November 9, 2023

Sweet Projects
Union Park
Hayes
UB34QQ

RE: Land at Bulls Bridge Industrial Estate North Hyde Gardens Hayes – SuDS Verification Information

To Whom It May Concern,

HDR have been requested to draft a verification statement of the current design strategy and collate relevant SuDS details, as-built information, and certifications of manufacturers.

The following design information can be verified by HDR as compliant with the original planning application and documentation. This information was part of the design package provided to the contractor.

- HDR-047X-SWS-BG-DR-C-520210 Rev 1
- HPF-0471-SWS-BG-DR-C-91111 Rev 14
- HPF-0471-SWS-BG-DR-C-91112 Rev 1
- HPF-0471-SWS-BG-DR-C-91113 Rev 8
- HPF-0471-SWS-BG-DR-C-91114 Rev 1
- HPF-0471-SWS-BG-DR-C-91118 Rev 11
- HPF-0471-SWS-BG-DR-C-91120 Rev 2
- HPF-0471-SWS-BG-DR-C-91136 Rev 2
- HPF-0471-SWS-BG-DR-C-91137 Rev 4
- HPF-0471-SWS-BG-DR-C-91138 Rev 3
- HPF-0471-SWS-BG-DR-C-91139 Rev 2
- HPF-0471-SWS-BG-DR-C-91140 Rev 1
- HPF-0471-SWS-BG-DR-C-91141 Rev 3
- HPF-0471-SWS-BG-DR-C-91142 Rev 4

The above information has been appended to this letter.

HDR Consulting Limited. Company Reg No: 26943273. Incorporated in: England & Wales.
Registered address: 240 Blackfriars Road, London, SE1 8NW, United Kingdom
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The following information was provided by Sweet Projects as additional supporting information.

- Permaceptor Datasheet
- Permavoid Biomat Datasheet
- Permavoid Modular Cell
- SciCloneX Data Sheet
- SWP-0471-SW-ZZ-TS-W-000002_Attenuation Tank – Stormwater Management
- SWP-0471-SW-ZZ-TS-W-000016_Wavin TwinWall Surface and Stormwater Drainage Pipe
- SWP-0471-SW-ZZ-TS-W-000020_Hydro Brake Optimum Flow Control
- SWP-0471-SW-ZZ-TS-W-000040_Hydro Brake Optimum Flow Control
- SWP-0471-SW-ZZ-TS-W-000023_Kingspan Klargester NSFP006 Full Retention Separator
- SWP-0471-SW-ZZ-TS-W-000024_Kingspan Klargester Class II Forecourt Separator

The above information has been appended to this letter.

Yours faithfully,
HDR Consulting Limited

Ulrich Groenewald *MIET CEng*
Associate Director

NOTES:

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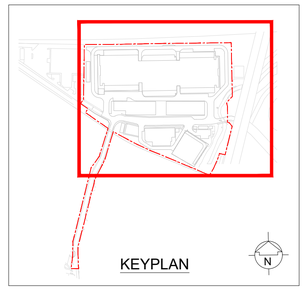

UNION PARK BLOCK 3
FFL: 31.300
GANTRY: 31.150 (SSL)

UNION PARK BLOCK 2
FFL: 31.300
GANTRY: 31.150 (SSL)

UNION PARK BLOCK 1
FFL: 31.300
GANTRY:31.150 (SSL)

EC3 ENERGY CENTRE
SSL:31.000

EC1 ENERGY CENTRE
SSL:31.000

EC2 ENERGY CENTRE
SSL 31.000

BLOCK 3 DRAINAGE
WORK IN PROGRESS

CONNECT TO THAMES
WATER MANHOLE (REF 1402)

BIKE SHELTER

VISITOR RECEPTION
CENTRE (II) FFL: 32.000m

BIKE SHELTER

VISITOR RECEPTION
CENTRE (I) FFL: 30.350

EX. BUILDING

MAST COMPOUND

HV SUBSTATION

NORTH HYDE GARDENS

RIVER CRANE

Lorry Park

Gantry

MoPs

Weir

Ramp

29.6m

LEGEND

PLANNING BOUNDARY	
DEMISE BOUNDARY	
EXISTING SURFACE WATER	EX-SW
EXISTING PRIVATE FOUL WATER	EX-FW
EXISTING PUBLIC FOUL WATER	EX-FW
PROPOSED SURFACE WATER	
PROPOSED BACK DROP	BD
PROPOSED FOUL WATER	
EXISTING THAMES VALLEY SEWER	TVS
PERMEABLE PAVING CONNECTIONS	PP01.XX
RAINWATER & CHANNEL CONNECTIONS (RWP01.XX)	RWP01.XX
DRAINAGE CHANNEL (CH01.XX,FWCH01.XX)	CH
SOIL VENT PIPE & FLOOR GULLY CONNECTIONS (SVP01.XX,FG01.XX)	
GULLY CONNECTION (GU01.XX)	
EXISTING GULLY CONNECTION (EXGU01.XX)	
SEWER NETWORK TO BE ABANDONED	
SWALE (SL01.XX)	
FILTRATION TRENCH (FT01.XX)	
LAND DRAIN (REFER DETAILS)	

Rev	Description	Date
P01	ISSUE FOR INFORMATION	14/07/23

Drawing Status: FOR INFORMATION
Suitability: S2

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w: www.hdrinc.com

Client: SWEET PROJECTS
Architect: NWA
Project: UNION PARK
Title: SITE WIDE
BELOW FINISHED GROUND LEVEL
FOUL AND SURFACE DRAINAGE
SITE LAYOUT

HDR Project Number: 10274713
Cad File Name: HDR-047X-SWS-BG-DR-C-520210

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
RJJ	JJ/UG	14/07/2023	1:500

Drawing Number: HDR-047X-SWS-BG-DR-C-520210
Revision: P01

File: \\UHRPFS01\DATA\REGIONAL WORKS DRIVE\PURLEY\17000\PUR17155 SWEET GROUP UNION STG 4+\6.0 CAD BIM\6.2 WIP\6.2.2 CAD\5 CIVIL\DRAWINGS\SITEWIDE\HDR-047X-SWS-BG-DR-C-520210.DWG User: Jensen, Jason Sheet: Layout1 Plot Date: 12/09/2023 10:59:31

NOTES:

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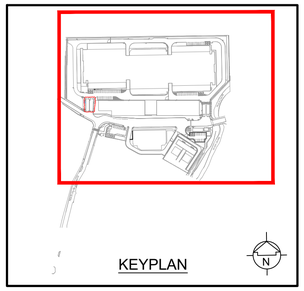
8. REFER TO GENERAL NOTES DRAWING HPF-0471-SWS-XX-TN-C-90010



KEYPLAN

FLOW CONTROL MANHOLE:
RESTRICTED DISCHARGE AT 44.9l/s
DESIGN HEAD AT 2.674m

FORECOURT SEPARATOR

CONTRACTOR TO CONSTRUCT NEW MANHOLE OVER EXISTING SEWER WHILST MAINTAINING CONNECTIVITY

FLOW CONTROL MANHOLE:
RESTRICTED DISCHARGE AT 9.3l/s
DESIGN HEAD AT 2.353m

EXISTING THAMES WATER PUBLIC SEWER MANHOLE (REF 1402)

Lorry Park
NORTH HYDE GARDENS
RIVER CRANE
THE PARKWAY
Gantry
MoPs
Ramp
Weir
29.6m
Yeading

LEGEND

- PLANNING BOUNDARY
- PHASE ONE CONSTRUCTION BOUNDARY
- EXISTING SURFACE WATER (EX-SW)
- EXISTING PRIVATE FOUL WATER (EX-FW)
- EXISTING PUBLIC FOUL WATER (EX-FW)
- PROPOSED SURFACE WATER
- PROPOSED BACK DROP (BD)
- PROPOSED FOUL WATER
- EXISTING THAMES VALLEY SEWER (TVS)
- RODDING EYE
- RAINWATER POINTS
- DRAINAGE CHANNEL (CH)
- SWALE
- SVP&FG
- FILTRATION TRENCH
- GULLEY CONNECTION
- SEWER NETWORK TO BE ABANDONED

Rev	Description	Date
T14	STAGE 4 ISSUE	27.09.23
T13	STAGE 4 ISSUE	08.09.23
T12	STAGE 4 ISSUE	25.08.23
T11	STAGE 4 ISSUE	28.07.23
T10	STAGE 4 ISSUE	07.07.23
T9	STAGE 4 ISSUE	10.01.23
T8	STAGE 4 ISSUE	04.10.22
T7	STAGE 4 ISSUE	30.09.22
T6	STAGE 4 ISSUE	16.09.22
T5	STAGE 4 ISSUE	25.07.22
T4	STAGE 4 ISSUE	16.06.22
T3	STAGE 4 ISSUE	01.04.22
T2	STAGE 4 ISSUE	28.02.22
T1	STAGE 4 ISSUE	07.02.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: FOR APPROVAL
Suitability: S4

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Client: SWEET PROJECTS
Architect: NWA
Project: UNION PARK
Title: PROPOSED BELOW GROUND DRAINAGE SITE LAYOUT

HDR | HPF Project Number: PUR17155
Cad File Name: HPF-0471-SWS-BG-DR-C-91111

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
DE/RJ	JJ/UG	27.09.2023	1:500

Drawing Number: HPF-0471-SWS-BG-DR-C-91111
Revision: T14

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Scalebar 100mm at scale 1:1

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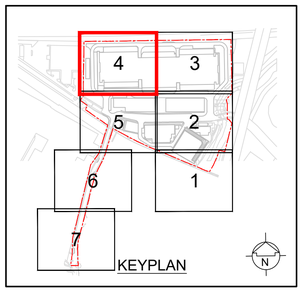
8. REFER TO GENERAL NOTES DRAWING HPF-0471-SWS-XX-TN-C-90010



KEYPLAN

STUB CONNECTION FOR FUTURE USE

STUB CONNECTION FOR FUTURE USE

FW01.01

SL01.01

SL01.02

BD

SW01.28

BD

63

65

CH01.18

CH01.19

EX-SW

UNION PARK BLOCK 3
FFL: 31.300m
GANTRY: 31.150m (SSL)

LEGEND

- PLANNING BOUNDARY
- DEMISE BOUNDARY
- PHASE ONE CONSTRUCTION BOUNDARY
- ZONE ONE
- ZONE TWO
- ZONE THREE
- ZONE FOUR
- ZONE FIVE
- EXISTING SURFACE WATER (EX-SW)
- EXISTING PRIVATE FOUL WATER (EX-FW)
- EXISTING PUBLIC FOUL WATER (EX-FW)
- PROPOSED SURFACE WATER
- PROPOSED BACK DROP (BD)
- PROPOSED FOUL WATER
- EXISTING THAMES VALLEY SEWER (TVS)
- PERMEABLE PAVING CONNECTIONS (PP01.XX)
- RAINWATER & CHANNEL CONNECTIONS (RWP01.XX)
- DRAINAGE CHANNEL (CH01.XX,FWCH01.XX) (CH)
- SOIL VENT PIPE & FLOOR GULLY CONNECTIONS (SVP01.XX,FG01.XX)
- GULLEY CONNECTION (GU01.XX)
- EXISTING GULLEY CONNECTION (EXGU01.XX)
- SEWER NETWORK TO BE ABANDONED
- SWALE (SL01.XX)
- FILTRATION TRENCH (FT01.XX)
- SETTING OUT POINTS FOR SWALE,CHANNELS,TANKS

Rev	Description	Date
T1	STAGE 4 ISSUE	01.04.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: STAGE 4 — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: PROPOSED BELOW GROUND DRAINAGE SHEET 1 OF 7

HDR | HPF Project Number: PUR17155

Cad File Name: HPF-0471-SWS-BG-DR-C-91112 TO 91121

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
SJ	UG	22.12.2021	1:200

Drawing Number: HPF-0471-SWS-BG-DR-C-91112 — Revision: T1

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Scalebar 100mm at scale 1:1

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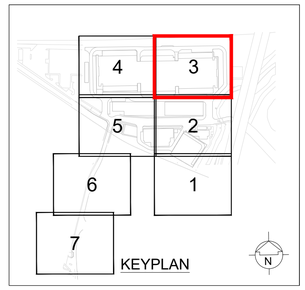

LEGEND

- PLANNING BOUNDARY
- PHASE ONE CONSTRUCTION BOUNDARY
- EXISTING SURFACE WATER (EX-SW)
- EXISTING PRIVATE FOUL WATER (EX-FW)
- EXISTING PUBLIC FOUL WATER (EX-FW)
- PROPOSED SURFACE WATER
- PROPOSED BACK DROP (BD)
- PROPOSED FOUL WATER
- EXISTING THAMES VALLEY SEWER (TVS)
- PERMEABLE PAVING CONNECTIONS (PP01.XX)
- RAINWATER & CHANNEL CONNECTIONS (RWP01.XX)
- DRAINAGE CHANNEL (CH01.XX,FWCH01.XX)
- SOIL VENT PIPE & FLOOR GULLY CONNECTIONS (SVP01.XX,FG01.XX)
- FOUL WATER RISING MAIN
- GULLEY CONNECTION (GU01.XX)
- EXISTING GULLEY CONNECTION (EXGU01.XX)
- SEWER NETWORK TO BE ABANDONED
- SWALE (SL01.XX)
- FILTRATION TRENCH (FT01.XX)
- SETTING OUT POINTS FOR SWALE,CHANNELS,TANKS

0 10 50 100
Scalebar 100mm at scale 1:1

Rev	Description	Date
T8	STAGE 4 ISSUE	17.10.23
T7	STAGE 4 ISSUE	25.08.23
T6	STAGE 4 ISSUE	28.07.23
T5	STAGE 4 ISSUE	04.10.22
T4	STAGE 4 ISSUE	30.09.22
T3	STAGE 4 ISSUE	16.09.22
T2	STAGE 4 ISSUE	25.07.22
T1	STAGE 4 ISSUE	01.04.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: FOR APPROVAL — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: PROPOSED BELOW GROUND DRAINAGE SHEET 2 OF 7

HDR | HPF Project Number:	PUR17155		
Cad File Name:	HPF-0471-SWS-BG-DR-C-91112 TO 91121		
Drawn: DE	Chkd/Appd: JJ/UG	Date: 17.10.2023	Scale @ A1: 1:200
Drawing Number: HPF-0471-SWS-BG-DR-C-91113			Revision: T8

File: \\HRPI-FS01\DATA\REGIONAL WORKS DRIVE\PURLEY\17000\PUR17155 SWEET GROUP UNION STG 4+\6.0 CAD BIM\6.2 WIP\6.2.2 CAD\5 CWA\DRAWINGS\HPF-0471-SWS-BG-DR-C-91112 TO 91121.DWG User: Jensen, Jason Sheet: 91113 Plot Date: 17/10/2023 14:55:50

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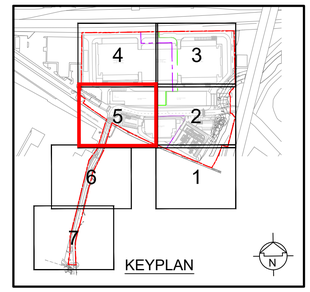

LEGEND

- PLANNING BOUNDARY
- DEMISE BOUNDARY
- PHASE ONE CONSTRUCTION BOUNDARY
- ZONE ONE
- EXISTING SURFACE WATER (EX-SW)
- EXISTING PRIVATE FOUL WATER (EX-FW)
- EXISTING PUBLIC FOUL WATER (EX-FW)
- PROPOSED SURFACE WATER
- PROPOSED BACK DROP (BD)
- PROPOSED FOUL WATER
- EXISTING THAMES VALLEY SEWER (TVS)
- RODDING EYE
- RAINWATER & CHANNEL CONNECTIONS
- DRAINAGE CHANNEL (CH)
- SOIL VENT PIPE & FLOOR GULLY CONNECTIONS
- GULLEY CONNECTION
- SEWER NETWORK TO BE ABANDONED

0 10 50 100
Scalebar 100mm at scale 1:1

Rev	Description	Date
T1	STAGE 4 ISSUE	28.02.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: STAGE 4 — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: PROPOSED BELOW GROUND DRAINAGE SHEET 3 OF 7

HDR | HPF Project Number:			
PUR17155			
Cad File Name: HPF-0471-SWS-BG-DR-C-91112 TO 91121			
Drawn: SJ	Chkd/Appd: UG	Date: 22.12.2021	Scale @ A1: 1:200@A1
Drawing Number: HPF-0471-SWS-BG-DR-C-91114			Revision: T1

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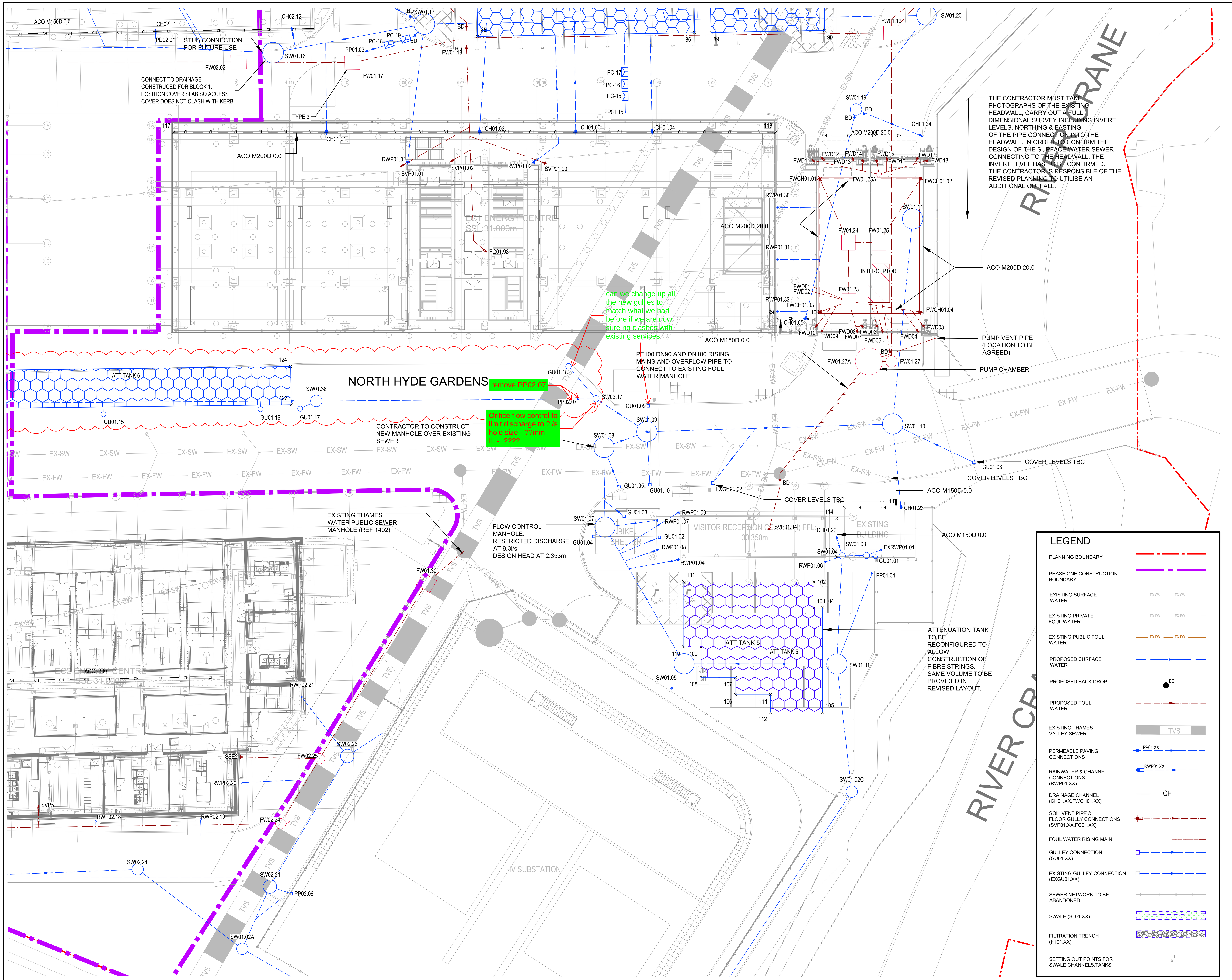
User: John, Shiky Sheet: 91114 Plot Date: 28-Feb-22 12:28:00 PM



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7. REFER TO GENERAL NOTES DRAWING HPF-0471-SWS-XX-TN-C-90010

KEYPLAN

LEGEND

- PLANNING BOUNDARY
- PHASE ONE CONSTRUCTION BOUNDARY
- EXISTING SURFACE WATER
- EXISTING PRIVATE FOUL WATER
- EXISTING PUBLIC FOUL WATER
- PROPOSED SURFACE WATER
- PROPOSED BACK DROP
- PROPOSED FOUL WATER
- EXISTING THAMES VALLEY SEWER
- PERMEABLE PAVING CONNECTIONS
- RAINWATER & CHANNEL CONNECTIONS (RWP01.XX)
- DRAINAGE CHANNEL (CH01.XX,FWCH01.XX)
- SOIL VENT PIPE & FLOOR GULLY CONNECTIONS (SVP01.XX,FG01.XX)
- FOUL WATER RISING MAIN
- GULLEY CONNECTION (GU01.XX)
- EXISTING GULLEY CONNECTION (EXGU01.XX)
- SEWER NETWORK TO BE ABANDONED
- SWALE (SL01.XX)
- FILTRATION TRENCH (FT01.XX)
- SETTING OUT POINTS FOR SWALE,CHANNELS,TANKS

Rev	Description	Date
T13	STAGE 4 ISSUE	30.10.23
T12	STAGE 4 ISSUE	17.10.23
T11	STAGE 4 ISSUE	27.09.23
T10	STAGE 4 ISSUE	18.09.23
T9	STAGE 4 ISSUE	08.09.23
T8	STAGE 4 ISSUE	25.08.23
T7	STAGE 4 ISSUE	28.07.23
T6	STAGE 4 ISSUE	07.07.23
T5	STAGE 4 ISSUE	10.01.23
T4	STAGE 4 ISSUE	16.09.22
T3	STAGE 4 ISSUE	01.04.22
T2	STAGE 4 ISSUE	28.02.22
T1	STAGE 4 ISSUE	07.02.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: FOR APPROVAL
Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: PROPOSED BELOW GROUND DRAINAGE SHEET 4 OF 7

HDR | HPF Project Number: PUR17155

Cad File Name: HPF-0471-SWS-BG-DR-C-91112 TO 91121

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
DE/RJ	JJ/UG	30.10.2023	1:200

Drawing Number: HPF-0471-SWS-BG-DR-C-91118
Revision: T13

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Scalebar 100mm at scale 1:1

File: S:\REGIONAL WORKS DRIVE\PURLEY\17000\PUR17155 SWEETT GROUP UNION STG 4+\6.0 CAD BIM\6.2 WIP\6.2.2 CAD\5 CIVIL\DRAWINGS\HPF-0471-SWS-BG-DR-C-91112 TO 91121.DWG User: Johnstone, Richard Sheet: 91118 Plot Date: 26/10/2023 10:32:08

NOTES:

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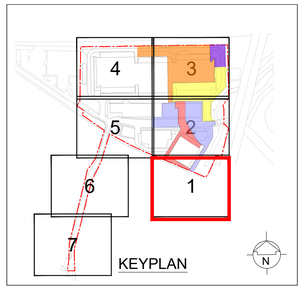
8. REFER TO GENERAL NOTES DRAWING HPF-0471-SWS-XX-TN-C-90010



KEYPLAN

SW01.02A

SW01.02B

Weir

29.6m

Ramp

Aqueduct

LEGEND

- PLANNING BOUNDARY
- DEMISE BOUNDARY
- PHASE ONE CONSTRUCTION BOUNDARY
- ZONE ONE
- ZONE TWO
- PROPOSED SURFACE WATER

0 10 50 100

Rev	Description	Date
T2	STAGE 4 ISSUE	28.07.23
T1	STAGE 4 ISSUE	01.04.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: FOR APPROVAL

Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: PROPOSED BELOW GROUND DRAINAGE SHEET 6 OF 7

HDR | HPF Project Number: PUR17155

Cad File Name: HPF-0471-SWS-BG-DR-C-91112 TO 91121

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
SJ	UG	28.07.2023	1:200

Drawing Number: HPF-0471-SWS-BG-DR-C-91120

Revision: T2

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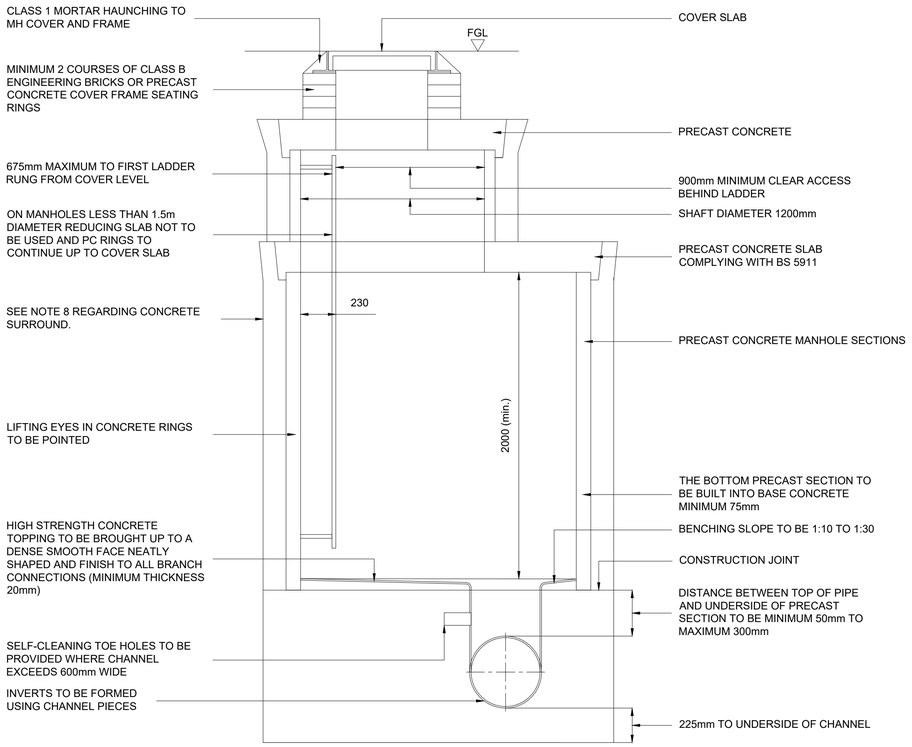
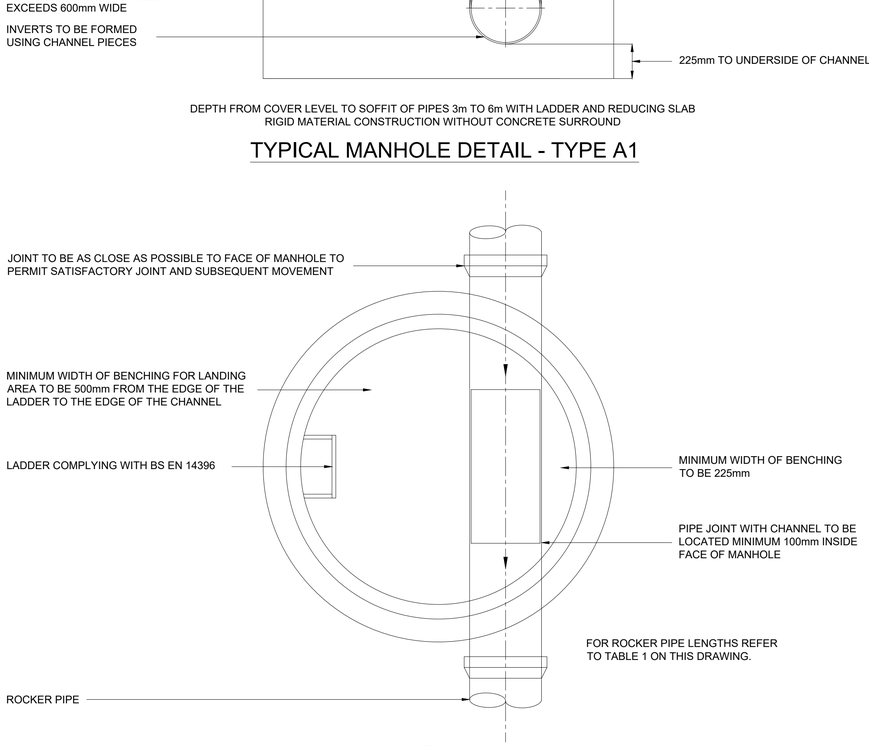
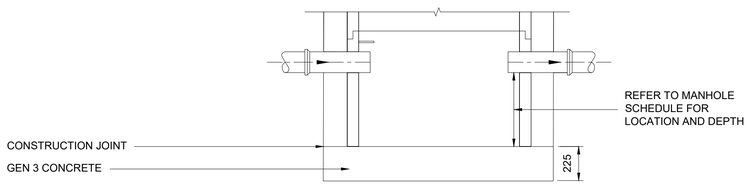


DEPTH FROM COVER LEVEL TO SOFFIT OF PIPES 3m TO 6m WITH LADDER AND REDUCING SLAB
RIGID MATERIAL CONSTRUCTION WITHOUT CONCRETE SURROUND

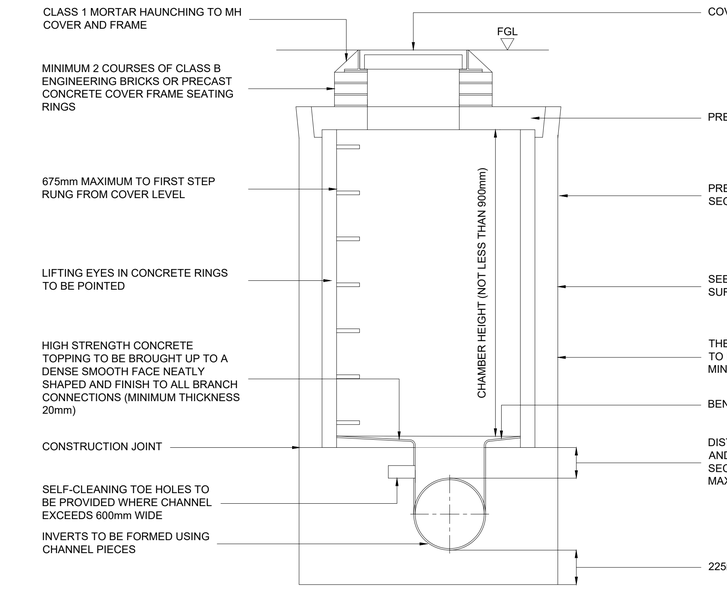
TYPICAL MANHOLE DETAIL - TYPE A1



PLAN



SUMP MANHOLE DETAIL



DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5m TO 3m
RIGID MATERIAL CONSTRUCTION WITHOUT CONCRETE SURROUND

TYPICAL MANHOLE DETAIL - TYPE B

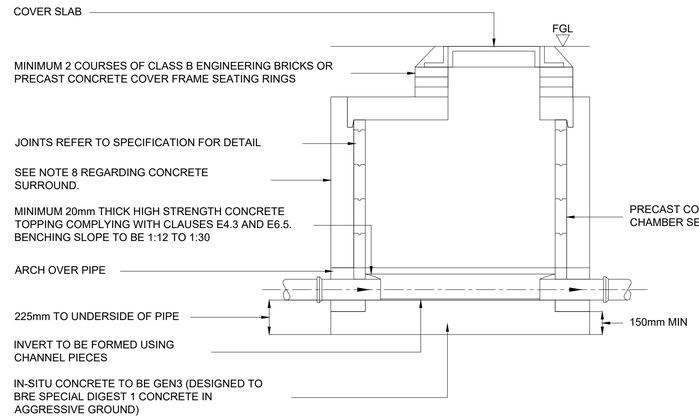
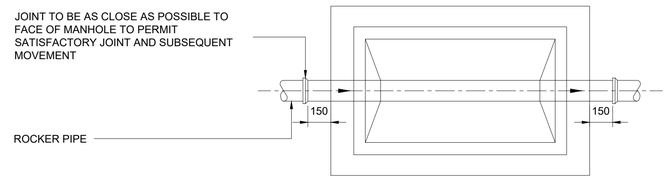


TABLE 1. ROCKER PIPE LENGTHS

PIPE DIA. (mm)	EFFECTIVE LENGTH (m)
150 - 600	0.60
601 - 750	1.00
>750	1.25

(RIGID MATERIAL DETAIL)

RECTANGULAR PRECAST MANHOLE - TYPE 3



WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS, ALWAYS USE THE MAIN CHANNEL BY FITTING 45° BEND ON INLET AND OUTLET

PLAN

NOTES:

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Rev	Description	Date
T2	STAGE 4 ISSUE	01.04.22
T1	STAGE 4 ISSUE	07.02.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: STAGE 4 — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: TYPICAL DRAINAGE DETAILS SHEET 1 OF 7

HDR | HPF Project Number: PUR17155

Cad File Name: HPF-0471-SWS-BG-DR-C-91136

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
HA	UG	13.07.2021	1:20

Drawing Number: HPF-0471-SWS-BG-DR-C-91136 — Revision: T2

0 10 50 100
Scalebar 100mm at scale 1:1

NOTES:

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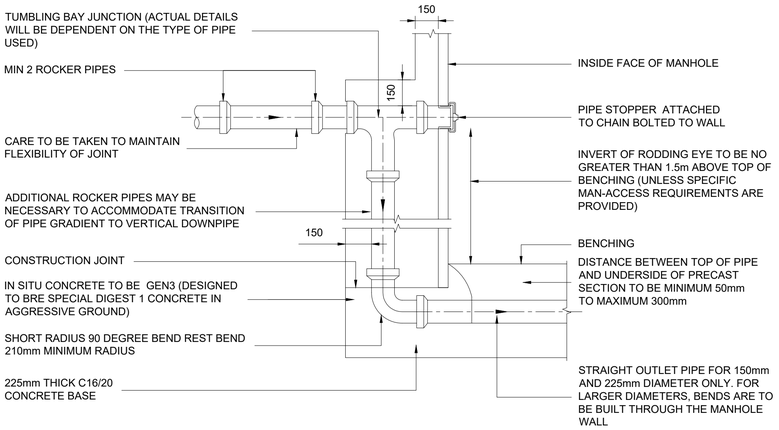
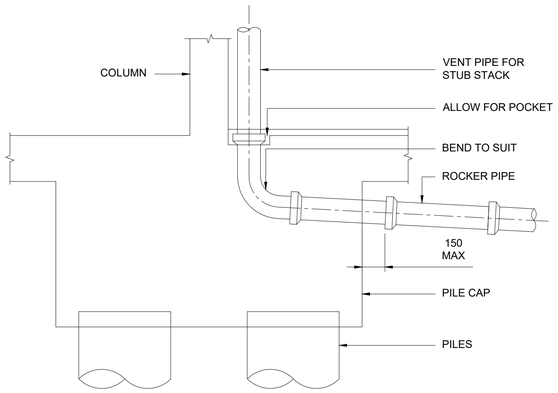
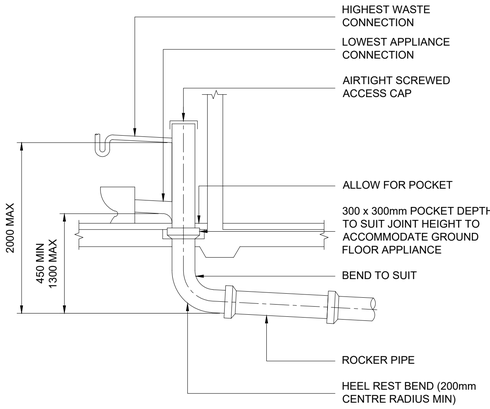


TYPICAL VERTICAL BACKDROP DETAIL

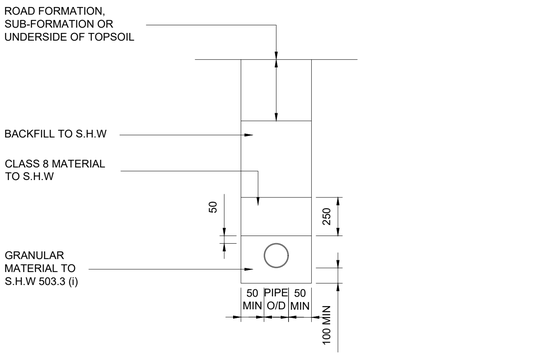


PIPES CROSSING THROUGH PILE CAP



PIPE TO BE LAID IN GROUND OR SUPPORTED AT EACH JOINT IF LAID ABOVE GROUND.

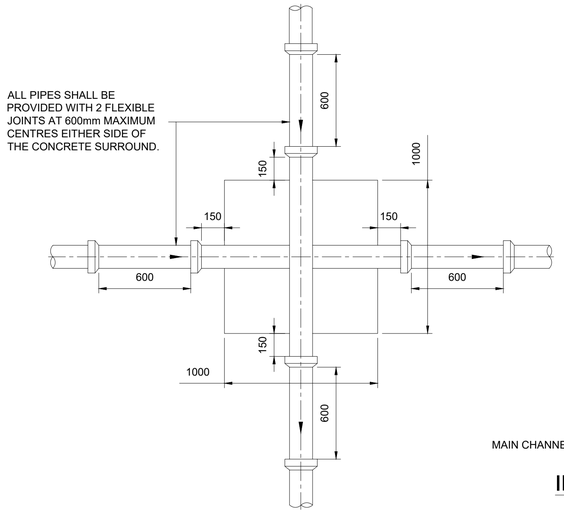
INTERNAL STACK CONNECTIONS



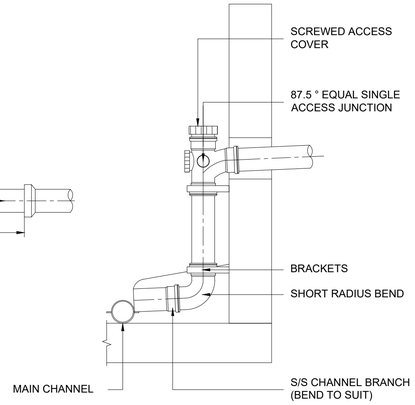
BEDDING BENEATH AND AT THE SIDES OF THE PIPE TO BE WELL COMPACTED. THE FIRST 300mm OF FILL ABOVE THE CROWN OF THE PIPE IS TO BE LIGHTLY TAMPED BY HAND. MECHANICAL COMPACTION MAY BE USED ONLY ABOVE THIS LEVEL. GEOTEXTILES MAY BE USED WHERE DIRECTED OR APPROVED BY THE ENGINEER TO CONTAIN BEDDING MATERIAL IN CERTAIN SOILS E.G. RUNNING SAND IN VERY WET CONDITIONS, WHERE DIRECTED OR APPROVED BY THE ENGINEER A TEMPORARY LAND DRAIN MAY BE LAID WITHIN THE GRANULAR BED.

GRANULAR BEDDING FOR FLEXIBLE PIPES

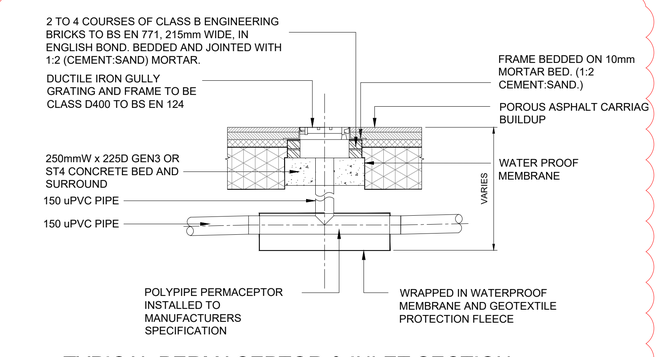
CLASS S BEDDING



PLAN

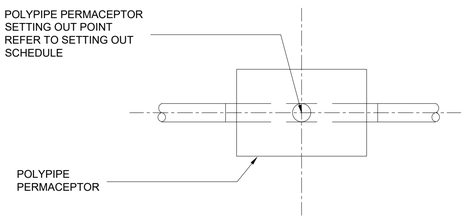


INTERNAL BACKDROP DETAIL



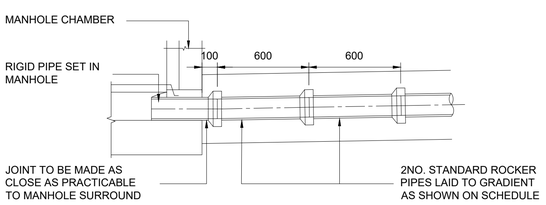
TYPICAL PERMACEPTOR & INLET SECTION

(SCALE 1:20)



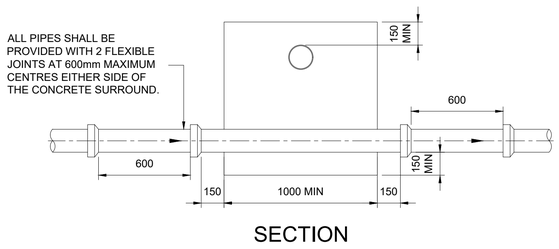
PERMACEPTOR PLAN

(SCALE 1:20)



SUITABLE FOR PIPE SIZES UP TO 600mm INTERNAL DIAMETER

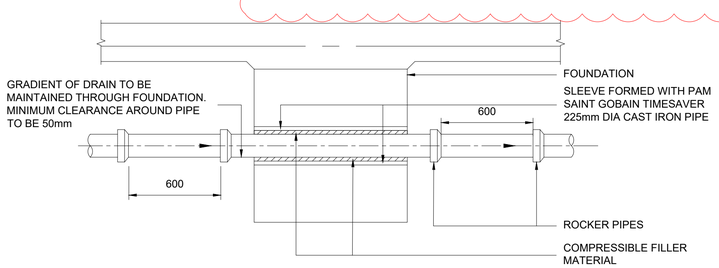
TYPICAL DOUBLE ROCKER PIPE DETAIL



SECTION

CONCRETE SURROUND SHALL BE PROVIDED WHERE THE DISTANCE BETWEEN THE SOFFIT OF THE LOWER DRAIN AND THE BARREL OF THE HIGHEST DRAIN IS LESS THAN 300mm.

PIPE TO PIPE CROSSOVER



DRAIN SLEEVE/DUCT TO BE LOCATED WHOLLY WITHIN THE MIDDLE THIRD OF THE FOUNDATION DEPTH. THE ENGINEER (HDR) IS TO BE ADVISED IF THIS IS NOT POSSIBLE. IN NORMAL SOIL CONDITIONS THE SLEEVE/DUCT IS TO GIVE A 50mm CLEARANCE ALL ROUND THE OUTSIDE OF THE DRAIN PIPE (THIS MAY BE ACHIEVED BY LIGHTLY PACKING THE SPACE WITH COMPRESSIBLE FILLER MATERIAL).

DRAINS THROUGH FOUNDATIONS

Rev	Description	Date
T4	STAGE 4 ISSUE	17.10.23
T3	STAGE 4 ISSUE	25.07.22
T2	STAGE 4 ISSUE	01.04.22
T1	STAGE 4 ISSUE	07.02.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: FOR APPROVAL — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: DRAINAGE TYPICAL DETAILS SHEET 2 OF 7

HDR | HPF Project Number: PUR17155

Cad File Name: HPF-0471-SWS-BG-DR-C-91137

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
HA	UG	17.10.2023	1:20

Drawing Number: HPF-0471-SWS-BG-DR-C-91137 — Revision: T4

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Scalebar 100mm at scale 1:1

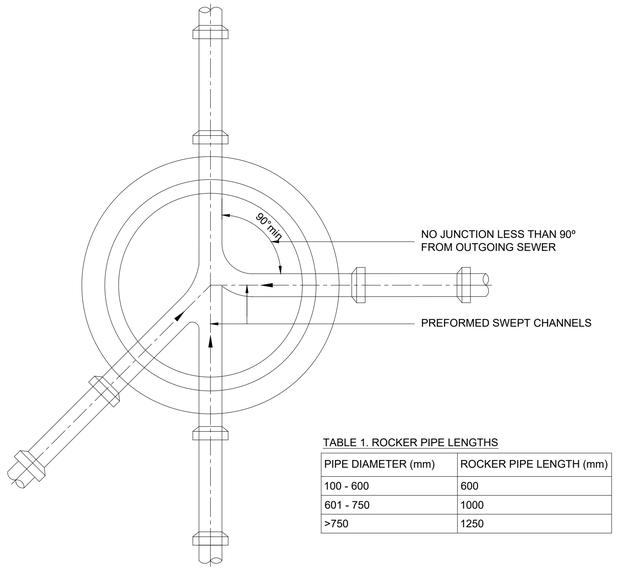
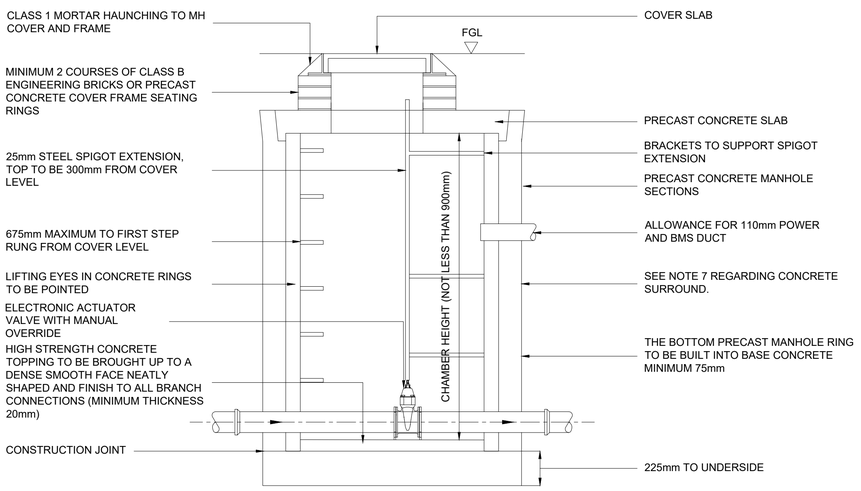


TABLE 1. ROCKER PIPE LENGTHS

PIPE DIAMETER (mm)	ROCKER PIPE LENGTH (mm)
100 - 600	600
601 - 750	1000
>750	1250

PIPE JUNCTIONS ARRANGEMENT

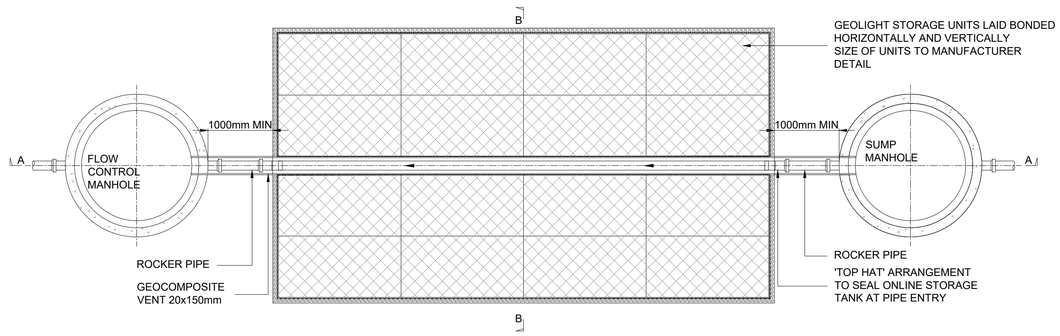
SCALE 1:20



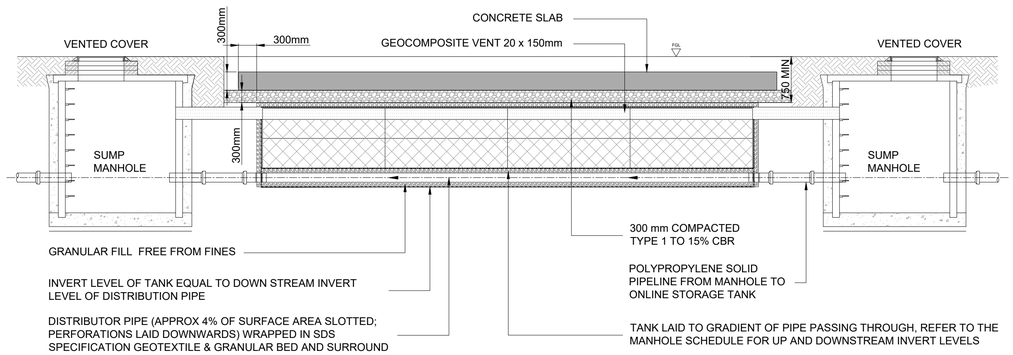
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 1.5m TO 3m
PRECAST RECTANGULAR CONCRETE CHAMBER SECTIONS WITH CONCRETE SURROUND

VALVE CHAMBER

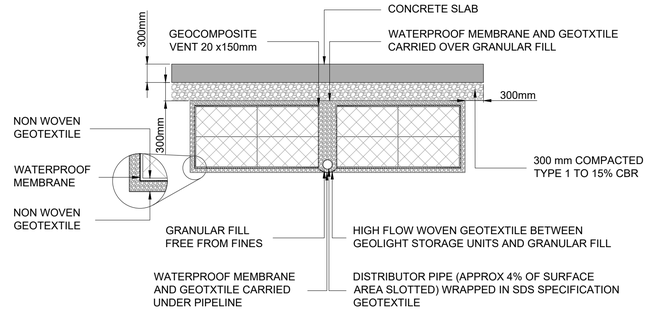
SCALE 1:20



PLAN



SECTION A-A



SECTION B-B

SDS GEOLIGHT 800 STORMWATER ATTENUATION SYSTEM

SCALE 1:50

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8. REFER TO GENERAL NOTES DRAWING HPF-0471-SWS-XX-TN-C-90010

Rev	Description	Date
T3	STAGE 4 ISSUE	01.04.22
T2	STAGE 4 ISSUE	28.02.22
T1	STAGE 4 ISSUE	07.02.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: STAGE 4 — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: DRAINAGE TYPICAL DETAILS SHEET 3 OF 7

HDR | HPF Project Number: PUR17155

Cad File Name: HPF-0471-SWS-BG-DR-C-91138

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
HA	UG	13.07.2021	AS SHOWN

Drawing Number: HPF-0471-SWS-BG-DR-C-91138 — Revision: T3

0 10 50 100
Scalebar 100mm at scale 1:1

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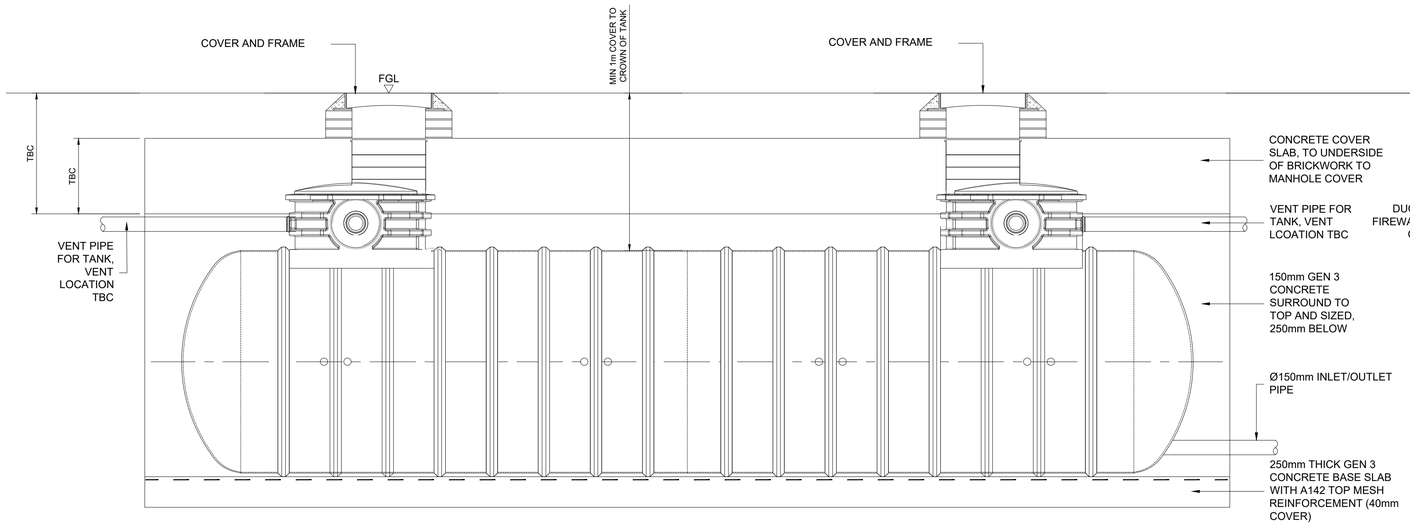
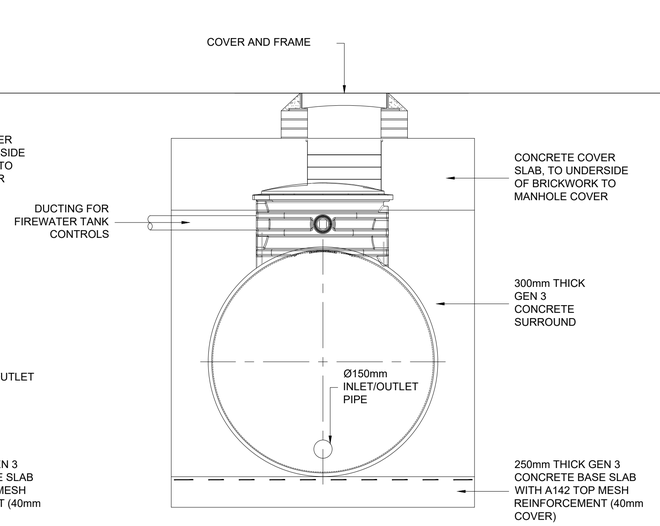
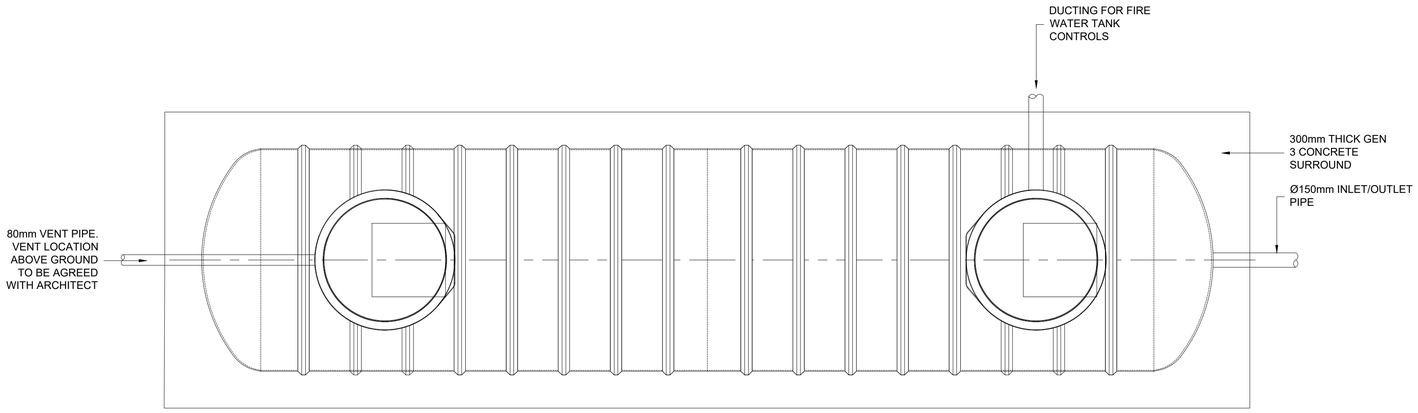


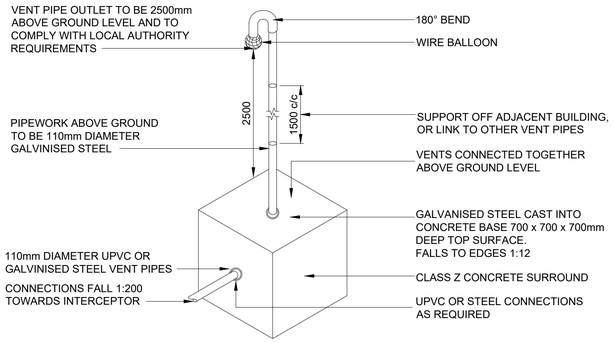
FIRE WATER TANK - FRONT ELEVATION
(SCALE 1:25)



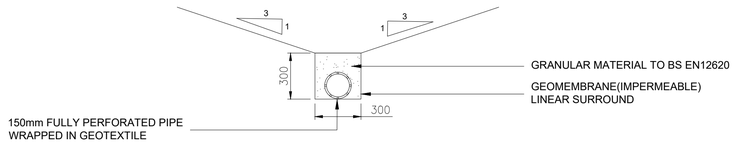
FIRE WATER TANK - SIDE ELEVATION
(SCALE 1:25)



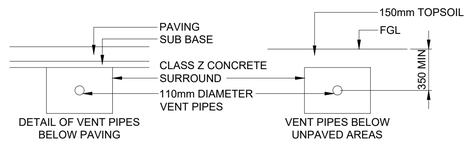
FIRE WATER TANK - PLAN
(SCALE 1:25)



SCHEMATIC OF INTERCEPTOR VENT PIPE
(NTS)



TYPICAL SWALE SECTION
(SCALE 1:20)



INTERCEPTOR VENT PIPES
(NTS)

Rev	Description	Date
T2	STAGE 4 ISSUE	01.04.22
T1	STAGE 4 ISSUE	28.02.22

Drawing Status: STAGE 4 — Suitability: S4

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w: www.hurleypalmerflatt.com

Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: TYPICAL DRAINAGE DETAILS SHEET 4 OF 7

HDR | HPF Project Number: PUR17155			
Cad File Name: HPF-0471-SWS-BG-DR-C-91139			
Drawn: DH	Chkd/Appd: UG	Date: 22.12.2021	Scale @ A1: AS SHOWN
Drawing Number: HPF-0471-SWS-BG-DR-C-91139			Revision: T2

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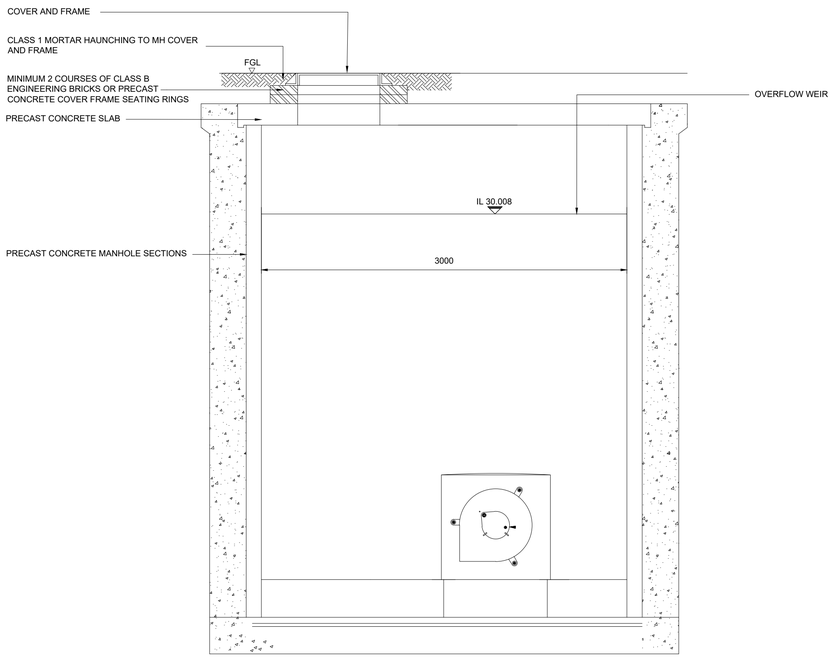

SECTION B-B
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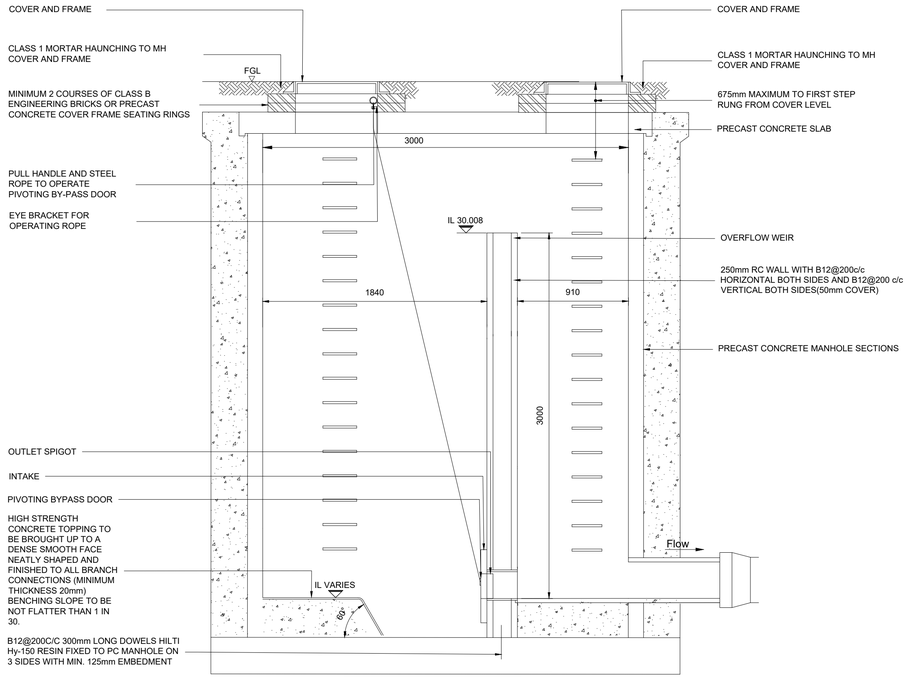

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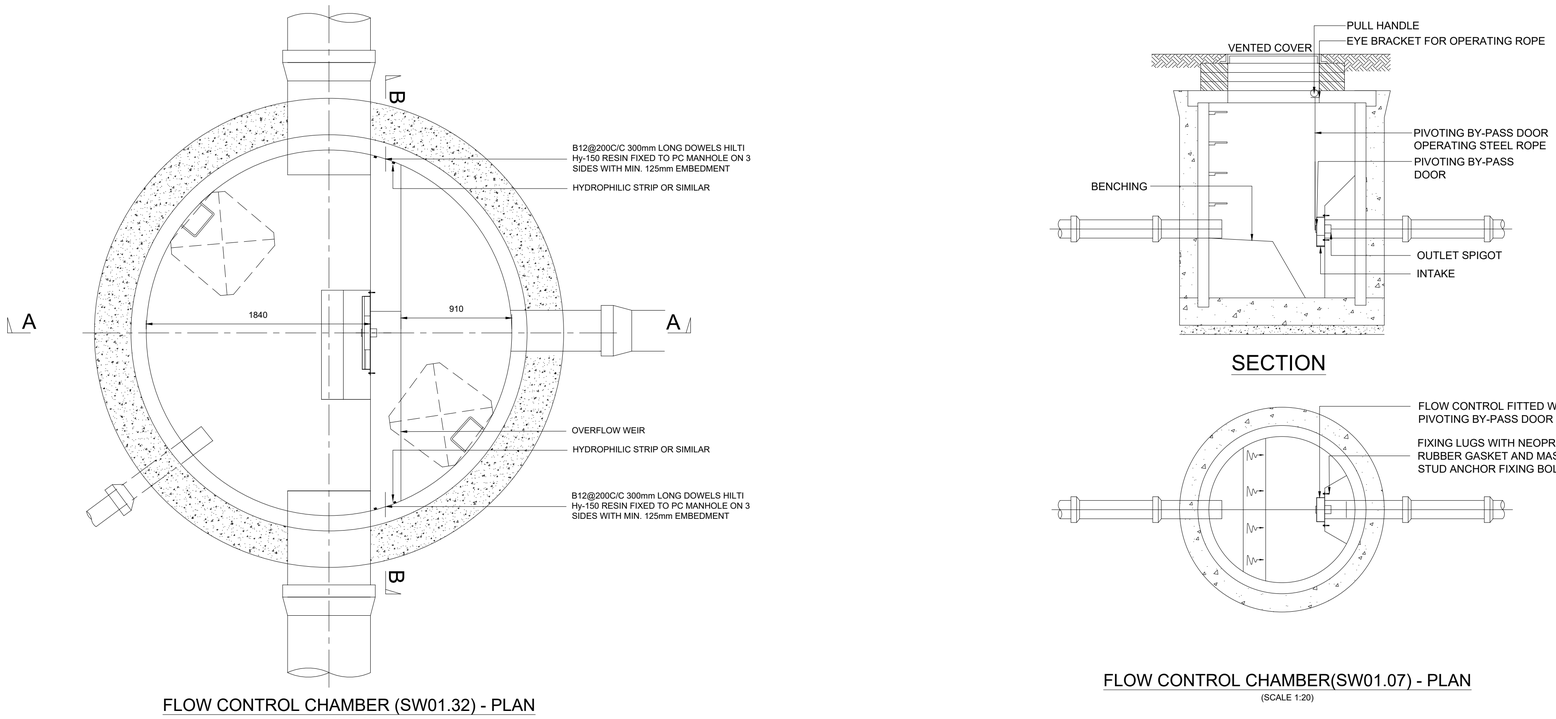

FLOW CONTROL CHAMBER (SW01.32) - PLAN
(SCALE 1:20)

SECTION

FLOW CONTROL CHAMBER(SW01.07) - PLAN
(SCALE 1:20)

Rev	Description	Date
T1	STAGE 4 ISSUE	01.04.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: STAGE 4 — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: TYPICAL DRAINAGE DETAILS SHEET 5 OF 7

HDR | HPF Project Number: PUR17155

Cad File Name: HPF-0471-SWS-BG-DR-C-91140

Drawn:	Chkd/Appd:	Date:	Scale @ A1:
SJ	UG	22.12.2021	1:20

Drawing Number: HPF-0471-SWS-BG-DR-C-91140 — Revision: T1

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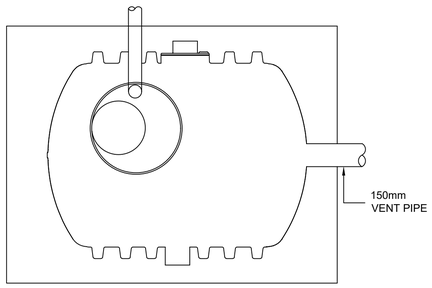
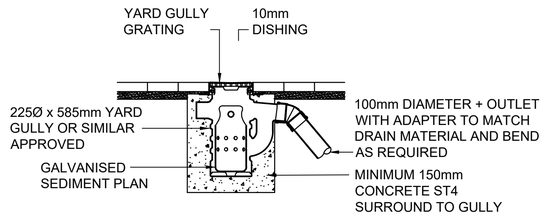
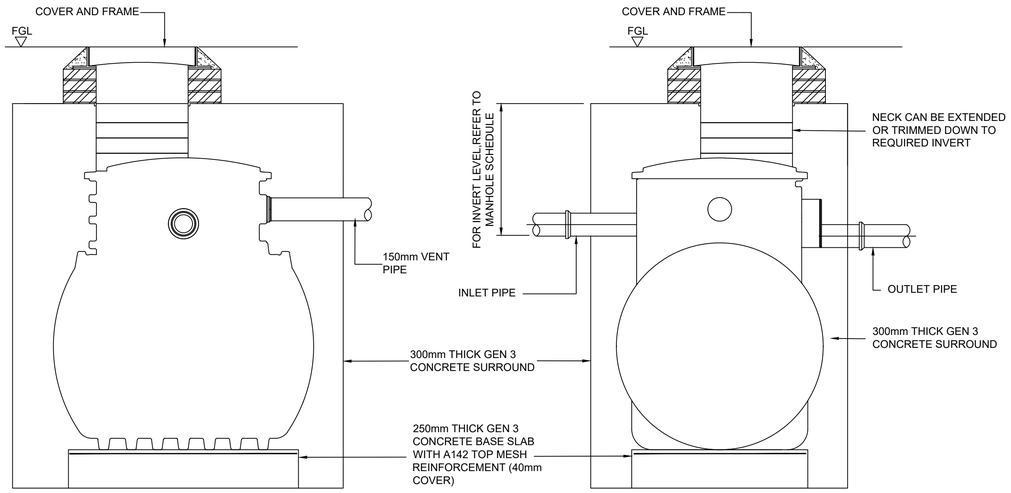
File: V:\REGIONAL WORKS DRIVE\PURLEY\17000\PUR17155 SWEETT GROUP UNION STG 4+\6.0 CAD BIM\6.2 WIP\6.2.2 CAD\5 CIVIL\DRAWINGS\HPF-0471-SWS-BG-DR-C-91140.DWG User: John, Shiky Sheet: HPF Plot Date: 01-Apr-22 5:05:21 PM





TYPICAL YARD GULLY



FULL RETENTION SEPARATOR

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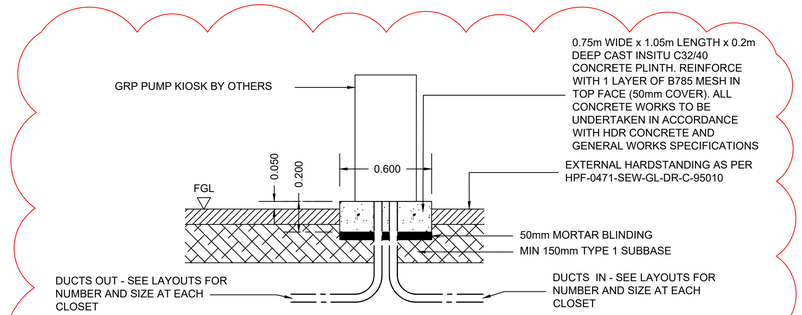
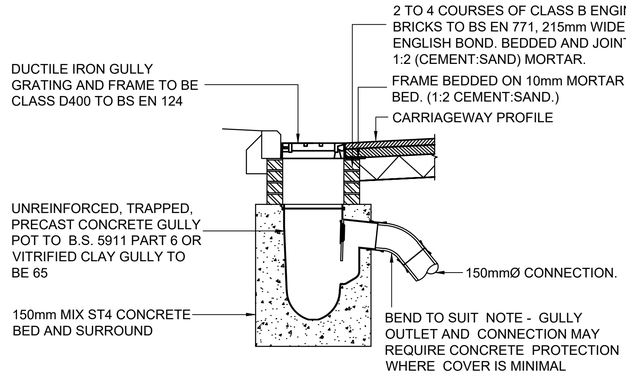


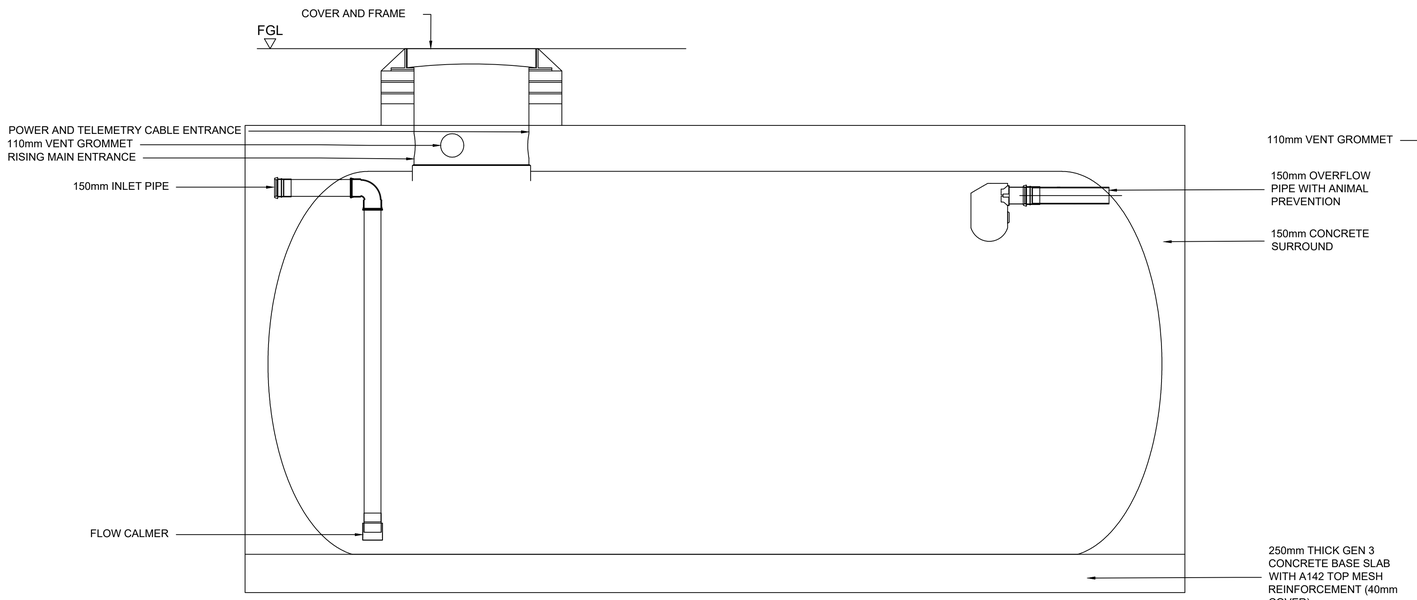
PUMP KIOSK PLINTH

SCALE 1:20



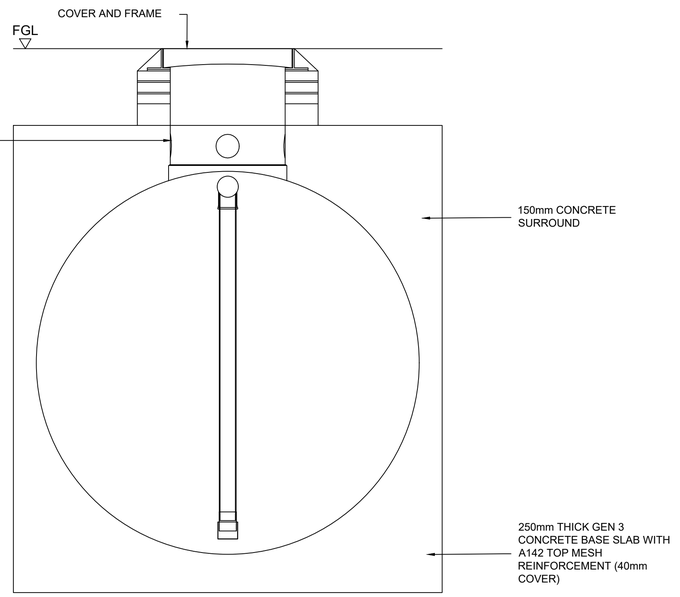
TYPICAL ROAD GULLY

(510mm x 840mm FOR ROAD GULLY, 375mm x 750mm FOR CAR PARK GULLY)



RAINWATER TANK NOMINAL CAPACITY 25000 LITRES

(SCALE 1:20)



END ELEVATION

(SCALE 1:20)

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Rev	Description	Date
T3	STAGE 4 ISSUE	28.09.23
T2	STAGE 4 ISSUE	02.06.23
T1	STAGE 4 ISSUE	01.04.22
P01	STAGE 4 EARLY WORKS	13.07.21

Drawing Status: FOR APPROVAL

Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: TYPICAL DRAINAGE DETAILS SHEET 6 OF 7

HDR | HPF Project Number:			
PUR17155			
Cad File Name: HPF-0471-SWS-BG-DR-C-91141			
Drawn: SJ	Chkd/Appd: UG	Date: 28.09.23	Scale @ A1: 1:20
Drawing Number: HPF-0471-SWS-BG-DR-C-91141			Revision: T3

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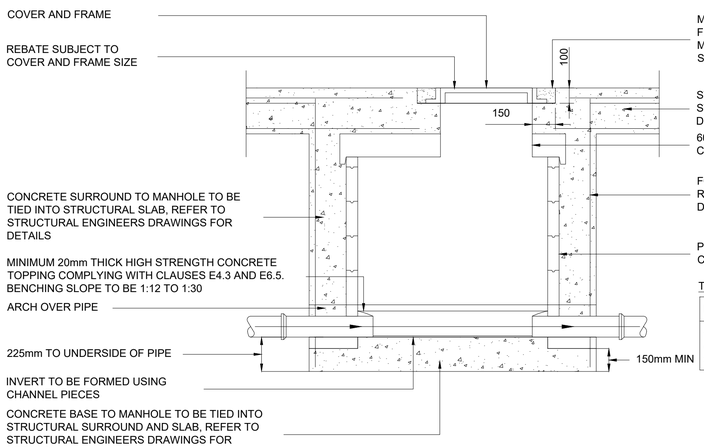
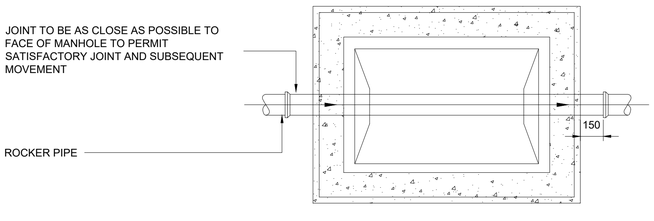


TABLE 1. ROCKER PIPE LENGTHS

PIPE DIA. (mm)	EFFECTIVE LENGTH (m)
150 - 600	0.60
601 - 750	1.00
>750	1.25

RECTANGULAR PRECAST INTERNAL FOUL MANHOLE

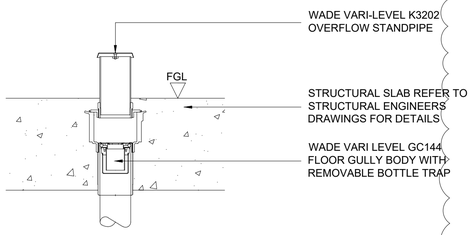
(SCALE 1:20)



WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS, ALWAYS USE THE MAIN CHANNEL BY FITTING 45° BEND ON INLET AND OUTLET

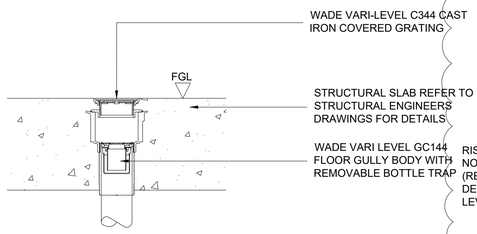
PLAN

BELOW GROUND SLAB PIPE HANGER



INTERNAL STANDPIPE GULLY

(SCALE 1:10)



INTERNAL FIRE WATER / FLOOR GULLY

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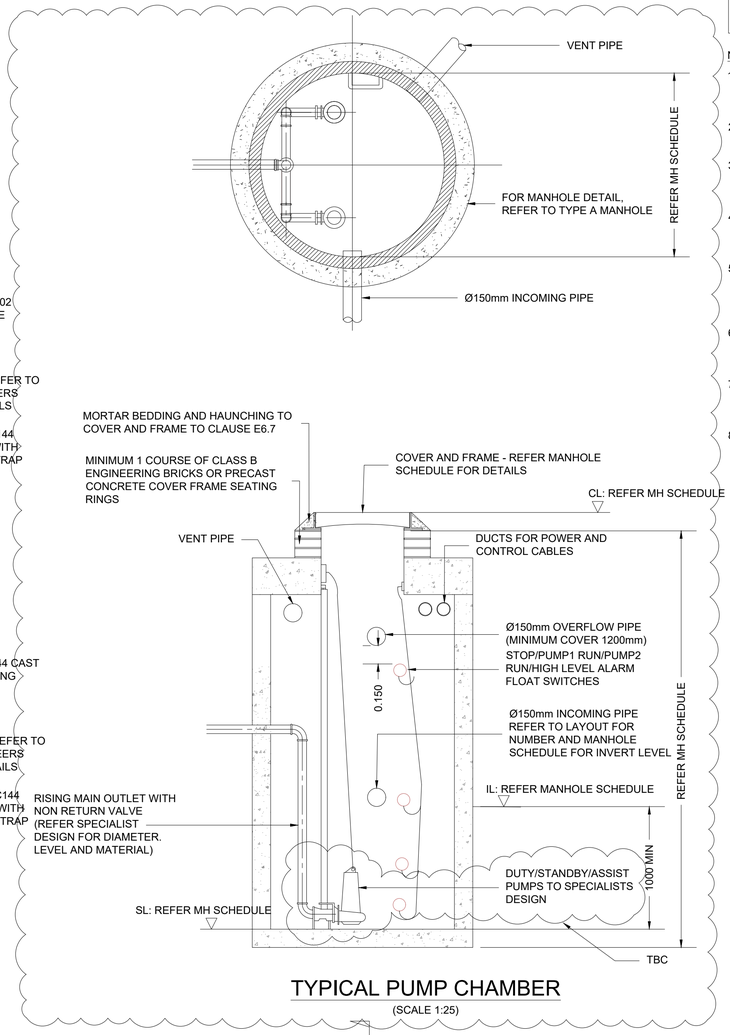

TYPICAL PUMP CHAMBER

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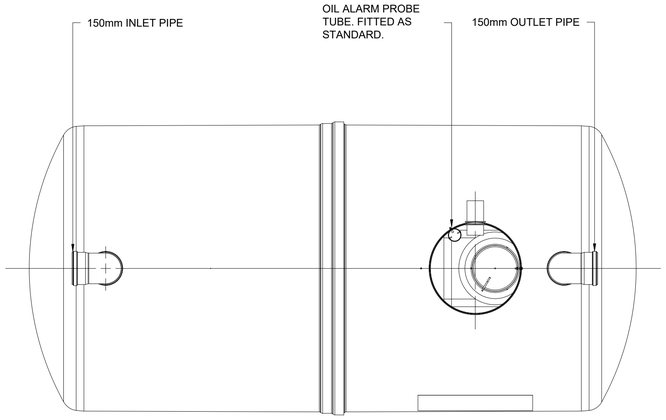
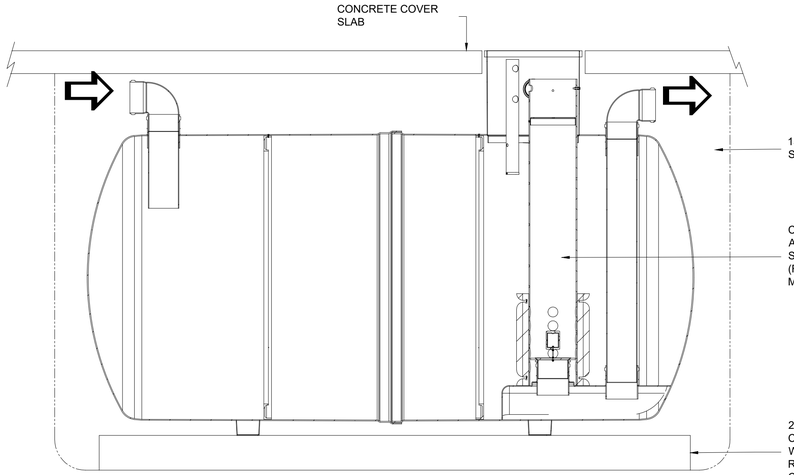


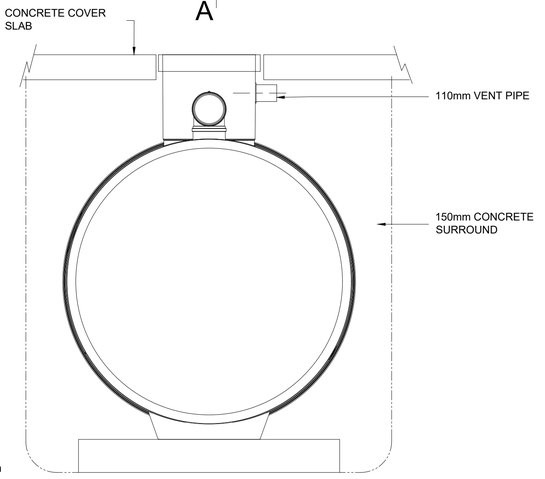
FORECOURT SEPARATOR - PLAN

(SCALE 1:20)



SECTION A-A

(SCALE 1:20)



END ELEVATION

(SCALE 1:20)

Rev	Description	Date
T4	STAGE 4 ISSUE	24.07.23
T3	STAGE 4 ISSUE	25.07.22
T2	STAGE 4 ISSUE	16.06.22
T1	STAGE 4 ISSUE	01.04.22

Drawing Status: FOR APPROVAL — Suitability: S4

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Client: SWEET PROJECTS

Architect: NWA

Project: UNION PARK

Title: DRAINAGE TYPICAL DETAILS SHEET 7 OF 7

HDR | HPF Project Number:			
PUR17155			
Cad File Name: HPF-0471-SWS-BG-DR-C-91142			
Drawn: DH	Chkd/Appd: UG	Date: 24.07.2023	Scale @ A1: AS SHOWN
Drawing Number: HPF-0471-SWS-BG-DR-C-91142			Revision: T4

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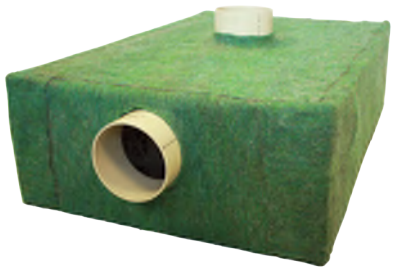
Permaceptor

Data Sheet

PRODUCT INFORMATION **P1** **ISSUE 2 - JUNE 2018**

Product code: PV04002

The Permaceptor functions as a combined run-off collection, silt/oil interceptor and treatment system. The system is designed to be used with conventional road/yard gullies and ideally laid with zero gradient to prevent the development of lateral velocities. Thus, its initial function is to 'still' sheet run-off from each sub-catchment and to encourage silt deposition. The outlet discharges via a weir and baffle component that separates oils and prevents the effluent and silt from progressing into the rest of the drainage system.



Applications

Permaceptor is used for stormwater collection, interception and the treatment of associated pollutants. The system comprises Permavoid and Permavoid Biomat units located to collect surface water run-off from sub-catchments of predominantly impervious or pervious pavements via Polypipe Ridgigully and Midigully. Permaceptor is suitable for use in a range of applications including residential, industrial estates, car parks and basements.

Key Benefits

- Gravity separation of oils and silts at source
- Accidental/catastrophic spills recoverable at source
- Trapped effluent naturally treated by aerobic digestion
- Can enhance the water quality and eliminate the need for end of line petrol/oil interceptors
- The system complies with the regulations of the treatment train criteria in a SuDS scheme as defined in the PPG3
- 100% recyclable
- Units are manufactured from 90% recycled polypropylene (PP)

Performance

The structural load bearing capacity of the Permavoid units have been tested in accordance with the following European Standard: BS 7533-13:2009. The system's structural design life expectancy, based upon creep test data (tested in accordance with CIRIA guidelines) is as follows; for lightly loaded areas such as car parks a design life of 50 years is achievable. For areas with prolonged HGV loading a typical design life may only be 25 years, depending on the design of the pavement surfacing and structural layers over the tank.

Installation

All calculations for Permaceptor units are based upon site-specific load cases, construction types and thickness, soil cover and ground conditions and the suitability must therefore be approved for each project.

Technical Support

Detailed guidance and assistance is available.
For further information, please contact our Technical Team on **+44 (0) 1509 615 100** or email **civils@polypipe.com** or visit **www.polypipe.com/civils-technical-hub**

ELEMENT	VALUE
PHYSICAL PROPERTIES	
Weight per unit	29kg
Length	1062mm
Width	708mm
Height	300mm
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	715kN/m²
Lateral	156kN/m²
SHORT TERM DEFLECTION	
Vertical	1mm per 126kN/m²
Lateral	1mm per 15kN/m²
TENSILE STRENGTH	
Of a single joint	42.4kN/m²
Of a single joint at (1% secant modulus)	18.8kN/m²
Bending resistance of unit	0.71kN/m
Bending resistance of single joint	0.16kN/m
Volumetric void ratio	92%
Average effective perforated surface area	52%
OTHER PROPERTIES	
Intrinsic permeability (k)	Minimum 1.0 x 10^{-5}
Oil retention	56g/m²
Effluent discharge at max. oil loading	10ppm
Ancillary	Permavoid Permatie
Material	Polymer concrete

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www.polypipe.com/wms

Polypipe

Permaceptor can be utilised in these SuDS techniques

TECHNIQUES													
Blue-Green roofs	Podium Decks	Trees	Sports Pitches	Cycle Paths	Permeable Paving (sub base & podium)	Bioretention & Rain Gardens	Attenuation Storage Tanks	Infiltration	Swales	Filter Drains	Detention Basins	Ponds & Wetlands	Filter Strips
	✓					✓	✓	✓					

Visit **www.polypipe.com/greeninfrastructure**

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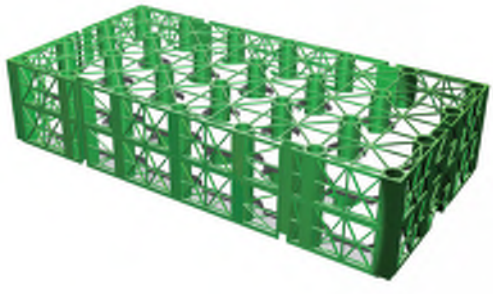
Permavoid Biomat

Data Sheet

PRODUCT INFORMATION **P1** **ISSUE 4 - JUNE 2018**

Product code: PV150BM

Permavoid Biomat is a high strength geocellular unit, containing a low density, oil treating, geosynthetic floating mat (biomat). The biomat floats on water and is designed to intercept and treat any potential residue emulsified oils that may be present within the surface water. The use of Permavoid Biomat provides additional oil retention and water treatment capability to an underground water storage system.



Applications

Permavoid Biomat units are suitable for use as a stormwater attenuation and/or infiltration system. The system comprises of single, interconnected cells which can be installed in the ground as part of a sub-base formation. Permavoid Biomat is suitable for use in a range of applications including residential, industrial estates, car parks, sports pitches, roofs, basements, pedestrian areas and rainwater harvesting.

Key Benefits

- Secondary treatment phase for potential residual hydrocarbons
- Pollutant-intercepting floating mat
- Same size as Permavoid 150 so can be incorporated into Permavoid attenuation designs
- Floating medium maintained at air-water interface allowing optimum conditions for aerobic degradation
- Self maintaining, degrades residual oils by absorption and aerobic digestion
- 100% recyclable
- Units are manufactured from 90% recycled polypropylene (pp)

Performance

The structural load bearing capacity of the Permavoid Biomat units have been tested in accordance with the following European Standard: BS 7533-13:2009. The system's structural design life expectancy, based upon creep test data (tested in accordance with CIRIA guidelines) is as follows; for lightly loaded areas such as car parks a design life of 50 years is achievable. For areas with prolonged HGV loading a typical design life may only be 25 years, depending on the design of the pavement surfacing and structural layers over the tank.

Installation

All calculations for Permavoid Biomat units are based upon site-specific load cases, pavement construction types and thickness, soil cover and ground conditions and the suitability must therefore be approved for each project.

Technical Support

Detailed guidance and assistance is available.
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ELEMENT	VALUE
PHYSICAL PROPERTIES	
Weight per unit	3kg
Length	708mm
Width	354mm
Depth	150mm
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	715kN/m²
Lateral	156kN/m²
SHORT TERM DEFLECTION	
Vertical	1mm per 126kN/m²
Lateral	1mm per 15kN/m²
TENSILE STRENGTH	
Of a single joint	42.4kN/m²
Of a single joint at (1% secant modulus)	18.8kN/m²
Bending resistance of unit	0.71kN/m
Bending resistance of single joint	0.16kN/m
OTHER PROPERTIES	
Volumetric void ratio	92%
Average effective perforated Surface area	52%
Intrinsic permeability (k)	Minimum 1.0 x 10^{-5}
Oil retention	56g/m²
Effluent Discharge at max. oil loading	10ppm
Ancillary	Permavoid Permatie Permavoid Shear Connector

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Polypipe

Permavoid Biomat

Data Sheet

Permavoid Biomat can be utilised in these SuDS techniques

TECHNIQUES													
Blue-Green roofs	Podium Decks	Trees	Sports Pitches	Cycle Paths	Permeable Paving (sub base & podium)	Bioretention & Rain Gardens	Attenuation Storage Tanks	Infiltration	Swales	Filter Drains	Detention Basins	Ponds & Wetlands	Filter Strips
				✓	✓	✓	✓	✓	✓	✓			

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Permavoid Modular Cell 150

Data Sheet

PRODUCT INFORMATION P1 ISSUE 5 - JUNE 2019

Product code: PVPP150

Permavoid is a geocellular interlocking system designed for shallow ground water storage or infiltration, to be used in place of traditional aggregate sub-base, or to provide source control above ground at both roof and podium level, removing the need for heavier and less efficient systems. The system has an exceptionally high compressive and tensile strength and bending resistance with a proprietary jointing system to create a horizontal structural 'raft' within the pavement that is ideal for the shallow attenuation of surface water. The system can also be combined in layers using interlocking shear connectors to increase depth in 85mm and 150mm increments. This is particularly useful in designing infiltration systems, allowing flexibility in balancing the soil permeability/ infiltration area of the Permavoid storage units and residual temporary attenuation.

Applications

The Permavoid units are suitable for use as a stormwater attenuation and/or infiltration. The system comprises of single, interconnected cells which can be installed in the ground as part of sub-base formation, or above ground as part of roof or podium attenuation systems for source control. Permavoid is suitable for use in a range of applications including residential, industrial estates, car parks, sports pitches, roofs, basements, pedestrian areas and rainwater harvesting.

Key Benefits

- High strength, high capacity, shallow, sub-base replacement system
- Stormwater attenuation and/or infiltration system
- Used as part of a sustainable drainage system (SuDS) scheme to offer stormwater storage at shallow construction depths
- 100% recyclable
- Units are manufactured from 100% recycled polypropylene (PP)

Performance

The structural load bearing capacity of the Permavoid units have been tested in accordance with the following European Standard: BS 7533-13:2009. The system's structural design life expectancy, based upon creep test data (tested in accordance with CIRIA guidelines) is as follows; for lightly loaded areas such as car parks a design life of 50 years is achievable. For areas with prolonged HGV loading a typical design life may only be 25 years, depending on the design of the pavement surfacing and structural layers over the tank.

Installation

All calculations for Permavoid units are based upon site-specific load cases, pavement construction types and thicknesses, soil cover and ground conditions and the suitability must therefore be approved for each project.

Technical Support

Detailed guidance and assistance is available.
For further information, please contact our Technical Team on +44 (0) 1509 615 100 or email civils@polypipe.com or visit www.polypipe.com/civils-technical-hub

ELEMENT	VALUE
PHYSICAL PROPERTIES	
Weight per unit	3kg
Weight per square metre	12kg
Length	708mm
Width	354mm
Depth	150mm
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	715kN/m^2
Lateral	156kN/m^2
SHORT TERM DEFLECTION	
Vertical	1mm per 126kN/m^2
Lateral	1mm per 15kN/m^2
TENSILE STRENGTH	
Of a single joint	42.4kN/m^2
Of a single joint at (1% secant modulus)	18.8kN/m^2
Bending resistance of unit	0.71kN/m
Bending resistance of single joint	0.16kN/m
OTHER PROPERTIES	
Volumetric void ratio	95%
Average effective perforated surface area	52%
Intrinsic permeability (k)	Minimum 1.0 x 10^{-5}
Ancillary	Permavoid Permatie Permavoid Shear Connector
Material	Polypropylene (PP)

HYDRAULIC PERFORMANCE						
3 units wide, 1 unit deep (1.06m x 0.15m)						
FREE DISCHARGE						
Gradient (%)	0	1	2	3	4	5
Flow Rate (l/m/s)	8	13	15	17	19	21

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Permavoid Modular Cell 150

Data Sheet

Permavoid Modular Cell 150 can be utilised in these SuDS techniques

TECHNIQUES													
Blue-Green roofs	Podium Decks	Trees	Sports Pitches	Cycle Paths	Permeable Paving (sub base & podium)	Bioretention & Rain Gardens	Attenuation Storage Tanks	Infiltration	Swales	Filter Drains	Detention Basins	Ponds & Wetlands	Filter Strips
	✓		✓	✓	✓	✓	✓	✓	✓	✓			

Visit www.polypipe.com/greeninfrastructure

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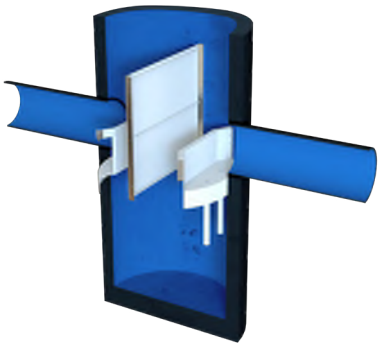
SciCloneX

Data Sheet

PRODUCT INFORMATION | **ISSUE 1 - APRIL 2022**

SciCloneX is a highly efficient hydrodynamic separation system to treat surface water run-off in urban areas. Thanks to a unique twin cyclone design and extended flow path, SciCloneX provides effective all-in-one treatment for total suspended solids (TSS), oil separation and the capture and retention of gross pollutants. It can achieve up to 80% and 99% effectiveness at removing TSS and oil respectively and has been tested to internationally recognised standard test protocols (NJCAT and NJDEP).



Applications

SciCloneX is suitable for use in all applications where the treatment of stormwater is required to protect downstream watercourses and enhance biodiversity. The robust Ridgistorm-XL chamber housing the treatment elements allows the system to be installed in both non-loaded and trafficked areas, ensuring a solution is available to suit all project requirements.

SuDS Mitigation Data

TSS	METALS	HYDROCARBONS
0.5	0.4	0.5

Key Benefits

- Available in 1200, 1800, 2400 & 3000mm diameters
- BBA HAPAS approved chamber with pre-installed lifting points
- Treatment levels tested to industry leading NJDEP protocols
- Market leading performance with excellent treatment flow rates
- Can have smaller footprint with equivalent performance to existing products
- Captures free-floating oils & gross pollutants
- Removes up to 80% of Total Suspended Solids (TSS)
- Retains sediment bound metals and hydrocarbons
- Extremely durable plastic construction with no moving parts
- Design life in excess of 100 years
- Easy to inspect and maintain
- Fully recyclable at end of service life

PRODUCT CODE	CHAMBER DIAMETER (mm)	IN/OUTLET DIAMETER (mm)	TREATMENT FLOW RATE - FINE (l/s)*	TREATMENT FLOW RATE - COARSE (l/s)**	MAXIMUM PEAK FLOW RATE (l/s)	MINIMUM OIL STORAGE CAPACITY (l)	MINIMUM SEDIMENT CAPACITY (m^3)	MAXIMUM HEADLOSS AT TREATMENT FLOW RATE - COARSE (mm)	STANDARD OVERALL CHAMBER DEPTH (mm)	STANDARD TOP OF CHAMBER TO IN/OUTLET INVERT LEVEL (mm)	MAXIMUM CHAMBER DEPTH (mm)
SCX1200300	1200	300	51	47	555	29	0.7	153	2600	1100	5500
SCX1800450	1800	450	115	105	835	66	1.6	174	2900	1400	5500
SCX2400600	2400	600	205	188	1682	118	2.8	196	4036	1700	5500
SCX3000750	3000	750	321	293	2874	185	4.4	217	4493	1700	5500

Other in/outlet diameters available on request
Chambers available with depth between Standard and Maximum to suit project specific design levels
*Based on sediment with a mean particle size of 63 microns and an annualised weighted TSS removal of at least 50%
**Based on sediment with a mean particle size of 112 microns and an annualised weighted TSS removal of at least 80%

Technical Support

For further information, please contact our Technical Team on **+44 (0) 1509 615100**
or email **civils@polypipe.com** or visit **www.polypipe.com/sciclonex**

Part of the GENUIT GROUP

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Polypipe
Civils & Green Urbanisation

Technical Submittal Form

Doc Ref.	SWP-0471-SW-ZZ-TS-W-000002		
To: (Name)	Neil Cooper	**From:** (Name)	Alhasan Sheriff
Company:	Ark Data Centres	**Company:**	Sweet Projects
Project Name:	Union Park	**Company Initials:** (3 capital letters)	SWP
Job No:	SP103	**Role:**	Main Contractor
Submission Date:	25/04/22	**Package Code:**	WP0001-Groundworks
Date Approval is Required:	23/05/22	**Revision:**	01
Date Approval was Received:			
SWP Submission No	SP103-WP0001-0001		

Description of Technical Submittal		
System Category	Group:	Disposal Systems
	Subgroup:	Surface Water drainage collection systems
	Section:	Storm water gravity drainage systems
	Object:	Rigid attenuation or storage tank for storm water flood attenuation
Equipment Category	Group:	Services and process source products
	Subgroup:	Tank, cylinder and vessel products
	Section:	Water tanks and cisterns
	Object:	Piped attenuation structures

Equipment Type (Fan Coil Unit, Radiator etc)	Attenuation Tank – Stormwater Management System
System Abbreviation	
Manufacturer	SDS
Model	GEOlight
Drawing No	HPF-0471-SWS-BG-DR-C-91138 T3
Specification reference	HPF-0471-SWS-XX-SPE-C-93000 464 Modular stormwater attenuation units Ss_50_35_80_72 Pr_60_50_96_62
Description or additional information:	
Is the proposal specification compliant?	Yes
Is the proposal an alternative to specification?	No
Details of reason for deviation from specification / alternative to specification:	
SWP / Consultant' comments:	

Designated Consultant to co-ordinate response from all parties

Organisation	Copied to	Comments

Consultant	Approval Status	Signed	Date

SDS
Water Infrastructure Systems

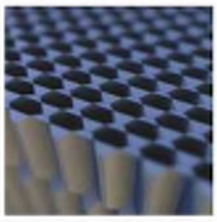
SDS GEOlight®

Stormwater Management System

Product Profile

SDS GEOlight® is an ultra lightweight honeycombed modular structure made from recycled PVC. The ready to install units are preformed to provide an underground stormwater storage facility, for the application of stormwater attenuation or infiltration.

The high void rate (>95%), high compressive strength (to 1000KN/m²) and low resistance to water flow makes SDS GEOlight® an ideal material for cost efficient and maintainable underground water storage during storm conditions.



SDS GEOlight® Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m³ reservoir, completed in one week.
- Light and easy to handle.
- Excellent hydraulic characteristics.
- The honeycomb structure is highly permeable, offering low resistance to water flow.
- SDS GEOlight®'s unique lateral and vertical filling arrangement requires a minimum amount of pipework and stone.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Modular format offers design flexibility to overcome topographical contraints and architectural requirements.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist separation and filtration technology such as SDS Aqua-Swirl™ and SDS Aqua-Filter™.
- Design service available, including calculations.

APPLICATIONS

RETAIL

INFRASTRUCTURE

INDUSTRIAL

RESIDENTIAL

COMMERCIAL

PUBLIC SECTOR

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	SDS GEOlight® 400	SDS GEOlight® 600	SDS GEOlight® 800
APPLICATIONS			
Stormwater Management			
Attenuation / Infiltration			
Bacterial filter-bed for biological treatment			
Hydrocarbon Separation			
Filtration and Separation Units			
SPECIFICATIONS			
Material	Recycled Rigid PVC		
Colour	Dark grey to black		
Standard length of a block	2000 mm	2000 mm	2000 mm
Standard width of a block	500 mm	500 mm	500 mm
Standard height of a block*	750 mm	750 mm	750 mm
	*Other block sizes available on request		
Void Ratio	> 95%	> 95%	> 95%
Compressive Strength	420 kN/m²	610 kN/m²	800 kN/m²
ADVANTAGES			
Highly cost effective			
Reduced excavation costs			
High void capacity			
Good UV resistance			
Good hydrocarbon resistance			

GEO DS/1021

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SDS
Water Infrastructure Systems

INNOVATORS IN
WATER TECHNOLOGY

SDS GEOlight®

Stormwater Management System

SDS GEOlight® is an ultra lightweight honeycombed modular structure, made from recycled PVC, that provides an underground storage facility for the application of stormwater attenuation or infiltration.

Stormwater Management

The Environment Agency is keen to promote the wider use of sustainable drainage systems, which reduce the impact of surface water runoff. There are two main ways of storing surface water for stormwater management:

- → Stormwater attenuation tanks
- → Soakaway infiltration systems

Stormwater Attenuation Systems

This consists of underground water storage facilities that hold excess water during periods of peak rainfall.

The stored water is gradually released in a controlled manner into the surface water drainage system or directly into watercourses, reducing the risk of upstream and downstream flooding.

Soakaway Infiltration Systems

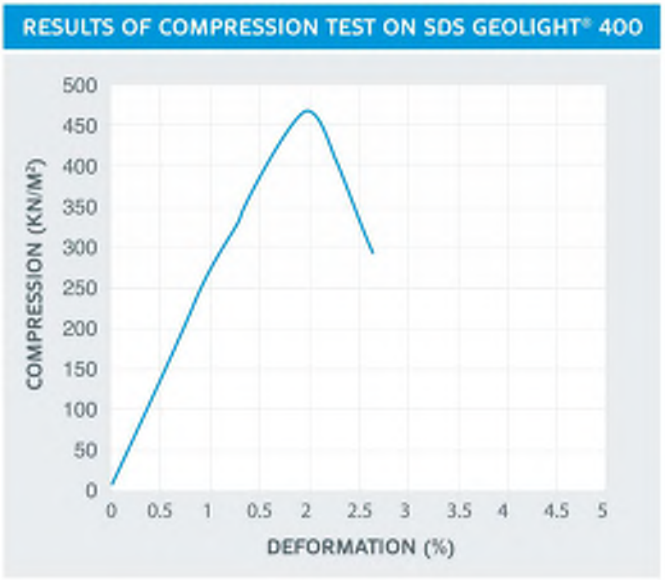
Soakaways are designed to store surface water runoff until it can be gradually absorbed by the surrounding ground.

SDS GEOlight® – an efficient and economic solution for stormwater management.

SDS GEOlight® Attenuation

SDS GEOlight® has been specifically designed to form underground water storage reservoirs in stormwater management schemes. Its honeycombed structure gives it certain unique characteristics that make it ideal for this purpose:

- → The high void rate (95%) of GEOlight® means that the maximum volume of water is stored in the minimum volume of storage unit.
- → High compressive strength. GEOlight® is available in two strengths as standard: 200 and 400kN/m². Note: Higher compressive strengths available from 600 to 1000 kN/m². The graph on the right shows the results of a compression test, where samples of GEOlight® 400 were compressed at the rate of 1mm per minute. The deformation at 400kN/m² is about 1.6%.



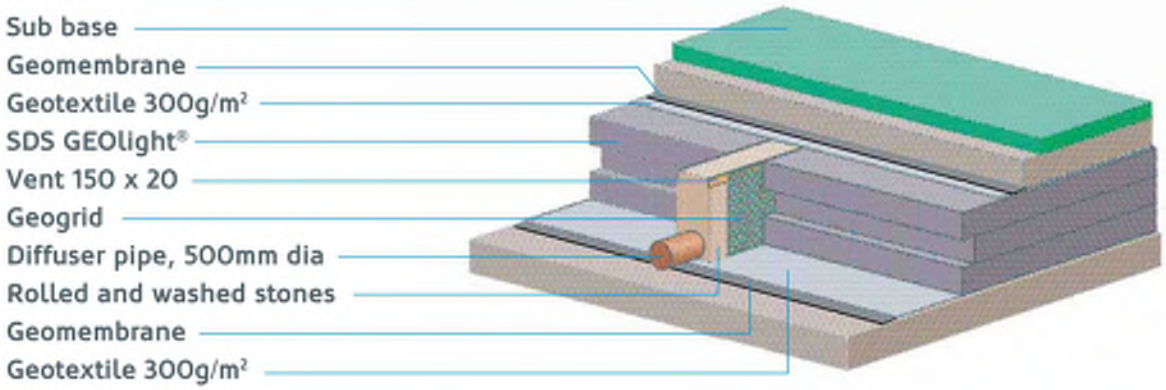
The GEOlight® Stormwater Attenuation System consists of two manholes (inspection chambers) connected by a length of perforated distribution pipe which feeds the stormwater storage reservoirs on either side formed from GEOlight®.

The distribution pipe is normally from 225mm up to 500mm diameter, generally covered in a trench that is filled with draining material such as 15/25 clean graded stone, free from fines.

The reservoirs and distribution pipe are wrapped in a waterproof membrane, such as butyl, to prevent seepage of water into the surrounding ground. The top of each GEOlight® reservoir has a vent which is connected back to the upstream manhole.

A geotextile or 10mm mesh geogrid is laid between the distribution pipe and GEOlight® to prevent the GEOlight® units being clogged by the draining materials.

SDS GEOlight® Attenuation



How does it work?

→ 1. In normal conditions, water enters a back drop manhole. This is the upstream manhole and any silt or sediment will collect in the bottom of the chamber. The water then flows along the distribution pipe into the downstream manhole. The upstream pipework is sized to cope with normal flow conditions. The distribution pipe and attenuation tank are sized to cope with storm conditions. The outflow pipe is sized to cope with the permissible discharge.

→ 2. In storm conditions the flow restrictor (vortex flow control or orifice plate) in the downstream manhole limits the amount of water flowing out of the manhole. This causes the water level in the distribution pipe to rise and water to spill into the GEOlight® reservoirs on either side. As the water level rises in the reservoirs, air is forced out of the high level vents into the upstream manhole.

→ 3. Once the storm has passed, the water level in the GEOlight® reservoirs gradually falls as water passes through the flow restrictor in the downstream manhole. The vents now allow air to return into the GEOlight® reservoirs. Gradually the reservoirs empty. The flow restrictor prevents excess surges of flood water to pass downstream and uses the storage reservoirs to store the water for the period of the storm.

Calculating the storage capacity

The storage capacity of the GEOlight® reservoirs is determined by the maximum outflow permitted, (set by the water company or Environment Agency), the impermeable area of the site and the rainfall return period – normally 1 in 30 years, but again can be dictated by the water company. A full design service, including calculations, can be supplied via a third party consultant.
Please contact SDS for details.

Other uses

The water storage ability of SDS GEOlight® lends itself to a number of other uses:

→ Water recycling combines with irrigation systems – this is increasingly popular: GEOlight® is used to retain stormwater which is then pumped as required to a network of standpipes for irrigation.

→ Drainage channels – the natural permeability of GEOlight® lends itself for use as an underground drainage channel that collects and drains away groundwater.

→ Pollution control – improved water runoff quality. When used in combination with oil / petrol separators, GEOlight® can replenish groundwater without the risk of contamination from oil, chemicals or suspended solids.

→ To form lightweight embankments (slope stabilisation) - GEOlight® can be used to quickly form the base of embankments that only weigh a fraction of earth embankments.

Stormwater Attenuation System

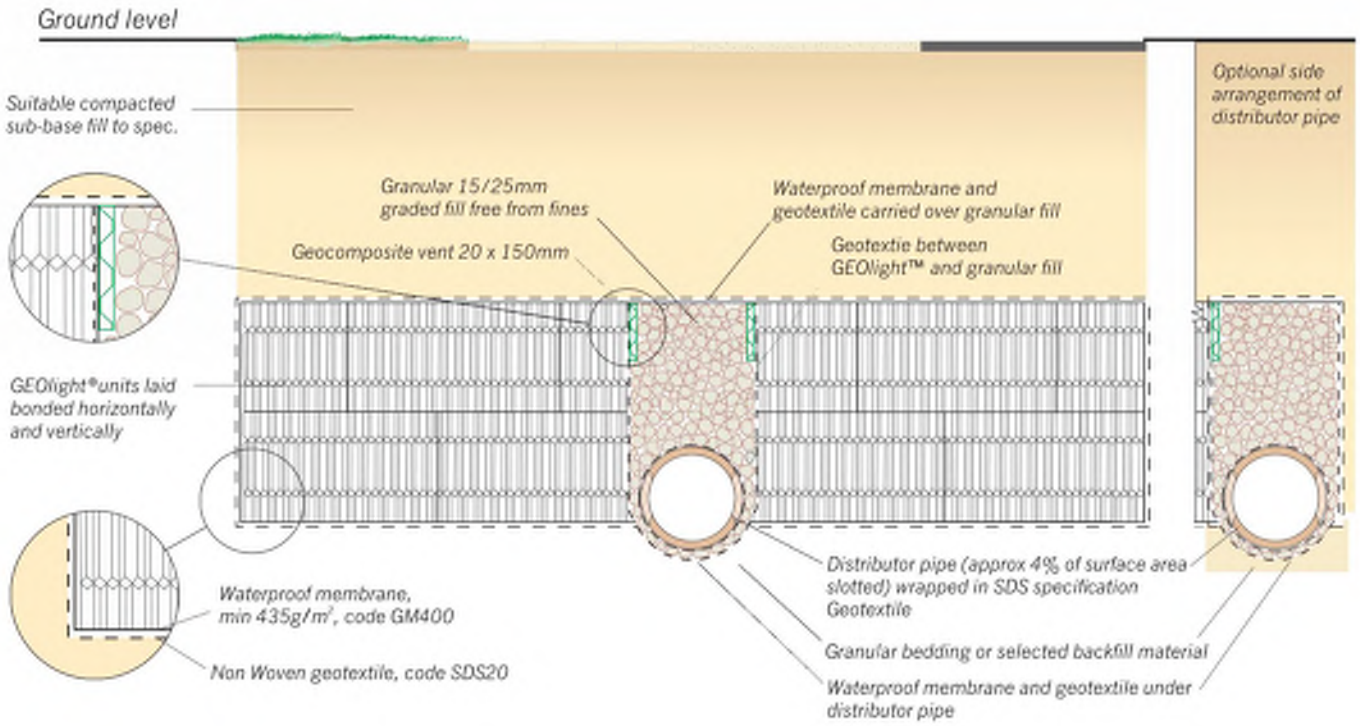
Design Details

The details on these two pages illustrate the construction of a typical SDS GEOlight® Stormwater Attenuation System. The length and height of the GEOlight® reservoirs is determined by the quantity of water to be stored.

The layout of each scheme is specifically designed to suit the characteristics and limitation of the site. Typically the distributor pipe would be arranged in the centre of the reservoir, but can alternatively be placed at the side where topographical constraints dictate.

The high performance waterproof membrane should be sealed continuously to encapsulate the GEOlight® reservoirs, distributor pipe and granular fill. It is protected by a heavyweight needle punched, non woven geotextile. To help with maintenance a high flow geotextile is placed between the granular fill and GEOlight® attenuation units to prevent silt and particles being washed into the reservoir. GEOlight® can be used under a range of surfaces e.g. grass, porous paving, standard paving block, tarmac and concrete.

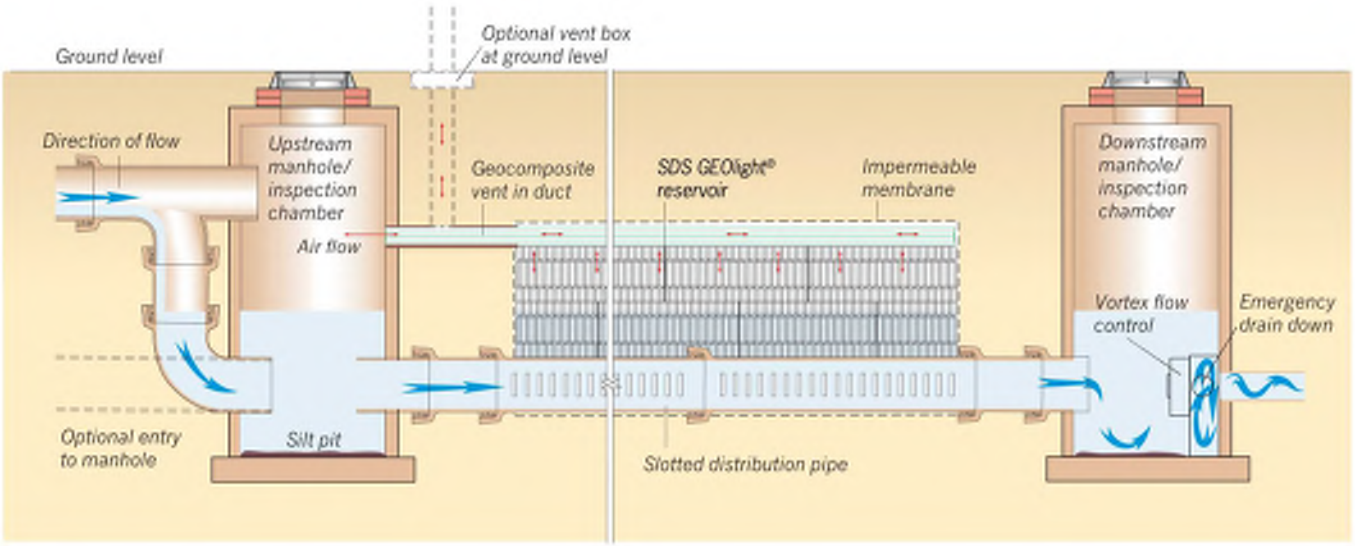
Cross Section



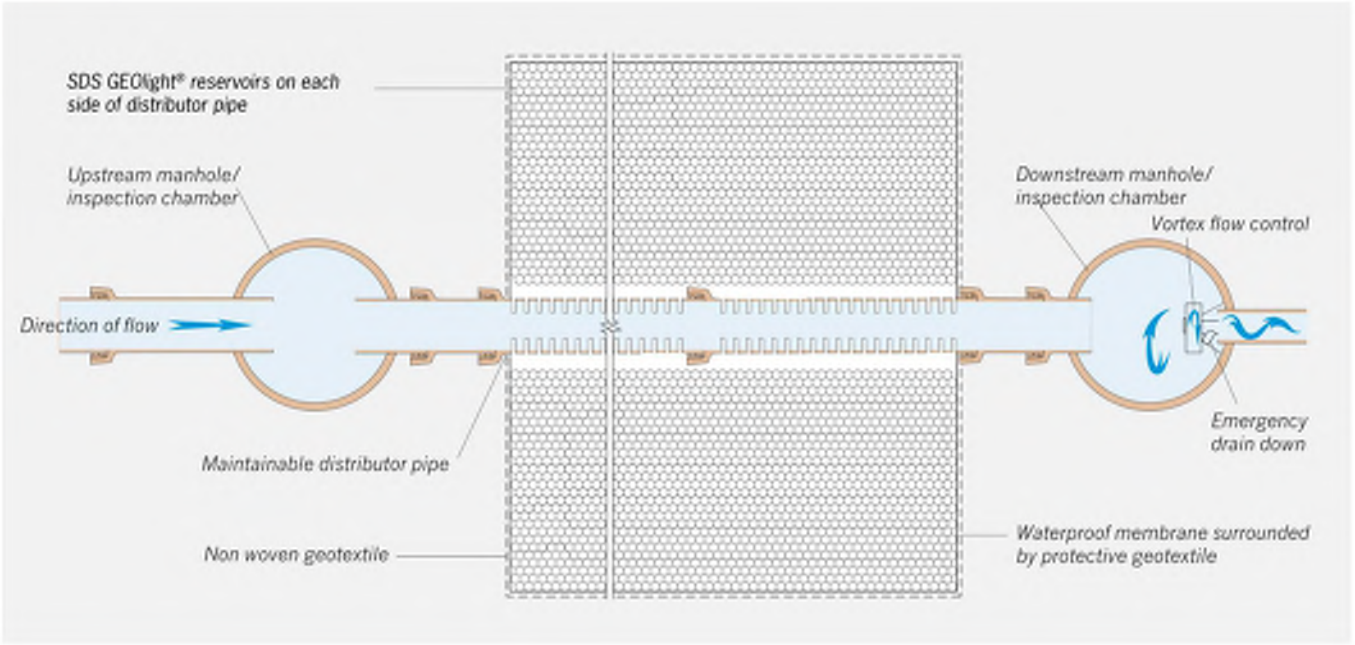
Stormwater Attenuation System

Design Details

Long Section



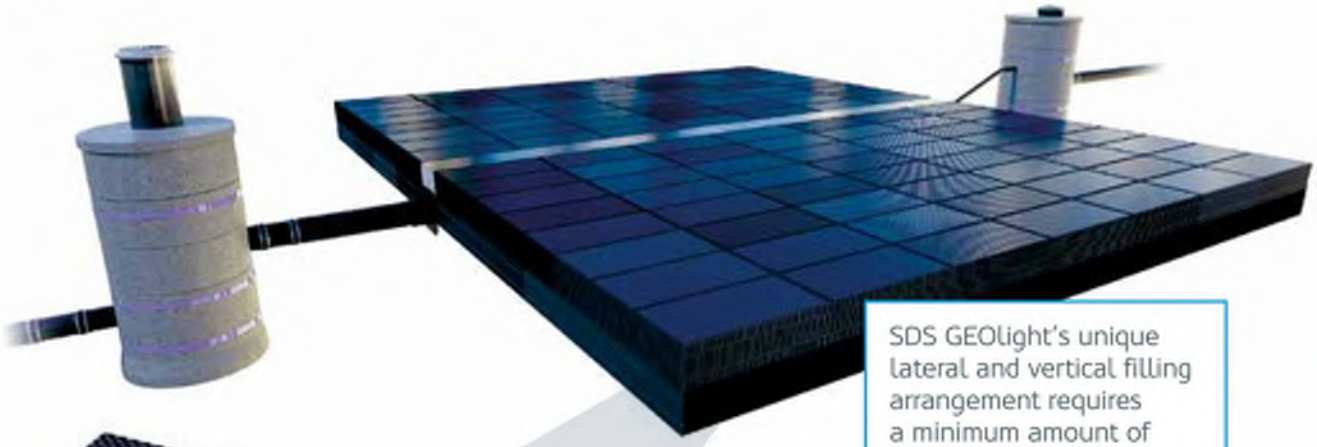
Plan



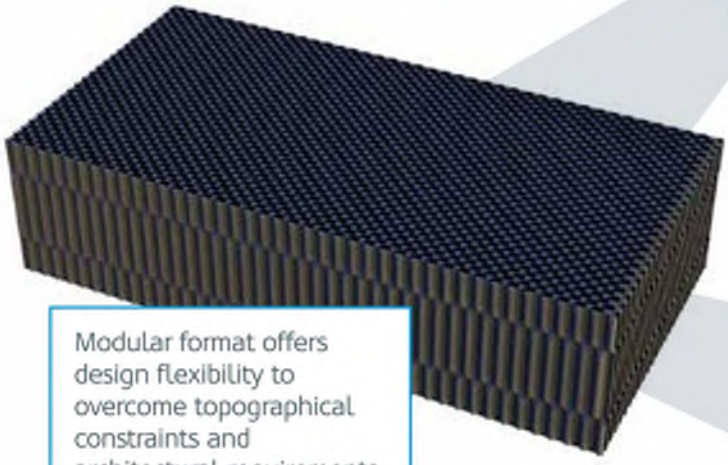
Benefits

- High compressive strength – can be located under all roads, car parks and amenity area surfaces.
- Reduced excavation costs – the very high void rate (95%) minimises the required volume of earthworks.
- Speed of installation – 1000m^3 reservoir, completed in one week.
- Light and easy to handle.
- Depth of tank invert reduced by using patented lateral supply.
- Simplified distribution pipe network, easy maintenance – dispensing with costly and complicated pipework configurations.
- Greatly reduces the risk of flooding when used as stormwater storage.
- Can also be used for water recycling and combining with irrigation systems.
- Can virtually eliminate pollution when used in combination with specialist petrol / oil separators.
- Design service available, including calculations.

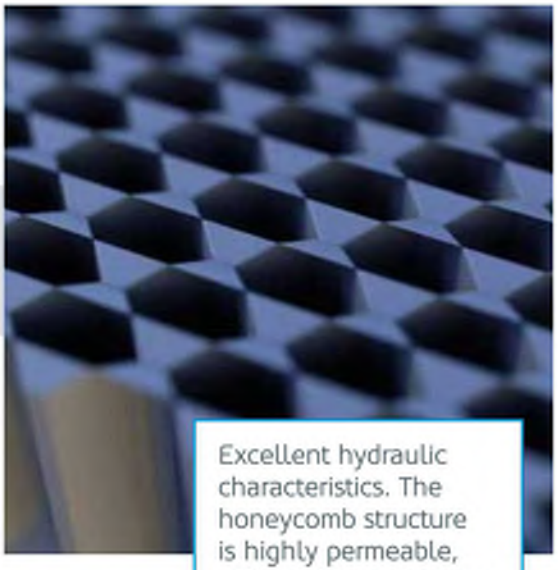
GEOlight® block



SDS GEOlight's unique lateral and vertical filling arrangement requires a minimum amount of pipework and stone.



Modular format offers design flexibility to overcome topographical constraints and architectural requirements.



Excellent hydraulic characteristics. The honeycomb structure is highly permeable, offering low resistance to water flow.

COSHH and Handling Information

1. COMPOSITION/INFORMATION ON INGREDIENTS:

Hazardous ingredients:
None as finished goods or products.

Types of materials:
Polyvinyl chloride (PVC)
MEK

2. HAZARDS IDENTIFICATION

Nature of hazard:
There are no health risks from the products during normal use. The products may contain various pigment colours and stabilisers that may be toxic. The chemicals are, however, bound within the product material and not easily extracted.

3. FIRST-AID MEASURES

Eye contact:
Plastic materials may cause physical irritation in the eyes. Wash out with large amounts of water. If irritation persists, seek medical advice.

Skin contact:
Not applicable.

Inhalation:
Not applicable.

Ingestion:
Not expected to have any toxic effects.

4. FIRE-FIGHTING MEASURES

Extinguishing media:
On small fires use any hand-held extinguisher type.
On large fires use water.

Fire and explosion hazards:
Melting plastics may flow and spread in a large fire.
Products of fire will be thick black toxic smoke.

Material characteristics:
PVC products will burn in the presence of a flame but are classed as self- extinguishing.

Protective equipment:
Wear self-contained breathing apparatus and protective clothing.

5. HANDLING AND STORAGE

Handling:
There are no hazards associated with the finished products. However, when cutting SDS GEOlight®, we recommend that the correct tools are used e.g. Handsaw or Alligator saw. When cutting, dust may be created; avoid inhaling these dusts. Take care of heat build-up within materials during cutting etc. The pallets of SDS GEOlight® units should be placed on level ground and should not be stacked on site. The maximum weight of the pallet of SDS GEOlight® units as delivered to site is 650kg (700kg on one copy), including packaging. Machines used to lift the pallet should be able to lift this weight safely. Loose individual units should not be stored more than three units high. SDS GEOlight® units are lightweight ranging from 23kg to 55kg and can be easily handled – one or two person lift.

Storage:
SDS GEOlight® units will resist the effects of UV light for up to six months; however, prolonged storage in direct sunlight should be avoided. SDS GEOlight® units should not be stored near to any fuel storage areas or any other solvents. SDS GEOlight® units are very robust and resistant to damage during normal handling; however, they should be secured in areas where impacts from vehicles or construction plant will be avoided.

Material characteristics:
PVC products will burn in the presence of a flame but are classed as self-extinguishing.

Protective equipment:
Wear self-contained breathing apparatus and protective clothing.

6. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory protection:
Not required under normal conditions of use. Where cutting etc. creates dust, wear a disposable half-mask to the standard FFP2S.

Hand protection:
Wear impervious strong gloves to prevent cuts to the hands while handling, cutting etc.

Eye protection:
Wear safety glasses when cutting etc.

Skin protection:
Wear overalls.

7. SITE HAZARDS

Other hazards for consideration:
Working in excavations and trenches – SDS GEOlight® may be designed with a shallow invert for infiltration (soakaway) or attenuation (storage) system. This negates the need for deep excavations or trenches, excavation near services e.g. gas, electricity or contaminated soil areas. N.B. All risk assessments should be undertaken by the main contractor for forklift, access to and working in excavations and trench support.

8. STABILITY AND REACTIVITY

Decomposition products:
Major thermal decomposition products are oxides of carbon. Relevant differences are (in addition): PVC may produce amounts of Hydrogen Chloride.

Stability:
These materials are stable at temperatures up to normal operating limits (moulding parameters).

9. ECOLOGICAL INFORMATION

Biodegradability:
Plastic products are not readily biodegradable but are not detrimental to terrestrial wildlife.

Aquatic toxicity:
Non-toxic to marine life.

10. DISPOSAL CONSIDERATIONS

Method:
The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

11. OTHER INFORMATION

As the handling, storage, use and disposal of the product are beyond our control SDS disclaims all liability for loss, damage, injury or expense in any way connected with such activities and further makes no warranties, expressed or implied, as to the suitability of the product for any particular use.

The preferred method of disposal is collection and recycling. Plastics can safely be placed with regular industrial or household wastes where recycling is not available.

SDS
Water Infrastructure Systems

INNOVATORS IN WATER TECHNOLOGY

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SDS
Water Infrastructure Systems

sdslimited.com

Technical Submittal Form

Doc Ref.	SWP-0471-SW-ZZ-TS-W-000016		
To: (Name)	Neil Cooper	**From:** (Name)	Alhasan Sheriff
Company:	Ark Data Centres	**Company:**	Sweet Projects
Project Name:	Union Park	**Company Initials:** (3 capital letters)	SWP
Job No:	SP103	**Role:**	Main Contractor
Submission Date:	11/05/22	**Package Code:**	WP0001 - Groundworks
Date Approval is Required:	25/05/22	**Revision:**	01
Date Approval Was Received:			
SWP Submission No	SP103-WP0001-0015		
Description of Technical Submittal			
System Category Group:	Ss_50 - Disposal systems		
Subgroup:	Ss_50_35 - Surface and wastewater drainage collection systems		
Section:	Ss_50_35_08 - Below-ground gravity drainage systems		
Object:	Ss_50_35_08_85 - Surface water below-ground drainage pipeline systems		
Equipment Category Group:			
Subgroup:			
Section:			
Object:			
Equipment Type (Fan Coil Unit, Radiator etc)	Surface Water Drainage Pipes		
System Abbreviation			
Manufacturer	Wavin		
Model	TwinWall Surface/Stormwater Drainage		
Drawing No	HPF-0471-SWS-BG-DR-C-91138 T3		
Specification reference	HPF-0471-SWS-XX-SPE-C-93000 - Section R12 – Clause - 345 Ss_50_35_08_85		
Description or additional information:			
Is the proposal specification compliant?	Yes		
Is the proposal an alternative to specification?	No		
Details of reason for deviation from specification / alternative to specification:			
SWP / Consultant' comments:			

Designated Consultant to co-ordinate response from all parties		
Organisation	**Copied to**	**Comments**

Consultant	**Approval Status**	**Signed**	**Date**

PRODUCT GUIDE

TwinWall

Surface and Stormwater Drainage

wavin

Wavin TwinWall

TwinWall Surface and Stormwater Drainage System

Contents

TwinWall Introduction

TwinWall Surface and Stormwater Drainage System

TwinWall
Surface and Stormwater Drainage System

TwinWall is a cost effective pipe system intended for use as a direct alternative to all non-pressurised gravity drain systems other than where Local Authority adoption is necessary. The TwinWall range is manufactured from both high density polyethylene and polypropylene. The materials used are optimised using Wavin's in-house technology to maximise the use of recycled materials.

Typical applications include highway filter and carrier drains, rail track drainage, and unadoptable surface water drains, for example, on industrial or commercial developments.

TwinWall is manufactured by a twin extrusion process in which the two layers are extruded simultaneously, one inside the other, and heat welded together in one continuous process.

Range Introduction

The pipe is available in nominal diameters of 150, 225, 300, 375, 450, 500 and 600mm in standard 6m lengths. It may be supplied either plain for use as a carrier drain, and either half or fully perforated for use as filter drains. Perforated pipe has 4 slots equally spaced around its circumference. Half perforated pipe has either 2 or 3 slots per dwell according to diameter with the permeable area reduced proportionally.

TwinWall when slotted exceeds the Department of Transport's minimum requirement of 1000mm^2 per metre length. The pipes are black in colour, the outer wall being corrugated and the inner wall having a smooth finish to assist the hydraulic flow.

The TwinWall construction helps to maintain flexibility and reduce the possibility of impact damage on site.
A comprehensive range of push fit components are also available for each diameter. Road gullies and non-entry inspection chambers for use with TwinWall also available.

System Overview

TwinWall is classed as a flexible pipe and as such it is recognised that it is designed to deform under loading.
The predicted 50 year ultimate stiffness of the pipe exceeds the minimum requirement of the Department of the Environment, Transport and the Regions and the Highways Agency requirements.

TwinWall can be used as an alternative to those listed for surface water drainage in Table 5/1 of the Manual of Contract Documents for Highways Works (MCHW), Volume 5.
The pipe will perform within the required design limits under main traffic loading.

TwinWall has a Stiffness Class of SN6 (6kN/m^2).

TwinWall Applications

Application

The TwinWall range is designed for use in gravity surface and stormwater drainage applications. Adaptors and reducers are available for connection to traditional materials. Uses include: highways filter drains, carrier drains, golf course land drainage, surface water / main culverts, catchpits, landfill / land reclamation, methane gas venting, leachate drainage.

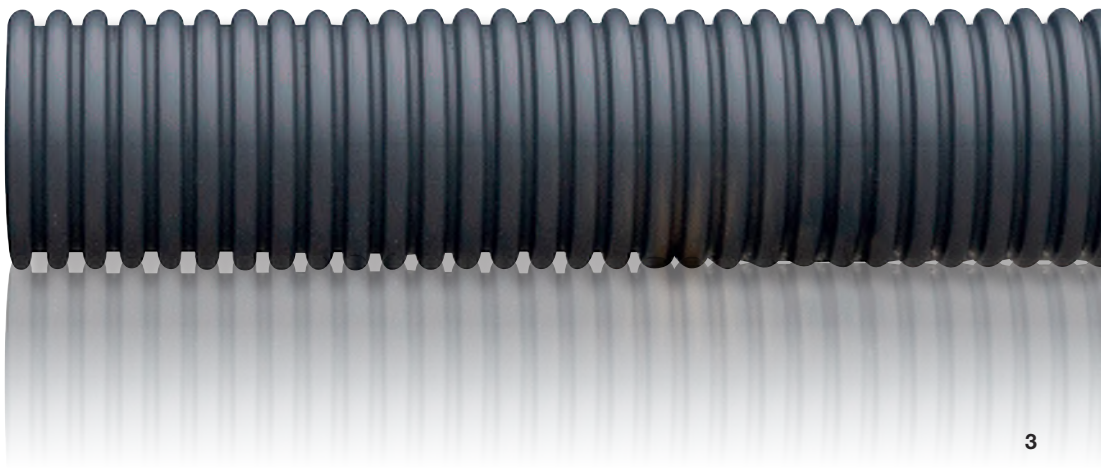
System Benefits

- TwinWall is lightweight, making installation quicker with reduced Health and Safety risks
- Ease of installation and the elimination of wastage reduces labour and plant costs
- Longer lengths and fewer joints assist in both flow capacity and self cleansing velocity
- The flexibility of TwinWall eliminates the need for rocker pipes, and the pipe can be cut on site
- TwinWall is resistant to most naturally occurring chemical and is therefore suitable for use in the majority of soil conditions

Quality Assurance

The following Agrément Certificates have been awarded to the Wavin TwinWall (150, 225, 300, 375, 450, 500 and 600mm) range of pipes, ring seals and fittings: 02/H070 HAPAS Roads and Bridges Wavin TwinWall Highway Drainage System 02/3940 Wavin TwinWall Drainage System.
Network Rail Parts and Drawing Systems (PADS) approved, Certificate Number: PA05/479.

BBA BRITISH BOARD OF AGRÉMENT
CERTIFICATE No 02/3940
CERTIFICATE No 02/H070



Product Details

TwinWall Surface and Stormwater Drainage System

Pipe

P/E Pipe 6.0m Unperforated

Material: PE

Nominal Size (mm) ID	OD	Part Number	Nº. of Slots Per Dwell	Permeable Area mm² m⁻¹
150	173	6TW076	–	–
225	260	9TW076	–	–
300	348	12TW076	–	–
375	429	375TW076	–	–
450	514	450TW076	–	–
500	572	500TW076	–	–
600	683	600TW076	–	–

P/E Pipe 6.0m Perforated

Material: PE

Nominal Size (mm) ID	OD	Part Number	Nº. of Slots Per Dwell	Permeable Area mm² m⁻¹
150	173	6TW176	4	6120 - 10200
225	260	9TW176	4	4680 - 11700
300	348	12TW176	4	5120 - 12800
375	429	375TW086	4	6266 - 10935
450	514	450TW086	4	6327 - 10333
500	572	500TW086	4	6687 - 10402
600	683	600TW086	4	6747 - 10121

P/E Pipe 6.0m Half Perforated

Material: PE - HD

Nominal Size (mm) ID	OD	Part Number	Nº. of Slots Per Dwell	Permeable Area mm² m⁻¹
150	173	6TW276	3	4590 - 7650
225	260	9TW276	3	3510 - 8775
300	348	12TW276	3	3840 - 9600
375	429	375TW096	2	3133 - 5468
450	514	450TW096	2	3164 - 5167
500	572	500TW096	2	3344 - 5201
600	683	600TW096	2	3374 - 5061

S/S Pipe 6.0m Unperforated

Material: PP

Nominal Size (mm) ID	OD	Part Number	Nº. of Slots Per Dwell	Permeable Area mm² m⁻¹
375	429	375TW046	–	–
450	514	450TW046	–	–
500	572	500TW046	–	–
600	683	600TW046	–	–

S/S Pipe 6.0m Perforated

Material: PP

Nominal Size (mm) ID	OD	Part Number	Nº. of Slots Per Dwell	Permeable Area mm^2 m^{-1}
375	429	375TW066	4	6266 - 10935
450	514	450TW066	4	6327 - 10333
500	572	500TW066	4	6687 - 10402
600	683	600TW066	4	6747 - 10121

S/S Pipe 6.0m Half Perforated

Material: PP

Nominal Size (mm) ID	OD	Part Number	Nº. of Slots Per Dwell	Permeable Area mm^2 m^{-1}
375	429	375TW056	2	3133 - 5468
450	514	450TW056	2	3164 - 5167
500	572	500TW056	2	3344 - 5201
600	683	600TW056	2	3374 - 5061

Couplers

D/S Pipe Coupler

- For joining TwinWall Pipe

Material: PE, PVC - U, PE - HD, PP

Nominal Size (mm)	Part Number	Material
150	6TW205	PVC - U
225	9TW205	PE - HD
300	12TW205	PE - HD
375	375TW205	PP
450	450TW205	PP
500	500TW205	PP
600	600TW205	PP

Adaptors

S/S Adaptor

- Connector to BS EN 295 thinwall clay spigot

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW129

Product Details

TwinWall Surface and Stormwater Drainage System

S/S Adaptor

- 6TW socket x 160mm BS EN 1401 spigot

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW141

D/S Adaptor

- 6TW socket x 160mm BS EN 1401 socket

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW142

S/S Adaptor

Material: PVC - U

Nominal Size (mm)	Part Number	Description
150	6TW145	6UR spigot x 6TW socket
225	9TW145	9UR spigot x 9TW socket
300	12TW145	12UR spigot x 12TW socket

Reducers

D/S Level Invert Reducer

- 6TW socket x 4TW socket

Material: PP

Nominal Size (mm)	Part Number
150	6TW097

S/S Level Invert Reducer

- 6TW spigot x 110mm BS EN 1401 socket, includes seal

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW099S

S/S Level Invert Reducer

Material: PP

Nominal Size (mm)	Part Number	Description
225	9TW095S	9TW spigot x 6TW socket, includes seal
300	12TW093S	12TW spigot x 9TW socket, includes seal
375	375TW099	375TW spigot x 12TW socket
450	450TW099	450TW spigot x 375TW socket
500	500TW099	500TW spigot x 450TW socket
600	600TW099	600TW spigot x 500TW socket

Short Radius Bends

D/S Bend – 87.5° ◆

Material: PP

Nominal Size (mm)	Part Number
150	6TW561
225	9TW561
300	12TW561
375	375TW561
450	450TW561
500	500TW561
600	600TW561

D/S Bend – 45° ◆

Material: PP

Nominal Size (mm)	Part Number
150	6TW563
225	9TW563
300	12TW563
375	375TW563
450	450TW563
500	500TW563
600	600TW563

◆ Actual product for 375mm fittings and above may differ from image shown.

Product Details

TwinWall Surface and Stormwater Drainage System

D/S Bend – 30º ◆

Material: PP

Nominal Size (mm)	Part Number
150	6TW566
225	9TW566
300	12TW566
375	375TW566
450	450TW566
500	500TW566
600	600TW566

D/S Bend – 15º ◆

Material: PP

Nominal Size (mm)	Part Number
150	6TW567
225	9TW567
300	12TW567
375	375TW567
450	450TW567
500	500TW567
600	600TW567

Junctions

Equal Junction – 45° ◆

- D/S Junction to TwinWall spigot

Material: PP

Nominal Size (mm)	Part Number
150	6TW213
225	9TW213
300	12TW213
375	375TW375x45
450	450TW450x45
500	500TW500x45
600	600TW600x45

◆ Actual product for 375mm fittings and above may differ from image shown.

Equal Junction – 90°

- D/S Junction to TwinWall spigot

Material: PP

Nominal Size (mm)	Part Number
150	6TW193
225	9TW193
300	12TW193

S/S Junction to TwinWall spigot

Material: PP

Nominal Size (mm)	Part Number
375	375TW375x90
450	450TW450x90
500	500TW500x90
600	600TW600x90

Unequal Junction – 45° ◆

- D/S Junction to TwinWall spigot

Material: PP

Nominal Size (mm)	Part Number
225 x 150	9TW227
300 x 150	12TW237
300 x 225	12TW240
375 x 150	375TW150x45
450 x 150	450TW150x45
500 x 150	500TW150x45
600 x 150	600TW150x45

◆ Actual product for 375mm fittings and above may differ from image shown.

Product Details

TwinWall Surface and Stormwater Drainage System

S/S Junction to TwinWall spigot – 45°

Material: PP

Nominal Size (mm)	Part Number
375 x 225	375TW225x45
375 x 300	375TW300x45
450 x 225	450TW225x45
450 x 300	450TW300x45
450 x 375	450TW375x45
500 x 225	500TW225x45
500 x 300	500TW300x45
500 x 375	500TW375x45
500 x 450	500TW450x45
600 x 225	600TW225x45
600 x 300	600TW300x45
600 x 375	600TW375x45
600 x 450	600TW450x45
600 x 500	600TW500x45

Unequal Junction – 90°

- S/S Junction to TwinWall spigot

Material: PP

Nominal Size (mm)	Part Number
375 x 150	375TW150x90
375 x 225	375TW225x90
450 x 150	450TW150x90
450 x 225	450TW225x90
500 x 150	500TW150x90
600 x 150	600TW150x90

End Caps

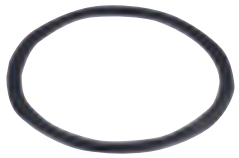
End Cap

- For TwinWall spigot

Material: PP

Nominal Size (mm)	Part Number
150	6TW750
225	9TW750
300	12TW750
375	375TW750
450	450TW750
500	500TW750
600	600TW750

Ring Seal



Ring Seal

- For TwinWall socket

Material: Rubber

Nominal Size (mm)	Part Number
150	6TW217
225	9TW217
300	12TW217
375	375TW117
450	450TW117
500	500TW117
600	600TW117

Road Gullies

P/E Road Gully

Material: PE

Nominal Size (mm)	Part Number	Dimensions (mm) Diameter	Depth
150	6TW650	450	900
150	6TW651	450	750

Jointing

TwinWall Surface and Stormwater Drainage System

Unlike traditional methods jointing PVC-U systems, the TwinWall method is unique and innovative, since the ring seal is positioned over the pipe spigot rather than being retained within a pipe or fitting socket.

The major advantages of the TwinWall jointing method are:

- There is no need to chamfer pipe ends
- The ring seal cannot be displaced during jointing

Preparation

Ensure that the two ribs that retain the sealing ring are sound.

Cutting

Pipes must be cut midway between the ribs. The design of the ribs allows the pipe to be cut square using a coarse toothed saw (see Figure 1).

Jointing Sequence

1. Clean pipe spigots and sockets. All dust, dirt and grit which could prevent an effective seal must be removed from pipe ends and sockets.
2. The correct position for the sealing ring is indicated in Figure 2 and 5 (i.e. between the first and second ribs from the pipe end).
3. Lubricant should be applied to the whole of the inside of the socket.
4. To make the joint, offer up the pipe to the socket, align pipe and push home. Alignment is important to facilitate jointing.

The force required to push the pipe home will vary according to pipe size and ambient temperature. Whatever method is used to apply the necessary force, care must be taken to ensure that there is no risk of damaging the pipe ends. The most convenient method is to use a lever ensuring the pipe end is protected.
A good technique is to lift the pipe up by passing a rope underneath. This makes it easier to align the spigot into the socket.

Figure 1: Correct cutting position

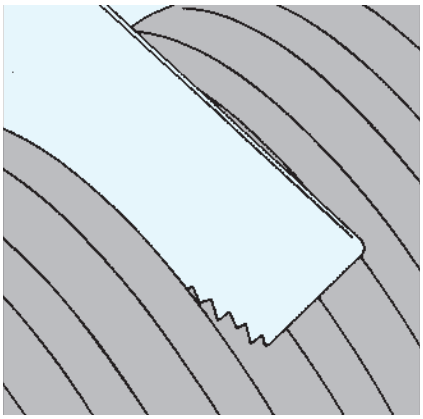


Figure 2: TwinWall Sealing Ring

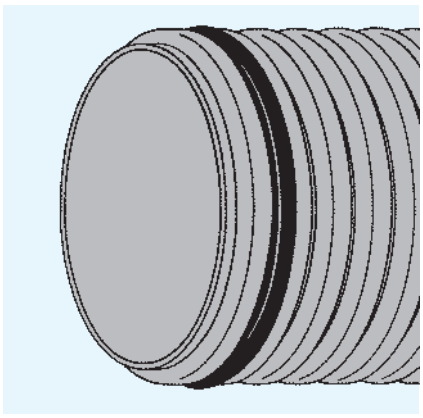


Figure 3: Applying the lubricant

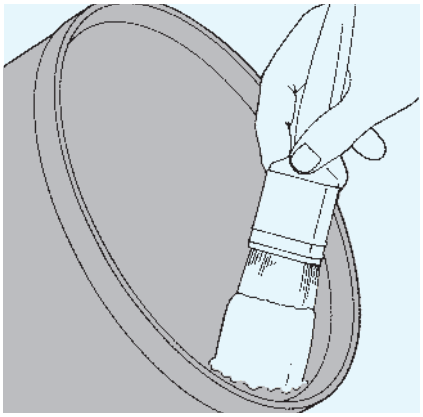


Figure 4: Protecting the pipe end

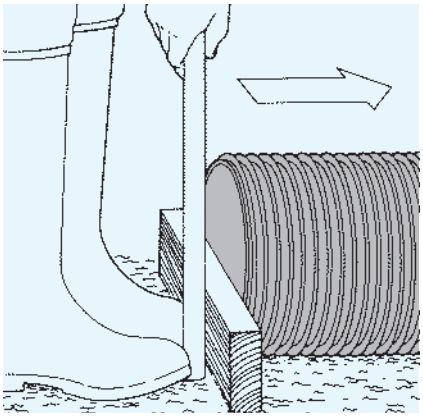
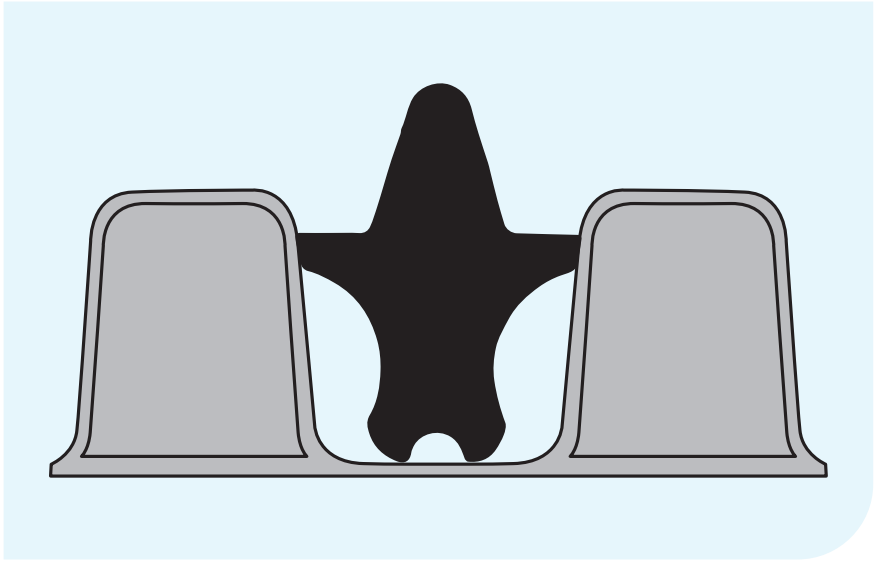


Figure 5: Placement of Ring Seal, between 1st and 2nd ribs



General Information

TwinWall Surface and Stormwater Drainage System

Materials

The TwinWall range is manufactured from both high density polyethylene and polypropylene. The materials used are optimised using Wavin's in-house technology to maximise the use of recycled materials.

Material	Product
PVC-U Unplasticised Polyvinyl Chloride	Fittings only
PP Polypropylene (Recycled)	Pipe and Fittings
PE Polyethylene	Pipe and Fittings
PE-HD Polyethylene (Recycled)	Pipe and Fittings

Quality, Standards and Approvals

The British Standards Institution has issued certificates registering Wavin as a firm of assessed capability, with a quality management system which meets the requirements of BS EN ISO 9001.

Wavin systems are the benchmark for excellence and product innovation: precision-manufactured using the most advanced injection moulding and extrusion machines. All products comply with or exceed relevant British and European standards to ensure reliability and long-lasting service.

Acceptance

The following Agrément Certificates have been awarded to the Wavin TwinWall (150, 225, 300, 375, 450, 500 and 600mm) range of pipes, ring seals and fittings:

- 02/H070 HAPAS Roads and Bridges Wavin TwinWall Highway Drainage System
- 02/3940 Wavin TwinWall Drainage System

Environment

All Wavin manufacturing sites operate Environmental Management Systems which comply with the requirements of and are certified to ISO 14001: 2004.

Health and Safety

The relevant provisions of the following legislation should be adhered to on site:

- Construction (Design and Management) Regulations 1994
- Control of Substances Hazardous to Health Regulations 1988
- Health and Safety at Work Act 1974
- Management of Health and Safety at Work Regulations 1999
- Manual Handling Operations Regulations 1992

Hazards associated with PVC-U, PVC-C, Polypropylene and Polyethylene

There are no particular hazards associated with handling, cutting or working with the materials mentioned above, and protective clothing or equipment is not normally required.

Safety Data Sheets covering PVC-U, PVC-C, PP, PE, lubricant, solvent cements and cleaners are available from the Wavin Technical Design Department, please call Technical Enquiries to obtain a copy.

Abbreviations

Key	
P/E:	Pipe and fittings with both ends plain or with one plain end and one special end
S/S:	Pipe and fittings with one or more ring-seal or push-fit sockets, but always one plain or special end
D/S:	Fittings with ring-seal or push-fit sockets at all ends

Supply

All systems are supplied through a nationwide network of merchant distributors. For details of your nearest merchant, contact Wavin Customer Services.

Sealing Rings

Sealing Rings are not supplied with pipe or fittings and need to be ordered separately.

General Information

TwinWall Surface and Stormwater Drainage System

Conditions of Sale

Wavin will not accept responsibility for the malfunction of any installation which includes components not supplied by Wavin. Goods are sold subject to Company conditions of sale.

Technical advice

Wavin TwinWall is backed by Wavin's comprehensive technical advice service. This is available to provide expert assistance at every stage of a project, from planning and product selection to installation and maintenance.

Contact Wavin Technical Design Department:

Tel: 0844 856 5165

Email: technical.design@wavin.co.uk or via online enquiry at wavin.co.uk

Literature

General

- Wavin Below Ground & Civils System: Trade Price List

Stormwater Management Systems

- Wavin AquaCell System: Product and Installation Manual
- Wavin Q-Bic Plus: Product and Installation Manual
- Wavin AquaGrid: Product and Installation Manual
- Wavin Vortex Valves: Product Overview
- Wavin Civils Channel Systems: Product and Installation Manual

Gravity Drain and Sewer Systems

- OsmaDrain System: Product and Installation Manual
- Osma UltraRib System: Product and Installation Manual
- Osma and Wavin Inspection Chamber Range: Product and Installation Manual

To request details with regards to any of the above components and/or for any technical enquires please contact:

Literature Request
Tel: 01249 766333
Email: literature@wavin.co.uk

Technical Design
Tel: 0844 856 5165
Email: technical.design@wavin.co.uk

Wavin Online
The complete range of Wavin/Osma product and installation guides are also available online at: wavin.co.uk

Notes

TwinWall Surface and Stormwater Drainage System

Notes

TwinWall Surface and Stormwater Drainage System

Discover our broad portfolio at www.wavin.co.uk

Hot & Cold Water
Foul Water
Gas & Water Mains
Indoor Climate
Storm Water
Geotextiles
Soil & Waste

orbia
Advancing life together

Wavin is part of Orbia, a community of companies working together to tackle some of the world's most complex challenges. We are bound by a common purpose: To Advance Life Around the World.

wavin

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WAVBG004 – February 2021

Technical Submittal Form

Doc Ref.	SWP-0471-SW-ZZ-TS-W-000020		
Company:	Ark Data Centres	**Company:**	Sweet Projects
Project Name:	Union Park	**Package Code:**	WP0013-Groundworks
Project No:	SP103	**Revision:**	04
Submission Date:	11/08/22	**Approval Required by:**	25/08/22
SWP Submission No:	SP103-WP0001-0034		
Description of Technical Submittal			
System Category Group:			
Subgroup:			
Section:			
Object:			
Equipment Category Group:	Pr_65 - Services and process distribution products		
Subgroup:	Pr_65_52 - Pipe, tube and fitting products		
Section:	Pr_65_52_01 - Access and inspection chambers and gullies		
Object:	Pr_65_52_01_95 - Vortex flow control units		
Equipment Type:		Vortex Flow Control Unit	
System Abbreviation:			
Manufacturer:		Hydro Brake	
Model:		Optimum Flow Control	
Drawing No:		HPF-0471-SWS-BG-DR-C-91140_T1 HPF-0471-SWS-BG-DR-C-91111_T5	
Specification reference:		HPF-0471-SWS-XX-SPE-C-93000 – Section R12 – Clause 437	
Description or additional information: Flow Control for Manhole SWMH01.07 – Flow 9.3l/s – Head 2.353m			
Is the proposal specification compliant?		Yes	
Is the proposal an alternative to specification?		N/A	
Details of reason for deviation from specification / alternative to specification:			

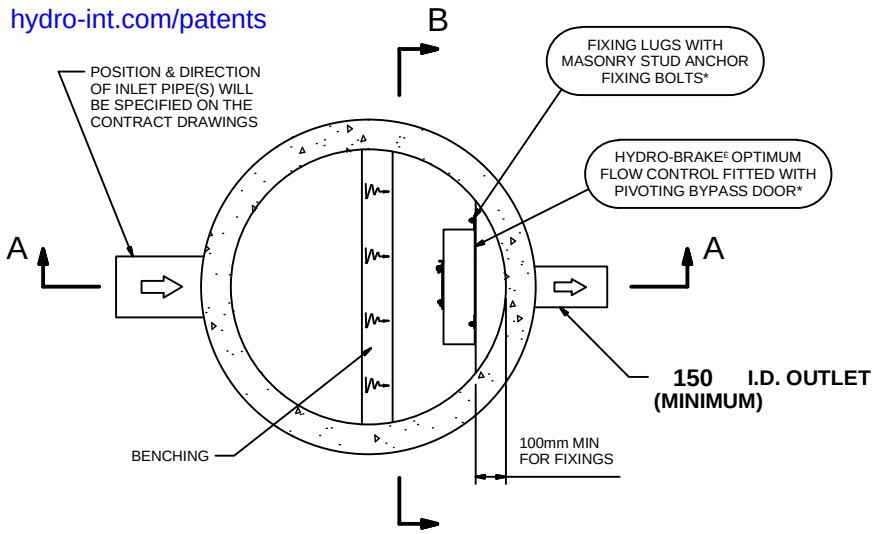
Technical Specification

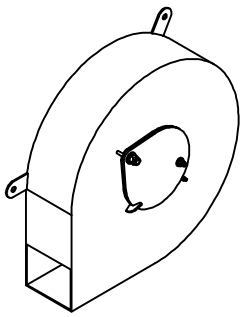
Control Point	Head (m)	Flow (l/s)
Primary Design	2.353	9.300
Flush-Flo™	0.530	8.169
Kick-Flo®	1.085	6.473
Mean Flow		7.555

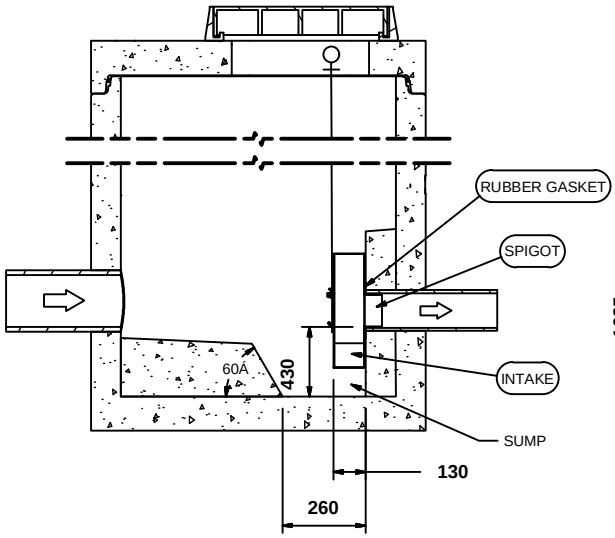
Hydro-Brake® Optimum Flow Control including:

- 5 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: 423 kg

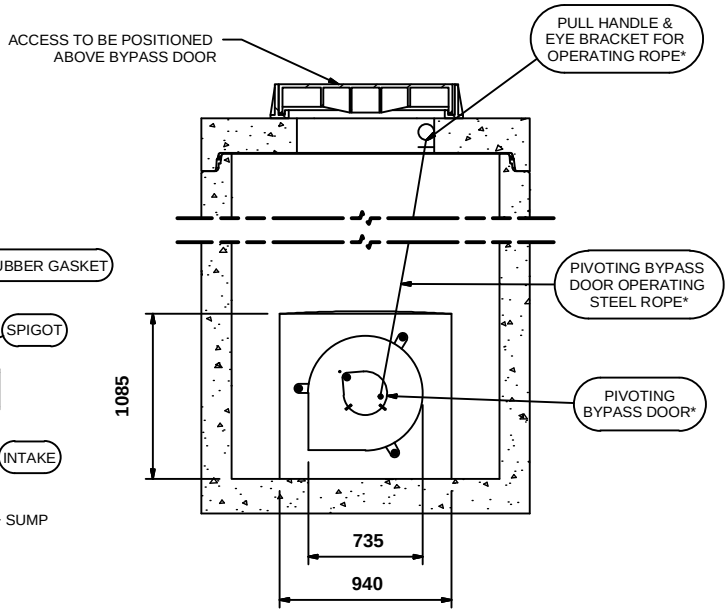
hydro-int.com/patents







SECTION A-A



SECTION B-B

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-0121-9300-2353-9300 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.

DATE	05/08/2022 09:57
SITE	20_21_2557 Project Union
DESIGNER	
REF	HQT-114154

SHE-0121-9300-2353-9300
Hydro-Brake® Optimum

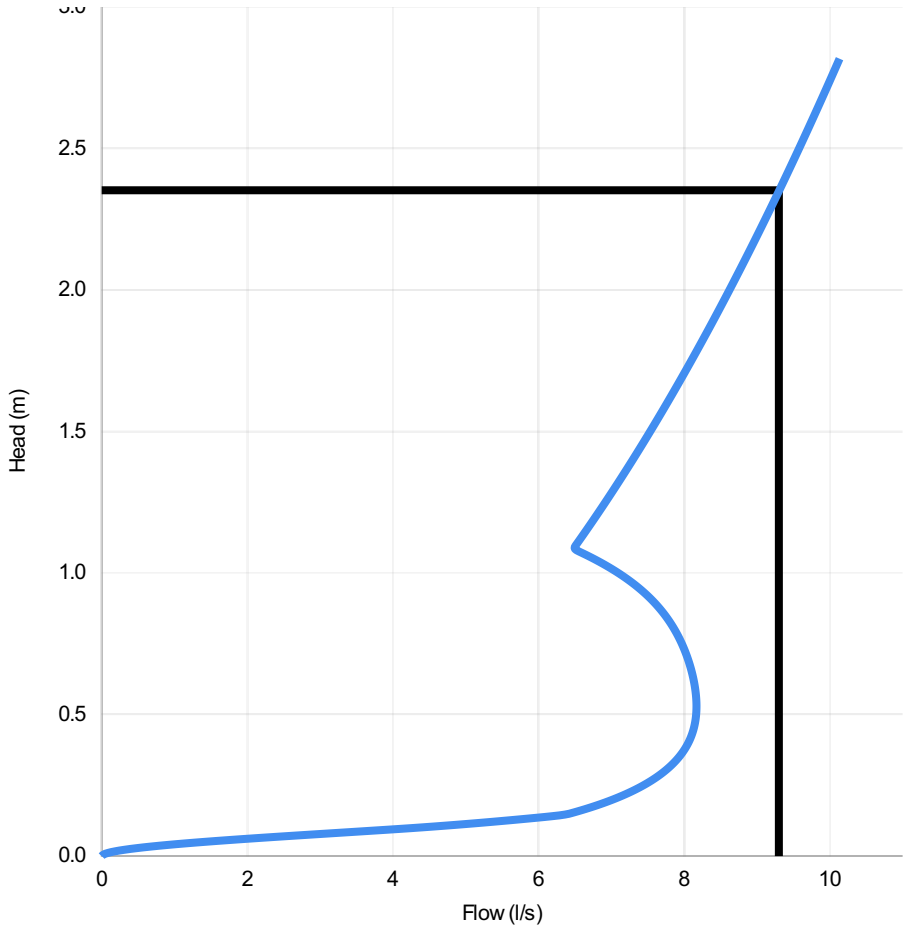
Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.353	9.300
Flush-Flo	0.530	8.169
Kick-Flo®	1.085	6.473
Mean Flow		7.555

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

WRc APPROVED
PT/329/0412

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.081	3.182
0.162	6.591
0.243	7.392
0.325	7.838
0.406	8.067
0.487	8.158
0.568	8.161
0.649	8.106
0.730	8.002
0.811	7.842
0.893	7.603
0.974	7.246
1.055	6.727
1.136	6.614
1.217	6.830
1.298	7.039
1.379	7.241
1.460	7.438
1.542	7.628
1.623	7.814
1.704	7.995
1.785	8.171
1.866	8.344
1.947	8.513
2.028	8.678
2.110	8.839
2.191	8.998
2.272	9.153
2.353	9.306

DESIGN ADVICE

The head/flow characteristics of this SHE-0121-9300-2353-9300 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	05/08/2022 09:57
Site	20_21_2557 Project Union
DESIGNER	
Ref	HQT-114154

SHE-0121-9300-2353-9300

Hydro-Brake Optimum®

Design Data

Hydro-Brake® Optimum

Vortex Flow Control

Inspired by nature and engineered to deliver the perfect curve, the Hydro-Brake® Optimum is the most advanced vortex flow control available. There is no equivalent to the Hydro-Brake® Optimum when it comes to delivering the best possible hydraulic performance with a passive flow control.

With a wide range of configurations and options available, the Hydro-Brake® Optimum is able to provide precision flow control to suit the vast majority of applications.

Figure 1 - The Hydro-Brake® Optimum is designed and manufactured to deliver precise, repeatable flow control.

Precision Engineered Vortex Flow Controls

Each Hydro-Brake® Optimum is custom configured to suit the application and is manufactured under strict quality assurance procedures to deliver precise flow control to exacting requirements.

Every unit is backed by significant R&D investment to fine-tune the performance, meaning that the Hydro-Brake® Optimum is the only vortex flow control to have been independently certified by the BBA and WRc.

BBA APPROVAL INSPECTION TESTING CERTIFICATION

wrc approved PT/409/0417

Benefits

- Manufactured from high grade stainless steel.
- Future proof – adjustable or replaceable inlet plates available to alter flow rates post-installation.
- Configurations available to suit a wide variety of installations.
- Large cross sectional area at all heads.
- Simple installation.
- Self-activating.
- No moving parts or external power requirement.

Versatile and Flexible

At Hydro International, we pride ourselves on providing solutions that meet your requirements, rather than providing a standard solution and asking you to compromise on your project needs.

The Hydro-Brake® Optimum offers designers options to precision-engineer a vortex flow control to:

- Minimise upstream storage volumes.
- Maximise internal (inlet & outlet) cross sectional areas to prevent blockages.
- Build-in a climate change factor to allow for future changes in flow rate.

Furthermore, if you need to retrofit a flow control, our dedicated team of engineers can assist with providing a customised Hydro-Brake® Optimum suitable for installation into existing drainage infrastructure.

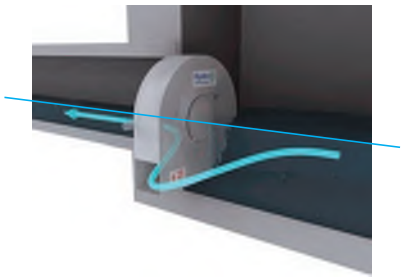
Design Data
Hydro-Brake® Optimum
Vortex Flow Control

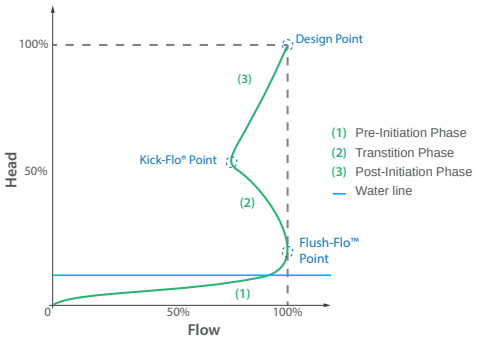
Operating Principles

The hydraulic behaviour of the Hydro-Brake® Optimum is described by its hydraulic characteristic curve, which relates the discharge flow from the unit to the hydraulic head acting upon that unit.

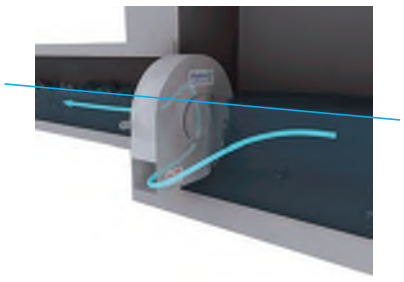
The hydraulic characteristic curve consists of three distinct sections, each corresponding to a different governing flow control regime:

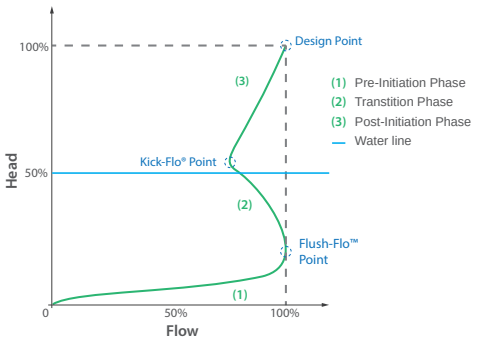
1. The pre-initiation phase – governed by orifice flow and defined on the characteristic curve as the region between the origin and the point at which the vortex begins to have a throttling effect (Flush-Flo™ point). In this region, the depth of water is below the soffit of the outlet orifice of the Hydro-Brake® Optimum.



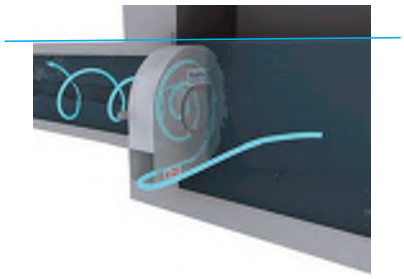


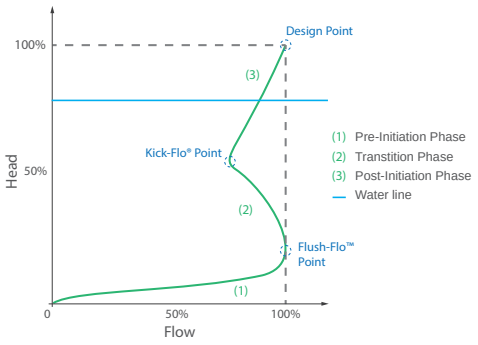
2. The transition phase – governed by vortex formation and defined on the characteristic curve as the region between the Flush-Flo™ and the point at which the vortex has fully initiated (Kick-Flo® point). In this region the vortex will continually form and collapse. A trapped volume of air inside the Hydro-Brake® Optimum will exert a backpressure and cause the discharge rate to reduce even though the hydraulic head continues to increase.





3. The post-initiation phase – governed by stable vortex flow and defined on the characteristic curve as the region above the Kick-Flo® point. A stable vortex is formed and sustained. An air filled core at the centre of the vortex acts as a pseudo-physical flow restriction by reducing the cross sectional area available for the passage of water.





Design Flexibility

It is possible for the Design Point to be achieved using a number of different flow control configurations, each with a different hydraulic response or characteristic curve.

An in-depth understanding of the flow regimes and interactions at each stage of the hydraulic characteristic curve allows custom configuration of the Hydro-Brake® Optimum to achieve the hydraulic profile best suited to the site requirements.

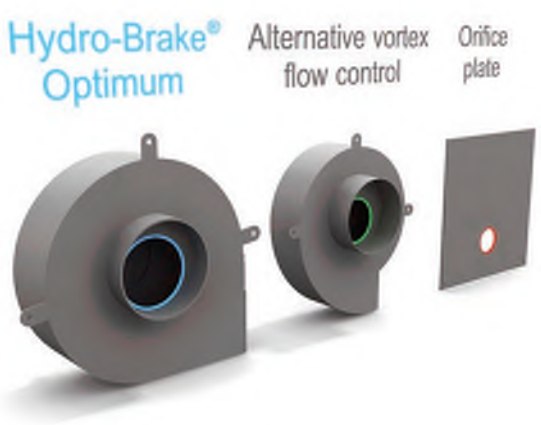
Hydro-Brake® Flow Control Series
Hydro-Brake® Hotline: 01275 337937
stormwater@hydro-int.com

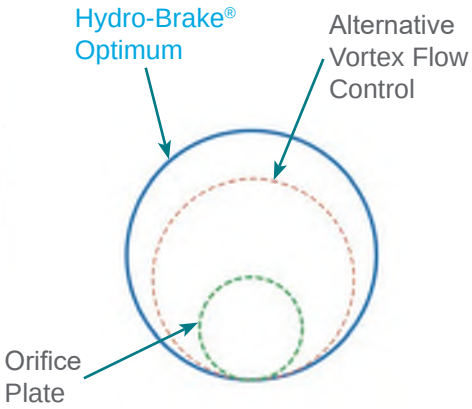
Design Data
Hydro-Brake® Optimum
Vortex Flow Control

Resilience by Design

Hydro-Brake® Optimum has outlets (clearances) up to 20% larger than competitor products to minimise the risk of blockages. All units are fitted with a pivoting bypass door to enable full access to the internal chamber and the outlet structure in the event that a blockage does occur.

All Hydro-Brake® Optimum units can also be supplied with an adjustable or replaceable inlet to future-proof the device, allowing flows to be altered post-installation, to account for site expansion or climate change.





Expert Design Support Services

Hydro International's professional engineers work with you to provide expert technical and aftersales support to ensure your projects meet exacting design requirements and deliver the very best hydraulic controls for your site.

With over 35 years' experience of flow control knowledge and experience, Hydro International's design support team is available to advise on any aspect of water flow management, including detailed modelling of vortex flow controls and composite outlet structures.

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Online Design Tool

Engineers have the flexibility to try out any number of flow control iterations and explore their impact on hydraulic performance.

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The new tool now also has the added options to size and design the First Defense® and Downstream Defender® stormwater treatment separators, alongside the existing functionality to size and design Hydro-Brake® Optimum flow controls.

hydro-int.design

Visit: hydro-int.design

Full MicroDrainage® Compatibility

Engineers can carry out sizing and flow rate calculations and conduct hydraulic modelling of drainage networks containing Hydro-Brake® Optimum units using the industry-standard drainage design software, MicroDrainage®.

XP solutions

Micro Drainage

Design Data
Hydro-Brake® Optimum
Vortex Flow Control

Easy to Install

Hydro-Brake® Optimum has a range of mounting options for ease of installation or can be supplied ready fitted into a manhole chamber (with or without a weir wall) for simple plug-and-play installation. There are no set-up or commissioning requirements.

The Hydro-Brake® Flow Control Series

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Every device in the series is tested and manufactured to exacting standards and wherever possible, independently accredited to provide the reassurance of reliable, repeatable through-life operation.

Hydro-Brake® Orifice

The low-cost option for unconstrainted sites (shown with optional screen).

Hydro-Brake® Optimum

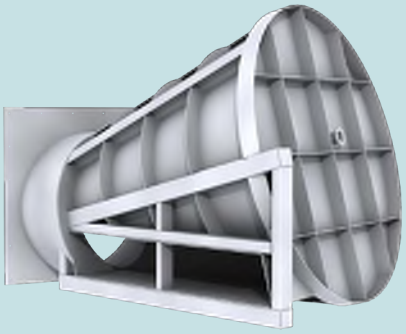
The vortex flow control with no equvalent, delivering Nature's Perfect Cuve with no moving parts and independently verified by the BBA and WRc.

Hydro-Brake® Agile

Precision engineered flow control for highly constrained applications.

Hydro-Brake® Flood Alleviation

The vortex controlled solution to watercourse flooding.



Patent: www.hydro-int.com/patents

Tel:+44 (0)1275 337 937 stormwater@hydro-int.com

Hydro International
Shearwater House, Clevedon Hall Estate, Victoria Road, Clevedon, BS21 7RD

hydro-int.com

Technical Submittal Form

Doc Ref.	SWP-0471-SW-ZZ-TS-W-000040		
Company:	Ark Data Centres	**Company:**	Sweet Projects
Project Name:	Union Park	**Package Code:**	WP0013-Groundworks
Project No:	SP103	**Revision:**	01
Submission Date:	03/08/22	**Approval Required by:**	10/08/22
SWP Submission No:	SP103-WP0001-0035		
Description of Technical Submittal			
System Category Group:			
Subgroup:			
Section:			
Object:			
Equipment Category Group:	Pr_65 - Services and process distribution products		
Subgroup:	Pr_65_52 - Pipe, tube and fitting products		
Section:	Pr_65_52_01 - Access and inspection chambers and gullies		
Object:	Pr_65_52_01_95 - Vortex flow control units		
Equipment Type:	Vortex Flow Control Unit		
System Abbreviation:			
Manufacturer:	Hydro Brake		
Model:	Optimum Flow Control		
Drawing No:	HPF-0471-SWS-BG-DR-C-91140_T1 HPF-0471-SWS-BG-DR-C-91111_T5		
Specification reference:	HPF-0471-SWS-XX-SPE-C-93000 – Section R12 – Clause 437		
Description or additional information: Flow Control for Manhole SW101.32 – Flow=44.9l/s, Head 2.606m			
Is the proposal specification compliant?	Yes		
Is the proposal an alternative to specification?	N/A		
Details of reason for deviation from specification / alternative to specification:			

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.674	44.900
Flush-Flo™	0.772	44.706
Kick-Flo®	1.644	35.561
Mean Flow		38.973

Hydro-Brake® Optimum Flow Control including:

- 8 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: 2029 kg

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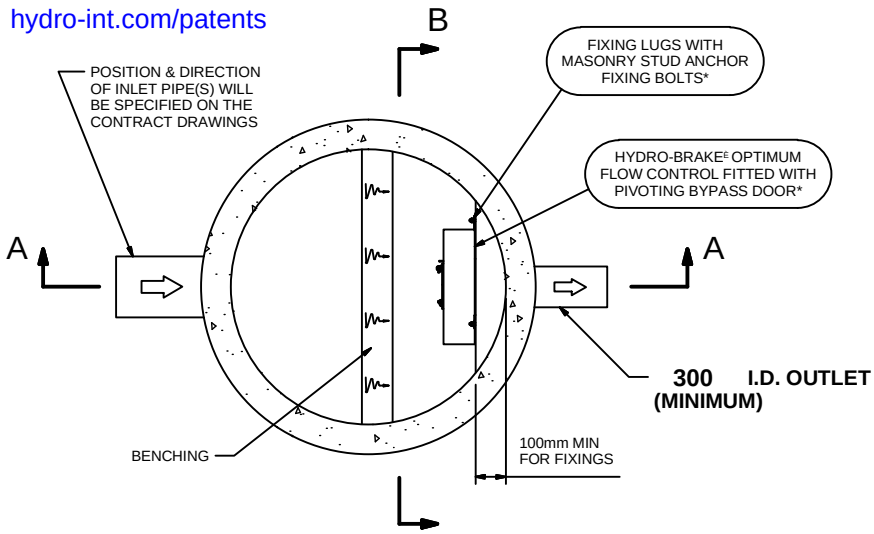
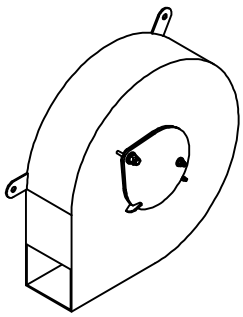
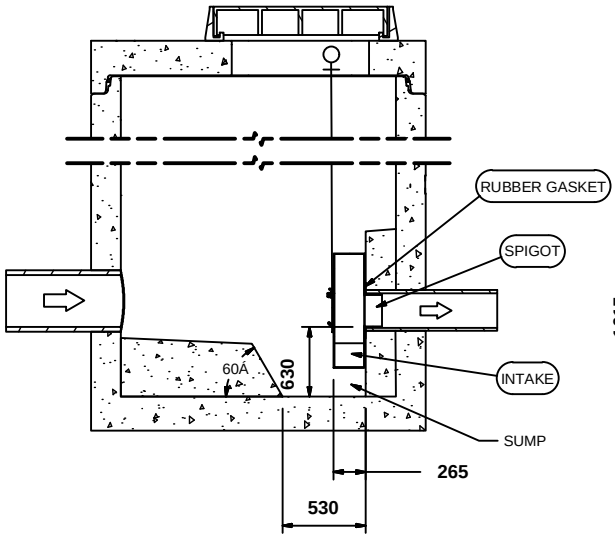
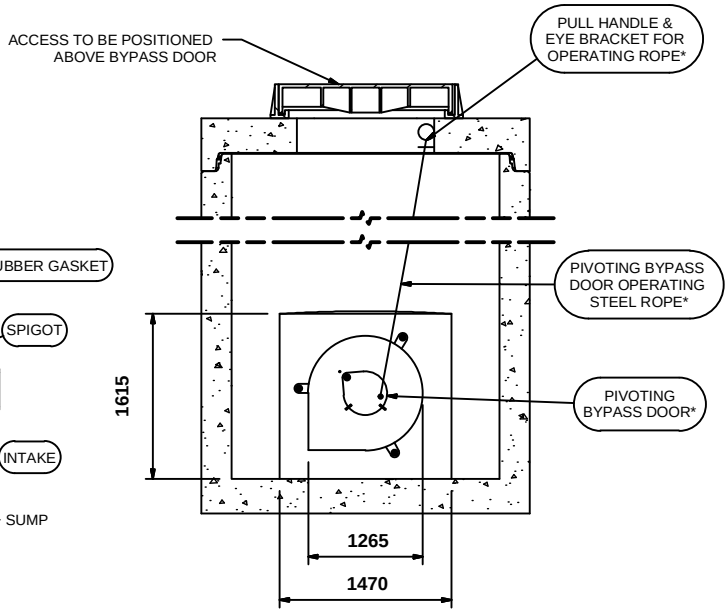






SECTION A-A



SECTION B-B

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-0258-4490-2674-4490 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.

DATE	02/08/2022 12:03
SITE	20_21_2557 Project Union
DESIGNER	
REF	HQT-114154 SW01.32

SHE-0258-4490-2674-4490
Hydro-Brake® Optimum

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.674	44.900
Flush-Flo	0.772	44.706
Kick-Flo®	1.644	35.561
Mean Flow		38.973

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

WRc APPROVED
PT/329/0412

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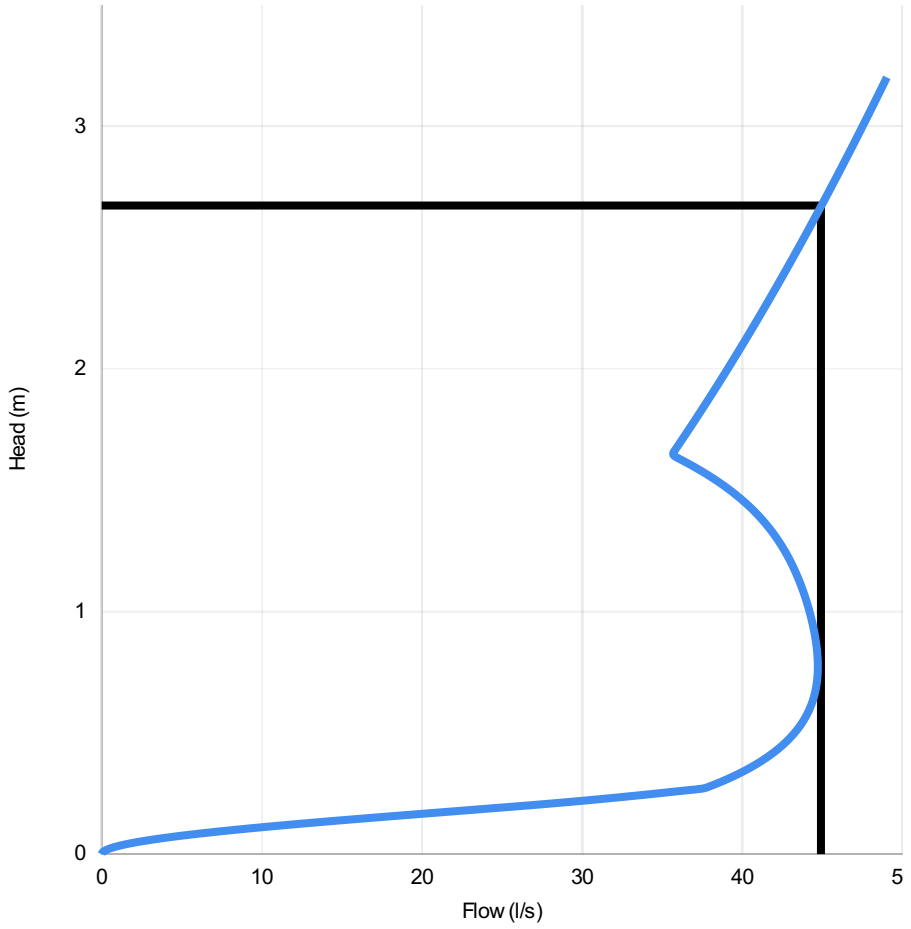

Head (m)	Flow (l/s)
0.000	0.000
0.092	7.148
0.184	23.499
0.277	37.851
0.369	40.815
0.461	42.697
0.553	43.836
0.645	44.448
0.738	44.688
0.830	44.668
0.922	44.465
1.014	44.125
1.106	43.663
1.199	43.057
1.291	42.255
1.383	41.173
1.475	39.706
1.568	37.733
1.660	35.727
1.752	36.665
1.844	37.579
1.936	38.469
2.029	39.339
2.121	40.188
2.213	41.019
2.305	41.832
2.397	42.629
2.490	43.411
2.582	44.177
2.674	44.931

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Hydro International®

DATE	02/08/2022 12:03
Site	20_21_2557 Project Union
DESIGNER	
Ref	HQT-114154 SW01.32

SHE-0258-4490-2674-4490

Hydro-Brake Optimum®

Design Data

Hydro-Brake® Optimum

Vortex Flow Control

Inspired by nature and engineered to deliver the perfect curve, the Hydro-Brake® Optimum is the most advanced vortex flow control available. There is no equivalent to the Hydro-Brake® Optimum when it comes to delivering the best possible hydraulic performance with a passive flow control.

With a wide range of configurations and options available, the Hydro-Brake® Optimum is able to provide precision flow control to suit the vast majority of applications.

Figure 1 - The Hydro-Brake® Optimum is designed and manufactured to deliver precise, repeatable flow control.

Precision Engineered Vortex Flow Controls

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Benefits

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Hydro-Brake® Optimum
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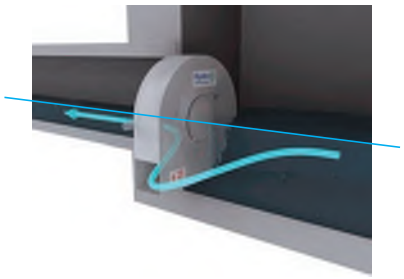

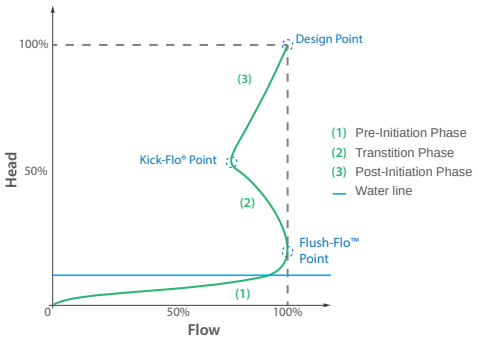

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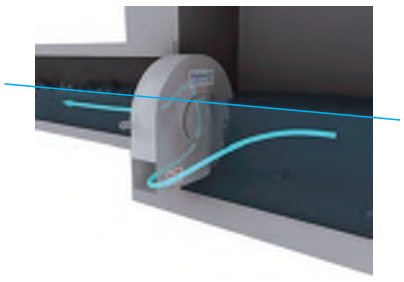

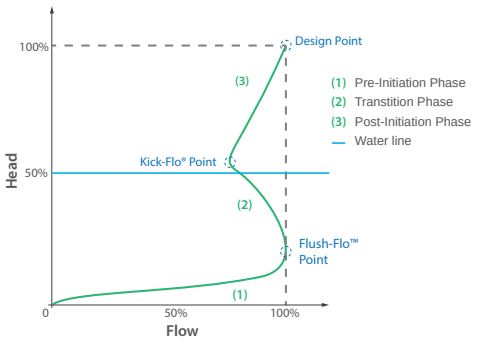

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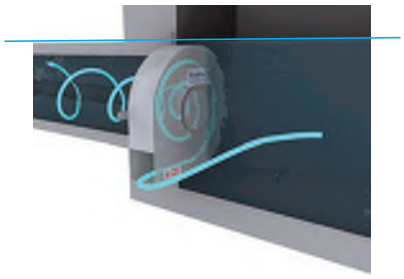

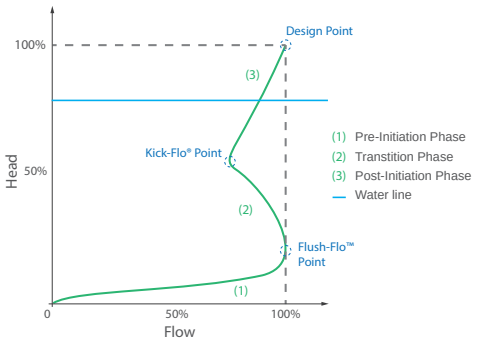

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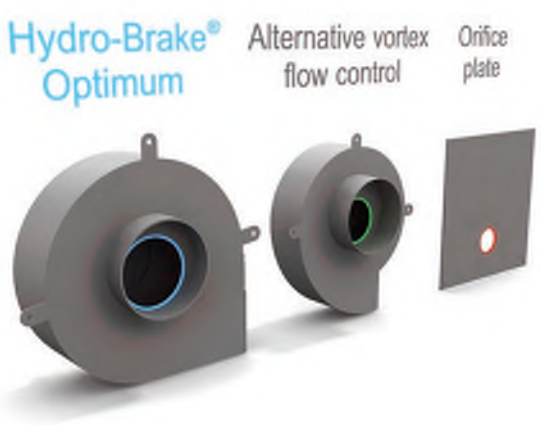

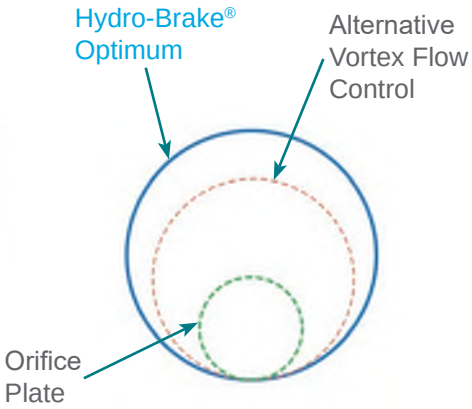

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hydro-int.design

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XP solutions

Micro Drainage

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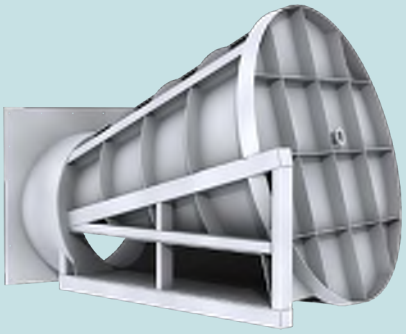


Patent: www.hydro-int.com/patents

Tel:+44 (0)1275 337 937 stormwater@hydro-int.com

Hydro International
Shearwater House, Clevedon Hall Estate, Victoria Road, Clevedon, BS21 7RD

hydro-int.com

Technical Submittal Form

Doc Ref.	SWP-0471-SW-ZZ-TS-W-000023		
To: (Name)	Neil Cooper	**From:** (Name)	Alhasan Sheriff
Company:	Ark Data Centres	**Company:**	Sweet Projects
Project Name:	Union Park	**Company Initials:** (3 capital letters)	SWP
Job No:	SP103	**Role:**	Main Contractor
Submission Date:	09/06/22	**Package Code:**	WP0001-Groundworks
Date Approval is Required:	07/07/22	**Revision:**	01
Date Approval Was Received:			
SWP Submission No	SP103-WP0001-0022		

Description of Technical Submittal		
System Category	Group:	Ss_50 - Disposal systems
	Subgroup:	Ss_50_70 - Drainage storage, treatment and disposal systems
	Section:	Ss_50_70_05 - Below-ground drainage disposal systems
	Object:	Ss_50_70_05_83 - Below-ground drainage oil and petrol separator systems
Equipment Category	Group:	
	Subgroup:	
	Section:	
	Object:	

Equipment Type (Fan Coil Unit, Radiator etc.)	Oil and separator units
System Abbreviation	
Manufacturer	Kingspan
Model	Klargester NSFP006
Drawing No	HPF-0471-SWS-BG-DR-C-91141_T1
Specification reference	HPF-0471-SWS-XX-SPE-C-93000 – Section R12 – Clause 421 Ss_50_70_05_83 - Below-ground drainage oil and petrol separator systems
Description or additional information: Oil level alarm included	
Is the proposal specification compliant?	Yes
Is the proposal an alternative to specification?	Yes
Details of reason for deviation from specification / alternative to specification:	
SWP / Consultant' comments:	

Designated Consultant to co-ordinate response from all parties		
Organisation	**Copied to**	**Comments**

Consultant	**Approval Status**	**Signed**	**Date**

Full Retention NSF RANGE

APPLICATION

Full retention separators are used in high risk spillage areas such as:

- Fuel distribution depots.
- Vehicle workshops.
- Scrap Yards

PERFORMANCE

Kingspan Klargester were the first UK manufacturer to have the required range (3-30 l/sec) certified to EN 858-1 in the UK. The NSF number denotes the flow at which the separator operates.

The British Standards Institute (BSI) have witnessed the performance tests of the required range of separators and have certified their performance, in relation to their flow and process performance to ensure that they met the effluent quality requirements of EN 858-1. Larger separator designs have been determined using the formulas extrapolated from the test range.

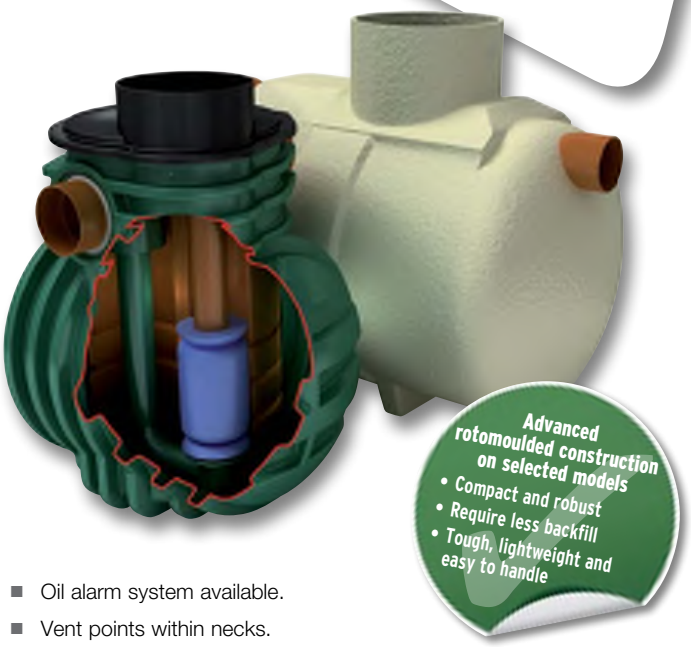
Each full retention separator design includes the necessary volume requirements for:

- Oil separation capacity.
- Silt storage capacity.
- Automatic closure device.
- Oil storage volume.
- Coalescer (Class I units only).

Klargester full retention separators treat the whole of the specified flow.

FEATURES

- Light and easy to install.
- Class I and Class II designs.
- 3-30 l/sec range independently tested and performance sampled, certified by the BSI.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.



- Oil alarm system available.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- GRP or rotomoulded construction (subject to model).

To specify a nominal size full retention separator, the following information is needed:-

- The calculated flow rate for the drainage area served. Our designs are based on the assumption that any interconnecting pipework fitted elsewhere on site does not impede flow into or out of the separator and that the influent is not pumped.
- The required discharge standard. This will decide whether a Class I or Class II unit is required.
- The drain invert inlet depth.
- Pipework type, size and orientation.

SIZES AND SPECIFICATIONS

UNIT NOMINAL SIZE	FLOW (l/s)	DRAINAGE AREA (m^2) PPG-3 (0.018)	STORAGE CAPACITY (litres) SILT	OIL	UNIT LENGTH (mm)	UNIT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT	MIN. INLET INLET (mm)	STANDARD PIPEWORK DIA. (mm)
NSFP003	3	170	300	30	1700	1350	1420	1345	500	160
NSFP006	6	335	600	60	1700	1350	1420	1345	500	160
NSFA010	10	555	1000	100	2610	1225	1050	1000	500	200
NSFA015	15	835	1500	150	3910	1225	1050	1000	500	200
NSFA020	20	1115	2000	200	3200	2010	1810	1760	1000	315
NSFA030	30	1670	3000	300	3915	2010	1810	1760	1000	315
NSFA040	40	2225	4000	400	4640	2010	1810	1760	1000	315
NSFA050	50	2780	5000	500	5425	2010	1810	1760	1000	315
NSFA065	65	3610	6500	650	6850	2010	1810	1760	1000	315
NSFA080	80	4445	8000	800	5744	2820	2500	2450	1000	300
NSFA100	100	5560	10000	1000	6200	2820	2500	2450	1000	400
NSFA125	125	6945	12500	1250	7365	2820	2500	2450	1000	450
NSFA150	150	8335	15000	1500	8675	2820	2550	2450	1000	525
NSFA175	175	9725	17500	1750	9975	2820	2550	2450	1000	525
NSFA200	200	11110	20000	2000	11280	2820	2550	2450	1000	600

Rotomoulded chamber construction GRP chamber construction

Technical Submittal Form

Doc Ref.	SWP-0471-SW-ZZ-TS-W-000024		
To: (Name)	Neil Cooper	**From:** (Name)	Alhasan Sheriff
Company:	Ark Data Centres	**Company:**	Sweet Projects
Project Name:	Union Park	**Company Initials:** (3 capital letters)	SWP
Job No:	SP103	**Role:**	Main Contractor
Submission Date:	09/06/22	**Package Code:**	WP0001-Groundworks
Date Approval is Required:	07/07/22	**Revision:**	01
Date Approval Was Received:			
SWP Submission No	SP103-WP0001-0023		

Description of Technical Submittal		
System Category	Group:	Ss_50 - Disposal systems
	Subgroup:	Ss_50_70 - Drainage storage, treatment and disposal systems
	Section:	Ss_50_70_05 - Below-ground drainage disposal systems
	Object:	Ss_50_70_05_83 - Below-ground drainage oil and petrol separator systems
Equipment Category	Group:	
	Subgroup:	
	Section:	
	Object:	

Equipment Type (Fan Coil Unit, Radiator etc.)	Forecourt Separator
System Abbreviation	
Manufacturer	Kingspan
Model	Klargester Class II
Drawing No	HPF-0471-SWS-BG-DR-C-91141_T1
Specification reference	HPF-0471-SWS-XX-SPE-C-93000 – Section R12 – Clause 421 Ss_50_70_05_83 - Below-ground drainage oil and petrol separator systems
Description or additional information: Oil level alarm included	
Is the proposal specification compliant?	Yes
Is the proposal an alternative to specification?	Yes
Details of reason for deviation from specification / alternative to specification:	
SWP / Consultant' comments:	

Designated Consultant to co-ordinate response from all parties		
Organisation	**Copied to**	**Comments**

Consultant	**Approval Status**	**Signed**	**Date**

Forecourt

APPLICATION

The forecourt separator is designed for installation in petrol filling station forecourts and similar applications. The function of the separator is to intercept hydrocarbon pollutants such as petroleum and oil and prevent their entry to the drainage system, thus protecting the environment against hydrocarbon contaminated surface water run-off and gross spillage.

PERFORMANCE

Operation ensures that the flow cannot exit the unit without first passing through the coalescer assembly.

In normal operation, the forecourt separator has sufficient capacity to provide storage for separated pollutants within the main chamber, but is also able to contain up to 7,600 litres of pollutant arising from the spillage of a fuel delivery tanker compartment on the petrol forecourt. The separator has been designed to ensure that oil cannot exit the separator in the event of a major spillage, subsequently the separator should be emptied immediately.

FEATURES

- Light and easy to install.
- Inclusive of silt storage volume.
- Fitted inlet/outlet connectors.
- Vent points within necks.
- Extension access shafts for deep inverts.
- Maintenance from ground level.
- Class I and Class II design.
- Oil storage volume.
- Coalescer (Class I unit only).
- Automatic closure device.
- Oil alarm system available.

INSTALLATION

The unit should be installed on a suitable concrete base slab and surrounded with concrete or pea gravel backfill. See sales drawing for installation.

If the separator is to be installed within a trafficked area, then a suitable cover slab must be designed to ensure that loads are not transmitted to the unit.

The separator should be installed and vented in accordance with Health and Safety Guidance Note HS(G)41 for filling stations, subject to Local Authority requirements.

SIZES AND SPECIFICATIONS

ENVIROCEPTOR CLASS	TOTAL CAP. (litres)	DRAINAGE AREA (m^2)	MAX. FLOW RATE (l/s)	LENGTH (mm)	DIAMETER (mm)	ACCESS SHAFT DIA. (mm)	BASE TO INLET INVERT (mm)	BASE TO OUTLET INVERT (mm)	STD. FALL ACROSS UNIT (mm)	MIN. INLET INVERT (mm)	STD. PIPEWORK (mm)	EMPTY WEIGHT (kg)
I	10000	555	10	3963	1920	600	2110	2060	50	400	160	500
II	10000	555	10	3963	1920	600	2110	2060	50	400	160	500
I	10000	1110	20	3963	1920	600	2110	2060	50	400	200	500
II	10000	1110	20	3963	1920	600	2110	2060	50	400	200	500

Alarm Systems

British European Standard EN 858-1 and Environment Agency Pollution Prevention Guideline PPG3 requires that all separators are to be fitted with an oil level alarm system and that it should be installed and calibrated by a suitably qualified technician so that it will respond to an alarm condition when the separator requires emptying.

- Easily fitted to existing tanks.
- Excellent operational range.
- Visual and audible alarm.
- Additional telemetry option.