Grand Union Village SEN School

LPA Ref: 2020/1369

Condition 11 – SuDs / Drainage Verification Report

Condition 11

Prior to occupation of the development, a Verification Report demonstrating that the approved drainage/SuDS measures have been fully implemented shall be submitted to the Local Planning Authority for approval in writing. This report must include:

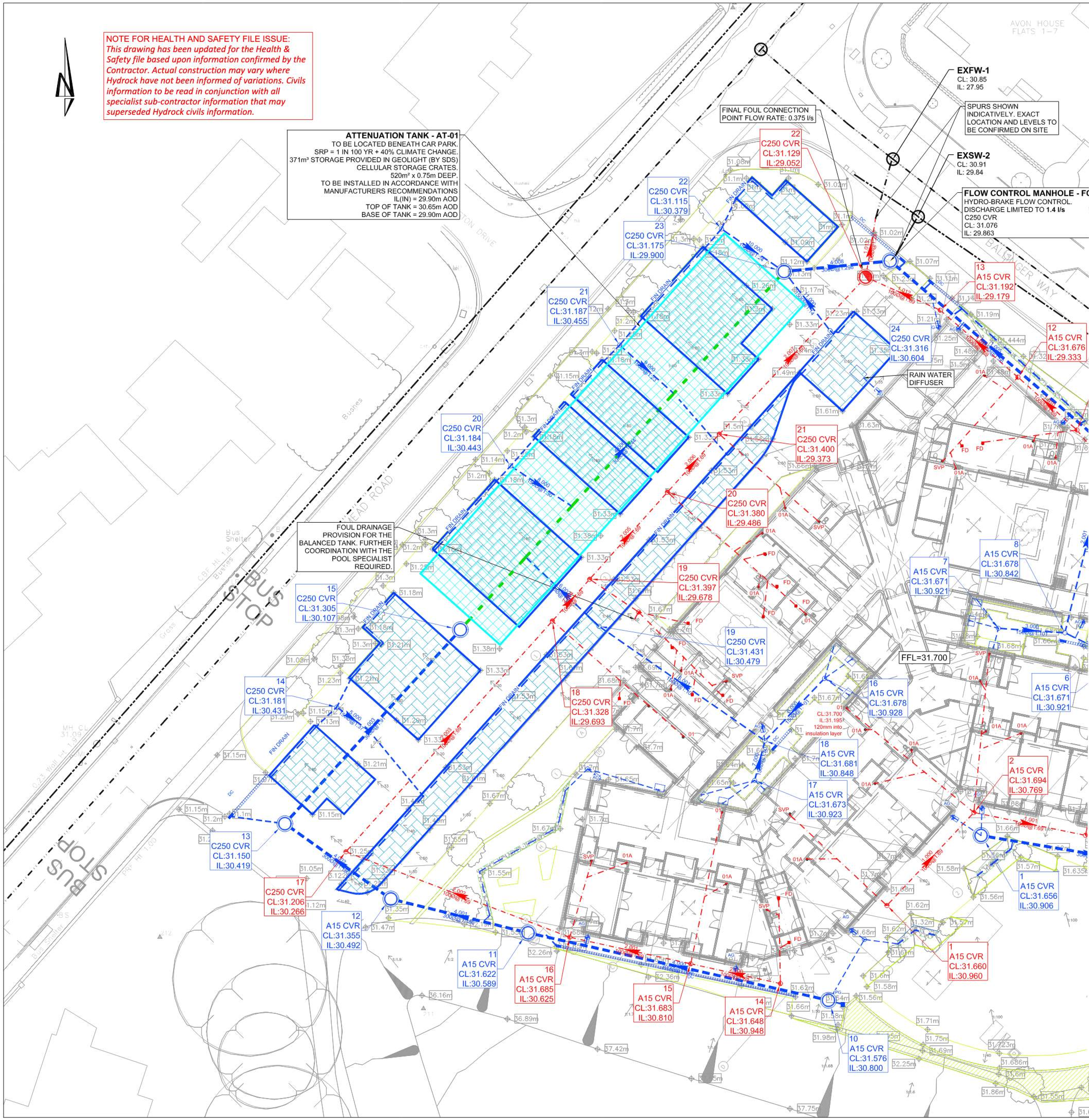
- As built drawings of the sustainable drainage systems including level information (if appropriate);
- Photographs of the completed sustainable drainage systems throughout the construction process;
- Any relevant certificates from manufacturers/suppliers of any drainage features; and
- A confirmation statement of the above signed by a chartered engineer.

This report includes submission in respect of each of the above requirements in order to discharge the condition.

Ref: HP014-RT01
Date: 26/06/2024

APPENDIX 1

As built drawings of the sustainable drainage systems including level information



LEGEND - DRAINAGE

PROPOSED DRAINAGE - FOUL

- FOUL WATER DRAIN - **PVCu** — Approx. gradient and diameter as noted, 100mm Ø UNO
- FOUL WATER MANHOLE (FW-01) — PC Ring 1.2m Ø UNO
- FOUL WATER INSPECTION CHAMBER (FW-01) — PVCu 450mm Ø. Max 1.2m depth - 600mm Ø reduced access to 3.0m

Note: All internal foul MH's and IC's to have recessed covers. double sealed and locking to prevent odours. Refer to layout for location.

- FOUL WATER SHALLOW ACCESS CHAMBER (SAC) — Max depth to invert 600mm from GL, 300mm Ø
- FOUL RODDING EYE (RE) — Ø as noted
- FOUL YARD GULLY (YG) (to be trapped) — Gully reference as noted on drawing. Cover grade to suit loading.
- FLOOR DRAIN (FD) (to be trapped) — Internal use only, refer to architect for details / specification. Roddable from above slab into standard (01) fitting. Floor Drain / Gully to be kept charged to avoid odours.
- FOUL OUTLET / STACK POSITION (01 & 01A) — Shown indicative, refer to architect for setting out. All branches 100mm Ø UNO.
  - 01 - Outlet connects into standard 90° rest bend.
  - 01A - Indicates access required in above slab plumbing for rodding, refer to service engineers drawings for details.
  - SVP - Indicates soil vent pipe by service engineer: with access.

PROPOSED DRAINAGE - STORM

- STORM WATER DRAIN - **PVCu** (150Ø@1:100) — Approx. gradient and diameter as noted, 150mm Ø UNO
- STORM WATER MANHOLE (SW-01) — PC Ring 1.2m Ø UNO
- STORM WATER INSPECTION CHAMBER (SW-01) — PVCu 450mm Ø. Max 1.2m depth - reduced access to 3.0m
- STORM RODDING EYE — Ø as noted
- SILT TRAP
- CONCRETE ENCASEMENT TO PIPE — Refer to limits of cover table drawing 7101
- RAIN WATER OUTLET (01 & 01A) — Shown indicative, refer to architect for setting out. Refer to rainwater pipe details for branch Ø.
  - 01 - Outlet connects into standard 90° rest bend.
  - 01A - Indicates access required in above slab plumbing for rodding, refer to service engineers drawings for details.
- RAIN WATER OUTLET ACCESS GULLY (AG) — AG - Outlet connects to gully.
- ROAD GULLY (RG) (to be trapped)
- YARD GULLY (YG) (to be trapped)
- PAVED AREA GULLY (PG) (to be trapped)
- DRAINAGE CHANNEL (DC) — (Refer to layout for specification)
- RWP CONNECTION TO SUNKEN PLANTER
- PERMEABLE PAVING (SYSTEM C) - PP-01
- ATTENUATION TANK - AT-01
- FILTER TRENCH WITH PERFORATED PIPE
- FIN DRAINAGE
- PERFORATED DRAINAGE PIPE

PUBLIC EXISTING DRAINAGE

- EXISTING PUBLIC FOUL SEWER (150Ø@1:100)
- EXISTING PUBLIC STORM SEWER (150Ø@1:100)

FOUNDATIONS

- INDICATES PIPE THROUGH FOUNDATION
- TOP OF FOUNDATION (TYPICAL) (T.O.F. 0.000)

KEY PLAN

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
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3. Note that all care has been taken with the export of DWG files and their content, but we recommend that you make due dimensional checks before using any DWG file information. Any errors found are to be reported to Hydrock immediately.
4. Levels shown in metres above Ordnance Datum (mAOD).
5. All private drainage to comply with current Building Regulations, BS EN-752 Drain and Sewer systems outside Buildings and other relevant British Standards and Codes of Practices.
6. All external drainage within trafficked areas with less than 1.2m cover to have type Z concrete bed and surround. All external drainage within landscaped areas with cover less than 0.6m to have type Z concrete bed and surround. All drainage with greater cover than the minimum required to have type S bed and surround.
7. All drainage to be laid soffit to soffit unless otherwise shown.
8. The Contractor is to verify the line, level and diameter of existing sewers before commencing drainage works.
9. All foul drainage to be minimum 100mm diameter, all surface water drainage to be minimum 150mm diameter unless otherwise shown.
10. Cover levels shown on this drawing refer to approximate surface levels. It is the contractors responsibility to ensure that access covers and frames are set at the final surface levels.
11. Where possible the contractor is to orientate manhole biscuits and covers to locate them parallel to kerbs and paving.
12. The Contractor should comply with hs(g) 47 "Avoiding Danger from Underground Services" when excavating around existing services.
13. It is the contractors responsibility to determine the location and depth of all existing services, mains and cables prior to construction.
14. Contractor to provide temporary screens in each of the down stream manholes during the construction period of the development in accordance with SFA 2.9.10 and the local sewerage undertakers requirements.
15. All in-situ concrete and precast concrete components to be manufactured using Sulphate Resisting Portland Cement, (SRPC) to BS 4027, if required, subject to soil conditions. Manhole components to be to BS EN 1917:2002.
16. All ironwork to be kite marked by BSI or certified by equal inspection authority.
17. All redundant connections to be capped off and grouted from the down stream manhole.
18. All new drainage pipes to be jetted, CCTV surveyed with DVD recording and any defects highlighted to the supervising officer. Following the rectification of any defects, the drain is to be re-surveyed with CCTV and the recordings made available to the project manager/engineer.
19. Prior to commencing the works the contractor is to confirm details of the existing drainage system as noted on the drawing.
20. Prior to commencing the works the contractor is to undertake the drainage investigation work as noted on the drawing.

REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
C01	CONSTRUCTION RECORD					
	R.COGBILL	04.05.23	M.STEWART	04.05.23	J.MAGEE	04.05.23
P08	FOUL SVP LOCATIONS UPDATED AS PER LATEST LAYOUT					
	J.SHIMMIN	30.03.22	M.STEWART	30.03.22	J.MAGEE	30.03.22
P07	FOUL SVP LOCATIONS UPDATED AS PER LATEST LAYOUT					
	R.COGBILL	10.03.22	M.STEWART	10.03.22	J.MAGEE	10.03.22
P06	STAGE APPROVAL					
	R.COGBILL	15.02.22	M.STEWART	15.02.22	J.MAGEE	15.02.22
P05	FOUL FLOW RATE ADDED					
	J.MAGEE	02.11.21	J. MAGEE	02.11.21		
P04	BELOW GROUND DRAINAGE UPDATED					
	J.ZYLINSKI	30.07.21	J. MAGEE	30.07.21	J. WELSH	30.07.21
P03	DRAINAGE LAYOUT REVISED TO SUIT NEW CONNECTION ON BALLINGER WAY					
	J.ZYLINSKI	28.07.21	J. MAGEE	28.07.21	J. WELSH	28.07.21
P02	DRAINAGE LAYOUT AMENDED TO INCLUDE BALANCED TANK FOR HYDROPOOL					
	J.SHIMMIN	10.06.21	D. GALLIMORE	10.06.21	J. ZYLINSKI	10.06.21
P01	DRAFT STAGE 4 ISSUE					
	J.SHIMMIN	13.05.21	D. GALLIMORE	13.05.21	J. ZYLINSKI	13.05.21

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CLIENT
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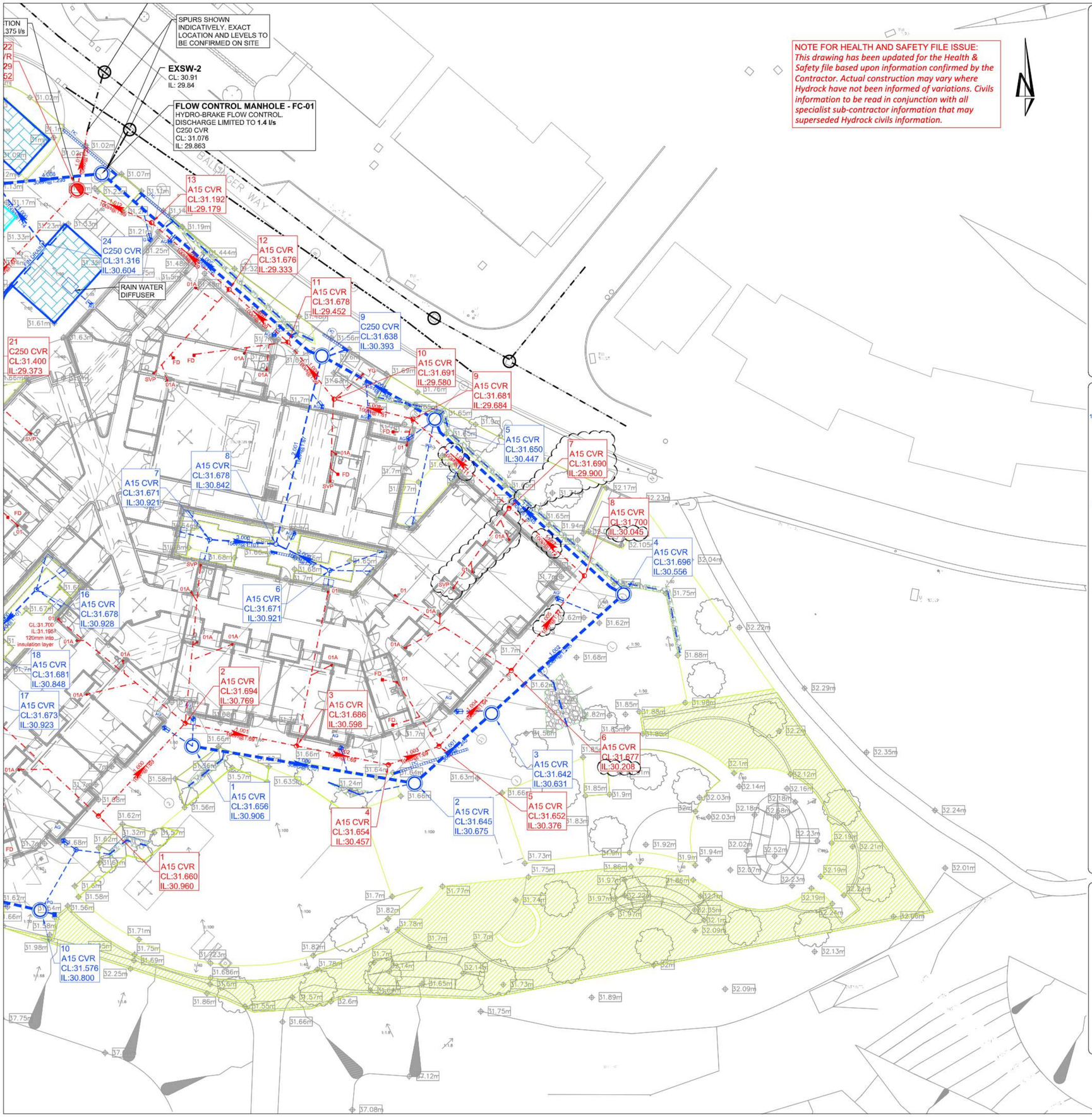
PROJECT
GRAND UNION VILLAGE

TITLE
FOUL AND SURFACE DRAINAGE LAYOUT
SHEET 1 OF 2

HYDROCK PROJECT NO.	SCALE @ A1
C-17016-C	1:200

STATUS DESCRIPTION	STATUS
CONSTRUCTION RECORD	CR

DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
FS0729-HYD-XX-ZZ-DR-C-7010	C01



NOTE FOR HEALTH AND SAFETY FILE ISSUE:
This drawing has been updated for the Health & Safety file based upon information confirmed by the Contractor. Actual construction may vary where Hydrock have not been informed of variations. Civils information to be read in conjunction with all specialist sub-contractor information that may superseded Hydrock civils information.

LEGEND - DRAINAGE

PROPOSED DRAINAGE - FOUL

100Ø@1:100 — FOUL WATER DRAIN - **PVCu**
Approx. gradient and diameter as noted, 100mm Ø UNO

FW-01 — FOUL WATER MANHOLE
PC Ring 1.2m Ø UNO

FW-01 — FOUL WATER INSPECTION CHAMBER
PVCu 450mm Ø. Max 1.2m depth - 600mm Ø reduced access to 3.0m

Note: All internal foul MH's and IC's to have recessed covers. double sealed and locking to prevent odours. Refer to layout for location.

SAC — FOUL WATER SHALLOW ACCESS CHAMBER
Max depth to invert 600mm from GL, 300mm Ø

RE — FOUL RODDING EYE
Ø as noted

YG — FOUL YARD GULLY (to be trapped)
Gully reference as noted on drawing.
Cover grade to suit loading.

FD — FLOOR DRAIN (to be trapped)
Internal use only, refer to architect for details / specification.
Roddable from above slab into standard (01) fitting.
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Shown indicative, refer to architect for setting out.
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01A - Indicates access required in above slab plumbing for rodding, refer to service engineers drawings for details.
SVP - Indicates soil vent pipe by service engineer: with access.

PROPOSED DRAINAGE - STORM

150Ø@1:100 — STORM WATER DRAIN - **PVCu**
Approx. gradient and diameter as noted, 150mm Ø UNO

SW-01 — STORM WATER MANHOLE
PC Ring 1.2m Ø UNO

SW-01 — STORM WATER INSPECTION CHAMBER
PVCu 450mm Ø. Max 1.2m depth - reduced access to 3.0m

RE — STORM RODDING EYE
Ø as noted

SILT TRAP

CONCRETE ENCASEMENT TO PIPE
Refer to limits of cover table drawing 7101

01 & 01A — RAIN WATER OUTLET
Shown indicative, refer to architect for setting out.
Refer to rainwater pipe details for branch Ø.
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AG — RAIN WATER OUTLET ACCESS GULLY
AG - Outlet connects to gully.

RG — ROAD GULLY (to be trapped)

YG — YARD GULLY (to be trapped)

PG — PAVED AREA GULLY (to be trapped)

DG — DRAINAGE CHANNEL
(Refer to layout for specification)

RWP CONNECTION TO SUNKEN PLANTER

PERMEABLE PAVING (SYSTEM C) - PP-01

ATTENUATION TANK - AT-01

FILTER TRENCH WITH PERFORATED PIPE

FIN DRAINAGE

PERFORATED DRAINAGE PIPE

PUBLIC EXISTING DRAINAGE

150Ø@1:100 — EXISTING PUBLIC FOUL SEWER

150Ø@1:100 — EXISTING PUBLIC STORM SEWER

FOUNDATIONS

INDICATES PIPE THROUGH FOUNDATION

T.O.F. 0.000 — TOP OF FOUNDATION (TYPICAL)

KEY PLAN

NOTES

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	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
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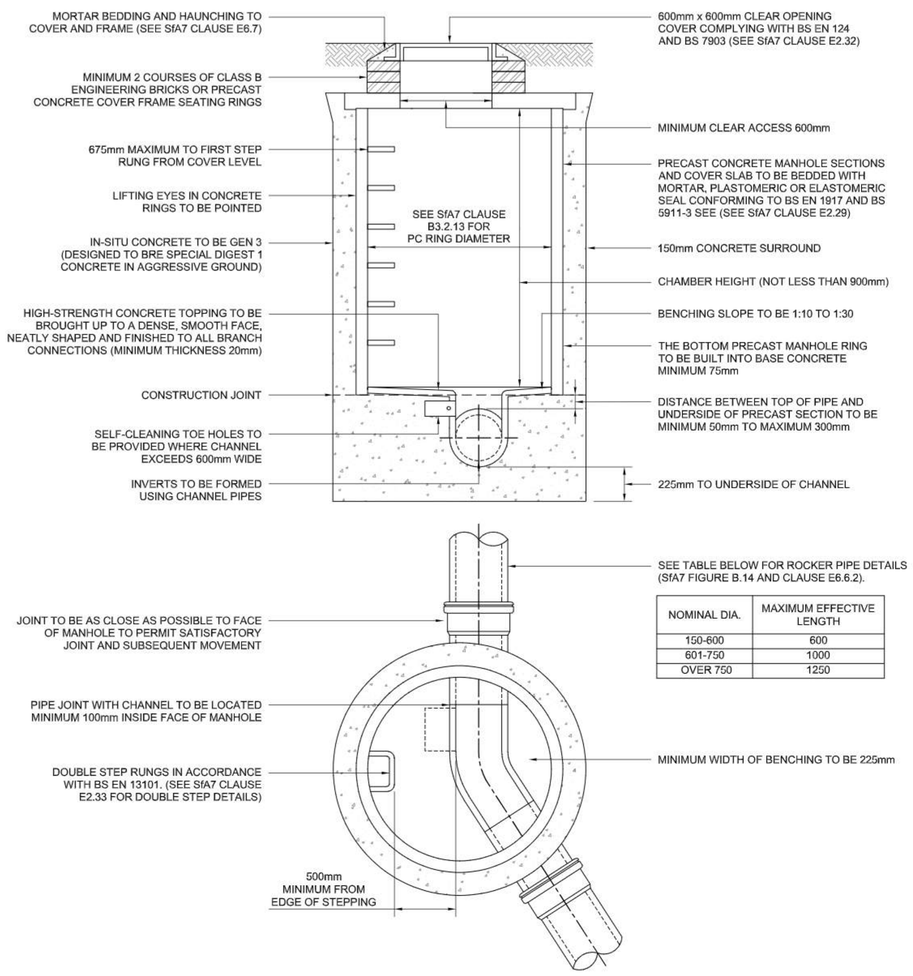
PROJECT
GRAND UNION VILLAGE

TITLE
FOUL AND SURFACE DRAINAGE LAYOUT
SHEET 2 OF 2

HYDROCK PROJECT NO.	SCALE @ A1
C-17016-C	1:200

STATUS DESCRIPTION	STATUS
CONSTRUCTION RECORD	CR

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
FS0729-HYD-XX-ZZ-DR-C-7011	C01

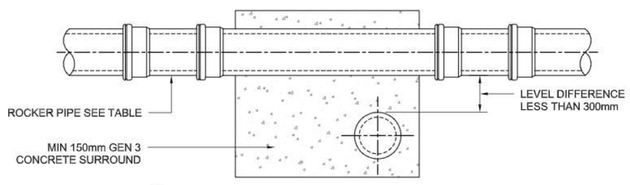


NOMINAL DIA.	MAXIMUM EFFECTIVE LENGTH
150-600	600
601-750	1000
OVER 750	1250

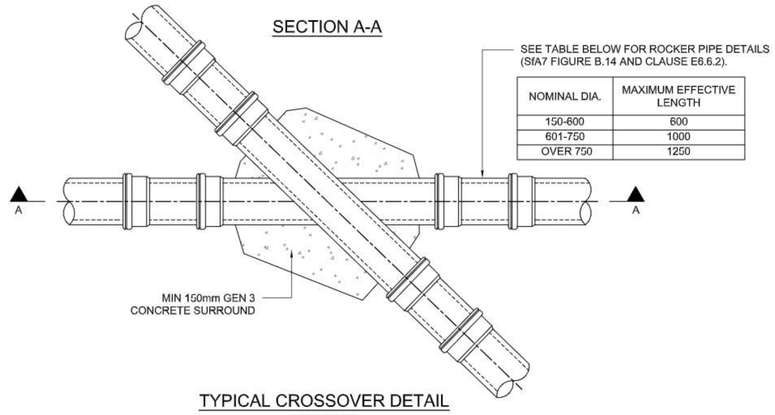
TYPICAL MANHOLE DETAIL - TYPE 2

SCALE 1:20

MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3.0m



SECTION A-A



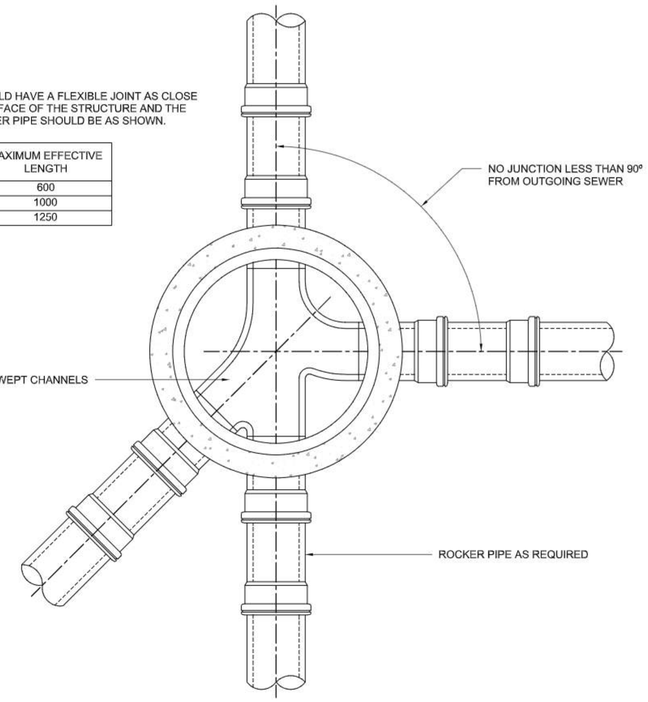
NOMINAL DIA.	MAXIMUM EFFECTIVE LENGTH
150-600	600
601-750	1000
OVER 750	1250

TYPICAL CROSSOVER DETAIL

SCALE 1:25

PIPES BUILT INTO MANHOLE SHOULD HAVE A FLEXIBLE JOINT AS CLOSE AS FEASIBLE TO THE EXTERNAL FACE OF THE STRUCTURE AND THE LENGTH OF THE NEXT ROCKER PIPE SHOULD BE AS SHOWN.

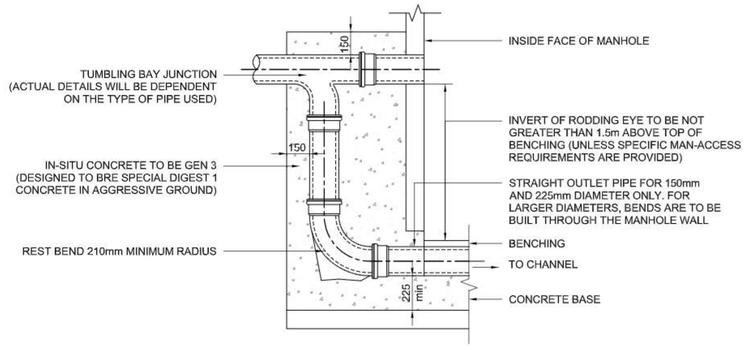
NOMINAL DIA.	MAXIMUM EFFECTIVE LENGTH
150-600	600
601-750	1000
OVER 750	1250



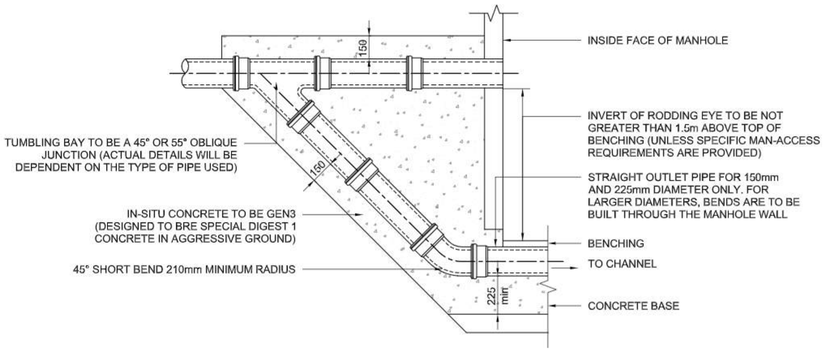
ALL PIPES ENTERING THE BOTTOM OF THE MANHOLE TO HAVE SOFFITS LEVEL.

TYPICAL ARRANGEMENT OF PIPE JUNCTIONS WITHIN MANHOLES

SCALE 1:20



EXTERNAL VERTICAL BACKDROP



EXTERNAL RAMPED BACKDROP

NOTE: STEEPER GRADIENTS ARE PREFERRED TO THE USE OF BACKDROPS. TYPE OF BACKDROP TO BE USED TO BE AGREED WITH UNDERTAKER.

TYPICAL VERTICAL AND RAMPED BACKDROP DETAIL

SCALE 1:20

KEY PLAN

NOTES

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REV						
	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
C01	CONSTRUCTION RECORD					
	R.COGBILL	04.05.23	M.STEWART	04.05.23	J.MAGEE	04.05.23
P03	STAGE APPROVAL					
	R.COGBILL	15.02.22	M.STEWART	15.02.22	J.MAGEE	15.02.22
P02	TITLE SHEET AMENDED					
	J.SHIMMIN	10.06.21	D. GALLIMORE	10.06.21	J. ZYLINSKI	10.06.21
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	J.SHIMMIN	13.05.21	D. GALLIMORE	13.05.21	J. ZYLINSKI	13.05.21

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CLIENT
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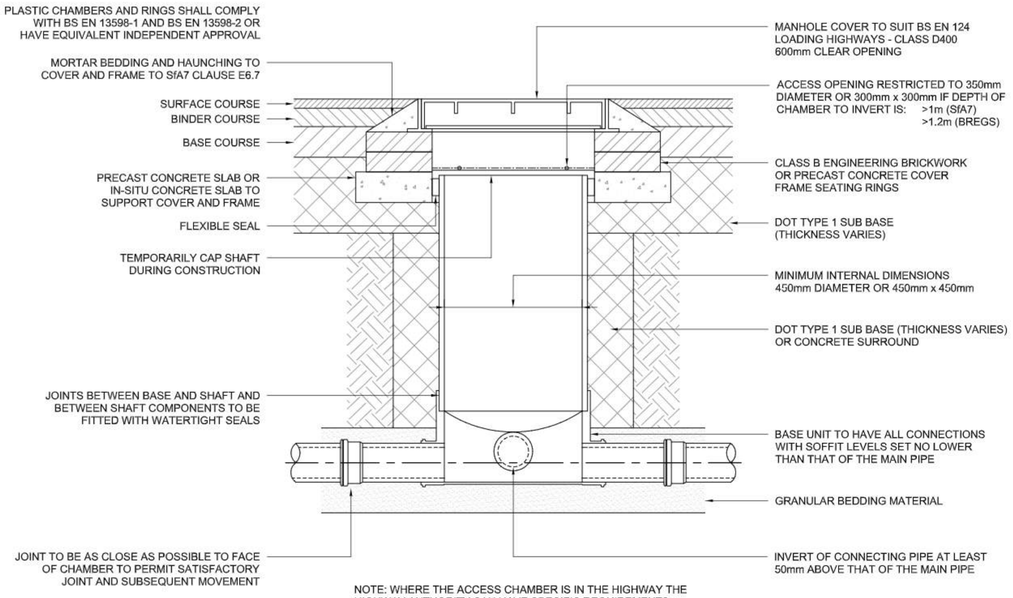
PROJECT
GRAND UNION VILLAGE

TITLE
FOUL AND SURFACE DRAINAGE STANDARD DETAILS SHEET 1

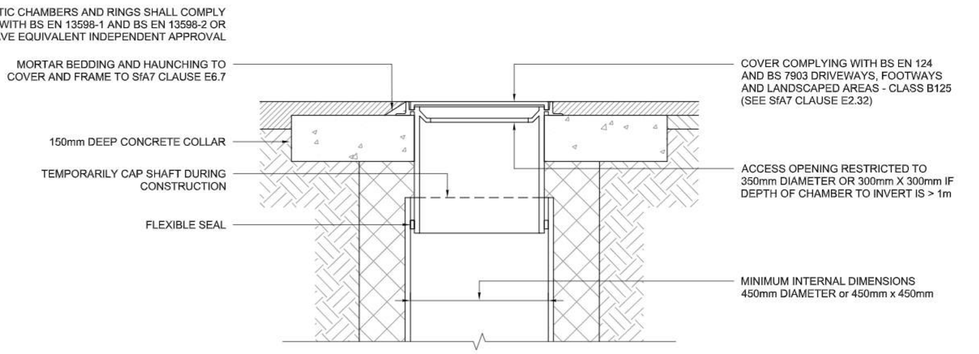
HYDROCK PROJECT NO.	SCALE @ A1
C-17016-C	AS SHOWN
STATUS DESCRIPTION: CONSTRUCTION RECORD	STATUS: CR
DRAWING NO. (PROJECT-CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER): FS0729-HYD-XX-ZZ-DR-C-7101	REVISION: C01



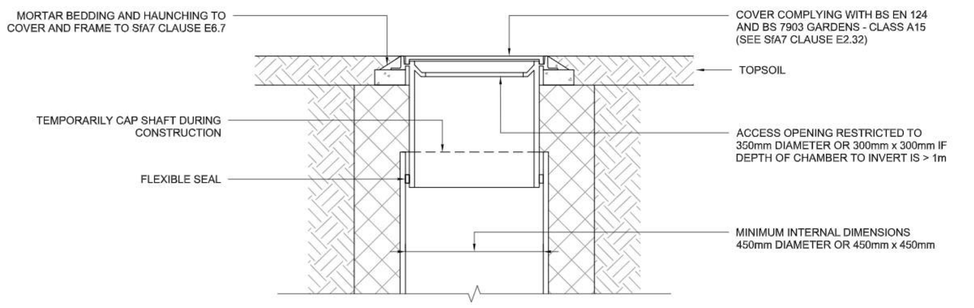
NOTE: WHERE THE ACCESS CHAMBER IS IN THE HIGHWAY THE HIGHWAY AUTHORITY CAN HAVE SPECIFIC REQUIREMENTS

TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (Flexible material detail)

SCALE 1:10
MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE
IN AREAS SUBJECT TO VEHICLE LOADING 3m, NON-ENTRY



SITED IN DOMESTIC DRIVEWAYS OR FOOTWAYS



SITED IN DOMESTIC GARDENS

NOTE: WHERE THE ACCESS CHAMBER IS IN THE HIGHWAY THE HIGHWAY AUTHORITY CAN HAVE SPECIFIC REQUIREMENTS

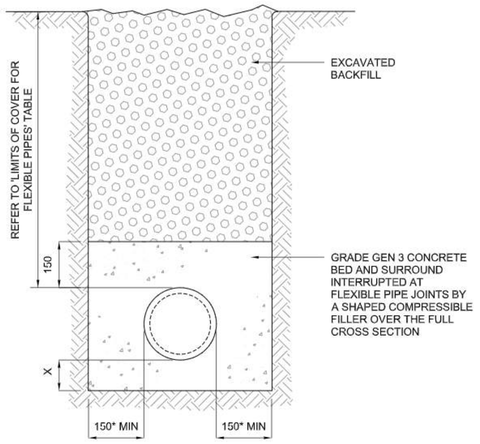
ALTERNATIVE TOP DETAILS FOR LIGHT VEHICLE LOADING AND LANDSCAPED AREAS - TYPE 3

SCALE 1:10

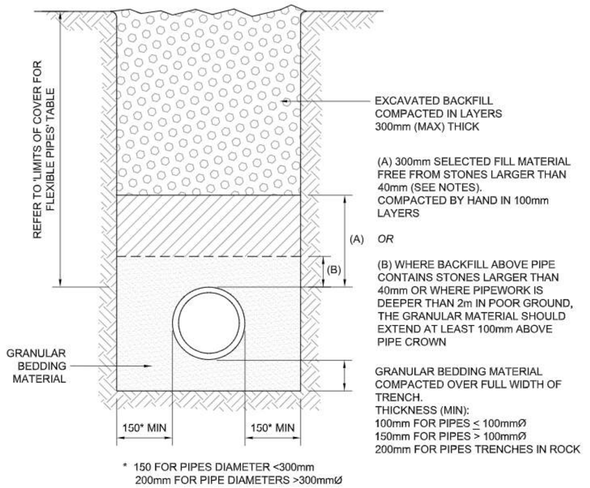
USE OF GRANULAR BEDDING MATERIAL:

NOMINAL BORE OF PIPE (min)	AGGREGATE SIZE (mm) SINGLE SIZED	GRADED
100	10	-
150	10 OR 14	14 TO 5
225-300	10,14 OR 20	14 TO 5 OR 20 TO 5
375-525	14 OR 20	14 TO 5 OR 20 TO 5
EXCEEDING 525	14,20 OR 40	14 TO 5 OR 20 TO 5 40 TO 5

DIM X ≥ 100mm FOR PIPES ≤ 100mmØ
DIM X ≥ 150mm FOR PIPES > 100mmØ
DIM X ≥ 200mm FOR PIPES TRENCHES IN ROCK



CLASS Z BEDDING
CONCRETE SURROUND



* 150 FOR PIPES DIAMETER <300mm
200mm FOR PIPE DIAMETERS >300mmØ

CLASS P BEDDING

TYPICAL PIPE BEDDING FOR PIPES UP TO 800mm DIA

SCALE 1:10

NOTES:

1. * = 150 FOR PIPES DIAMETER UP TO 300mm,
   * = 200mm FOR PIPE DIAMETERS OVER 300mmØ

BASED ON NARROW TRENCH THEORY: DESIGNER TO CONFIRM FOR SPECIFIC PIPELINE.

2. BACKFILL MATERIAL TO BE SELECTED EXCAVATED MATERIAL WHERE THIS MATERIAL COMPLIES WITH CESWI. ADDITIONAL MATERIAL TO MAKE UP ANY DEFICIENCY TO BE GRANULAR SUB-BASE TYPE 1 UNLESS STATED OTHERWISE.

3. IN WET, SOFT, OR SILTY SOILS, WHERE LATERAL SUPPORT IS NOT OBTAINED OR WHERE FINES MAY MIGRATE, THE GRANULAR BEDDING MATERIAL SHALL BE SURROUNDED BY GEOTEXTILE FABRIC WITH MIN 200 OVERLAP.

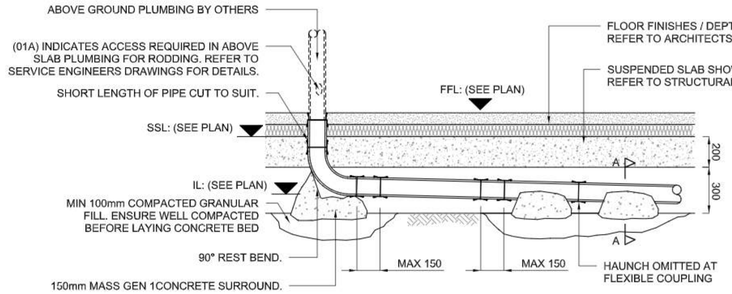
4. TRENCH BACKFILL TO MEET HIGHWAY SPECIFICATION WHEN LAID IN ROAD OR FOOTPATH.

FOR AREAS ADOPTED HIGHWAYS	FOR AREAS SUBJECT TO LIGHT VEHICULAR ACCESS	FOR AREAS NOT UNDER ROADS OR BUILDINGS
USE CLASS P BEDDING WHERE COVER IS: 1.2m Min & 8.0m Max - FOR 100mm DIA PIPES 1.2m MIn & 4.0m Max - FOR 150mm DIA PIPES OR GREATER FOR DEFINITION OF AREAS OF ADOPTED HIGHWAY SEE LAYOUT DRG	USE CLASS P BEDDING WHERE COVER IS: 0.9m Min & 8.0m Max - FOR 100mm DIA PIPES 0.9m MIn & 5.0m Max - FOR 150mm DIA PIPES OR GREATER FOR DEFINITION OF AREAS OF VEHICLE ACCESS SEE LAYOUT DRG	USE CLASS P BEDDING WHERE COVER IS: 0.6m Min & 8.0m Max - FOR 100mm DIA PIPES 0.6m MIn & 5.0m Max - FOR 150mm DIA PIPES OR GREATER
WHERE COVER IS LESS THAN THE ABOVE: FOR UPVC PIPE USE OPTION 1 CLASS Z + REINFORCEMENT AS RECOMMENDED IN BS5955-6:1980 OR OPTION 2 CLASS Q BEDDING + RC SLAB PROTECTION. REFER TO NBS FOR DETAILS.		WHERE COVER IS LESS THAN THE ABOVE: FOR UPVC PIPE USE CLASS Z

NOTE:
REFERENCE SHOULD BE MADE TO PIPE MANUFACTURER/SUPPLIER TO CONFIRM THE LIMITS OF COVER NOTED ABOVE ARE ACCEPTABLE

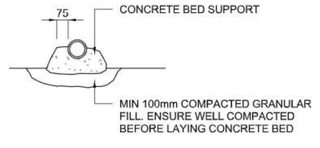
LIMITS OF COVER TO FLEXIBLE (PVCu) PIPES

BS EN 752 & BUILDING REGS PART H



TYPICAL INTERNAL OUTLET: (01) & (01A) FOR SUSPENDED SLAB

SCALE 1:20
(REFER TO DRAINAGE DRAWING FOR LOCATION)



SECTION A-A

KEY PLAN

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REV						
C01	CONSTRUCTION RECORD					
	R.COGBILL	04.05.23	M.STEWART	04.05.23	J.MAGEE	04.05.23
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	R.COGBILL	15.02.22	M.STEWART	15.02.22	J.MAGEE	15.02.22
P02	TITLE SHEET AMENDED					
	J.SHIMMIN	10.06.21	D. GALLIMORE	10.06.21	J. ZYLINSKI	10.06.21
P01	DRAFT STAGE 4 ISSUE					
	J.SHIMMIN	13.05.21	D. GALLIMORE	13.05.21	J. ZYLINSKI	13.05.21
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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PROJECT
GRAND UNION VILLAGE

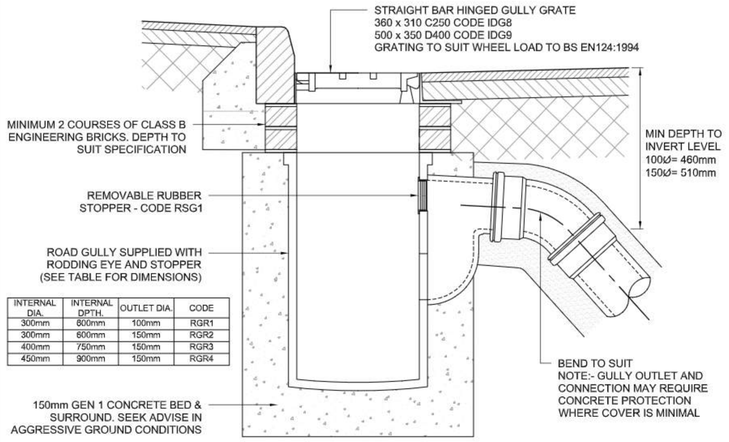
TITLE
FOUL AND SURFACE DRAINAGE STANDARD DETAILS SHEET 2

HYDROCK PROJECT NO.	SCALE @ A1
C-17016-C	AS SHOWN

STATUS DESCRIPTION	STATUS
CONSTRUCTION RECORD	CR

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER) FS0729-HYD-XX-ZZ-DR-C-7102

REVISION C01



INTERNAL DIA.	INTERNAL DPTH.	OUTLET DIA.	CODE
300mm	600mm	100mm	RGR1
300mm	600mm	150mm	RGR2
400mm	750mm	150mm	RGR3
450mm	900mm	150mm	RGR4

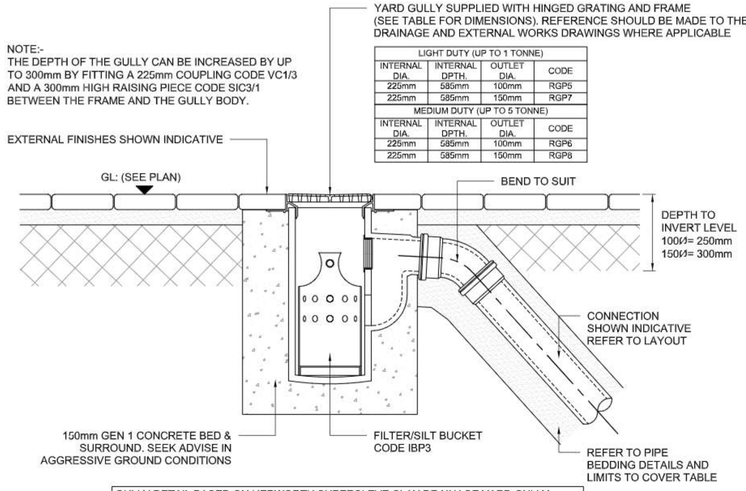
GULLY DETAIL BASED ON HEPWORTH SUPERSLEVE CLAY DRAINAGE ROAD GULLY DETAIL. FOR FURTHER DETAILS REFER TO MANUFACTURERS RECOMMENDATIONS.

SHOULD AN ALTERNATIVE GULLY WISH TO BE SPECIFIED THEN IT IS THE RESPONSIBILITY OF THE SPECIFIER TO ENSURE THAT THE ALTERNATIVE IS COMPARABLE IN TERMS OF DETAIL AND PERFORMANCE REQUIREMENTS. PROPOSALS SHOULD BE SUBMITTED WHERE APPLICABLE TO THE DESIGNER FOR APPROVAL.

DETAIL RG: ROAD GULLY

SCALE 1:10

NOTE:-
THE DEPTH OF THE GULLY CAN BE INCREASED BY UP TO 300mm BY FITTING A 225mm COUPLING CODE VC1/3 AND A 300mm HIGH RAISING PIECE CODE SIC3/1 BETWEEN THE FRAME AND THE GULLY BODY.



LIGHT DUTY (UP TO 1 TONNE)			
INTERNAL DIA.	INTERNAL DPTH.	OUTLET DIA.	CODE
225mm	585mm	100mm	RGP5
225mm	585mm	150mm	RGP7
MEDIUM DUTY (UP TO 5 TONNE)			
INTERNAL DIA.	INTERNAL DPTH.	OUTLET DIA.	CODE
225mm	585mm	100mm	RGP6
225mm	585mm	150mm	RGP8

GULLY DETAIL BASED ON HEPWORTH SUPERSLEVE CLAY DRAINAGE YARD GULLY DETAIL. FOR FURTHER DETAILS REFER TO MANUFACTURERS RECOMMENDATIONS.

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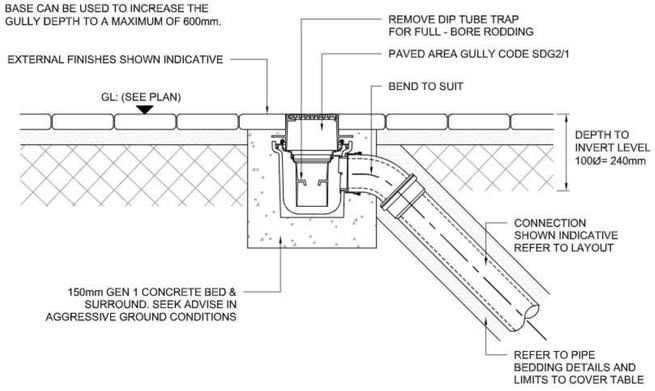
DETAIL YG: YARD GULLY

SCALE 1:10

NOTE:- A CUT LENGTH OF 150mm SUPERSLEVE PIPE AND A 150mm COUPLING INSERTED BETWEEN THE HOPPER AND THE BASE CAN BE USED TO INCREASE THE GULLY DEPTH TO A MAXIMUM OF 600mm.

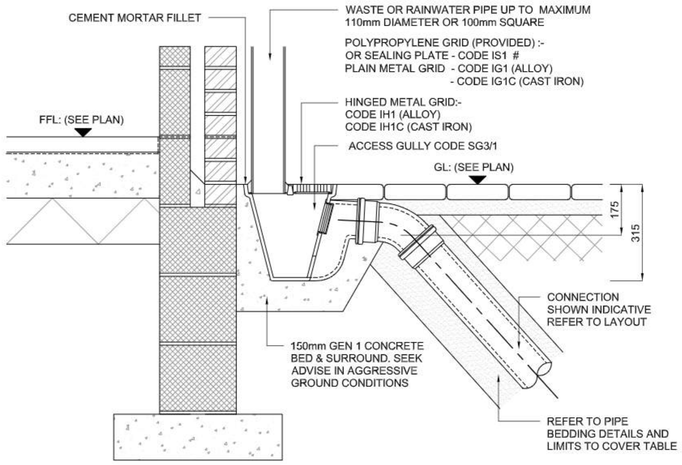


GULLY DETAIL BASED ON HEPWORTH SUPERSLEVE CLAY DRAINAGE PAVED GULLY DETAIL. FOR FURTHER DETAILS REFER TO MANUFACTURERS RECOMMENDATIONS.

SHOULD AN ALTERNATIVE GULLY WISH TO BE SPECIFIED THEN IT IS THE RESPONSIBILITY OF THE SPECIFIER TO ENSURE THAT THE ALTERNATIVE IS COMPARABLE IN TERMS OF DETAIL AND PERFORMANCE REQUIREMENTS. PROPOSALS SHOULD BE SUBMITTED WHERE APPLICABLE TO THE DESIGNER FOR APPROVAL.

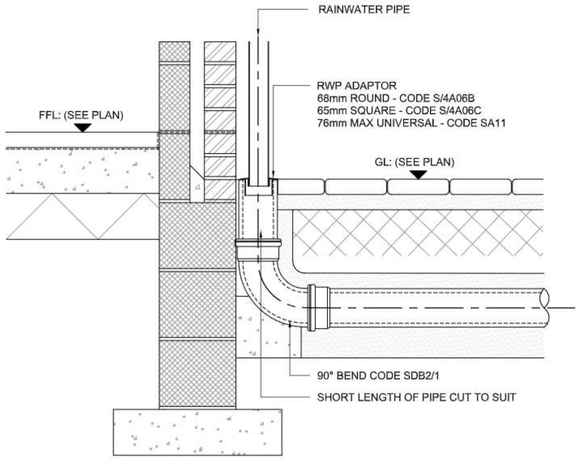
DETAIL PG: PAVED GULLY

SCALE 1:10



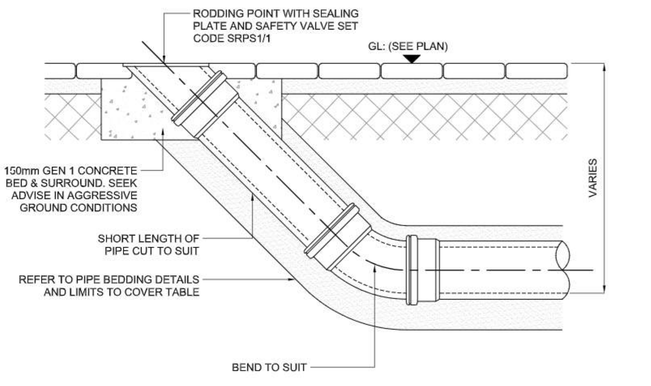
DETAIL AG: ACCESS GULLY

SCALE 1:10



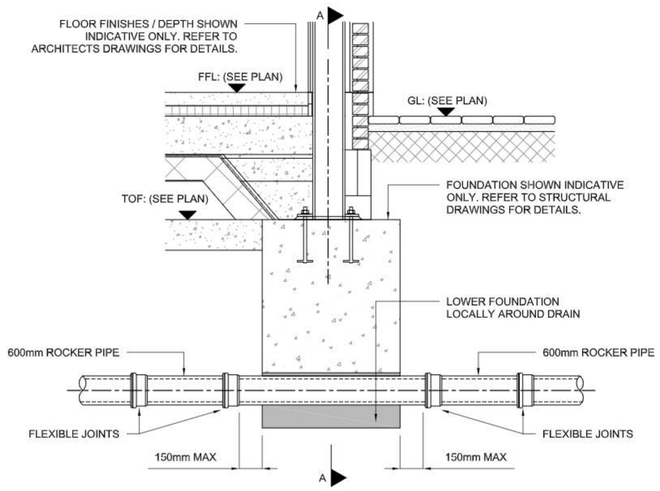
TYPICAL EXTERNAL RAINWATER PIPE 01 & 01A

SCALE 1:10



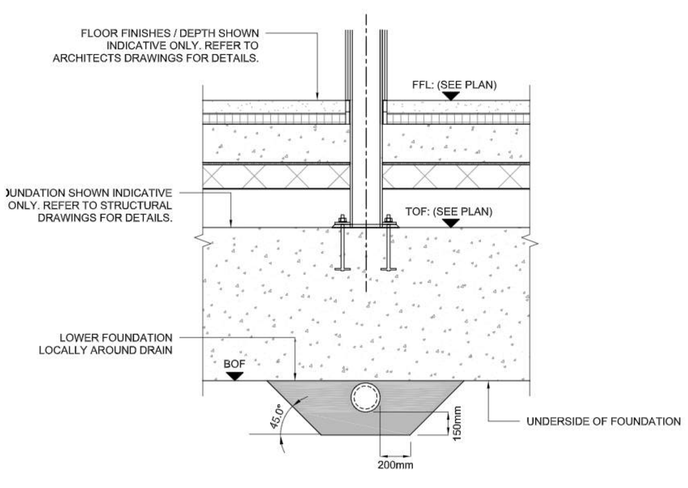
TYPICAL RODDING EYE DETAIL

SCALE 1:10



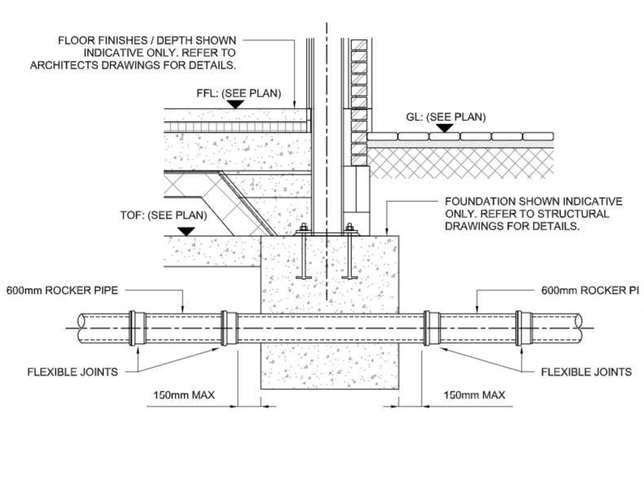
TYPICAL DRAIN BENEATH FOUNDATION DETAIL

SCALE 1:20



SECTION A-A

SCALE 1:20



TYPICAL DRAIN THROUGH FOUNDATION DETAIL

SCALE 1:20

KEY PLAN

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PROJECT
GRAND UNION VILLAGE

TITLE
FOUL AND SURFACE DRAINAGE
STANDARD DETAILS SHEET 3

HYDROCK PROJECT NO.
C-17016-C

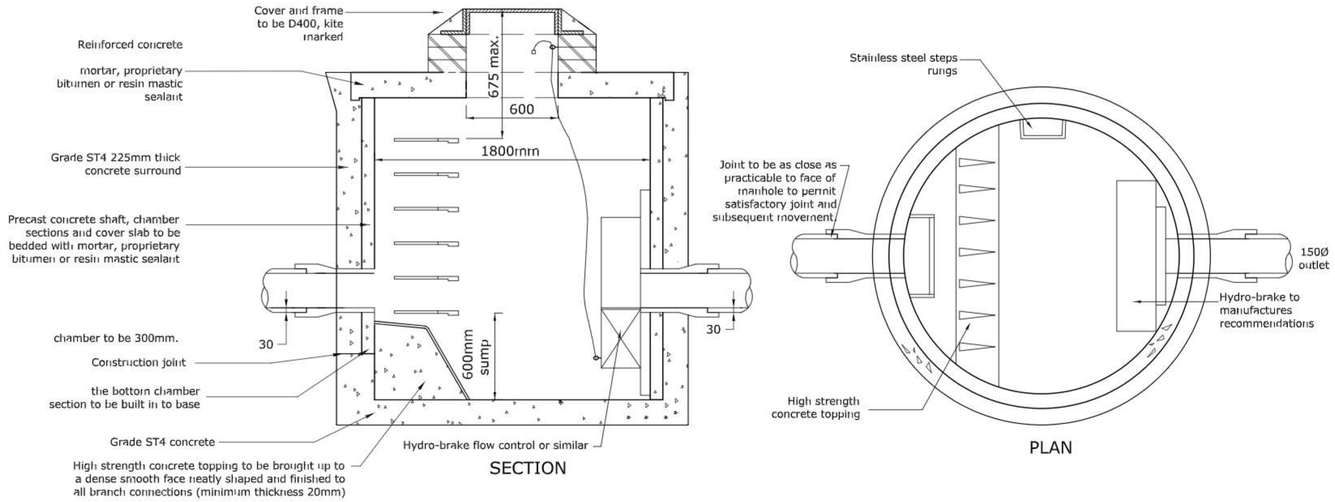
SCALE @ A1
AS SHOWN

STATUS DESCRIPTION
CONSTRUCTION RECORD

STATUS
CR

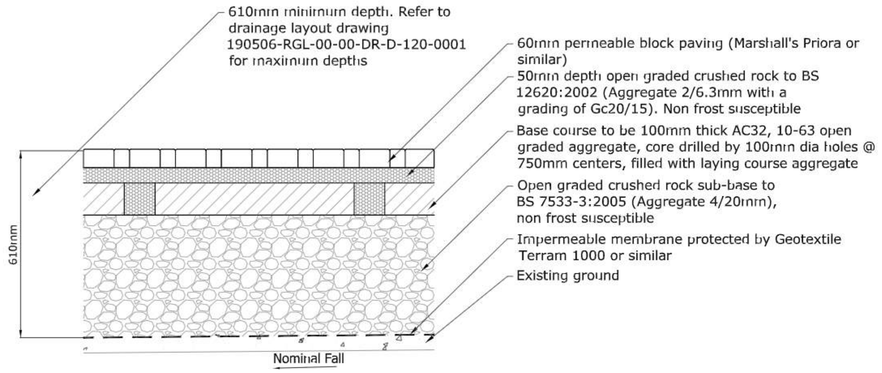
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)
FS0729-HYD-XX-ZZ-DR-C-7103

REVISION
C01



TYPICAL HYDROBRAKE CHAMBER

SCALE 1:20

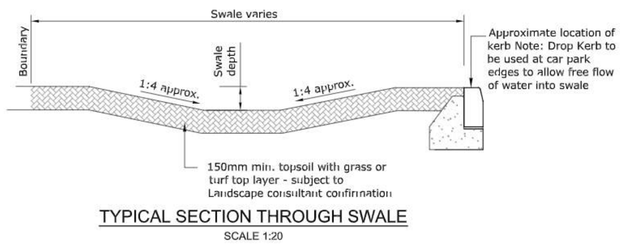


PRIVATE POROUS BLOCK PAVING DETAIL

SCALE 1:20

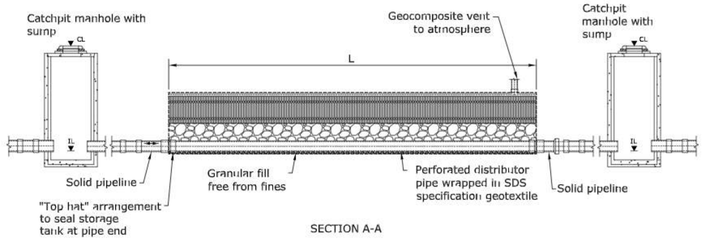
Note:

1. Sub-base to fall at a gradient of no flatter than 1:1000 towards the outfall

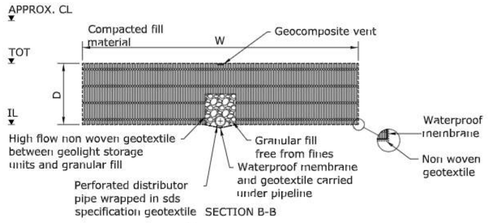


TYPICAL SECTION THROUGH SWALE

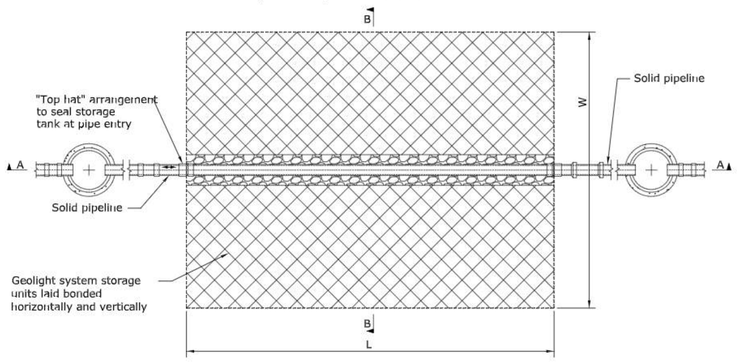
SCALE 1:20



SECTION A-A



SECTION B-B



TYPICAL SDS STORAGE TANK

SCALE 1:20

(or similar approved)
Refer to drainage plan for tank sizes

KEY PLAN

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PROJECT

GRAND UNION VILLAGE

TITLE

FOUL AND SURFACE DRAINAGE
STANDARD DETAILS SHEET 4

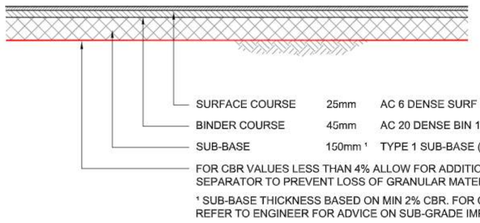
HYDROCK PROJECT NO.	SCALE @ A1
C-17016-C	AS SHOWN

STATUS DESCRIPTION	STATUS
CONSTRUCTION RECORD	CR

DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
FS0729-HYD-XX-ZZ-DR-C-7104	C01

PAVEMENT BUILD-UPS ARE SUBJECT TO IN-SITU CBR TESTS AT SUB-GRADE LEVEL

(REFER TO SITE INVESTIGATION FOR GROUND CONDITIONS)

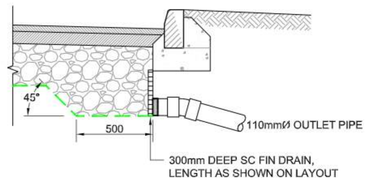


¹ SUB-BASE THICKNESS BASED ON MIN 2% CBR. FOR CBR VALUES BELOW 2% REFER TO ENGINEER FOR ADVICE ON SUB-GRADE IMPROVEMENT MEASURES.

INCREASE SUB-BASE TO 300mm IN MEWP ZONE (SUBJECT TO LOADING) AREA TO BE CONFIRMED

TYPE A1: ASPHALT PAVING FOOTWAY CONSTRUCTION
(Pedestrian loading only)

SCALE 1:20



TYPICAL FIN DRAIN OUTLET DETAIL
SCALE 1:20

PAVEMENT BUILD-UPS ARE SUBJECT TO IN-SITU CBR TESTS AT SUB-GRADE LEVEL

(REFER TO SITE INVESTIGATION FOR GROUND CONDITIONS)

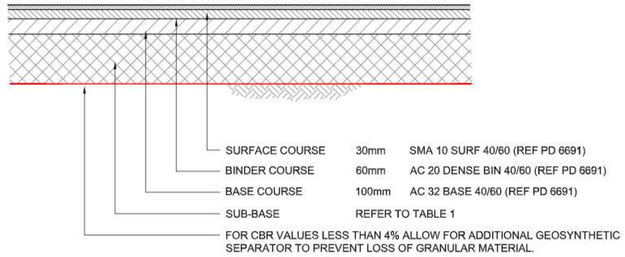


Table 1 : Minimum Sub-base Thickness

California Bearing Ratio (CBR) Values	MINIMUM THICKNESS (mm) OF SUB-BASE (Consolidated in accordance with HCHW Volume 1 clause 801, table 8/1)
LESS THAN 2.5%	N/A ¹
2.5%	350
3%	300
4%	250
5%	225
10%	175
15%	150
GREATER THAN 15%	150 ²

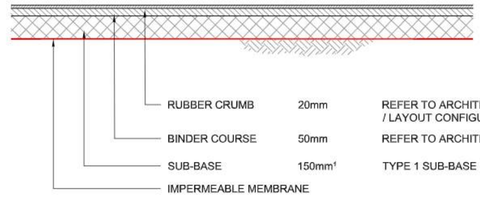
¹ For all pavements on subgrades with CBR values below 2.5%, 150mm of sub-base on a varying thickness of capping must be used. Refer to engineer for advise.
² The minimum depth of Type 1 material is 150mm.

TYPE A3: ASPHALT PAVING CONSTRUCTION
(Cars, Light Vehicles & Occasional Heavy Goods Vehicles)

SCALE 1:20

PAVEMENT BUILD-UPS ARE SUBJECT TO IN-SITU CBR TESTS AT SUB-GRADE LEVEL

(REFER TO SITE INVESTIGATION FOR GROUND CONDITIONS)



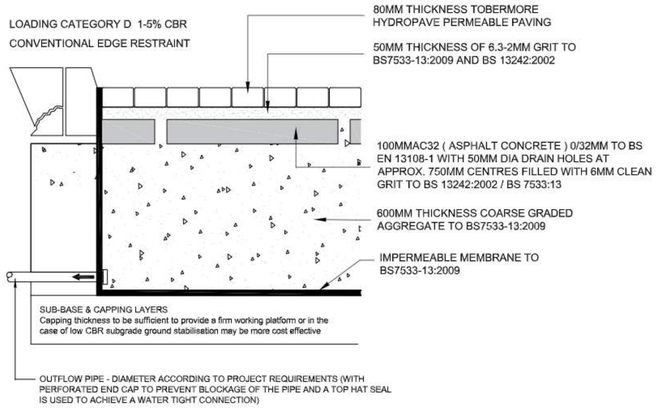
¹ SUB-BASE THICKNESS BASED ON MIN 2% CBR. FOR CBR VALUES BELOW 2% REFER TO ENGINEER FOR ADVICE ON SUB-GRADE IMPROVEMENT MEASURES.

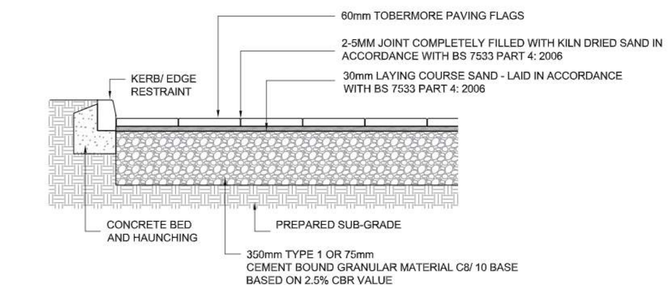
TYPE RC1: RUBBER CRUMB FOOTWAY CONSTRUCTION
(Pedestrian loading only)

SCALE 1:20

DISCLAIMER:

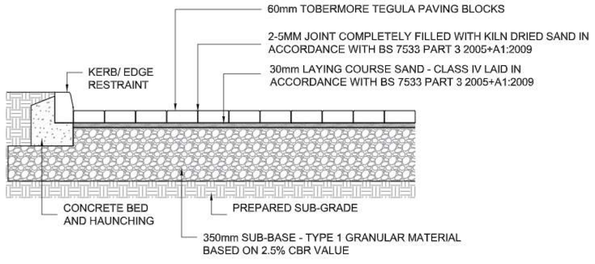
- THESE DESIGN CROSS-SECTIONS AND SUGGESTED BUILD-UPS ARE PROVIDED FOR ILLUSTRATION ONLY AND ARE INTENDED TO DEPICT AN IDEALISED SITUATION.
- IN ALL INSTANCES, LOCAL DESIGN SOLUTIONS ARE PREFERRED AND SHOULD BE CHECKED TO ENSURE SUITABILITY WITH GROUND CONDITIONS AND PLANNED TRAFFIC USAGE.
- REFER TO BS 7533 PART 13 FOR DEPTHS OF CAPPING LAYERS.
- ALL REFERENCES ARE TO LATEST EDITION OF BS 7533. TOBERMORE CAN PROVIDE A PROJECT SPECIFIC SOLUTION IF REQUIRED.





TYPE P-F1: TOBERMORE BEAUFORT FLAG PAVING
(Pedestrian loading only)

SCALE 1:20

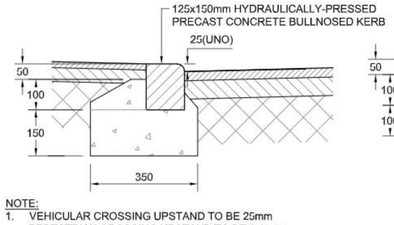


TYPE P-B1: TOBERMORE TEGULA BLOCK PAVING
(Pedestrian loading only)

SCALE 1:20

TYPE P-B3 (P): TOBERMORE HYDROPAVE PEDESTRA
(LOADING CATEGORY D)

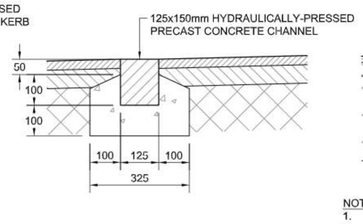
SCALE 1:20



NOTE:
1. VEHICULAR CROSSING UPSTAND TO BE 25mm
   PEDESTRIAN CROSSING UPSTAND TO BE 0-6mm

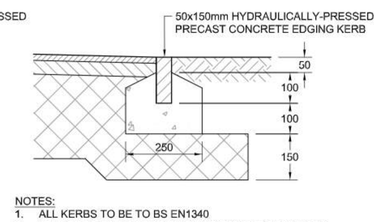
BULL NOSE KERB DETAIL
(BN 25mm AND BN FLUSH)

SCALE 1:10



CHANNEL BLOCK KERB DETAIL
(CS2)

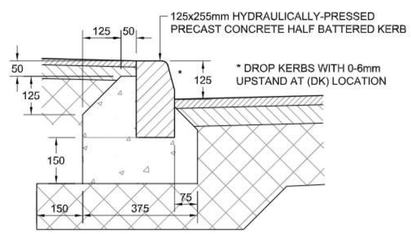
SCALE 1:10



NOTES:
1. ALL KERBS TO BE TO BS EN1340
2. ALL KERBS TO BE BEDDED ON CONCRETE GRADE ST4
3. ALL KERBS TO BE BACKED WITH CONCRETE GRADE ST1

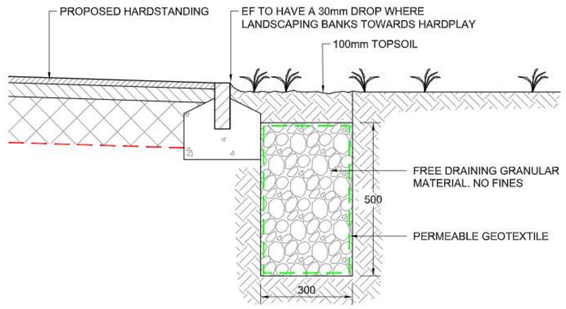
FOOTWAY EDGING DETAIL
(EF)

SCALE 1:10



HALF BATTERED KERB DETAIL
(HB2)

SCALE 1:10



TOPSOIL COVERED GRAVEL FILTER DRAIN DETAIL
SCALE 1:10

KEY PLAN

NOTE FOR HEALTH AND SAFETY FILE ISSUE:
This drawing has been updated for the Health & Safety file based upon information confirmed by the Contractor. Actual construction may vary where Hydrock have not been informed of variations. Civils information to be read in conjunction with all specialist sub-contractor information that may superseded Hydrock civils information.

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. The DWG file is issued for the purposes of coordination only and do not represent formal drawing issue and are not to be reprinted in any form. Formal issue of drawings is via DWF, Adobe PDF files and/or hard copies and their associated information issue sheets.
3. Note that all care has been taken with the export of DWG files and their content, but we recommend that you make due dimensional checks before using any DWG file information. Any errors found are to be reported to Hydrock immediately.
4. CBR values in accordance with SI report. contractor to inform engineer of any soft spots during construction.
5. In the event of any contradiction between this drawing and the specification, then the contractor shall seek clarification from the engineer before proceeding.
6. All in-situ concrete and precast concrete components to be manufactured using sulphate resisting portland cement (srpc) to BS 4027, if required, subject to soil conditions.
7. Refer to landscape architects drawings for extent of external surfaces and kerbing.
8. Drainage trenches within traffic areas and footways or in areas to be adopted shall be backfilled using granular type 1 material up to the road formation level.
9. Old drainage or service trenches to be excavated are to remove soft or degraded material and backfilled with specified granular sub-base material.
10. Subgrade variation: if material appears to vary from anticipated conditions, or if there are extensive soft spots, test subgrade CBR to BS 1377-4 OR BS 1377-9.
11. Soft or damaged areas to be excavated and replaced with sub-base material, compacted in layers 300 mm (maximum) thick.
12. Final excavation to formation / subformation level to be carried before compaction of subgrade.
13. Excavation or compaction not to be carried out in wet conditions whan the subgrade may be damaged or destabilized.
14. Compact thoroughly by roller or other suitable means, adequate to resist subsidence or deformation of the subgrade during construction and of the completed roads / pavings.
15. Particular care to be taken when compacting fully at intrusions, perimeters and where local excavation or backfilling has taken place.
16. Subgrade improvement layer (capping) to Highways Agency 'Specification For Highway Works', Table 6/1, Placed and compacted to Highways Agency 'Specification For Highway Works', Table 6/1, Clauses 612 and 613.3, 613.8, 613.9, 613.10 and 613.13.
17. Depth of frost susceptible material below final surface of paving to be (minimum) 450mm.
18. Do not place fill on frozen surfaces. remove material affected by frost. Replace and re-compact if not damaged after thawing.
19. Subgrades and sub-base should be protected to prevent degradation by construction traffic, construction operations and inclement weather.
20. Type 1 unbound mixture for sub-base to Highways Agency 'Specification For Highway Works', Clause 801 and 803.
21. Type 1 to be spread and levelled in 150 mm maximum layers, each layer thoroughly compacted.
22. At drainage fittings, inspection covers, perimeters and where local excavation and backfilling has taken place particular care should be taken to ensure material is fully compacted.

REV						
C04	CONSTRUCTION RECORD					
	R.COGBILL	04.05.23	M.STEWART	04.05.23	J.MAGEE	04.05.23
C03	LOADING NOTE REVISED					
	J.SHIMMIN	30/03/22	M.STEWART	30/03/22	J.MAGEE	30/03/22
C02	EXTERNAL DETAILS UPDATED TO SUIT LATEST LANDSCAPE ARCHITECTS LAYOUT					
	J.SHIMMIN	18/03/22	M.STEWART	18/03/22	J.MAGEE	18/03/22
C01	CONSTRUCTION ISSUE					
	J.SHIMMIN	26.01.22	M.STEWART	26.01.22	J.MAGEE	26.01.22
P01	DRAFT STAGE 4 ISSUE					
	J.SHIMMIN	13.05.21	D. GALLIMORE	13.05.21	J. ZYLINSKI	13.05.21
	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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e: bristolcentral@hydrock.com

CLIENT
ISG

PROJECT
GRAND UNION VILLAGE

TITLE
ROAD AND FOOTPATH CONSTRUCTION DETAILS SHEET 1

HYDROCK PROJECT NO.
C-17016-C

SCALE @ A1
AS SHOWN

STATUS DESCRIPTION
CONSTRUCTION RECORD

STATUS
CR

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)
FS0729-HYD-XX-ZZ-DR-C-7300

REVISION
C04

APPENDIX 2

Photographs of the completed sustainable drainage

systems throughout the construction process;

Week 5 Photos

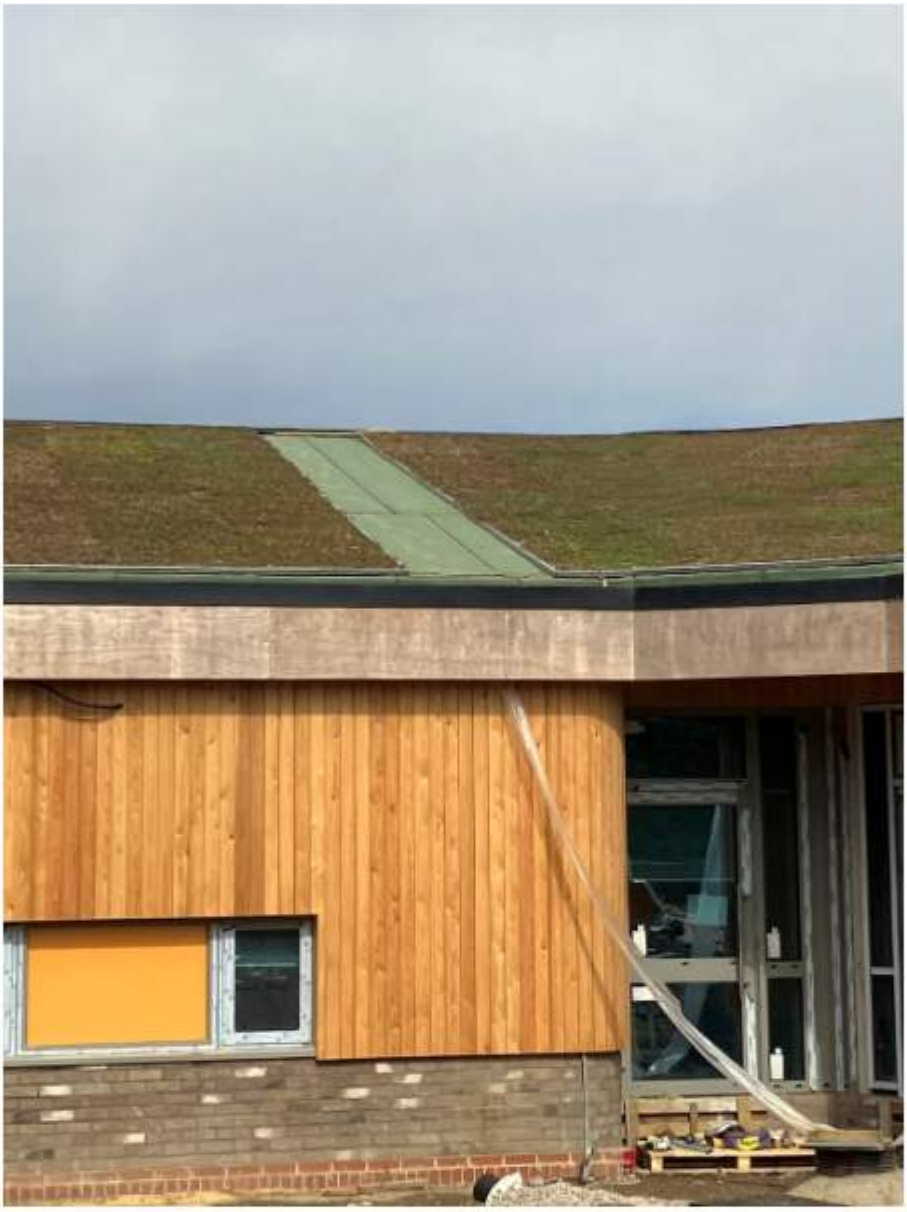
Week 6 Photos

Week 8 Photos

Week 9 Photos

Week 10 Photos

Green Roof Photos



Drainage and Manhole Photos

APPENDIX 3

Any relevant certificates from manufacturers/suppliers of any drainage features; and

Drainage Check Sheets

HARRINGTONS BUILDERS PLC

HBPLC-FM-QA-152 - Drainage Check Sheet

Form Reference	F1.1365883
Owned By	Gerti Qamili (Harringtons Builders)
Date	16/06/2022 09:44:48
Status	Closed
Project Name	369 - Grand Union Village
Project Reference	369
Location	369 - Grand Union Village

Date of Inspection	16/06/2022
Location	369 - Grand Union Village
Inspected By	Gerti Qamili

Document Name	Type	Created By	Date
Location Mark Up.png	Unknown	Gerti Qamili (Harringtons Builders)	16/06/2022 09:46:35

Drawing Ref	FS0729-HYD-XX-ZZ-DR-C-7010
Specification Ref	C01

Pre-Construction Phase
A.Ensure all relevant risk assessments and method statements are approved and operatives briefed.
B.Check all relevant designs/drawings are approved and operatives working to latest revisions.
C.Check that all materials used are approved and have been stored in accordance with manufacturers guidelines.
D.Ensure all required permits are issued to carry out the works, such as: Permit to load, permit to dig etc.

Construction Phase

Pipe Run Location (Mh to Mh)	Foul Man hole 6-5

Phase A (Excavation & Pipe Install)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Excavation level	Yes		Gerti Qamili	16/06/2022
2	Trench width	Yes	600	Gerti Qamili	16/06/2022
3	Pipe diameter/Type	Yes	PVC 100mm	Gerti Qamili	16/06/2022
4	Pipe Connections/Joints	Yes		Gerti Qamili	16/06/2022
5	Bed Type	Yes	Shingles	Gerti Qamili	16/06/2022
6	Surround Type	Yes	Shingles	Gerti Qamili	16/06/2022
7	Line and Level	Yes		Gerti Qamili	16/06/2022
8	Identification/Warning Tape	No		Gerti Qamili	16/06/2022
9	Interim Pipe Test	Yes		Gerti Qamili	16/06/2022

Images

#3

16/06/2022 09:47:06

Phase A Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 16/06/2022 09:46:03	16/06/2022	

HARRINGTONS BUILDERS PLC

#	Check Item	Signature	Date	Comment
2	Client Sign-off	C.Taylor (ISG) 16/06/2022 14:17:19		

Phase B (Backfill & Reinstatement)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Backfill Material	Yes	Crush	Gerti Qamili	16/06/2022
2	Backfilling/Reinstatement	Yes		Gerti Qamili	16/06/2022
3	Compaction	Yes		Gerti Qamili	16/06/2022
4	Final Pipe Test	Yes		Gerti Qamili	16/06/2022
5	Other	No		Gerti Qamili	16/06/2022

Final Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 16/06/2022 09:46:18	16/06/2022	
2	Client Sign-off	C.Taylor (ISG) 16/06/2022 14:17:22		

Post-Construction
1. Ensure all pipes are clean and clear or any construction debris.
2.Issue handover certificate to the client once all post-construction activities are completed, (as-built survey, CCTV survey, snagging and NCR close-out).

Comments

Third Party Sign-Off (Optional)

#	Check Item	Signature	Date	Comment
1	Third Party Sign-Off			

HARRINGTONS BUILDERS PLC

HBPLC-FM-QA-157 - Manhole Check Sheet

Form Reference	F1.1396349
Owned By	Gerti Qamili (Harringtons Builders)
Date	01/07/2022 09:16:32
Status	Closed
Project Name	369 - Grand Union Village
Project Reference	369
Location	369 - Grand Union Village

Date of Inspection	01/07/2022
Location	369 - Grand Union Village
Inspected By	Gerti Qamili

Document Name	Type	Created By	Date
Location Mark Up.png	Unknown	Gerti Qamili (Harringtons Builders)	01/07/2022 09:22:49

Drawing Ref	FS0729-HYD-XX-ZZ-DR-7010
Specification Ref	C02

Pre-Construction Phase
A.Ensure all relevant risk assessments and method statements are approved and operatives briefed.
B.Check all relevant designs/drawings are approved and operatives working to latest revisions.
C.Check that all materials used are approved and have been stored in accordance with manufacturers guidelines.
D.Ensure all required permits are issued to carry out the works, such as: Permit to load, permit to dig etc.

Construction Phase

Manhole Ref:	Man hole 13

Phase A (Manhole Install)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Manhole Type	Yes		Gerti Qamili	01/07/2022
2	Manhole Size:	Yes	1200mm	Gerti Qamili	01/07/2022
3	Pipe Inlets:	Yes		Gerti Qamili	01/07/2022
4	Pipe Outlets	Yes		Gerti Qamili	01/07/2022
5	Step Irons in correct orientation	No		Gerti Qamili	01/07/2022

Images

#2

01/07/2022 09:24:48

Phase A Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 01/07/2022 09:19:04	01/07/2022	
2	Client Sign-off	C.Taylor (ISG) 04/07/2022 08:02:39		

HARRINGTONS BUILDERS PLC

Phase B (Backfill & Reinstatement)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Surround Type:	Yes	GEN3 Concrete	Gerti Qamili	01/07/2022
2	Cover Type / Level / Orientation	Yes	D400	Gerti Qamili	01/07/2022
3	Benching (if applicable)	Yes		Gerti Qamili	01/07/2022
4	Backfill Material	Yes	As Dug	Gerti Qamili	01/07/2022
5	Compaction	Yes		Gerti Qamili	01/07/2022
6	Backfilling / Reinstatement as per design	Yes		Gerti Qamili	01/07/2022
7	Final Testing	Yes		Gerti Qamili	01/07/2022
8	Other:	No		Gerti Qamili	01/07/2022

Final Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 01/07/2022 09:19:35	01/07/2022	
2	Client Sign-off	C.Taylor (ISG) 04/07/2022 08:02:43		

Post-Construction
1. Ensure all manholesare clean and clear or any construction debris.
2.Issue handover certificate to the client once all post-construction activities are completed, (as-built survey, CCTV survey, snagging and NCR close-out).

Comments

Third Party Sign-Off (Optional)

#	Check Item	Signature	Date	Comment
1	Third Party Sign-Off			

HARRINGTONS BUILDERS PLC

HBPLC-FM-QA-152 - Drainage Check Sheet

Form Reference	F1.1365891
Owned By	Gerti Qamili (Harringtons Builders)
Date	16/06/2022 09:47:25
Status	Closed
Project Name	369 - Grand Union Village
Project Reference	369
Location	369 - Grand Union Village

Date of Inspection	16/06/2022
Location	369 - Grand Union Village
Inspected By	Gerti Qamili

Document Name	Type	Created By	Date
Location Mark Up.png	Unknown	Gerti Qamili (Harringtons Builders)	16/06/2022 09:50:04

Drawing Ref	FS0729-HYD-XX-ZZ-DR-C-7010
Specification Ref	C01

Pre-Construction Phase
A.Ensure all relevant risk assessments and method statements are approved and operatives briefed.
B.Check all relevant designs/drawings are approved and operatives working to latest revisions.
C.Check that all materials used are approved and have been stored in accordance with manufacturers guidelines.
D.Ensure all required permits are issued to carry out the works, such as: Permit to load, permit to dig etc.

Construction Phase

Pipe Run Location (Mh to Mh)	Foul Man hole 5-4

Phase A (Excavation & Pipe Install)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Excavation level	Yes		Gerti Qamili	16/06/2022
2	Trench width	Yes	600	Gerti Qamili	16/06/2022
3	Pipe diameter/Type	Yes	PVC 100mm	Gerti Qamili	16/06/2022
4	Pipe Connections/Joints	Yes		Gerti Qamili	16/06/2022
5	Bed Type	Yes	Shingles	Gerti Qamili	16/06/2022
6	Surround Type	Yes	Shingles	Gerti Qamili	16/06/2022
7	Line and Level	Yes		Gerti Qamili	16/06/2022
8	Identification/Warning Tape	No		Gerti Qamili	16/06/2022
9	Interim Pipe Test	Yes		Gerti Qamili	16/06/2022

Images

#3

16/06/2022 09:49:38

Phase A Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 16/06/2022 09:48:09	16/06/2022	

HARRINGTONS BUILDERS PLC

#	Check Item	Signature	Date	Comment
2	Client Sign-off	C.Taylor (ISG) 04/07/2022 08:24:46		

Phase B (Backfill & Reinstatement)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Backfill Material	Yes	Crush	Gerti Qamili	16/06/2022
2	Backfilling/Reinstatement	Yes		Gerti Qamili	16/06/2022
3	Compaction	Yes		Gerti Qamili	16/06/2022
4	Final Pipe Test	Yes		Gerti Qamili	16/06/2022
5	Other	No		Gerti Qamili	16/06/2022

Final Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 20/06/2022 13:12:20		
2	Client Sign-off	C.Taylor (ISG) 04/07/2022 08:24:48		

Post-Construction
1. Ensure all pipes are clean and clear or any construction debris.
2.Issue handover certificate to the client once all post-construction activities are completed, (as-built survey, CCTV survey, snagging and NCR close-out).

Comments

Third Party Sign-Off (Optional)

#	Check Item	Signature	Date	Comment
1	Third Party Sign-Off			

HARRINGTONS BUILDERS PLC

HBPLC-FM-QA-152 - Drainage Check Sheet

Form Reference	F1.1365959
Owned By	Gerti Qamili (Harringtons Builders)
Date	16/06/2022 10:04:19
Status	Closed
Project Name	369 - Grand Union Village
Project Reference	369
Location	369 - Grand Union Village

Date of Inspection	16/06/2022
Location	369 - Grand Union Village
Inspected By	Gerti Qamili

Document Name	Type	Created By	Date
Location Mark Up.png	Unknown	Gerti Qamili (Harringtons Builders)	16/06/2022 10:05:59

Drawing Ref	FS0729-HYD-XX-ZZ-DR-C-7010
Specification Ref	C01

Pre-Construction Phase
A.Ensure all relevant risk assessments and method statements are approved and operatives briefed.
B.Check all relevant designs/drawings are approved and operatives working to latest revisions.
C.Check that all materials used are approved and have been stored in accordance with manufacturers guidelines.
D.Ensure all required permits are issued to carry out the works, such as: Permit to load, permit to dig etc.

Construction Phase

Pipe Run Location (Mh to Mh)	Foul Man hole 18

Phase A (Excavation & Pipe Install)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Excavation level	Yes		Gerti Qamili	16/06/2022
2	Trench width	Yes	600	Gerti Qamili	16/06/2022
3	Pipe diameter/Type	Yes	PVC 100mm	Gerti Qamili	16/06/2022
4	Pipe Connections/Joints	Yes		Gerti Qamili	16/06/2022
5	Bed Type	Yes	GEN3 Concrete	Gerti Qamili	16/06/2022
6	Surround Type	Yes	GEN3 Concrete	Gerti Qamili	16/06/2022
7	Line and Level	Yes		Gerti Qamili	16/06/2022
8	Identification/Warning Tape	No		Gerti Qamili	16/06/2022
9	Interim Pipe Test	Yes		Gerti Qamili	16/06/2022

Images

#3

16/06/2022 10:07:03

Phase A Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 16/06/2022 10:06:34	16/06/2022	

HARRINGTONS BUILDERS PLC

#	Check Item	Signature	Date	Comment
2	Client Sign-off	C.Taylor (ISG) 04/07/2022 08:24:26		

Phase B (Backfill & Reinstatement)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Backfill Material	Yes	Crush	Gerti Qamili	16/06/2022
2	Backfilling/Reinstatement	Yes		Gerti Qamili	16/06/2022
3	Compaction	Yes		Gerti Qamili	16/06/2022
4	Final Pipe Test	Yes		Gerti Qamili	16/06/2022
5	Other	No		Gerti Qamili	16/06/2022

Final Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 16/06/2022 10:06:51	16/06/2022	
2	Client Sign-off	C.Taylor (ISG) 04/07/2022 08:24:30		

Post-Construction
1. Ensure all pipes are clean and clear or any construction debris.
2.Issue handover certificate to the client once all post-construction activities are completed, (as-built survey, CCTV survey, snagging and NCR close-out).

Comments

Third Party Sign-Off (Optional)

#	Check Item	Signature	Date	Comment
1	Third Party Sign-Off			

HARRINGTONS BUILDERS PLC

HBPLC-FM-QA-152 - Drainage Check Sheet

Form Reference	F1.1411097
Owned By	Gerti Qamili (Harringtons Builders)
Date	08/07/2022 09:56:39
Status	Closed
Project Name	369 - Grand Union Village
Project Reference	369
Location	369 - Grand Union Village

Date of Inspection	08/07/2022
Location	369 - Grand Union Village
Inspected By	Gerti Qamili

Document Name	Type	Created By	Date
Location Mark Up.png	Unknown	Gerti Qamili (Harringtons Builders)	08/07/2022 10:04:57

Drawing Ref	FS0729-HYD-XX-ZZ-DR-C-7010
Specification Ref	C01

Pre-Construction Phase
A.Ensure all relevant risk assessments and method statements are approved and operatives briefed.
B.Check all relevant designs/drawings are approved and operatives working to latest revisions.
C.Check that all materials used are approved and have been stored in accordance with manufacturers guidelines.
D.Ensure all required permits are issued to carry out the works, such as: Permit to load, permit to dig etc.

Construction Phase

Pipe Run Location (Mh to Mh)	Storm Man hole Run 13-12

Phase A (Excavation & Pipe Install)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Excavation level	Yes		Gerti Qamili	08/07/2022
2	Trench width	Yes	600	Gerti Qamili	08/07/2022
3	Pipe diameter/Type	Yes	300mm	Gerti Qamili	08/07/2022
4	Pipe Connections/Joints	Yes		Gerti Qamili	08/07/2022
5	Bed Type	Yes	Shingle	Gerti Qamili	08/07/2022
6	Surround Type	Yes	Shingle	Gerti Qamili	08/07/2022
7	Line and Level	Yes		Gerti Qamili	08/07/2022
8	Identification/Warning Tape	No		Gerti Qamili	08/07/2022
9	Interim Pipe Test	Yes		Gerti Qamili	08/07/2022

Images

#3

08/07/2022 10:05:12

Phase A Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 08/07/2022 10:02:12	08/07/2022	

HARRINGTONS BUILDERS PLC

#	Check Item	Signature	Date	Comment
2	Client Sign-off	C.Taylor (ISG) 15/07/2022 09:37:53		

Phase B (Backfill & Reinstatement)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Backfill Material	Yes	Crush	Gerti Qamili	08/07/2022
2	Backfilling/Reinstatement	Yes		Gerti Qamili	08/07/2022
3	Compaction	Yes		Gerti Qamili	08/07/2022
4	Final Pipe Test	Yes		Gerti Qamili	08/07/2022
5	Other	No		Gerti Qamili	08/07/2022

Final Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 08/07/2022 10:04:20	08/07/2022	
2	Client Sign-off	C.Taylor (ISG) 15/07/2022 10:09:52		

Post-Construction
1. Ensure all pipes are clean and clear or any construction debris.
2.Issue handover certificate to the client once all post-construction activities are completed, (as-built survey, CCTV survey, snagging and NCR close-out).

Comments

Third Party Sign-Off (Optional)

#	Check Item	Signature	Date	Comment
1	Third Party Sign-Off			

HARRINGTONS BUILDERS PLC

HBPLC-FM-QA-152 - Drainage Check Sheet

Form Reference	F1.1411152
Owned By	Gerti Qamili (Harringtons Builders)
Date	08/07/2022 10:11:38
Status	Closed
Project Name	369 - Grand Union Village
Project Reference	369
Location	369 - Grand Union Village

Date of Inspection	08/07/2022
Location	369 - Grand Union Village
Inspected By	Gerti Qamili

Document Name	Type	Created By	Date
Location Mark Up.png	Unknown	Gerti Qamili (Harringtons Builders)	08/07/2022 10:12:30

Drawing Ref	FS0729-HYD-XX-ZZ-DR-C-7010
Specification Ref	C01

Pre-Construction Phase
A.Ensure all relevant risk assessments and method statements are approved and operatives briefed.
B.Check all relevant designs/drawings are approved and operatives working to latest revisions.
C.Check that all materials used are approved and have been stored in accordance with manufacturers guidelines.
D.Ensure all required permits are issued to carry out the works, such as: Permit to load, permit to dig etc.

Construction Phase

Pipe Run Location (Mh to Mh)	Land Drainage Man Hole 14

Phase A (Excavation & Pipe Install)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Excavation level	Yes		Gerti Qamili	08/07/2022
2	Trench width	Yes	600	Gerti Qamili	08/07/2022
3	Pipe diameter/Type	Yes	300mm	Gerti Qamili	08/07/2022
4	Pipe Connections/Joints	Yes		Gerti Qamili	08/07/2022
5	Bed Type	Yes	Shingle	Gerti Qamili	08/07/2022
6	Surround Type	Yes	Shingle	Gerti Qamili	08/07/2022
7	Line and Level	Yes		Gerti Qamili	08/07/2022
8	Identification/Warning Tape	No		Gerti Qamili	08/07/2022
9	Interim Pipe Test	Yes		Gerti Qamili	08/07/2022

Images

#3

08/07/2022 10:14:31

Phase A Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 08/07/2022 10:13:14	08/07/2022	

HARRINGTONS BUILDERS PLC

#	Check Item	Signature	Date	Comment
2	Client Sign-off	C.Taylor (ISG) 15/07/2022 09:37:34		

Phase B (Backfill & Reinstatement)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Backfill Material	Yes	Crush	Gerti Qamili	08/07/2022
2	Backfilling/Reinstatement	Yes		Gerti Qamili	08/07/2022
3	Compaction	Yes		Gerti Qamili	08/07/2022
4	Final Pipe Test	Yes		Gerti Qamili	08/07/2022
5	Other	Yes	Membrane Geoxtile installed	Gerti Qamili	08/07/2022

Final Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 15/07/2022 09:48:56		
2	Client Sign-off	C.Taylor (ISG) 15/07/2022 10:09:31		

Post-Construction
1. Ensure all pipes are clean and clear or any construction debris.
2.Issue handover certificate to the client once all post-construction activities are completed, (as-built survey, CCTV survey, snagging and NCR close-out).

Comments

Third Party Sign-Off (Optional)

#	Check Item	Signature	Date	Comment
1	Third Party Sign-Off			

Attenuation/Soakaway Check Sheet

HARRINGTONS BUILDERS PLC

HBPLC-FM-QA-150 - Attenuation & Soakaway Check Sheet

Form Reference	F1.1355337
Owned By	Gerti Qamili (Harringtons Builders)
Date	10/06/2022 12:18:45
Status	Closed
Project Name	369 - Grand Union Village
Project Reference	369
Location	369 - Grand Union Village

Date of Inspection	10/06/2022
Location	369 - Grand Union Village
Inspected By	Gerti Qamili

Document Name	Type	Created By	Date
E255720_01_A - ATT1 - Grand Union Village SEND School - Construction.pdf	Pdf	Gerti Qamili (Harringtons Builders)	10/06/2022 12:42:30

Drawing Ref	E255720_01_A - ATT1 - Grand Union Village SEND School - Construction
Specification Ref	

Pre-Construction Phase
A.Ensure all relevant risk assessments and method statements are approved and operatives briefed.
B.Check all relevant designs/drawings are approved and operatives working to latest revisions.
C.Check that all materials used are approved and have been stored in accordance with manufacturers guidelines.
D.Ensure all required permits are issued to carry out the works, such as: Permit to load, permit to dig etc.

Construction Phase

Phase A (Excavation & Installation)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Line and Level	Yes		Gerti Qamili	01/03/2022
2	Excavation	Yes		Gerti Qamili	01/03/2022
3	Temporary Works (If Applicable)	No		Gerti Qamili	01/03/2022
4	Bedding Type	Yes	Primary shingles 10mm	Gerti Qamili	01/03/2022
5	Install Geotextile	Yes		Gerti Qamili	01/03/2022
6	Membrane Type	Yes	Geomembrane	Gerti Qamili	01/03/2022
7	Install Tank Units	Yes		Gerti Qamili	01/03/2022
8	Pipe Diameter/Type:	Yes	300	Gerti Qamili	01/03/2022
9	Geomembrane Welding Check	Yes		Gerti Qamili	01/03/2022

Images

#6

10/06/2022 12:23:45

10/06/2022 12:23:47

Phase A Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 10/06/2022 12:20:15	01/03/2022	

HARRINGTONS BUILDERS PLC

#	Check Item	Signature	Date	Comment
2	Client Sign-off	 C.Taylor (ISG) 10/06/2022 12:54:10	10/06/2022	

Phase B (Surround & Backfill)

#	Check Item	Completed	Comment	Inspected By:	Date
1	Surround	Yes	Primary shingles	Gerti Qamili	01/03/2022
2	Vent Pipes Installation	Yes		Gerti Qamili	01/03/2022
3	Backfill Material	No		Gerti Qamili	01/03/2022
4	Backfilling / Reinstatement as per design	No		Gerti Qamili	01/03/2022

Final Sign-Off

#	Check Item	Signature	Date	Comment
1	HBPLC Sign-off	G.Qamili (Harringtons Builders) 10/06/2022 12:20:34	01/03/2022	
2	Client Sign-off	 C.Taylor (ISG) 10/06/2022 12:54:17	10/06/2022	

Post-Construction
Ensure all handover documentation and sign-offs have been compiled and issued to client

Comments

Third Party Sign-Off (Optional)

#	Check Item	Signature	Date	Comment
1	Third Party Sign-Off			

Document Name	Type	Created By	Date
01 GEOlight Brochure.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:46:58
04 GSE Ultraflex Smooth GEOmembrane Datasheet.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:02
06 Bontect NW Datasheet.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:08
100-22-DI Grand Union Village Send School O&M.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:12
300mm Carrier Pipe.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:15
E255720_01_A - ATT1 - Grand Union Village SEND School - Construction.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:26
GEOlight 750mm - 500mm Datasheet.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:32
SDS GEOlight Maintenance.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:36
Sign Off.pdf	Pdf	Gerti Qamili (Harringtons Builders)	01/07/2022 08:47:39

Green Roof Test and Classification Reports

BRE Global Test Report

CEN/TS 1187: 2012 Test 4 External fire exposure to roofs test (sloping) on Bauder BTGRS + XF301, 60mm PIR,18mm OSB3

Prepared for: Bauder Ltd

Date: Issue 1: 22 November 2022

Report Number: P123972-1000 **Test date: 13 September 2022**

BRE Global Ltd
Watford, Herts
WD25 9XX

Customer Services 0333 321 8811

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Prepared for:

Bauder Ltd
70 Landseer Road
Ipswich
IP3 0DH
UK

UKAS TESTING
0578

Prepared by

Name P Potter

Position Senior Technician

Signature 

Authorised by

Name J Hunter

Position Section Leader, Reaction to Fire

Date 22 November 2022

Signature 

bre

Table of Contents

1 Objective

To test the sample described in Section 2 according to its capacity to resist penetration by fire, using the external fire exposure to roofs test (sloping) specified in CEN/TS 1187: 2012 Test 4[1].

2 Sample

2.1 Traceability

The test samples were supplied by the client. BRE Global were not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market. The results apply to the sample as received.

2.2 Description of sample and test format.

Unless otherwise stated all measurements are nominal.

Test Sponsor	Bauder, 70 Landseer Road, Ipswich, IP3 0DH
Manufacturer of sample	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Sample name/reference	BauderGREEN XF 301
Place of manufacture	Germany
Sample description (as provided by test sponsor/manufacturer)	BTGRS System: 2 layers of bituminous membrane 1.5mm (+2mm fleece) fleece- backed PVC membrane, 60 mm insulation A full definition of the product tested, as supplied by the test sponsor is included in Appendix A.
Description of sample (as received by BRE Global)	1. Sedum layer of approx. 25-50mm on a soil/gravel bed, on a grey non-woven fabric blanket of thickness 0.5-0.6mm. 2. Black bitumen type membrane with a green granular coating. Thickness approx. 5mm. 3. Attached to (2)- a second bitumen type membrane measuring 600 x 200mm, fixing a row of 12 vertical metal spikes 25mm high. 4. Black bitumen type membrane with blue patterned facing applied beneath (2) and onto 4 sides. Thickness 2.6-3.3mm. 5. Rigid off-white insulation foam, 60mm thick, foil faced. 6. Black bituminous VCL, 2 to 3 mm thick 7. OSB base, 18mm thick

	Photographs of the sample are included in Appendix B.
Sample receipt date	10 August and 01 September 2022
Test face	Sedum face
Test format	The test was carried out in the sloping (45°) position
Date of test	13 September 2022
Purchase order	N/A
Test operator	P Potter

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3 Conditioning

The specimens were conditioned as required by the standard.

4 Results

4.1 Preliminary ignition test

Specimen reference	Joint	Ambient	Flame spread mm	Flame duration min:sec	Penetration min:sec
E14362-4	Insulation layered both pairs	22.2°C 55.1%RH	0	1:02	None

4.2 Penetration test

Specimen reference	Joint	Ambient	Penetration min:sec	Observations
E14362-3	Membrane layer, overlap approx. 100mm; sedum layer – butt joints; OSB butt joint; insulation – central butt joint	22.2°C 54.8%RH	None	Ignited on application of pilot flame at 5mins. Flames out at 7:46mins.
E14362-2	Insulation – central butt joint	22.3°C 55.8%RH	None	Ignited on application of pilot flame at 5mins. Flames out at 6:59mins.
E14362-1	Insulation – central butt joint	22.1°C 59.3%RH	None	Ignited on application of pilot flame at 5mins. Flames out at 6:54mins.

4.3 Observations

No dripping of material occurred from the underside of any specimen tested, nor was any mechanical failure, or development of holes, observed.

5 Conclusion

CEN/TS 1187: 2012 does not contain acceptance criteria and therefore this test report does not indicate a pass or fail of the product.

6 Validity

This test report does not represent type approval or certification of the product.

The information in section 2.2 and Appendix A of this report, other than that indicated otherwise, has been supplied by the test sponsor and has not been independently verified by BRE Global. The validity of the results is conditional on the accuracy of that data.

Because of the nature of reaction to fire testing and the consequent difficulty in quantifying the uncertainty of measurement of reaction to fire, it is not possible to provide a stated degree of accuracy of the results.

7 Reference

1 CEN/TS 1187: 2012. Test methods for external fire exposure to roofs. Test 4 – Method with two stages incorporating burning brands, wind and supplementary radiant heat. CEN, Avenue Marnlx 17, B-1000, Brussels, Belgium.

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Appendix A Product description provided by the test sponsor

PRODUCT DEFINITION

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Product reference/number	BauderGREEN XF 301
General description of roofing product tested and build up	BTGRS System: 2 layers of bituminous membrane (1.5mm (+2mm fleece) Fleece-Backed PVC membrane
Manufacturer of the roofing product (Company name and address)	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Place of manufacture	As above
Test specimens assembled by (if not by roof product manufacturer)	Bauder UK
Thickness (overall depth of roof structure tested)	100mm
Mass per unit area (overall value for the roof structure tested)	46kg per 0.7056m2
Flame retardant treatment added, or organic content limited during production (yes/no), if yes give details	As listed below.
Harmonised EN product standard, and AVCP System No. if applicable	No
Please describe the roof build up, layer by layer, starting with the upper roof surface. Please add or remove rows as required.	
Test face (Layer 1) - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	XF301 Sedum Blanket Bauder UK Ltd Vegetation blanket 28mm 19.76 kg per 0.7056m2 Green/Red Loose laid on to retention strip to secure Lap over moisture layer N/A

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Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich		
Product name of roof covering tested		Bauder BTGRS + XF301
Layer 2	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Retention Strip Bauder GmbH Retention Strip 2mm Stainless Steel angle Note 1 Silver Fixed with 200mm strip of Plant E Capping Sheet N/A N/A
Layer 3	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Plant E Bauder GmbH Capping Sheet 5.2mm 6 Kg/m2 Green Torch on Overlapped Note 1
Layer 4	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSA Duo Bauder GmbH Underlayer 3mm 3.5 Kg/m2 Black Self-adhered Overlapped Note 1
Layer 5	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	PIR FA-TE Insulation Bauder GmbH PIR Insulation (aluminium foil facing) 60mm 5.50kg per 0.7056m2 White Adhered with PU insulation adhesive Adhered no overlap, butt jointed TEP, ca. 2.5%

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Layer 6 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSD Mica Bauder GmbH Self-adhesive Air and Vapour Control Layer 2.5mm 2.5 Kg/m2 Black Self-adhesive 80mm Overlap Note 1
Layer 7 (eg "deck"or "substrate") - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	OSB3 Deck board Unknown Oriented Strand Board 18mm 8.06kg per 0.7056m2 Brown n/a n/a None

Note 1: This information was not provided by the test sponsor.

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Appendix B Photographs of the test specimens

Figure 1: Test face

Figure 2: Edge cut away examined post test

Figure 3: OSB base

Figure 4: Test specimen before application of sedum layer and side boards, showing retention strip

Report Ends

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BRE Global Classification Report

Classification report for roofs/roof coverings exposed to external fire (sloping) in accordance with EN 13501-5: 2016 on Bauder BTGRS + XF301, 60mm PIR, 18mm OSB3

Prepared for: Bauder Ltd

Date: Issue 1: 22 November 2022

Report Number: P123972-1001 **Test date: 13 September 2022**

BRE Global Ltd
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Prepared for:

Bauder Ltd
70 Landseer Road
Ipswich
IP3 0DH
UK

Prepared by

Name P Potter

Position Senior Technician

Signature 

Authorised by

Name J Hunter

Position Section Leader, Reaction to Fire

Date 22 November 2022

Signature 

bre

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BRE Global

EXTERNAL EXPOSURE TO FIRE CLASSIFICATION (sloping) REPORT OF

Bauder BTGRS + XF301, 60mm PIR, 18mm OSB3

Classification report No.:	P123972-1001
Issue number:	1
Sponsor:	Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH
Product name:	Bauder BTGRS + XF301
Prepared by:	BRE Global Ltd., Bucknalls Lane, Garston, Watford, WD25 9XX, England.
Approved Body Number	0832
Date of issue:	22 November 2022

This classification report consists of 14 pages and may only be used or reproduced in its entirety.

1 Introduction

This classification report defines the classification (sloping) assigned to roof/roof covering Bauder BTGRS + XF301, 60mm PIR in accordance with the procedures given in EN 13501-5: 2016.

2 Sample

2.1 Traceability

The test samples were supplied by the client. BRE Global were not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market. The results apply to the sample as received.

2.2 Description of the roof/roof covering

Unless otherwise stated all measurements are nominal.

Test Sponsor	Bauder, 70 Landseer Road, Ipswich, IP3 0DH
Manufacturer of sample	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Sample name/reference	BauderGREEN XF 301
Place of manufacture	Germany
Sample description (as provided by test sponsor/manufacturer)	BTGRS System: 2 layers of bituminous membrane 1.5mm (+2mm fleece) fleece- backed PVC membrane A full definition of the product tested, as supplied by the test sponsor is included in Appendix A.
Description of sample (as received by BRE Global)	1. Sedum layer of approx. 25-50mm on a soil/gravel bed, on a grey non-woven fabric blanket of thickness 0.5-0.6mm. 2. Black bitumen type membrane with a green granular coating. Thickness approx. 5mm. 3. Attached to (2)- a second bitumen type membrane measuring 600 x 200mm, fixing a row of 12 vertical metal spikes 25mm high. 4. Black bitumen type with blue patterned facing applied beneath (2) and onto 4 sides. Thickness 2.6-3.3mm. 5. Rigid off-white insulation foam, 60mm thick, foil faced. 6. Black bituminous VCL, 2 to 3 mm thick 7. OSB base, 18mm thick

	Photographs of the sample are included in Appendix B.
Sample receipt date	10 August and 01 September 2022
Test face	Sedum face
Test format	The test was carried out in the sloping (45°) position
Date of test	13 September 2022
Purchase order	N/A
Test operator	P Potter

3 Reports in support of classification

Name of Laboratory	Name of sponsor	Test report ref. no.	Test method
BRE Global	Bauder Ltd	P123972-1000	CEN/TS 1187: 2012 Test 4

4 Test results in support of classification

4.1 Test conditions:

Test pitch: Sloping

Deck: As product description, Section 2

Supporting structure: As product description, Section 2

4.2 Preliminary test (stage 1)

Parameter	Criteria				Test result	Compliance			
	Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)		Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)
Burn time	< 5 min	< 5 min	< 5 min	≥5 min	62 sec	Y	-	-	-
Flame spread distance	< 0,38m	< 0,38m	< 0,38m	No limit	0 mm	Y	-	-	-
Penetration	None	None	None	None	None	Y	-	-	-

4.3 Penetration test (stage 2)

Parameter	Criteria				Test results				Compliance			
	Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)	Specimen 1	Specimen 2	Specimen 3	Mean*	Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)
Penetration time	≥ 60 min	< 60 min ≥ 30 min	<30 min	< 30 min	≥ 60 min	≥ 60 min	≥ 60 min	60 min	Y	-	-	-
* If one or two of the specimens have not failed at one hour, a time of 60 min shall be used in calculating the mean time of penetration												

5 Classification and field of application

5.1 Reference of classification

This classification has been carried out in accordance with EN 13501-5: 2016.

5.2 Classification

The roof / roof covering Bauder BTGRS + XF301, 60mm PIR as described in Section 2 above and Appendix A, in relation to its external fire performance is classified:

B_{ROOF}(t4)

5.3 Field of application

This classification is valid for the following conditions:

Range of pitches	10° < pitch ≤ 70°
Substrate / deck	Deck 18 mm OSB. As tested, no variation allowed
Supporting structure	As tested, no variation allowed
Product configuration	As tested, no variation allowed
Product composition	As tested, no variation allowed
Product application method	As tested, no variation allowed
Product thickness	As tested, no variation allowed
Product colour	As tested, no variation allowed
Joints	As tested, no variation allowed

6 Limitations

This classification document does not represent type approval or certification of the product.

The information in section 2.2 and Appendix A of this report, other than that indicated otherwise, has been supplied by the test sponsor and has not been independently verified by BRE Global. The validity of the results is conditional on the accuracy of that data.

7 Reference

1 EN 13501-5: 2016 Fire classification of construction products and building elements – Part 5: Classification using data from external fire exposure to roofs tests. CEN, Avenue Marnlx 17, B-1000, Brussels, Belgium. 2016.

2 CEN/TS 1187: 2012 Test methods for external fire exposure to roofs. Test 4 – Two stage method incorporating burning brands, wind and supplementary radiant heat. CEN, Avenue Marnlx 17, B-1000, Brussels, Belgium. 2012.

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Appendix A Product description provided by the test sponsor

PRODUCT DEFINITION

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Product reference/number	BauderGREEN XF 301
General description of roofing product tested and build up	BTGRS System: 2 layers of bituminous membrane (1.5mm (+2mm fleece) Fleece-Backed PVC membrane
Manufacturer of the roofing product (Company name and address)	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Place of manufacture	As above
Test specimens assembled by (if not by roof product manufacturer)	Bauder UK
Thickness (overall depth of roof structure tested)	100mm
Mass per unit area (overall value for the roof structure tested)	46kg per 0.7056m2
Flame retardant treatment added, or organic content limited during production (yes/no), if yes give details	As listed below.
Harmonised EN product standard, and AVCP System No. if applicable	No
Please describe the roof build up, layer by layer, starting with the upper roof surface. Please add or remove rows as required.	
Test face (Layer 1) - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	XF301 Sedum Blanket Bauder UK Ltd Vegetation blanket 28mm 19.76 kg per 0.7056m2 Green/Red Loose laid on to retention strip to secure Lap over moisture layer N/A

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich		
Product name of roof covering tested		Bauder BTGRS + XF301
Layer 2	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Retention Strip Bauder GmbH Retention Strip 2mm Stainless Steel angle Note 1 Silver Fixed with 200mm strip of Plant E Capping Sheet N/A N/A
Layer 3	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Plant E Bauder GmbH Capping Sheet 5.2mm 6 Kg/m2 Green Torch on Overlapped Note 1
Layer 4	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSA Duo Bauder GmbH Underlayer 3mm 3.5 Kg/m2 Black Self-adhered Overlapped Note 1
Layer 5	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	PIR FA-TE Insulation Bauder GmbH PIR Insulation (aluminium foil facing) 60mm 5.50kg per 0.7056m2 White Adhered with PU insulation adhesive Adhered no overlap, butt jointed TEP, ca. 2.5%

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich		
Product name of roof covering tested		Bauder BTGRS + XF301
Layer 6	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSD Mica Bauder GmbH Self-adhesive Air and Vapour Control Layer 2.5mm 2.5 Kg/m2 Black Self-adhesive 80mm Overlap Note 1
Layer 7 (eg "deck"or "substrate")	- Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	OSB3 Deck board Unknown Oriented Strand Board 18mm 8.06kg per 0.7056m2 Brown n/a n/a None

Note 1: This information was not provided by the test sponsor.

bre

Appendix B Photographs of a test specimen

Figure 1: Test face

Figure 2: Edge cut away examined post test

Figure 3: OSB base

Figure 4: Test specimen before application of sedum layer and side boards, showing retention strip

Report Ends

BRE Global Test Report

CEN/TS 1187: 2012 Test 4 External fire exposure to roofs test (sloping) on Bauder BTGRS + XF301, 220mm Insulation, 18mm OSB

Prepared for: Bauder Ltd
Date: Issue 1: 22 November 2022
Report Number: P123972-1002 **Test date: 26 September 2022**

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Prepared for:

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Ipswich
IP3 0DH
UK

UKAS TESTING
0578

bre

Prepared by

Name P Potter

Position Senior Technician

Signature 

Authorised by

Name J Hunter

Position Section Leader, Reaction to Fire

Date 22 November 2022

Signature 

bre

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1 Objective

To test the sample described in Section 2 according to its capacity to resist penetration by fire, using the external fire exposure to roofs test (sloping) specified in CEN/TS 1187: 2012 Test 4[1].

2 Sample

2.1 Traceability

The test samples were supplied by the client. BRE Global were not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market. The results apply to the sample as received.

2.2 Description of sample and test format.

Unless otherwise stated all measurements are nominal.

Test Sponsor	Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH
Manufacturer of sample	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Sample name/reference	BauderGREEN XF 301
Place of manufacture	Germany
Sample description (as provided by test sponsor/manufacturer)	BTGRS System: 2 layers of bituminous membrane (1.5mm (+2mm fleece) Fleece-Backed PVC membrane, 220 mm insulation A full definition of the product tested, as supplied by the test sponsor is included in Appendix A.
Description of sample (as received by BRE Global)	1. Sedum layer approx. 25-50mm thick on soil/gravel bed, on a grey non-woven fabric blanket approx. 0.5-0.6mm thick 2. Black bitumen type membrane with a green granular coating approx. 5mm thick. 3. Attached to (2) a second bitumen type membrane measuring 600 x 200mm fixing a row of 12 vertical metal spikes (retention strip) - 25mm in height 4. Black bitumen type layer with a blue patterned facing applied beneath layer (2) and on to 4 sides. Thickness 2.7-3.2mm 5. Two layers of foil faced off-white rigid foam, upper layer being 60mm thick and lower layer 160mm thick 6. Black bitumen type VCL – 2-3mm thick

	7. OSB base – 18mm thick Photographs of the sample are included in Appendix B.
Sample receipt date	10 August and 14 September
Test face	Sedum face
Test format	The test was carried out in the sloping (45°) position
Date of test	26 September 2022
Purchase order	N/A
Test operator	P Potter

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3 Conditioning

The specimens were conditioned as required by the standard.

4 Results

4.1 Preliminary ignition test

Specimen reference	Joint	Ambient	Flame spread mm	Flame duration min:sec	Penetration min:sec
E14362-3	OSB-Centralised butt joint;insulation – one butt joint placed at 260/600mm from edge	18.8°C 57.5%RH	0	1:00	None

4.2 Penetration test

Specimen reference	Joint	Ambient	Penetration min:sec	Observations
E14362-1	OSB-Centralised butt joint; Membrane 90mm overlap; insulation – one butt joint placed at 260/600mm from edge	18.8°C 56.5%RH	None	Ignited on application of pilot flame at 5mins. Flaming ceased at 6:07mins
E14362-2	OSB-Centralised butt joint;insulation – one butt joint placed at 260/600mm from edge	19.1°C 57.4%RH	None	Ignited on application of pilot flame at 5mins. Flaming ceased at 5:48mins
E14362-4	OSB-Centralised butt joint;insulation – one butt joint placed at 260/600mm from edge	19.4°C 57.7%RH	None	Ignited on application of pilot flame at 5mins. Flaming ceased at 6:22mins

4.3 Observations

No dripping of material occurred from the underside of any specimen tested, nor was any mechanical failure, or development of holes, observed.

5 Conclusion

CEN/TS 1187: 2012 does not contain acceptance criteria and therefore this test report does not indicate a pass or fail of the product.

6 Validity

This test report does not represent type approval or certification of the product.

The information in section 2.2 and Appendix A of this report, other than that indicated otherwise, has been supplied by the test sponsor and has not been independently verified by BRE Global. The validity of the results is conditional on the accuracy of that data.

Because of the nature of reaction to fire testing and the consequent difficulty in quantifying the uncertainty of measurement of reaction to fire, it is not possible to provide a stated degree of accuracy of the results.

7 Reference

1 CEN/TS 1187: 2012. Test methods for external fire exposure to roofs. Test 4 – Method with two stages incorporating burning brands, wind and supplementary radiant heat. CEN, Avenue Marnlx 17, B-1000, Brussels, Belgium.

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Appendix A Product description provided by the test sponsor

PRODUCT DEFINITION

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Product reference/number	BauderGREEN XF 301
General description of roofing product tested and build up	BTGRS System: 2 layers of bituminous membrane (1.5mm (+2mm fleece) Fleece-Backed PVC membrane
Manufacturer of the roofing product (Company name and address)	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Place of manufacture	As above
Test specimens assembled by (if not by roof product manufacturer)	Bauder UK
Thickness (overall depth of roof structure tested)	274mm
Mass per unit area (overall value for the roof structure tested)	44kg per 0.7056m2
Flame retardant treatment added, or organic content limited during production (yes/no), if yes give details	As listed below.
Harmonised EN product standard, and AVCP System No. if applicable	No
Please describe the roof build up, layer by layer, starting with the upper roof surface. Please add or remove rows as required.	
Test face (Layer 1) - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	XF301 Sedum Blanket Bauder UK Ltd Vegetation blanket 28mm 19.76 kg per 0.7056m2 Green/Red Loose laid on to retention strip to secure Lap over moisture layer N/A

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Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Layer 2 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Retention Strip Bauder GmbH Retention Strip 2mm Stainless Steel angle Silver Fixed with 200mm strip of Plant E Capping Sheet N/A N/A
Layer 3 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Plant E Bauder GmbH Capping Sheet 5.2mm 6 Kg/m2 Green Torch on Overlapped
Layer 4 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSA Duo Bauder GmbH Underlayer 3mm 3.5 Kg/m2 Black Self-adhered Overlapped
Layer 5 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	PIR FA-TE Insulation Bauder GmbH PIR Insulation (aluminium foil facing) 220mm (60mm + 120 mm) 5.40kg per 0.7056m2 White Adhered with PU insulation adhesive Adhered no overlap, butt jointed TEP, ca. 2.5%

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Layer 6 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSD Mica Bauder GmbH Self-adhesive Air and Vapour Control Layer 2.5mm 2.5 Kg/m2 Black Self-adhesive 80mm Overlap
Layer 7 (eg "deck"or "substrate") - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	OSB3 Deck board Unknown Oriented Strand Board 18mm 8.06kg per 0.7056m2 Brown n/a n/a None

Note 1: This information was not provided by the test sponsor.

Note 2: At the request of the test sponsor this commercially sensitive information which forms part of the definition of the product tested/classified has been withheld from the report and is held on a confidential client file by BRE Global.

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Appendix B Photographs of the test specimens

Figure 1: Test face

Figure 2: Green granular coating with metal spikes

Figure 3: Base

Report Ends

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BRE Global Classification Report

Classification report for roofs/roof coverings exposed to external fire (sloping) in accordance with EN 13501-5: 2016 on Bauder BTGRS + XF301, 220mm Insulation, 18mm OSB

Prepared for: Bauder Ltd

Date: Issue 1: 22 November 2022

Report Number: P123972-1003 **Test date: 26 September 2022**

BRE Global Ltd
Watford, Herts
WD25 9XX

Customer Services 0333 321 8811

From outside the UK:
T + 44 (0) 1923 664000
F + 44 (0) 1923 664010
E enquiries@bre.co.uk
www.bre.co.uk

Prepared for:

Bauder Ltd
70 Landseer Road
Ipswich
IP3 0DH
UK

Prepared by

Name P Potter

Position Senior Technician

Signature 

Authorised by

Name J Hunter

Position Section Leader, Reaction to Fire

Date 22 November 2022

Signature 

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BRE Global

EXTERNAL EXPOSURE TO FIRE CLASSIFICATION (sloping) REPORT OF

Bauder BTGRS + XF301, 220mm insulation, 18mm OSB

Classification report No.:	P123972-1003
Issue number:	1
Sponsor:	Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH
Product name:	Bauder BTGRS + XF301, 260mm PIR
Prepared by:	BRE Global Ltd., Bucknalls Lane, Garston, Watford, WD25 9XX, England.
Approved Body Number	0832
Date of issue:	22 November 2022

This classification report consists of 13 pages and may only be used or reproduced in its entirety.

1 Introduction

This classification report defines the classification (sloping) assigned to roof/roof covering Bauder BTGRS +XF301, 220mm insulation in accordance with the procedures given in EN 13501-5: 2016.

2 Sample

2.1 Traceability

The test samples were supplied by the client. BRE Global were not involved in the sample selection process and therefore cannot comment upon the relationship between samples supplied for test and the product supplied to market. The results apply to the sample as received.

2.2 Description of the roof/roof covering

Unless otherwise stated all measurements are nominal.

Test Sponsor	Bauder Ltd, 70 Landseer Road, Ipswich, IP3 0DH
Manufacturer of sample	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Sample name/reference	BauderGREEN XF 301
Place of manufacture	Germany
Sample description (as provided by test sponsor/manufacturer)	BTGRS System: 2 layers of bituminous membrane (1.5mm (+2mm fleece) Fleece-Backed PVC membrane, 220 mm insulation A full definition of the product tested, as supplied by the test sponsor is included in Appendix A.
Description of sample (as received by BRE Global)	1. Sedum layer approx. 25-50mm thick on soil/gravel bed, on a grey non-woven fabric blanket approx. 0.5-0.6mm thick 2. Black bitumen type membrane with a green granular coating approx. 5mm thick. 3. Attached to (2) a second bitumen type membrane measuring 600 x 200mm fixing a row of 12 vertical metal spikes (retention strip) - 25mm in height 4. Black bitumen type layer with a blue patterned facing applied beneath layer (2) and on to 4 sides. Thickness 2.7-3.2mm 5. Two layers of foil faced off-white rigid foam, upper layer being 60mm thick and lower layer 160mm thick 6. Black bitumen type VCL – 2-3mm thick

	7. OSB base – 18mm thick Photographs of the sample are included in Appendix B.
Sample receipt date	10 August and 14 September
Test face	Sedum face
Test format	The test was carried out in the sloping (45°) position
Date of test	26 September 2022
Purchase order	N/A
Test operator	P Potter

3 Reports in support of classification

Name of Laboratory	Name of sponsor	Test report ref. no.	Test method
BRE Global	Bauder Ltd	P123972-1002	CEN/TS 1187: 2012 Test 4

4 Test results in support of classification

4.1 Test conditions:

Test pitch: Sloping

Deck: As product description, Section 2

Supporting structure: As product description, Section 2

4.2 Preliminary test (stage 1)

Parameter	Criteria				Test result	Compliance			
	Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)		Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)
Burn time	< 5 min	< 5 min	< 5 min	≥5 min	60 sec	Y	-	-	-
Flame spread distance	< 0,38m	< 0,38m	< 0,38m	No limit	0 mm	Y	-	-	-
Penetration	None	None	None	None	None	Y	-	-	-

4.3 Penetration test (stage 2)

Parameter	Criteria				Test results				Compliance			
	Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)	Specimen 1	Specimen 2	Specimen 3	Mean*	Class B_{ROOF}(t4)	Class C_{ROOF}(t4)	Class D_{ROOF}(t4)	Class E_{ROOF}(t4)
Penetration time	≥ 60 min	< 60 min ≥ 30 min	<30 min	< 30 min	≥ 60 min	≥ 60 min	≥ 60 min	60 min	Y	-	-	-
* If one or two of the specimens have not failed at one hour, a time of 60 min shall be used in calculating the mean time of penetration												

5 Classification and field of application

5.1 Reference of classification

This classification has been carried out in accordance with EN 13501-5: 2016.

5.2 Classification

The roof / roof covering Bauder BTGRS +XF301, 220mm insulation, as described in Section 2 above and Appendix A, in relation to its external fire performance is classified:

B_{ROOF}(t4)

5.3 Field of application

This classification is valid for the following conditions:

Range of pitches	10° < pitch ≤ 70°
Substrate / deck	Deck 18 mm OSB. As tested, no variation allowed
Supporting structure	As tested, no variation allowed
Product configuration	As tested, no variation allowed
Product composition	As tested, no variation allowed
Product application method	As tested, no variation allowed
Product thickness	As tested, no variation allowed
Product colour	As tested, no variation allowed
Joints	As tested, no variation allowed

6 Limitations

This classification document does not represent type approval or certification of the product.

The information in section 2.2 and Appendix A of this report, other than that indicated otherwise, has been supplied by the test sponsor and has not been independently verified by BRE Global. The validity of the results is conditional on the accuracy of that data.

7 Reference

1 EN 13501-5: 2016 Fire classification of construction products and building elements – Part 5: Classification using data from external fire exposure to roofs tests. CEN, Avenue Marnlx 17, B-1000, Brussels, Belgium. 2016.

2 CEN/TS 1187: 2012 Test methods for external fire exposure to roofs. Test 4 – Two stage method incorporating burning brands, wind and supplementary radiant heat. CEN, Avenue Marnlx 17, B-1000, Brussels, Belgium. 2012.

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Appendix A Product description provided by the test sponsor

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Product reference/number	BauderGREEN XF 301
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Manufacturer of the roofing product (Company name and address)	Paul Bauder GmbH Dresdener Str. 80, 02994 Bernsdorf, Germany
Place of manufacture	As above
Test specimens assembled by (if not by roof product manufacturer)	Bauder UK
Thickness (overall depth of roof structure tested)	274mm
Mass per unit area (overall value for the roof structure tested)	44kg per 0.7056m2
Flame retardant treatment added, or organic content limited during production (yes/no), if yes give details	As listed below.
Harmonised EN product standard, and AVCP System No. if applicable	No
Please describe the roof build up, layer by layer, starting with the upper roof surface. Please add or remove rows as required.	
Test face (Layer 1) - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	XF301 Sedum Blanket Bauder UK Ltd Vegetation blanket 28mm 19.76 kg per 0.7056m2 Green/Red Loose laid on to retention strip to secure Lap over moisture layer N/A

Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Layer 2 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Retention Strip Bauder GmbH Retention Strip 2mm Stainless Steel angle Silver Fixed with 200mm strip of Plant E Capping Sheet N/A N/A
Layer 3 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	Plant E Bauder GmbH Capping Sheet 5.2mm 6 Kg/m2 Green Torch on Overlapped
Layer 4 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSA Duo Bauder GmbH Underlayer 3mm 3.5 Kg/m2 Black Self-adhered Overlapped
Layer 5 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	PIR FA-TE Insulation Bauder GmbH PIR Insulation (aluminium foil facing) 220mm (60mm + 120 mm) 5.40kg per 0.7056m2 White Adhered with PU insulation adhesive Adhered no overlap, butt jointed TEP, ca. 2.5%

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Test sponsor (Company name and address): Bauder, 70 Landseer Rd Ipswich	
Product name of roof covering tested	Bauder BTGRS + XF301
Layer 6 - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	KSD Mica Bauder GmbH Self-adhesive Air and Vapour Control Layer 2.5mm 2.5 Kg/m2 Black Self-adhesive 80mm Overlap
Layer 7 (eg "deck"or "substrate") - Name/reference - Manufacturer - Type - Thickness - Mass per unit area - Colour - Application method - Joint details (fixing method, overlap, etc) - Fire retardant (trade name, generic type, amount)	OSB3 Deck board Unknown Oriented Strand Board 18mm 8.06kg per 0.7056m2 Brown n/a n/a None

Note 1: This information was not provided by the test sponsor.

Note 2: At the request of the test sponsor this commercially sensitive information which forms part of the definition of the product tested/classified has been withheld from the report and is held on a confidential client file by BRE Global.

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Appendix B Photographs of a test specimen

Figure 1: Test face

Figure 2: Green granular coating with metal spikes

Figure 3: Base

Report Ends

APPENDIX 4

A confirmation statement of the above signed by a chartered engineer

SDS Ltd Sign off QA Sheet

ATTENUATION TANK		**ATT:**	1	**DATE:**	4-3-22
SITE:	Grand Union Village Secondary School			**TANK VOLUME:**	390
LOCATION:	Northolt			**DIMENSIONS:**	48-11-0.750
DRAINAGE:	**ATTENUATION**			**JOB NO:**	100-22

SECTION 1 AND 7 TO BE SIGNED BY CLIENTS ENGINEER

CHECK	DATE	COMMENT	SDS	
1. SETTING OUT and FORMATION		**Engineer to sign and date prior to laying of materials**	BH	M W
2. TANK BASE	1	Installed as per manufacturers recommendations	BH	M W
3. EXTERNAL PROTECTIVE COVERINGS:	1	Installed as per manufacturers recommendations	BH	M W
a. Base of Tank	2	Installed as per manufacturers recommendations	BH	M W
b. Vertical sides	2	Installed as per manufacturers recommendations	BH	M N
c. Top of tank	0	Installed as per manufacturers recommendations	BH	M N
4. WELDED GEOMEMBRANE	2	Installed as per manufacturers recommendations	BH	M N
a. Welded joint	1	Installed as per manufacturers recommendations	BH	M N
b. Base of Tank	3	Installed as per manufacturers recommendations	BH	M N
c. Vertical sides	0	Installed as per manufacturers recommendations	BH	M N
d. Top of Tank		Installed as per manufacturers recommendations	BH	M N
5. GEOLIGHT UNITS	1	Installed as per manufacturers recommendations	BH	M N
6. GEOTEXTILE PIPE TRENCH		Installed as per manufacturers recommendations	BH	M N
7. PIPEWORK: mm	4	Installed as per manufacturers recommendations	BH	M N
a. Invert levels		**Engineer to sign and date prior to laying of materials**	**N/A**	M N
b. position		**Engineer to sign and date prior to laying of materials**	**N/A**	M N
c. diameter		**Engineer to sign and date prior to laying of materials**	**N/A**	M N
d. penetrations sealed		Installed as per manufacturers recommendations	BH	M N
8. VENT SYSTEM		Installed as per manufacturers recommendations	BH	M N
9. BACKFILLING				

PLEASE NOTE: Only back fill around pipe after the connection between tank and manhole is complete so that the pipe is not compromised in any way with an open end. Failure to comply may result in the pipe being damaged. It may be necessary to put stone over pipe when filling pipe trench but make sure enough pipe is protruding so that stone is not directly on open end. SDS will not accept responsibility.

In signing this document, you are in agreement that the above work meets your specifications. Please note that changes to any project elements after sign-off may be subject to additional charges.

SUB CONTRACTOR	**SUSTAINABLE DRAINAGE SYSTEMS LTD**	**Signed**	BH
		Printed	Ben Hunt
MAIN CONTRACTOR	Harringtons Builders Plc	**Signed**	M. McNulty
		Printed	Michael McNulty