S3.000	67.809	65.701	All	0.000		(None)	(None)
S3.001	67.561	65.527	All	0.000		(None)	(None)
S3.002	67.447	65.436	All	0.000		(None)	(None)
S3.003	67.326	65.344	All	0.000		(None)	(None)
S3.004	67.044	64.988	All	0.000		(None)	(None)
S4.000	67.809	65.701	All	0.000		(None)	(None)
S5.000	66.458	64.567	All	0.000		(None)	(None)
S5.002	66.276	64.206	All	0.000		(None)	(None)
S5.003	66.229	64.188	All	0.000		(None)	(None)
S1.010	66.197	63.947	All	0.000		(None)	(None)
S1.011	66.039	63.884	All	0.000	1364.2	(None)	(None)
S1.012	65.956	63.863	All	0.000		(None)	(None)
S1.013	65.728	63.777	All	0.000		(None)	(None)
S1.014	65.510	63.614	All	0.000		(None)	(None)
S6.000	66.458	64.267	All	0.000		(None)	(None)
S1.016	65.100	63.450	All	0.000		(None)	(None)
S1.015	65.500	63.563	All	0.000	4.9	(None)	(None)
S5.001	66.444	64.258	All	0.000		(None)	(None)
S1.008	66.244	64.284	All	0.000		(None)	(None)
S1.009	66.229	63.963	All	0.000		(None)	(None)

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Designed by: JDM	Checked by: JDM		Approved By: MCC
		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S1	68.543 67.120	Diameter / Length: 1.200					Manhole
E:530569.775 N:139190.206	1.423						
			{a} S1.000	Pipe	67.120	Diam/Width:150	Not Applicable
S2	69.093 66.756	Diameter / Length: 1.200	{1} S1.000	Pipe	66.828	Diam/Width:150	Manhole
E:530597.909 N:139182.572	2.337						
			{a} S1.001	Pipe	66.756	Diam/Width:225	Not Applicable
S3	67.845 65.845	Diameter / Length: 1.200	{1} S1.001	Pipe	65.845	Diam/Width:225	Manhole
E:530606.426 N:139213.883	2.000		{2} S2.000	Pipe	65.845	Diam/Width:225	
			{a} S1.002	Pipe	65.845	Diam/Width:225	Not Applicable
S5	67.408 65.616	Diameter / Length: 1.200	{1} S1.002	Pipe	65.691	Diam/Width:225	Manhole
E:530610.381 N:139228.459	1.792						
			{a} S1.003	Pipe	65.616	Diam/Width:300	Not Applicable
S6	67.301 65.453	Diameter / Length: 1.200	{1} S1.003	Pipe	65.453	Diam/Width:300	Manhole
E:530603.220 N:139234.386	1.848						
			{a} S1.004	Pipe	65.453	Diam/Width:300	Not Applicable

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
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Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S7	67.044 64.688	Diameter / Length: 1.350	{1} S1.004	Pipe	64.845	Diam/Width:300	Manhole
E:530569.741 N:139243.422	2.356		{2} S3.004	Pipe	64.988	Diam/Width:150	
			{a} S1.005	Pipe	64.688	Diam/Width:450	Not Applicable
S14	66.728 64.566	Diameter / Length: 1.350	{1} S1.005	Pipe	64.566	Diam/Width:450	Manhole
E:530564.746 N:139267.276	2.162						
			{a} S1.006	Pipe	64.566	Diam/Width:450	Not Applicable
S15	66.376 64.441	Diameter / Length: 1.350	{1} S1.006	Pipe	64.441	Diam/Width:450	Manhole
E:530571.267 N:139291.474	1.935						
			{a} S1.007	Pipe	64.441	Diam/Width:450	Not Applicable
S16	66.238 64.315	Diameter / Length: 1.500	{1} S1.007	Pipe	64.390	Diam/Width:450	Manhole
E:530575.792 N:139300.706	1.923						
			{a} S1.008	Pipe	64.315	Diam/Width:525	Not Applicable
S27	65.963 64.452	Diameter / Length: 1.200					Manhole
E:530581.628 N:139324.096	1.511						
			{a} S7.000	Pipe	64.452	Diam/Width:300	Not Applicable

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Designed by: JDM	Checked by: JDM		Approved By: MCC
		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S28	65.888 64.421	Diameter / Length: 1.200	{1} S7.000	Pipe	64.421	Diam/Width:300	Manhole
E:530583.162 N:139331.051	1.467						
			{a} S7.001	Pipe	64.421	Diam/Width:300	Not Applicable
S29	65.785 64.376	Diameter / Length: 1.200	{1} S7.001	Pipe	64.376	Diam/Width:300	Manhole
E:530583.159 N:139341.403	1.409						
			{a} S7.002	Pipe	64.376	Diam/Width:300	Not Applicable
S30	65.700 64.334	Diameter / Length: 1.200	{1} S7.002	Pipe	64.334	Diam/Width:300	Manhole
E:530588.878 N:139349.307	1.367						
			{a} S7.003	Pipe	64.334	Diam/Width:300	Not Applicable
S31	65.624 64.222	Diameter / Length: 1.200	{1} S7.003	Pipe	64.222	Diam/Width:300	Manhole
E:530614.246 N:139345.393	1.402						
			{a} S7.004	Pipe	64.222	Diam/Width:300	Not Applicable
S26	65.728 63.627	Diameter / Length: 1.800	{1} S7.004	Pipe	64.152	Diam/Width:300	Manhole
E:530627.758 N:139336.726	2.101		{2} S1.013	Pipe	63.777	Diam/Width:675	
			{a} S1.014	Pipe	63.627	Diam/Width:825	Not Applicable

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S32	65.500 63.563	Diameter / Length: 1.200	{1} S1.015	Pipe	63.563	Diam/Width:150	Manhole
E:530632.909 N:139345.451	1.937						
			{a} S1.016	Pipe	63.563	Diam/Width:150	Not Applicable
S33	65.100 63.450	Diameter / Length: 1.200	{1} S1.016	Pipe	63.450	Diam/Width:150	Manhole
E:530633.527 N:139356.758	1.650						
							Not Applicable
S4	67.756 66.040	Diameter / Length: 1.200					Manhole
E:530636.508 N:139205.764	1.716						
			{a} S2.000	Pipe	66.040	Diam/Width:225	Not Applicable
S8	68.407 67.057	Diameter / Length: 1.200					Manhole
E:530559.348 N:139191.959	1.350						
			{a} S3.000	Pipe	67.057	Diam/Width:150	Not Applicable
S9	67.809 65.701	Diameter / Length: 1.200	{1} S3.000	Pipe	65.701	Diam/Width:150	Manhole
E:530534.950 N:139198.112	2.108		{2} S4.000	Pipe	65.701	Diam/Width:150	
			{a} S3.001	Pipe	65.701	Diam/Width:150	Not Applicable

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Designed by: JDM	Checked by: JDM		Approved By: MCC
		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S11	67.561 65.527	Diameter / Length: 1.200	{1} S3.001	Pipe	65.527	Diam/Width:150	Manhole
E:530539.501 N:139214.945	2.034						
			{a} S3.002	Pipe	65.527	Diam/Width:150	Not Applicable
S12	67.447 65.436	Diameter / Length: 1.200	{1} S3.002	Pipe	65.436	Diam/Width:150	Manhole
E:530542.881 N:139223.348	2.011						
			{a} S3.003	Pipe	65.436	Diam/Width:150	Not Applicable
S13	67.326 65.344	Diameter / Length: 1.200	{1} S3.003	Pipe	65.344	Diam/Width:150	Manhole
E:530548.854 N:139230.359	1.982						
			{a} S3.004	Pipe	65.344	Diam/Width:150	Not Applicable
S10	67.248 65.898	Diameter / Length: 1.200					Manhole
E:530515.854 N:139202.861	1.350						
			{a} S4.000	Pipe	65.898	Diam/Width:150	Not Applicable
S19	66.599 65.273	Diameter / Length: 1.200					Manhole
E:530649.327 N:139237.754	1.326						
			{a} S5.000	Pipe	65.273	Diam/Width:150	Not Applicable

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S20	66.458 64.267	Diameter / Length: 1.350	{1} S5.000	Pipe	64.567	Diam/Width:150	Manhole
E:530654.135 N:139255.472	2.191		{2} S6.000	Pipe	64.267	Diam/Width:450	
			{a} S5.001	Pipe	64.267	Diam/Width:450	Not Applicable
S21	66.444 64.258	Diameter / Length: 1.350	{1} S5.001	Pipe	64.258	Diam/Width:450	Manhole
E:530654.997 N:139258.649	2.186						
			{a} S5.002	Pipe	64.258	Diam/Width:450	Not Applicable
S22	66.276 64.206	Diameter / Length: 1.350	{1} S5.002	Pipe	64.206	Diam/Width:450	Manhole
E:530649.378 N:139275.921	2.070						
			{a} S5.003	Pipe	64.206	Diam/Width:450	Not Applicable
S18	66.229 63.963	Diameter / Length: 1.500	{1} S5.003	Pipe	64.188	Diam/Width:450	Manhole
E:530651.024 N:139282.021	2.266		{2} S1.009	Pipe	63.963	Diam/Width:675	
			{a} S1.010	Pipe	63.963	Diam/Width:675	Not Applicable
S23	66.197 63.947	Diameter / Length: 1.500	{1} S1.010	Pipe	63.947	Diam/Width:675	Manhole
E:530655.203 N:139286.948	2.250						
			{a} S1.011	Pipe	63.947	Diam/Width:675	Not Applicable

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S24	66.039 63.884	Diameter / Length: 1.500	{1} S1.011	Pipe	63.884	Diam/Width:675	Manhole
E:530661.560 N:139311.240	2.155						
			{a} S1.012	Pipe	63.884	Diam/Width:675	Not Applicable
S25	65.956 63.863	Diameter / Length: 1.500	{1} S1.012	Pipe	63.863	Diam/Width:675	Manhole
E:530656.992 N:139318.479	2.093						
			{a} S1.013	Pipe	63.863	Diam/Width:675	Not Applicable
S17	66.244 64.134	Diameter / Length: 1.500	{1} S1.008	Pipe	64.284	Diam/Width:525	Manhole
E:530585.048 N:139299.829	2.110						
			{a} S1.009	Pipe	64.134	Diam/Width:675	Not Applicable

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Inflow Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area (4)	S8		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (5)	S10		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (6)	S7		Time of Concentration	0.205	100	0	100	0.205
Catchment Area (7)	S16		Time of Concentration	0.133	100	0	100	0.133
Catchment Area (8)	S28		Time of Concentration	0.101	100	0	100	0.101
Catchment Area (9)	S30		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (10)	S26		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (11)	S24		Time of Concentration	0.038	100	0	100	0.038
Catchment Area (41)	S16		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (60)	S13		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (73)	S10		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (74)	S1		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (77)	S3		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (78)	S3		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (80)	S6		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (82)	S6		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (83)	S12		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (86)	S8		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (89)	S8		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (90)	S1		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (91)	S1		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (92)	S1		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (93)	S2		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (94)	S2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (95)	S12		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (99)	S9		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (100)	S10		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (101)	S10		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (103)	S10		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (104)	S4		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (105)	S4		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (106)	S4		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (107)	S4		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (108)	S3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (109)	S19		Time of Concentration	0.002	100	0	100	0.002
Catchment Area (111)	S19		Time of Concentration	0.009	100	0	100	0.009

Project: Coptthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Inflow Summary Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (112)	S19		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (114)	S20		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (115)	S20		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (119)	S16		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (120)	S17		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (121)	S16		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (122)	S17		Time of Concentration	0.017	100	0	100	0.017
Catchment Area (125)	S6		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (126)	S6		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (127)	S6		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (129)	S7		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (131)	S7		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (132)	S14		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (133)	S14		Time of Concentration	0.017	100	0	100	0.017
Catchment Area (135)	S23		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (139)	S17		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (141)	S17		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (144)	S17		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (145)	S27		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (150)	S17		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (153)	S19		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (154)	S6		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (155)	S19		Time of Concentration	0.023	100	0	100	0.023
Catchment Area (156)	S1		Time of Concentration	0.028	100	0	100	0.028
TOTAL		0.0		0.989				0.989

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S1.000	S1	S2	29.152	Pipe	100.000	0.6	150	68.543
S1.001	S2	S3	32.449	Pipe	35.635	0.6	225	69.093
Branch: S2.000								
S2.000	S4	S3	31.159	Pipe	160.000	0.6	225	67.756
S1.002	S3	S5	15.102	Pipe	97.904	0.6	225	67.845
S1.003	S5	S6	9.296	Pipe	57.000	0.6	300	67.408
S1.004	S6	S7	34.678	Pipe	57.000	0.6	300	67.301
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
Branch: S4.000								
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561
S3.003	S12	S13	9.211	Pipe	100.000	0.6	150	67.447
S3.004	S13	S7	24.635	Pipe	69.186	0.6	150	67.326
S1.005	S7	S14	24.371	Pipe	199.763	0.6	450	67.044
S1.006	S14	S15	25.061	Pipe	200.488	0.6	450	66.728
S1.007	S15	S16	10.282	Pipe	200.000	0.6	450	66.376
S1.008	S16	S17	9.297	Pipe	300.000	0.6	525	66.238
S1.009	S17	S18	68.337	Pipe	400.000	0.6	675	66.244
Branch: S5.000								
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276
S1.010	S18	S23	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S23	S24	25.110	Pipe	400.000	0.6	675	66.197
S1.012	S24	S25	8.560	Pipe	400.000	0.6	675	66.039
S1.013	S25	S26	34.461	Pipe	400.711	0.6	675	65.956
Branch: S7.000								
S7.000	S27	S28	7.122	Pipe	230.000	0.6	300	65.963
S7.001	S28	S29	10.352	Pipe	230.000	0.6	300	65.888
S7.002	S29	S30	9.756	Pipe	230.000	0.6	300	65.785
S7.003	S30	S31	25.668	Pipe	230.000	0.6	300	65.700
S7.004	S31	S26	16.053	Pipe	230.000	0.6	300	65.624
S1.014	S26	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S32	3.951	Pipe	78.016	0.6	150	65.510
S1.016	S32	S33	11.323	Pipe	100.000	0.6	150	65.500

Project: Copthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S1.000	67.120	69.093	66.828		5	
S1.001	66.756	67.845	65.845		5	
Branch: S2.000						
S2.000	66.040	67.845	65.845		5	
S1.002	65.845	67.408	65.691		5	
S1.003	65.616	67.301	65.453		0	
S1.004	65.453	67.044	64.845		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
Branch: S4.000						
S4.000	65.898	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	
S3.003	65.436	67.326	65.344		5	
S3.004	65.344	67.044	64.988		5	
S1.005	64.688	66.728	64.566		5	
S1.006	64.566	66.376	64.441		5	
S1.007	64.441	66.238	64.390		0	
S1.008	64.315	66.244	64.284		5	
S1.009	64.134	66.229	63.963		5	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	
S1.010	63.963	66.197	63.947		0	
S1.011	63.947	66.039	63.884		5	
S1.012	63.884	65.956	63.863		5	
S1.013	63.863	65.728	63.777		0	
Branch: S7.000						
S7.000	64.452	65.888	64.421		5	
S7.001	64.421	65.785	64.376		5	
S7.002	64.376	65.700	64.334		0	
S7.003	64.334	65.624	64.222		5	
S7.004	64.222	65.728	64.152		0	
S1.014	63.627	65.510	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (3)	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
Branch: S5.000								
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276
Branch: S1.000								
S1.000	S1	S2	29.152	Pipe	100.000	0.6	150	68.543
S1.001	S2	S3	32.449	Pipe	35.635	0.6	225	69.093
Branch: S2.000								
S2.000	S4	S3	31.159	Pipe	160.000	0.6	225	67.756
S1.002	S3	S5	15.102	Pipe	97.904	0.6	225	67.845
S1.003	S5	S6	9.296	Pipe	57.000	0.6	300	67.408
S1.004	S6	S7	34.678	Pipe	57.000	0.6	300	67.301
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
Branch: S4.000								
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561
S3.003	S12	S13	9.211	Pipe	100.000	0.6	150	67.447
S3.004	S13	S7	24.635	Pipe	69.186	0.6	150	67.326
S1.005	S7	S14	24.371	Pipe	199.763	0.6	450	67.044
S1.006	S14	S15	25.061	Pipe	200.488	0.6	450	66.728
S1.007	S15	S16	10.282	Pipe	200.000	0.6	450	66.376
S1.008	S16	S17	9.297	Pipe	300.000	0.6	525	66.238
S1.009	S17	S18	68.337	Pipe	400.000	0.6	675	66.244
S1.010	S18	S23	6.461	Pipe	400.000	0.6	675	66.229

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S6.000	64.319	66.458	64.267		0	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	
Branch: S1.000						
S1.000	67.120	69.093	66.828		5	
S1.001	66.756	67.845	65.845		5	
Branch: S2.000						
S2.000	66.040	67.845	65.845		5	
S1.002	65.845	67.408	65.691		5	
S1.003	65.616	67.301	65.453		0	
S1.004	65.453	67.044	64.845		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
Branch: S4.000						
S4.000	65.898	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	
S3.003	65.436	67.326	65.344		5	
S3.004	65.344	67.044	64.988		5	
S1.005	64.688	66.728	64.566		5	
S1.006	64.566	66.376	64.441		5	
S1.007	64.441	66.238	64.390		0	
S1.008	64.315	66.244	64.284		5	
S1.009	64.134	66.229	63.963		5	
S1.010	63.963	66.197	63.947		0	

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (4)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561
S3.003	S12	S13	9.211	Pipe	100.000	0.6	150	67.447
S3.004	S13	S7	24.635	Pipe	69.186	0.6	150	67.326
Branch: S1.000								
S1.000	S1	S2	29.152	Pipe	100.000	0.6	150	68.543
S1.001	S2	S3	32.449	Pipe	35.635	0.6	225	69.093
Branch: S2.000								
S2.000	S4	S3	31.159	Pipe	160.000	0.6	225	67.756
S1.002	S3	S5	15.102	Pipe	97.904	0.6	225	67.845
S1.003	S5	S6	9.296	Pipe	57.000	0.6	300	67.408
S1.004	S6	S7	34.678	Pipe	57.000	0.6	300	67.301
S1.005	S7	S14	24.371	Pipe	199.763	0.6	450	67.044
S1.006	S14	S15	25.061	Pipe	200.488	0.6	450	66.728
S1.007	S15	S16	10.282	Pipe	200.000	0.6	450	66.376
S1.008	S16	S17	9.297	Pipe	300.000	0.6	525	66.238
S1.009	S17	S18	68.337	Pipe	400.000	0.6	675	66.244
Branch: S5.000								
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276
S1.010	S18	S23	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S23	S24	25.110	Pipe	400.000	0.6	675	66.197
S1.012	S24	S25	8.560	Pipe	400.000	0.6	675	66.039
S1.013	S25	S26	34.461	Pipe	400.711	0.6	675	65.956
Branch: S7.000								
S7.000	S27	S28	7.122	Pipe	230.000	0.6	300	65.963
S7.001	S28	S29	10.352	Pipe	230.000	0.6	300	65.888
S7.002	S29	S30	9.756	Pipe	230.000	0.6	300	65.785
S7.003	S30	S31	25.668	Pipe	230.000	0.6	300	65.700
S7.004	S31	S26	16.053	Pipe	230.000	0.6	300	65.624
S1.014	S26	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S32	3.951	Pipe	78.016	0.6	150	65.510
S1.016	S32	S33	11.323	Pipe	100.000	0.6	150	65.500

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (4)		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S4.000	65.898	67.809	65.701		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	
S3.003	65.436	67.326	65.344		5	
S3.004	65.344	67.044	64.988		5	
Branch: S1.000						
S1.000	67.120	69.093	66.828		5	
S1.001	66.756	67.845	65.845		5	
Branch: S2.000						
S2.000	66.040	67.845	65.845		5	
S1.002	65.845	67.408	65.691		5	
S1.003	65.616	67.301	65.453		0	
S1.004	65.453	67.044	64.845		5	
S1.005	64.688	66.728	64.566		5	
S1.006	64.566	66.376	64.441		5	
S1.007	64.441	66.238	64.390		0	
S1.008	64.315	66.244	64.284		5	
S1.009	64.134	66.229	63.963		5	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	
S1.010	63.963	66.197	63.947		0	
S1.011	63.947	66.039	63.884		5	
S1.012	63.884	65.956	63.863		5	
S1.013	63.863	65.728	63.777		0	
Branch: S7.000						
S7.000	64.452	65.888	64.421		5	
S7.001	64.421	65.785	64.376		5	
S7.002	64.376	65.700	64.334		0	
S7.003	64.334	65.624	64.222		5	
S7.004	64.222	65.728	64.152		0	
S1.014	63.627	65.510	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (5)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276
Branch: S1.000								
S1.000	S1	S2	29.152	Pipe	100.000	0.6	150	68.543
S1.001	S2	S3	32.449	Pipe	35.635	0.6	225	69.093
Branch: S2.000								
S2.000	S4	S3	31.159	Pipe	160.000	0.6	225	67.756
S1.002	S3	S5	15.102	Pipe	97.904	0.6	225	67.845
S1.003	S5	S6	9.296	Pipe	57.000	0.6	300	67.408
S1.004	S6	S7	34.678	Pipe	57.000	0.6	300	67.301
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
Branch: S4.000								
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561
S3.003	S12	S13	9.211	Pipe	100.000	0.6	150	67.447
S3.004	S13	S7	24.635	Pipe	69.186	0.6	150	67.326
S1.005	S7	S14	24.371	Pipe	199.763	0.6	450	67.044
S1.006	S14	S15	25.061	Pipe	200.488	0.6	450	66.728
S1.007	S15	S16	10.282	Pipe	200.000	0.6	450	66.376
S1.008	S16	S17	9.297	Pipe	300.000	0.6	525	66.238
S1.009	S17	S18	68.337	Pipe	400.000	0.6	675	66.244
S1.010	S18	S23	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S23	S24	25.110	Pipe	400.000	0.6	675	66.197
S1.012	S24	S25	8.560	Pipe	400.000	0.6	675	66.039
S1.013	S25	S26	34.461	Pipe	400.711	0.6	675	65.956
Branch: S7.000								
S7.000	S27	S28	7.122	Pipe	230.000	0.6	300	65.963
S7.001	S28	S29	10.352	Pipe	230.000	0.6	300	65.888
S7.002	S29	S30	9.756	Pipe	230.000	0.6	300	65.785
S7.003	S30	S31	25.668	Pipe	230.000	0.6	300	65.700
S7.004	S31	S26	16.053	Pipe	230.000	0.6	300	65.624
S1.014	S26	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S32	3.951	Pipe	78.016	0.6	150	65.510
S1.016	S32	S33	11.323	Pipe	100.000	0.6	150	65.500

Project: Copthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (5)		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	
Branch: S1.000						
S1.000	67.120	69.093	66.828		5	
S1.001	66.756	67.845	65.845		5	
Branch: S2.000						
S2.000	66.040	67.845	65.845		5	
S1.002	65.845	67.408	65.691		5	
S1.003	65.616	67.301	65.453		0	
S1.004	65.453	67.044	64.845		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
Branch: S4.000						
S4.000	65.898	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	
S3.003	65.436	67.326	65.344		5	
S3.004	65.344	67.044	64.988		5	
S1.005	64.688	66.728	64.566		5	
S1.006	64.566	66.376	64.441		5	
S1.007	64.441	66.238	64.390		0	
S1.008	64.315	66.244	64.284		5	
S1.009	64.134	66.229	63.963		5	
S1.010	63.963	66.197	63.947		0	
S1.011	63.947	66.039	63.884		5	
S1.012	63.884	65.956	63.863		5	
S1.013	63.863	65.728	63.777		0	
Branch: S7.000						
S7.000	64.452	65.888	64.421		5	
S7.001	64.421	65.785	64.376		5	
S7.002	64.376	65.700	64.334		0	
S7.003	64.334	65.624	64.222		5	
S7.004	64.222	65.728	64.152		0	
S1.014	63.627	65.510	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (1)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (6)	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S2.000	S4	S3	31.159	Pipe	160.000	0.6	225	67.756
Branch: S1.000								
S1.000	S1	S2	29.152	Pipe	100.000	0.6	150	68.543
S1.001	S2	S3	32.449	Pipe	35.635	0.6	225	69.093
S1.002	S3	S5	15.102	Pipe	97.904	0.6	225	67.845
S1.003	S5	S6	9.296	Pipe	57.000	0.6	300	67.408
S1.004	S6	S7	34.678	Pipe	57.000	0.6	300	67.301
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
Branch: S4.000								
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561
S3.003	S12	S13	9.211	Pipe	100.000	0.6	150	67.447
S3.004	S13	S7	24.635	Pipe	69.186	0.6	150	67.326
S1.005	S7	S14	24.371	Pipe	199.763	0.6	450	67.044
S1.006	S14	S15	25.061	Pipe	200.488	0.6	450	66.728
S1.007	S15	S16	10.282	Pipe	200.000	0.6	450	66.376
S1.008	S16	S17	9.297	Pipe	300.000	0.6	525	66.238
S1.009	S17	S18	68.337	Pipe	400.000	0.6	675	66.244
Branch: S5.000								
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276
S1.010	S18	S23	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S23	S24	25.110	Pipe	400.000	0.6	675	66.197
S1.012	S24	S25	8.560	Pipe	400.000	0.6	675	66.039
S1.013	S25	S26	34.461	Pipe	400.711	0.6	675	65.956
Branch: S7.000								
S7.000	S27	S28	7.122	Pipe	230.000	0.6	300	65.963
S7.001	S28	S29	10.352	Pipe	230.000	0.6	300	65.888
S7.002	S29	S30	9.756	Pipe	230.000	0.6	300	65.785
S7.003	S30	S31	25.668	Pipe	230.000	0.6	300	65.700
S7.004	S31	S26	16.053	Pipe	230.000	0.6	300	65.624
S1.014	S26	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S32	3.951	Pipe	78.016	0.6	150	65.510
S1.016	S32	S33	11.323	Pipe	100.000	0.6	150	65.500

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (6)		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S2.000	66.040	67.845	65.845		5	
Branch: S1.000						
S1.000	67.120	69.093	66.828		5	
S1.001	66.756	67.845	65.845		5	
S1.002	65.845	67.408	65.691		5	
S1.003	65.616	67.301	65.453		0	
S1.004	65.453	67.044	64.845		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
Branch: S4.000						
S4.000	65.898	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	
S3.003	65.436	67.326	65.344		5	
S3.004	65.344	67.044	64.988		5	
S1.005	64.688	66.728	64.566		5	
S1.006	64.566	66.376	64.441		5	
S1.007	64.441	66.238	64.390		0	
S1.008	64.315	66.244	64.284		5	
S1.009	64.134	66.229	63.963		5	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	
S1.010	63.963	66.197	63.947		0	
S1.011	63.947	66.039	63.884		5	
S1.012	63.884	65.956	63.863		5	
S1.013	63.863	65.728	63.777		0	
Branch: S7.000						
S7.000	64.452	65.888	64.421		5	
S7.001	64.421	65.785	64.376		5	
S7.002	64.376	65.700	64.334		0	
S7.003	64.334	65.624	64.222		5	
S7.004	64.222	65.728	64.152		0	
S1.014	63.627	65.510	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (7)	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
Branch: S4.000								
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S3.000	67.057	67.809	65.701		5	
Branch: S4.000						
S4.000	65.898	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (8)	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S4.000	65.898	67.809	65.701		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	

Project: Copthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (2)	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S7.000	S27	S28	7.122	Pipe	230.000	0.6	300	65.963
S7.001	S28	S29	10.352	Pipe	230.000	0.6	300	65.888
S7.002	S29	S30	9.756	Pipe	230.000	0.6	300	65.785
S7.003	S30	S31	25.668	Pipe	230.000	0.6	300	65.700
S7.004	S31	S26	16.053	Pipe	230.000	0.6	300	65.624
Branch: S5.000								
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276
Branch: S1.000								
S1.000	S1	S2	29.152	Pipe	100.000	0.6	150	68.543
S1.001	S2	S3	32.449	Pipe	35.635	0.6	225	69.093
Branch: S2.000								
S2.000	S4	S3	31.159	Pipe	160.000	0.6	225	67.756
S1.002	S3	S5	15.102	Pipe	97.904	0.6	225	67.845
S1.003	S5	S6	9.296	Pipe	57.000	0.6	300	67.408
S1.004	S6	S7	34.678	Pipe	57.000	0.6	300	67.301
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
Branch: S4.000								
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561
S3.003	S12	S13	9.211	Pipe	100.000	0.6	150	67.447
S3.004	S13	S7	24.635	Pipe	69.186	0.6	150	67.326
S1.005	S7	S14	24.371	Pipe	199.763	0.6	450	67.044
S1.006	S14	S15	25.061	Pipe	200.488	0.6	450	66.728
S1.007	S15	S16	10.282	Pipe	200.000	0.6	450	66.376
S1.008	S16	S17	9.297	Pipe	300.000	0.6	525	66.238
S1.009	S17	S18	68.337	Pipe	400.000	0.6	675	66.244
S1.010	S18	S23	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S23	S24	25.110	Pipe	400.000	0.6	675	66.197
S1.012	S24	S25	8.560	Pipe	400.000	0.6	675	66.039
S1.013	S25	S26	34.461	Pipe	400.711	0.6	675	65.956
S1.014	S26	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S32	3.951	Pipe	78.016	0.6	150	65.510
S1.016	S32	S33	11.323	Pipe	100.000	0.6	150	65.500

Project: Cophthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (2)		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentratio n (mins)	Time Of Travel (mins)
S7.000	64.452	65.888	64.421		5	
S7.001	64.421	65.785	64.376		5	
S7.002	64.376	65.700	64.334		0	
S7.003	64.334	65.624	64.222		5	
S7.004	64.222	65.728	64.152		0	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	
Branch: S1.000						
S1.000	67.120	69.093	66.828		5	
S1.001	66.756	67.845	65.845		5	
Branch: S2.000						
S2.000	66.040	67.845	65.845		5	
S1.002	65.845	67.408	65.691		5	
S1.003	65.616	67.301	65.453		0	
S1.004	65.453	67.044	64.845		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
Branch: S4.000						
S4.000	65.898	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	
S3.003	65.436	67.326	65.344		5	
S3.004	65.344	67.044	64.988		5	
S1.005	64.688	66.728	64.566		5	
S1.006	64.566	66.376	64.441		5	
S1.007	64.441	66.238	64.390		0	
S1.008	64.315	66.244	64.284		5	
S1.009	64.134	66.229	63.963		5	
S1.010	63.963	66.197	63.947		0	
S1.011	63.947	66.039	63.884		5	
S1.012	63.884	65.956	63.863		5	
S1.013	63.863	65.728	63.777		0	
S1.014	63.627	65.510	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (9)	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S1.000	S1	S2	29.152	Pipe	100.000	0.6	150	68.543
S1.001	S2	S3	32.449	Pipe	35.635	0.6	225	69.093
Branch: S2.000								
S2.000	S4	S3	31.159	Pipe	160.000	0.6	225	67.756
S1.002	S3	S5	15.102	Pipe	97.904	0.6	225	67.845
S1.003	S5	S6	9.296	Pipe	57.000	0.6	300	67.408
S1.004	S6	S7	34.678	Pipe	57.000	0.6	300	67.301
Branch: S3.000								
S3.000	S8	S9	25.162	Pipe	18.563	0.6	150	68.407
Branch: S4.000								
S4.000	S10	S9	19.678	Pipe	100.000	0.6	150	67.248
S3.001	S9	S11	17.437	Pipe	100.000	0.6	150	67.809
S3.002	S11	S12	9.058	Pipe	100.000	0.6	150	67.561
S3.003	S12	S13	9.211	Pipe	100.000	0.6	150	67.447
S3.004	S13	S7	24.635	Pipe	69.186	0.6	150	67.326
S1.005	S7	S14	24.371	Pipe	199.763	0.6	450	67.044
S1.006	S14	S15	25.061	Pipe	200.488	0.6	450	66.728
S1.007	S15	S16	10.282	Pipe	200.000	0.6	450	66.376
S1.008	S16	S17	9.297	Pipe	300.000	0.6	525	66.238
S1.009	S17	S18	68.337	Pipe	400.000	0.6	675	66.244
Branch: S5.000								
S5.000	S19	S20	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S20	17.382	Pipe	334.263	0.6	450	66.938
S5.001	S20	S21	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S21	S22	18.163	Pipe	350.000	0.6	450	66.444
S5.003	S22	S18	6.318	Pipe	350.000	0.6	450	66.276
S1.010	S18	S23	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S23	S24	25.110	Pipe	400.000	0.6	675	66.197
S1.012	S24	S25	8.560	Pipe	400.000	0.6	675	66.039
S1.013	S25	S26	34.461	Pipe	400.711	0.6	675	65.956
Branch: S7.000								
S7.000	S27	S28	7.122	Pipe	230.000	0.6	300	65.963
S7.001	S28	S29	10.352	Pipe	230.000	0.6	300	65.888
S7.002	S29	S30	9.756	Pipe	230.000	0.6	300	65.785
S7.003	S30	S31	25.668	Pipe	230.000	0.6	300	65.700
S7.004	S31	S26	16.053	Pipe	230.000	0.6	300	65.624
S1.014	S26	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S32	3.951	Pipe	78.016	0.6	150	65.510
S1.016	S32	S33	11.323	Pipe	100.000	0.6	150	65.500

Project: Copthorne Optimisation Northern Plot Surface Water		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (9)		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S1.000	67.120	69.093	66.828		5	
S1.001	66.756	67.845	65.845		5	
Branch: S2.000						
S2.000	66.040	67.845	65.845		5	
S1.002	65.845	67.408	65.691		5	
S1.003	65.616	67.301	65.453		0	
S1.004	65.453	67.044	64.845		5	
Branch: S3.000						
S3.000	67.057	67.809	65.701		5	
Branch: S4.000						
S4.000	65.898	67.809	65.701		5	
S3.001	65.701	67.561	65.527		5	
S3.002	65.527	67.447	65.436		0	
S3.003	65.436	67.326	65.344		5	
S3.004	65.344	67.044	64.988		5	
S1.005	64.688	66.728	64.566		5	
S1.006	64.566	66.376	64.441		5	
S1.007	64.441	66.238	64.390		0	
S1.008	64.315	66.244	64.284		5	
S1.009	64.134	66.229	63.963		5	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.276	64.206		0	
S5.003	64.206	66.229	64.188		0	
S1.010	63.963	66.197	63.947		0	
S1.011	63.947	66.039	63.884		5	
S1.012	63.884	65.956	63.863		5	
S1.013	63.863	65.728	63.777		0	
Branch: S7.000						
S7.000	64.452	65.888	64.421		5	
S7.001	64.421	65.785	64.376		5	
S7.002	64.376	65.700	64.334		0	
S7.003	64.334	65.624	64.222		5	
S7.004	64.222	65.728	64.152		0	
S1.014	63.627	65.510	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Cophthorne Optimisation Northern Plot Surface Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: JDM	Approved By: MCC
Report Details: Type: Network Design Criteria Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	2.0
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.350

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	10000.00
Max. Slope (1:X)	10.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Junctions Storm Phase: Northern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S1	Manhole	530775.194	139420.893	67.397	1.350	66.047	Circular	1.200
S2	Manhole	530772.344	139404.388	67.166	1.350	65.816	Circular	1.200
S3	Manhole	530747.574	139408.431	66.681	1.350	65.331	Circular	0.650
S4	Manhole	530748.223	139412.491	66.906	1.616	65.290	Circular	0.650
S5	Manhole	530743.036	139413.856	67.219	1.982	65.236	Circular	0.650
S6	Manhole	530731.074	139417.003	67.368	2.300	65.068	Circular	1.200
S10	Manhole	530728.949	139410.445	67.124	2.102	65.022	Circular	0.650
S7	Manhole	530765.130	139429.528	67.784	1.350	66.434	Circular	0.450
S8	Manhole	530738.094	139434.196	67.554	1.396	66.158	Circular	0.450
S9	Manhole	530734.647	139432.858	67.528	1.407	66.121	Circular	0.450

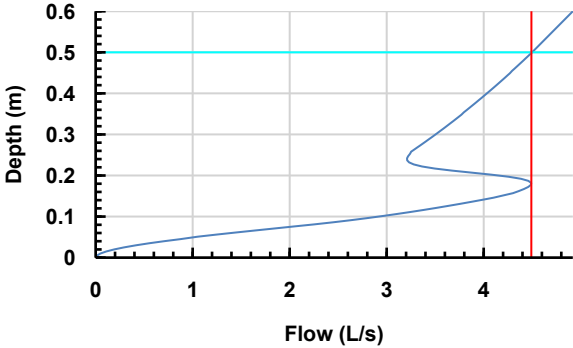
Name	Lock
S1	None
S2	None
S3	None
S4	None
S5	None
S6	None
S10	None
S7	None
S8	None
S9	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S1	Inlet (1)	Catchment Area (4) Catchment Area (14)	(None)	No Restriction
S2	Inlet	S1.000 Catchment Area (25) Catchment Area (24) Catchment Area (23)	(None)	No Restriction
S3	Inlet	S1.001	(None)	No Restriction
S4	Inlet	S1.002	(None)	No Restriction
S5	Inlet	S1.003	(None)	No Restriction
	Inlet (1)	S2.000 Catchment Area (20)	(None)	No Restriction
	Inlet (2)	Catchment Area (21) Catchment Area (22)	(None)	No Restriction
S6	Inlet	S1.004 S3.002	(None)	No Restriction
S10	Inlet	S1.005	(None)	No Restriction
S7	Inlet	Catchment Area (11) Catchment Area (9)	(None)	No Restriction
S8	Inlet	S3.000	(None)	No Restriction
S9	Inlet	S3.001 Catchment Area (10)	(None)	No Restriction

Project: Cophthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
Report Details: Type: Junctions Storm Phase: Northern Surface		Designed by: JDM	Checked by: JDM		Approved By: MCC
		Consultant : Stantec Caversham Bridge House Waterman Place			

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S1	Outlet	S1.000	Free Discharge
S2	Outlet	S1.001	Free Discharge
S3	Outlet	S1.002	Free Discharge
S4	Outlet	S1.003	Free Discharge
S5	Outlet	S1.004	Free Discharge
S6	Outlet	S1.005	Hydro-Brake®
	Invert Level (m)	65.068	
	Design Depth (m)	0.500	
	Design Flow (L/s)	4.5	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0105-4500-0500-4500	
			
S7	Outlet	S3.000	Free Discharge
S8	Outlet	S3.001	Free Discharge
S9	Outlet	S3.002	Free Discharge

Project: Cophthorne Optimisation Northern Plot Surface Water +10% Urban Creep	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Stormwater Controls Storm Phase: Northern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	67.255
Depth (m)	1.200
Base Level (m)	65.280
Number of Crates Long	4
Number of Crates Wide	13
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	30.415

Outlets

Outlet

Outgoing Connection	S2.000
Outlet Type	Free Discharge

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Connections Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
S1.000	16.750	Pipe	72.506		0.6	225	67.397	66.047
S1.001	25.098	Pipe	51.722		0.6	225	67.166	65.816
S1.002	4.112	Pipe	100.000		0.6	225	66.681	65.331
S1.003	5.363	Pipe	100.000		0.6	225	66.906	65.290
S1.004	12.369	Pipe	73.537		0.6	225	67.219	65.236
S1.005	6.893	Pipe	150.000		0.6	225	67.368	65.068
S3.000	27.436	Pipe	99.377		0.6	150	67.784	66.434
S3.001	3.698	Pipe	100.000		0.6	150	67.554	66.158
S3.002	16.253	Pipe	15.436		0.6	150	67.528	66.121
S2.000	4.914	Pipe	111.690		0.6	150	67.483	65.280

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Min. Downstream Invert Level (m)	Flow Restriction (L/s)	Culvert Type	Culvert Entrance
S1.000	67.166	65.816	All	0.000		(None)	(None)
S1.001	66.681	65.331	All	0.000		(None)	(None)
S1.002	66.906	65.290	All	0.000		(None)	(None)
S1.003	67.219	65.236	All	0.000		(None)	(None)
S1.004	67.368	65.068	All	0.000		(None)	(None)
S1.005	67.124	65.022	All	0.000	4.9	(None)	(None)
S3.000	67.554	66.158	All	0.000		(None)	(None)
S3.001	67.528	66.121	All	0.000		(None)	(None)
S3.002	67.368	65.068	All	0.000		(None)	(None)
S2.000	67.219	65.236	All	0.000		(None)	(None)

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Manhole Schedule Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S1	67.397 66.047	Diameter / Length: 1.200					Manhole
E:530775.194 N:139420.893	1.350						
			{a} S1.000	Pipe	66.047	Diam/Width:225	Not Applicable
S2	67.166 65.816	Diameter / Length: 1.200	{1} S1.000	Pipe	65.816	Diam/Width:225	Manhole
E:530772.344 N:139404.388	1.350						
			{a} S1.001	Pipe	65.816	Diam/Width:225	Not Applicable
S3	66.681 65.331	Diameter / Length: 0.650	{1} S1.001	Pipe	65.331	Diam/Width:225	Manhole
E:530747.574 N:139408.431	1.350						
			{a} S1.002	Pipe	65.331	Diam/Width:225	Not Applicable
S4	66.906 65.290	Diameter / Length: 0.650	{1} S1.002	Pipe	65.290	Diam/Width:225	Manhole
E:530748.223 N:139412.491	1.616						
			{a} S1.003	Pipe	65.290	Diam/Width:225	Not Applicable
S5	67.219 65.236	Diameter / Length: 0.650	{1} S1.003	Pipe	65.236	Diam/Width:225	Manhole
E:530743.036 N:139413.856	1.982		{2} S2.000	Pipe	65.236	Diam/Width:150	
			{a} S1.004	Pipe	65.236	Diam/Width:225	Not Applicable

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Manhole Schedule Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S6	67.368 65.068	Diameter / Length: 1.200	{1} S1.004	Pipe	65.068	Diam/Width:225	Manhole
E:530731.074 N:139417.003	2.300		{2} S3.002	Pipe	65.068	Diam/Width:150	
			{a} S1.005	Pipe	65.068	Diam/Width:225	Not Applicable
S10	67.124 65.022	Diameter / Length: 0.650	{1} S1.005	Pipe	65.022	Diam/Width:225	Manhole
E:530728.949 N:139410.445	2.102						
							Not Applicable
S7	67.784 66.434	Diameter / Length: 0.450					Manhole
E:530765.130 N:139429.528	1.350						
			{a} S3.000	Pipe	66.434	Diam/Width:150	Not Applicable
S8	67.554 66.158	Diameter / Length: 0.450	{1} S3.000	Pipe	66.158	Diam/Width:150	Manhole
E:530738.094 N:139434.196	1.396						
			{a} S3.001	Pipe	66.158	Diam/Width:150	Not Applicable
S9	67.528 66.121	Diameter / Length: 0.450	{1} S3.001	Pipe	66.121	Diam/Width:150	Manhole
E:530734.647 N:139432.858	1.407						
			{a} S3.002	Pipe	66.121	Diam/Width:150	Not Applicable

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Inflow Summary Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area (4)	S1		Time of Concentration	0.050	100	10	110	0.055
Catchment Area (9)	S7		Time of Concentration	0.019	100	10	110	0.021
Catchment Area (10)	S9		Time of Concentration	0.003	100	10	110	0.003
Catchment Area (11)	S7		Time of Concentration	0.011	100	10	110	0.012
Catchment Area (14)	S1		Time of Concentration	0.012	100	10	110	0.013
Catchment Area (20)	S5		Time of Concentration	0.010	100	10	110	0.011
Catchment Area (21)	S5		Time of Concentration	0.003	100	10	110	0.004
Catchment Area (22)	S5		Time of Concentration	0.004	100	10	110	0.004
Catchment Area (23)	S2		Time of Concentration	0.005	100	10	110	0.005
Catchment Area (24)	S2		Time of Concentration	0.007	100	10	110	0.008
Catchment Area (25)	S2		Time of Concentration	0.007	100	10	110	0.008
TOTAL		0.0		0.130				0.143

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Network Design Criteria Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	2.0
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.350

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	10000.00
Max. Slope (1:X)	10.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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Project: Cophthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Inflows Summary Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			



Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area (4)	FSR: 100 years: +40 %: 15 mins: Summer	0.05	31.1	13.553
Catchment Area (9)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	12.1	5.283
Catchment Area (10)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	1.7	0.757
Catchment Area (11)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.0	3.065
Catchment Area (14)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.4	3.209
Catchment Area (20)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.1	2.674
Catchment Area (21)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	2.1	0.914
Catchment Area (22)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	2.4	1.037
Catchment Area (23)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	2.9	1.253
Catchment Area (24)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.3	1.890
Catchment Area (25)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.3	1.884

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Junctions Summary Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			



Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S1	FSR: 100 years: +40 %: 60 mins: Winter	67.397	66.047	66.697	0.649	18.5	0.734	0.000	18.5	28.557	Surcharged
S2	FSR: 100 years: +40 %: 60 mins: Winter	67.166	65.816	66.693	0.876	24.1	0.991	0.000	21.8	36.049	Surcharged
S3	FSR: 100 years: +40 %: 120 mins: Summer	66.681	65.331	66.684	1.353	19.7	3.907	3.458	18.7	45.592	Flood
S4	FSR: 100 years: +40 %: 120 mins: Summer	66.906	65.290	66.684	1.394	18.7	0.463	0.000	17.6	45.296	Flood Risk
S5	FSR: 100 years: +40 %: 60 mins: Winter	67.219	65.236	66.685	1.449	26.1	0.481	0.000	4.9	50.557	Surcharged
S6	FSR: 100 years: +40 %: 60 mins: Winter	67.368	65.068	66.684	1.616	9.8	1.828	0.000	4.9	34.387	Surcharged
S10	FSR: 30 years: +0 %: 30 mins: Winter	67.124	65.022	65.073	0.051	4.9	0.000	0.000	4.9	15.067	OK
S7	FSR: 100 years: +40 %: 120 mins: Winter	67.784	66.434	66.695	0.261	6.1	0.041	0.000	6.1	17.681	Surcharged
S8	FSR: 100 years: +40 %: 120 mins: Winter	67.554	66.158	66.688	0.530	6.1	0.084	0.000	6.0	17.680	Surcharged
S9	FSR: 100 years: +40 %: 120 mins: Winter	67.528	66.121	66.687	0.566	6.5	0.090	0.000	6.5	19.282	Surcharged

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Stormwater Controls Summary Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			



Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 100 years: +40 %: 60 mins: Winter	66.686	66.686	1.406	1.406	25.1	29.845	0.000	0.000	3.6	8.128	1.874	OK

Project: Copthorne Optimisation Northern Plot Surface Water +10% Urban Creep		Date: 15/09/0025			
		Designed by: JDM	Checked by: JDM		Approved By: MCC
Report Details: Type: Connections Summary Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			



Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S1.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S1	S2	67.397	66.369	0.225	16.538	1.0	0.52	31.5	Surcharged
S1.001	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S2	S3	67.166	66.313	0.225	20.444	1.0	0.51	37.0	Surcharged
S1.002	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S3	S4	66.681	66.293	0.225	19.037	0.8	0.63	32.7	Surcharged
S1.003	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S4	S5	66.906	66.286	0.225	18.041	0.7	0.55	28.8	Surcharged
S1.004	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S5	S6	67.219	65.736	0.225	3.540	0.3	0.11	6.6	Surcharged
S1.005	FSR: 30 years: +0 %: 30 mins: Winter	Pipe	S6	S10	67.368	65.855	0.053	15.067	0.7	0.12	4.9	Surcharged
S3.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S7	S8	67.784	66.578	0.133	8.289	1.1	1.02	18.2	OK
S3.001	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S8	S9	67.554	66.326	0.150	8.301	1.4	0.99	17.6	Surcharged
S3.002	FSR: 100 years: +40 %: 15 mins: Winter	Pipe	S9	S6	67.528	66.297	0.150	9.062	1.0	0.39	17.6	Surcharged
S2.000	FSR: 100 years: +40 %: 240 mins: Summer	Pipe	Cellular Storage	S5	67.483	66.643	0.150	0.000	0.5	0.25	4.1	Surcharged

Project: Cophthorne Optimisation Northern Plot Surface Water +10% Urban Creep	Date: 15/09/0025			
	Designed by: JDM	Checked by: JDM	Approved By: MCC	
Report Details: Type: Phase Management Storm Phase: Northern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			



Northern Surface

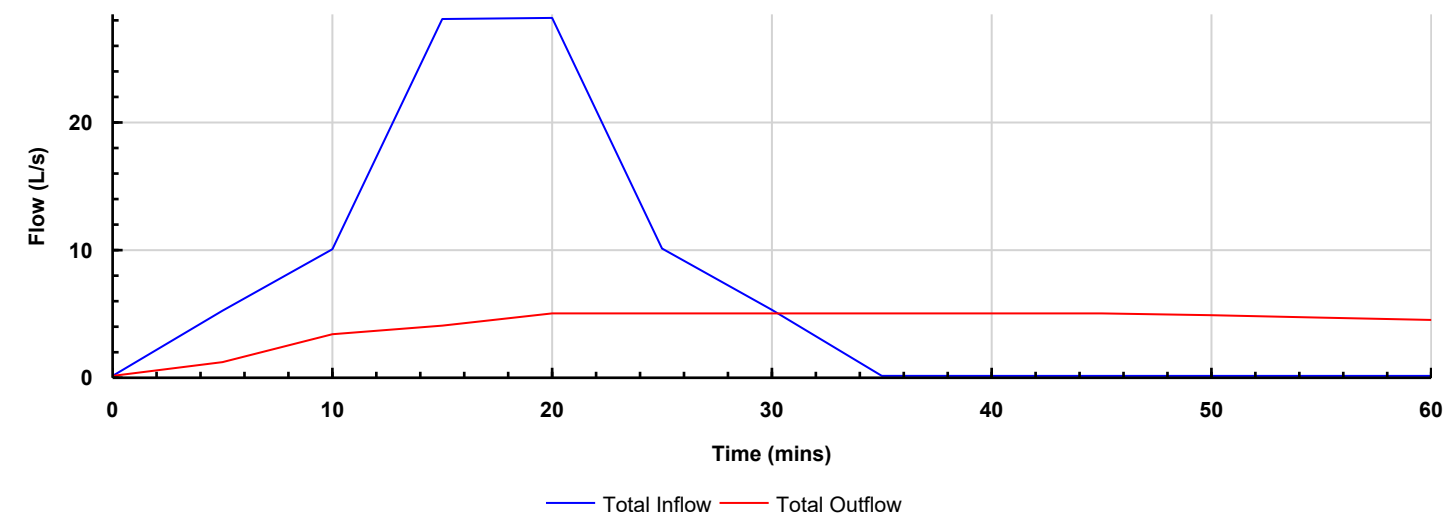
FSR: 30 years: Increase Rainfall (%): +0: 30 mins: Winter

Tables

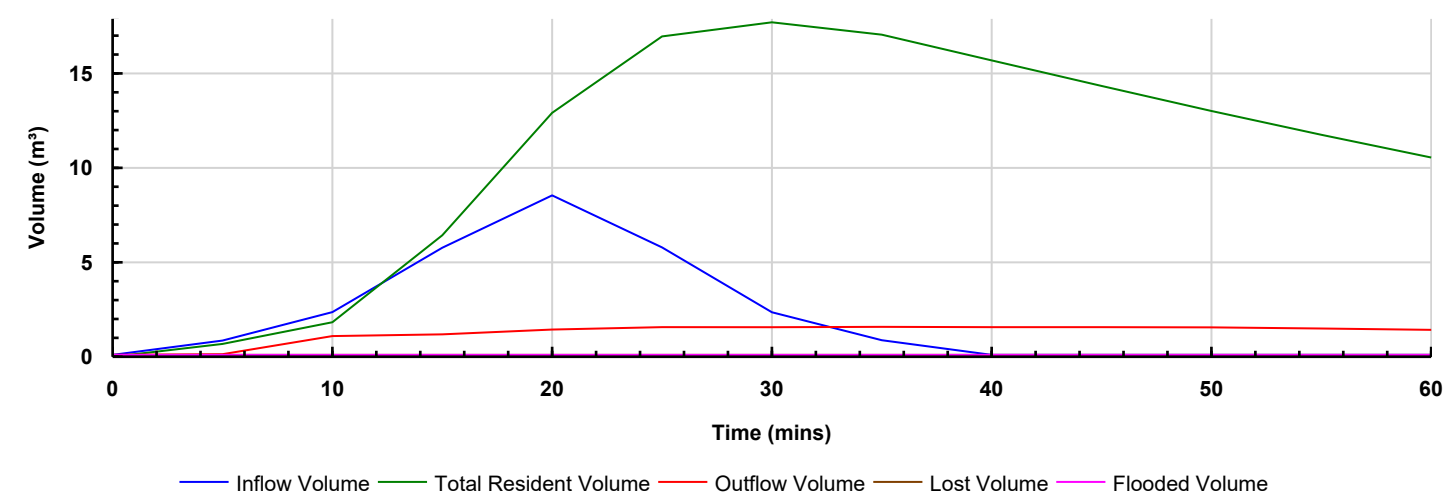
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
S10			4.9	15.067
TOTAL	28.2	26.002	4.9	15.067

Graphs

Flow Graph



Volume Graph



Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S8	Manhole	530597.909	139182.572	69.098	2.342	66.756	Circular	1.200
S9	Manhole	530606.426	139213.883	68.079	2.234	65.845	Circular	1.200
S11	Manhole	530610.381	139228.459	67.585	1.969	65.616	Circular	1.200
S12	Manhole	530603.220	139234.386	67.366	1.913	65.453	Circular	1.200
S7	Manhole	530569.741	139243.422	66.989	2.301	64.688	Circular	1.350
S13	Manhole	530564.746	139267.276	66.648	2.082	64.566	Circular	1.350
S14	Manhole	530570.710	139289.407	66.329	1.888	64.441	Circular	1.350
S15	Manhole	530578.450	139295.724	66.256	1.866	64.390	Circular	1.500
S25	Manhole	530581.628	139324.096	65.986	1.534	64.452	Circular	1.200
S26	Manhole	530583.162	139331.051	65.928	1.507	64.421	Circular	1.200
S27	Manhole	530583.159	139341.403	65.848	1.547	64.301	Circular	1.200
S28	Manhole	530588.878	139349.307	65.781	1.522	64.259	Circular	1.200
S29	Manhole	530614.246	139345.393	65.650	1.503	64.147	Circular	1.200
S24	Manhole	530627.758	139336.726	65.728	2.101	63.627	Circular	1.800
S30	Manhole	530632.909	139345.451	65.500	1.937	63.563	Circular	1.200
S31	Manhole	530633.527	139356.758	65.100	1.650	63.450	Circular	1.200
S10	Manhole	530636.508	139205.764	68.079	2.039	66.040	Circular	1.200
S3	Manhole	530557.312	139191.355	68.262	1.205	67.057	Circular	1.200
S2	Manhole	530534.768	139197.440	67.669	2.043	65.626	Circular	1.200
S4	Manhole	530539.501	139214.945	67.442	1.967	65.475	Circular	1.200
S5	Manhole	530542.881	139223.348	67.343	1.943	65.400	Circular	1.200
S6	Manhole	530548.854	139230.359	67.237	1.914	65.323	Circular	1.200
S1	Manhole	530516.274	139202.432	67.669	1.771	65.898	Circular	1.200
S17	Manhole	530649.327	139237.754	66.599	1.326	65.273	Circular	1.200
S18	Manhole	530654.135	139255.472	66.458	2.191	64.267	Circular	1.350
S19	Manhole	530654.997	139258.649	66.444	2.186	64.258	Circular	1.350
S16	Manhole	530649.543	139276.535	66.274	2.068	64.206	Circular	1.350
S20	Manhole	530651.024	139282.021	66.229	2.266	63.963	Circular	1.500
S21	Manhole	530655.203	139286.948	66.197	2.325	63.872	Circular	1.800
S22	Manhole	530661.560	139311.240	66.039	2.230	63.809	Circular	1.800
S23	Manhole	530656.992	139318.479	65.956	2.243	63.713	Circular	1.800

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Lock
S8	None
S9	None
S11	None
S12	None
S7	None
S13	None
S14	None
S15	None
S25	None
S26	None
S27	None
S28	None
S29	None
S24	None
S30	None
S31	All
S10	None
S3	All
S2	All
S4	All
S5	All
S6	All
S1	All
S17	None
S18	None
S19	None
S16	None
S20	None
S21	None
S22	None
S23	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S8	Inlet	Catchment Area (106) Catchment Area (68) Catchment Area (67) Catchment Area (66) Catchment Area (65)	(None)	No Restriction
S9	Inlet	S3.000 S4.000 Catchment Area (19) Catchment Area (64)	(None)	No Restriction
S11	Inlet	S3.001 Catchment Area (49) Catchment Area (35) Catchment Area (34) Catchment Area (43)	(None)	No Restriction
	Inlet (1)	Catchment Area (20)	(None)	No Restriction
S12	Inlet	S3.002	(None)	No Restriction
	Inlet (1)	Catchment Area (21) Catchment Area (33) Catchment Area (22) Catchment Area (61) Catchment Area (62)	(None)	No Restriction
S7	Inlet	S3.003 S1.004 Catchment Area (32) Catchment Area (31) Catchment Area (59)	(None)	No Restriction
	Inlet (1)	Catchment Area (105)	(None)	No Restriction
S13	Inlet	S1.005	(None)	No Restriction
	Inlet (1)	Catchment Area (18)	(None)	No Restriction

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S14	Inlet	S1.006 Catchment Area Catchment Area (29)	(None)	No Restriction
	Inlet (1)	Catchment Area (104) Catchment Area (30)	(None)	No Restriction
S15	Inlet	S1.007 Catchment Area (83)	(None)	No Restriction
	Inlet (1)	Catchment Area (103) Catchment Area (2) Catchment Area (36) Catchment Area (81) Catchment Area (82) Catchment Area (85) Catchment Area (86) Catchment Area (3) Catchment Area (37) Catchment Area (39) Catchment Area (40) Catchment Area (87) Catchment Area (4)	(None)	No Restriction
S25	Inlet	Catchment Area (1) Catchment Area (80)	(None)	No Restriction
S26	Inlet	S7.000 Catchment Area (79)	(None)	No Restriction
	Inlet (1)	Catchment Area (16)	(None)	No Restriction
S27	Inlet	S7.001 Catchment Area (78)	(None)	No Restriction
S28	Inlet	S7.002 Catchment Area (77)	(None)	No Restriction
	Inlet (1)	Catchment Area (15)	(None)	No Restriction
S29	Inlet	S7.003	(None)	No Restriction
	Inlet (1)	Catchment Area (14)	(None)	No Restriction
S24	Inlet	S7.004 S1.013	(None)	No Restriction
	Inlet (1)	Catchment Area (13)	(None)	No Restriction
S30	Inlet	S1.015	(None)	No Restriction
S31	Inlet	S1.016	(None)	No Restriction
S10	Inlet	Catchment Area (95) Catchment Area (54) Catchment Area (53) Catchment Area (51) Catchment Area (50) Catchment Area (52)	(None)	No Restriction
S3	Inlet	Catchment Area (94) Catchment Area (58) Catchment Area (57) Catchment Area (101) Catchment Area (56)	(None)	No Restriction
S2	Inlet	S2.000 S1.000	(None)	No Restriction
	Inlet (1)	Catchment Area (24)	(None)	No Restriction
S4	Inlet	S1.001	(None)	No Restriction
	Inlet (1)	Catchment Area (26)	(None)	No Restriction
S5	Inlet	S1.002 Catchment Area (69) Catchment Area (55) Catchment Area (70)	(None)	No Restriction
	Inlet (1)	Catchment Area (25)	(None)	No Restriction
S6	Inlet	S1.003 Catchment Area (23) Catchment Area (60)	(None)	No Restriction
	Inlet (1)	Catchment Area (17)	(None)	No Restriction

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

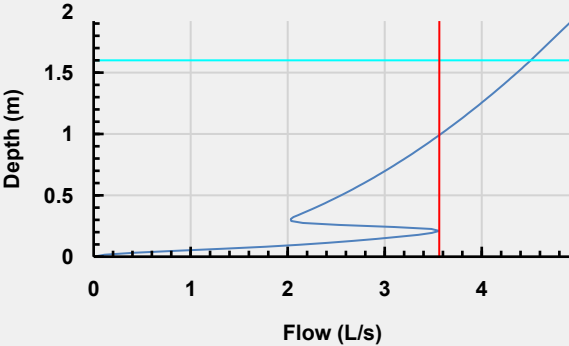
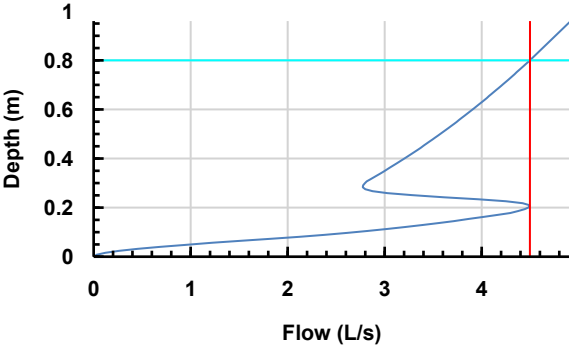
Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S1	Inlet	Catchment Area (93) Catchment Area (75) Catchment Area (74) Catchment Area (73)	(None)	No Restriction
	Inlet (1)	Catchment Area (76)	(None)	No Restriction
S17	Inlet (1)	Catchment Area (92) Catchment Area (97) Catchment Area (96) Catchment Area (48) Catchment Area (47) Catchment Area (46)	(None)	No Restriction
	Inlet	S5.000 S6.000	(None)	No Restriction
S18	Inlet (1)	Catchment Area (5) Catchment Area (45) Catchment Area (44)	(None)	No Restriction
	Inlet	S5.001 Catchment Area (42)	(None)	No Restriction
S16	Inlet	S5.002 S1.008 Catchment Area (6)	(None)	No Restriction
	Inlet (1)	Catchment Area (8) Catchment Area (41)	(None)	No Restriction
S20	Inlet	S1.009 Catchment Area (7)	(None)	No Restriction
	Inlet (1)	Catchment Area (9)	(None)	No Restriction
S21	Inlet	S1.010 Catchment Area (89) Catchment Area (88)	(None)	No Restriction
	Inlet	S1.011 Catchment Area (27)	(None)	No Restriction
S22	Inlet (1)	Catchment Area (11) Catchment Area (10)	(None)	No Restriction
	Inlet	S1.012 Catchment Area (91) Catchment Area (12) Catchment Area (90)	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S8	Outlet	S3.000	Free Discharge
S9	Outlet	S3.001	Free Discharge
S11	Outlet	S3.002	Free Discharge
S12	Outlet	S3.003	Free Discharge
S7	Outlet	S1.005	Free Discharge
S13	Outlet	S1.006	Free Discharge
S14	Outlet	S1.007	Free Discharge
S15	Outlet	S1.008	Free Discharge
S25	Outlet	S7.000	Free Discharge
S26	Outlet	S7.001	Free Discharge
S27	Outlet	S7.002	Free Discharge
S28	Outlet	S7.003	Free Discharge
S29	Outlet	S7.004	Free Discharge
S24	Outlet	S1.014	Free Discharge
	Outlet	S1.016	Hydro-Brake®

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Junctions Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



S30	Junction	Outlet Name	Outgoing Connection	Outlet Type
	Invert Level (m)		63.563	
	Design Depth (m)		1.600	
	Design Flow (L/s)		4.5	
	Objective		Minimise Upstream Storage Requirements	
	Application		Surface Water Only	
	Sump Available		☐	
	Unit Reference		CHE-0086-4500-1600-4500	
				
	S10	Outlet	S4.000	Free Discharge
S3	Outlet	S2.000	Free Discharge	
S2	Outlet	S1.001	Free Discharge	
S4	Outlet	S1.002	Free Discharge	
S5	Outlet	S1.003	Free Discharge	
S6	Outlet	S1.004	Free Discharge	
S1	Outlet	S1.000	Free Discharge	
S17	Outlet	S5.000	Free Discharge	
S18	Outlet	S5.001	Free Discharge	
S19	Outlet	S5.002	Free Discharge	
S16	Outlet	S1.009	Free Discharge	
S20	Outlet	S1.010	Free Discharge	
S21	Outlet	(None)	Hydro-Brake®	
	Invert Level (m)		63.872	
	Design Depth (m)		0.800	
	Design Flow (L/s)		4.5	
	Objective		Minimise Upstream Storage Requirements	
	Application		Surface Water Only	
	Sump Available		☐	
	Unit Reference		CHE-0099-4500-0800-4500	
				
	Outlet (1)		S1.011	Weir
Width (m)		1.000		
Coefficient of Discharge		0.544		
Crest Level (m)		65.335		
S22	Outlet	S1.012	Free Discharge	
S23	Outlet	S1.013	Free Discharge	

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Stormwater Controls Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			



Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.503
Depth (m)	1.600
Base Level (m)	63.614
Number of Crates Long	10
Number of Crates Wide	10
Number of Crates High	4
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	76.289

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	S1.014
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	S1.015
Outlet Type	Free Discharge



Cellular Storage (1)

Type : Cellular Storage

Dimensions

Exceedance Level (m)	66.515
Depth (m)	1.600
Base Level (m)	64.319
Number of Crates Long	28
Number of Crates Wide	28
Number of Crates High	4
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	596.436

Inlets

Outlets

Outlet

Outgoing Connection	S6.000
Outlet Type	Free Discharge

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Connections Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
S3.000	32.449	Pipe	35.635		0.6	225	69.098	66.756
S3.001	15.102	Pipe	97.904		0.6	225	68.079	65.845
S3.002	9.296	Pipe	57.000		0.6	300	67.585	65.616
S3.003	34.678	Pipe	57.000		0.6	300	67.366	65.453
S1.005	24.371	Pipe	199.763		0.6	450	66.989	64.688
S1.006	22.921	Pipe	183.366		0.6	450	66.648	64.566
S1.007	9.990	Pipe	194.332		0.6	450	66.329	64.441
S7.000	7.122	Pipe	230.000		0.6	300	65.986	64.452
S7.001	10.352	Pipe	230.000		0.6	300	65.928	64.421
S7.002	9.756	Pipe	230.000		0.6	375	65.848	64.301
S7.003	25.668	Pipe	230.000		0.6	375	65.781	64.259
S7.004	16.053	Pipe	230.000		0.6	375	65.650	64.147
S4.000	31.159	Pipe	160.000		0.6	225	68.079	66.040
S2.000	23.350	Pipe	17.226		0.6	150	68.262	67.057
S1.001	18.133	Pipe	120.000		0.6	225	67.669	65.626
S1.002	9.058	Pipe	120.000		0.6	225	67.442	65.475
S1.003	9.211	Pipe	120.000		0.6	225	67.343	65.400
S1.004	24.635	Pipe	60.085		0.6	225	67.237	65.323
S1.000	19.156	Pipe	97.351		0.6	150	67.669	65.898
S5.000	18.359	Pipe	26.021		0.6	150	66.599	65.273
S5.002	18.698	Pipe	360.314		0.6	450	66.444	64.258
S1.009	5.683	Pipe	314.808		0.6	450	66.274	64.206
S1.010	6.461	Pipe	400.000		0.6	675	66.229	63.963
S1.011	25.110	Pipe	400.000		0.6	750	66.197	63.872
S1.012	8.560	Pipe	400.000		0.6	750	66.039	63.809
S1.013	34.461	Pipe	400.000		0.6	825	65.956	63.713
S1.014	6.182	Pipe	487.064		0.6	825	65.728	63.627
S6.000	14.884	Pipe	286.240		0.6	450	66.515	64.319
S1.016	11.323	Pipe	100.000		0.6	150	65.500	63.563
S1.015	3.951	Pipe	78.016		0.6	150	65.503	63.614
S5.001	3.292	Pipe	365.819		0.6	450	66.458	64.267
S1.008	73.637	Pipe	401.095		0.6	450	66.256	64.390

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Connections Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Min. Downstream Invert Level (m)	Flow Restriction (L/s)	Culvert Type	Culvert Entrance
S3.000	68.079	65.845	All	0.000		(None)	(None)
S3.001	67.585	65.691	All	0.000		(None)	(None)
S3.002	67.366	65.453	All	0.000		(None)	(None)
S3.003	66.989	64.845	All	0.000		(None)	(None)
S1.005	66.648	64.566	All	0.000		(None)	(None)
S1.006	66.329	64.441	All	0.000		(None)	(None)
S1.007	66.256	64.390	All	0.000		(None)	(None)
S7.000	65.928	64.421	All	0.000		(None)	(None)
S7.001	65.848	64.376	All	0.000		(None)	(None)
S7.002	65.781	64.259	All	0.000		(None)	(None)
S7.003	65.650	64.147	All	0.000		(None)	(None)
S7.004	65.728	64.077	All	0.000		(None)	(None)
S4.000	68.079	65.845	All	0.000		(None)	(None)
S2.000	67.669	65.701	All	0.000		(None)	(None)
S1.001	67.442	65.475	All	0.000		(None)	(None)
S1.002	67.343	65.400	All	0.000		(None)	(None)
S1.003	67.237	65.323	All	0.000		(None)	(None)
S1.004	66.989	64.913	All	0.000		(None)	(None)
S1.000	67.669	65.701	All	0.000		(None)	(None)
S5.000	66.458	64.567	All	0.000		(None)	(None)
S5.002	66.274	64.206	All	0.000		(None)	(None)
S1.009	66.229	64.188	All	0.000		(None)	(None)
S1.010	66.197	63.947	All	0.000		(None)	(None)
S1.011	66.039	63.809	All	0.000	1364.2	(None)	(None)
S1.012	65.956	63.788	All	0.000		(None)	(None)
S1.013	65.728	63.627	All	0.000		(None)	(None)
S1.014	65.503	63.614	All	0.000		(None)	(None)
S6.000	66.458	64.267	All	0.000		(None)	(None)
S1.016	65.100	63.450	All	0.000	4.9	(None)	(None)
S1.015	65.500	63.563	All	0.000		(None)	(None)
S5.001	66.444	64.258	All	0.000		(None)	(None)
S1.008	66.274	64.206	None	0.000		(None)	(None)

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S8	69.098 66.756	Diameter / Length: 1.200					Manhole
E:530597.909 N:139182.572	2.342						
			{a} S3.000	Pipe	66.756	Diam/Width:225	Not Applicable
S9	68.079 65.845	Diameter / Length: 1.200	{1} S3.000	Pipe	65.845	Diam/Width:225	Manhole
E:530606.426 N:139213.883	2.234		{2} S4.000	Pipe	65.845	Diam/Width:225	
			{a} S3.001	Pipe	65.845	Diam/Width:225	Not Applicable
S11	67.585 65.616	Diameter / Length: 1.200	{1} S3.001	Pipe	65.691	Diam/Width:225	Manhole
E:530610.381 N:139228.459	1.969						
			{a} S3.002	Pipe	65.616	Diam/Width:300	Not Applicable
S12	67.366 65.453	Diameter / Length: 1.200	{1} S3.002	Pipe	65.453	Diam/Width:300	Manhole
E:530603.220 N:139234.386	1.913						
			{a} S3.003	Pipe	65.453	Diam/Width:300	Not Applicable
S7	66.989 64.688	Diameter / Length: 1.350	{1} S3.003	Pipe	64.845	Diam/Width:300	Manhole
E:530569.741 N:139243.422	2.301		{2} S1.004	Pipe	64.913	Diam/Width:225	
			{a} S1.005	Pipe	64.688	Diam/Width:450	Not Applicable

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S13	66.648 64.566	Diameter / Length: 1.350	{1} S1.005	Pipe	64.566	Diam/Width:450	Manhole
E:530564.746 N:139267.276	2.082						
			{a} S1.006	Pipe	64.566	Diam/Width:450	Not Applicable
S14	66.329 64.441	Diameter / Length: 1.350	{1} S1.006	Pipe	64.441	Diam/Width:450	Manhole
E:530570.710 N:139289.407	1.888						
			{a} S1.007	Pipe	64.441	Diam/Width:450	Not Applicable
S15	66.256 64.390	Diameter / Length: 1.500	{1} S1.007	Pipe	64.390	Diam/Width:450	Manhole
E:530578.450 N:139295.724	1.866						
			{a} S1.008	Pipe	64.390	Diam/Width:450	Not Applicable
S25	65.986 64.452	Diameter / Length: 1.200					Manhole
E:530581.628 N:139324.096	1.534						
			{a} S7.000	Pipe	64.452	Diam/Width:300	Not Applicable
S26	65.928 64.421	Diameter / Length: 1.200	{1} S7.000	Pipe	64.421	Diam/Width:300	Manhole
E:530583.162 N:139331.051	1.507						
			{a} S7.001	Pipe	64.421	Diam/Width:300	Not Applicable

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Designed by: JDM	Checked by: MCC		Approved By:
		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S27	65.848 64.301	Diameter / Length: 1.200	{1} S7.001	Pipe	64.376	Diam/Width:300	Manhole
E:530583.159 N:139341.403	1.547						
			{a} S7.002	Pipe	64.301	Diam/Width:375	Not Applicable
S28	65.781 64.259	Diameter / Length: 1.200	{1} S7.002	Pipe	64.259	Diam/Width:375	Manhole
E:530588.878 N:139349.307	1.522						
			{a} S7.003	Pipe	64.259	Diam/Width:375	Not Applicable
S29	65.650 64.147	Diameter / Length: 1.200	{1} S7.003	Pipe	64.147	Diam/Width:375	Manhole
E:530614.246 N:139345.393	1.503						
			{a} S7.004	Pipe	64.147	Diam/Width:375	Not Applicable
S24	65.728 63.627	Diameter / Length: 1.800	{1} S7.004	Pipe	64.077	Diam/Width:375	Manhole
E:530627.758 N:139336.726	2.101		{2} S1.013	Pipe	63.627	Diam/Width:825	
			{a} S1.014	Pipe	63.627	Diam/Width:825	Not Applicable
S30	65.500 63.563	Diameter / Length: 1.200	{1} S1.015	Pipe	63.563	Diam/Width:150	Manhole
E:530632.909 N:139345.451	1.937						
			{a} S1.016	Pipe	63.563	Diam/Width:150	Not Applicable

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Designed by: JDM	Checked by: MCC		Approved By:
		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S31	65.100 63.450	Diameter / Length: 1.200	{1} S1.016	Pipe	63.450	Diam/Width:150	Manhole
E:530633.527	1.650						
N:139356.758							Not Applicable
S10	68.079 66.040	Diameter / Length: 1.200					Manhole
E:530636.508	2.039						
N:139205.764			{a} S4.000	Pipe	66.040	Diam/Width:225	Not Applicable
S3	68.262 67.057	Diameter / Length: 1.200					Manhole
E:530557.312	1.205						
N:139191.355			{a} S2.000	Pipe	67.057	Diam/Width:150	Not Applicable
S2	67.669 65.626	Diameter / Length: 1.200	{1} S2.000	Pipe	65.701	Diam/Width:150	Manhole
E:530534.768	2.043		{2} S1.000	Pipe	65.701	Diam/Width:150	
N:139197.440			{a} S1.001	Pipe	65.626	Diam/Width:225	Not Applicable
S4	67.442 65.475	Diameter / Length: 1.200	{1} S1.001	Pipe	65.475	Diam/Width:225	Manhole
E:530539.501	1.967						
N:139214.945			{a} S1.002	Pipe	65.475	Diam/Width:225	Not Applicable

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Designed by: JDM	Checked by: MCC		Approved By:
		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S5	67.343 65.400	Diameter / Length: 1.200	{1} S1.002	Pipe	65.400	Diam/Width:225	Manhole
E:530542.881 N:139223.348	1.943						
			{a} S1.003	Pipe	65.400	Diam/Width:225	Not Applicable
S6	67.237 65.323	Diameter / Length: 1.200	{1} S1.003	Pipe	65.323	Diam/Width:225	Manhole
E:530548.854 N:139230.359	1.914						
			{a} S1.004	Pipe	65.323	Diam/Width:225	Not Applicable
S1	67.669 65.898	Diameter / Length: 1.200					Manhole
E:530516.274 N:139202.432	1.771						
			{a} S1.000	Pipe	65.898	Diam/Width:150	Not Applicable
S17	66.599 65.273	Diameter / Length: 1.200					Manhole
E:530649.327 N:139237.754	1.326						
			{a} S5.000	Pipe	65.273	Diam/Width:150	Not Applicable
S18	66.458 64.267	Diameter / Length: 1.350	{1} S5.000	Pipe	64.567	Diam/Width:150	Manhole
E:530654.135 N:139255.472	2.191		{2} S6.000	Pipe	64.267	Diam/Width:450	
			{a} S5.001	Pipe	64.267	Diam/Width:450	Not Applicable

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S19	66.444 64.258	Diameter / Length: 1.350	{1} S5.001	Pipe	64.258	Diam/Width:450	Manhole
E:530654.997 N:139258.649	2.186						
			{a} S5.002	Pipe	64.258	Diam/Width:450	Not Applicable
S16	66.274 64.206	Diameter / Length: 1.350	{1} S5.002	Pipe	64.206	Diam/Width:450	Manhole
E:530649.543 N:139276.535	2.068		{2} S1.008	Pipe	64.206	Diam/Width:450	
			{a} S1.009	Pipe	64.206	Diam/Width:450	Not Applicable
S20	66.229 63.963	Diameter / Length: 1.500	{1} S1.009	Pipe	64.188	Diam/Width:450	Manhole
E:530651.024 N:139282.021	2.266						
			{a} S1.010	Pipe	63.963	Diam/Width:675	Not Applicable
S21	66.197 63.872	Diameter / Length: 1.800	{1} S1.010	Pipe	63.947	Diam/Width:675	Manhole
E:530655.203 N:139286.948	2.325						
			{a} S1.011	Pipe	63.872	Diam/Width:750	Not Applicable
S22	66.039 63.809	Diameter / Length: 1.800	{1} S1.011	Pipe	63.809	Diam/Width:750	Manhole
E:530661.560 N:139311.240	2.230						
			{a} S1.012	Pipe	63.809	Diam/Width:750	Not Applicable

Project: Copthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S23	65.956 63.713	Diameter / Length: 1.800	{1} S1.012	Pipe	63.788	Diam/Width:750	Manhole
E:530656.992 N:139318.479	2.243						
			{a} S1.013	Pipe	63.713	Diam/Width:825	Not Applicable

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	S14		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (1)	S25		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (2)	S15		Time of Concentration	0.020	100	0	100	0.020
Catchment Area (3)	S15		Time of Concentration	0.017	100	0	100	0.017
Catchment Area (4)	S15		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (5)	S18		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (6)	S16		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (7)	S20		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (8)	S16		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (9)	S20		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (10)	S22		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (11)	S22		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (12)	S23		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (13)	S24		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (14)	S29		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (15)	S28		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (16)	S26		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (17)	S6		Time of Concentration	0.019	100	0	100	0.019
Catchment Area (18)	S13		Time of Concentration	0.016	100	0	100	0.016
Catchment Area (19)	S9		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (20)	S11		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (21)	S12		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (22)	S12		Time of Concentration	0.016	100	0	100	0.016
Catchment Area (23)	S6		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (24)	S2		Time of Concentration	0.027	100	0	100	0.027
Catchment Area (25)	S5		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (26)	S4		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (27)	S22		Time of Concentration	0.020	100	0	100	0.020
Catchment Area (29)	S14		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (30)	S14		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (31)	S7		Time of Concentration	0.016	100	0	100	0.016
Catchment Area (32)	S7		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (33)	S12		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (34)	S11		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (35)	S11		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (36)	S15		Time of Concentration	0.007	100	0	100	0.007

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Catchment Area (37)	S15		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (39)	S15		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (40)	S15		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (41)	S16		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (42)	S19		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (43)	S11		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (44)	S18		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (45)	S18		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (46)	S17		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (47)	S17		Time of Concentration	0.002	100	0	100	0.002
Catchment Area (48)	S17		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (49)	S11		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (50)	S10		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (51)	S10		Time of Concentration	0.002	100	0	100	0.002
Catchment Area (52)	S10		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (53)	S10		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (54)	S10		Time of Concentration	0.001	100	0	100	0.001
Catchment Area (55)	S5		Time of Concentration	0.002	100	0	100	0.002
Catchment Area (56)	S3		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (57)	S3		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (58)	S3		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (59)	S7		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (60)	S6		Time of Concentration	0.015	100	0	100	0.015
Catchment Area (61)	S12		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (62)	S12		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (64)	S9		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (65)	S8		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (66)	S8		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (67)	S8		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (68)	S8		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (69)	S5		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (70)	S5		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (73)	S1		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (74)	S1		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (75)	S1		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (76)	S1		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (77)	S28		Time of Concentration	0.011	100	0	100	0.011

Project: Copthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Inflow Summary Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (78)	S27		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (79)	S26		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (80)	S25		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (81)	S15		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (82)	S15		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (83)	S15		Time of Concentration	0.008	100	0	100	0.008
Catchment Area (85)	S15		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (86)	S15		Time of Concentration	0.018	100	0	100	0.018
Catchment Area (87)	S15		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (88)	S21		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (89)	S21		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (90)	S23		Time of Concentration	0.024	100	0	100	0.024
Catchment Area (91)	S23		Time of Concentration	0.024	100	0	100	0.024
Catchment Area (92)	S17		Time of Concentration	0.022	100	0	100	0.022
Catchment Area (93)	S1		Time of Concentration	0.021	100	0	100	0.021
Catchment Area (94)	S3		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (95)	S10		Time of Concentration	0.027	100	0	100	0.027
Catchment Area (96)	S17		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (97)	S17		Time of Concentration	0.002	100	0	100	0.002
Catchment Area (101)	S3		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (103)	S15		Time of Concentration	0.016	100	0	100	0.016
Catchment Area (104)	S14		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (105)	S7		Time of Concentration	0.016	100	0	100	0.016
Catchment Area (106)	S8		Time of Concentration	0.048	100	0	100	0.048
TOTAL		0.0		1.127				1.127

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S1.000	S1	S2	19.156	Pipe	97.351	0.6	150	67.669
Branch: S2.000								
S2.000	S3	S2	23.350	Pipe	17.226	0.6	150	68.262
S1.001	S2	S4	18.133	Pipe	120.000	0.6	225	67.669
S1.002	S4	S5	9.058	Pipe	120.000	0.6	225	67.442
S1.003	S5	S6	9.211	Pipe	120.000	0.6	225	67.343
S1.004	S6	S7	24.635	Pipe	60.085	0.6	225	67.237
Branch: S3.000								
S3.000	S8	S9	32.449	Pipe	35.635	0.6	225	69.098
Branch: S4.000								
S4.000	S10	S9	31.159	Pipe	160.000	0.6	225	68.079
S3.001	S9	S11	15.102	Pipe	97.904	0.6	225	68.079
S3.002	S11	S12	9.296	Pipe	57.000	0.6	300	67.585
S3.003	S12	S7	34.678	Pipe	57.000	0.6	300	67.366
S1.005	S7	S13	24.371	Pipe	199.763	0.6	450	66.989
S1.006	S13	S14	22.921	Pipe	183.366	0.6	450	66.648
S1.007	S14	S15	9.990	Pipe	194.332	0.6	450	66.329
S1.008	S15	S16	73.637	Pipe	401.095	0.6	450	66.256
Branch: S5.000								
S5.000	S17	S18	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S18	14.884	Pipe	286.240	0.6	450	66.515
S5.001	S18	S19	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S19	S16	18.698	Pipe	360.314	0.6	450	66.444
S1.009	S16	S20	5.683	Pipe	314.808	0.6	450	66.274
S1.010	S20	S21	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S21	S22	25.110	Pipe	400.000	0.6	750	66.197
S1.012	S22	S23	8.560	Pipe	400.000	0.6	750	66.039
S1.013	S23	S24	34.461	Pipe	400.000	0.6	825	65.956
Branch: S7.000								
S7.000	S25	S26	7.122	Pipe	230.000	0.6	300	65.986
S7.001	S26	S27	10.352	Pipe	230.000	0.6	300	65.928
S7.002	S27	S28	9.756	Pipe	230.000	0.6	375	65.848
S7.003	S28	S29	25.668	Pipe	230.000	0.6	375	65.781
S7.004	S29	S24	16.053	Pipe	230.000	0.6	375	65.650
S1.014	S24	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S30	3.951	Pipe	78.016	0.6	150	65.503
S1.016	S30	S31	11.323	Pipe	100.000	0.6	150	65.500

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025		
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path		Designed by: JDM	Checked by: MCC	
		Consultant : Stantec Caversham Bridge House Waterman Place		

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S1.000	65.898	67.669	65.701		5	
Branch: S2.000						
S2.000	67.057	67.669	65.701		5	
S1.001	65.626	67.442	65.475		5	
S1.002	65.475	67.343	65.400		5	
S1.003	65.400	67.237	65.323		5	
S1.004	65.323	66.989	64.913		5	
Branch: S3.000						
S3.000	66.756	68.079	65.845		5	
Branch: S4.000						
S4.000	66.040	68.079	65.845		5	
S3.001	65.845	67.585	65.691		5	
S3.002	65.616	67.366	65.453		5	
S3.003	65.453	66.989	64.845		5	
S1.005	64.688	66.648	64.566		5	
S1.006	64.566	66.329	64.441		5	
S1.007	64.441	66.256	64.390		5	
S1.008	64.390	66.274	64.206		5	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.274	64.206		5	
S1.009	64.206	66.229	64.188		5	
S1.010	63.963	66.197	63.947		5	
S1.011	63.872	66.039	63.809		5	
S1.012	63.809	65.956	63.788		5	
S1.013	63.713	65.728	63.627		5	
Branch: S7.000						
S7.000	64.452	65.928	64.421		5	
S7.001	64.421	65.848	64.376		5	
S7.002	64.301	65.781	64.259		5	
S7.003	64.259	65.650	64.147		5	
S7.004	64.147	65.728	64.077		5	
S1.014	63.627	65.503	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (1)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S7.000	S25	S26	7.122	Pipe	230.000	0.6	300	65.986
S7.001	S26	S27	10.352	Pipe	230.000	0.6	300	65.928
S7.002	S27	S28	9.756	Pipe	230.000	0.6	375	65.848
S7.003	S28	S29	25.668	Pipe	230.000	0.6	375	65.781
S7.004	S29	S24	16.053	Pipe	230.000	0.6	375	65.650
Branch: S5.000								
S5.000	S17	S18	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S18	14.884	Pipe	286.240	0.6	450	66.515
S5.001	S18	S19	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S19	S16	18.698	Pipe	360.314	0.6	450	66.444
Branch: S3.000								
S3.000	S8	S9	32.449	Pipe	35.635	0.6	225	69.098
Branch: S4.000								
S4.000	S10	S9	31.159	Pipe	160.000	0.6	225	68.079
S3.001	S9	S11	15.102	Pipe	97.904	0.6	225	68.079
S3.002	S11	S12	9.296	Pipe	57.000	0.6	300	67.585
S3.003	S12	S7	34.678	Pipe	57.000	0.6	300	67.366
Branch: S2.000								
S2.000	S3	S2	23.350	Pipe	17.226	0.6	150	68.262
Branch: S1.000								
S1.000	S1	S2	19.156	Pipe	97.351	0.6	150	67.669
S1.001	S2	S4	18.133	Pipe	120.000	0.6	225	67.669
S1.002	S4	S5	9.058	Pipe	120.000	0.6	225	67.442
S1.003	S5	S6	9.211	Pipe	120.000	0.6	225	67.343
S1.004	S6	S7	24.635	Pipe	60.085	0.6	225	67.237
S1.005	S7	S13	24.371	Pipe	199.763	0.6	450	66.989
S1.006	S13	S14	22.921	Pipe	183.366	0.6	450	66.648
S1.007	S14	S15	9.990	Pipe	194.332	0.6	450	66.329
S1.008	S15	S16	73.637	Pipe	401.095	0.6	450	66.256
S1.009	S16	S20	5.683	Pipe	314.808	0.6	450	66.274
S1.010	S20	S21	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S21	S22	25.110	Pipe	400.000	0.6	750	66.197
S1.012	S22	S23	8.560	Pipe	400.000	0.6	750	66.039
S1.013	S23	S24	34.461	Pipe	400.000	0.6	825	65.956
S1.014	S24	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S30	3.951	Pipe	78.016	0.6	150	65.503
S1.016	S30	S31	11.323	Pipe	100.000	0.6	150	65.500

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (1)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S7.000	64.452	65.928	64.421		5	
S7.001	64.421	65.848	64.376		5	
S7.002	64.301	65.781	64.259		5	
S7.003	64.259	65.650	64.147		5	
S7.004	64.147	65.728	64.077		5	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.274	64.206		5	
Branch: S3.000						
S3.000	66.756	68.079	65.845		5	
Branch: S4.000						
S4.000	66.040	68.079	65.845		5	
S3.001	65.845	67.585	65.691		5	
S3.002	65.616	67.366	65.453		5	
S3.003	65.453	66.989	64.845		5	
Branch: S2.000						
S2.000	67.057	67.669	65.701		5	
Branch: S1.000						
S1.000	65.898	67.669	65.701		5	
S1.001	65.626	67.442	65.475		5	
S1.002	65.475	67.343	65.400		5	
S1.003	65.400	67.237	65.323		5	
S1.004	65.323	66.989	64.913		5	
S1.005	64.688	66.648	64.566		5	
S1.006	64.566	66.329	64.441		5	
S1.007	64.441	66.256	64.390		5	
S1.008	64.390	66.274	64.206		5	
S1.009	64.206	66.229	64.188		5	
S1.010	63.963	66.197	63.947		5	
S1.011	63.872	66.039	63.809		5	
S1.012	63.809	65.956	63.788		5	
S1.013	63.713	65.728	63.627		5	
S1.014	63.627	65.503	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (2)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S5.000	S17	S18	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S18	14.884	Pipe	286.240	0.6	450	66.515
S5.001	S18	S19	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S19	S16	18.698	Pipe	360.314	0.6	450	66.444
Branch: S3.000								
S3.000	S8	S9	32.449	Pipe	35.635	0.6	225	69.098
Branch: S4.000								
S4.000	S10	S9	31.159	Pipe	160.000	0.6	225	68.079
S3.001	S9	S11	15.102	Pipe	97.904	0.6	225	68.079
S3.002	S11	S12	9.296	Pipe	57.000	0.6	300	67.585
S3.003	S12	S7	34.678	Pipe	57.000	0.6	300	67.366
Branch: S2.000								
S2.000	S3	S2	23.350	Pipe	17.226	0.6	150	68.262
Branch: S1.000								
S1.000	S1	S2	19.156	Pipe	97.351	0.6	150	67.669
S1.001	S2	S4	18.133	Pipe	120.000	0.6	225	67.669
S1.002	S4	S5	9.058	Pipe	120.000	0.6	225	67.442
S1.003	S5	S6	9.211	Pipe	120.000	0.6	225	67.343
S1.004	S6	S7	24.635	Pipe	60.085	0.6	225	67.237
S1.005	S7	S13	24.371	Pipe	199.763	0.6	450	66.989
S1.006	S13	S14	22.921	Pipe	183.366	0.6	450	66.648
S1.007	S14	S15	9.990	Pipe	194.332	0.6	450	66.329
S1.008	S15	S16	73.637	Pipe	401.095	0.6	450	66.256
S1.009	S16	S20	5.683	Pipe	314.808	0.6	450	66.274
S1.010	S20	S21	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S21	S22	25.110	Pipe	400.000	0.6	750	66.197
S1.012	S22	S23	8.560	Pipe	400.000	0.6	750	66.039
S1.013	S23	S24	34.461	Pipe	400.000	0.6	825	65.956
Branch: S7.000								
S7.000	S25	S26	7.122	Pipe	230.000	0.6	300	65.986
S7.001	S26	S27	10.352	Pipe	230.000	0.6	300	65.928
S7.002	S27	S28	9.756	Pipe	230.000	0.6	375	65.848
S7.003	S28	S29	25.668	Pipe	230.000	0.6	375	65.781
S7.004	S29	S24	16.053	Pipe	230.000	0.6	375	65.650
S1.014	S24	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S30	3.951	Pipe	78.016	0.6	150	65.503
S1.016	S30	S31	11.323	Pipe	100.000	0.6	150	65.500

Project: Copthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025		
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (2)		Designed by: JDM	Checked by: MCC	
		Consultant : Stantec Caversham Bridge House Waterman Place		

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.274	64.206		5	
Branch: S3.000						
S3.000	66.756	68.079	65.845		5	
Branch: S4.000						
S4.000	66.040	68.079	65.845		5	
S3.001	65.845	67.585	65.691		5	
S3.002	65.616	67.366	65.453		5	
S3.003	65.453	66.989	64.845		5	
Branch: S2.000						
S2.000	67.057	67.669	65.701		5	
Branch: S1.000						
S1.000	65.898	67.669	65.701		5	
S1.001	65.626	67.442	65.475		5	
S1.002	65.475	67.343	65.400		5	
S1.003	65.400	67.237	65.323		5	
S1.004	65.323	66.989	64.913		5	
S1.005	64.688	66.648	64.566		5	
S1.006	64.566	66.329	64.441		5	
S1.007	64.441	66.256	64.390		5	
S1.008	64.390	66.274	64.206		5	
S1.009	64.206	66.229	64.188		5	
S1.010	63.963	66.197	63.947		5	
S1.011	63.872	66.039	63.809		5	
S1.012	63.809	65.956	63.788		5	
S1.013	63.713	65.728	63.627		5	
Branch: S7.000						
S7.000	64.452	65.928	64.421		5	
S7.001	64.421	65.848	64.376		5	
S7.002	64.301	65.781	64.259		5	
S7.003	64.259	65.650	64.147		5	
S7.004	64.147	65.728	64.077		5	
S1.014	63.627	65.503	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (3)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S1.000	S1	S2	19.156	Pipe	97.351	0.6	150	67.669
Branch: S2.000								
S2.000	S3	S2	23.350	Pipe	17.226	0.6	150	68.262
S1.001	S2	S4	18.133	Pipe	120.000	0.6	225	67.669
S1.002	S4	S5	9.058	Pipe	120.000	0.6	225	67.442
S1.003	S5	S6	9.211	Pipe	120.000	0.6	225	67.343
S1.004	S6	S7	24.635	Pipe	60.085	0.6	225	67.237
Branch: S3.000								
S3.000	S8	S9	32.449	Pipe	35.635	0.6	225	69.098
Branch: S4.000								
S4.000	S10	S9	31.159	Pipe	160.000	0.6	225	68.079
S3.001	S9	S11	15.102	Pipe	97.904	0.6	225	68.079
S3.002	S11	S12	9.296	Pipe	57.000	0.6	300	67.585
S3.003	S12	S7	34.678	Pipe	57.000	0.6	300	67.366
S1.005	S7	S13	24.371	Pipe	199.763	0.6	450	66.989

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S1.000	65.898	67.669	65.701		5	
Branch: S2.000						
S2.000	67.057	67.669	65.701		5	
S1.001	65.626	67.442	65.475		5	
S1.002	65.475	67.343	65.400		5	
S1.003	65.400	67.237	65.323		5	
S1.004	65.323	66.989	64.913		5	
Branch: S3.000						
S3.000	66.756	68.079	65.845		5	
Branch: S4.000						
S4.000	66.040	68.079	65.845		5	
S3.001	65.845	67.585	65.691		5	
S3.002	65.616	67.366	65.453		5	
S3.003	65.453	66.989	64.845		5	
S1.005	64.688	66.648	64.566		5	

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (4)	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	From	To	Length (m)	Connection Type	Slope (1:X)	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)
S3.000	S8	S9	32.449	Pipe	35.635	0.6	225	69.098
Branch: S4.000								
S4.000	S10	S9	31.159	Pipe	160.000	0.6	225	68.079
S3.001	S9	S11	15.102	Pipe	97.904	0.6	225	68.079
S3.002	S11	S12	9.296	Pipe	57.000	0.6	300	67.585
S3.003	S12	S7	34.678	Pipe	57.000	0.6	300	67.366
Branch: S2.000								
S2.000	S3	S2	23.350	Pipe	17.226	0.6	150	68.262
Branch: S1.000								
S1.000	S1	S2	19.156	Pipe	97.351	0.6	150	67.669
S1.001	S2	S4	18.133	Pipe	120.000	0.6	225	67.669
S1.002	S4	S5	9.058	Pipe	120.000	0.6	225	67.442
S1.003	S5	S6	9.211	Pipe	120.000	0.6	225	67.343
S1.004	S6	S7	24.635	Pipe	60.085	0.6	225	67.237
S1.005	S7	S13	24.371	Pipe	199.763	0.6	450	66.989
S1.006	S13	S14	22.921	Pipe	183.366	0.6	450	66.648
S1.007	S14	S15	9.990	Pipe	194.332	0.6	450	66.329
S1.008	S15	S16	73.637	Pipe	401.095	0.6	450	66.256
Branch: S5.000								
S5.000	S17	S18	18.359	Pipe	26.021	0.6	150	66.599
Branch: S6.000								
S6.000	Cellular Storage (1)	S18	14.884	Pipe	286.240	0.6	450	66.515
S5.001	S18	S19	3.292	Pipe	365.819	0.6	450	66.458
S5.002	S19	S16	18.698	Pipe	360.314	0.6	450	66.444
S1.009	S16	S20	5.683	Pipe	314.808	0.6	450	66.274
S1.010	S20	S21	6.461	Pipe	400.000	0.6	675	66.229
S1.011	S21	S22	25.110	Pipe	400.000	0.6	750	66.197
S1.012	S22	S23	8.560	Pipe	400.000	0.6	750	66.039
S1.013	S23	S24	34.461	Pipe	400.000	0.6	825	65.956
Branch: S7.000								
S7.000	S25	S26	7.122	Pipe	230.000	0.6	300	65.986
S7.001	S26	S27	10.352	Pipe	230.000	0.6	300	65.928
S7.002	S27	S28	9.756	Pipe	230.000	0.6	375	65.848
S7.003	S28	S29	25.668	Pipe	230.000	0.6	375	65.781
S7.004	S29	S24	16.053	Pipe	230.000	0.6	375	65.650
S1.014	S24	Cellular Storage	6.182	Pipe	487.064	0.6	825	65.728
S1.015	Cellular Storage	S30	3.951	Pipe	78.016	0.6	150	65.503
S1.016	S30	S31	11.323	Pipe	100.000	0.6	150	65.500

Project: Copthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Network Design Report Storm Phase: Southern Surface Flow Path: Flow Path (4)		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Total Area (ha)	Local Time of Concentration (mins)	Time Of Travel (mins)
S3.000	66.756	68.079	65.845		5	
Branch: S4.000						
S4.000	66.040	68.079	65.845		5	
S3.001	65.845	67.585	65.691		5	
S3.002	65.616	67.366	65.453		5	
S3.003	65.453	66.989	64.845		5	
Branch: S2.000						
S2.000	67.057	67.669	65.701		5	
Branch: S1.000						
S1.000	65.898	67.669	65.701		5	
S1.001	65.626	67.442	65.475		5	
S1.002	65.475	67.343	65.400		5	
S1.003	65.400	67.237	65.323		5	
S1.004	65.323	66.989	64.913		5	
S1.005	64.688	66.648	64.566		5	
S1.006	64.566	66.329	64.441		5	
S1.007	64.441	66.256	64.390		5	
S1.008	64.390	66.274	64.206		5	
Branch: S5.000						
S5.000	65.273	66.458	64.567		5	
Branch: S6.000						
S6.000	64.319	66.458	64.267		0	
S5.001	64.267	66.444	64.258		5	
S5.002	64.258	66.274	64.206		5	
S1.009	64.206	66.229	64.188		5	
S1.010	63.963	66.197	63.947		5	
S1.011	63.872	66.039	63.809		5	
S1.012	63.809	65.956	63.788		5	
S1.013	63.713	65.728	63.627		5	
Branch: S7.000						
S7.000	64.452	65.928	64.421		5	
S7.001	64.421	65.848	64.376		5	
S7.002	64.301	65.781	64.259		5	
S7.003	64.259	65.650	64.147		5	
S7.004	64.147	65.728	64.077		5	
S1.014	63.627	65.503	63.614		5	
S1.015	63.614	65.500	63.563		0	
S1.016	63.563	65.100	63.450		0	

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	2.0
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.350

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	10000.00
Max. Slope (1:X)	10.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Junctions Storm Phase: Northern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S1	Manhole	530775.194	139420.893	67.397	1.350	66.047	Circular	1.200
S2	Manhole	530772.344	139404.388	67.166	1.350	65.816	Circular	1.200
S3	Manhole	530747.574	139408.431	66.681	1.350	65.331	Circular	0.650
S4	Manhole	530748.223	139412.491	66.906	1.616	65.290	Circular	0.650
S5	Manhole	530743.036	139413.856	67.219	1.982	65.236	Circular	0.650
S6	Manhole	530731.074	139417.003	67.368	2.300	65.068	Circular	1.200
S10	Manhole	530728.949	139410.445	67.124	2.102	65.022	Circular	0.650
S7	Manhole	530765.130	139429.528	67.784	1.350	66.434	Circular	0.450
S8	Manhole	530738.094	139434.196	67.554	1.396	66.158	Circular	0.450
S9	Manhole	530734.647	139432.858	67.528	1.407	66.121	Circular	0.450

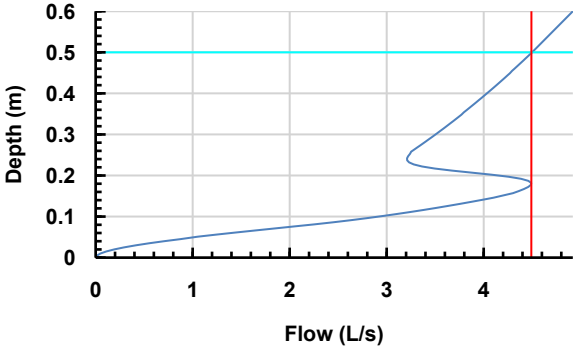
Name	Lock
S1	None
S2	None
S3	None
S4	None
S5	None
S6	None
S10	None
S7	None
S8	None
S9	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S1	Inlet (1)	Catchment Area (4) Catchment Area (14)	(None)	No Restriction
S2	Inlet	S1.000 Catchment Area (25) Catchment Area (24) Catchment Area (23)	(None)	No Restriction
S3	Inlet	S1.001	(None)	No Restriction
S4	Inlet	S1.002	(None)	No Restriction
S5	Inlet	S1.003	(None)	No Restriction
	Inlet (1)	S2.000 Catchment Area (20)	(None)	No Restriction
	Inlet (2)	Catchment Area (21) Catchment Area (22)	(None)	No Restriction
S6	Inlet	S1.004 S3.002	(None)	No Restriction
S10	Inlet	S1.005	(None)	No Restriction
S7	Inlet	Catchment Area (11) Catchment Area (9)	(None)	No Restriction
S8	Inlet	S3.000	(None)	No Restriction
S9	Inlet	S3.001 Catchment Area (10)	(None)	No Restriction

Project: Cophorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
Report Details: Type: Junctions Storm Phase: Northern Surface		Designed by: JDM	Checked by: MCC		Approved By:
		Consultant : Stantec Caversham Bridge House Waterman Place			

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S1	Outlet	S1.000	Free Discharge
S2	Outlet	S1.001	Free Discharge
S3	Outlet	S1.002	Free Discharge
S4	Outlet	S1.003	Free Discharge
S5	Outlet	S1.004	Free Discharge
S6	Outlet	S1.005	Hydro-Brake®
	Invert Level (m)	65.068	
	Design Depth (m)	0.500	
	Design Flow (L/s)	4.5	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0105-4500-0500-4500	
			
S7	Outlet	S3.000	Free Discharge
S8	Outlet	S3.001	Free Discharge
S9	Outlet	S3.002	Free Discharge

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Northern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		





Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	67.255
Depth (m)	1.200
Base Level (m)	65.280
Number of Crates Long	4
Number of Crates Wide	13
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	30.415

Outlets

Outlet

Outgoing Connection	S2.000
Outlet Type	Free Discharge

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Connections Storm Phase: Northern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
S1.000	16.750	Pipe	72.506		0.6	225	67.397	66.047
S1.001	25.098	Pipe	51.722		0.6	225	67.166	65.816
S1.002	4.112	Pipe	100.000		0.6	225	66.681	65.331
S1.003	5.363	Pipe	100.000		0.6	225	66.906	65.290
S1.004	12.369	Pipe	73.537		0.6	225	67.219	65.236
S1.005	6.893	Pipe	150.000		0.6	225	67.368	65.068
S3.000	27.436	Pipe	99.377		0.6	150	67.784	66.434
S3.001	3.698	Pipe	100.000		0.6	150	67.554	66.158
S3.002	16.253	Pipe	15.436		0.6	150	67.528	66.121
S2.000	4.914	Pipe	111.690		0.6	150	67.483	65.280

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Min. Downstream Invert Level (m)	Flow Restriction (L/s)	Culvert Type	Culvert Entrance
S1.000	67.166	65.816	All	0.000		(None)	(None)
S1.001	66.681	65.331	All	0.000		(None)	(None)
S1.002	66.906	65.290	All	0.000		(None)	(None)
S1.003	67.219	65.236	All	0.000		(None)	(None)
S1.004	67.368	65.068	All	0.000		(None)	(None)
S1.005	67.124	65.022	All	0.000	4.9	(None)	(None)
S3.000	67.554	66.158	All	0.000		(None)	(None)
S3.001	67.528	66.121	All	0.000		(None)	(None)
S3.002	67.368	65.068	All	0.000		(None)	(None)
S2.000	67.219	65.236	All	0.000		(None)	(None)

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S1	67.397 66.047	Diameter / Length: 1.200					Manhole
E:530775.194 N:139420.893	1.350						
			{a} S1.000	Pipe	66.047	Diam/Width:225	Not Applicable
S2	67.166 65.816	Diameter / Length: 1.200	{1} S1.000	Pipe	65.816	Diam/Width:225	Manhole
E:530772.344 N:139404.388	1.350						
			{a} S1.001	Pipe	65.816	Diam/Width:225	Not Applicable
S3	66.681 65.331	Diameter / Length: 0.650	{1} S1.001	Pipe	65.331	Diam/Width:225	Manhole
E:530747.574 N:139408.431	1.350						
			{a} S1.002	Pipe	65.331	Diam/Width:225	Not Applicable
S4	66.906 65.290	Diameter / Length: 0.650	{1} S1.002	Pipe	65.290	Diam/Width:225	Manhole
E:530748.223 N:139412.491	1.616						
			{a} S1.003	Pipe	65.290	Diam/Width:225	Not Applicable
S5	67.219 65.236	Diameter / Length: 0.650	{1} S1.003	Pipe	65.236	Diam/Width:225	Manhole
E:530743.036 N:139413.856	1.982		{2} S2.000	Pipe	65.236	Diam/Width:150	
			{a} S1.004	Pipe	65.236	Diam/Width:225	Not Applicable

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S6	67.368 65.068	Diameter / Length: 1.200	{1} S1.004	Pipe	65.068	Diam/Width:225	Manhole
E:530731.074 N:139417.003	2.300		{2} S3.002	Pipe	65.068	Diam/Width:150	
			{a} S1.005	Pipe	65.068	Diam/Width:225	Not Applicable
S10	67.124 65.022	Diameter / Length: 0.650	{1} S1.005	Pipe	65.022	Diam/Width:225	Manhole
E:530728.949 N:139410.445	2.102						
							Not Applicable
S7	67.784 66.434	Diameter / Length: 0.450					Manhole
E:530765.130 N:139429.528	1.350						
			{a} S3.000	Pipe	66.434	Diam/Width:150	Not Applicable
S8	67.554 66.158	Diameter / Length: 0.450	{1} S3.000	Pipe	66.158	Diam/Width:150	Manhole
E:530738.094 N:139434.196	1.396						
			{a} S3.001	Pipe	66.158	Diam/Width:150	Not Applicable
S9	67.528 66.121	Diameter / Length: 0.450	{1} S3.001	Pipe	66.121	Diam/Width:150	Manhole
E:530734.647 N:139432.858	1.407						
			{a} S3.002	Pipe	66.121	Diam/Width:150	Not Applicable

Project: Copthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Inflow Summary Storm Phase: Northern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area (4)	S1		Time of Concentration	0.050	100	0	100	0.050
Catchment Area (9)	S7		Time of Concentration	0.019	100	0	100	0.019
Catchment Area (10)	S9		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (11)	S7		Time of Concentration	0.011	100	0	100	0.011
Catchment Area (14)	S1		Time of Concentration	0.012	100	0	100	0.012
Catchment Area (20)	S5		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (21)	S5		Time of Concentration	0.003	100	0	100	0.003
Catchment Area (22)	S5		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (23)	S2		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (24)	S2		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (25)	S2		Time of Concentration	0.007	100	0	100	0.007
TOTAL		0.0		0.130				0.130

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Northern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

FSR

Type: FSR

Return Period (years)	2.0
Region	England And Wales
M5-60 (mm)	20.0
Ratio R	0.350

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	10000.00
Max. Slope (1:X)	10.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.2	0.542
Catchment Area (1)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.3	1.013
Catchment Area (2)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.3	1.447
Catchment Area (3)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.8	1.205
Catchment Area (4)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.5	1.516
Catchment Area (5)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.9	0.803
Catchment Area (6)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.7	0.758
Catchment Area (7)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.2	0.096
Catchment Area (8)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.4	1.058
Catchment Area (9)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.9	0.824
Catchment Area (10)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.1	0.896
Catchment Area (11)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.8	0.797
Catchment Area (12)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.2	0.959
Catchment Area (13)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.4	1.055
Catchment Area (14)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.5	1.088
Catchment Area (15)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.0	1.321
Catchment Area (16)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.2	0.938
Catchment Area (17)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.1	1.345
Catchment Area (18)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.7	1.163
Catchment Area (19)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.5	0.641
Catchment Area (20)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.2	0.956

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (21)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.2	0.959
Catchment Area (22)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.7	1.154
Catchment Area (23)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.5	0.629
Catchment Area (24)	FSR: 2 years: +0 %: 15 mins: Summer	0.03	4.4	1.915
Catchment Area (25)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.7	0.755
Catchment Area (26)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.8	0.764
Catchment Area (27)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.4	1.462
Catchment Area (29)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.0	0.426
Catchment Area (30)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.0	0.417
Catchment Area (31)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.6	1.136
Catchment Area (32)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.3	1.001
Catchment Area (33)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.0	0.884
Catchment Area (34)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.9	0.833
Catchment Area (35)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.1	0.914
Catchment Area (36)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.2	0.527
Catchment Area (37)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.6	0.698
Catchment Area (39)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.6	0.680
Catchment Area (40)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.0	1.324
Catchment Area (41)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.5	1.094
Catchment Area (42)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	0.9	0.396
Catchment Area (43)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.3	0.581
Catchment Area (44)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.2	0.521
Catchment Area (45)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.1	0.455
Catchment Area (46)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.1	0.455
Catchment Area (47)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.3	0.129

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
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Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (48)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.3	0.563
Catchment Area (49)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.0	0.435
Catchment Area (50)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.7	0.288
Catchment Area (51)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.3	0.150
Catchment Area (52)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.4	0.587
Catchment Area (53)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	0.9	0.408
Catchment Area (54)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.2	0.081
Catchment Area (55)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.3	0.114
Catchment Area (56)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.2	0.938
Catchment Area (57)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.7	0.288
Catchment Area (58)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.5	0.641
Catchment Area (59)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.7	0.318
Catchment Area (60)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.4	1.055
Catchment Area (61)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.0	0.443
Catchment Area (62)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	0.8	0.366
Catchment Area (64)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.0	1.300
Catchment Area (65)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.1	0.893
Catchment Area (66)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.0	0.878
Catchment Area (67)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.0	0.863
Catchment Area (68)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.1	0.911
Catchment Area (69)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	0.9	0.408
Catchment Area (70)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.3	0.560
Catchment Area (73)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.2	0.542
Catchment Area (74)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.4	0.602
Catchment Area (75)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.4	0.608

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (76)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.2	0.962
Catchment Area (77)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.8	0.776
Catchment Area (78)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.1	0.464
Catchment Area (79)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.0	0.884
Catchment Area (80)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.0	0.446
Catchment Area (81)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.6	0.701
Catchment Area (82)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.7	0.288
Catchment Area (83)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.2	0.542
Catchment Area (85)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.0	0.854
Catchment Area (86)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.9	1.274
Catchment Area (87)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.0	0.881
Catchment Area (88)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.2	0.506
Catchment Area (89)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.7	0.719
Catchment Area (90)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.9	1.714
Catchment Area (91)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.9	1.714
Catchment Area (92)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.6	1.567
Catchment Area (93)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	3.4	1.480
Catchment Area (94)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	2.2	0.959
Catchment Area (95)	FSR: 2 years: +0 %: 15 mins: Summer	0.03	4.5	1.972
Catchment Area (96)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.5	0.210
Catchment Area (97)	FSR: 2 years: +0 %: 15 mins: Summer	0.00	0.3	0.114
Catchment Area (101)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.4	0.626
Catchment Area (103)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.6	1.118
Catchment Area (104)	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.9	0.815
Catchment Area (105)	FSR: 2 years: +0 %: 15 mins: Summer	0.02	2.6	1.148

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (106)	FSR: 2 years: +0 %: 15 mins: Summer	0.05	7.9	3.428
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Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.4	1.028
Catchment Area (1)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.4	1.916
Catchment Area (2)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	6.3	2.749
Catchment Area (3)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.2	2.282
Catchment Area (4)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	6.6	2.872
Catchment Area (5)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.5	1.526
Catchment Area (6)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.3	1.439
Catchment Area (7)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	0.4	0.177
Catchment Area (8)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.6	2.009
Catchment Area (9)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.6	1.565
Catchment Area (10)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.9	1.700
Catchment Area (11)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.5	1.505
Catchment Area (12)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.2	1.826
Catchment Area (13)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.6	1.997
Catchment Area (14)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	4.7	2.054
Catchment Area (15)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.7	2.501
Catchment Area (16)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.1	1.778
Catchment Area (17)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.9	2.554
Catchment Area (18)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.1	2.204
Catchment Area (19)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.8	1.214
Catchment Area (20)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.2	1.811

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
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Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (21)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.2	1.820
Catchment Area (22)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.0	2.189
Catchment Area (23)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.7	1.193
Catchment Area (24)	FSR: 30 years: +0 %: 15 mins: Summer	0.03	8.4	3.643
Catchment Area (25)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.3	1.430
Catchment Area (26)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.3	1.448
Catchment Area (27)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	6.4	2.773
Catchment Area (29)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.8	0.804
Catchment Area (30)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.8	0.795
Catchment Area (31)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.0	2.162
Catchment Area (32)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.4	1.907
Catchment Area (33)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.9	1.679
Catchment Area (34)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.6	1.577
Catchment Area (35)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.0	1.733
Catchment Area (36)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.3	1.007
Catchment Area (37)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.0	1.319
Catchment Area (39)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.0	1.286
Catchment Area (40)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.8	2.510
Catchment Area (41)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	4.8	2.072
Catchment Area (42)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.7	0.756
Catchment Area (43)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.5	1.097
Catchment Area (44)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.3	0.980
Catchment Area (45)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.0	0.872
Catchment Area (46)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.0	0.872
Catchment Area (47)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	0.6	0.240

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Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (48)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.5	1.070
Catchment Area (49)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.9	0.825
Catchment Area (50)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	1.3	0.546
Catchment Area (51)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	0.6	0.279
Catchment Area (52)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.6	1.112
Catchment Area (53)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.8	0.768
Catchment Area (54)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	0.4	0.156
Catchment Area (55)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	0.5	0.210
Catchment Area (56)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.1	1.778
Catchment Area (57)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	1.3	0.546
Catchment Area (58)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.8	1.214
Catchment Area (59)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	1.4	0.606
Catchment Area (60)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.6	2.006
Catchment Area (61)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.9	0.837
Catchment Area (62)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.6	0.687
Catchment Area (64)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.7	2.465
Catchment Area (65)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.9	1.694
Catchment Area (66)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.8	1.664
Catchment Area (67)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.8	1.640
Catchment Area (68)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.0	1.721
Catchment Area (69)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.8	0.768
Catchment Area (70)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.4	1.058
Catchment Area (73)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.4	1.028
Catchment Area (74)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.6	1.139
Catchment Area (75)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.7	1.157

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (76)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.2	1.829
Catchment Area (77)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.4	1.466
Catchment Area (78)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.0	0.881
Catchment Area (79)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.9	1.682
Catchment Area (80)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	1.9	0.843
Catchment Area (81)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.1	1.331
Catchment Area (82)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	1.3	0.546
Catchment Area (83)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.4	1.031
Catchment Area (85)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.7	1.619
Catchment Area (86)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.5	2.417
Catchment Area (87)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.8	1.673
Catchment Area (88)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.2	0.959
Catchment Area (89)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.1	1.361
Catchment Area (90)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	7.5	3.244
Catchment Area (91)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	7.5	3.253
Catchment Area (92)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	6.8	2.977
Catchment Area (93)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	6.5	2.809
Catchment Area (94)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	4.2	1.820
Catchment Area (95)	FSR: 30 years: +0 %: 15 mins: Summer	0.03	8.6	3.742
Catchment Area (96)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	0.9	0.393
Catchment Area (97)	FSR: 30 years: +0 %: 15 mins: Summer	0.00	0.5	0.213
Catchment Area (101)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.7	1.187
Catchment Area (103)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	4.9	2.126
Catchment Area (104)	FSR: 30 years: +0 %: 15 mins: Summer	0.01	3.5	1.541
Catchment Area (105)	FSR: 30 years: +0 %: 15 mins: Summer	0.02	5.0	2.171

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Catchment Area (106)	FSR: 30 years: +0 %: 15 mins: Summer	0.05	14.9	6.497
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Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.3	1.859
Catchment Area (1)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	8.0	3.479
Catchment Area (2)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	11.5	4.990
Catchment Area (3)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	9.5	4.139
Catchment Area (4)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	12.0	5.212
Catchment Area (5)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.4	2.771
Catchment Area (6)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.0	2.609
Catchment Area (7)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	0.7	0.327
Catchment Area (8)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	8.4	3.647
Catchment Area (9)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.5	2.846
Catchment Area (10)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.1	3.086
Catchment Area (11)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.3	2.735
Catchment Area (12)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.6	3.311
Catchment Area (13)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	8.3	3.629
Catchment Area (14)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	8.6	3.731
Catchment Area (15)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	10.4	4.540
Catchment Area (16)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.4	3.224
Catchment Area (17)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	10.6	4.636
Catchment Area (18)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	9.2	3.998
Catchment Area (19)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.1	2.204
Catchment Area (20)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.5	3.281

Project: Cophthorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Inflows Summary Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (21)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.6	3.302
Catchment Area (22)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	9.1	3.977
Catchment Area (23)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.0	2.171
Catchment Area (24)	FSR: 100 years: +40 %: 15 mins: Summer	0.03	15.2	6.601
Catchment Area (25)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.0	2.597
Catchment Area (26)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.0	2.630
Catchment Area (27)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	11.6	5.032
Catchment Area (29)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.4	1.461
Catchment Area (30)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.3	1.440
Catchment Area (31)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	9.0	3.920
Catchment Area (32)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.9	3.452
Catchment Area (33)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.0	3.047
Catchment Area (34)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.6	2.855
Catchment Area (35)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.2	3.140
Catchment Area (36)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.2	1.820
Catchment Area (37)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.5	2.393
Catchment Area (39)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.4	2.336
Catchment Area (40)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	10.5	4.549
Catchment Area (41)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	8.6	3.761
Catchment Area (42)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.1	1.368
Catchment Area (43)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.6	1.994
Catchment Area (44)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.1	1.790
Catchment Area (45)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.6	1.577
Catchment Area (46)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.6	1.577
Catchment Area (47)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	1.0	0.435

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (48)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.5	1.937
Catchment Area (49)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.4	1.499
Catchment Area (50)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	2.3	0.990
Catchment Area (51)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	1.2	0.507
Catchment Area (52)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.6	2.021
Catchment Area (53)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.2	1.401
Catchment Area (54)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	0.6	0.285
Catchment Area (55)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	0.9	0.384
Catchment Area (56)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.4	3.233
Catchment Area (57)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	2.3	0.990
Catchment Area (58)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.1	2.207
Catchment Area (59)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	2.5	1.101
Catchment Area (60)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	8.4	3.641
Catchment Area (61)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.5	1.517
Catchment Area (62)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	2.9	1.248
Catchment Area (64)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	10.3	4.471
Catchment Area (65)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.1	3.071
Catchment Area (66)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.0	3.026
Catchment Area (67)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.8	2.981
Catchment Area (68)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.2	3.125
Catchment Area (69)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.2	1.392
Catchment Area (70)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.4	1.925
Catchment Area (73)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.3	1.859
Catchment Area (74)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.8	2.069
Catchment Area (75)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.8	2.105

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

Catchment Area (76)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.6	3.317
Catchment Area (77)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.1	2.660
Catchment Area (78)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.7	1.598
Catchment Area (79)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.0	3.050
Catchment Area (80)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	3.5	1.535
Catchment Area (81)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.6	2.417
Catchment Area (82)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	2.3	0.990
Catchment Area (83)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.3	1.871
Catchment Area (85)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.7	2.939
Catchment Area (86)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	10.1	4.388
Catchment Area (87)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.0	3.038
Catchment Area (88)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.0	1.739
Catchment Area (89)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.7	2.462
Catchment Area (90)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	13.5	5.893
Catchment Area (91)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	13.6	5.905
Catchment Area (92)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	12.4	5.401
Catchment Area (93)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	11.7	5.095
Catchment Area (94)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	7.6	3.302
Catchment Area (95)	FSR: 100 years: +40 %: 15 mins: Summer	0.03	15.6	6.790
Catchment Area (96)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	1.6	0.708
Catchment Area (97)	FSR: 100 years: +40 %: 15 mins: Summer	0.00	0.9	0.390
Catchment Area (101)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	5.0	2.159
Catchment Area (103)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	8.9	3.857
Catchment Area (104)	FSR: 100 years: +40 %: 15 mins: Summer	0.01	6.4	2.792
Catchment Area (105)	FSR: 100 years: +40 %: 15 mins: Summer	0.02	9.1	3.941

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



Catchment Area (106)	FSR: 100 years: +40 %: 15 mins: Summer	0.05	27.1	11.786
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Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S8	FSR: 2 years: +0 %: 15 mins: Summer	69.098	66.756	66.820	0.064	16.1	0.073	0.000	15.6	6.980	OK
S9	FSR: 2 years: +0 %: 15 mins: Summer	68.079	65.845	65.965	0.119	27.7	0.135	0.000	25.1	12.367	OK
S11	FSR: 2 years: +0 %: 15 mins: Summer	67.585	65.616	65.724	0.108	33.7	0.123	0.000	33.2	16.080	OK
S12	FSR: 2 years: +0 %: 15 mins: Summer	67.366	65.453	65.564	0.111	41.9	0.126	0.000	39.5	19.656	OK
S7	FSR: 2 years: +0 %: 30 mins: Summer	66.989	64.688	64.993	0.305	59.3	0.436	0.000	56.2	51.247	OK
S13	FSR: 2 years: +0 %: 30 mins: Summer	66.648	64.566	64.980	0.414	57.9	0.592	0.000	56.2	52.834	OK
S14	FSR: 2 years: +0 %: 30 mins: Summer	66.329	64.441	64.967	0.526	59.5	0.753	0.000	58.8	55.563	Surcharged
S15	FSR: 2 years: +0 %: 30 mins: Summer	66.256	64.390	64.959	0.569	78.8	1.005	0.000	78.0	72.006	Surcharged
S25	FSR: 2 years: +0 %: 15 mins: Summer	65.986	64.452	64.497	0.045	3.4	0.051	0.000	3.2	1.457	OK
S26	FSR: 2 years: +0 %: 15 mins: Summer	65.928	64.421	64.487	0.066	7.4	0.075	0.000	7.0	3.273	OK
S27	FSR: 2 years: +0 %: 15 mins: Summer	65.848	64.301	64.367	0.066	8.0	0.075	0.000	7.7	3.733	OK
S28	FSR: 2 years: +0 %: 15 mins: Summer	65.781	64.259	64.337	0.078	12.6	0.088	0.000	11.8	5.826	OK
S29	FSR: 2 years: +0 %: 15 mins: Summer	65.650	64.147	64.231	0.083	14.3	0.094	0.000	12.8	6.882	OK
S24	FSR: 2 years: +0 %: 120 mins: Summer	65.728	63.627	63.899	0.272	13.7	0.692	0.000	11.2	32.683	OK
S30	FSR: 2 years: +0 %: 120 mins: Summer	65.500	63.563	63.898	0.335	3.7	0.379	0.000	3.6	30.526	Surcharged
S31	FSR: 2 years: +0 %: 120 mins: Summer	65.100	63.450	63.495	0.045	3.6	0.000	0.000	3.6	30.493	OK
S10	FSR: 2 years: +0 %: 15 mins: Summer	68.079	66.040	66.105	0.065	8.0	0.073	0.000	7.6	3.485	OK
S3	FSR: 2 years: +0 %: 15 mins: Summer	68.262	67.057	67.100	0.044	8.0	0.050	0.000	7.7	3.449	OK
S2	FSR: 2 years: +0 %: 15 mins: Summer	67.669	65.626	65.739	0.113	21.2	0.127	0.000	20.6	9.550	OK
S4	FSR: 2 years: +0 %: 15 mins: Summer	67.442	65.475	65.598	0.123	22.3	0.139	0.000	21.3	10.302	OK
S5	FSR: 2 years: +0 %: 15 mins: Summer	67.343	65.400	65.528	0.128	25.5	0.144	0.000	24.8	12.128	OK
S6	FSR: 2 years: +0 %: 15 mins: Summer	67.237	65.323	65.435	0.112	31.8	0.127	0.000	30.1	15.044	OK
S1	FSR: 2 years: +0 %: 15 mins: Summer	67.669	65.898	65.978	0.080	9.7	0.090	0.000	9.1	4.190	OK
S17	FSR: 2 years: +0 %: 15 mins: Summer	66.599	65.273	65.318	0.046	7.0	0.052	0.000	6.7	2.993	OK
S18	FSR: 2 years: +0 %: 30 mins: Summer	66.458	64.267	64.864	0.597	92.4	0.854	0.000	3.6	69.697	Surcharged
S19	FSR: 2 years: +0 %: 30 mins: Summer	66.444	64.258	64.874	0.616	87.6	0.881	0.000	3.6	64.775	Surcharged
S16	FSR: 2 years: +0 %: 30 mins: Summer	66.274	64.206	64.896	0.690	82.4	0.987	0.000	17.5	75.886	Surcharged
S20	FSR: 2 years: +0 %: 30 mins: Summer	66.229	63.963	64.896	0.933	17.9	1.649	0.000	10.9	14.612	Surcharged
S21	FSR: 2 years: +0 %: 30 mins: Summer	66.197	63.872	64.896	1.024	11.4	2.606	0.000	4.9	13.147	Surcharged
S22	FSR: 2 years: +0 %: 120 mins: Summer	66.039	63.809	63.899	0.090	3.2	0.229	0.000	3.2	6.651	OK
S23	FSR: 2 years: +0 %: 120 mins: Summer	65.956	63.713	63.899	0.186	7.6	0.473	0.000	6.0	16.023	OK

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Junctions Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S8	FSR: 30 years: +0 %: 15 mins: Summer	69.098	66.756	66.847	0.091	30.4	0.103	0.000	29.7	13.221	OK
S9	FSR: 30 years: +0 %: 15 mins: Summer	68.079	65.845	66.037	0.191	52.8	0.216	0.000	47.6	23.422	OK
S11	FSR: 30 years: +0 %: 15 mins: Summer	67.585	65.616	65.778	0.162	63.8	0.184	0.000	62.2	30.519	OK
S12	FSR: 30 years: +0 %: 15 mins: Summer	67.366	65.453	65.628	0.175	78.8	0.198	0.000	58.8	37.204	OK
S7	FSR: 30 years: +0 %: 15 mins: Summer	66.989	64.688	65.593	0.905	100.9	1.294	0.000	117.7	73.631	Surcharged
S13	FSR: 30 years: +0 %: 15 mins: Summer	66.648	64.566	65.551	0.985	118.8	1.409	0.000	128.9	76.011	Surcharged
S14	FSR: 30 years: +0 %: 15 mins: Winter	66.329	64.441	65.458	1.017	128.2	1.455	0.000	135.1	79.370	Surcharged
S15	FSR: 30 years: +0 %: 15 mins: Winter	66.256	64.390	65.435	1.046	149.9	1.848	0.000	159.6	102.907	Surcharged
S25	FSR: 30 years: +0 %: 15 mins: Summer	65.986	64.452	64.521	0.069	6.3	0.078	0.000	6.1	2.757	OK
S26	FSR: 30 years: +0 %: 15 mins: Summer	65.928	64.421	64.514	0.093	14.0	0.105	0.000	13.3	6.211	OK
S27	FSR: 30 years: +0 %: 15 mins: Summer	65.848	64.301	64.397	0.096	15.4	0.109	0.000	14.9	7.088	OK
S28	FSR: 30 years: +0 %: 15 mins: Summer	65.781	64.259	64.370	0.111	24.0	0.126	0.000	22.7	11.053	OK
S29	FSR: 30 years: +0 %: 15 mins: Summer	65.650	64.147	64.266	0.119	27.5	0.135	0.000	25.2	13.075	OK
S24	FSR: 30 years: +0 %: 120 mins: Winter	65.728	63.627	64.155	0.528	15.4	1.345	0.000	12.3	50.942	OK
S30	FSR: 30 years: +0 %: 120 mins: Winter	65.500	63.563	64.154	0.591	3.6	0.668	0.000	3.4	32.777	Surcharged
S31	FSR: 30 years: +0 %: 360 mins: Summer	65.100	63.450	63.495	0.045	3.6	0.000	0.000	3.6	82.409	OK
S10	FSR: 30 years: +0 %: 15 mins: Summer	68.079	66.040	66.131	0.091	15.2	0.103	0.000	14.6	6.604	OK
S3	FSR: 30 years: +0 %: 15 mins: Summer	68.262	67.057	67.117	0.061	15.0	0.069	0.000	14.8	6.498	OK
S2	FSR: 30 years: +0 %: 30 mins: Summer	67.669	65.626	65.820	0.194	27.6	0.220	0.000	30.7	24.174	OK
S4	FSR: 30 years: +0 %: 30 mins: Summer	67.442	65.475	65.744	0.269	32.9	0.305	0.000	34.1	26.095	Surcharged
S5	FSR: 30 years: +0 %: 30 mins: Summer	67.343	65.400	65.689	0.289	39.4	0.326	0.000	40.6	30.733	Surcharged
S6	FSR: 30 years: +0 %: 15 mins: Summer	67.237	65.323	65.630	0.307	48.5	0.347	0.000	57.0	28.768	Surcharged
S1	FSR: 30 years: +0 %: 15 mins: Summer	67.669	65.898	66.026	0.128	18.3	0.145	0.000	17.1	7.832	OK
S17	FSR: 30 years: +0 %: 15 mins: Summer	66.599	65.273	65.336	0.063	13.2	0.072	0.000	12.9	5.706	OK
S18	FSR: 30 years: +0 %: 15 mins: Summer	66.458	64.267	65.243	0.976	192.4	1.397	0.000	9.0	99.114	Surcharged
S19	FSR: 30 years: +0 %: 15 mins: Summer	66.444	64.258	65.248	0.990	182.4	1.417	0.000	8.7	91.823	Surcharged
S16	FSR: 30 years: +0 %: 15 mins: Summer	66.274	64.206	65.264	1.058	174.1	1.513	0.000	23.1	107.116	Surcharged
S20	FSR: 30 years: +0 %: 720 mins: Winter	66.229	63.963	65.352	1.389	1313.6	2.455	0.000	50.9	457.240	Surcharged
S21	FSR: 30 years: +0 %: 15 mins: Summer	66.197	63.872	65.260	1.388	20.5	3.533	0.000	4.9	14.291	Surcharged
S22	FSR: 30 years: +0 %: 120 mins: Winter	66.039	63.809	64.156	0.346	4.3	0.882	0.000	3.5	10.867	OK
S23	FSR: 30 years: +0 %: 120 mins: Winter	65.956	63.713	64.155	0.442	8.8	1.126	0.000	6.2	24.500	OK

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		





FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S8	FSR: 100 years: +40 %: 15 mins: Summer	69.098	66.756	67.368	0.612	55.1	0.692	0.000	40.2	23.901	Surcharged
S9	FSR: 100 years: +40 %: 15 mins: Summer	68.079	65.845	67.125	1.280	70.8	1.448	0.000	58.1	42.679	Surcharged
S11	FSR: 100 years: +40 %: 15 mins: Summer	67.585	65.616	66.894	1.278	87.5	1.445	0.000	77.4	55.476	Surcharged
S12	FSR: 100 years: +40 %: 15 mins: Summer	67.366	65.453	66.819	1.366	107.5	1.545	0.000	97.9	67.867	Surcharged
S7	FSR: 100 years: +40 %: 15 mins: Summer	66.989	64.688	66.515	1.827	181.2	2.614	0.000	185.8	133.729	Surcharged
S13	FSR: 100 years: +40 %: 15 mins: Summer	66.648	64.566	66.413	1.847	188.0	2.643	0.000	196.8	137.783	Flood Risk
S14	FSR: 100 years: +40 %: 15 mins: Summer	66.329	64.441	66.314	1.873	200.8	2.680	0.000	208.8	144.880	Flood Risk
S15	FSR: 100 years: +40 %: 15 mins: Summer	66.256	64.390	66.247	1.857	286.6	3.282	0.000	278.5	185.969	Flood Risk
S25	FSR: 100 years: +40 %: 480 mins: Winter	65.986	64.452	65.474	1.022	1.3	1.156	0.000	1.5	15.852	Surcharged
S26	FSR: 100 years: +40 %: 480 mins: Winter	65.928	64.421	65.474	1.053	3.0	1.190	0.000	3.0	35.834	Surcharged
S27	FSR: 100 years: +40 %: 480 mins: Winter	65.848	64.301	65.473	1.172	3.4	1.326	0.000	3.4	41.375	Surcharged
S28	FSR: 100 years: +40 %: 480 mins: Winter	65.781	64.259	65.472	1.213	5.3	1.372	0.000	5.3	63.496	Surcharged
S29	FSR: 100 years: +40 %: 480 mins: Winter	65.650	64.147	65.471	1.324	6.3	1.497	0.000	6.3	74.730	Flood Risk
S24	FSR: 100 years: +40 %: 480 mins: Winter	65.728	63.627	65.473	1.846	22.5	4.698	0.000	21.5	219.167	Flood Risk
S30	FSR: 100 years: +40 %: 480 mins: Winter	65.500	63.563	65.468	1.905	6.1	2.154	0.000	4.8	197.745	Flood Risk
S31	FSR: 100 years: +40 %: 480 mins: Winter	65.100	63.450	63.503	0.053	4.8	0.000	0.000	4.8	197.694	OK
S10	FSR: 100 years: +40 %: 15 mins: Summer	68.079	66.040	67.133	1.093	27.5	1.236	0.000	22.0	12.095	Surcharged
S3	FSR: 100 years: +40 %: 30 mins: Summer	68.262	67.057	67.434	0.378	18.4	0.427	0.000	18.1	15.930	Surcharged
S2	FSR: 100 years: +40 %: 30 mins: Summer	67.669	65.626	67.225	1.599	48.1	1.808	0.000	46.7	44.285	Surcharged
S4	FSR: 100 years: +40 %: 30 mins: Summer	67.442	65.475	67.067	1.592	50.7	1.800	0.000	49.5	47.835	Surcharged
S5	FSR: 100 years: +40 %: 30 mins: Summer	67.343	65.400	66.961	1.561	59.3	1.765	0.000	58.1	56.298	Surcharged
S6	FSR: 100 years: +40 %: 15 mins: Summer	67.237	65.323	66.813	1.490	73.6	1.685	0.000	80.0	52.205	Surcharged
S1	FSR: 100 years: +40 %: 15 mins: Summer	67.669	65.898	67.488	1.590	33.2	1.798	0.000	26.6	14.239	Flood Risk
S17	FSR: 100 years: +40 %: 15 mins: Summer	66.599	65.273	65.830	0.557	24.0	0.630	0.000	23.4	10.372	Surcharged
S18	FSR: 100 years: +40 %: 15 mins: Summer	66.458	64.267	65.492	1.225	281.1	1.753	0.000	6.4	164.335	Surcharged
S19	FSR: 100 years: +40 %: 15 mins: Summer	66.444	64.258	65.527	1.269	268.3	1.815	0.000	6.4	150.925	Surcharged
S16	FSR: 100 years: +40 %: 15 mins: Summer	66.274	64.206	65.605	1.399	301.5	2.002	0.000	148.6	191.939	Surcharged
S20	FSR: 100 years: +40 %: 15 mins: Summer	66.229	63.963	65.573	1.610	155.9	2.845	0.000	156.0	43.744	Surcharged
S21	FSR: 100 years: +40 %: 15 mins: Summer	66.197	63.872	65.567	1.695	165.7	4.313	0.000	165.7	42.614	Surcharged
S22	FSR: 100 years: +40 %: 480 mins: Winter	66.039	63.809	65.470	1.661	23.3	4.228	0.000	20.8	124.083	Surcharged
S23	FSR: 100 years: +40 %: 480 mins: Winter	65.956	63.713	65.471	1.758	22.5	4.474	0.000	21.6	158.904	Surcharged

Project: Cophorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		





FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 2 years: +0 %: 120 mins: Summer	63.899	63.899	0.285	0.285	11.2	13.537	0.000	0.000	3.7	30.651	82.255	OK
Cellular Storage (1)	FSR: 2 years: +0 %: 240 mins: Winter	64.584	64.584	0.265	0.265	24.7	98.508	0.000	0.000	3.6	49.120	83.484	OK

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		





FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 30 years: +0 %: 120 mins: Winter	64.155	64.155	0.541	0.541	12.3	25.720	0.000	0.000	3.6	33.301	66.286	OK
Cellular Storage (1)	FSR: 30 years: +0 %: 360 mins: Winter	64.914	64.914	0.595	0.595	31.3	221.468	0.000	0.000	7.2	92.564	62.868	OK

Project: Cophorne Optimisation Southern Plot Surface Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Southern Surface		Consultant : Stantec Caversham Bridge House Waterman Place			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 100 years: +40 %: 600 mins: Winter	65.479	65.479	1.865	1.865	19.8	76.269	0.000	0.000	6.0	240.274	0.027	OK
Cellular Storage (1)	FSR: 100 years: +40 %: 480 mins: Winter	65.471	65.471	1.152	1.152	49.9	428.824	0.000	0.000	23.6	193.506	28.102	OK

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Connections Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S3.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S8	S9	69.098	66.820	0.092	6.980	1.0	0.18	15.6	OK
S3.001	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S9	S11	68.079	65.965	0.114	12.367	1.2	0.48	25.1	OK
S3.002	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S11	S12	67.585	65.724	0.110	16.080	1.4	0.22	33.2	OK
S3.003	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S12	S7	67.366	65.564	0.108	19.656	1.7	0.27	39.5	OK
S1.005	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S7	S13	66.989	64.967	0.335	38.633	1.1	0.33	75.3	OK
S1.006	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S13	S14	66.648	64.958	0.447	39.817	1.0	0.31	73.1	OK
S1.007	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S14	S15	66.329	64.943	0.450	41.977	0.8	0.32	74.0	Surcharged
S7.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S25	S26	65.986	64.497	0.056	1.457	0.4	0.04	3.2	OK
S7.001	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S26	S27	65.928	64.487	0.064	3.273	0.6	0.1	7.0	OK
S7.002	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S27	S28	65.848	64.367	0.072	3.733	0.5	0.06	7.7	OK
S7.003	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S28	S29	65.781	64.337	0.081	5.826	0.7	0.09	11.8	OK
S7.004	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S29	S24	65.650	64.231	0.081	6.882	0.7	0.1	12.8	OK
S4.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S10	S9	68.079	66.105	0.092	3.485	0.5	0.19	7.6	OK
S2.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S3	S2	68.262	67.100	0.043	3.449	1.8	0.18	7.7	OK
S1.001	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S2	S4	67.669	65.739	0.118	9.550	1.0	0.43	20.6	OK
S1.002	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S4	S5	67.442	65.598	0.125	10.302	0.9	0.45	21.3	OK
S1.003	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S5	S6	67.343	65.528	0.120	12.128	1.1	0.52	24.8	OK
S1.004	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S6	S7	67.237	65.435	0.109	15.044	1.6	0.45	30.1	OK
S1.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S1	S2	67.669	65.978	0.077	4.190	1.0	0.51	9.1	OK
S5.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S17	S18	66.599	65.318	0.143	2.993	1.5	0.19	6.7	OK
S5.002	FSR: 2 years: +0 %: 60 mins: Summer	Pipe	S19	S16	66.444	64.706	0.450	0.479	0.2	0.02	3.8	OK

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Connections Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

S1.009	FSR: 2 years: +0 %: 30 mins: Winter	Pipe	S16	S20	66.274	64.864	0.450	14.932	0.7	0.11	19.5	Surcharged
S1.010	FSR: 2 years: +0 %: 30 mins: Winter	Pipe	S20	S21	66.229	64.864	0.675	14.018	0.4	0.03	12.0	Surcharged
S1.011	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S21	S22	66.197	64.870	0.027	0.000	0.0	0	0.0	Surcharged
S1.012	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S22	S23	66.039	63.864	0.050	3.130	0.5	0.01	6.5	OK
S1.013	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S23	S24	65.956	63.814	0.144	6.892	0.5	0.02	15.3	OK
S1.014	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S24	Cellular Storage	65.728	63.814	0.194	12.923	0.9	0.04	26.5	OK
S6.000	FSR: 2 years: +0 %: 60 mins: Summer	Pipe	Cellular Storage (1)	S18	66.515	64.531	0.248	0.000	0.0	0.02	3.8	OK
S1.016	FSR: 2 years: +0 %: 120 mins: Summer	Pipe	S30	S31	65.500	63.898	0.046	30.493	0.8	0.2	3.6	Surcharged
S1.015	FSR: 2 years: +0 %: 60 mins: Summer	Pipe	Cellular Storage	S30	65.503	63.888	0.150	16.628	0.4	0.19	3.8	Surcharged
S5.001	FSR: 2 years: +0 %: 60 mins: Summer	Pipe	S18	S19	66.458	64.695	0.438	0.539	0.3	0.02	3.8	OK
S1.008	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	S15	S16	66.256	64.932	0.450	54.730	0.6	0.55	87.5	Surcharged

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Connections Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



FSR: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S3.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S8	S9	69.098	66.847	0.141	13.221	1.1	0.34	29.7	OK
S3.001	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S9	S11	68.079	66.037	0.179	23.422	1.4	0.91	47.6	OK
S3.002	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S11	S12	67.585	65.778	0.169	30.519	1.5	0.42	62.2	OK
S3.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S12	S7	67.366	65.618	0.300	37.269	1.4	0.41	60.8	OK
S1.005	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S7	S13	66.989	65.337	0.450	97.780	0.9	0.54	122.9	Surcharged
S1.006	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S13	S14	66.648	65.551	0.450	76.011	0.8	0.54	128.9	Surcharged
S1.007	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S14	S15	66.329	65.432	0.450	79.290	0.9	0.6	137.9	Surcharged
S7.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S25	S26	65.986	64.521	0.081	2.757	0.4	0.08	6.1	OK
S7.001	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S26	S27	65.928	64.514	0.090	6.211	0.8	0.18	13.3	OK
S7.002	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S27	S28	65.848	64.397	0.104	7.088	0.6	0.11	14.9	OK
S7.003	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S28	S29	65.781	64.370	0.115	11.053	0.8	0.17	22.7	OK
S7.004	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S29	S24	65.650	64.266	0.115	13.075	0.9	0.19	25.2	OK
S4.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S10	S9	68.079	66.131	0.141	6.604	0.6	0.36	14.6	OK
S2.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S3	S2	68.262	67.117	0.082	6.498	1.5	0.34	14.8	OK
S1.001	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S2	S4	67.669	65.805	0.193	18.160	1.1	0.82	38.8	OK
S1.002	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S4	S5	67.442	65.683	0.216	19.635	1.0	0.83	39.5	OK
S1.003	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	S5	S6	67.343	65.610	0.225	23.132	1.3	0.93	43.9	OK
S1.004	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S6	S7	67.237	65.630	0.225	28.768	1.5	0.85	57.0	Surcharged
S1.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S1	S2	67.669	66.026	0.122	7.832	1.1	0.95	17.1	OK
S5.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S17	S18	66.599	65.336	0.150	5.706	1.2	0.37	12.9	OK
S5.002	FSR: 30 years: +0 %: 960 mins: Summer	Pipe	S19	S16	66.444	64.855	0.450	31.508	0.3	0.2	33.6	Surcharged

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
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Report Details: Type: Connections Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

S1.009	FSR: 30 years: +0 %: 720 mins: Winter	Pipe	S16	S20	66.274	64.877	0.450	357.657	2.2	1.56	283.3	Surcharged
S1.010	FSR: 30 years: +0 %: 480 mins: Winter	Pipe	S20	S21	66.229	64.910	0.675	251.234	0.4	0.25	116.7	Surcharged
S1.011	FSR: 30 years: +0 %: 600 mins: Winter	Pipe	S21	S22	66.197	64.895	0.119	0.252	0.0	0	0.0	Surcharged
S1.012	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S22	S23	66.039	64.034	0.235	10.044	0.6	0.02	12.6	OK
S1.013	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S23	S24	65.956	64.033	0.361	14.266	0.4	0.03	25.9	OK
S1.014	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	S24	Cellular Storage	65.728	64.029	0.409	23.282	1.2	0.07	47.3	OK
S6.000	FSR: 30 years: +0 %: 600 mins: Summer	Pipe	Cellular Storage (1)	S18	66.515	64.884	0.450	0.000	0.4	0.26	50.1	Surcharged
S1.016	FSR: 30 years: +0 %: 360 mins: Summer	Pipe	S30	S31	65.500	64.127	0.046	82.409	0.8	0.2	3.6	Surcharged
S1.015	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	Cellular Storage	S30	65.503	64.029	0.150	3.883	0.5	0.21	4.3	Surcharged
S5.001	FSR: 30 years: +0 %: 960 mins: Summer	Pipe	S18	S19	66.458	64.855	0.450	18.422	0.3	0.21	34.8	Surcharged
S1.008	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	S15	S16	66.256	65.195	0.450	132.882	1.1	1.12	179.1	Surcharged

Project: Copthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Connections Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S3.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S8	S9	69.098	67.368	0.225	23.901	1.0	0.46	40.2	Surcharged
S3.001	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S9	S11	68.079	66.978	0.225	57.374	1.6	1.21	63.7	Surcharged
S3.002	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S11	S12	67.585	66.711	0.300	74.509	1.3	0.56	82.9	Surcharged
S3.003	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S12	S7	67.366	66.629	0.300	91.613	1.6	0.7	102.5	Surcharged
S1.005	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S7	S13	66.989	66.305	0.450	177.380	1.2	0.85	194.5	Surcharged
S1.006	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S13	S14	66.648	66.185	0.450	178.873	1.3	0.84	200.2	Surcharged
S1.007	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S14	S15	66.329	66.063	0.450	185.516	1.3	0.91	211.5	Flood Risk
S7.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S25	S26	65.986	64.559	0.119	4.957	0.4	0.15	11.1	OK
S7.001	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S26	S27	65.928	64.552	0.125	10.972	0.9	0.33	24.4	OK
S7.002	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S27	S28	65.848	64.509	0.229	12.053	0.7	0.21	27.3	OK
S7.003	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S28	S29	65.781	64.508	0.305	17.774	0.9	0.32	41.8	OK
S7.004	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S29	S24	65.650	64.508	0.375	18.527	1.0	0.35	46.7	OK
S4.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S10	S9	68.079	67.133	0.225	12.061	0.6	0.54	22.0	Surcharged
S2.000	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S3	S2	68.262	67.434	0.150	15.930	1.6	0.42	18.1	Surcharged
S1.001	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S2	S4	67.669	67.131	0.225	32.893	1.3	1.07	50.9	Surcharged
S1.002	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S4	S5	67.442	66.948	0.225	35.536	1.5	1.23	58.5	Surcharged
S1.003	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S5	S6	67.343	66.889	0.225	41.828	1.7	1.43	68.0	Surcharged
S1.004	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S6	S7	67.237	66.813	0.225	52.205	2.0	1.19	80.0	Surcharged
S1.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S1	S2	67.669	67.488	0.150	14.239	1.5	1.48	26.6	Flood Risk
S5.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S17	S18	66.599	65.830	0.150	10.372	1.4	0.67	23.4	Surcharged
S5.002	FSR: 100 years: +40 %: 2160 mins: Summer	Pipe	S19	S16	66.444	65.370	0.450	75.711	0.7	0.67	113.3	Surcharged

Project: Cophorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Connections Summary Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			

S1.009	FSR: 100 years: +40 %: 2160 mins: Winter	Pipe	S16	S20	66.274	65.361	0.450	924.474	2.6	2.3	418.0	Surcharged
S1.010	FSR: 100 years: +40 %: 2160 mins: Winter	Pipe	S20	S21	66.229	65.415	0.675	903.968	0.7	0.53	247.3	Surcharged
S1.011	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S21	S22	66.197	65.567	0.348	34.447	1.6	0.26	160.9	Surcharged
S1.012	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S22	S23	66.039	64.506	0.707	35.898	1.2	0.3	183.0	OK
S1.013	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	S23	S24	65.956	64.506	0.825	38.993	0.8	0.24	186.9	OK
S1.014	FSR: 100 years: +40 %: 2160 mins: Summer	Pipe	S24	Cellular Storage	65.728	64.504	0.825	287.392	1.8	0.3	211.7	Surcharged
S6.000	FSR: 100 years: +40 %: 2160 mins: Summer	Pipe	Cellular Storage (1)	S18	66.515	65.365	0.450	1.240	0.7	0.59	113.0	Surcharged
S1.016	FSR: 100 years: +40 %: 480 mins: Winter	Pipe	S30	S31	65.500	65.468	0.055	197.694	0.8	0.27	4.8	Flood Risk
S1.015	FSR: 100 years: +40 %: 2160 mins: Summer	Pipe	Cellular Storage	S30	65.503	64.504	0.150	287.478	1.0	0.91	18.4	Surcharged
S5.001	FSR: 100 years: +40 %: 2160 mins: Winter	Pipe	S18	S19	66.458	65.360	0.450	75.872	3.8	3.6	605.3	Surcharged
S1.008	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	S15	S16	66.256	65.979	0.450	238.641	1.8	1.75	280.8	Flood Risk

Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Phase Management Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			



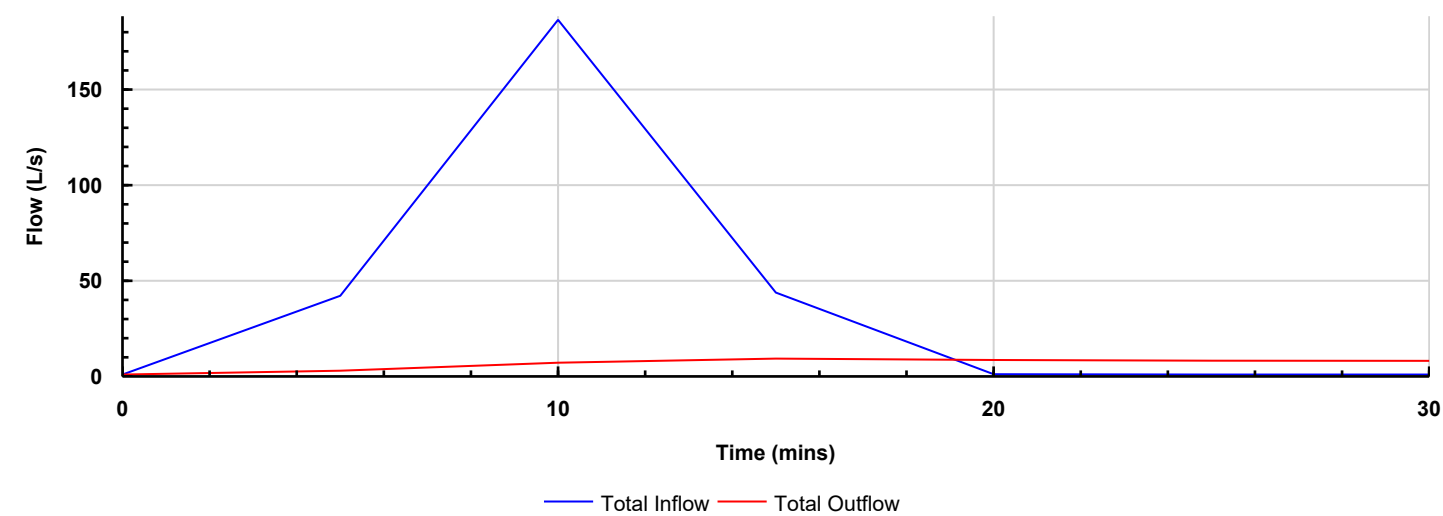
Southern Surface
FSR: 2 years: Increase Rainfall (%): +0: 15 mins: Summer

Tables

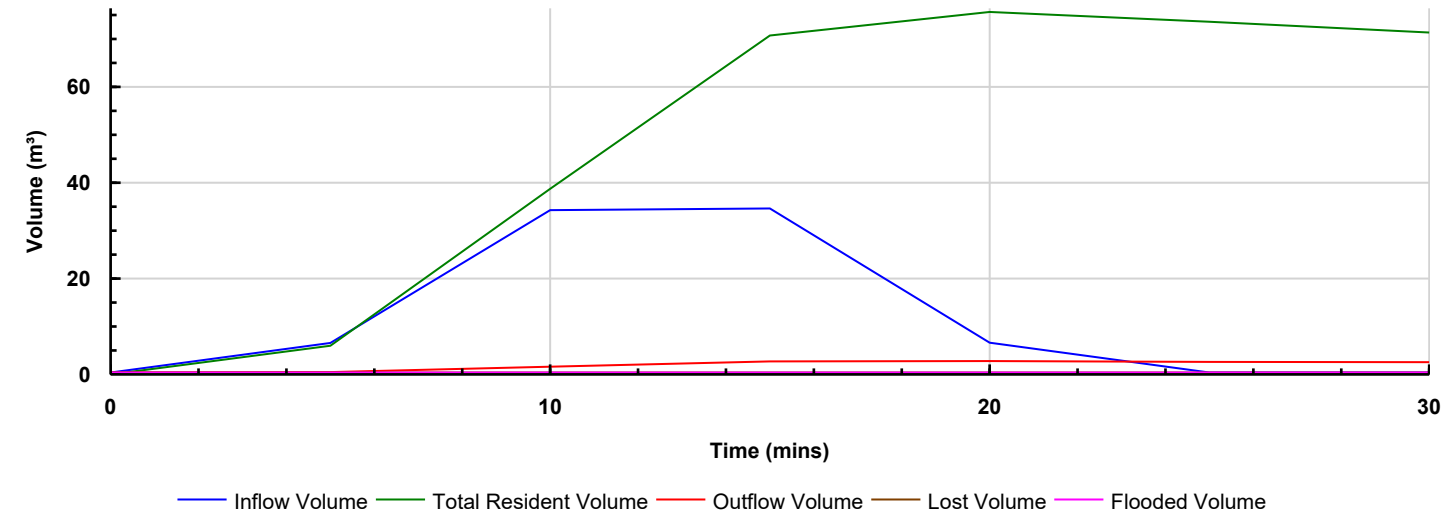
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
S31			3.5	4.161
S21			4.9	6.286
TOTAL	186.5	80.934	8.4	10.447

Graphs

Flow Graph



Volume Graph



Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	
Report Details: Type: Phase Management Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place		



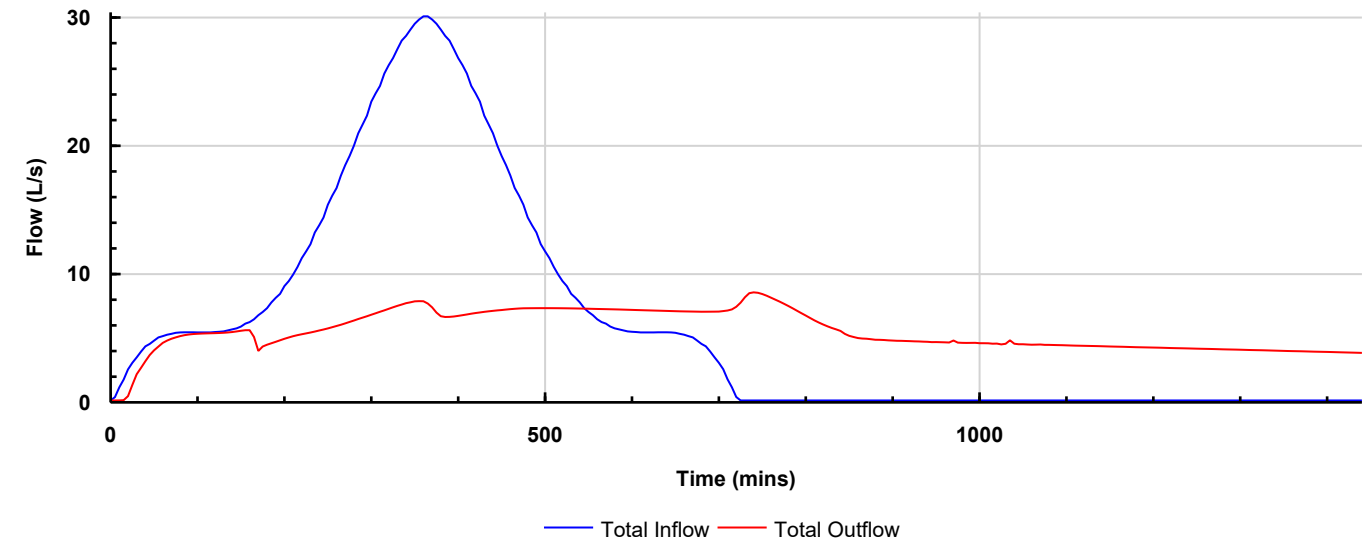
Southern Surface
FSR: 30 years: Increase Rainfall (%): +0: 720 mins: Winter

Tables

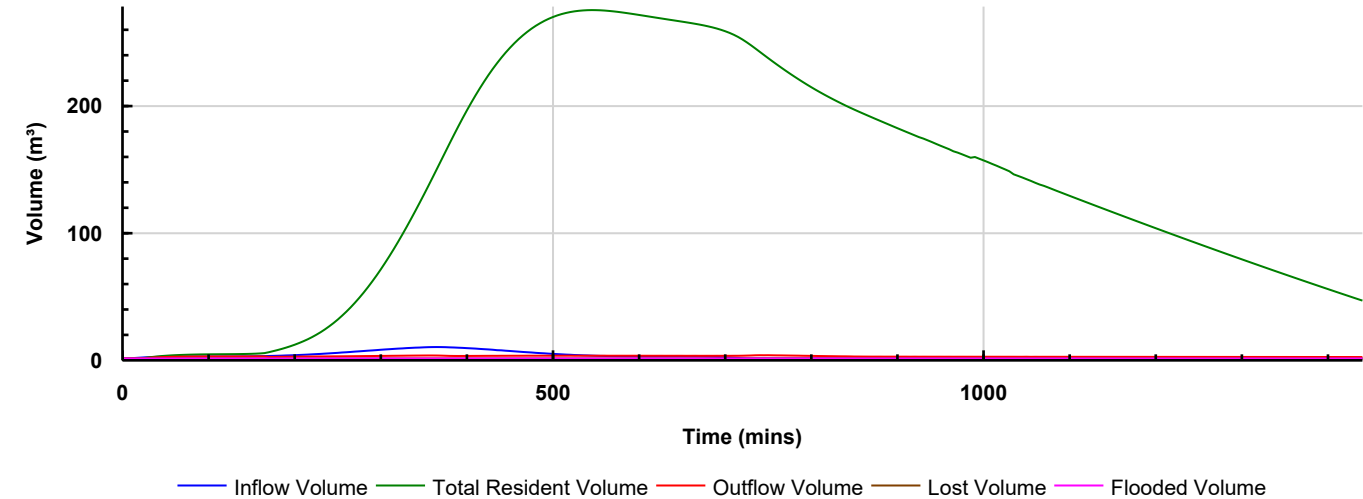
Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
S31			3.6	98.416
S21			4.9	368.966
TOTAL	30.1	513.493	8.5	467.382

Graphs

Flow Graph



Volume Graph



Project: Cophthorne Optimisation Southern Plot Surface Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Phase Management Storm Phase: Southern Surface	Consultant : Stantec Caversham Bridge House Waterman Place			



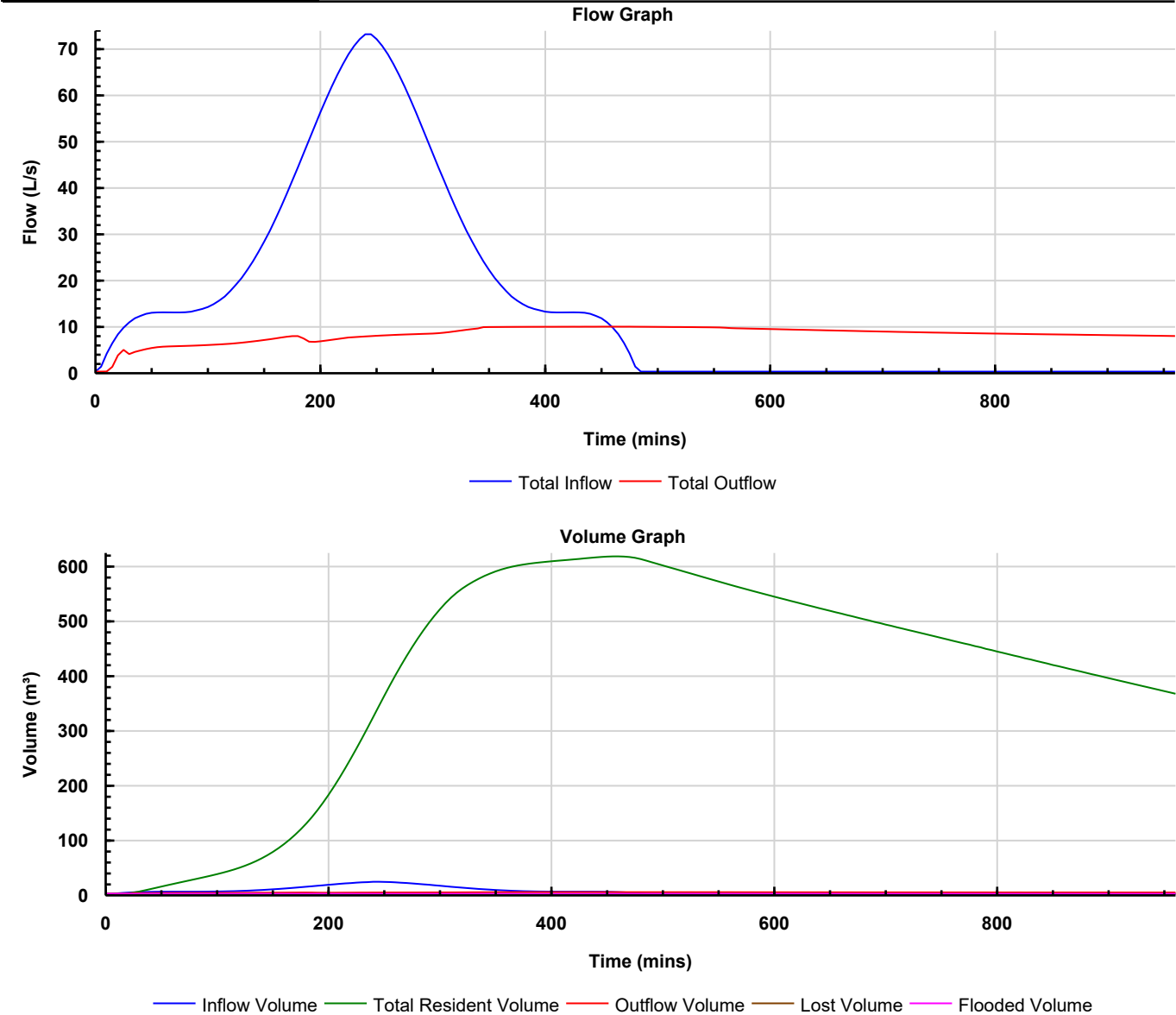
Southern Surface

FSR: 100 years: Increase Rainfall (%): +40: 480 mins: Winter

Tables

Name	Max. Inflow (L/s)	Total Inflow Volume (m³)	Max. Outflow (L/s)	Total Outflow Volume (m³)
S31			4.8	197.694
S21			4.9	266.200
TOTAL	73.2	834.194	9.8	463.894

Graphs



TECHNICAL NOTE

8. Appendix C

Project: Copthorne Optimisation Southern Plot Foul Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: IA	Approved By: PK
Report Details: Type: Connections Foul Phase: Northern Foul	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
F1.000	19.813	Pipe	100.000		1.5	150	67.497	66.147
F1.001	28.757	Pipe	100.000		1.5	150	67.200	65.949
F1.002	4.182	Pipe	100.000		1.5	150	66.724	65.661
F1.004	4.381	Pipe	20.000		1.5	150	67.161	65.437
F1.003	17.920	Pipe	98.464		1.5	150	66.871	65.619
F2.000	28.651	Pipe	36.000		1.5	150	67.786	66.836
F2.001	4.279	Pipe	36.000		1.5	150	67.485	66.040
F2.002	17.954	Pipe	37.094		1.5	150	67.396	65.921

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Min. Cover Depth (m)	Culvert Type	Culvert Entrance
F1.000	67.200	65.949	All	0.000	(None)	(None)
F1.001	66.724	65.661	All	0.000	(None)	(None)
F1.002	66.871	65.619	All	0.000	(None)	(None)
F1.004	67.122	65.218	All	0.000	(None)	(None)
F1.003	67.161	65.437	All	0.000	(None)	(None)
F2.000	67.485	66.040	All	0.000	(None)	(None)
F2.001	67.396	65.921	All	0.000	(None)	(None)
F2.002	67.161	65.437	All	0.000	(None)	(None)

Project: Cophthorne Optimisation Southern Plot Foul Water	Date: 15/09/0025			
	Designed by: JDM	Checked by: IA	Approved By: PK	
Report Details: Type: Network Design Report Foul Phase: Northern Foul Flow Path: Flow Path	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Total Area (ha)	Total Dwellings	Proportional Depth (mm)	Proportional Velocity (m/s)	Proportional Velocity At 1/3 Flow (m/s)	Full Bore Velocity (m/s)	Capacity (L/s)	Flow (L/s)
F1.000	0.001	2.00	9	0.234		0.876	15.478	0.093
F1.001	0.003	4.00	12	0.281	0.205	0.876	15.478	0.185
F1.002	0.005	6.00	14	0.323	0.234	0.876	15.478	0.278
F1.003	0.005	6.00	14	0.326	0.224	0.883	15.599	0.278
Branch: F2.000								
F2.000						1.463	25.858	
F2.001						1.463	25.858	
F2.002						1.441	25.473	
F1.004	0.005	6.00	10	0.566	0.401	1.965	34.724	0.278

Project: Copthorne Optimisation Southern Plot Foul Water	Date: 15/09/0025		
	Designed by: JDM	Checked by: IA	Approved By: PK
Report Details: Type: Network Design Criteria Foul Phase: Northern Foul	Consultant : Stantec Caversham Bridge House Waterman Place		



Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Inverts
Min. Slope (1:X)	100.00
Max. Slope (1:X)	5.00
Velocity Criteria	(UK) 1/3 Proportional Velocity
Min. Velocity (m/s)	0.75
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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Project: Cophthorne Optimisation Southern Plot Foul Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Junctions Foul Phase: Southern Foul	Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
F9	Manhole	530600.229	139180.548	69.100	3.141	65.959	Circular	1.200
F10	Manhole	530608.493	139211.002	67.551	1.826	65.725	Circular	1.200
F12	Manhole	530611.869	139223.441	67.142	1.512	65.630	Circular	1.200
F13	Manhole	530604.603	139231.015	67.072	1.520	65.552	Circular	1.200
F7	Manhole	530570.544	139240.257	67.333	2.042	65.291	Circular	1.200
F14	Manhole	530572.049	139245.803	67.251	2.003	65.248	Circular	1.200
F15	Manhole	530567.546	139267.304	66.680	1.595	65.085	Circular	1.200
F16	Manhole	530573.158	139288.128	66.352	1.471	64.881	Circular	1.200
F17	Manhole	530579.612	139292.834	66.394	1.565	64.829	Circular	1.200
F24	Manhole	530652.819	139278.718	66.206	2.474	63.732	Circular	1.200
F19	Manhole	530652.308	139273.212	66.260	2.644	63.617	Circular	1.200
F25	Manhole	530657.141	139259.691	66.382	2.884	63.498	Circular	1.200
F27	Manhole	530682.156	139253.030	67.047	3.741	63.306	Circular	1.200
F11	Manhole	530633.233	139204.325	67.551	1.781	65.770	Circular	1.200
F1	Manhole	530508.693	139202.562	67.803	1.150	66.653	Circular	1.200
F2	Manhole	530536.700	139195.388	67.816	1.380	66.436	Circular	1.200
F4	Manhole	530541.457	139213.011	67.602	1.297	66.305	Circular	1.200
F5	Manhole	530543.874	139221.090	67.551	1.447	66.104	Circular	1.200
F6	Manhole	530551.197	139229.452	67.462	1.623	65.839	Circular	1.200
F3	Manhole	530553.788	139191.011	67.972	1.678	66.294	Circular	1.200
F18	Manhole	530587.893	139323.513	65.893	0.614	65.279	Circular	0.600
F20	Manhole	530603.726	139341.910	65.554	0.450	65.104	Circular	1.200
F21	Manhole	530611.365	139339.912	65.522	0.476	65.046	Circular	1.200
F22	Manhole	530662.941	139307.437	65.911	1.316	64.595	Circular	1.200
F23	Manhole	530657.933	139288.300	66.112	2.163	63.949	Circular	1.200
F26	Manhole	530651.805	139240.014	66.572	1.350	65.222	Circular	1.200

Name	Lock
F9	All
F10	All
F12	All
F13	All
F7	All
F14	All
F15	All
F16	All
F17	All
F24	All
F19	All
F25	All
F27	All
F11	All
F1	All
F2	All
F4	All
F5	All
F6	All
F3	All
F18	All
F20	All
F21	All
F22	All
F23	All
F26	All

Project: Copthorne Optimisation Southern Plot Foul Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Junctions Foul Phase: Southern Foul	Consultant : Stantec Caversham Bridge House Waterman Place		



Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
F9	Inlet	Catchment Area (1)	(None)	No Restriction
F10	Inlet	F3.001	(None)	No Restriction
	Inlet (1)	F4.000	(None)	No Restriction
F12	Inlet	F3.002	(None)	No Restriction
F13	Inlet	F3.003	(None)	No Restriction
		Base Flow (7)		
F7	Inlet	F3.004	(None)	No Restriction
	Inlet (1)	F1.004	(None)	No Restriction
F14	Inlet	F1.005	(None)	No Restriction
F15	Inlet	F1.006	(None)	No Restriction
F16	Inlet	Base Flow (9)	(None)	No Restriction
		F1.007		
F17	Inlet	F1.008	(None)	No Restriction
	Inlet (1)	F5.000	(None)	No Restriction
F24	Inlet	Base Flow (10)	(None)	No Restriction
	Inlet (1)	Catchment Area (3)	(None)	No Restriction
F19	Inlet	F6.003	(None)	No Restriction
	Inlet (1)	F6.004	(None)	No Restriction
F25	Inlet	F1.009	(None)	No Restriction
		F1.010		
F27	Inlet	F7.000	(None)	No Restriction
F11	Inlet	F1.011	(None)	No Restriction
F1	Inlet	Base Flow (5)	(None)	No Restriction
		Base Flow		
F2	Inlet	F1.000	(None)	No Restriction
		F2.000		
F4	Inlet	F1.001	(None)	No Restriction
F5	Inlet	F1.002	(None)	No Restriction
F6	Inlet	F1.003	(None)	No Restriction
F3	Inlet	Catchment Area	(None)	No Restriction
		Base Flow (2)		
F18	Inlet	Base Flow (11)	(None)	No Restriction
F20	Inlet	Base Flow (12)	(None)	No Restriction
F21	Inlet	F6.000	(None)	No Restriction
		Base Flow (13)		
F22	Inlet	F6.001	(None)	No Restriction
		Catchment Area (2)		
F23	Inlet	F6.002	(None)	No Restriction
F26	Inlet	Catchment Area (4)	(None)	No Restriction

Project: Copthorne Optimisation Southern Plot Foul Water	Date: 19/11/0025			
	Designed by: JDM	Checked by: MCC	Approved By:	
Report Details: Type: Junctions Foul Phase: Southern Foul	Consultant : Stantec Caversham Bridge House Waterman Place			

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
F9	Outlet	F3.001	Free Discharge
F10	Outlet	F3.002	Free Discharge
F12	Outlet	F3.003	Free Discharge
F13	Outlet	F3.004	Free Discharge
F7	Outlet	F1.005	Free Discharge
F14	Outlet	F1.006	Free Discharge
F15	Outlet	F1.007	Free Discharge
F16	Outlet	F1.008	Free Discharge
F17	Outlet	F1.009	Free Discharge
F24	Outlet	F6.004	Free Discharge
F19	Outlet	F1.010	Free Discharge
F25	Outlet	F1.011	Free Discharge
F11	Outlet	F4.000	Free Discharge
F1	Outlet	F1.000	Free Discharge
F2	Outlet	F1.001	Free Discharge
F4	Outlet	F1.002	Free Discharge
F5	Outlet	F1.003	Free Discharge
F6	Outlet	F1.004	Free Discharge
F3	Outlet	F2.000	Free Discharge
F18	Outlet	F5.000	Free Discharge
F20	Outlet	F6.000	Free Discharge
F21	Outlet	F6.001	Free Discharge
F22	Outlet	F6.002	Free Discharge
F23	Outlet	F6.003	Free Discharge
F26	Outlet	F7.000	Free Discharge

Project: Copthorne Optimisation Southern Plot Foul Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Connections Foul Phase: Southern Foul	Consultant : Stantec Caversham Bridge House Waterman Place		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
F3.001	31.556	Pipe	135.000		1.5	150	69.100	65.959
F3.002	12.888	Pipe	135.000		1.5	150	67.551	65.725
F3.003	10.495	Pipe	135.000		1.5	150	67.142	65.630
F3.004	35.291	Pipe	135.000		1.5	150	67.072	65.552
F1.005	5.746	Pipe	135.000		1.5	150	67.333	65.291
F1.006	21.968	Pipe	135.000		1.5	150	67.251	65.248
F1.007	21.567	Pipe	105.961		1.5	150	66.680	65.085
F1.008	7.987	Pipe	153.972		1.5	150	66.352	64.881
F6.004	5.530	Pipe	47.975		1.5	150	66.206	63.732
F1.010	14.360	Pipe	121.009		1.5	150	66.260	63.617
F1.011	25.887	Pipe	135.000		1.5	150	66.382	63.498
F4.000	25.624	Pipe	146.426		1.5	150	67.551	65.900
F1.000	28.911	Pipe	132.959		1.5	150	67.803	66.653
F1.001	18.253	Pipe	138.957		1.5	150	67.816	66.436
F1.002	8.434	Pipe	42.000		1.5	150	67.602	66.305
F1.003	11.115	Pipe	42.000		1.5	150	67.551	66.104
F1.004	22.159	Pipe	40.437		1.5	150	67.462	65.839
F2.000	17.640	Pipe	77.513		1.5	150	67.972	66.294
F5.000	31.776	Pipe	70.614		1.5	150	65.893	65.279
F6.000	7.896	Pipe	135.000		1.5	150	65.554	65.104
F6.001	60.948	Pipe	135.000		1.5	150	65.522	65.046
F6.002	19.782	Pipe	30.643		1.5	150	65.911	64.595
F6.003	10.861	Pipe	50.000		1.5	150	66.112	63.949
F7.000	20.388	Pipe	11.824		1.5	150	66.572	65.222
F1.009	75.298	Pipe	62.113		1.5	150	66.394	64.829

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Lock	Min. Downstream Invert Level (m)	Culvert Type	Culvert Entrance
F3.001	67.551	65.725	All	0.000	(None)	(None)
F3.002	67.142	65.630	All	0.000	(None)	(None)
F3.003	67.072	65.552	All	0.000	(None)	(None)
F3.004	67.333	65.291	All	0.000	(None)	(None)
F1.005	67.251	65.248	All	0.000	(None)	(None)
F1.006	66.680	65.085	All	0.000	(None)	(None)
F1.007	66.352	64.881	All	0.000	(None)	(None)
F1.008	66.394	64.829	All	0.000	(None)	(None)
F6.004	66.260	63.617	All	0.000	(None)	(None)
F1.010	66.382	63.498	All	0.000	(None)	(None)
F1.011	67.047	63.306	All	0.000	(None)	(None)
F4.000	67.551	65.725	All	0.000	(None)	(None)
F1.000	67.816	66.436	All	0.000	(None)	(None)
F1.001	67.602	66.305	All	0.000	(None)	(None)
F1.002	67.551	66.104	All	0.000	(None)	(None)
F1.003	67.462	65.839	All	0.000	(None)	(None)
F1.004	67.333	65.291	All	0.000	(None)	(None)
F2.000	67.816	66.066	All	0.000	(None)	(None)
F5.000	66.394	64.829	All	0.000	(None)	(None)
F6.000	65.522	65.046	All	0.000	(None)	(None)
F6.001	65.911	64.595	All	0.000	(None)	(None)
F6.002	66.112	63.949	All	0.000	(None)	(None)
F6.003	66.206	63.732	All	0.000	(None)	(None)
F7.000	66.382	63.498	All	0.000	(None)	(None)
F1.009	66.260	63.617	All	0.000	(None)	(None)

Project: Copthorne Optimisation Southern Plot Foul Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Foul Phase: Southern Foul		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
F9	69.100 65.959	Diameter / Length: 1.200					Manhole
E:530600.229 N:139180.548	3.141						
			{a} F3.001	Pipe	65.959	Diam/Width:150	Not Applicable
F10	67.551 65.725	Diameter / Length: 1.200	{1} F3.001	Pipe	65.725	Diam/Width:150	Manhole
E:530608.493 N:139211.002	1.826		{2} F4.000	Pipe	65.725	Diam/Width:150	
			{a} F3.002	Pipe	65.725	Diam/Width:150	Not Applicable
F12	67.142 65.630	Diameter / Length: 1.200	{1} F3.002	Pipe	65.630	Diam/Width:150	Manhole
E:530611.869 N:139223.441	1.512						
			{a} F3.003	Pipe	65.630	Diam/Width:150	Not Applicable
F13	67.072 65.552	Diameter / Length: 1.200	{1} F3.003	Pipe	65.552	Diam/Width:150	Manhole
E:530604.603 N:139231.015	1.520						
			{a} F3.004	Pipe	65.552	Diam/Width:150	Not Applicable
F7	67.333 65.291	Diameter / Length: 1.200	{1} F3.004	Pipe	65.291	Diam/Width:150	Manhole
E:530570.544 N:139240.257	2.042		{2} F1.004	Pipe	65.291	Diam/Width:150	
			{a} F1.005	Pipe	65.291	Diam/Width:150	Not Applicable

Project: Cophthorne Optimisation Southern Plot Foul Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Foul Phase: Southern Foul		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
F14	67.251 65.248	Diameter / Length: 1.200	{1} F1.005	Pipe	65.248	Diam/Width:150	Manhole
E:530572.049 N:139245.803	2.003						
			{a} F1.006	Pipe	65.248	Diam/Width:150	Not Applicable
F15	66.680 65.085	Diameter / Length: 1.200	{1} F1.006	Pipe	65.085	Diam/Width:150	Manhole
E:530567.546 N:139267.304	1.595						
			{a} F1.007	Pipe	65.085	Diam/Width:150	Not Applicable
F16	66.352 64.881	Diameter / Length: 1.200	{1} F1.007	Pipe	64.881	Diam/Width:150	Manhole
E:530573.158 N:139288.128	1.471						
			{a} F1.008	Pipe	64.881	Diam/Width:150	Not Applicable
F17	66.394 64.829	Diameter / Length: 1.200	{1} F1.008	Pipe	64.829	Diam/Width:150	Manhole
E:530579.612 N:139292.834	1.565		{2} F5.000	Pipe	64.829	Diam/Width:150	
			{a} F1.009	Pipe	64.829	Diam/Width:150	Not Applicable
F24	66.206 63.732	Diameter / Length: 1.200	{1} F6.003	Pipe	63.732	Diam/Width:150	Manhole
E:530652.819 N:139278.718	2.474						
			{a} F6.004	Pipe	63.732	Diam/Width:150	Not Applicable

Project: Copthorne Optimisation Southern Plot Foul Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Foul Phase: Southern Foul		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
F19	66.260 63.617	Diameter / Length: 1.200	{1} F6.004	Pipe	63.617	Diam/Width:150	Manhole
E:530652.308 N:139273.212	2.644		{2} F1.009	Pipe	63.617	Diam/Width:150	
			{a} F1.010	Pipe	63.617	Diam/Width:150	Not Applicable
F25	66.382 63.498	Diameter / Length: 1.200	{1} F1.010	Pipe	63.498	Diam/Width:150	Manhole
E:530657.141 N:139259.691	2.884		{2} F7.000	Pipe	63.498	Diam/Width:150	
			{a} F1.011	Pipe	63.498	Diam/Width:150	Not Applicable
F27	67.047 63.306	Diameter / Length: 1.200	{1} F1.011	Pipe	63.306	Diam/Width:150	Manhole
E:530682.156 N:139253.030	3.741						
							Not Applicable
F11	67.551 65.770	Diameter / Length: 1.200					Manhole
E:530633.233 N:139204.325	1.781						
			{a} F4.000	Pipe	65.900	Diam/Width:150	Not Applicable
F1	67.803 66.653	Diameter / Length: 1.200					Manhole
E:530508.693 N:139202.562	1.150						
			{a} F1.000	Pipe	66.653	Diam/Width:150	Not Applicable

Project: Cophthorne Optimisation Southern Plot Foul Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Foul Phase: Southern Foul		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
F2	67.816 66.436	Diameter / Length: 1.200	{1} F1.000	Pipe	66.436	Diam/Width:150	Manhole
E:530536.700 N:139195.388	1.380		{2} F2.000	Pipe	66.066	Diam/Width:150	
			{a} F1.001	Pipe	66.436	Diam/Width:150	Not Applicable
F4	67.602 66.305	Diameter / Length: 1.200	{1} F1.001	Pipe	66.305	Diam/Width:150	Manhole
E:530541.457 N:139213.011	1.297						
			{a} F1.002	Pipe	66.305	Diam/Width:150	Not Applicable
F5	67.551 66.104	Diameter / Length: 1.200	{1} F1.002	Pipe	66.104	Diam/Width:150	Manhole
E:530543.874 N:139221.090	1.447						
			{a} F1.003	Pipe	66.104	Diam/Width:150	Not Applicable
F6	67.462 65.839	Diameter / Length: 1.200	{1} F1.003	Pipe	65.839	Diam/Width:150	Manhole
E:530551.197 N:139229.452	1.623						
			{a} F1.004	Pipe	65.839	Diam/Width:150	Not Applicable
F3	67.972 66.294	Diameter / Length: 1.200					Manhole
E:530553.788 N:139191.011	1.678						
			{a} F2.000	Pipe	66.294	Diam/Width:150	Not Applicable

Project: Copthorne Optimisation Southern Plot Foul Water		Date: 19/11/0025			
Report Details: Type: Manhole Schedule Foul Phase: Southern Foul		Designed by: JDM	Checked by: MCC		Approved By:
		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
F18	65.893 65.279	Diameter / Length: 0.600					Manhole
E:530587.893 N:139323.513	0.614						
			{a} F5.000	Pipe	65.279	Diam/Width:150	Not Applicable
F20	65.554 65.104	Diameter / Length: 1.200					Manhole
E:530603.726 N:139341.910	0.450						
			{a} F6.000	Pipe	65.104	Diam/Width:150	Not Applicable
F21	65.522 65.046	Diameter / Length: 1.200	{1} F6.000	Pipe	65.046	Diam/Width:150	Manhole
E:530611.365 N:139339.912	0.476						
			{a} F6.001	Pipe	65.046	Diam/Width:150	Not Applicable
F22	65.911 64.595	Diameter / Length: 1.200	{1} F6.001	Pipe	64.595	Diam/Width:150	Manhole
E:530662.941 N:139307.437	1.316						
			{a} F6.002	Pipe	64.595	Diam/Width:150	Not Applicable
F23	66.112 63.949	Diameter / Length: 1.200	{1} F6.002	Pipe	63.949	Diam/Width:150	Manhole
E:530657.933 N:139288.300	2.163						
			{a} F6.003	Pipe	63.949	Diam/Width:150	Not Applicable

Project: Copthorne Optimisation Southern Plot Foul Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Manhole Schedule Foul Phase: Southern Foul		Consultant : Stantec Caversham Bridge House Waterman Place			

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
F26	66.572 65.222	Diameter / Length: 1.200					Manhole
E:530651.805 N:139240.014	1.350						
			{a} F7.000	Pipe	65.222	Diam/Width:150	Not Applicable

Project: Cophthorne Optimisation Southern Plot Foul Water		Date: 19/11/0025			
		Designed by: JDM	Checked by: MCC		Approved By:
Report Details: Type: Inflow Summary Foul Phase: Southern Foul		Consultant : Stantec Caversham Bridge House Waterman Place			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Base Flow	F1	0.2						
Base Flow (2)	F3	0.2						
Base Flow (5)	F11	0.2						
Base Flow (7)	F13	0.3						
Base Flow (9)	F15	0.2						
Base Flow (10)	F17	0.6						
Base Flow (11)	F18	0.1						
Base Flow (12)	F20	0.1						
Base Flow (13)	F21	0.1						
Catchment Area	F6		Foul	0.000		10		0.00
Catchment Area (1)	F9		Foul	0.000		10		0.00
Catchment Area (2)	F22		Foul	0.000		10		0.00
Catchment Area (3)	F24		Foul	0.000		10		0.00
Catchment Area (4)	F26		Foul	0.000		10		0.00
TOTAL		1.9		0.001				0.00

Project: Cophthorne Optimisation Southern Plot Foul Water	Date: 19/11/0025		
	Designed by: JDM	Checked by: MCC	Approved By:
Report Details: Type: Network Design Criteria Foul Phase: Southern Foul	Consultant : Stantec Caversham Bridge House Waterman Place		



Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Inverts
Min. Slope (1:X)	135.00
Max. Slope (1:X)	5.00
Velocity Criteria	(UK) 1/3 Proportional Velocity
Min. Velocity (m/s)	0.75
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
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9. Appendix D

Flood Risk Assessment

Document: Version: 0.2

Copthorne Flood Risk Assessment

St Modwen Developments Ltd

November 2013



Flood Risk Assessment

Copthorne Flood Risk Assessment

St Modwen Developments Ltd

November 2013

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Document history

Draft Flood Risk Assessment

Copthorne Flood Risk Assessment

St Modwen

This document has been issued and amended as follows:

Version	Date	Description	Created by	Verified by	Approved by
0.1	August 2013	Draft	H. Gebre		
0.2	November 2013	Draft Final	H. Gebre		

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Appendix A – Revised Existing Flood Outlines (CD)

Appendix B – Masterplan

Appendix C – Proposed Flood Outlines (CD)

Appendix D – Comparison of Existing and Proposed Flood Outlines (CD)

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1 Introduction

1.1 Terms of Reference

Hydroland has been commissioned by Rodgers Leask Limited to produce a Flood Risk Assessment (FRA) in support of an outline planning application for the master planning stage (hereafter referred to as 'the proposed development') for development in Copthorne (hereafter referred to as 'the proposed development site').

The proposed mixed development site is approximately 54 hectares (Ha) in area. The proposed development comprises a mixed land use of residential, and business properties, sites for a primary school and a GP surgery, social amenities such as play areas, allotments and green open spaces.

Policy guidance for development and flood risk is part of the wider National Planning Policy Framework (NPPF) and the associated technical guidance, published in March 2012. This FRA considers the development with regard to NPPF and addresses any flood risk concerns raised by the Environment Agency and Mid Sussex District Council.

1.2 Purpose of Study

This assessment deals solely with the effects of fluvial flooding, and also identifies and examines the residual flood risk to the development site and neighbouring properties. A separate drainage strategy has been prepared for this site. The aim of this report is primarily to consider fluvial flood risk and satisfy requirements under NPPF. This assessment has also been undertaken in accordance with CIRIA C624 'Development and Flood Risk – Guidance for the Construction Industry' (2004) and the NPPF Technical Guide (2012). Data and information have been obtained from the following sources:

- Proposed site development plans dated October 2013;
- West Sussex County Council Strategic Flood Risk Assessment (SFRA); and
- Burstow Stream Modelling Report undertaken by Capita Symonds in July 2012
- Mid Sussex Strategic Flood Risk Assessment
- West Sussex County Council Local Flood Risk Management Strategy
- West Sussex County Council Preliminary Flood Risk Assessment
- Mid Sussex Local Development Framework

1.3 Ordnance Survey Base Mapping

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2 Development Site

2.1 Existing Site

The development site is located approximately 2km south east of Gatwick Airport and 4km north east of Crawley City Centre, at grid reference TQ 305 391. The proposed development site is currently Greenfield with forested, agricultural and grassland areas. The development site is bounded on the south by the A264 Copthorne Way and to the north by agricultural and forest land. The west of the development site is bounded by the M23 while the east is bounded by Holly Farm and Shipley Bridge Lane. Figure 2.1 shows a general location plan.

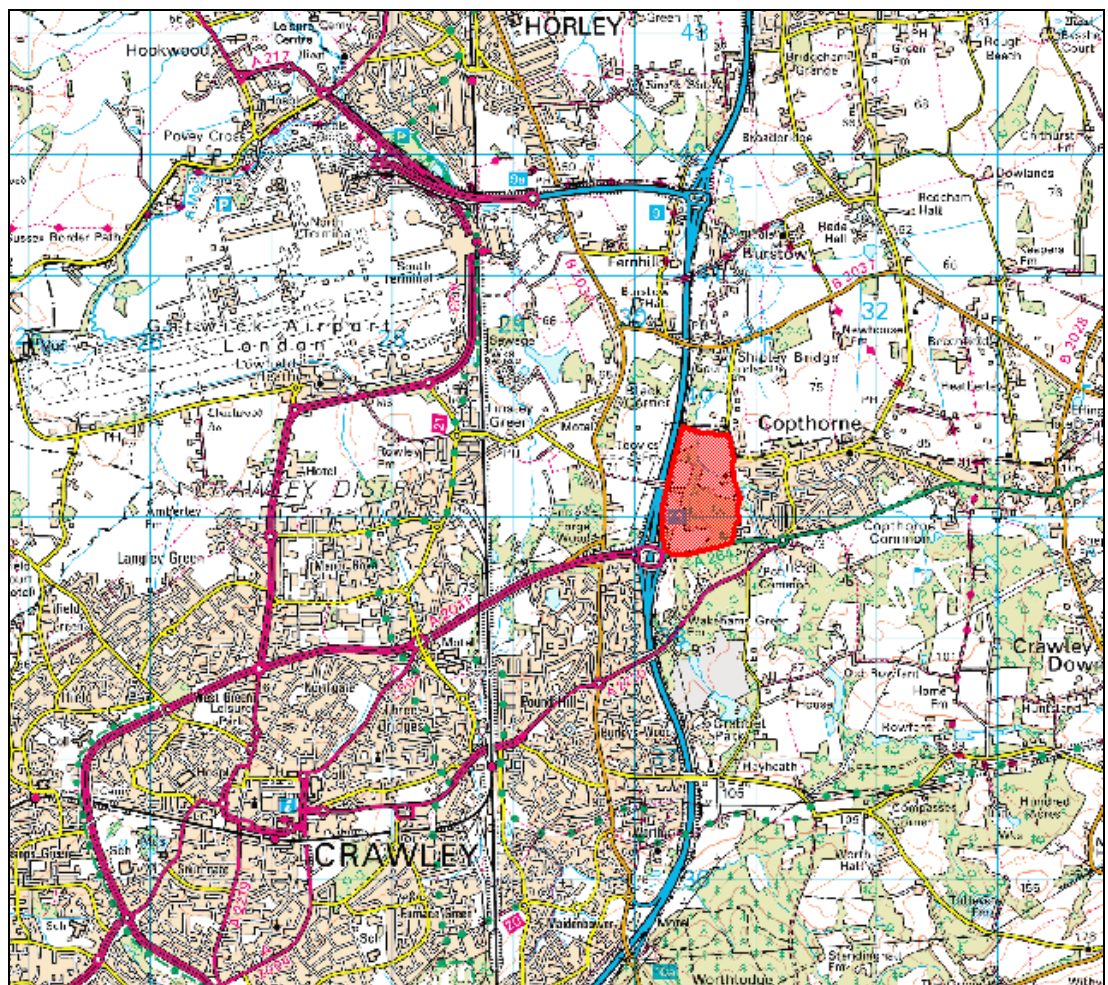


Figure2. 1: Location Plan (red polygon – proposed development area)

The closest Environment Agency maintained 'Main Rivers' affiliated to the site are Copthorne Brook and Burstow Stream. Copthorne Brook runs from the eastern portion of the development boundary for about 450 meters at which point it confluences with Burstow Stream. Burstow Stream runs in a northern direction for about 300m before leaving the site. There is a drain that runs from the south western portion of the site in a northerly direction into the Copthorne Brook at its confluence with Burstow Stream. There are no known formal flood defences present along either the Copthorne Brook or Burstow Stream through the site. There is a sewage pumping station adjacent to the site.

2.2 Development Proposals

St Modwen is looking to develop previously undeveloped Greenfield land with a view of providing increased housing, business and social. Figure 2.2 shows the area proposed for development which is approximately 54 hectares (Ha) in area. A larger plan is included within Appendix A of this FRA. Figure 2.3 shows the proposed development outline superimposed onto an extract from Google maps.

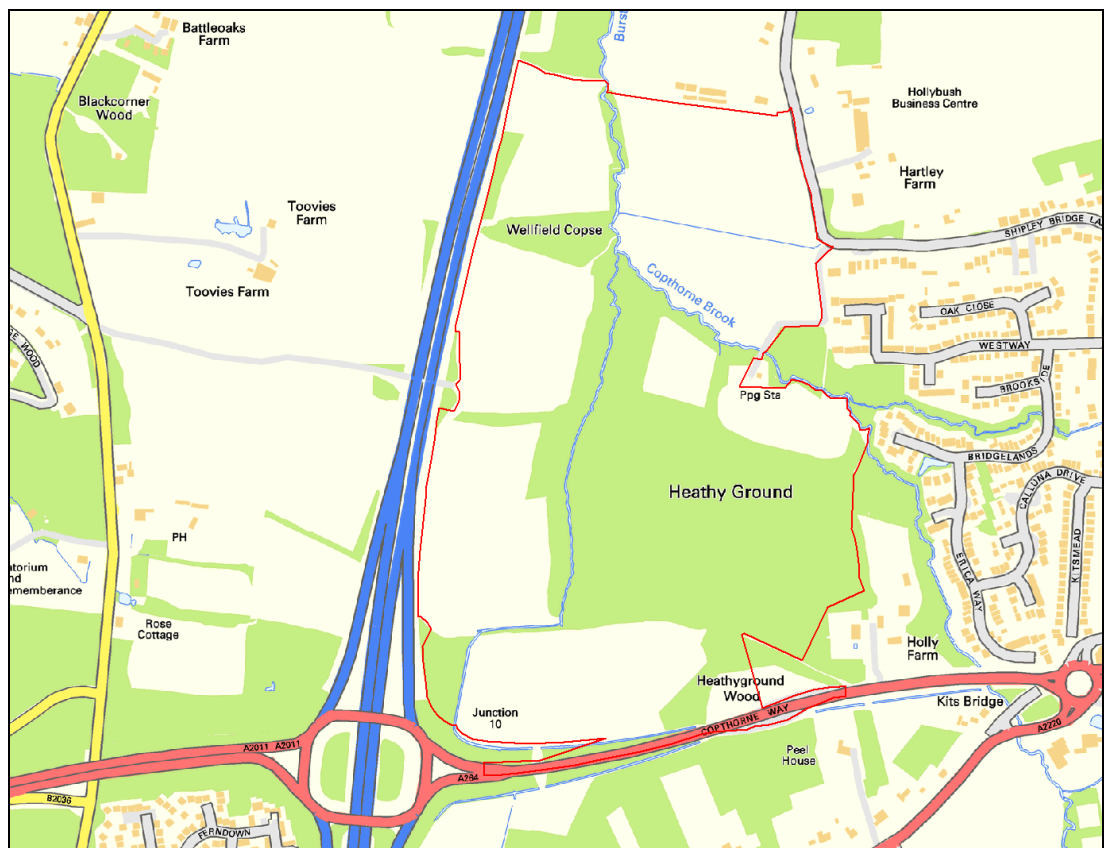


Figure2. 2: Development area

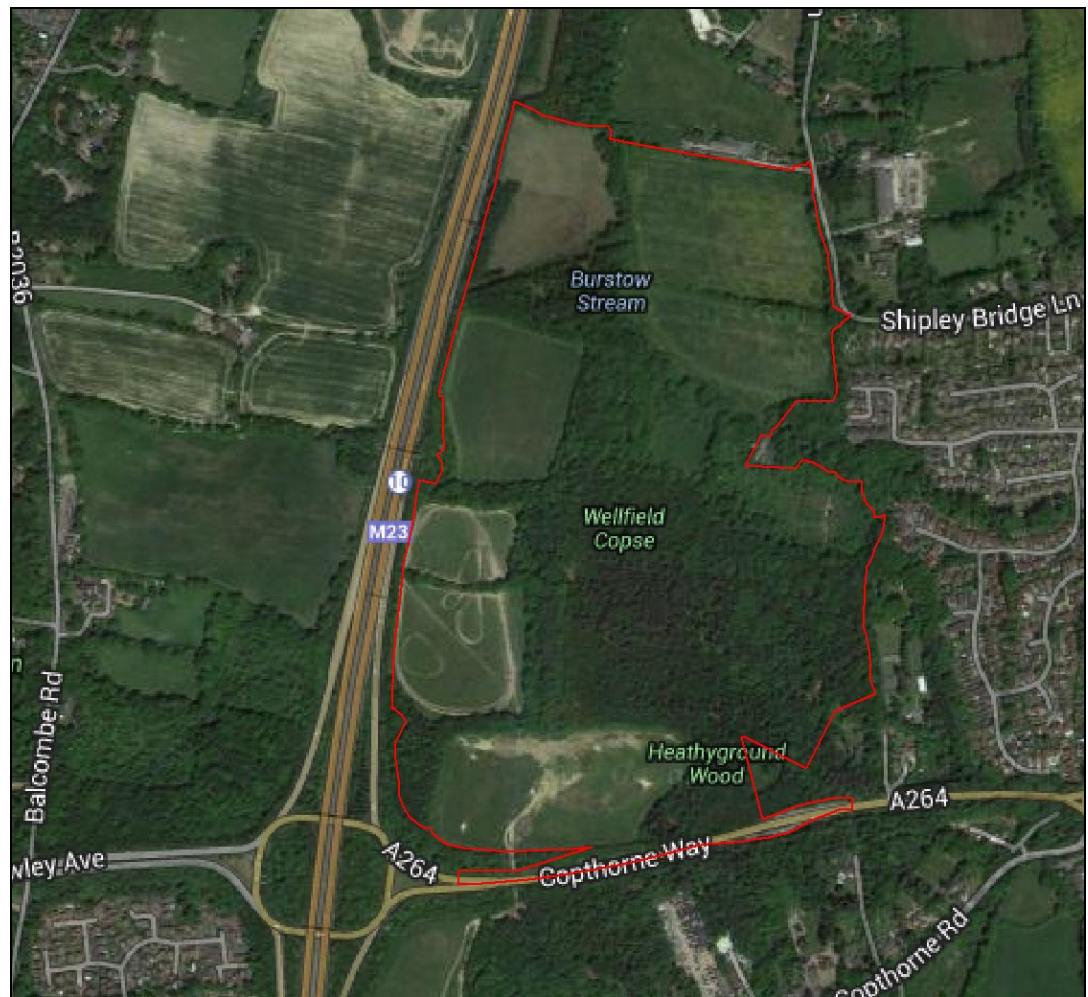


Figure2. 3: Development area (courtesy of Google maps)

2.3 Masterplan

Figure 2.3 shows the proposed site master plan. Appendix B contains a larger version of this illustration.

This FRA, therefore, is to support the outline planning application for the Masterplan. The development is outlined to contain the following:

- Business units, and associated parking;
- Residential units, and associated parking;
- Sites for a primary school and a GP surgery;
- Informal public open space;
- Allotments;
- Play areas;
- Green corridors;
- Roads / footways

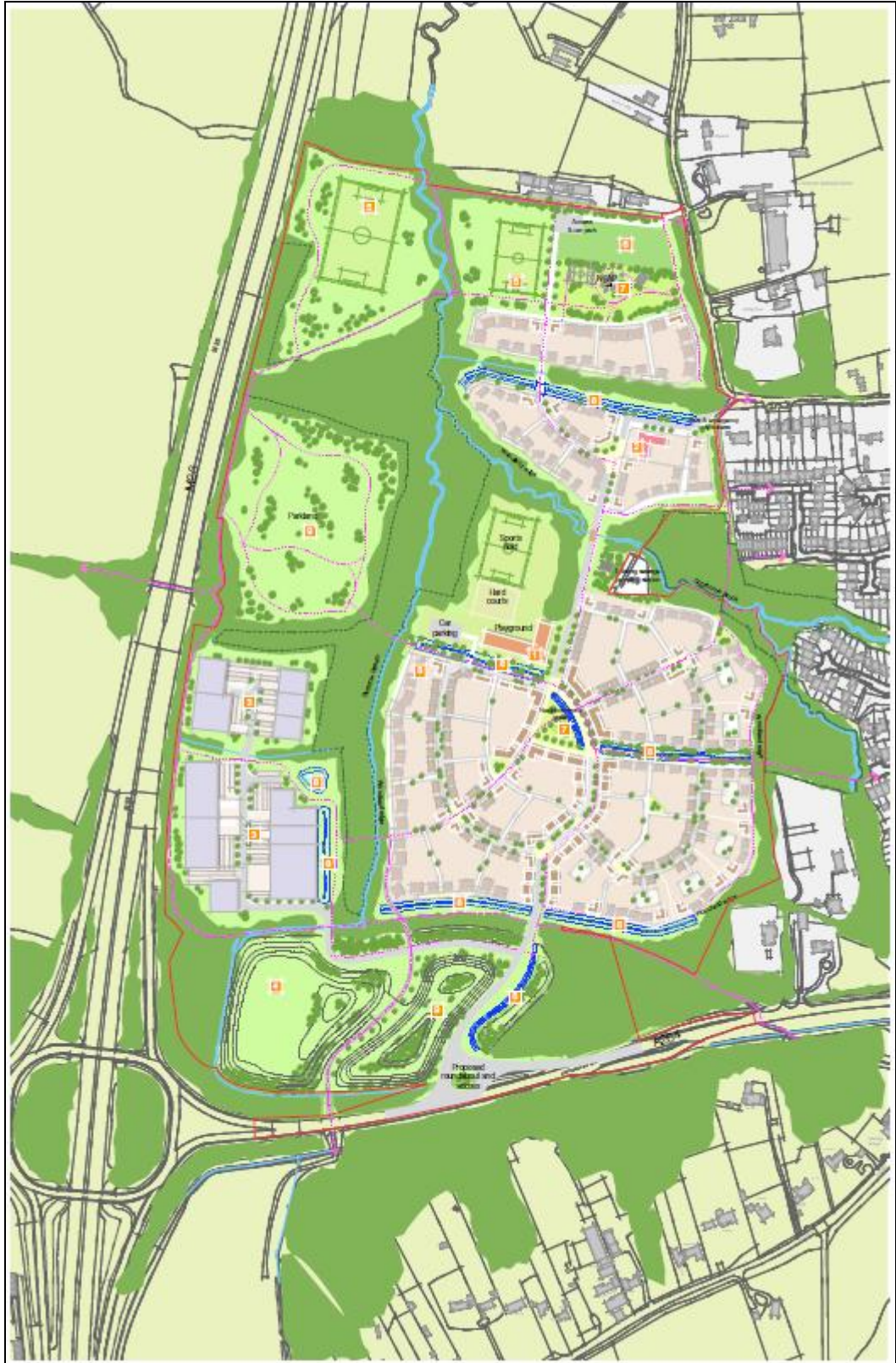


Figure2. 4: Masterplan

This Flood Risk Assessment outlines the risk of fluvial flooding to the site, both pre and post development, and any potential hydraulic effects the proposed site outlay would have on the fluvial regime of adjacent watercourses.

3 Planning Policy

3.1 West Sussex County Council Local Flood Risk Management Strategy

The proposed development site falls within the north western part of Mid Sussex District Council (MSDC), itself an area within West Sussex County Council. The West Sussex Local Flood Risk Management Strategy (LFRMS) aims to increase awareness of local flood risk issues. It also sets out how partners are working together to reduce flood risk. The LFRMS provides an overview of the on-going flood risk management work underway across West Sussex and the organisations in West Sussex with responsibility for flood risk management. The LFRMS states West Sussex has had a history of flooding from various sources; however no specific mention is made of the proposed development site being flooded.

3.2 Mid Sussex District Council SFRA

The Strategic Flood Risk Assessment (SFRA) provides the building blocks upon which the Council's planning and development control decisions will be made, identifying the areas within the proposed development plan at risk from all sources of flooding.

The Mid Sussex District Council Strategic Flood Risk Assessment (SFRA) was published in March 2008 to form part of the background information and evidence to be used in the development of the District Council's Core Strategy – Development Plan Document (DPD), particularly with regards to the identification of broad strategic options for new development in the district. It was produced following guidance and advice provided by both the Environment Agency and the District Council.

According to the SFRA the development site is situated in the Copthorne area, which is within the upper reaches of the River Mole catchment. The SFRA identifies fluvial flood risk as the main flood risk issue in this locality. It goes on to state that within Copthorne and to the west of the village are significant areas of Flood Zone 2 and 3 that are associated with a number of tributaries within the River Mole catchment and that any proposed development within these areas will need to be accompanied by a FRA.

3.3 West Sussex Preliminary Flood Risk Assessment

In accordance with the Flood Risk Regulations 2009, West Sussex County Council has produced a Preliminary Flood Risk Assessment (PFRA). This was submitted to the Environment Agency in May 2011. The preliminary flood risk assessment is

aimed at providing a high level overview of flood risk from local flood sources such as surface water, groundwater, ordinary watercourses and canals. It does not directly consider flooding from main rivers. The proposed development site (Cophthorne) is not within an indicative flood risk area.

4 Existing Published Flood Risk

4.1 Environment Agency Fluvial Flooding

One watercourse runs through the site, the Copthorne Brook which changes name to Burstow Stream. These are both Environment Agency designated “Main Rivers”. The Environment Agency publishes Flood Risk Zone Maps which relate to the likelihood and magnitude of fluvial flooding in a given area. The existing Flood Zones held by the Environment Agency for the proposed development site (shown in Figure 4.1) indicate areas of fluvial flood risk across the site, showing that the site is located within:

- **Flood Zone 1 (low probability)** – land assessed as having less than 1 in 1000 annual probability of river or sea flooding (<0.1%); and
- **Flood Zone 2 (medium probability)** - land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year;

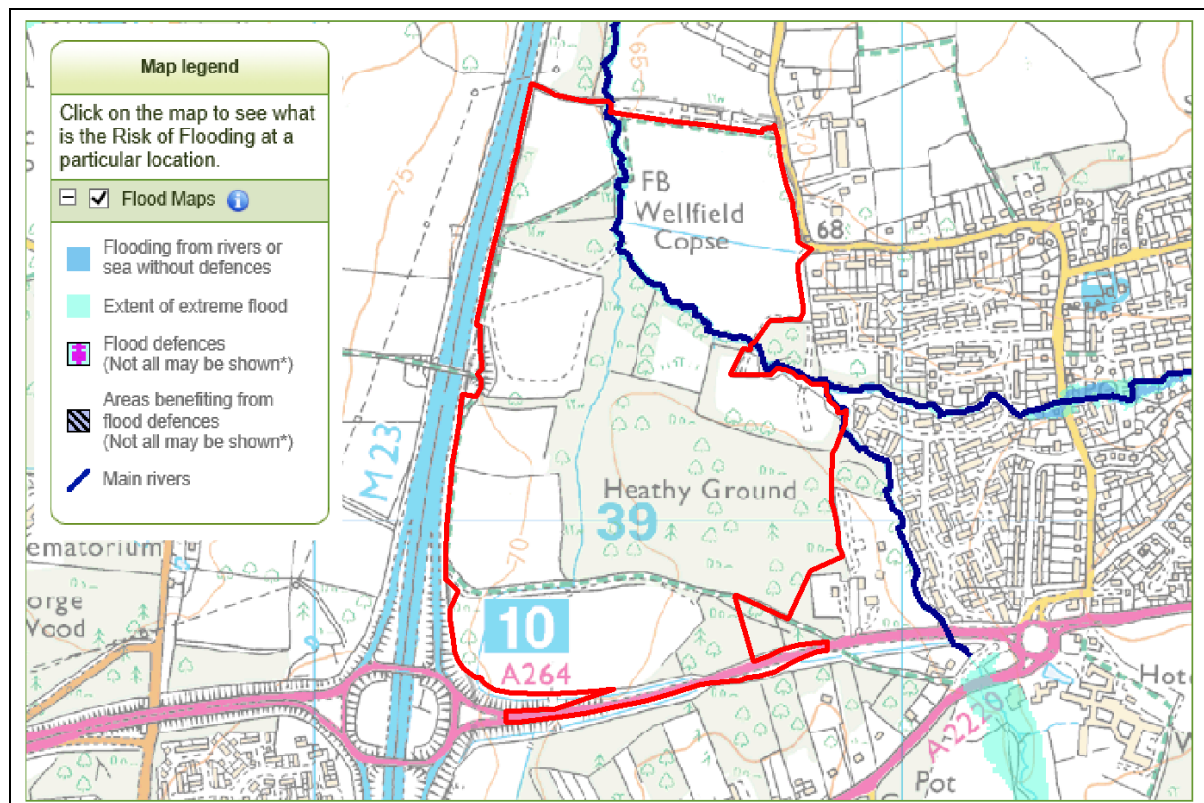


Figure4. 1: Copthorne development site and Environment Agency flood zones

The darker blue shading represents Flood Zone 3a – classified as having a High Probability of flooding (which equates to a > 1% AEP event). The lighter cyan

shading represents Flood Zone 2 – classified as having a Medium Probability of flooding (between a 0.1% and 1% AEP event). The areas outside of this are classified as Flood Zone 1 – Low Probability. Figure 4.2 shows the delineation of flood zones.

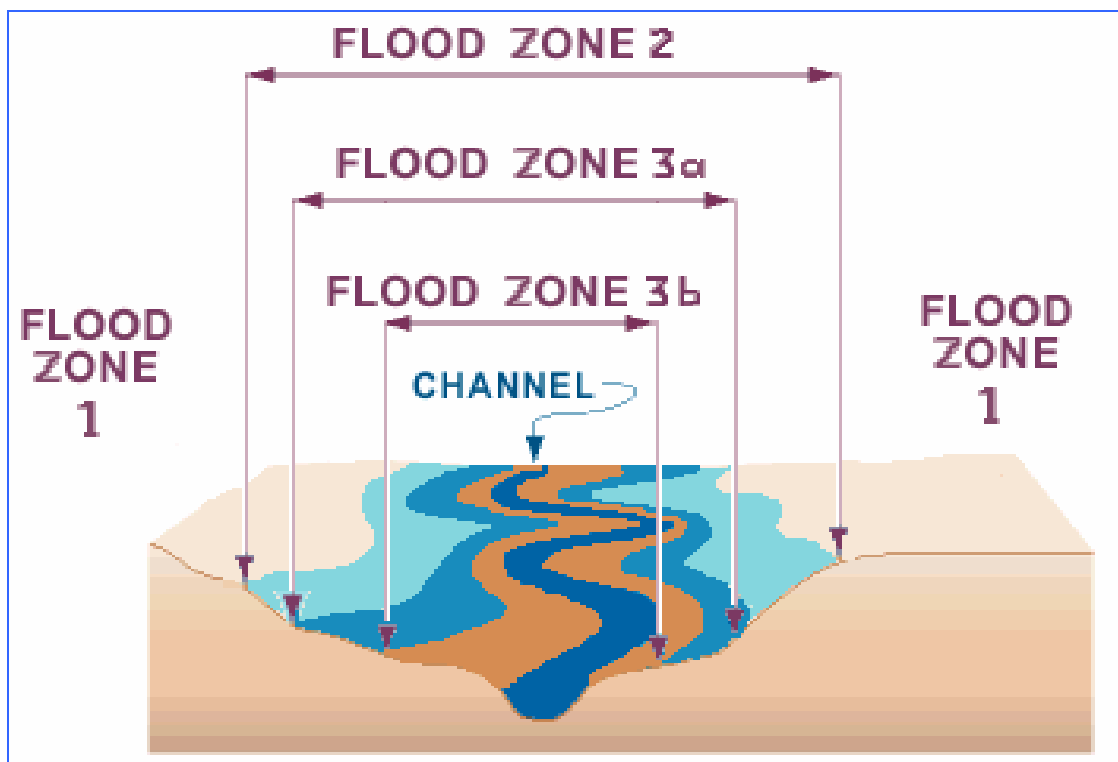


Figure4. 2: EA Flood Zone Delineation

4.2 Burstow Stream Modelling Report (Capita Symonds - July 2012)

Capita Symonds undertook a modelling study of the Burstow Stream, of which Copthorne Stream is a tributary (Burstow Stream Modelling Study) for the Environment Agency in July 2012. This study was undertaken, using ESTRY-TUFLOW 1D/2D hybrid unsteady state modelling software, to identify areas potentially at risk of flooding from the watercourse and its tributaries. Flood extent outputs of this study were similar to those of the existing published Environment Agency Flood Zones and are illustrated in Figure 4.3.



Figure4. 3: Capita Symonds Flood Outlines (red polygon – 1%AEP, pink polygon – 1%AEP+CC, yellow – 0.1%AEP)

Both the Environment Agency published outlines and the Capita Symonds 2012 outlines tally well with each other. According to figures 4.1 to 4.3, flooding is restricted to a narrow corridor along the channel which places the majority of the development site within Flood Zones 1(low probability) and a small portion in Flood Zone 2(medium probability).

4.3 Other sources of flooding

West Sussex County Council has produced a Preliminary Flood Risk Assessment which is aimed at providing a high level overview of flood risk from local flood sources such as surface water, groundwater, ordinary watercourses, sewers, and canals but not directly consider flooding from main rivers. There aren't any impounded water bodies identified within or around the vicinity that would pose a flood risk to the site. The proposed development site (Copthorne) is not within an indicative flood risk area.

4.4 Historical Flooding

Though the proposed development site is largely outside Flood Zones 2 and 3 it has been reported that the area has flooded historically. However, there are no available records of historical flooding on these streams, particularly Copthorne Brook and Burstow Stream, within the Mid Sussex area.

5 Modelled Existing Fluvial Flood Risk

5.1 Background

An early engagement with Mid Sussex District Council (MSDC) was carried out by submitting a scoping report. In their formal scoping opinion, MSDC acknowledged the presence of the ordinary watercourse which flows in northerly direction from the south western border of the development site as shown in Figure 5.1. This drain is not considered to be an Environment Agency “Main River” so the EA does not hold any flood risk data for it. However, MSDC has pointed out that this flood risk assessment must nonetheless consider the flood risk from the ordinary watercourse. The existing Capita Symonds 2012 EA model does not include the ordinary watercourse but has it as a simple point inflow into Copthorne Brook.



Figure5. 1: Un-named Drain

5.2 Model update

In order to determine the full impacts of all the watercourses in this location it was considered imperative to include this drain in the hydraulic model. Hydroland Consulting Engineers updated the Capita Symonds hydraulic model with this drain, as part of their commission to produce this FRA, to provide a more detailed representation of the fluvial flood risk identified in the July 2012 Burstow Stream Modelling Study.

As there is no survey data available for this ordinary watercourse, the LiDAR was used as base data and the watercourse was represented as part of the 2D domain with a point inflow at the top end of the watercourse. The hydrology used for this ordinary watercourse was adopted from the hydrological analysis undertaken by Capita Symonds as part of their 2012 study, and was simply moved upstream to the new location as opposed to the old location at the confluence with the main channel.

This representation undoubtedly produced very conservative flood extents in the sense that the capacity of the channel was significantly reduced. However, the approach was deemed suitable for this FRA purpose as flood levels would only be lower if adequate channel survey and 1D representation was undertaken and included in the hydraulic model.

The choice of software (TUFLOW-ESTRY) used for the 2012 Capita Symonds study was judged to be fit for the FRA purpose and adopted as an appropriate hydraulic assessment tool.

The updated existing base model was run for the 5%, 1%, 1%+CC, and 0.1%AEP scenarios to produce updated flood risk outlines. The resultant updated, existing, flood risk map is shown in Figure 5.2 and Appendix C.



Figure5. 2: Updated flood outlines (blue polygon – 5%AEP, red polygon – 1%AEP, pink polygon – 1%AEP+CC, yellow – 0.1%AEP)

5.3 Flood outline update

This shows a more comprehensive risk of flooding and shall therefore be taken forward as the existing basecase.

The updated existing flood outlines were superimposed onto the proposed Masterplan (Figure 5.3). As stated in Section 5.2 this has produced a conservative estimate of flood risk to the proposed development. The design scenario is discussed in Chapter 6.

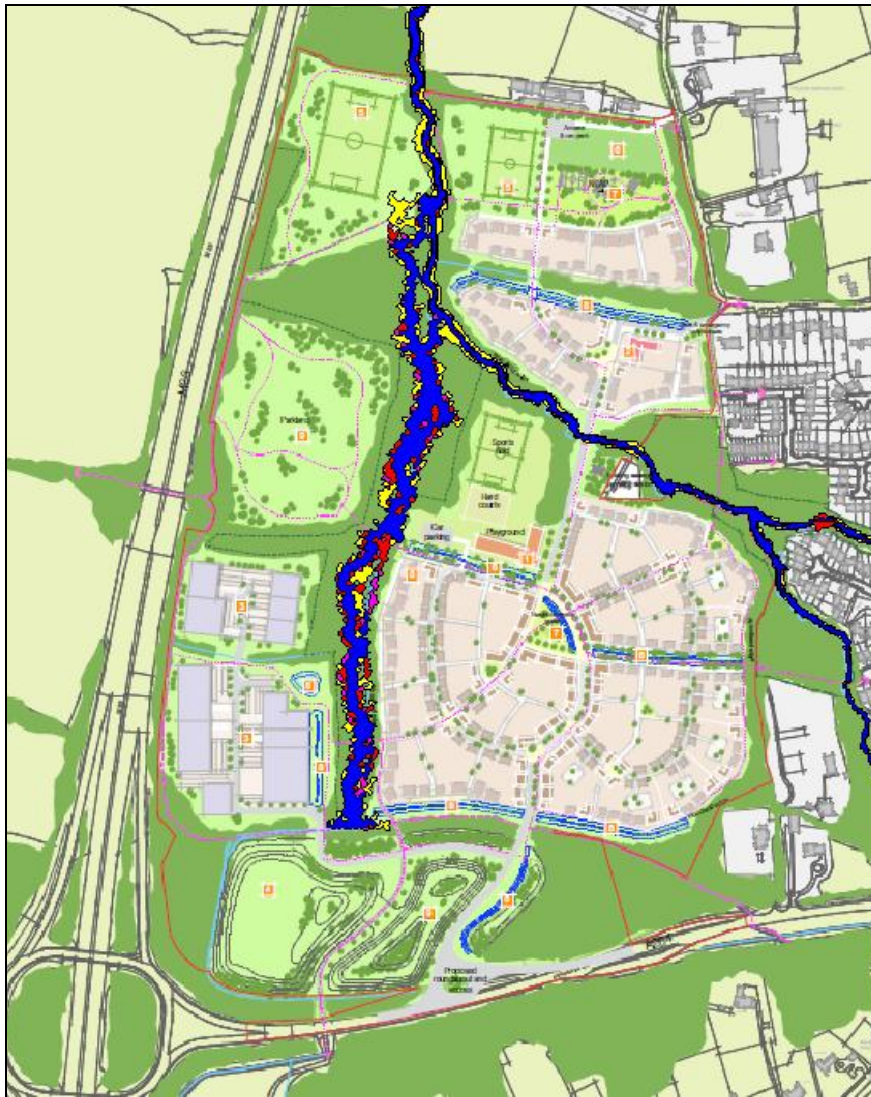


Figure 5.3: Updated flood outlines superimposed onto the proposed development (blue polygon – 5%AEP, red polygon – 1%AEP, pink polygon – 1%AEP+CC, yellow – 0.1%AEP)

As shown in Figure 5.3 the flood outlines attributed to the ordinary watercourse are larger than those of the Copthorne Brook and Burstow Stream. The reason for this is that as there was no channel survey for the ordinary watercourse the inflows were placed directly onto the ground model and allowed to follow the terrain. Therefore the flood outlines, on the ordinary watercourse, were largely dependent on the grid size thereby producing a conservative estimate of flood risk.

6 Development specific modelling and results

6.1 Overview

When developing in areas of flood risk, consideration must be given to the potential loss of floodplain storage which may increase the level of flood risk locally or downstream. A key requirement of NPPF is that 'developments should be safe from flooding without increasing the risk elsewhere'. Consideration should also be given to:

- The potential loss of floodplain storage
- The acceptability of the risk to the type of development and vulnerability
- The Impact of climate change on the development;
- And for this particular development, the flood risk to users of, or others in the vicinity of the development should not increase and where possible positively seek for opportunity to reduce Hazard.

6.2 Proposed development

The Copthorne development proposal is described in Chapter 2 of this report. The main hydraulic influence to the existing fluvial regime of the Copthorne Brook in the design scenario is the bridge river crossing adjacent to the existing sewage pumping station (Figure 6.1). To reflect this design scenario Hydroland made amendments to the updated existing hydraulic model and added the proposed bridge to hydraulically assess the impact of the bridge in the flood risk of the area locally, upstream and downstream.

6.3 Proposed development bridge crossing

The draft FRA, report submitted in August 2013, for comment had the bridge designed to have similar dimensions and geometry as the bridge immediately upstream of this crossing, however following a planning proposal comment received from EA on the 4th of November 2012, the bridge was hydraulically designed to satisfying the following design criteria, recommended by the EA as best practice:

- The bridge soffit level and flood span should normally be set at whichever is the highest: 600 mm above the design flood level of 1 in 100 year event plus climate change; or 300 mm above either of the upstream bank tops.
- The bridge should be clear spanning.
- The bridge should produce no difference in water levels (afflux) between the upstream and downstream sides.
- Use open parapets/handrails where appropriate

- Service pipes carrying utilities crossing the watercourse must not impinge into the cross section of the bridge opening.

Section 6.8 gives details of the design bridge parameters



Figure6. 1: Masterplan showing location of proposed Copthorne Brook crossing

6.4 Proposed development hydraulic criterion

The design scenario hydraulic model was subjected to simulations reflecting the 5%, 1%, 0.5%, 1% plus CC, and 0.1% AEP events under the proposed scenario. There is no plan in the proposed development to substantially raise the existing ground levels, thus, there will not be any potential loss of floodplain storage. Minimum floor levels of the residential properties should be set 600mm above the 1%AEP+CC levels where the flood level for the design event is taken from the closest channel cross-section, or floodplain maximum water level, which determines the flood risk locally. However there

will be an increase in the impermeable land of the area when compared to the pre-development conditions. For more detail on the drainage arrangement, please refer to the separate drainage strategy report.

6.5 Comparison of the existing and proposed scenarios

Though a suite of AEP events were simulated, the 1%+CC AEP event is used here as a comparison of the effects of the design proposals in Copthorne. Figure 6.2 shows the difference in flood extents between the revised existing and development scenarios for the 1%AEP+CC fluvial event. This comparison is repeated in Appendix E which also includes the 5%, 1%, and the 0.1% comparisons.

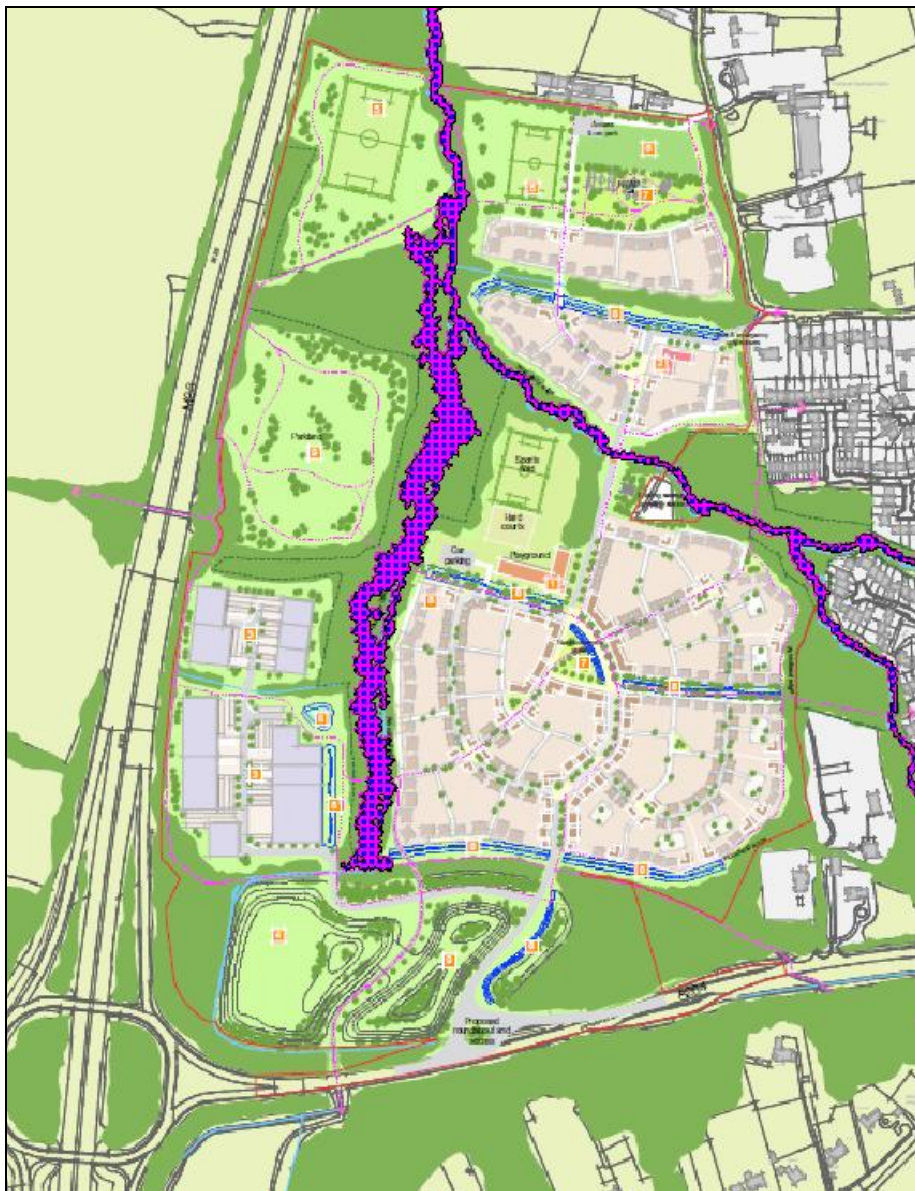


Figure6. 2: 1%AEP+CC event comparison between the existing and design scenarios (pink checked-existing, solid blue-design)

As can be seen from Figure 6.2, there is negligible difference between the existing and design scenario flood outlines. This shows that the proposed development does not exacerbate the existing flood risk regime.

6.6 Proposed Scenario Flood Risk

6.6.1 1%AEP proposed flood outline

The development is not within Flood Zone 3 and has negligible impact on the 1% AEP design flow and associated flood risk locally or downstream as can be seen in Figure 6.3. Appendix D contains the flood outlines for the development proposals.

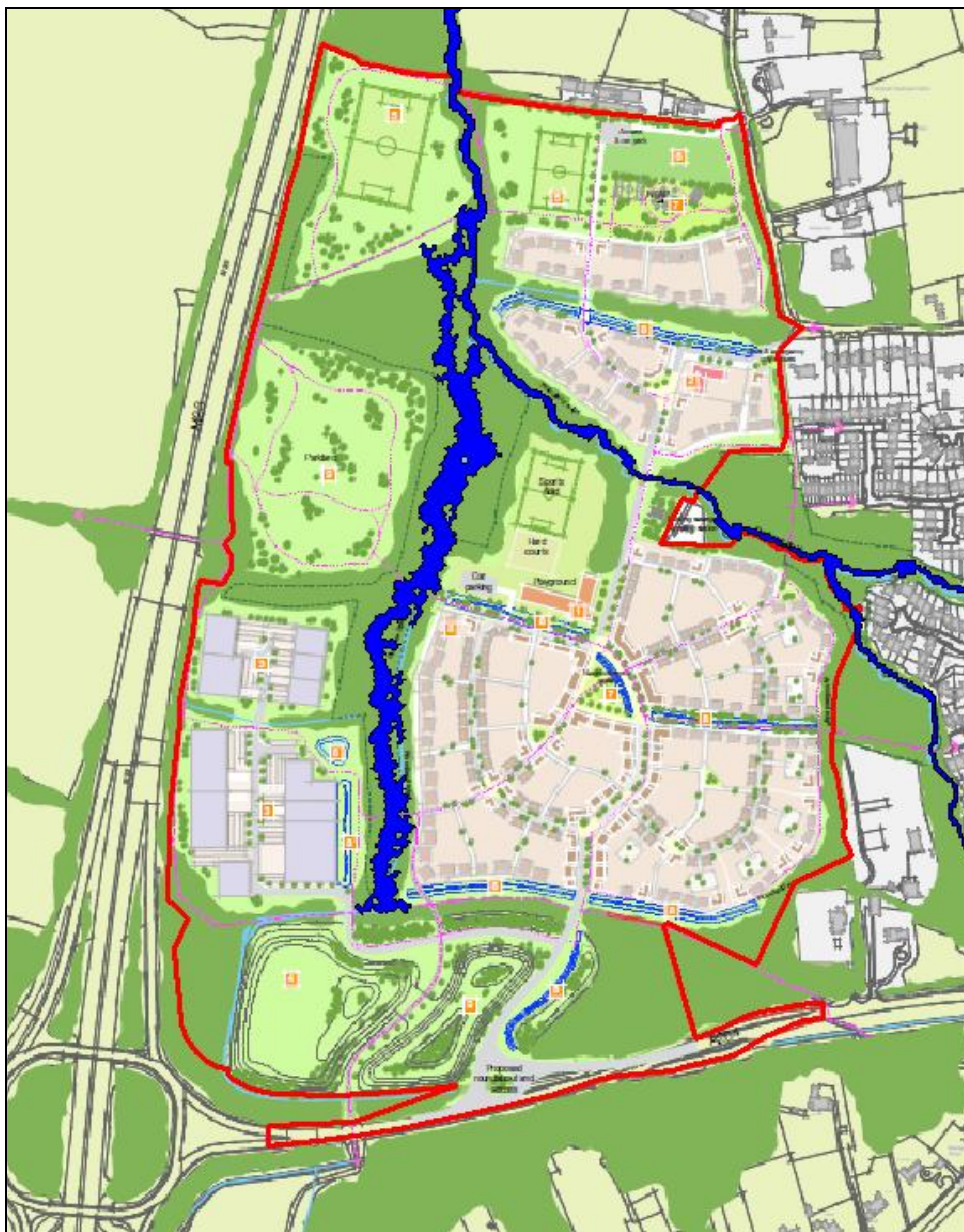


Figure6. 3: 1%AEP proposed outline

6.6.2 1%AEP+Climate Change proposed flood outline

The climate change scenario is tested by increasing the 1%AEP flow by 20% for total potential change anticipated for 2050's based on the Climate Change Adaption EA advice 2009 release. The 1%AEP + climate change (CC) scenario is the largest flood event used in planning policy and guidance to ensure developments are made safe. This is done by making use of flood levels from the climate change scenario to support the decision making processes on finished floor levels or defence freeboard. The development is outside the 1%AEP+CC outline and does not have any impact on the 1%AEP+CC flow associated flood risk locally or downstream as can be seen in the Figure 6.4. Appendix D contains the flood outlines for the development proposals.

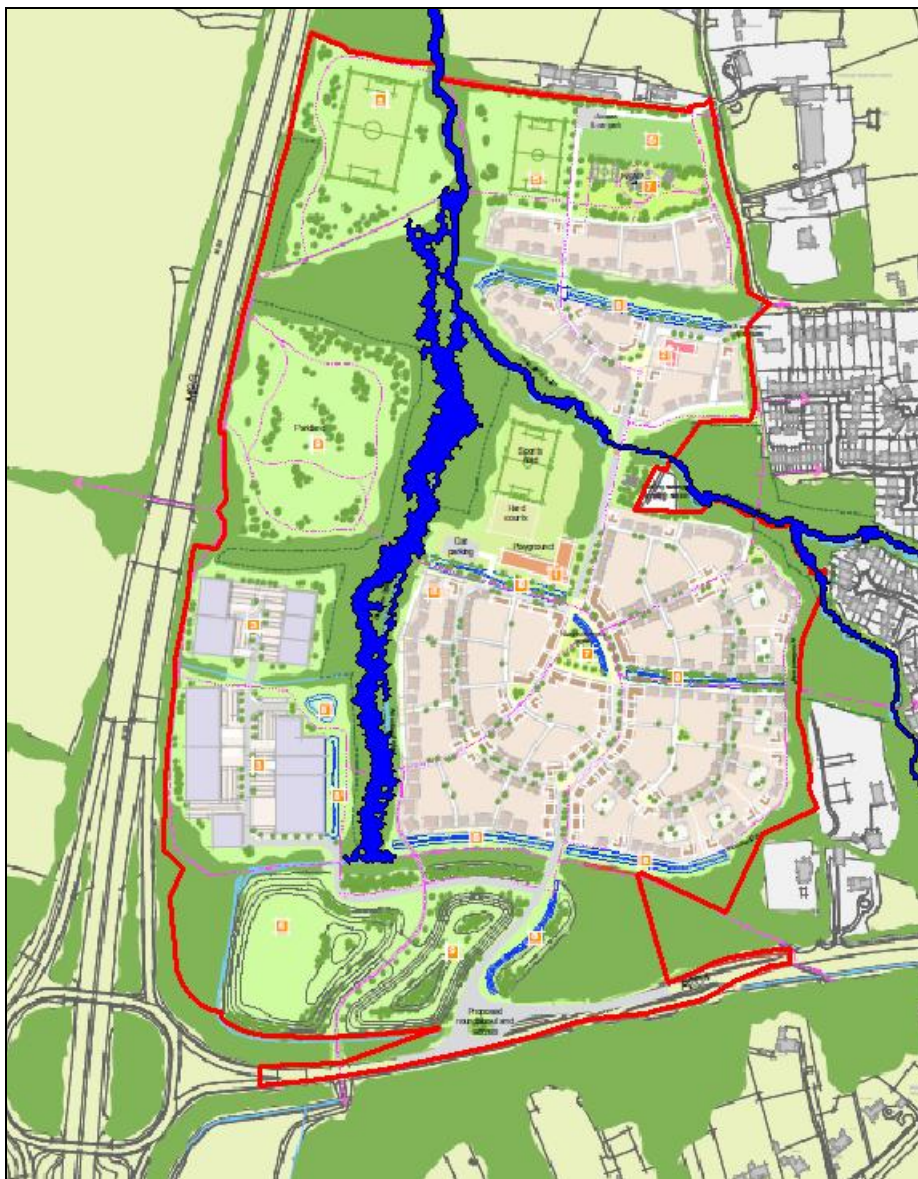


Figure6. 4:1%AEP+CC proposed outline

6.6.3 0.1%AEP proposed flood outline

The 0.1%AEP event is the most extreme design event considered in flood mapping. However, it has less significance when it comes to planning policy or guidance to development.

The development area is not flooded by the 0.1%AEP event in either the existing or design scenario, as shown in Figure 6.5 and as there is no plan to raise the site from its current level, the site will have no adverse impact on the flood risk to the area or downstream as it will not impede flow routes or result in loss of floodplain storage. Based on the above assessment, the development is not increasing flood risk.

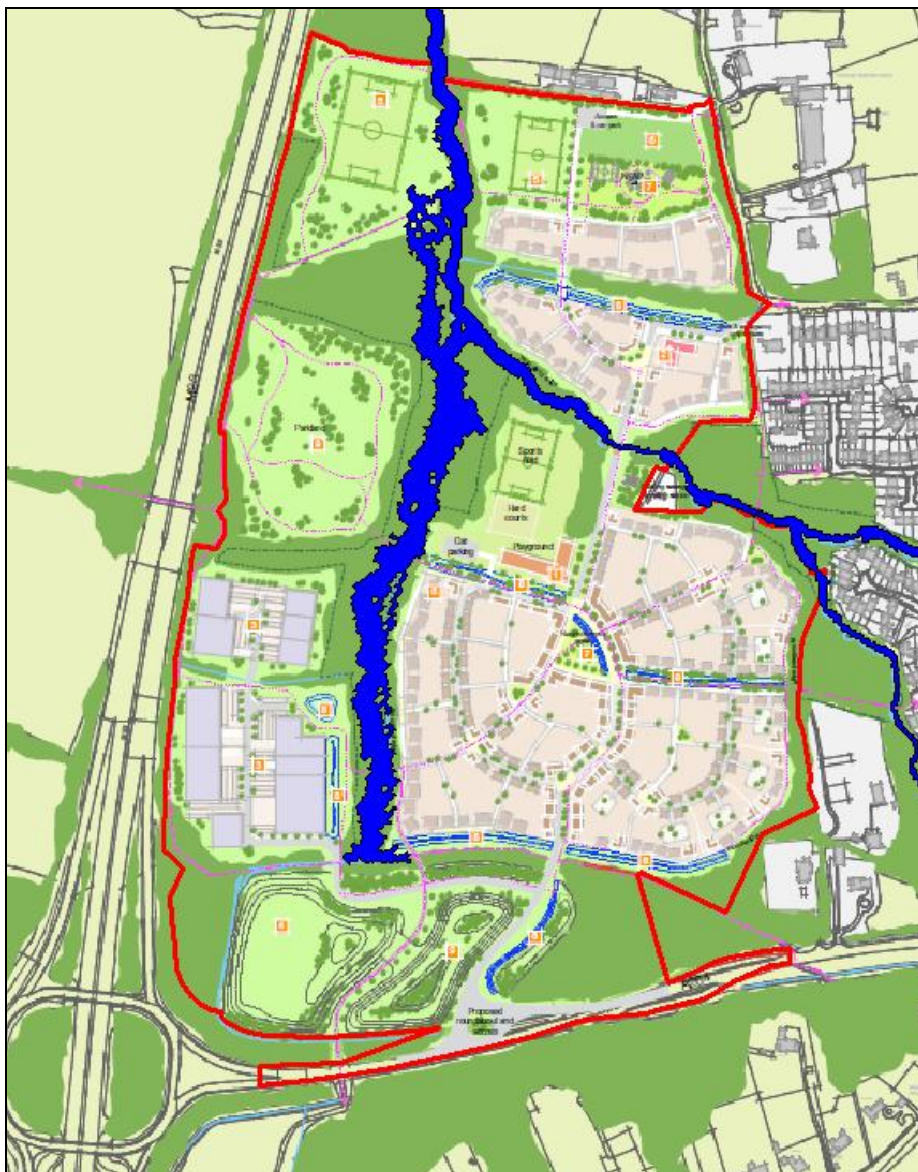


Figure6. 5: 0.1%AEP proposed outline

6.7 Comparison of Maximum Water Levels at Selected Locations

In addition to the flood extent comparison between the existing and design scenarios highlighted in the preceding sections, a comparison of maximum water levels within the

channel at selected nodes within the proposed development site. Figure 6.6 shows a schematic of the nodes selected whilst Table 6.1 provides the corresponding maximum water levels. Appendix A contains the model nodes and maximum water levels for the whole model. The table shows that there is a very negligible difference in maximum water levels between the existing and design scenarios.



Figure6. 6: Model Node Locations

Table6. 1: Maximum Water Level at Selected Nodes through the Site (mAOD)

Maximum Water Level at Selected Nodes through the Site (mAOD)								
Node Label	20yr		100yr		100yrCC		1000yr	
	Existing	Design	Existing	Design	Existing	Design	Existing	Design
KB185	65.194	65.194	65.393	65.392	65.493	65.492	65.835	65.833
KB285	64.769	64.768	65.037	65.033	65.164	65.159	65.568	65.565
KB385	64.474	64.465	64.839	64.831	64.983	64.975	65.454	65.45
CB1169	64.434	64.424	64.801	64.791	64.945	64.937	65.416	65.411
CB1177	64.402	64.391	64.77	64.76	64.914	64.905	65.382	65.377
CB1198B	64.399	64.388	64.765	64.755	64.909	64.899	65.375	65.37

Maximum Water Level at Selected Nodes through the Site (mAOD)								
Node Label	20yr		100yr		100yrCC		1000yr	
	Existing	Design	Existing	Design	Existing	Design	Existing	Design
CB1204	64.337	64.324	64.694	64.683	64.834	64.824	65.288	65.283
CB1251	64.262	64.246	64.618	64.605	64.758	64.746	65.204	65.198
CB1288B	64.258	64.242	64.613	64.6	64.752	64.74	65.187	65.183
*CB1292/CB1320	64.12	64.126	64.465	64.472	64.601	64.607	65.018	65.013
CB1377	63.89	63.895	64.232	64.238	64.367	64.373	64.789	64.795
CB1477	63.728	63.732	64.078	64.084	64.217	64.222	64.649	64.654
BS0	63.686	63.69	64.034	64.039	64.172	64.177	64.599	64.605
BS24	63.469	63.473	63.836	59.451	63.977	63.982	64.395	64.4
BS142	63.359	63.363	63.775	63.721	63.914	63.857	64.256	64.261
BS188	63.184	63.188	63.528	63.532	63.658	63.662	64.025	64.03
BS272	63.166	63.169	63.51	63.514	63.639	63.644	64.004	64.008
BS288	63.026	63.03	63.386	63.391	63.518	63.522	63.87	63.874
BS388	62.928	62.932	63.294	63.298	63.427	63.431	63.772	63.775
BS488	62.78	62.783	63.152	63.156	63.29	63.294	63.61	63.613
BS588	62.636	62.64	63.014	63.018	63.154	63.157	63.431	63.433
BS664	62.6	62.603	62.976	62.98	63.114	63.118	63.37	63.372
BS688	62.449	62.452	62.805	62.809	62.935	62.938	63.171	63.173

Note: the downstream end of reach CB1292 in the existing scenario and reach CB1320 in the design scenario fall at the same location following insertion of the design bridge.

6.8 Design Bridge Analysis

As stated in Section 6.3, the bridge was re-designed to satisfy the prior mentioned criteria, and is hydraulically represented in the 1D ESTRY part of the numerical model. The calculated soffit level, based on the above two criteria, is given in Table 6.2.

Table 6. 2: Bridge soffit level options

Soffit level	(100yrCC plus 600mm)	65.272mAOD
	Estimated bank tops plus 300mm	65.701mAOD

Assuming all local and design conditions allow, the 65.701mAOD is the recommended soffit level and was taken forward for the final design of the bridge crossing. Table 6.3 gives a full assessment of the energy loss associated with the bridge and as can be seen from the table, the bridge have virtually no impact on the water level of the channel

Table 6. 3: Design bridge energy losses

Maximum Water Level(AOD)					
Return period		20yr	100yr	100_Ccyr	1000yr
Upstream cross-section	H CB1292.2	64.185	64.535	64.672	65.087
Downstream Cross-section	H CB1300B.2	64.181	64.530	64.667	65.079
Losses(m)		0.004	0.005	0.005	0.008

6.9 Emergency Evacuation

Developments in flood risk areas must provide safe dry places of refuge for people to await instructions from emergency services and clear practices for evacuation. The majority of the development lies within Flood Zone 1. The road crossing Copthorne Brook between the two proposed residential areas is shown to be at low risk of flooding and would therefore provide a safe evacuation route at all times, even during large return period events.

6.10 Flood Warnings

The development is shown to be at low risk of flooding, therefore there is no immediate need to consider the introduction of formal flood warnings from the Environment Agency operated 'Floodline' of extreme fluvial events from the Copthorne Brook and Burstow Stream. In areas at risk of flooding these warnings are normally Automated Voice Messaging (AVM), mobile loudhailer, Environment Agency website and loudhailer. Contact should be made with the Environment Agency on 08459881188 to register for Floodline warnings direct.

6.11 Flood Hazard

Comparison of the existing scenario to the design scenario shows there is no marked increase in flood hazard.

6.12 Flood Resilience and Resistance

The development area is shown to be at low risk of flooding therefore flood resilience and resistance is not to be considered at this time.

6.13 Loss of Floodplain Storage

As detailed in the Masterplan and evidenced by the flood outline extents in both the existing and proposed scenarios the majority of the proposed development is located within Flood Zone 1, with a small portion of Flood Zone 2, apart from the road crossing Copthorne Brook between the two proposed residential areas. The proposed development does not impact on floodplain storage therefore there is no need for any floodplain volume compensation.

6.14 Residual Risk

The development area is shown to be at low risk of flooding therefore residual risk is not considered to be an issue. However, a strict maintenance regime should be put in place to ensure that the proposed bridge crossing Copthorne Brook is kept clear of blockage and debris.

6.15 Other Sources of Flooding-Post Development

Section 4.3 identifies that the proposed development site is not in an indicative area of flooding from other sources surface water, groundwater, ordinary watercourses, sewers, and canals.

The post development drainage strategy, prepared by Rogers Leask, proposes that the post development runoff rates, into the watercourses crossing the site, will be restricted to the equivalent Greenfield rate for storms up to the 1 in 100yr, including climate change, return period event. There are no plans to have impounded water bodies within the development site. Therefore, it is not envisaged that the development will increase the risk of flooding to itself or the surrounding area.

7 Flood Risk Mitigation

7.1 Sequential Approach

NPPF aims to ensure inappropriate development is avoided in areas at risk of flooding. The Sequential Test, required under NPPF, is a tool for determining land uses that are compatible with the level of flood risk at each development site within a Local Authority area.

The Environment Agency produces flood zones that are the starting point for the Sequential Test. Flood Zones 2 and 3 indicate the land at medium to high risk of flooding during extreme events, and Flood Zone 1 is the low risk zone, which is all land outside Zones 2 and 3. These flood zones refer to the probability of sea and river flooding only, excluding any existing defences.

Table 7.1 summarises the annual probability of fluvial flooding in relation to the Flood Zones and the land uses considered appropriate for each Zone. It is based upon Table 1 of NPPF.

Table 7.1: Flood Zone summary table and appropriate land uses

Flood Zone	Annual Probability of Flooding	Appropriate Land Users
Flood Zone 1 Low probability	< 1 in 1000 (<1%) annual probability of flooding in any given year.	All land users
Flood Zone 2 Medium probability	1 in 100 – 1 in 1000 (1% - 0.1%) annual probability of flooding in any given year.	Less vulnerable More vulnerable Water compatible <i>Highly vulnerable uses are only appropriate in this zone if the Exception Test is passed.</i>
Flood Zone 3 High probability	1 in 100 (1%) annual probability of flooding in any given year.	Water compatible Essential infrastructure <i>The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed.</i>

The proposed development site is within Flood Zones 1 and 2 on the current Environment Agency on-line flood maps and as evidenced in the most recent FRA hydraulic modelling. In accordance with Table 2 of NPPF, the proposed development will fall into the ‘Less Vulnerable’ and ‘More Vulnerable’ vulnerability classes. This development is an opportunity to provide increased housing, economic opportunities and social amenities to Copthorne.

This development would be deemed suitable under NPPF and assessment of other sites would not be required.

7.2 Exception Test

In terms of national guidance on flood risk and development, NPPF states that the application of the Exception Test, for necessary development in sites of higher probability of flooding, is appropriate “for use when there are large areas in Flood Zones 2 and 3, where the Sequential Test alone cannot deliver acceptable sites, but where some continuing development is necessary for wider sustainable development reasons, taking into account the need to avoid social or economic blight”.

Table 5.2 (extracted from Table 3 in Technical Guidance to National Planning Policy Framework) summarises the flood risk vulnerability and flood zone ‘compatibility’ for the application of the Sequential Test.

Table 5.2: Exception Test parameters (extracted from Table 3 of NPPF)

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Key: ✓ Development is appropriate.
 ✗ Development should not be permitted.

As set out in NPPF the proposed development must fulfil the following stringent conditions in order to pass the Exception Test:

- **Part A** - It must be demonstrated that the development provides wider sustainability benefits to the area that outweigh flood risk, informed by a SFRA where one has been prepared.
- **Part B** - The development should be on developable previously developed land or, if it is not on previously developed land, that there are no reasonable alternative sites on developable previously developed land.
- **Part C** - A Flood Risk Assessment must demonstrate that the development will be safe, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

7.3 Parts A, B and C of the Exception Test

As stated in section 2.3 and supported by Table 7.2, the proposed development lies in Flood Zones 1 and 2 where both “More Vulnerable” and “Less Vulnerable” development is permissible without having to undertake an Exception Test. The development does not contain any “Highly Vulnerable” elements. Though the development is designated to be on a on Greenfield Site, it provides increased residential and business units, community facilities, and open space providing wider sustainability benefits in line with the Mid Sussex SFRA, and there are no other reasonable alternative sites on previously developed land;, and; this FRA has demonstrated that the development is safe and does not increase flooding ether within or outside of the site. Though the development includes “More Vulnerable” elements, these are located outside Flood Zone 3 therefore development is appropriate.

7.4 Increased Flood Risk and Mitigation

There is no increased flood risk, therefore no mitigation is required.

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8 Conclusion

The proposed scheme will involve building of residential and business properties with the inclusion of social amenities.

The Sequential Test showed this development would be deemed suitable under NPPF as an opportunity to provide additional housing, business, and social amenities to Copthorne and assessment of other sites would not be required.

The Exception Test showed that the development was More Vulnerable and does not increase the risk of flooding either within the site or both upstream and downstream of it

Overall, this FRA has demonstrated that the proposed development provides wider sustainability benefits to the area that outweigh the flood risk. The report shows that there is no flood risk to the site or the surrounding area.

This development will contribute to the long term development of Mid Sussex District Council.

Though the development is in Flood Zone 1, minimum floor levels of the residential properties should however be set 600mm above the 1%AEP+CC levels where the flood level for the design event is taken from the closest channel cross-section, or maximum floodplain water level, which determines the flood risk locally.

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Appendix A

Modelled Flood Levels



- Key
- 1 2 Form Entry primary school
 - 2 Doctors surgery
 - 3 Storage and distribution or light industry
 - 4 Residential care home
 - 5 Space for formal sports pitches if required
 - 6 Allotments
 - 7 Equipped play area
 - 8 Attenuation basin and swales
 - 9 Informal open space

- Site boundary
- Public rights of way
- Proposed footpaths/pedestrian links
- Development blocks
- Key frontage
- Existing vegetation
- Ancient woodland
- Proposed strategic planting

Notes/Revisions
Rev A: 18.05.13 Amendments following client and design team comments
Rev B: 10.05.13 Amendments in accordance with land use plan
Rev C: 18.10.13 GP surgery relocated, care home & sports pavilion removed & road layout updated/amended

Land West of Copthorne
St Modwen

Illustrative Master Plan
DRAFT

185004/IMP	Revision: C
FOR COMMENT	Date issued: 07/13
1:2000@A1	Drawn by: GP Checked by: SN

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Appendix B

Masterplan

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Appendix C

Revised Existing Flood Outlines

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Appendix D

Proposed Flood Outlines

Refer to CD

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Appendix E

Comparison of Existing and Proposed Flood Outlines

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