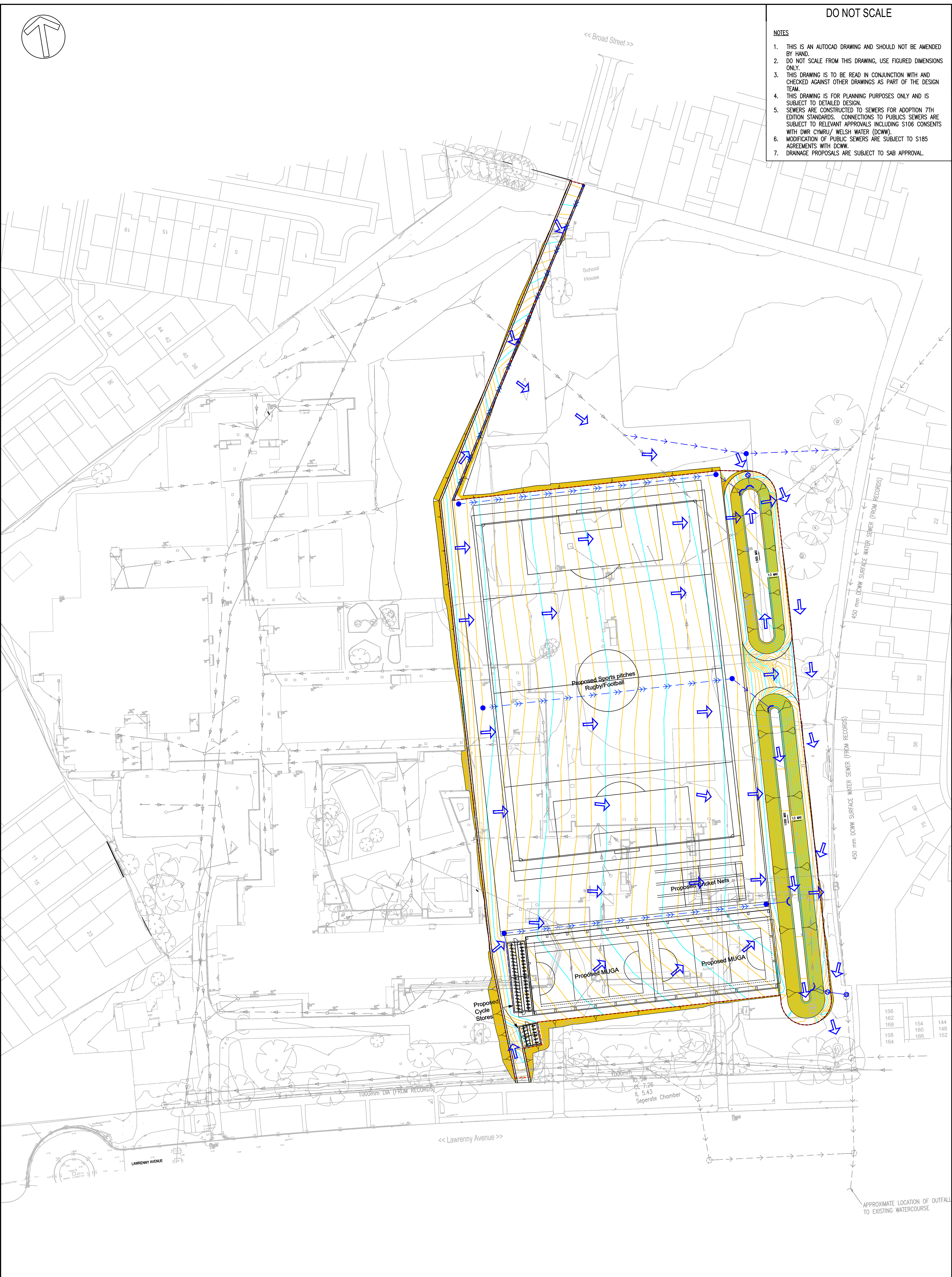


DO NOT SCALE

NOTES

1. THIS IS AN AUTOCAD DRAWING AND SHOULD NOT BE AMENDED BY HAND.
2. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH AND CHECKED AGAINST OTHER DRAWINGS AS PART OF THE DESIGN TEAM.
4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS SUBJECT TO DETAILED DESIGN.
5. SEWERS ARE CONSTRUCTED TO SEWERS FOR ADOPTION 7TH EDITION STANDARDS. CONNECTIONS TO PUBLICS SEWERS ARE SUBJECT TO RELEVANT APPROVALS INCLUDING S106 CONSENTS WITH DWR CYMRU/ WELSH WATER (DCWW).
6. MODIFICATION OF PUBLIC SEWERS ARE SUBJECT TO S185 AGREEMENTS WITH DCWW.
7. DRAINAGE PROPOSALS ARE SUBJECT TO SAB APPROVAL.



File name: \\UK.WSPGROUP.COM\CENTRAL\DATA\PROJECTS\70096653\FITZALAN_HS\WSP_Plan_1440403_WP02_Civil_Engineering\70096653-FITZALAN_HS\WSP_Plan_1440403_WP02_Civil_Engineering\70096653-FITZALAN_HS\WSP_Plan_1440403_WP02_Civil_Engineering.dwg, created on 18 November 2023 10:58:48 by Iain James

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	10/11/2023	PM	FIRST ISSUE	WF	WF

DRAWING STATUS: S2 - FOR INFORMATION



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CLIENT: CARDIFF CITY COUNCIL	ARCHITECT: STRIDE TREGLOWN
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PROJECT: FITZALAN HIGH SCHOOL (LAWRENNY AVENUE) PITCHES	TITLE: PROPOSED SURFACE WATER DRAINAGE STRATEGY
--	--

SCALE @ A1: 1:500	CHECKED: WF	APPROVED: WF
PROJECT No: 70096653	DESIGNED: PM	DATE: November 23
DRAWING No: 6653-WSP-ZZ-ZZ-DR-CV-05003	REV: P01	

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Appendix D

DRAINAGE CALCULATIONS



Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address: WSP		



Catchment Area 1 Asphalt Paving

Type : Catchment Area

Area (ha)	0.052
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area 2 asphalt Paving

Type : Catchment Area

Area (ha)	0.006
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area 2 Asphalt Paving

Type : Catchment Area

Area (ha)	0.023
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area 1 Sports Pitch

Type : Catchment Area

Area (ha)	0.484
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.800
Winter Volumetric Runoff	0.800
Time of Concentration (mins)	5
Percentage Impervious (%)	80

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address: WSP		



Catchment Area 2 Sports Pitch

Type : Catchment Area

Area (ha)	0.555
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.800
Winter Volumetric Runoff	0.800
Time of Concentration (mins)	5
Percentage Impervious (%)	80



Catchment Area 2 Asphalt paving

Type : Catchment Area

Area (ha)	0.078
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area 2 MUGA

Type : Catchment Area

Area (ha)	0.146
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.800
Winter Volumetric Runoff	0.800
Time of Concentration (mins)	5
Percentage Impervious (%)	80

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: WSP		



Catchment 1 Sports Pitch

Type : Porous Paving

Dimensions

Exceedance Elevation (m)	6.835
Depth (m)	0.850
Base Elevation (m)	5.985
Paving Layer Depth (mm)	400
Membrane Percolation (m/hr)	1.0
Porosity (%)	30
Length (m)	58.825
Long. Slope (1:x)	155.00
Width (m)	80.007
Total Volume (m³)	637.927

Under Drain

Height Above Base (m)	0.150
Diameter (mm)	100
No. of Barrels	12
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 1 Sports Pitch
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	PP N
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	0.11
---------------------	------

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: WSP		



Catchment 2 Sports Pitch

Type : Porous Paving

Dimensions

Exceedance Elevation (m)	6.884
Depth (m)	0.850
Base Elevation (m)	6.034
Paving Layer Depth (mm)	400
Membrane Percolation (m/hr)	1.0
Porosity (%)	30
Length (m)	107.592
Long. Slope (1:x)	174.00
Width (m)	53.129
Total Volume (m³)	776.969

Under Drain

Height Above Base (m)	0.150
Diameter (mm)	100
No. of Barrels	22
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 2 Sports Pitch
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	PP MID
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	0.11
---------------------	------

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: WSP		



Catchment 2 MUGA

Type : Porous Paving

Dimensions

Exceedance Elevation (m)	6.833
Depth (m)	0.850
Base Elevation (m)	5.983
Paving Layer Depth (mm)	400
Membrane Percolation (m/hr)	1.0
Porosity (%)	30
Length (m)	21.663
Long. Slope (1:x)	180.00
Width (m)	71.654
Total Volume (m³)	210.031

Under Drain

Height Above Base (m)	0.150
Diameter (mm)	100
No. of Barrels	4
Release Height (m)	0.000
Friction Scheme	Manning's n
n	0.015

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 2 MUGA
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	MUGA
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	0.11
---------------------	------

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: WSP		



Swale N

Type : Swale

Swale

Exceedance Elevation (m)	6.489
Depth (m)	0.672
Base Elevation (m)	5.817
Top Width (m)	10.716
Side Slope (1:x)	3.00
Base Width (m)	6.684
Freeboard (mm)	300
Length (m)	52.436
Long. Slope (1:x)	500.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.033
Total Volume (m³)	152.153

Inlets

Inlet (1)

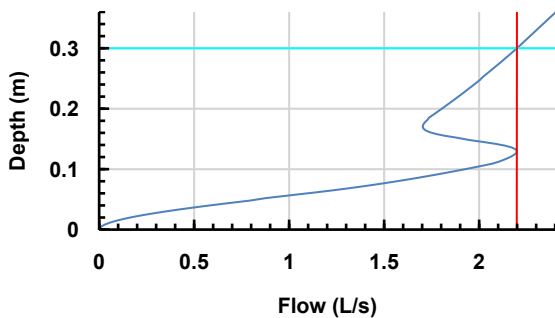
Inlet Type	Point Inflow
Incoming Item(s)	P1.002
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	P1.003
Outlet Type	Hydro-Brake®
Invert Elevation (m)	5.817
Design Depth (m)	0.300
Design Flow (L/s)	2.2
Objective	Minimize Upstream Storage Requirements
Application	Surface Water Only
Sump Available	<input type="checkbox"/>

Unit Reference	CHE-0080-2200-0300-2200
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Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: WSP		



Advanced

Swale

Porosity (%)	100
--------------	-----



Swale S

Type : Swale


Swale

Exceedance Elevation (m)	6.400
Depth (m)	0.700
Base Elevation (m)	5.700
Top Width (m)	10.752
Side Slope (1:x)	3.00
Base Width (m)	6.552
Freeboard (mm)	300
Length (m)	96.617
Long. Slope (1:x)	500.00
Filtration Rate (m/hr)	0.0
Friction Scheme	Manning's n
n	0.033
Total Volume (m³)	299.584

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	P2.002 P3.002
Bypass Destination	(None)
Inlet Destination	Ponding Area
Capacity Type	No Restriction

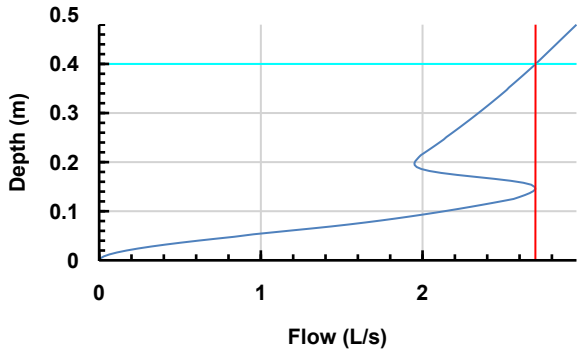
Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES		Date: 08/11/2023			
Report Details: Type: Stormwater Controls Storm Phase: Phase		Designed by: PM	Checked by: WF		Approved By:
		Company Address: WSP			

Outlets

Outlet

Outgoing Connection	P2.003
Outlet Type	Hydro-Brake®
Invert Elevation (m)	5.700
Design Depth (m)	0.400
Design Flow (L/s)	2.7
Objective	Minimize Upstream Storage Requirements
Application	Surface Water Only
Sump Available	<input type="checkbox"/>

Unit Reference	CHE-0086-2700-0400-2700
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Advanced

Swale

Porosity (%)	100
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Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Connections Storm Phase: Phase	Company Address: WSP		



Name	Length (m)	Connection Type	Slope (1:x)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Elevation (m)	Upstream Invert Elevation (m)
P2.000	74.391	Pipe	-256.265	0.013		150	7.318	5.744
P2.001	14.843	Pipe	106.018	0.013		150	6.884	6.034
P1.000	76.763	Pipe	-30.222		0.6	150	7.338	3.445
P1.001	8.765	Pipe	52.170		0.6	150	6.835	5.985
P1.004	3.579	Pipe	123.422		0.6	150	6.400	5.817
P1.005	6.281	Pipe	153.200		0.6	150	6.431	5.788
P1.002	3.490	Pipe	0.000	0.013		150	6.489	5.817
P1.003	3.209	Pipe	0.000		0.6	150	6.594	5.817
P2.002	57.512	Pipe	296.454		0.6	150	6.694	5.894
P2.003	34.314	Pipe	394.417		0.6	150	6.593	5.700
P3.002	1.580	Pipe	0.000		0.6	150	6.769	5.700
P3.000	78.268	Pipe	-350.409	0.013		225	7.254	5.753
P3.001	7.478	Pipe	27.054	0.013		150	6.833	5.976
PP MID	50.510	Pipe	174.000	0.013		150	7.318	6.034
PP N	47.578	Pipe	18.732	0.013		150	7.400	5.985
P2.004	6.713	Pipe	195.491	0.013		150	6.400	5.613
P2.005	5.791	Pipe	172.041	0.013		150	6.501	5.579
MUGA	45.074	Pipe	196.000	0.013		150	7.320	5.983

Name	Downstream Cover Elevation (m)	Downstream Invert Elevation (m)	Lock	Flow Restriction (L/s)
P2.000	6.884	6.034	None	
P2.001	6.694	5.894	None	
P1.000	6.835	5.985	None	
P1.001	6.489	5.817	None	
P1.004	6.431	5.788	None	
P1.005	6.620	5.747	None	2.4
P1.002	6.400	5.817	None	
P1.003	6.400	5.817	None	2.4
P2.002	6.593	5.700	None	
P2.003	6.400	5.613	None	2.7
P3.002	6.593	5.700	None	
P3.000	6.833	5.976	None	
P3.001	6.769	5.700	None	
PP MID	7.318	5.744	None	
PP N	7.338	3.445	None	
P2.004	6.501	5.579	None	
P2.005	6.600	5.545	None	2.9
MUGA	7.254	5.753	None	

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address: WSP		



Flow Options

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

Pipe Options

Lock Slope Options	None
Design Level	Level Crowns
Min. Cover Depth (m)	0.850
Min. Slope (1:x)	150.00
Max. Slope (1:x)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.048
Use Flow Restriction	<input checked="" type="checkbox"/>
Reduce Channel Depths	<input checked="" type="checkbox"/>

Manhole Options

Apply Offset	<input type="checkbox"/>
<p>An error has occurred while processing TextBox 'txtSynchroniseManholeInvertLevelsHeader': The expression contains object 'SynchroniseManholeInvertLevelsTitle' that is not defined in the current context.</p>	
	<input type="checkbox"/>

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address: WSP		



Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	305
Perform First Flush Analysis	<input type="checkbox"/>

Rainfall

FSR Type: FSR

Region	England and Wales
M5-60 (mm)	19.0
Ratio R	0.293
Summer	<input checked="" type="checkbox"/>
Winter	<input checked="" type="checkbox"/>

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
100.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: WSP		



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 1 Asphalt Paving	FSR: 2 years: +0 %: 15 mins: Summer	0.05	10.1	4.369
Catchment Area 2 asphalt Paving	FSR: 2 years: +0 %: 15 mins: Summer	0.01	1.2	0.517
Catchment Area 2 Asphalt Paving	FSR: 2 years: +0 %: 15 mins: Summer	0.02	4.5	1.930
Catchment Area 1 Sports Pitch	FSR: 2 years: +0 %: 15 mins: Summer	0.48	60.7	26.173
Catchment Area 2 Sports Pitch	FSR: 2 years: +0 %: 15 mins: Summer	0.56	69.6	30.015
Catchment Area 2 Asphalt paving	FSR: 2 years: +0 %: 15 mins: Summer	0.08	15.3	6.591
Catchment Area 2 MUGA	FSR: 2 years: +0 %: 15 mins: Summer	0.15	18.3	7.898

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: WSP		



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 1 Asphalt Paving	FSR: 30 years: +0 %: 15 mins: Summer	0.05	19.3	8.308
Catchment Area 2 asphalt Paving	FSR: 30 years: +0 %: 15 mins: Summer	0.01	2.3	0.982
Catchment Area 2 Asphalt Paving	FSR: 30 years: +0 %: 15 mins: Summer	0.02	8.5	3.674
Catchment Area 1 Sports Pitch	FSR: 30 years: +0 %: 15 mins: Summer	0.48	115.8	49.774
Catchment Area 2 Sports Pitch	FSR: 30 years: +0 %: 15 mins: Summer	0.56	132.8	57.074
Catchment Area 2 Asphalt paving	FSR: 30 years: +0 %: 15 mins: Summer	0.08	29.2	12.535
Catchment Area 2 MUGA	FSR: 30 years: +0 %: 15 mins: Summer	0.15	34.9	15.016

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address: WSP		



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 1 Asphalt Paving	FSR: 100 years: +40 %: 15 mins: Summer	0.05	34.9	15.016
Catchment Area 2 asphalt Paving	FSR: 100 years: +40 %: 15 mins: Summer	0.01	4.1	1.764
Catchment Area 2 Asphalt Paving	FSR: 100 years: +40 %: 15 mins: Summer	0.02	15.4	6.636
Catchment Area 1 Sports Pitch	FSR: 100 years: +40 %: 15 mins: Summer	0.48	208.9	89.918
Catchment Area 2 Sports Pitch	FSR: 100 years: +40 %: 15 mins: Summer	0.56	239.5	103.113
Catchment Area 2 Asphalt paving	FSR: 100 years: +40 %: 15 mins: Summer	0.08	52.6	22.642
Catchment Area 2 MUGA	FSR: 100 years: +40 %: 15 mins: Summer	0.15	63.0	27.128

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: WSP		



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

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (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
MH4	FSR: 2 years: +0 %: 60 mins: Summer	7.318	5.744	6.061	0.317	2.8	0.358	0.000	1.5	1.490	Surcharged
MH5	FSR: 2 years: +0 %: 120 mins: Summer	6.884	6.034	6.066	0.032	1.3	0.036	0.000	1.4	1.037	OK
HW3	FSR: 2 years: +0 %: 120 mins: Summer	6.694	5.894	5.963	0.069	1.4	0.078	0.000	0.8	0.968	OK
HW5	FSR: 2 years: +0 %: 1440 mins: Summer	6.400	5.613	5.659	0.046	1.0	0.052	0.000	1.0	42.704	OK
OF2	FSR: 2 years: +0 %: 1440 mins: Summer	6.600	5.545	5.574	0.029	1.0	0.000	0.000	1.0	42.681	OK
HW4	FSR: 2 years: +0 %: 30 mins: Summer	6.769	5.700	5.950	0.250	9.1	0.283	0.000	9.1	5.390	Surcharged
MH6	FSR: 2 years: +0 %: 15 mins: Summer	7.254	5.753	6.084	0.331	16.5	0.374	0.000	9.3	4.680	Surcharged
MH1	FSR: 2 years: +0 %: 120 mins: Summer	7.338	3.445	6.012	2.567	4.9	2.903	0.000	1.2	6.957	Surcharged
MH2	FSR: 2 years: +0 %: 120 mins: Summer	6.835	5.985	6.006	0.021	1.2	0.024	0.000	1.1	3.277	OK
HW1	FSR: 2 years: +0 %: 60 mins: Summer	6.489	5.817	5.925	0.108	0.5	0.122	0.000	0.9	0.895	OK
OF1	FSR: 2 years: +0 %: 1440 mins: Summer	6.620	5.747	5.764	0.017	0.4	0.000	0.000	0.4	17.776	OK
HW2	FSR: 2 years: +0 %: 1440 mins: Summer	6.400	5.817	5.837	0.020	0.4	0.023	0.000	0.4	17.788	OK
FC1	FSR: 2 years: +0 %: 1440 mins: Summer	6.431	5.788	5.835	0.047	0.4	0.053	0.000	0.4	17.779	OK
MH7	FSR: 2 years: +0 %: 30 mins: Summer	6.833	5.976	6.034	0.057	8.9	0.065	0.000	9.1	5.722	OK
FC2	FSR: 2 years: +0 %: 1440 mins: Summer	6.501	5.579	5.656	0.077	1.0	0.087	0.000	1.0	42.687	OK

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: WSP		



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

Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (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
MH4	FSR: 30 years: +0 %: 30 mins: Summer	7.318	5.744	6.157	0.413	5.9	0.467	0.000	4.6	3.077	Surcharged
MH5	FSR: 30 years: +0 %: 30 mins: Summer	6.884	6.034	6.091	0.057	4.6	0.065	0.000	4.6	1.856	OK
HW3	FSR: 30 years: +0 %: 60 mins: Summer	6.694	5.894	6.021	0.127	4.0	0.143	0.000	3.2	2.542	OK
HW5	FSR: 30 years: +0 %: 1440 mins: Winter	6.400	5.613	5.718	0.105	2.3	0.118	0.000	2.3	163.904	OK
OF2	FSR: 30 years: +0 %: 1440 mins: Winter	6.600	5.545	5.591	0.046	2.3	0.000	0.000	2.3	163.865	OK
HW4	FSR: 30 years: +0 %: 30 mins: Summer	6.769	5.700	6.007	0.307	14.7	0.347	0.000	14.8	13.237	Surcharged
MH6	FSR: 30 years: +0 %: 15 mins: Summer	7.254	5.753	6.361	0.608	31.4	0.688	0.000	23.7	11.200	Surcharged
MH1	FSR: 30 years: +0 %: 30 mins: Summer	7.338	3.445	6.104	2.659	13.3	3.007	0.000	5.7	7.199	Surcharged
MH2	FSR: 30 years: +0 %: 30 mins: Summer	6.835	5.985	6.033	0.048	5.7	0.054	0.000	5.7	3.092	OK
HW1	FSR: 30 years: +0 %: 30 mins: Summer	6.489	5.817	5.982	0.165	5.7	0.186	0.000	5.6	2.884	Surcharged
OF1	FSR: 30 years: +0 %: 1440 mins: Winter	6.620	5.747	5.781	0.034	1.6	0.000	0.000	1.6	103.802	OK
HW2	FSR: 30 years: +0 %: 1440 mins: Winter	6.400	5.817	5.894	0.077	1.6	0.087	0.000	1.6	103.834	OK
FC1	FSR: 30 years: +0 %: 1440 mins: Winter	6.431	5.788	5.892	0.104	1.6	0.118	0.000	1.6	103.810	OK
MH7	FSR: 30 years: +0 %: 15 mins: Winter	6.833	5.976	6.107	0.131	22.4	0.148	0.000	20.0	8.469	OK
FC2	FSR: 30 years: +0 %: 1440 mins: Winter	6.501	5.579	5.715	0.136	2.3	0.154	0.000	2.3	163.875	OK

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: WSP		



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


Junction	Storm Event	Cover Elevation (m)	Invert Elevation (m)	Max. Elevation (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
MH4	FSR: 100 years: +40 %: 15 mins: Summer	7.318	5.744	6.406	0.662	15.4	0.749	0.000	9.1	4.695	Surcharged
MH5	FSR: 100 years: +40 %: 30 mins: Summer	6.884	6.034	6.116	0.082	7.4	0.093	0.000	7.5	4.521	OK
HW3	FSR: 100 years: +40 %: 30 mins: Summer	6.694	5.894	6.086	0.192	7.5	0.218	0.000	7.5	4.391	Surcharged
HW5	FSR: 100 years: +40 %: 1440 mins: Summer	6.400	5.613	5.744	0.131	2.7	0.148	0.000	2.7	336.415	OK
OF2	FSR: 100 years: +40 %: 1440 mins: Summer	6.600	5.545	5.594	0.049	2.7	0.000	0.000	2.7	336.162	OK
HW4	FSR: 100 years: +40 %: 15 mins: Summer	6.769	5.700	6.228	0.528	30.1	0.597	0.000	27.1	16.293	Surcharged
MH6	FSR: 100 years: +40 %: 15 mins: Summer	7.254	5.753	7.030	1.277	56.7	1.444	0.000	34.6	23.272	Flood Risk
MH1	FSR: 100 years: +40 %: 15 mins: Summer	7.338	3.445	6.533	3.088	34.9	3.492	0.000	14.3	10.656	Surcharged
MH2	FSR: 100 years: +40 %: 15 mins: Summer	6.835	5.985	6.064	0.079	14.3	0.089	0.000	13.4	4.913	OK
HW1	FSR: 100 years: +40 %: 15 mins: Summer	6.489	5.817	6.009	0.192	13.4	0.218	0.000	14.7	4.697	Surcharged
OF1	FSR: 100 years: +40 %: 360 mins: Summer	6.620	5.747	5.786	0.039	2.2	0.000	0.000	2.2	52.558	OK
HW2	FSR: 100 years: +40 %: 360 mins: Summer	6.400	5.817	5.931	0.114	2.2	0.128	0.000	2.2	52.751	OK
FC1	FSR: 100 years: +40 %: 360 mins: Summer	6.431	5.788	5.929	0.141	2.2	0.160	0.000	2.2	52.601	OK
MH7	FSR: 100 years: +40 %: 15 mins: Summer	6.833	5.976	6.571	0.595	34.6	0.673	0.000	30.1	16.518	Flood Risk
FC2	FSR: 100 years: +40 %: 1440 mins: Summer	6.501	5.579	5.741	0.163	2.7	0.184	0.000	2.7	336.216	Surcharged

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES		Date: 08/11/2023		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: PM	Checked by: WF	Approved By:
		Company Address: WSP		



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

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Swale N	FSR: 2 years: +0 %: 1440 mins: Summer	5.926	5.878	0.004	0.061	0.8	7.813	0.000	0.000	0.4	17.799	254	94.865
Swale S	FSR: 2 years: +0 %: 1440 mins: Summer	5.899	5.788	0.006	0.088	1.8	18.263	0.000	0.000	1.0	42.722	233	93.904
Catchment 1 Sports Pitch	FSR: 2 years: +0 %: 240 mins: Winter	6.547	6.002	0.182	0.017	15.7	82.863	0.000	0.000	0.4	3.310		87.011
Catchment 2 Sports Pitch	FSR: 2 years: +0 %: 480 mins: Winter	6.827	6.044	0.175	0.010	10.6	117.864	0.000	0.000	0.1	1.637		84.830
Catchment 2 MUGA	FSR: 2 years: +0 %: 240 mins: Summer	6.273	6.019	0.169	0.036	8.1	25.208	0.000	0.000	0.9	3.629		87.998

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023			
	Designed by: PM	Checked by: WF	Approved By:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: WSP			

Status
OK
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Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES		Date: 08/11/2023		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: PM	Checked by: WF	Approved By:
		Company Address: WSP		



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

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Swale N	FSR: 30 years: +0 %: 1440 mins: Winter	5.977	5.977	0.055	0.160	2.9	39.757	0.000	0.000	1.6	103.858	267	73.871
Swale S	FSR: 30 years: +0 %: 1440 mins: Winter	5.902	5.864	0.009	0.164	3.5	49.705	0.000	0.000	2.3	163.937	223	83.409
Catchment 1 Sports Pitch	FSR: 30 years: +0 %: 1440 mins: Winter	6.542	6.049	0.177	0.064	7.3	206.710	0.000	0.000	2.6	77.118	1470	67.597
Catchment 2 Sports Pitch	FSR: 30 years: +0 %: 1440 mins: Winter	6.825	6.099	0.173	0.065	8.4	244.507	0.000	0.000	2.1	74.726	2228	68.531
Catchment 2 MUGA	FSR: 30 years: +0 %: 120 mins: Summer	6.307	6.043	0.204	0.060	21.2	37.969	0.000	0.000	1.8	5.787		81.922

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: WSP		



Status
OK
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Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES		Date: 08/11/2023		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: PM	Checked by: WF	Approved By:
		Company Address: WSP		



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

Stormwater Control	Storm Event	Max. US Elevation (m)	Max. DS Elevation (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Swale N	FSR: 100 years: +40 %: 360 mins: Summer	6.097	6.097	0.175	0.280	7.3	88.274	0.000	0.000	2.2	52.979	390	41.983
Swale S	FSR: 100 years: +40 %: 240 mins: Summer	5.975	5.975	0.082	0.275	15.5	123.181	0.000	0.000	2.7	46.119	390	58.883
Catchment 1 Sports Pitch	FSR: 100 years: +40 %: 960 mins: Summer	6.570	6.288	0.206	0.303	27.6	295.842	0.000	0.000	7.0	199.212	873	53.625
Catchment 2 Sports Pitch	FSR: 100 years: +40 %: 1440 mins: Summer	6.840	6.368	0.187	0.334	22.7	351.349	0.000	0.000	6.5	283.713	993	54.780
Catchment 2 MUGA	FSR: 100 years: +40 %: 480 mins: Summer	6.327	6.102	0.224	0.119	15.3	81.469	0.000	0.000	5.1	45.445	417	61.211

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES	Date: 08/11/2023		
	Designed by: PM	Checked by: WF	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: WSP		



Status
OK
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Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES		Date: 08/11/2023		
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: PM	Checked by: WF	Approved By:
		Company Address: WSP		



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


Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P2.000	FSR: 2 years: +0 %: 60 mins: Summer	Pipe	MH4	MH5	7.318	6.061	0.150	0.000	0.1	0.11	1.5	Surcharged
P2.001	FSR: 2 years: +0 %: 120 mins: Summer	Pipe	MH5	HW3	6.884	6.066	0.048	1.031	0.6	0.09	1.4	OK
P1.000	FSR: 2 years: +0 %: 120 mins: Summer	Pipe	MH1	MH2	7.338	6.012	0.150	0.000	0.1	0.09	1.2	Surcharged
P1.001	FSR: 2 years: +0 %: 120 mins: Summer	Pipe	MH2	HW1	6.835	6.006	0.065	3.277	0.2	0.05	1.1	OK
P1.004	FSR: 2 years: +0 %: 1440 mins: Summer	Pipe	HW2	FC1	6.400	5.837	0.034	17.788	0.1	0.02	0.4	OK
P1.005	FSR: 2 years: +0 %: 1440 mins: Summer	Pipe	FC1	OF1	6.431	5.835	0.017	17.776	0.3	0.03	0.4	OK
P1.002	FSR: 2 years: +0 %: 60 mins: Summer	Pipe	HW1	Swale N	6.489	5.925	0.055	0.000	0.2	0.07	0.9	OK
P1.003	FSR: 2 years: +0 %: 1440 mins: Summer	Pipe	Swale N	HW2	6.594	5.839	0.024	17.791	0.2	0.03	0.4	OK
P2.002	FSR: 2 years: +0 %: 120 mins: Summer	Pipe	HW3	Swale S	6.694	5.963	0.040	0.967	0.2	0.08	0.8	OK
P2.003	FSR: 2 years: +0 %: 1440 mins: Summer	Pipe	Swale S	HW5	6.593	5.728	0.040	42.714	0.3	0.11	1.0	OK
P3.002	FSR: 2 years: +0 %: 30 mins: Summer	Pipe	HW4	Swale S	6.769	5.950	0.132	0.000	0.6	0.69	9.1	Surcharged
P3.000	FSR: 2 years: +0 %: 15 mins: Summer	Pipe	MH6	MH7	7.254	6.084	0.182	0.000	0.3	0.31	9.3	Surcharged
P3.001	FSR: 2 years: +0 %: 30 mins: Summer	Pipe	MH7	HW4	6.833	6.034	0.150	5.722	1.0	0.31	9.1	OK
PP MID	FSR: 2 years: +0 %: 480 mins: Winter	Pipe	Catchment 2 Sports Pitch	MH4	7.318	6.103	0.150	0.000	0.0	0.01	0.1	OK
PP N	FSR: 2 years: +0 %: 240 mins: Winter	Pipe	Catchment 1 Sports Pitch	MH1	7.400	6.044	0.150	0.000	0.0	0.01	0.4	OK
P2.004	FSR: 2 years: +0 %: 1440 mins: Summer	Pipe	HW5	FC2	6.400	5.659	0.062	42.704	0.1	0.09	1.0	OK
P2.005	FSR: 2 years: +0 %: 1440 mins: Summer	Pipe	FC2	OF2	6.501	5.656	0.030	42.681	0.4	0.08	1.0	OK
MUGA	FSR: 2 years: +0 %: 240 mins: Summer	Pipe	Catchment 2 MUGA	MH6	7.320	6.037	0.150	0.000	0.1	0.09	0.9	OK

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES		Date: 08/11/2023		
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: PM	Checked by: WF	Approved By:
		Company Address: WSP		



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

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P2.000	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	MH4	MH5	7.318	6.157	0.150	0.000	0.3	0.35	4.6	Surcharged
P2.001	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	MH5	HW3	6.884	6.091	0.073	1.846	0.5	0.31	4.6	OK
P1.000	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	MH1	MH2	7.338	6.104	0.150	0.000	0.3	0.43	5.7	Surcharged
P1.001	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	MH2	HW1	6.835	6.033	0.106	3.092	0.4	0.23	5.7	OK
P1.004	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	HW2	FC1	6.400	5.894	0.091	103.834	0.1	0.1	1.6	OK
P1.005	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	FC1	OF1	6.431	5.892	0.034	103.802	0.5	0.11	1.6	OK
P1.002	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	HW1	Swale N	6.489	5.982	0.086	0.000	0.5	0.42	5.6	Surcharged
P1.003	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	Swale N	HW2	6.594	5.925	0.078	103.842	0.2	0.12	1.6	OK
P2.002	FSR: 30 years: +0 %: 60 mins: Summer	Pipe	HW3	Swale S	6.694	6.021	0.075	2.538	0.4	0.31	3.2	OK
P2.003	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	Swale S	HW5	6.593	5.774	0.078	163.924	0.3	0.27	2.3	OK
P3.002	FSR: 30 years: +0 %: 30 mins: Summer	Pipe	HW4	Swale S	6.769	6.007	0.150	0.000	0.8	1.11	14.8	Surcharged
P3.000	FSR: 30 years: +0 %: 15 mins: Summer	Pipe	MH6	MH7	7.254	6.361	0.225	0.000	0.6	0.8	23.7	Surcharged
P3.001	FSR: 30 years: +0 %: 15 mins: Winter	Pipe	MH7	HW4	6.833	6.107	0.150	8.469	1.1	0.68	20.0	OK
PP MID	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	Catchment 2 Sports Pitch	MH4	7.318	6.177	0.150	68.811	0.1	0.18	2.1	OK

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES				Date: 08/11/2023							
Designed by: PM		Checked by: WF		Approved By:							
Report Details: Type: Connections Summary Storm Phase: Phase				Company Address: WSP							


PP N	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	Catchment 1 Sports Pitch	MH1	7.400	6.131	0.150	70.410	0.1	0.07	2.6	OK
P2.004	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	HW5	FC2	6.400	5.718	0.120	163.904	0.2	0.22	2.3	OK
P2.005	FSR: 30 years: +0 %: 1440 mins: Winter	Pipe	FC2	OF2	6.501	5.715	0.047	163.865	0.5	0.2	2.3	OK
MUGA	FSR: 30 years: +0 %: 120 mins: Summer	Pipe	Catchment 2 MUGA	MH6	7.320	6.065	0.150	0.000	0.1	0.16	1.8	OK

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES		Date: 08/11/2023		
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: PM	Checked by: WF	Approved By:
		Company Address: WSP		



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

Connection	Storm Event	Connection Type	From	To	Upstream Cover Elevation (m)	Max. US Water Elevation (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
P2.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	MH4	MH5	7.318	6.406	0.150	0.000	0.5	0.68	9.1	Surcharged
P2.001	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	MH5	HW3	6.884	6.116	0.137	4.513	0.9	0.5	7.5	OK
P1.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	MH1	MH2	7.338	6.533	0.150	0.000	0.8	1.08	14.3	Surcharged
P1.001	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	MH2	HW1	6.835	6.064	0.136	4.913	0.8	0.54	13.4	OK
P1.004	FSR: 100 years: +40 %: 360 mins: Summer	Pipe	HW2	FC1	6.400	5.931	0.128	52.751	0.2	0.14	2.2	OK
P1.005	FSR: 100 years: +40 %: 360 mins: Summer	Pipe	FC1	OF1	6.431	5.929	0.040	52.558	0.6	0.15	2.2	OK
P1.002	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	HW1	Swale N	6.489	6.009	0.097	0.000	1.2	1.11	14.7	Surcharged
P1.003	FSR: 100 years: +40 %: 360 mins: Summer	Pipe	Swale N	HW2	6.594	6.045	0.114	52.880	0.2	0.17	2.2	Surcharged
P2.002	FSR: 100 years: +40 %: 30 mins: Summer	Pipe	HW3	Swale S	6.694	6.086	0.113	4.389	0.5	0.73	7.5	Surcharged
P2.003	FSR: 100 years: +40 %: 240 mins: Winter	Pipe	Swale S	HW5	6.593	5.877	0.092	46.151	0.3	0.3	2.7	Surcharged
P3.002	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	HW4	Swale S	6.769	6.228	0.150	0.000	1.5	2.05	27.1	Surcharged
P3.000	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	MH6	MH7	7.254	7.030	0.225	0.000	0.9	1.16	34.6	Flood Risk
P3.001	FSR: 100 years: +40 %: 15 mins: Summer	Pipe	MH7	HW4	6.833	6.571	0.150	16.518	1.7	1.03	30.1	Flood Risk
PP MID	FSR: 100 years: +40 %: 1440 mins: Summer	Pipe	Catchment 2 Sports Pitch	MH4	7.318	6.239	0.150	274.919	0.4	0.56	6.5	Surcharged

Project: FITZALAN HIGH SCHOOL LAWRENNY AVENUE PITCHES				Date: 08/11/2023							
Designed by: PM		Checked by: WF		Approved By:							
Report Details: Type: Connections Summary Storm Phase: Phase				Company Address: WSP							

PP N	FSR: 100 years: +40 %: 960 mins: Summer	Pipe	Catchment 1 Sports Pitch	MH1	7.400	6.195	0.150	184.549	0.4	0.2	7.0	Surcharged
P2.004	FSR: 100 years: +40 %: 1440 mins: Summer	Pipe	HW5	FC2	6.400	5.744	0.147	336.415	0.2	0.25	2.7	OK
P2.005	FSR: 100 years: +40 %: 1440 mins: Summer	Pipe	FC2	OF2	6.501	5.741	0.050	336.162	0.5	0.23	2.7	Surcharged
MUGA	FSR: 100 years: +40 %: 480 mins: Summer	Pipe	Catchment 2 MUGA	MH6	7.320	6.158	0.150	34.483	0.3	0.47	5.1	Surcharged



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