

SURFACE WATER DRAINAGE DESIGN

for

Mr WAQAR AHMED

**CONVERSION OF FORMER SNOOKER HALL TO A
WEDDING VENUE**

at

KIRKMANSHULME LANE, MANCHESTER, M18 7BA

JULY 2022 – Revision A

REFORD

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B	United Utilities sewer records
C	Surface water drainage design

1. INTRODUCTION

1.1 This surface water drainage design has been produced on behalf of Mr Waqar Ahmed in order to discharge Condition 17 of the planning approval from Manchester City Council, reference 129773/FO/2021, for the proposed change of use of a former snooker hall to a wedding venue with associated internal and external alterations at Kirkmanshulme Lane, Manchester, M18 7BA. A location plan is included within Appendix A.

1.2 Condition 17 states the following:

No further development to that already taken place, shall commence until a surface water drainage scheme for the site, based on sustainable drainage principles has been submitted to and approved in writing by the City Council as Local Planning Authority. The development shall then be constructed and completed in accordance with the approved details.

The scheme shall also include:

- Surface water drainage layout including discharge points, proposed attenuation and proposed overland flow routes for extreme events (up to a 1 in 100 year including 40% climate change allowance);
- Consideration of alternative green SuDS solution (that is either utilising infiltration or attenuation) if practicable;
- Details of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment. Provide at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within Conurbation Core Critical Drainage Area.
- Evidence that the drainage system has been designed (unless an area is designated to hold and / or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event with allowance for 40% climate change in any part of a building;
- Hydraulic calculation of the proposed drainage system;

- Construction details of flow control and SuDS elements.
- Details of how the scheme shall be maintained and managed after completion.

1.3 This drainage scheme is produced to discharge Condition 17 of the planning approval. It describes the existing site conditions and proposed development. It assesses the potential impact of proposals on existing drainage and includes a proposed scheme for the provision of new drainage to serve the proposed development.

2. BASE INFORMATION

Existing site

- 2.1 The proposal relates to a piece of land of total area approx. 1.14ha, that lies immediately to the west of the Diamond Lodge Hotel, and between the A57 Hyde Road that lies along the northern boundary of the site and Kirkmanshulme Lane that lies along the southern boundary of the site.
- 2.2 The site comprises the former Rileys snooker hall, car parking areas and rough ground.
- 2.3 The site is generally flat.

Site geology

- 2.4 The online Soilscales viewer has identified the geology of this parcel of land as slowly permeable seasonally wet acid loamy and clayey soils with impeded drainage.
- 2.5 Based upon the nature of the soils identified, it is unlikely that infiltration techniques will be able to be used for the discharge of surface water back into the ground.

Understanding of existing drainage local to the site

- 2.6 United Utilities sewer records identify a public combined sewer lying within Kirkmanshulme Lane that flows to the southwest, and a public combined sewer lying within the A57 Hyde Road that flows to the northwest. The sewers take surface water runoff from the local urban area. The sewer records are included within Appendix B.
- 2.7 Private drainage lies within the development site. Surface water runoff from the building roof and car parking areas discharges into a surface water drainage system that flows to the north.

Proposed development

- 2.8 The proposed development is for the proposed change of use of the former snooker hall to a wedding venue with associated internal and external alterations.

3. PROPOSED SURFACE WATER DRAINAGE DESIGN

- 3.1 The area of the site for which this surface water drainage design applies is only for the area of the site in which the converted snooker hall and associated external works are located, an area of 2,460m².
- 3.2 In accordance with the National Standards for Sustainable Drainage, the drainage design should incorporate the use of Sustainable Drainage (SUDS) where possible. The approach promotes the use infiltration features in the first instance. If drainage cannot be achieved solely through infiltration due to site conditions or contamination risks, the preferred options are (in order of preference):
- (i) a controlled discharge to a local waterbody or watercourse, or
 - (ii) a controlled discharge into the public sewer network (depending on availability and capacity).
- 3.3 It is a requirement of the planning condition that at least a 50% reduction in runoff rate compared to the existing rates is to be provided, as the site is located within Conurbation Core Critical Drainage Area.
- 3.4 The online Soilscales viewer has identified the geology of this parcel of land as slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils with impeded drainage. Based upon the nature of the soils identified, it is unlikely that infiltration techniques will be able to be used for the discharge of surface water back into the ground.
- 3.5 There are no watercourses local to the site.
- 3.6 United Utilities sewer records identify a public combined sewer lying within Kirkmanshulme Lane that flows to the southwest, and a public combined sewer lying within the A57 Hyde Road that flows to the northwest. The sewers take surface water runoff from the local urban area.
- 3.7 Private drainage lies within the area of the site in which the converted snooker hall and associated external works are located. Surface water runoff from the building roof

is collected by downpipes and discharges into a surface water drainage system situated around the building to a surface water manhole at the building's north-western corner. The drains then flow to the north towards the A57 Hyde Road.

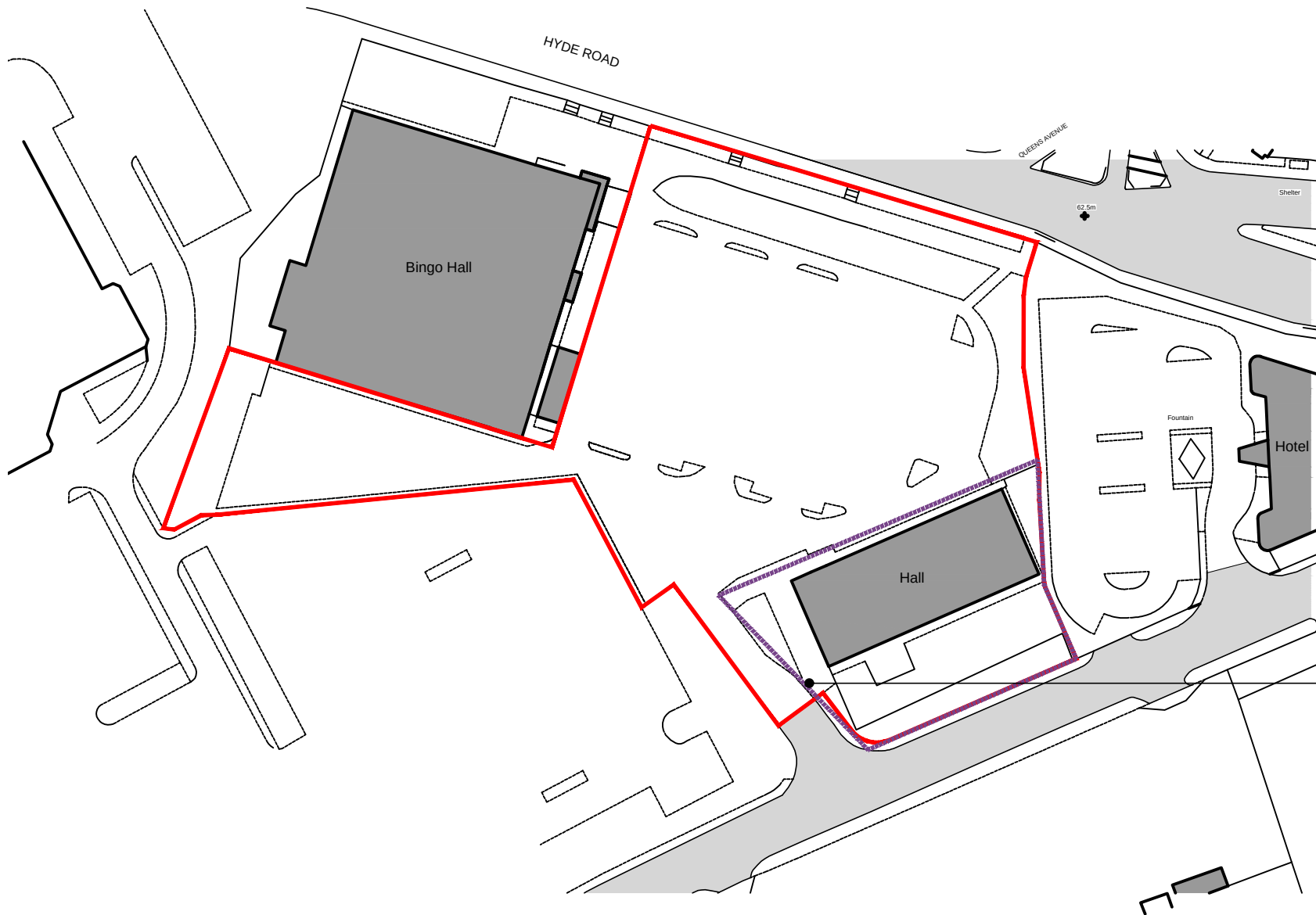
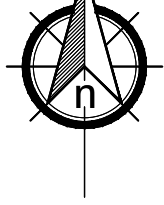
- 3.8 It is therefore intended, as the building is being converted, that the existing surface water drainage serving the building roof will remain unchanged. However, new surface water drainage will be provided for the associated hardstanding areas, to comprise car parking, and a restricted discharge made into the existing surface water manhole that lies at the building's north-western corner.
- 3.9 Normally, due to the size of the site, surface water runoff from this area would be controlled to 5 l/s. However in order to provide a reduction in runoff rate compared to the existing rate, it is proposed that surface water runoff from the hardstanding areas to comprise car parking, will be restricted to 2 l/s for all rainfall events up to the 100 year critical rain storm plus 40% on stored volumes enabling a discharge into the existing surface water manhole that lies at the building's north-western corner. The additional 40% is to allow for climate change and has been included in the surface water volume.
- 3.10 A surface water drainage design has been carried out for the proposed site development for all events up to the 100 year critical rain storm plus 40% for climate change on stored volumes. Surface water runoff from the car parking area will discharge into new French drainage laid behind the car park edging. Attenuation is provided within the proposed drainage network of pipes and chambers and underground storage beneath the proposed soft landscaping area. The surface water drainage design is included within Appendix C.
- 3.11 The building owner will be responsible for the maintenance of the various drainage features of the scheme. Maintenance will be funded by the building owner.
- 3.12 The table below lists the various drainage features utilised within the proposed drainage design, along with the maintenance regime that should be followed.

<u>SURFACE WATER DRAINAGE</u>	
Regular maintenance	Frequency
Visually inspect gutters to ensure they are kept clear of leaves, debris etc. Lift covers of drainage to inspect chambers for debris and build-up of silts.	Every six months. No triggers other than maintenance to be taken on regular schedule.
Brush car parking areas regularly and remove all sweepings from hard surfaces and inspect gullies for debris and silt. Clean out gullies.	As required. Indicator of problem / trigger for remedial action when gullies clogged or blocked and remaining full and overflowing.
Check manhole covers are securely in place. Specialist operatives with current confined spaces training to lift covers and visually inspect manholes to ensure they are kept clear of leaves, debris, silt, etc. Check drainage pipes are operating as expected.	Every six months or when notified.
Occasional tasks	Frequency
Remove leaves and debris from gutters. Remove debris from inspection chambers to ensure outlets are kept clear of debris to ensure adequate drainage.	As required. Indicator of problem / trigger for maintenance when surcharging or flooding of drains occurs or gutters and chambers full of debris and leaves etc.
Specialist operatives with current confined spaces training to remove debris and silt from the manholes to ensure outlets are kept clear of debris to ensure adequate drainage.	As required from regular maintenance inspection to trigger works.
Remedial work	Frequency
Should drains be heavily blocked or damaged contact drainage maintenance company for unblocking / repair works.	As required. Indicator of problem / trigger for maintenance when drainage not functioning and unblocking pipes and chambers etc. not effective.
The specialist operatives are to advise of any repair works necessary to the manholes. Drains heavily blocked or damaged to be jetted / repaired.	As required from regular maintenance inspection to trigger works.

4. SUMMARY AND CONCLUSIONS

- 4.1 This surface water drainage design has been produced on behalf of Mr Waqar Ahmed in order to discharge Condition 17 of the planning approval from Manchester City Council, reference 129773/FO/2021, for the proposed change of use of a former snooker hall to a wedding venue with associated internal and external alterations at Kirkmanshulme Lane, Manchester, M18 7BA.
- 4.2 Surface water runoff from the hardstanding areas to comprise car parking, will be restricted to 2 l/s for all rainfall events up to the 100 year critical rain storm plus 40% on stored volumes enabling a discharge into the existing surface water manhole that lies at the building's north-western corner.

APPENDIX A

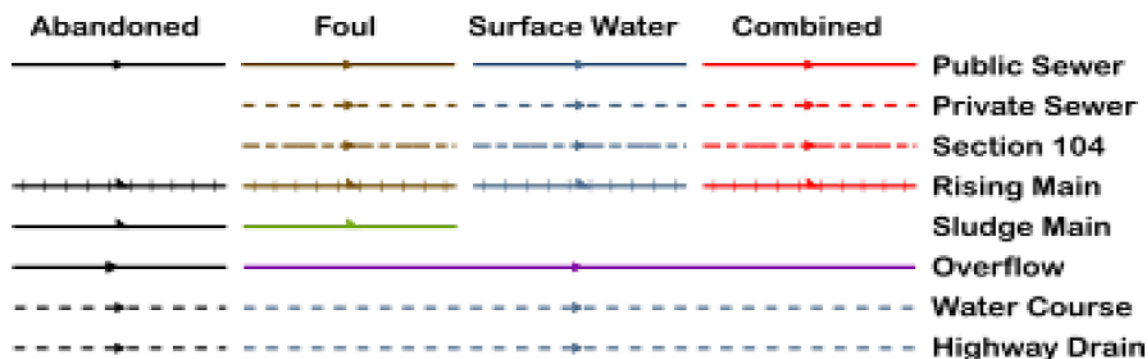


APPLICANTS
OWNERSHIP
Purple outline
indicates land under
applicants ownership

Site location plan @ 1:1250

APPENDIX B

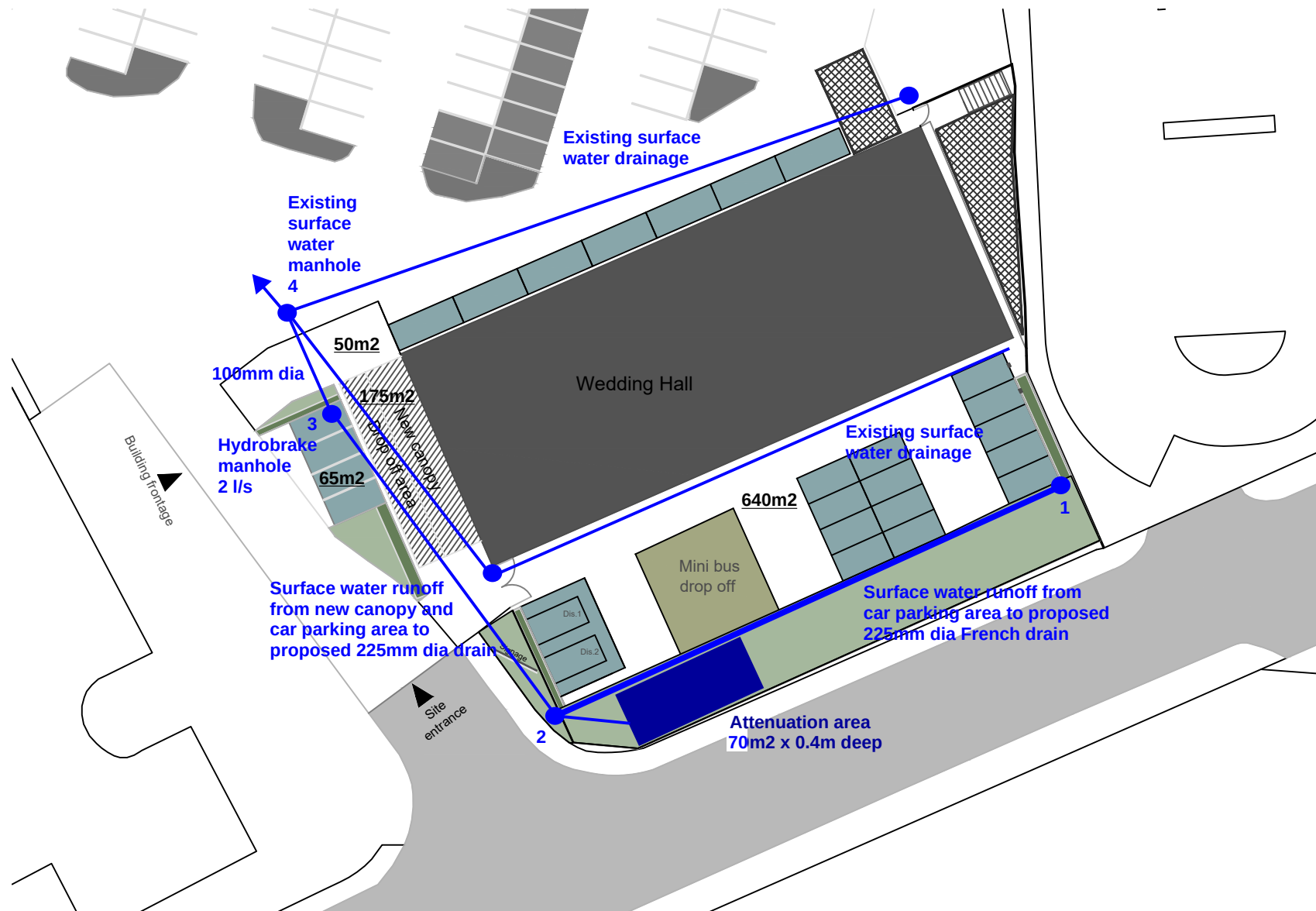
Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	
Drop Shaft	Change of Characteristic
Orifice Plate	

APPENDIX C



PROPOSED SURFACE WATER DRAINAGE LAYOUT

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	75.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	18.000	Minimum Backdrop Height (m)	2.000
Ratio-R	0.350	Preferred Cover Depth (m)	0.450
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.064	5.00	63.000	1200	0.450
2	0.018	5.00	63.000	1200	0.690
3	0.011	5.00	63.000	1200	0.880
4			63.000	1200	1.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	48.000	0.600	62.550	62.310	0.240	200.0	225	5.87	55.2
1.001	2	3	32.000	0.600	62.310	62.120	0.190	168.4	225	6.40	53.2
1.002	3	4	12.000	0.600	62.120	62.000	0.120	100.0	100	6.66	52.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	0.921	36.6	9.6	0.225	0.465	0.064	0.0
1.001	1.004	39.9	11.8	0.465	0.655	0.082	0.0
1.002	0.769	6.0	13.2	0.780	0.900	0.093	0.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	48.000	200.0	225	Circular	63.000	62.550	0.225	63.000	62.310	0.465
1.001	32.000	168.4	225	Circular	63.000	62.310	0.465	63.000	62.120	0.655
1.002	12.000	100.0	100	Circular	63.000	62.120	0.780	63.000	62.000	0.900

Link

1.000

1.001

1.002

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	63.000	0.450	1200				
				0	1.000	62.550	225
2	63.000	0.690	1200		1	1.000	62.310
				0	1.001	62.310	225
3	63.000	0.880	1200		1	1.001	62.120
				0	1.002	62.120	100
4	63.000	1.000	1200		1	1.002	62.000
							100

Simulation Settings

Rainfall Methodology	FSR	Summer CV	0.750	Drain Down Time (mins)	240
FSR Region	England and Wales	Winter CV	0.840	Additional Storage (m³/ha)	20.0
M5-60 (mm)	18.000	Analysis Speed	Normal	Check Discharge Rate(s)	x
Ratio-R	0.350	Skip Steady State	x	Check Discharge Volume	x

Storm Durations

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

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

Node 3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	62.120	Product Number	CTL-SHE-0069-2000-0880-2000
Design Depth (m)	0.880	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node 2 Link Surround Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.32	Link	1.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	62.310	Surround Shape	(Trench)
Safety Factor	2.0	Time to half empty (mins)	176	Diameter (mm)	600

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	62.310
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	260

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	70.0	0.0	0.400	70.0	0.0	0.401	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	62.628	0.078	7.7	0.3120	0.0000	OK
60 minute winter	2	47	62.366	0.056	5.4	3.8526	0.0000	OK
60 minute winter	3	44	62.374	0.254	4.1	0.3507	0.0000	SURCHARGED
15 minute summer	4	1	62.000	0.000	1.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	7.7	1.114	0.210	0.3637	
60 minute winter	2	1.001	3	3.5	0.213	0.088	0.7589	
60 minute winter	3	Hydro-Brake®	4	2.0				8.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	62.673	0.123	18.9	0.4891	0.0000	OK
120 minute winter	2	98	62.504	0.194	8.2	13.7108	0.0000	OK
120 minute winter	3	98	62.504	0.384	3.7	0.5299	0.0000	SURCHARGED
15 minute summer	4	1	62.000	0.000	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	18.7	1.297	0.511	0.8091	
120 minute winter	2	1.001	3	3.0	0.201	0.075	1.2188	
120 minute winter	3	Hydro-Brake®	4	2.0				26.4

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.79%

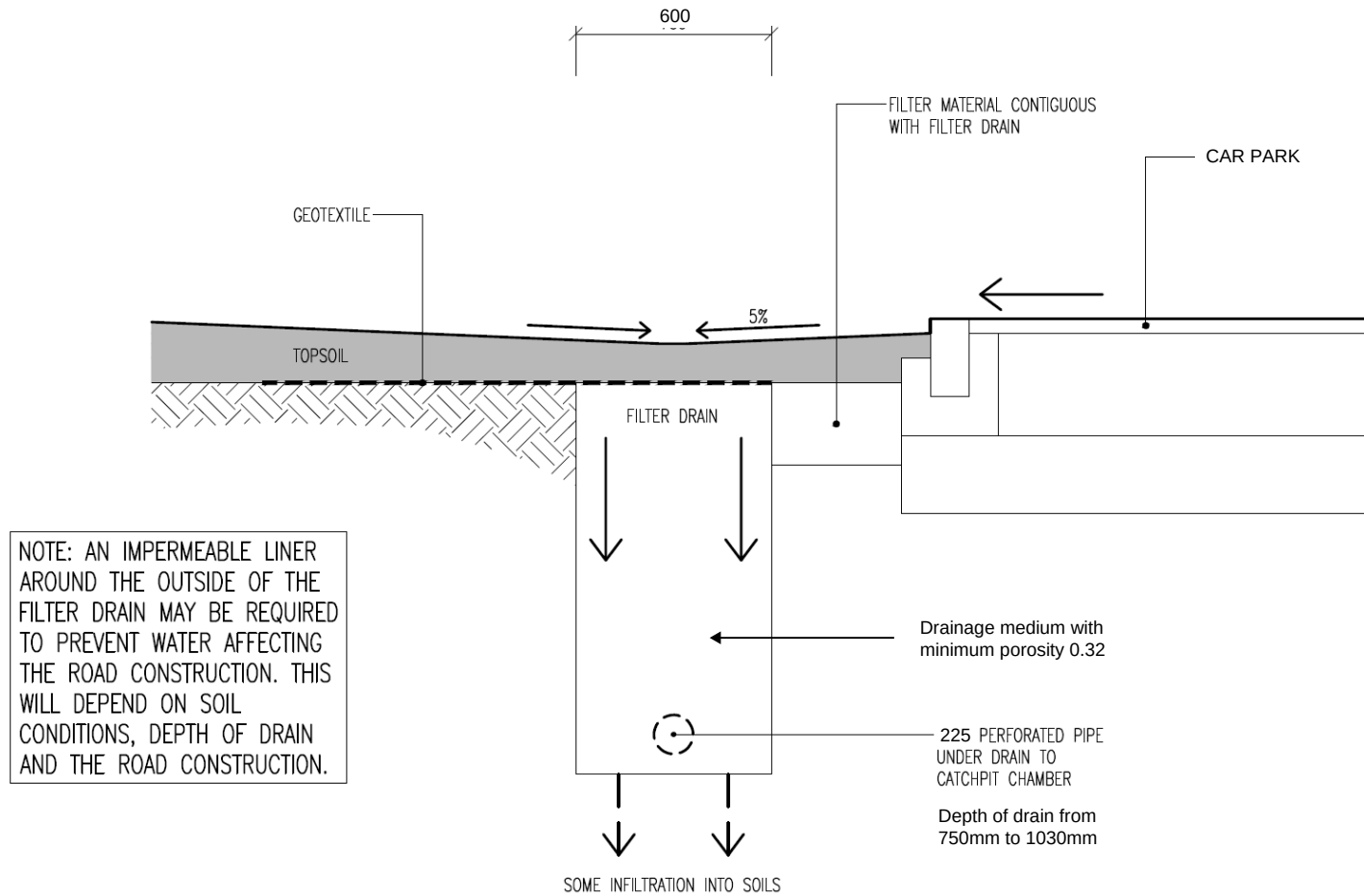
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	62.692	0.142	24.4	0.5645	0.0000	OK
120 minute winter	2	116	62.598	0.288	10.8	20.7848	0.0000	SURCHARGED
120 minute winter	3	116	62.597	0.477	3.9	0.6590	0.0000	SURCHARGED
15 minute summer	4	1	62.000	0.000	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	24.2	1.339	0.662	1.0487	
120 minute winter	2	1.001	3	3.2	0.203	0.080	1.2727	
120 minute winter	3	Hydro-Brake®	4	2.0				34.6

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	1	172	62.942	0.392	8.8	1.5586	0.0000	FLOOD RISK
180 minute winter	2	172	62.942	0.632	11.3	31.7849	0.0000	FLOOD RISK
180 minute winter	3	172	62.941	0.821	3.2	1.1342	0.0000	FLOOD RISK
15 minute summer	4	1	62.000	0.000	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	1	1.000	2	8.8	0.712	0.240	1.9090	
180 minute winter	2	1.001	3	2.7	0.198	0.067	1.2727	
180 minute winter	3	Hydro-Brake®	4	2.0				43.4



FILTER DRAIN DETAILS
– COMBINED SURFACE WATER AND
GROUNDWATER DRAINAGE

Technical Specification

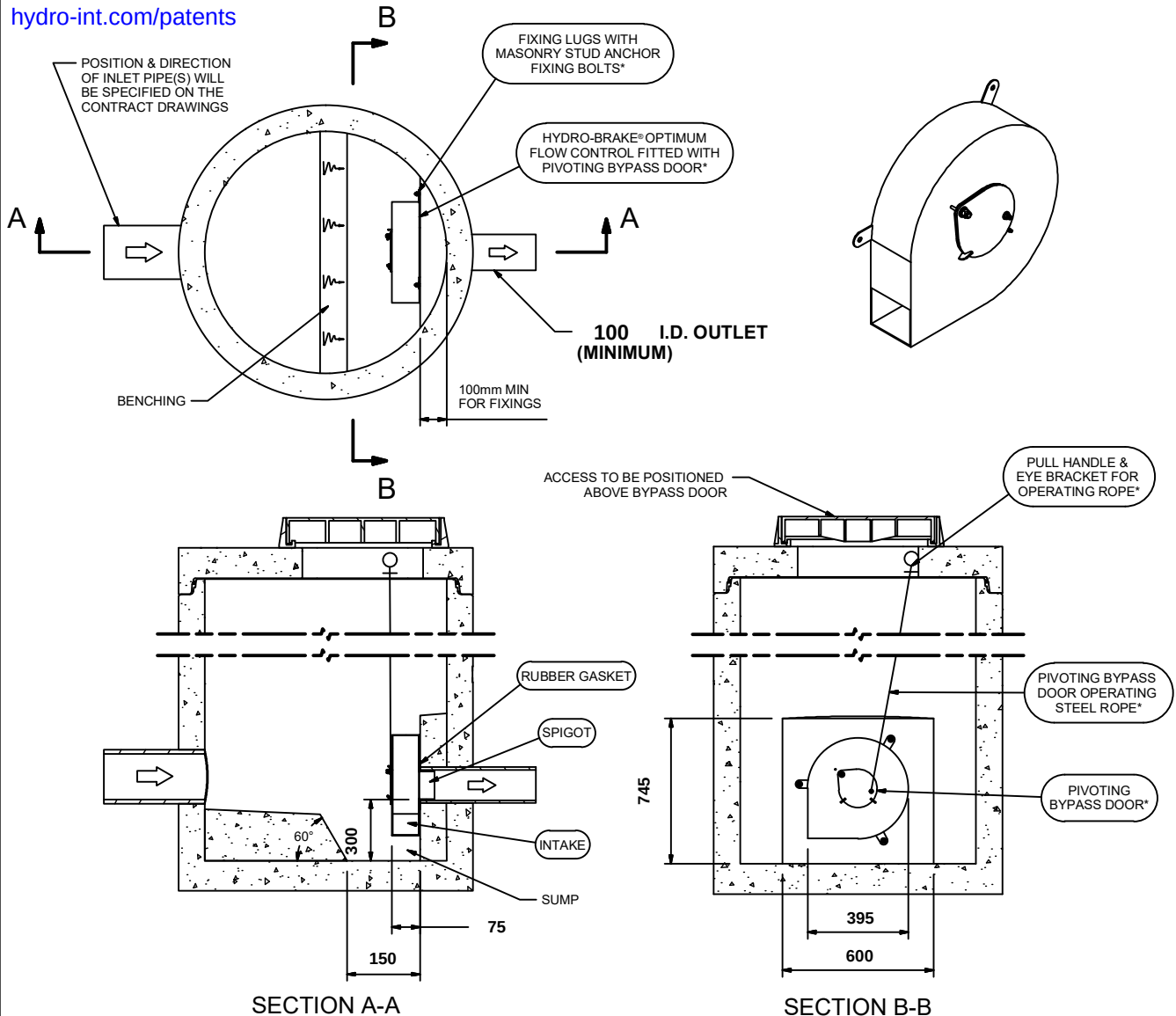
Control Point	Head (m)	Flow (l/s)
Primary Design	0.880	2.000
Flush-Flo™	0.270	1.993
Kick-Flo®	0.554	1.624
Mean Flow		1.753

Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 73 kg



hydro-int.com/patents



IMPORTANT:

○ LIMIT OF HYDRO INTERNATIONAL SUPPLY

THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS

* WHERE SUPPLIED

HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

**DESIGN
ADVICE**



The head/flow characteristics of this SHE-0069-2000-0880-2000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International®

DATE 7/22/2022 6:07 PM

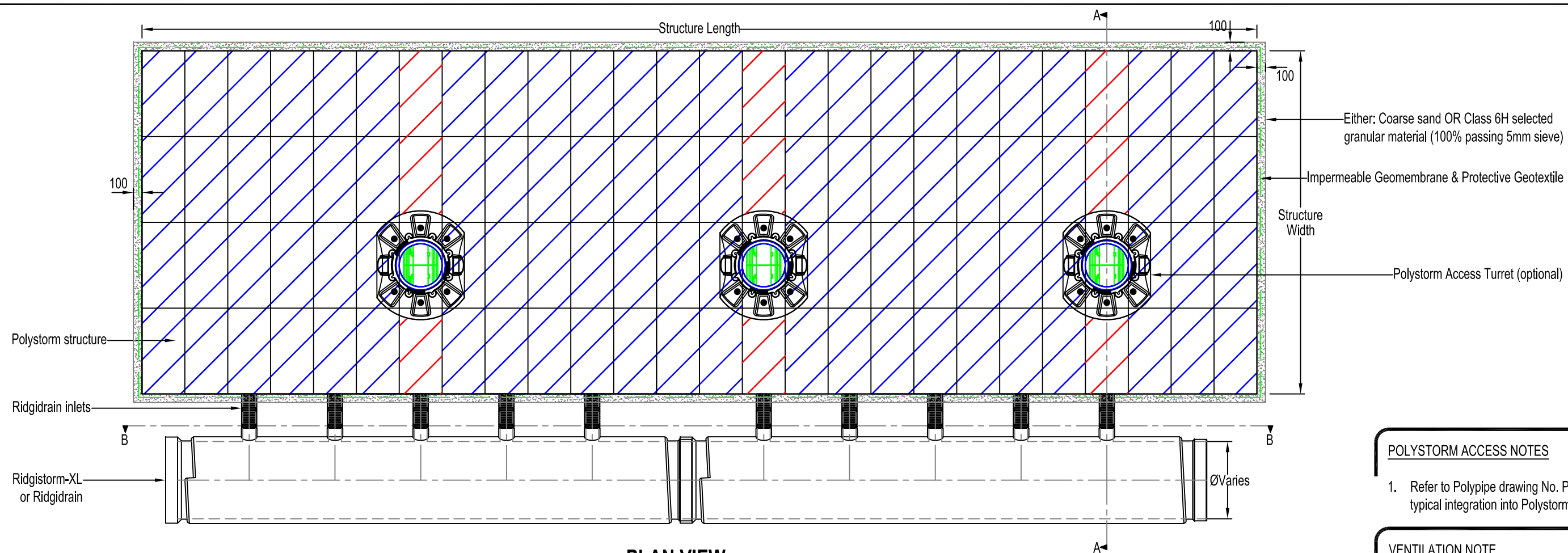
SITE Wedding Hall

DESIGNER Robert Ford

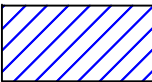
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SHE-0069-2000-0880-2000

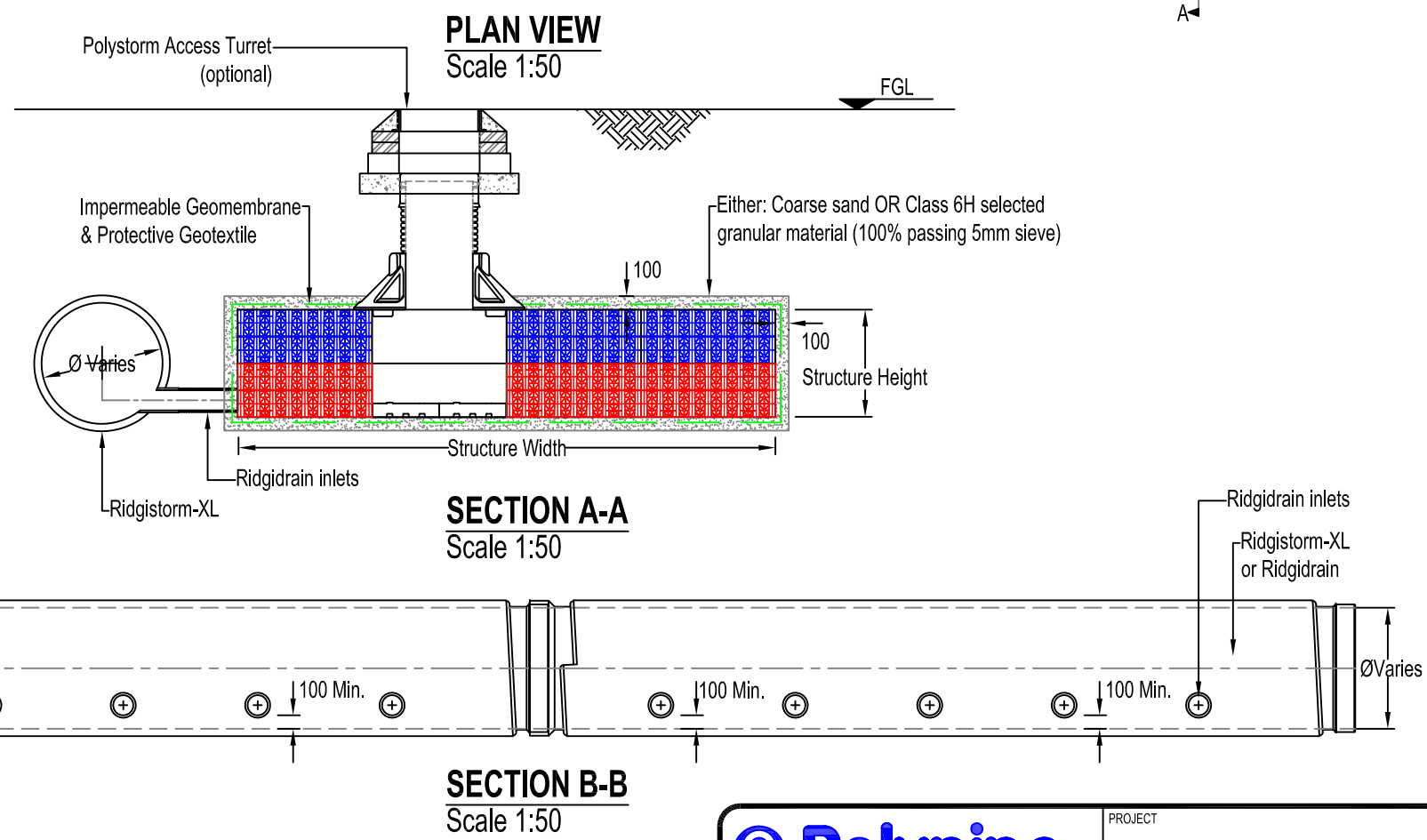
Hydro-Brake® Optimum



KEY:

 POLYSTORM (PSM1, 1A & 2 CELL)

 POLYSTORM (PSM4 CELL)



POLYSTORM ACCESS NOTES

1. Refer to Polypipe drawing No. PSM_SD_PSM_004 for typical integration into Polystorm structure.

VENTILATION NOTE

For information on Ventilation Options please refer to drawing ref: PSM_SD_PSM_002

MANIFOLD NOTE

For information on Manifold connections please refer to drawing ref: PSM_SD_008

- NOTES**
1. All dimensions in millimetres, unless otherwise stated.
 2. All dimensions are nominal and may vary within manufacturing or construction tolerances.
 3. All site temporary and enabling works by others.
 4. Polypipe products to be installed in accordance with Polypipe civils recommendations (refer to Polypipe technical guidance for further information), giving due consideration to the requirements of the organisation who will be taking ultimate owner ship of the installation.
 5. This drawing is intended for guidance only. Confirmation of the information contained within this document should be sought from the consulting engineers before final design or construction activities commence.

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PROJECT	POLYSTORM STANDARD DETAILS	STATUS		FOR INFORMATION	
		DATE	DRAWN BY		
		17/03/16	JL		
TITLE	OFFLINE STORAGE EXAMPLE ONE	ORIGINAL SIZE	SCALE		
		A3	AS SHOWN		
		DRAWING No.		REV.	
		PSM_SD_EG_001			