

JOB NAME	White Oaks Leisure Centre
JOB No.	L2394
DATE	October 2021

# SURFACE WATER DRAINAGE VERIFICATION REPORT

**CONTENTS**

1 VERIFICATION REPORT..... 1

SCHEDULE OF APPENDICES

- APPENDIX A – ARCHITECTURAL INFORMATION
- APPENDIX B – DRAINAGE DRAWINGS
- APPENDIX C – CCTV DRAINAGE REPORTS
- APPENDIX D – SITE PHOTOGRAPHS & ANNOTATED PLAN
- APPENDIX E – PRODUCT DATA SHEETS
- APPENDIX F – SuDS MAINTENANCE SCHEDULE
- APPENDIX F – ASSET RECORD SHEETS

This report has been prepared for the sole benefit, use and information of ISG, for the purposes described and the liability of Furness Partnership Ltd. in respect of the information contained within the report will not extend to any third party.

REVISION	DATE	ISSUE STATUS	PREPARED BY	CHECKED BY
P1	29.10.21	FOR REVIEW	M.H	R.C
P2	08.12.21	FOR REVIEW	M.H	R.C

## 1 VERIFICATION REPORT

- 1.1 The following information demonstrates that the surface water drainage network for phase 1 of the White Oak Leisure Centre development has been installed to comply with the scheme approved under 19/02951/HYB. The following report is based on the information provided by ISG as the main contractor. This includes CCTV survey information, site photographs, manufacturer drawings, and product data sheets.

### *CHANGES FROM DESIGN*

- 1.2 The only significant change from the design that has been approved is the use of a 40mm orifice plate that has been installed in place of a Hydrobrake for the temporary discharge restriction. Photos of the installation can be found in Appendix D. The orifice plate has been designed to restrict the flow rate to 3l/s, as per the original Hydrobrake design, so there is no change in the design philosophy.

# APPENDIX A – ARCHITECTURAL INFORMATION

Service Access Road  
Timber Fence and Gates  
Close Boarded

Stairs  
height 4320mm  
risers 27  
going 350mm  
rise 160mm  
width 2000mm

Pedestrian Pavement  
Textured Flag Paving  
(Marshalls Saxon or E.A.)

**SERVICE ACCESS ROAD**

Service Access Road  
Timber Fence and Gates  
Close Boarded

Incoming Gas and Water Point  
Clear width with bollard  
protection

External Services Compound.  
Grey steel rigid mesh fencing  
and gate. Solid FR board  
protection to final escape  
route. 1m clear gate.

**BOWLS CLUB**

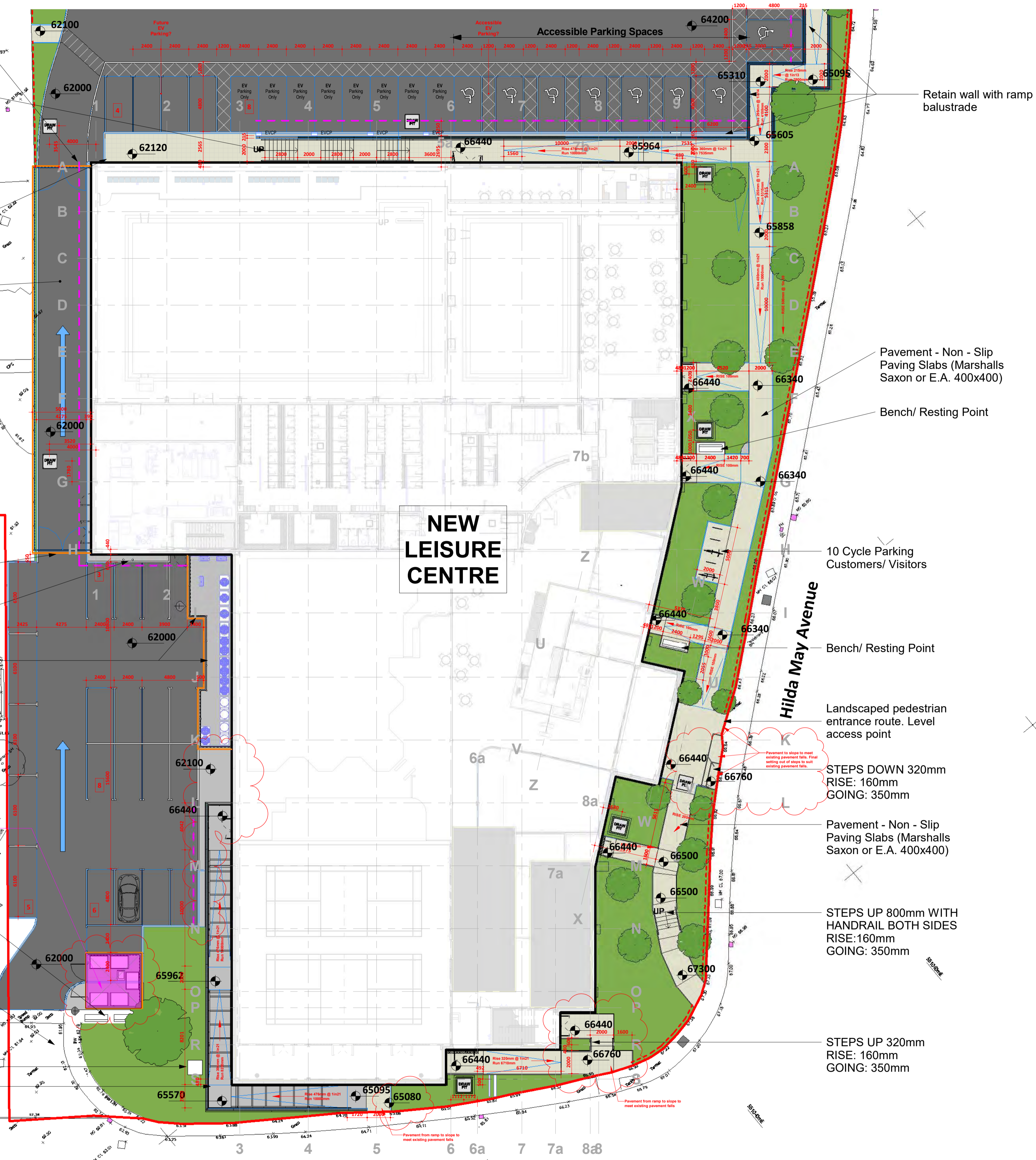
Temporary Bin Compound  
[21 sqm]  
Timber Fence and Gates  
Close Boarded

Benches for staff seating  
BREEAM Hea07

Existing road entrance

Incoming gas kiosk  
External Escape Ramp  
Durbar plate on steel frame

**BOWLS PARKING**  
Standard 22  
**TOTAL 22**



Retain wall with ramp  
balustrade

Pavement - Non - Slip  
Paving Slabs (Marshalls  
Saxon or E.A. 400x400)

Bench/ Resting Point

10 Cycle Parking  
Customers/ Visitors

Bench/ Resting Point

Landscaped pedestrian  
entrance route. Level  
access point

STEPS DOWN 320mm  
RISE: 160mm  
GOING: 350mm

Pavement - Non - Slip  
Paving Slabs (Marshalls  
Saxon or E.A. 400x400)

STEPS UP 800mm WITH  
HANDRAIL BOTH SIDES  
RISE: 160mm  
GOING: 350mm

STEPS UP 320mm  
RISE: 160mm  
GOING: 350mm

Garrolds Close

**1 0513 Site External Works 2of2**  
1 : 200

Drawing Notes  
SAUNDERS BOSTON did not carry out the Structural and MEP designs. SBA included information provided by the CONSULTANTS for coordination purposes ONLY  
Generally, red denotes the indicative Structural layout and light purple the MEP layout.  
Refer to the CONSULTANTS information to confirm scope and design.  
Level 0 from DATUM = +66.240

Scale 1:200

- No. Note
- All dimensions to be verified on site by GENERAL CONTRACTOR prior to any work, setting out or shop drawings being prepared.
  - Drawings not to be scaled. Work to figured dimensions only.
  - © copyright SAUNDERS BOSTON LIMITED. All rights reserved. This drawing remains the property of SAUNDERS BOSTON LIMITED at all times and may not be reproduced or copied in whole or in part without their prior written consent.
  - This drawing and related specifications are for use only in the stated location.
  - This drawing is to be read in conjunction with all other Consultants drawings and specifications.
  - Drainage has not been surveyed and any/all pipe locations and below ground drainage runs are indicative.
  - It is assumed that all works will be carried out by a competent contractor who will be working, where appropriate, to an approved method statement.

**Note**  
**TO BE READ IN CONJUNCTION WITH SBA SITE DRAWINGS 0501 - 0513**

**LEVEL:**  
DATUM LEVEL / GROUND F.F.L. 0 = 66.440m AOD

All footpaths to have precast edging strip between footpath and soft landscaping

External Lighting Layout refer to Electrical Engineer's Drawings

Surface Water Drainage Layout refer to Civil Engineer's Drawings

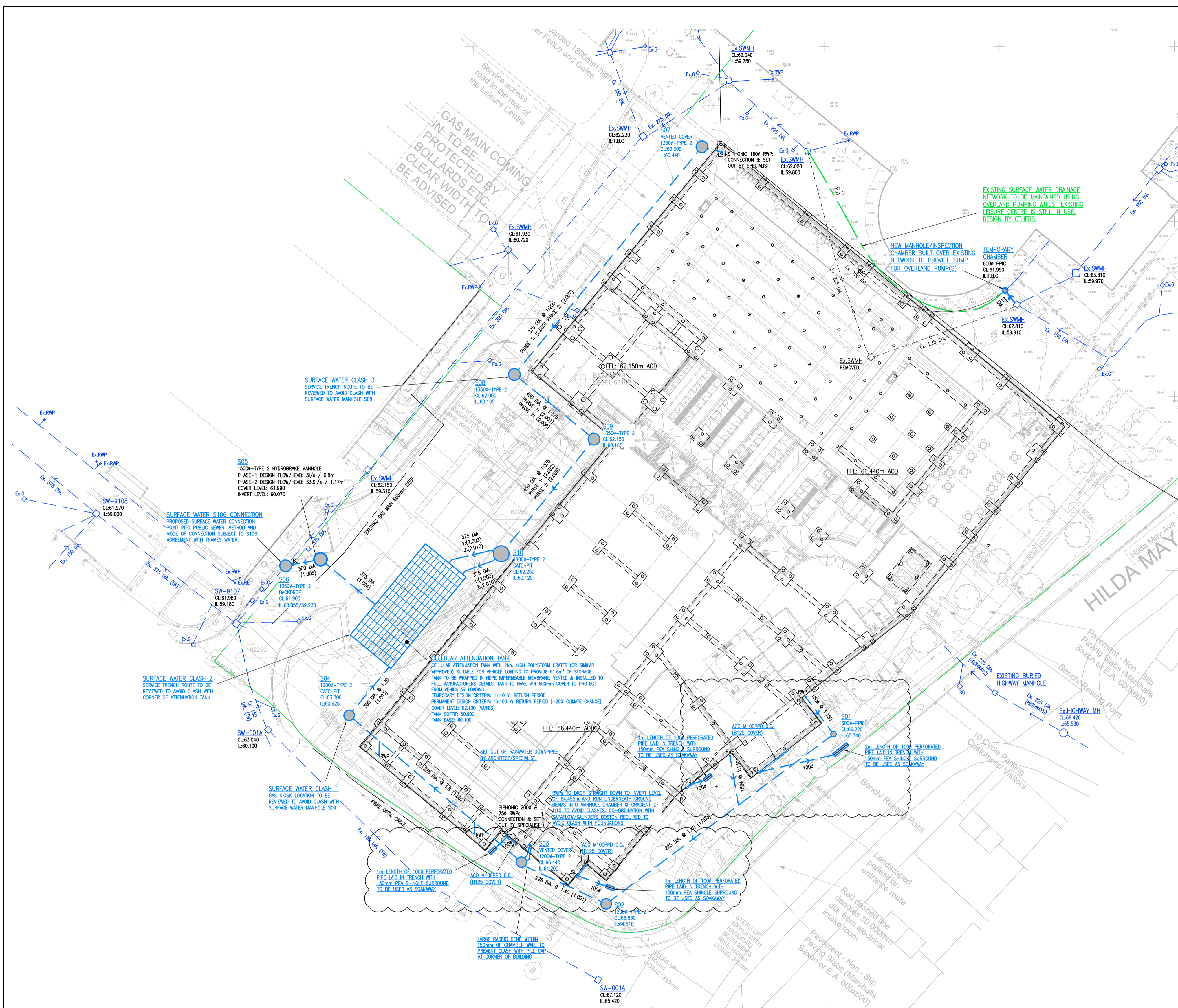
Soft Landscape Layout refer to Landscape Architect's Drawings

- EXTERNAL WORKS LEGEND**
- Tarmac Surfacing (Suitable for heavy duty use)
  - Pavement Non slip paving slabs (Marshalls Saxon or E.A.)
  - Fence Line 1800mm high
  - Site Protection Line: Bollards, post and knee fencing and/or kerbs as required
  - Building Vehicle Protection Line: Parking/manoeuvring areas are within 1m of the building façade and delivery areas or routes are within 2 metres of the façade. Bollards, protection rails and/or double kerbs as required. [BREEAM Mat 05]

C10	Notes and drawings updated to comment.	13/08/21	IB	AT
C9	Updated to comment. Notes and dimensions updated.	16/04/21	IB	AT
C8	General arrangement and setting out updates.	26/02/21	IB	AT
C7	Levels updated to comment.	08/02/21	IB	AT
No.	Revision	Date	Chk	Auth

<p>Eastern Gate House, 119 Newmarket Road, Cambridge CB8 8HA T:01223 367733 office@saundersboston.co.uk</p> <p>The Generator, The Gallery, King's Wharf The Quay, Exeter EX2 4AN T:01392 346627 www.saundersboston.co.uk</p>		Alliance Leisure Services	
		Job White Oak Leisure Centre	
Drawing Site External Works 2of2		Scale As indicated @A1	
SBA Project Code 1689		Drawn TZ	Checked CW
Date 11/08/19		Revision C10	
<p>project originator zone level type role number</p> <p>1689-SBA-XX-XX-DR-A-0513</p>			

## APPENDIX B – DRAINAGE DRAWINGS



**ADDITIONAL DRAINAGE NOTES:**

- LOCATION OF ALL EXISTING DRAINAGE TO BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF WORKS AS IT IS APPROXIMATELY TRANSLATED FROM SURVEY DRAWING.
- ALL DRAINAGE AT MANHOLES/ACCESS CHAMBERS TO CONNECT WITH SOFFITS LEVEL UNLESS OTHERWISE NOTED. MANHOLE INVERT LEVELS SHOWN ON PLAN ARE THAT OF LOWEST OUTGOING PIPE.
- WHERE OBSLIQUE CONNECTIONS ARE NOT POSSIBLE 87.5° CURVED SQUARE BRANCH CONNECTIONS TO BE USED IN DIRECTION OF FLOW OF MAIN LINE.
- ALL DRAINAGE WITHIN 300mm OF UNDERSIDE OF STRUCTURAL SLAB TO HAVE FULL GEN 3 CONCRETE BED AND SURROUND.
- ALL PROPOSED SURFACE WATER DRAINAGE TO BE 150mm DIA. LAID AT FALLS NOT LESS THAN 1:150 UNLESS OTHERWISE NOTED.
- ALL RAINWATER DOWNPIPES THAT DO NOT CONNECT DIRECTLY TO AN ACCESS POINT SHALL HAVE A RIDDING FACILITY FITTED.
- ALL INTERNAL MANHOLE & INSPECTION CHAMBERS TO HAVE SCREW DOWN DOUBLE SEAL ACCESS COVERS.
- ALL INTERNAL & EXTERNAL SURFACE WATER INSPECTION CHAMBERS SITUATED IN AREAS WITHOUT VEHICULAR ACCESS TO BE TYPE 3 CHAMBERS WITH 150mm DOT TYPE 1 SURROUND UNLESS NOTED OTHERWISE.
- ALL EXTERNAL SURFACE WATER INSPECTION CHAMBERS SITUATED IN AREAS WITH VEHICULAR ACCESS TO BE TYPE 3 CHAMBERS WITH GEN 3 CONCRETE SURROUND UNLESS NOTED OTHERWISE.
- ALL TYPE 3 INSPECTION CHAMBERS WHERE DEPTH TO INVERT OF CHAMBER IS > 1m SHALL HAVE COVER FRAME WITH ACCESS RESTRICTED TO 350mm DIA. OR 300x300mm SQUARE.
- ALL EXTERNAL SURFACE WATER MANHOLES TO BE MIN. 1200mm DIA. WIDE WALL (125mm THICK) TYPE 2 PRECAST CONCRETE CHAMBERS UNLESS NOTED OTHERWISE.
- MANHOLE COVER LEVELS ARE SUBJECT TO CONFIRMATION OF FINAL EXTERNAL & INTERNAL LEVELS.
- EXTERNAL GULLY/CHANNEL POSITIONS SHOWN ARE INDICATIVE AND SUBJECT TO CHANGE FOLLOWING CONFIRMATION OF FINAL EXTERNAL LEVELS.
- FINAL GULLY POSITIONS TO SUIT SITE LOW POINTS WITH SUFFICIENT SURFACE FALLS TO ENSURE SURFACE WATER DRAINS WITHOUT PONDING (MINIMUM SURFACE FALL OF 1:60 IS RECOMMENDED).
- THE LOAD CLASS OF ALL COVERS, GRATINGS, GULLIES, CHANNELS & FRAMES TO CHAMBERS TO SUIT THEIR LOCATION AS FOLLOWS (REFER TO MANHOLE SCHEDULE FOR CONFIRMATION):
  - A15 – INTERNAL LOCATIONS
  - B125 – EXTERNAL WITH PEDESTRIAN ACCESS ONLY
  - C250 – EXTERNAL LIGHTLY TRAFFICKED AREAS
  - D400 – MAIN ROADS/HIGHWAYS
  - E600 – HGV/LOADING BAY AREAS
- GRATINGS IN PEDESTRIAN AREAS TO HAVE HEEL SAFE ANTI-SLIP COVERS.
- THE CONSTRUCTION OF ALL EXISTING GULLIES, MANHOLE CHAMBERS & THEIR COVERS & GRATINGS TO BE "MADE GOOD" OR REPAIRED/REPLACED TO SUIT REVISSED LEVEL/LOCATION.
- REFERENCE SHOULD BE MADE TO ARCHITECT & M&E ENGINEERS DRAWINGS FOR ABOVE GROUND DRAINAGE DETAILS & SET-OUT.

**General Notes**

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- ALL DRAINAGE TO BE TO THE SATISFACTION OF THE LOCAL AUTHORITY BUILDING CONTROL AND MAIN DRAINAGE SECTIONS ON MATTERS INVOLVING PUBLIC SEWERS.
- ALL PIPEWORK, BENDS AND JUNCTIONS TO BE EXTRA STRENGTH VITRIFIED CLAY TO BS 65:1991, BS EN 295 OR PVCu TO BS EN 1401 TO BE AGREED WITH RELEVANT AUTHORITY.
- INVERT LEVELS ON EXISTING DRAINS & OUTFALLS TO BE CHECKED PRIOR TO COMMENCEMENT OF WORKS.
- TRENCH WIDTHS GENERALLY:- AS SMALL AS PRACTICABLE BUT NOT LESS THAN PIPE DIAMETER +300mm OR LARGER IF SPECIFIED. TRENCH SIDES MUST BE VERTICAL FROM BOTTOM UP TO 300mm ABOVE CROWN OF PIPE.
- WHERE DRAINAGE PIPES HAVE LESS THAN 1.2m COVER IN TRAFFICKED AREAS AND LESS THAN 600mm UNDER LANDSCAPED AREAS PIPES SHALL HAVE A FULL CLASS 2 CONCRETE SURROUND. CONCRETE PROTECTION TO BE DISCONTINUED AT EACH PIPE JOINT WITH COMPRESSIBLE MATERIAL. ALL OTHER FLEXIBLE PIPES TO HAVE CLASS 3 GRANULAR BEDDING DETAIL UNLESS OTHERWISE NOTED. ALL OTHER RIGID PIPES TO HAVE CLASS B GRANULAR BEDDING DETAIL UNLESS OTHERWISE NOTED.
- GRANULAR BEDDING:
  - 10mm SINGLE SIZED COARSE AGGREGATE SHALL BE USED ON PIPES NOT EXCEEDING 140mm DIAMETER.
  - 2-14mm WELL GRADED COARSE AGGREGATE MAY BE USED ON PIPES EXCEEDING 140mm BUT NOT EXCEEDING 400mm DIAMETER.
  - 4-20mm WELL GRADED COARSE AGGREGATE MAY BE USED ON PIPES EXCEEDING 400mm DIAMETER.
  - THE DEPTH OF GRANULAR BEDDING UNDER THE PIPES SHALL BE X/6 OR 150mm, WHICHEVER IS GREATER, WHERE X=EXTERNAL DIAMETER OF THE PIPE.
- ADAPTABLE PUBLIC SEWERS TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERS FOR ADOPTION, 7th EDITION, SEPTEMBER 2012.
- ALL PRIVATE DRAINAGE WORKS SHALL BE IN ACCORDANCE WITH "THE BUILDING REGULATIONS APPROVED DOCUMENT H" AND BRITISH STANDARD BS EN 752.
- ALL NEW DRAINAGE TO BE TESTED PRIOR TO BACKFILL OF THE TRENCHES & PRIOR TO HANDOVER TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
- THE CONTRACTOR MUST LIAISE WITH THE LOCAL AUTHORITY MAIN DRAINAGE SECTION PRIOR TO COMMENCEMENT OF WORK ON PUBLIC DRAINAGE.
- TRENCH BACKFILL SHALL BE COMPACTED IN LAYERS NOT EXCEEDING 250mm ONCE 300mm COVER HAS BEEN PROVIDED TO THE TOP OF PIPE.
- THE CONTRACTOR SHALL ALLOW IN HIS RATES FOR MAINTAINING FLOW IN PUBLIC SEWERS AT ALL TIMES DURING DIVERSION WORKS INCLUDING TEMPORARY PUMPING AND ALSO KEEPING EXCAVATIONS FREE FROM GROUNDWATER INCLUDING PUMPING AND FORMATION OF TEMPORARY SUMPS.
- THE CONTRACTOR SHALL MAKE PROVISIONS FOR AND LIAISE WITH ALL RELEVANT STATUTORY BODIES FOR THE MANAGEMENT OF TRAFFIC WHILE CARRYING OUT WORKS IN THE PUBLIC HIGHWAY.
- THE CONTRACTOR IS TO SATISFY HIMSELF TO THE POSITION AND DEPTH OF THE PUBLIC UTILITIES AND ALLOW FOR TEMPORARY SUPPORT, PROTECTION AND DIVERSION WORKS AS NECESSARY. THE CONTRACTOR SHALL ALSO INCLUDE FOR ANY TRIAL PIT EXCAVATIONS NECESSARY.
- BACKFILL TO EXCAVATIONS IN PUBLIC HIGHWAYS TO BE WELL COMPACTED GRANULAR TYPE 1 TO CL.803 OF THE DTP SPECIFICATION FOR HIGHWAY WORKS 2009.
- ALL EXTERNAL GULLIES TO BE 375mm DIA. MINIMUM. PRECAST CONCRETE, HEAVY DUTY, KITE MARKED & ANTI-THEFT.

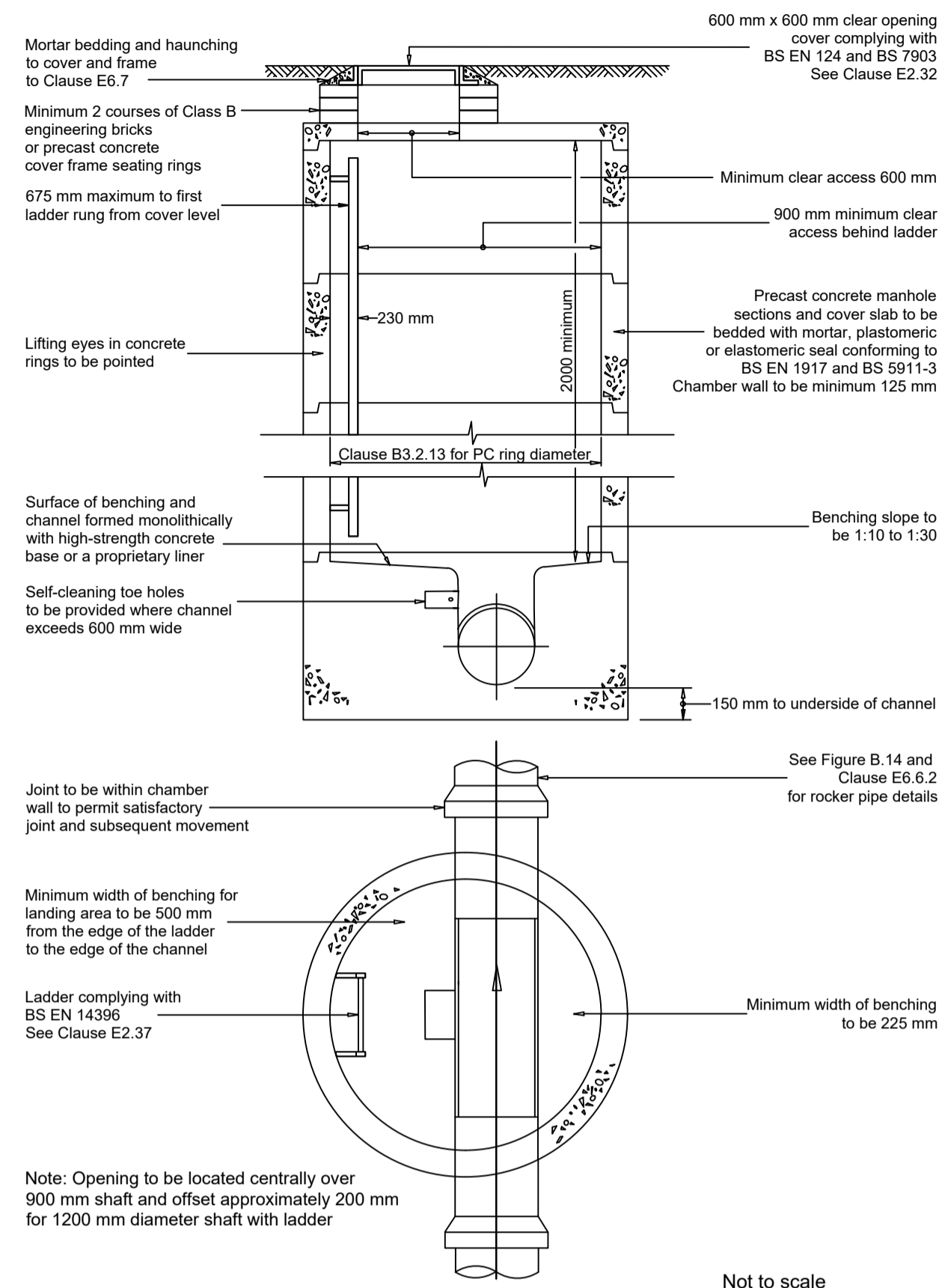
**PROPOSED SURFACE WATER DRAINAGE LAYOUT – PHASE 1**  
SCALE: 1:250

Rev	Date	Comment	By	Check
C3	18.12.20	THRESHOLD DRAINAGE CHANNELS ADDED.	M.H.	R.C.
C2	20.08.20	GRAVITY AND SIPHONIC RAINWATER PIPE LOCATIONS ADDED, LAYOUT REVISED TO SUIT.	M.H.	R.C.
C1	07.08.20	SURFACE WATER ROUTE UNDER SPORTS STORE REVISED. RAINWATER PIPES ADDED. HYDROBRAKE MANHOLE MOVED TO AVOID CLASH WITH SERVICE TRENCH. S01 – S02 ROUTE REVISED TO AVOID CLASH WITH SUBSTATION. ISSUED FOR CONSTRUCTION.	M.H.	L.D.W.
P.02	25.06.20	SURFACE WATER DRAIN REVISED TO RUN UNDERNEATH BUILDING. HYDROBRAKE MANHOLE LOCATION MOVED TO AVOID CLASH WITH GAS MAIN.	M.H.	L.D.W.
P.01	26.05.20	REVISED FOLLOWING EXTERNAL LEVELS & PLANNING COMMENTS.	M.H.	L.D.W.
T.01	07.04.20	ISSUED FOR CONTRACTOR PROPOSALS.	M.H.	L.D.W.

LEGEND.	
	ABANDONED SEWER TO BE REMOVED
	EXISTING SURFACE WATER SEWERS
	NEW SURFACE WATER SEWERS
	CONCRETE ENCASED SW SEWER
	NEW SURFACE WATER MANHOLE
	EXISTING SURFACE WATER RISING MAIN
	SURFACE WATER RISING MAIN
	NEW LAND DRAINS
	VERTICAL BACK DROP
	PETROL INTERCEPTOR
	DRAINAGE CHANNEL
	ROAD GULLY
	TRAPPED ROAD GULLY
	TRAPPED SUMP UNIT
	RAIN WATER PIPE
	RODDING EYE

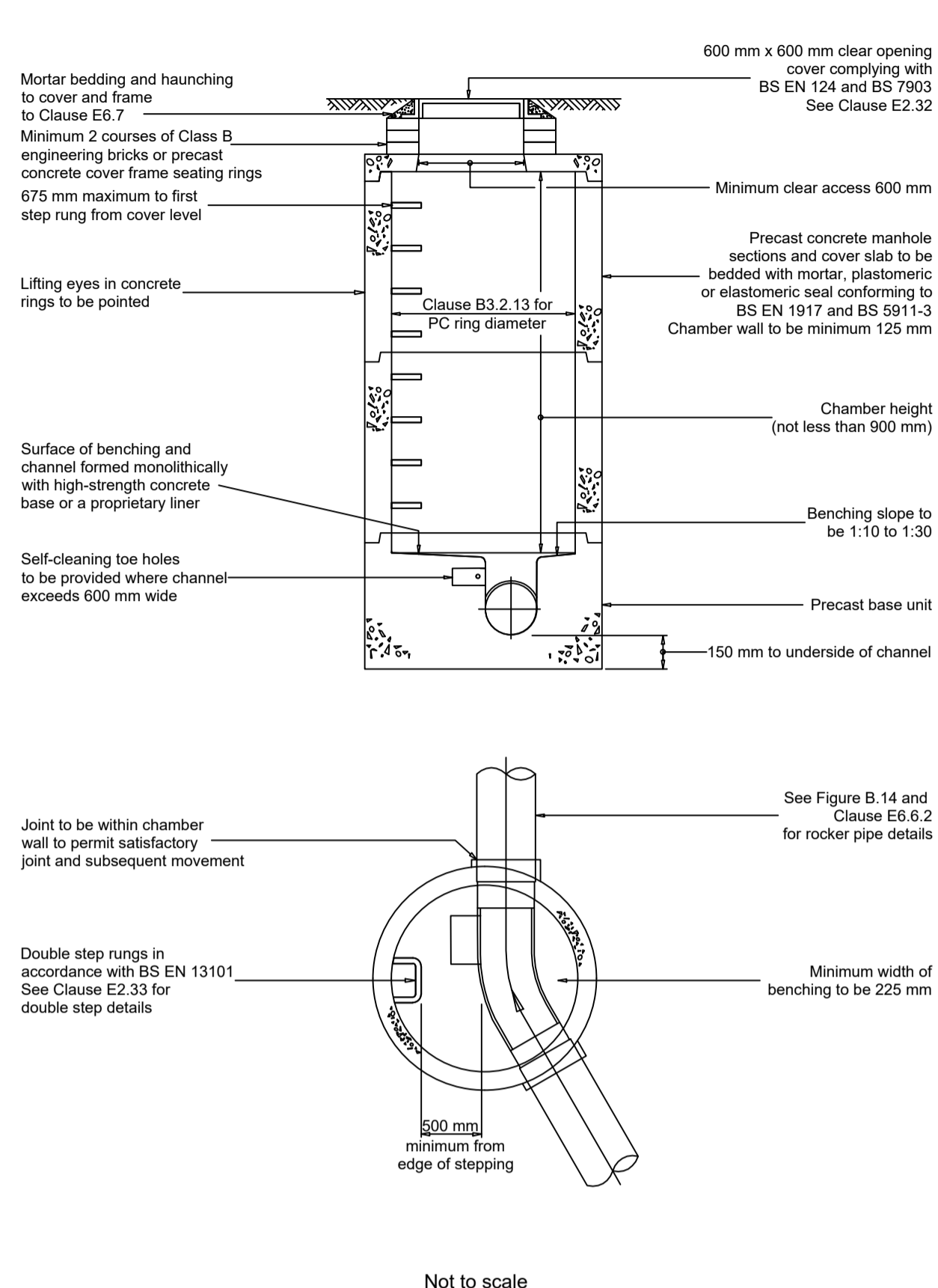
Status Code		Drawing Status	
A		CONSTRUCTION	
This drawing may only be used for construction/manufacture if status is CONSTRUCTION			
<b>Furness Partnership</b> Consulting Structural/Civil Engineers London 20 Britton Street, London, EC1M 6TX Tel: 020 7490 4353 Fax: 020 7490 4354 E-mail: info@furnesspartnership.com Bradford The Paper Hall, Anne Gate, Bradford, BD1 4EQ Tel: 01274 392092 E-mail: mail@furnesspartnership.com			
Project			
<b>WHITE OAKS LEISURE CENTRE SEVENOAKS</b>			
Drawing Title			
<b>PROPOSED LEISURE CENTRE SURFACE WATER DRAINAGE LAYOUT - PHASE 1</b>			
FP Job No.	Drawn	Date	Checked
L2394	M.H.	NOV '19	L.D.W.
Scale @ A1			
		1:250	
PROJECT	OPERATOR	ZONE / VOLUME	LEVEL / LOCATION
1689	FUR	XX	XX
FILE TYPE	ROLE	SHEET No.	Rev.
DR	D	0921	C3

**FIGURE B.11**  
**TYPICAL MANHOLE DETAIL - TYPE 1B (Alternative construction detail)**  
Depth from cover level to soffit of pipe 3 m to 6 m



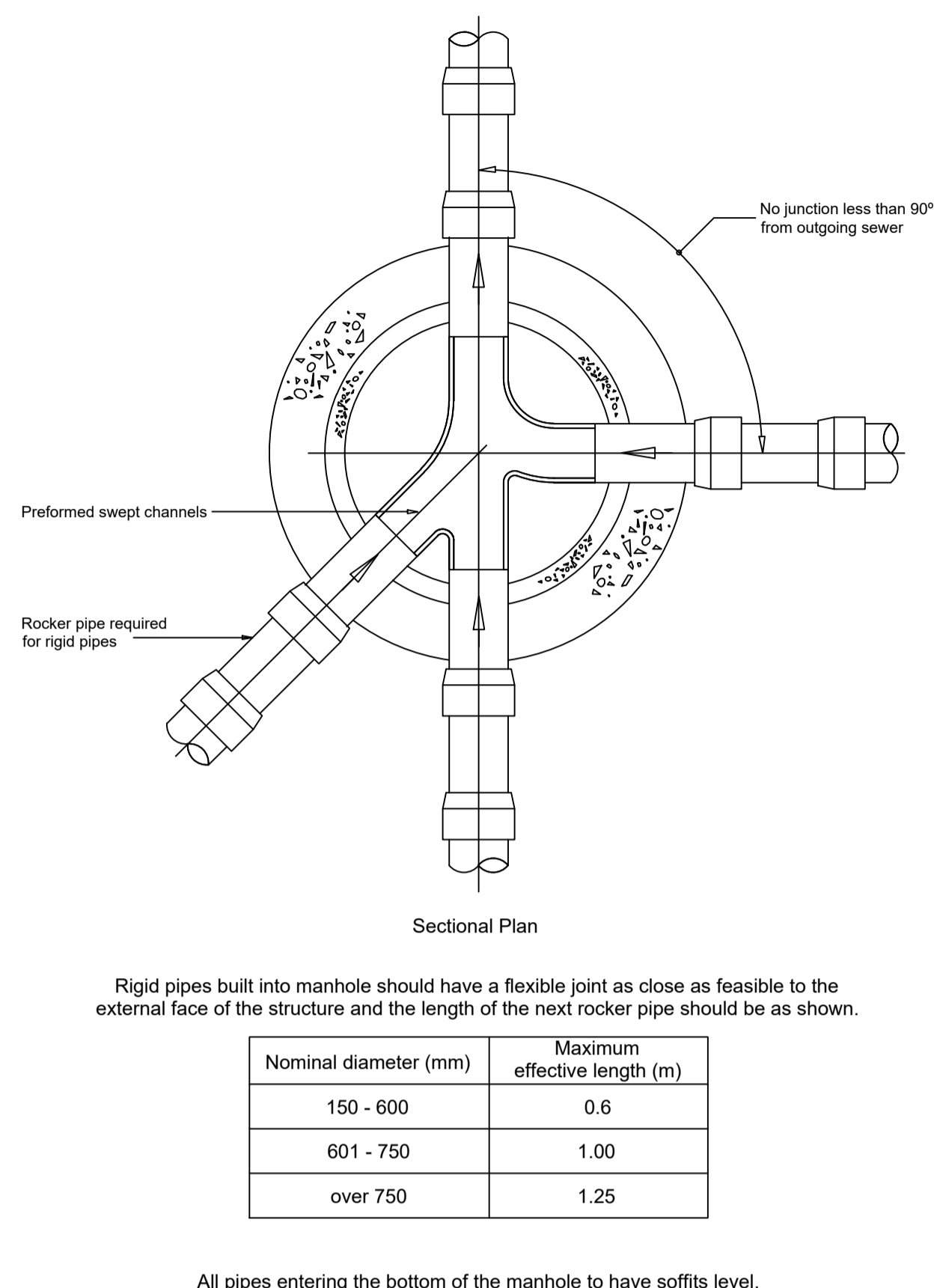
Not to scale

**FIGURE B.13**  
**TYPICAL MANHOLE DETAIL - TYPE 2 (Alternative construction detail)**  
Maximum depth from cover level to soffit of pipe 3.0 m



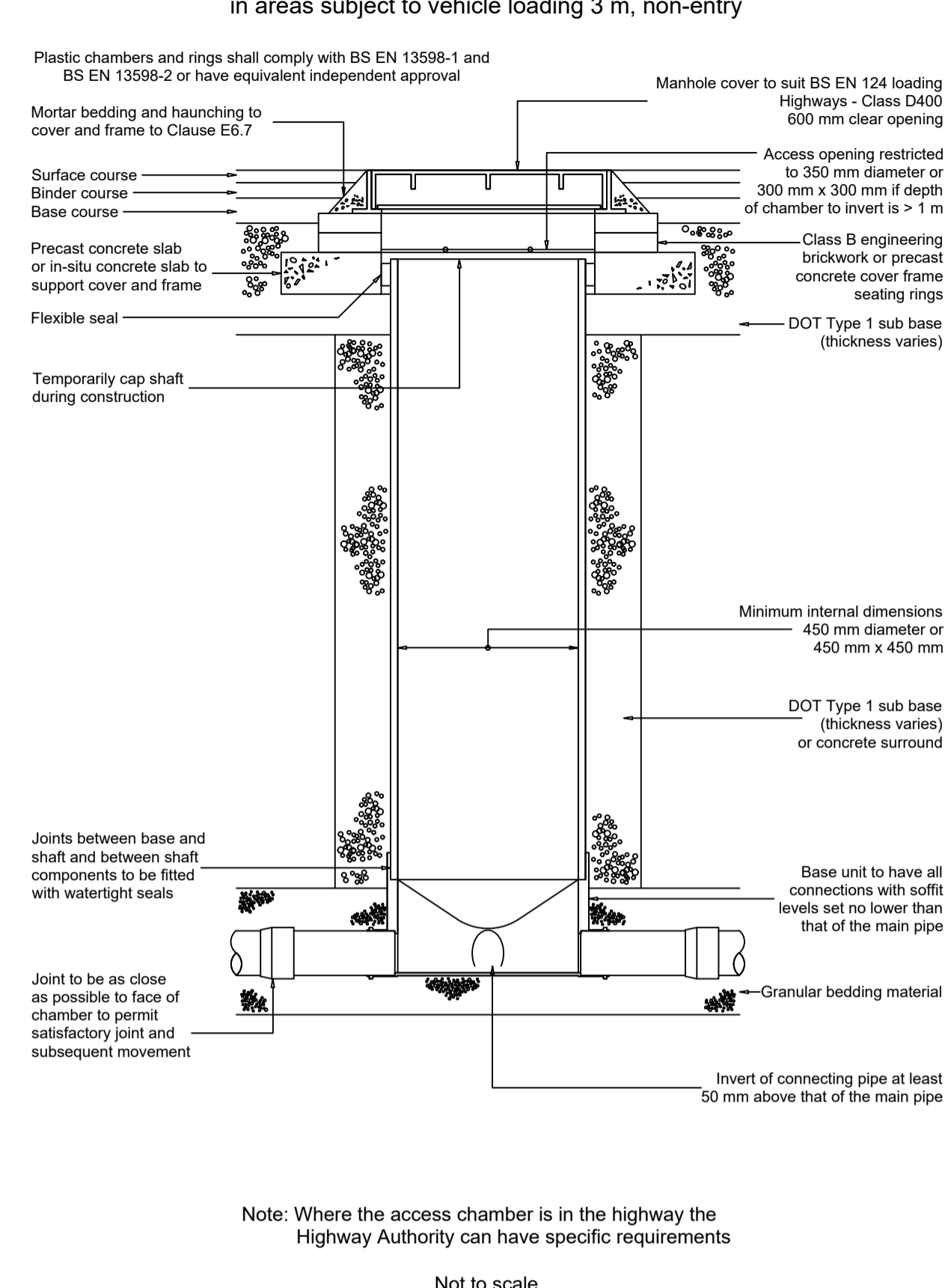
Not to scale

**FIGURE B.14**  
**TYPICAL ARRANGEMENT OF PIPE JUNCTIONS WITHIN MANHOLES**



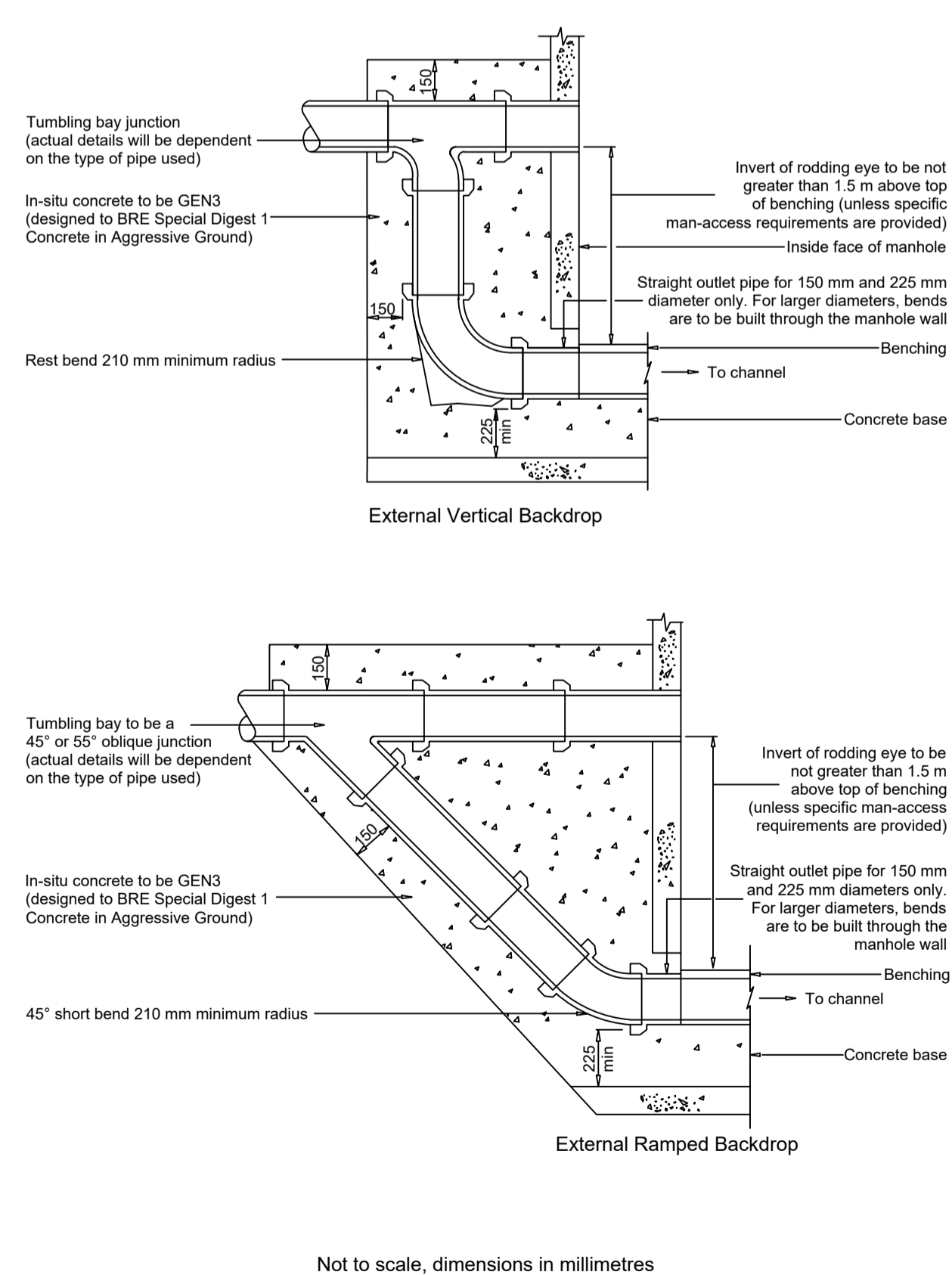
All pipes entering the bottom of the manhole to have soffits level.

**FIGURE B.16**  
**TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (Flexible material detail)**  
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry



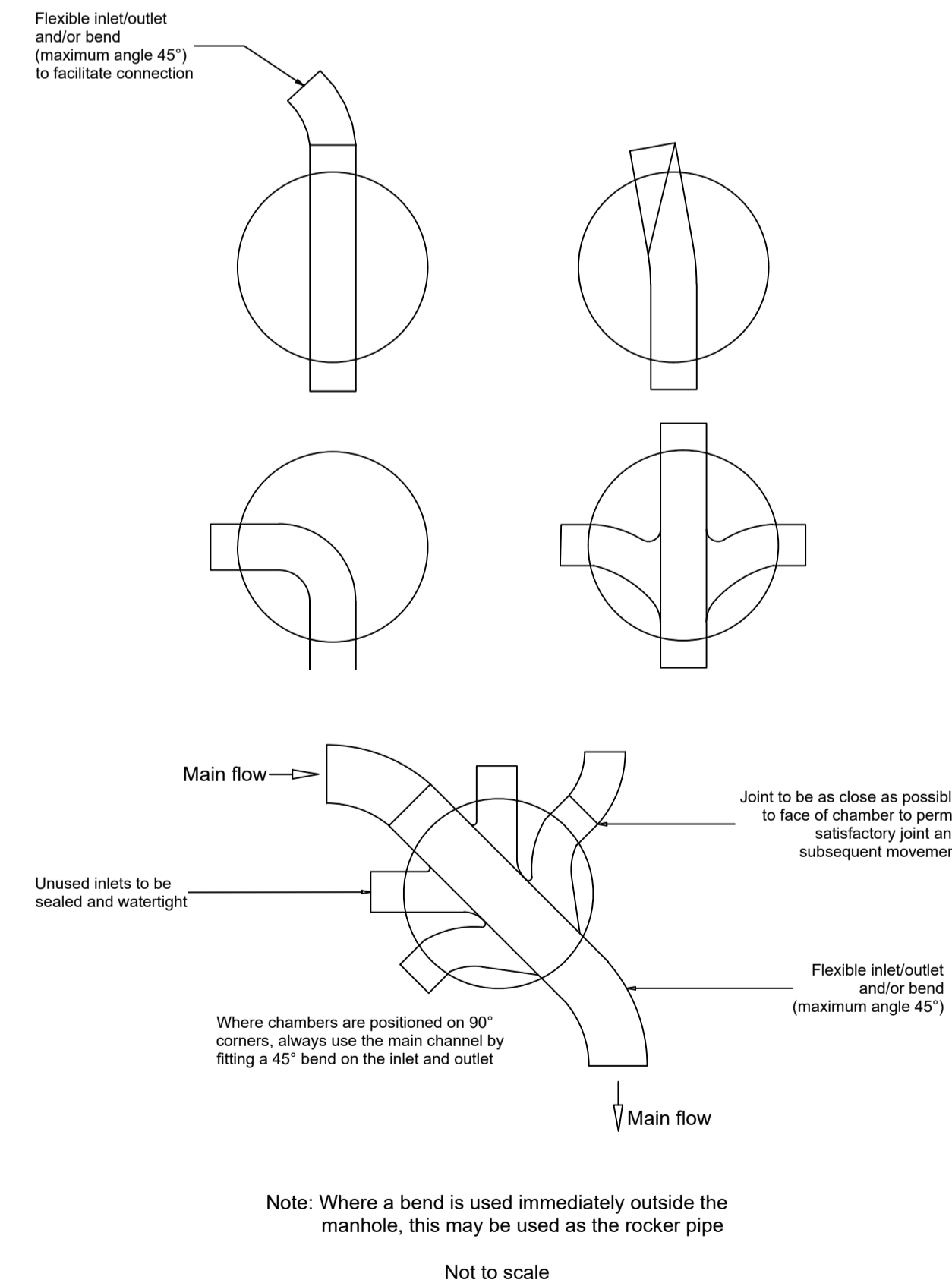
Not to scale

**FIGURE B.15**  
**TYPICAL VERTICAL AND RAMPED BACKDROP DETAIL**  
Note: Steeper gradients are preferred to the use of backdrops.  
Type of backdrop to be used to be agreed with Undertaker.



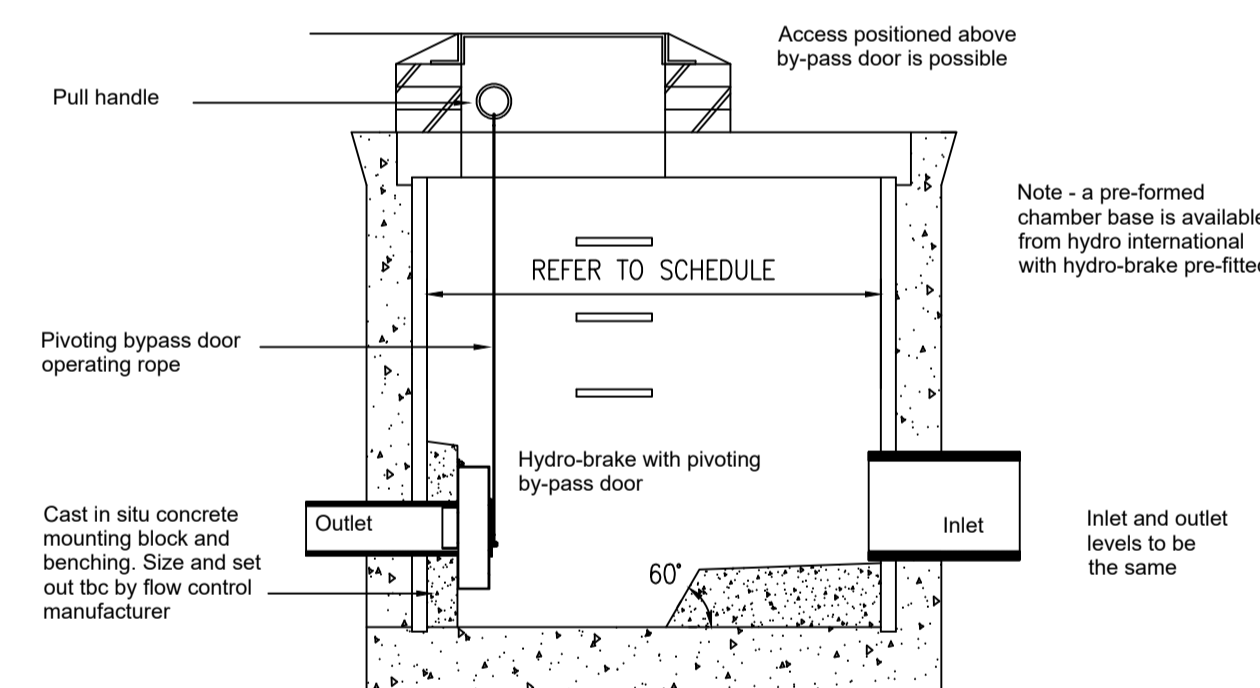
Not to scale, dimensions in millimetres

**FIGURE B.20**  
**ALTERNATIVE BASE LAYOUTS FOR TYPE 3 CHAMBERS**

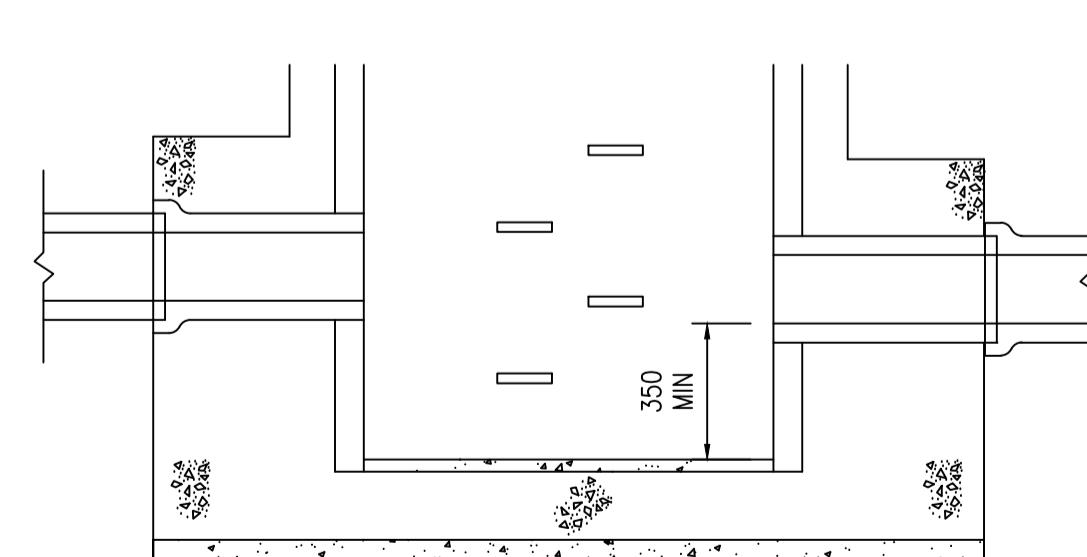


Not to scale

**TYPICAL HYDROBRAKE MANHOLE DETAIL**



**TYPICAL CATCHPIT MANHOLE DETAIL**



C1	07.08.20	ISSUED FOR CONSTRUCTION.	M.H	L.D.W
T.01	07.04.20	ISSUED FOR CONTRACTOR PROPOSALS.	M.H	L.D.W
Rev	Date	Comment	By	Check

Status Code	Drawing Status
A	CONSTRUCTION

This drawing may only be used for construction/manufacture if status is CONSTRUCTION

**Furness Partnership**  
Consulting Structural/Civil Engineers

London 20 Britton Street, London, EC1M 6TX  
tel: 020 7490 4353 fax: 020 7490 4354  
e-mail: info@furnesspartnership.com

Bradford The Paper Hall, Anne Gate, Bradford, BD1 4EQ  
tel: 01274 332092  
e-mail: mail@furnesspartnership.com

Project

**WHITE OAKS LEISURE CENTRE**  
**SEVENOAKS**

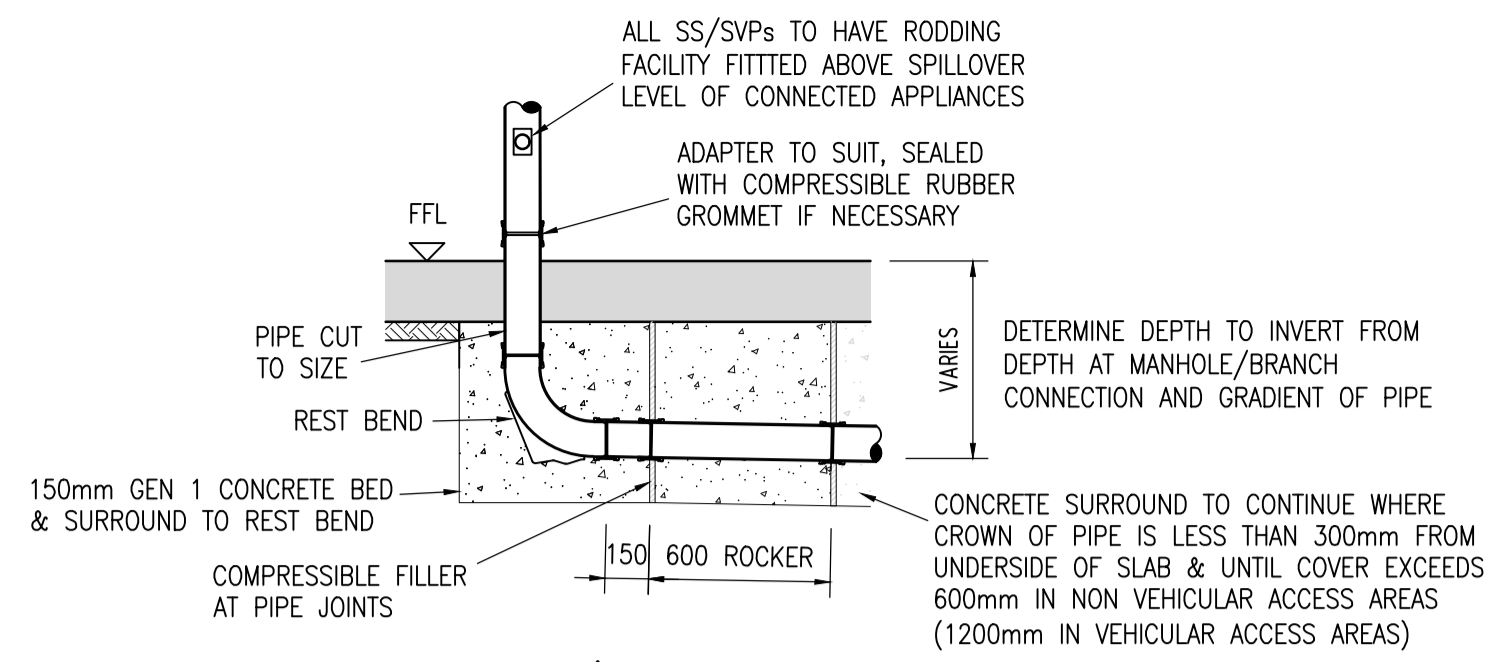
Drawing Title

**PROPOSED DRAINAGE DETAILS**  
**SHEET 1 OF 2**

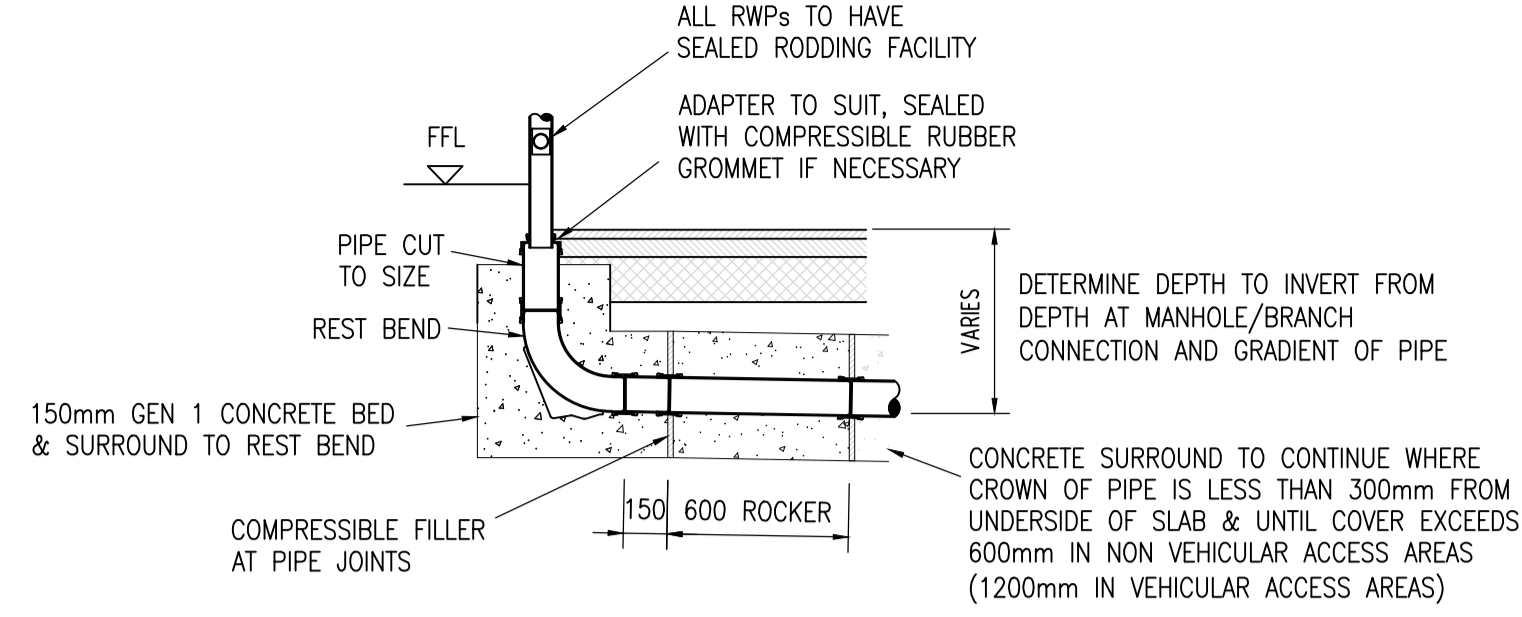
FP Job No.	Drawn	Date	Checked	Scale @ A1
L2394	M.H	NOV '19	L.D.W	1:250

PROJECT	OPERATOR	ZONE / VOLUME	LEVEL / LOCATION	FILE TYPE	ROLE	SHEET No.	Rev.
1689	FUR	XX	XX	DR	D	0931	C1

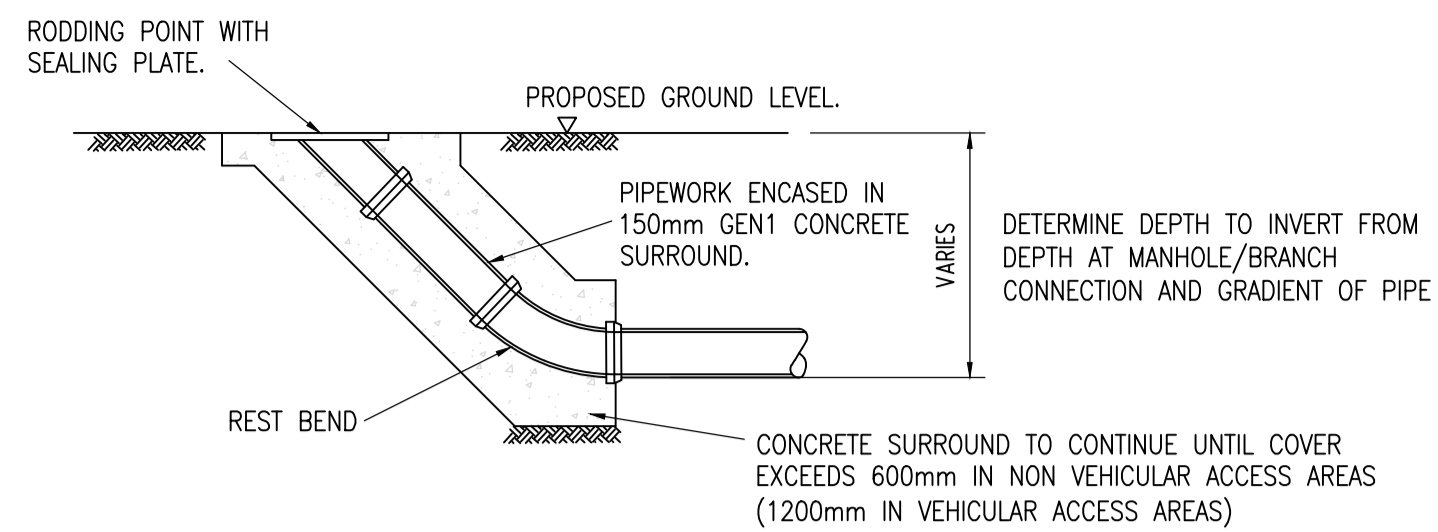




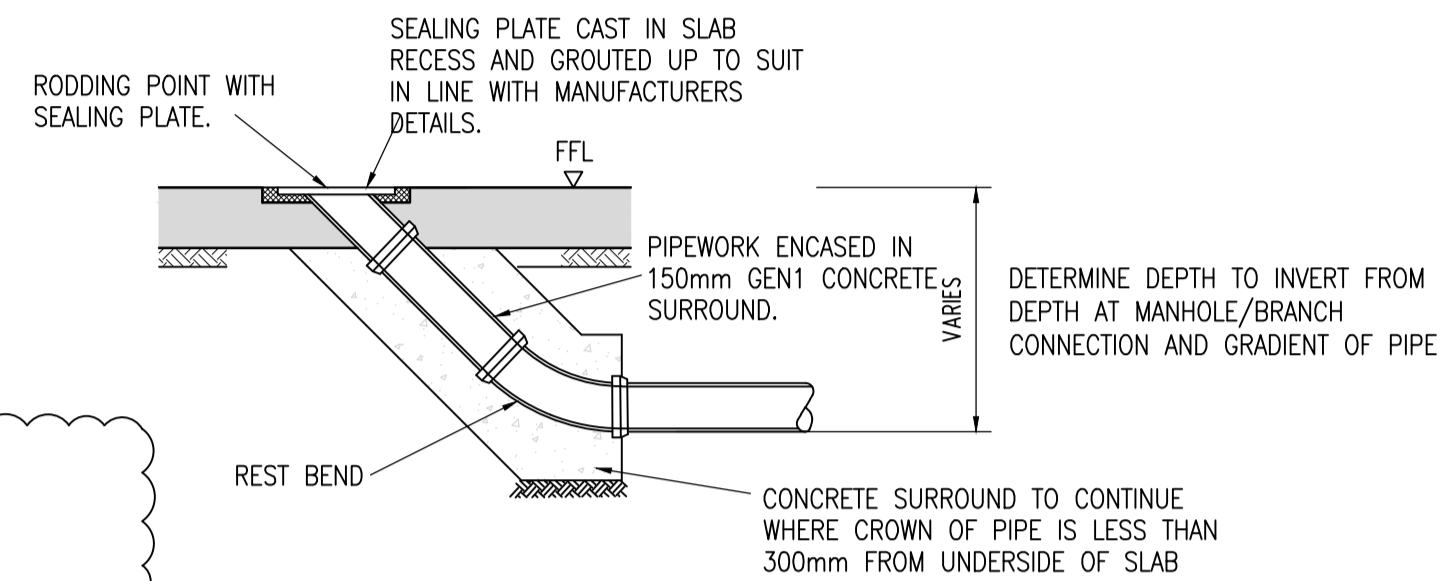
TYPICAL SS/SVP CONNECTION



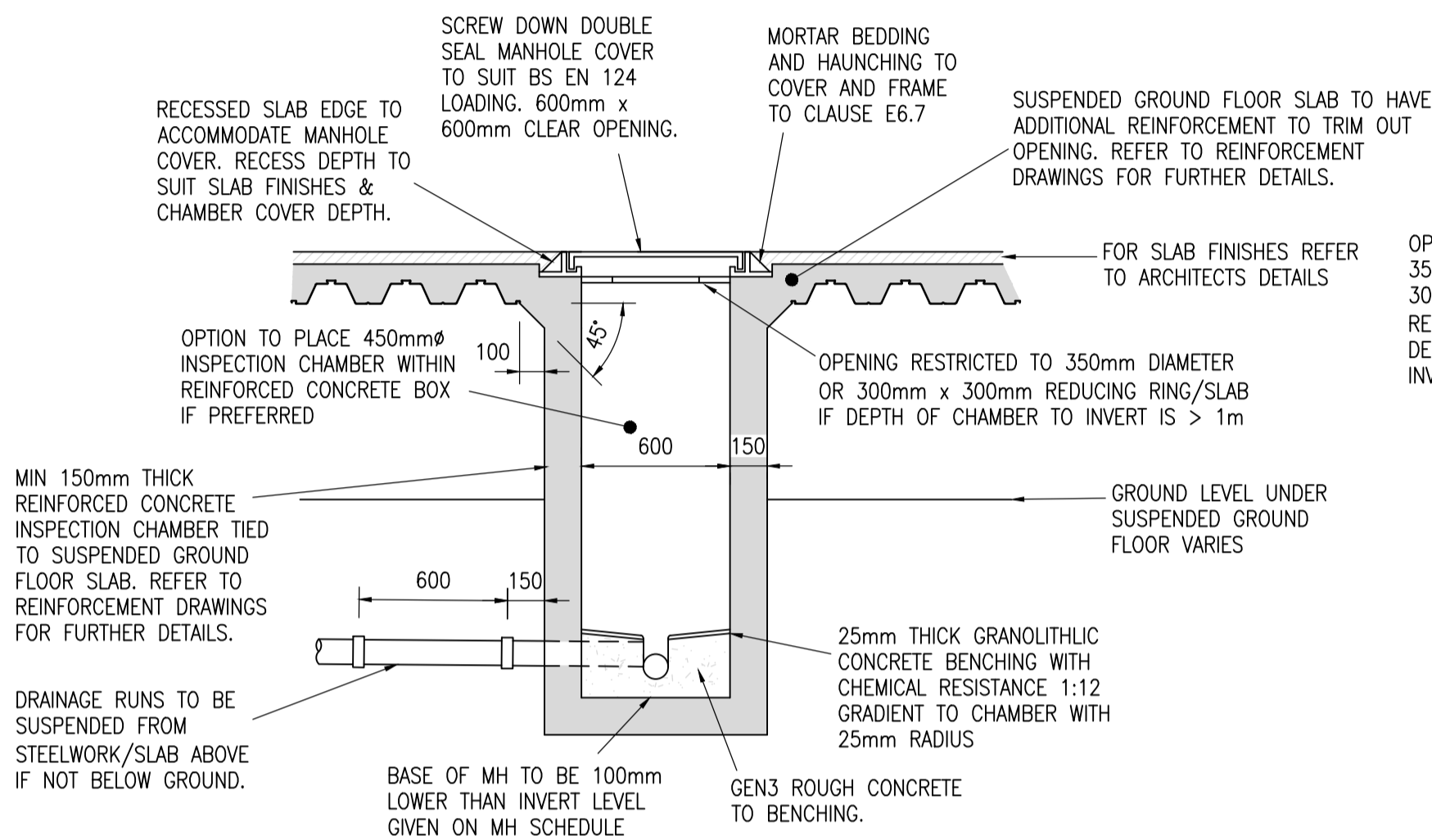
TYPICAL RWP CONNECTION



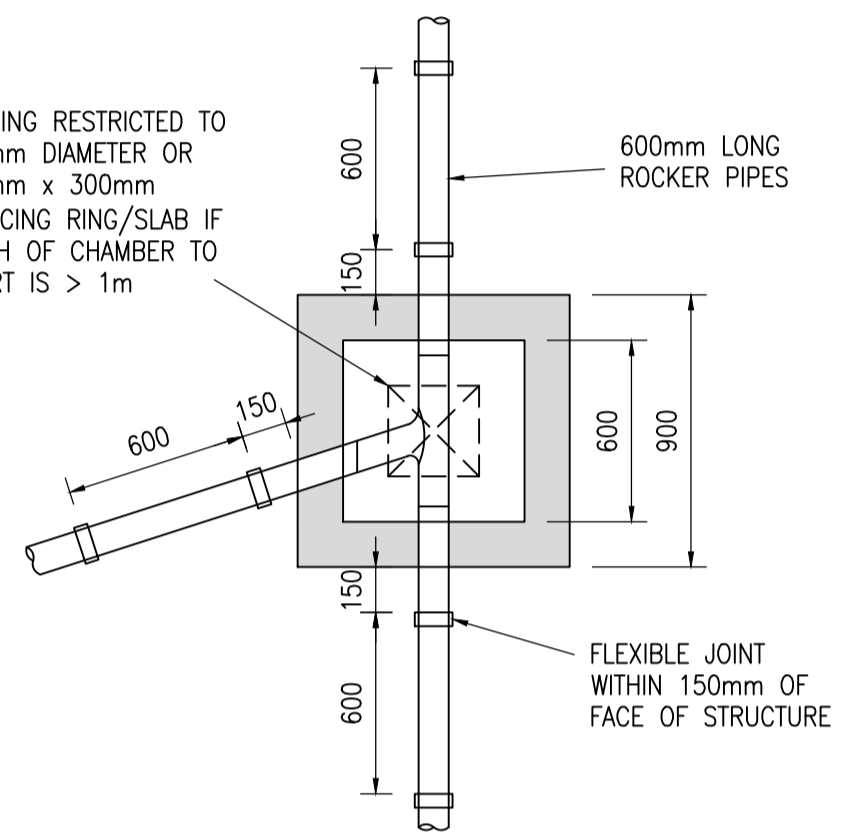
EXTERNAL RODDING EYE DETAIL



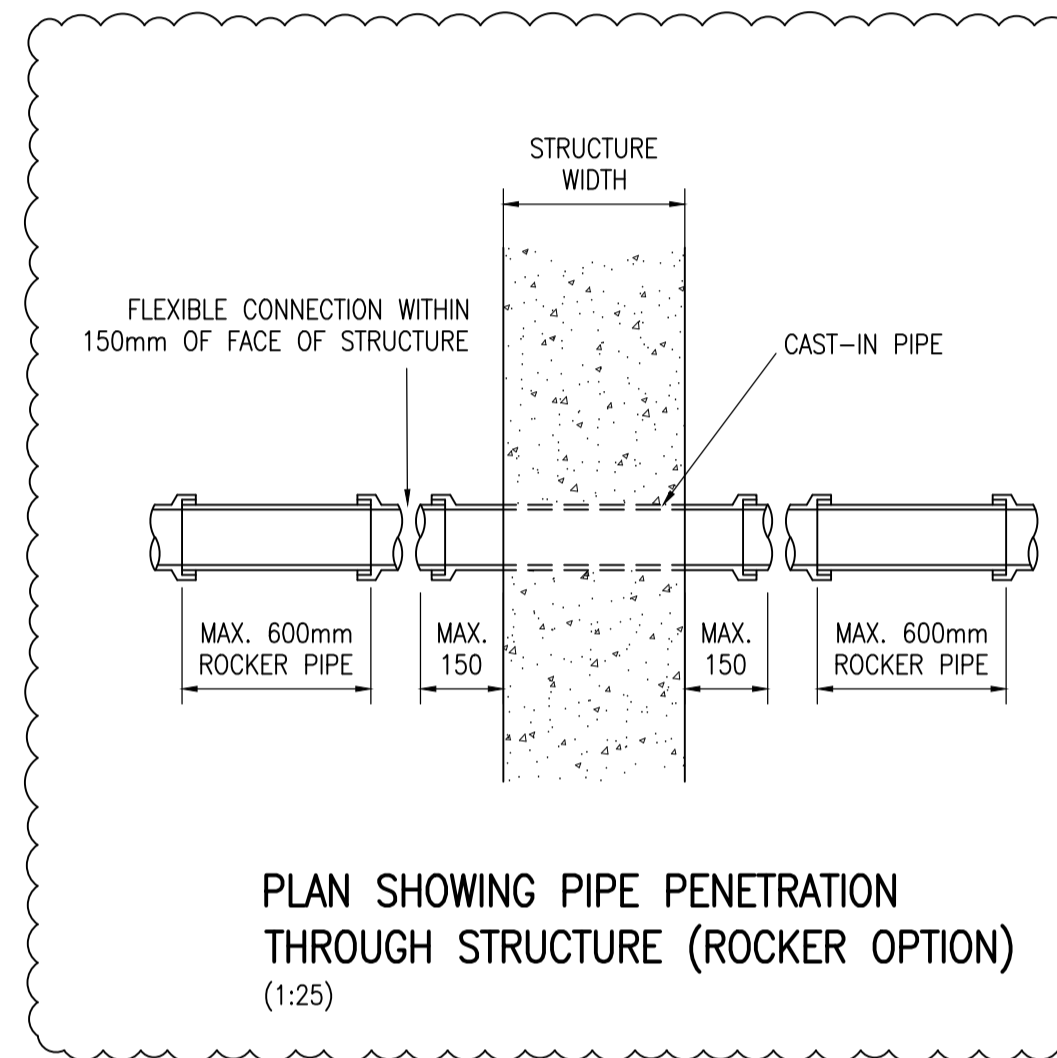
INTERNAL RODDING EYE DETAIL



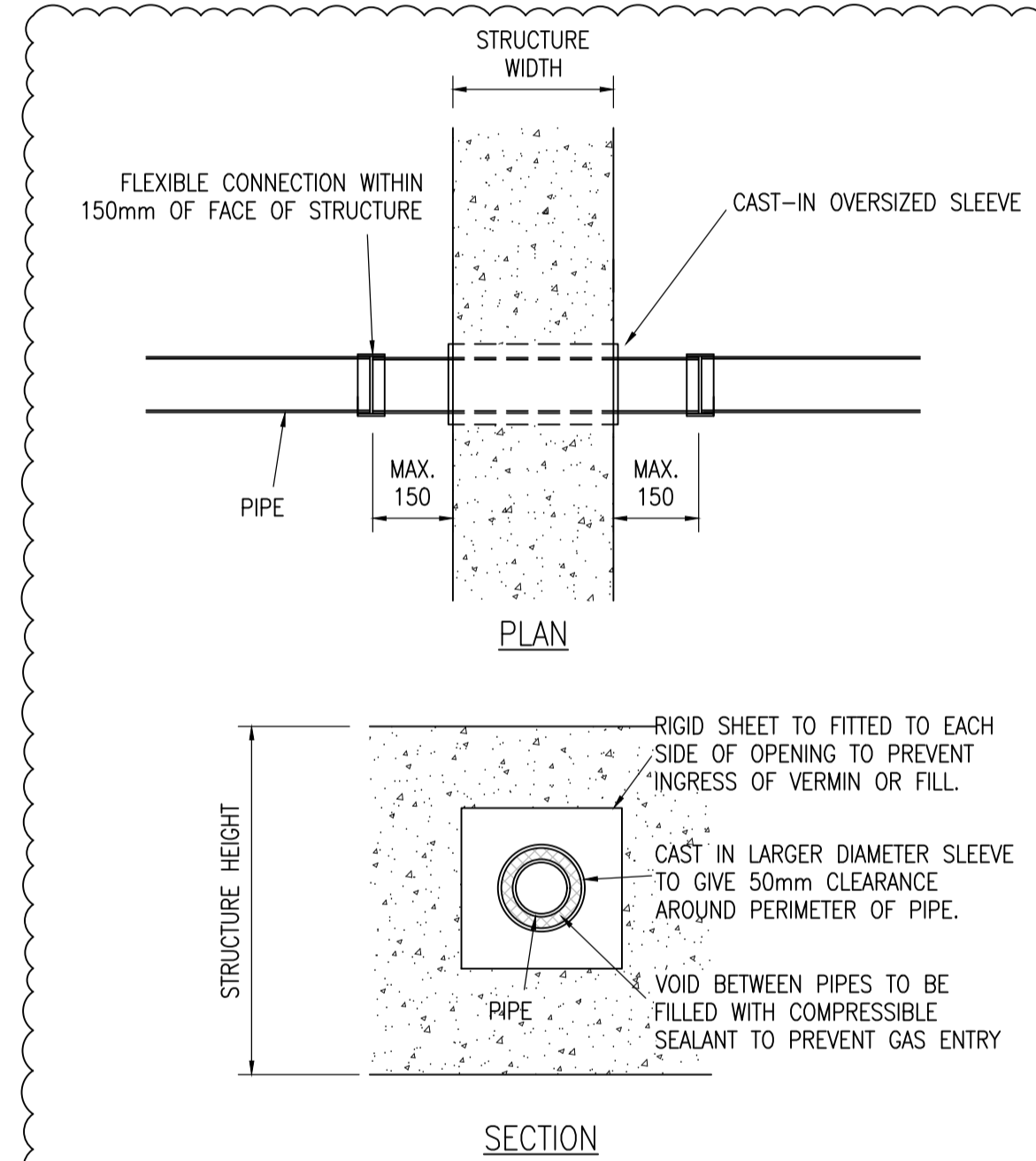
SUSPENDED MANHOLE - SECTION



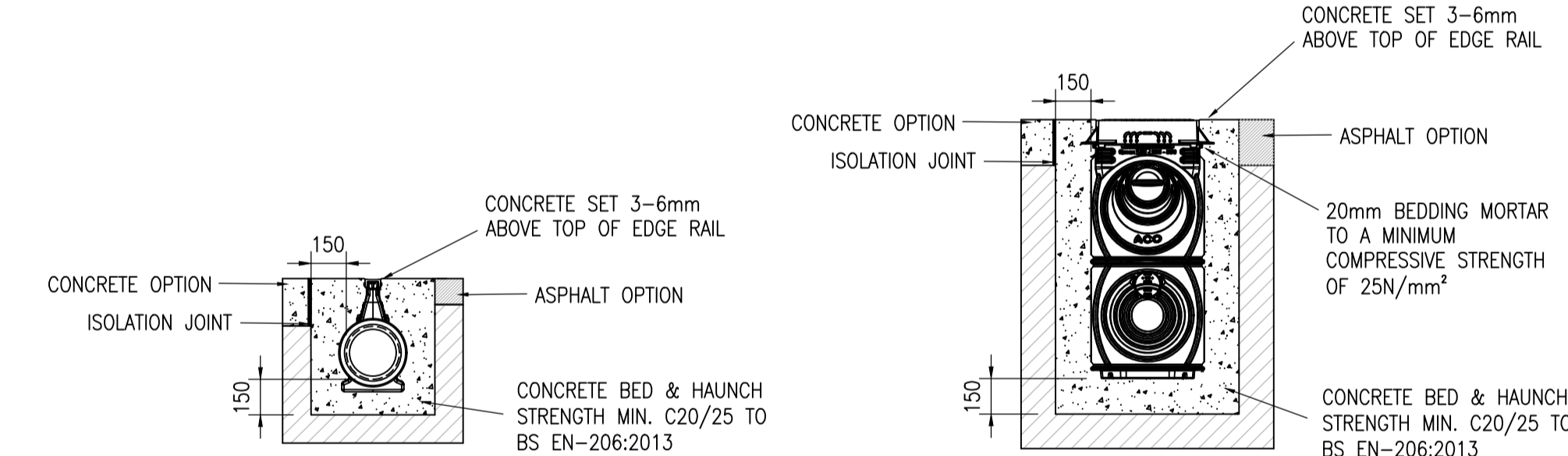
SUSPENDED MANHOLE - PLAN



PLAN SHOWING PIPE PENETRATION THROUGH STRUCTURE (ROCKER OPTION) (1:25)

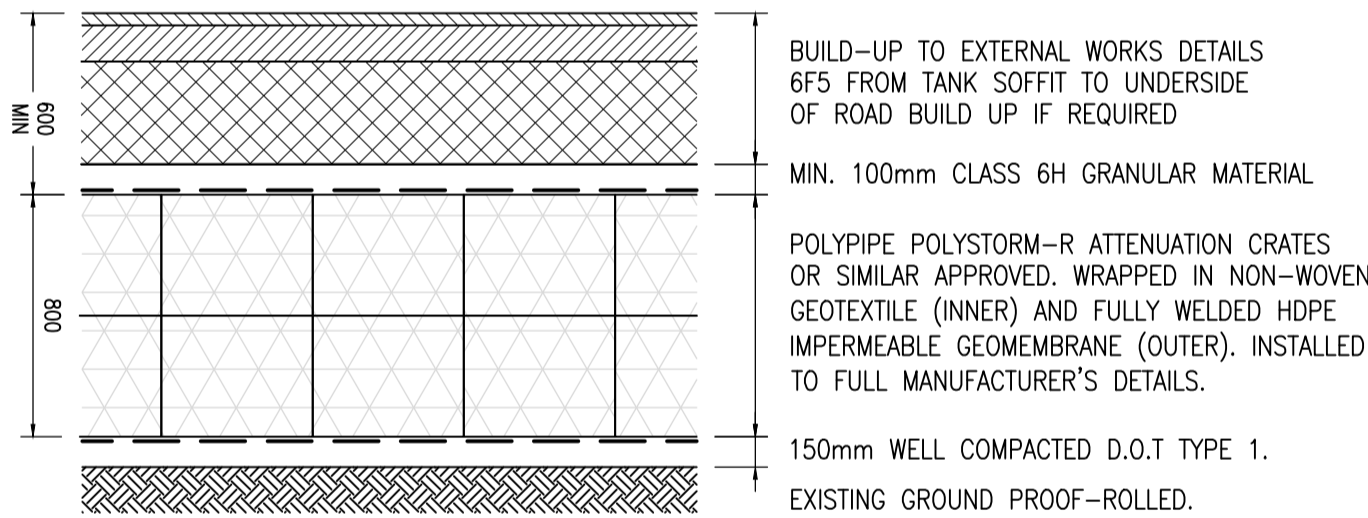


PIPE PENETRATION THROUGH STRUCTURE (SLEEVE OPTION) (1:25)

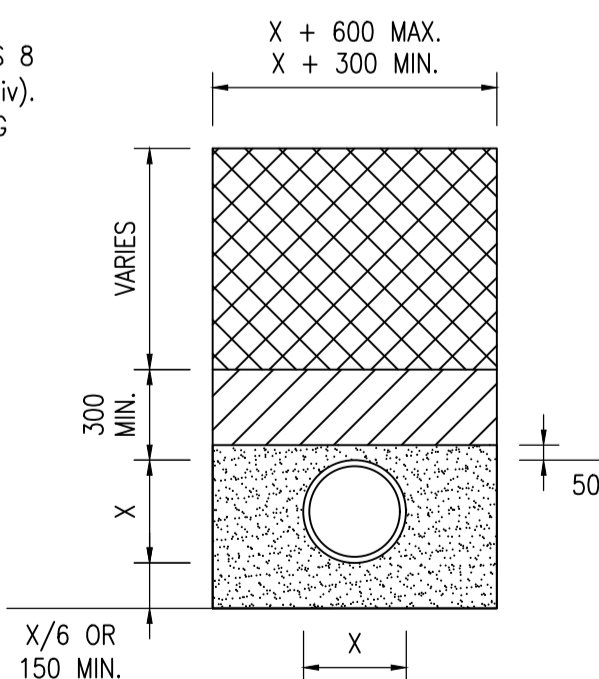
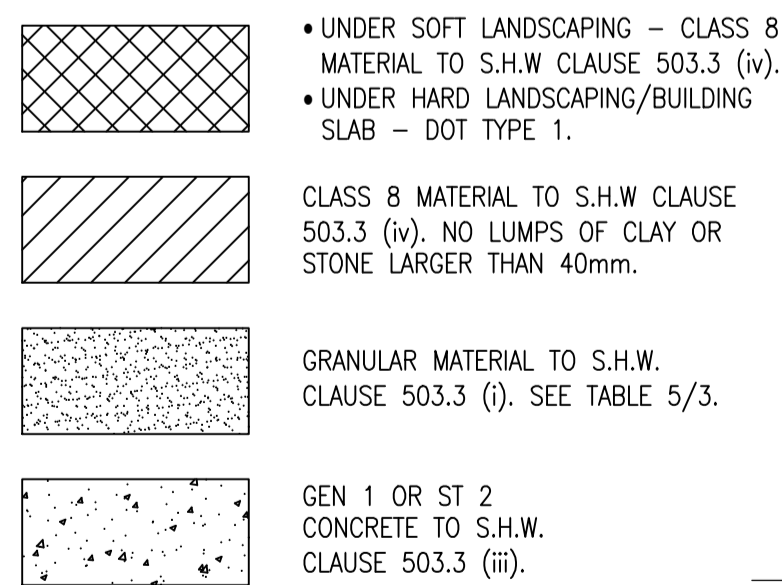


ACO Qmax 150/225/350 INSTALLATION DETAIL TO LOAD CLASS D400

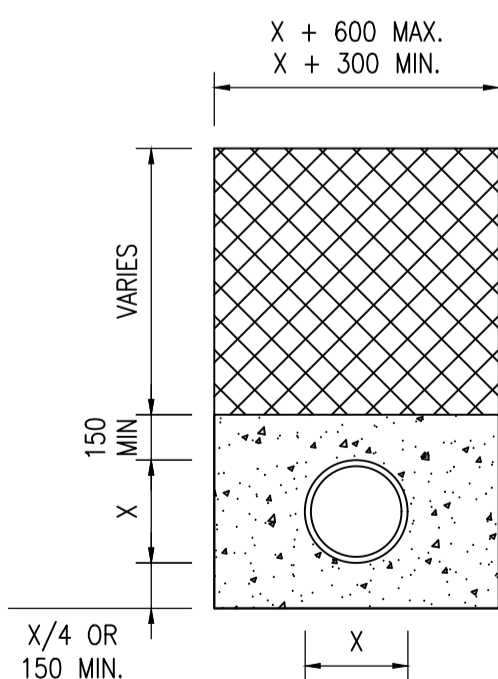
ACO Qmax 150/225/350 OUTLET CHAMBER TO LOAD CLASS D400



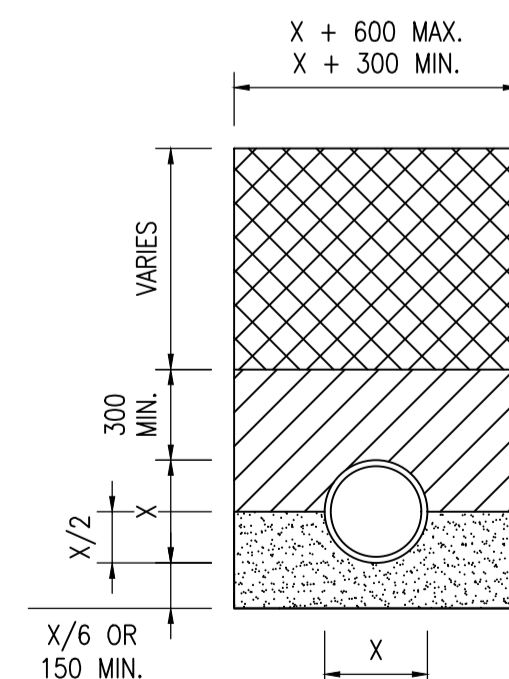
BUILD UP ABOVE ATTENUATION CRATES (1:25)



CLASS S BEDDING DETAIL (FLEXIBLE PIPES)



CLASS Z BEDDING DETAIL (FLEXIBLE & RIGID PIPES)



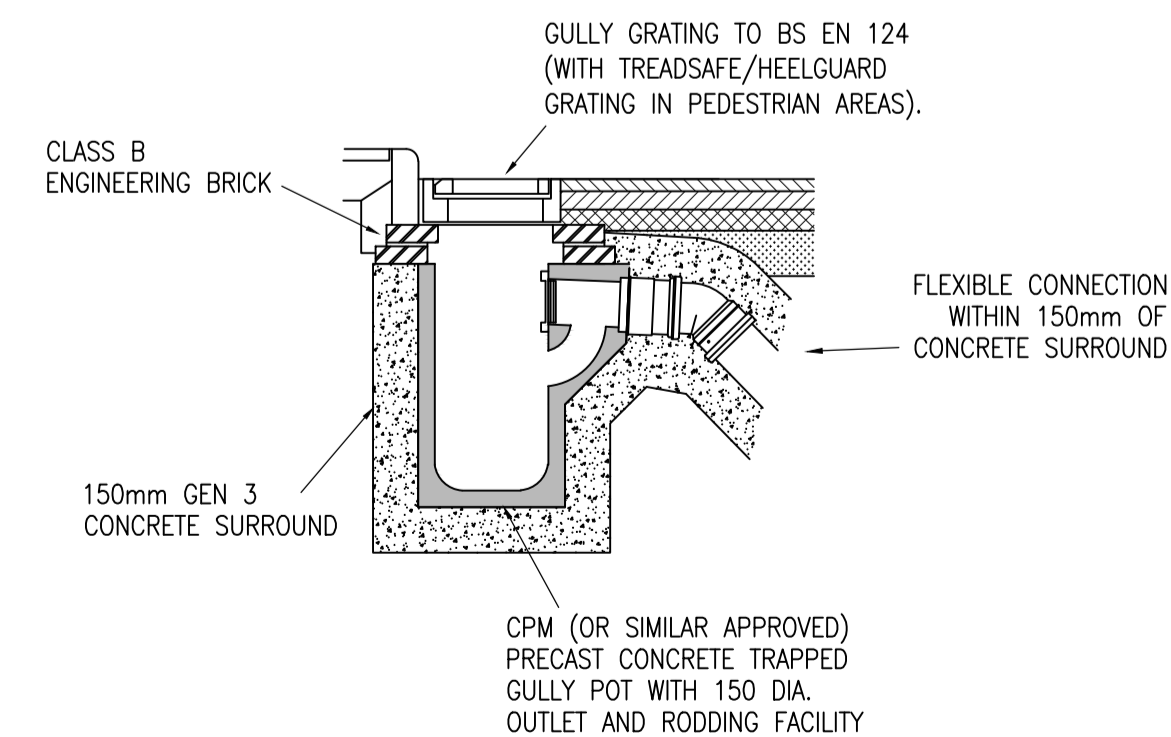
CLASS B BEDDING DETAIL (RIGID PIPES ONLY)

CLASS S/B GRANULAR BEDDING MATERIAL - S.H.W 503 (i) TABLE 5/3 [BS EN 13242] -

NOMINAL PIPE DIAMETER (mm)	SINGLE SIZED COARSE AGGREGATE (mm)	GRADED COARSE AGGREGATE (mm)
NOT EXCEEDING 140	4/10	-
EXCEEDING 140 BUT NOT EXCEEDING 400	4/10, 6/10 OR 10/20	2/14 OR 4/20
EXCEEDING 400	4/10, 6/14, 10/20 OR 20/40	2/14, 4/20 OR 4/40

CLASS Z COMPRESSIBLE FILLER BOARD DETAILS

NOMINAL PIPE DIAMETER (mm)	THICKNESS OF COMPRESSIBLE FILLER (mm)
LESS THAN 450	18
450 - 1200	36
GREATER THAN 1200	54



TYPICAL PRECAST CONCRETE ROAD GULLY DETAIL (1:25)

Rev	Date	Comment	By	Check
C2	20.08.20	PIPE PENETRATION DETAILS ADDED.	M.H	R.C
C1	07.08.20	ISSUED FOR CONSTRUCTION.	M.H	L.D.W
P.01	19.06.20	INTERNAL MANHOLE DETAIL ADDED.	M.H	L.D.W
T.01	07.04.20	ISSUED FOR CONTRACTOR PROPOSALS.	M.H	L.D.W

Status Code	Drawing Status
A	CONSTRUCTION

This drawing may only be used for construction/manufacture if status is CONSTRUCTION

**Furness Partnership**  
Consulting Structural/Civil Engineers

London 20 Britton Street, London, EC1M 6TX  
tel: 020 7490 4353 fax: 020 7490 4354  
e-mail: info@furnesspartnership.com

Bradford The Paper Hall, Anne Gate, Bradford, BD1 4EQ  
tel: 01274 330092  
e-mail: mail@furnesspartnership.com

Project

**WHITE OAKS LEISURE CENTRE SEVENOAKS**

Drawing Title

**PROPOSED DRAINAGE DETAILS SHEET 2 OF 2**

FP Job No.	Drawn	Date	Checked	Scale @ A1
L2394	M.H	NOV '19	L.D.W	1:250

PROJECT	OPERATOR	ZONE / VOLUME	LEVEL / LOCATION	FILE TYPE	ROLE	SHEET No.	Rev.
1689	FUR	XX	XX	DR	D	0932	C2


FOUL WATER MANHOLE SCHEDULE												
REF	COVER LEVEL	INVERT LEVEL	MAX DEPTH TO INVERT	MIN COVER TO SOFFIT	PIPE DIA (mm)		MANHOLE TYPE	COVER GRADE	MIN COVER SIZE (mm)	COMMENTS	EASTINGS	NORTHINGS
F.01	66.440	65.240	1.200	1.100	100		450x450mm SUSPENDED	A15	600x600	SUSPENDED PPIC CHAMBER WITH SCREW DOWN DOUBLE SEAL ACCESS COVER	551047886	169137519
F.02	66.440	64.950	1.490	1.340	100	150	450x450mm SUSPENDED	A15	600x600	SUSPENDED PPIC CHAMBER WITH SCREW DOWN DOUBLE SEAL ACCESS COVER	551046924	169129699
F.03	66.440	64.735	1.705	1.555	100	150	450x450mm SUSPENDED	A15	600x600	SUSPENDED PPIC CHAMBER WITH SCREW DOWN DOUBLE SEAL ACCESS COVER	551055089	169122975
<del>F.04</del>										MANHOLE REMOVED		
F.05	66.000	64.305	1.695	1.545	100	150	1200 DIA - TYPE 2	B125	600x600	-	551068384	169112013
F.06	66.250	64.270	1.980	1.830	100	150	1200 DIA - TYPE 2	B125	600x600	-	551065841	169109116
F.07	66.440	64.970	1.470	1.370	100		450x450mm SUSPENDED	A15	600x600	SUSPENDED PPIC CHAMBER WITH SCREW DOWN DOUBLE SEAL ACCESS COVER	551058194	169129638
F.08	66.440	64.825	1.615	1.515	100		450x450mm SUSPENDED	A15	600x600	SUSPENDED PPIC CHAMBER WITH SCREW DOWN DOUBLE SEAL ACCESS COVER	551083390	169138236
F.09	66.440	64.770	1.670	1.570	100		450x450mm SUSPENDED	A15	600x600	SUSPENDED PPIC CHAMBER WITH SCREW DOWN DOUBLE SEAL ACCESS COVER	551084694	169135111
F.10	65.105	64.705	0.400	0.300	100		450 DIA - TYPE 3	B125	600x600	PPIC	551086937	169133140
F.11	66.440	64.550	1.890	1.790	100		450 DIA - TYPE 3	A15	600x600	PPIC - SCREW DOWN DOUBLE SEAL ACCESS COVER	551055409	169114283
<del>F.12</del>										REMOVED		
<del>F.13</del>										REMOVED		
F.14	62.000	61.160	0.840	0.740	100		1200 DIA - TYPE 2	D400	600x600	-	551027373	169137732
F.15	62.050	60.935	1.115	0.965	100	150	1200 DIA - TYPE 2	D400	600x600	-	551018612	169129900
F.16	62.150	61.100	1.050	0.825	150	225	1200 DIA - TYPE 2	D400	600x600	SCREW DOWN DOUBLE SEAL ACCESS COVER	551032734	169141745
F.17	62.000	60.965	1.035	0.810	225		1200 DIA - TYPE 2	D400	600x600	VENTED MANHOLE COVER	551028988	169137934

PHASE 1 - SURFACE WATER MANHOLE SCHEDULE												
REF	COVER LEVEL	INVERT LEVEL	MAX DEPTH TO INVERT	MIN COVER TO SOFFIT	PIPE DIA (mm)		MANHOLE TYPE	COVER GRADE	MIN COVER SIZE (mm)	COMMENTS	EASTINGS	NORTHINGS
S.01	66.220	65.340	0.880	0.655	150	225	600 DIA - TYPE 3	B125	600x600	PPIC	551060793	169101793
S.02	66.830	64.510	2.320	2.095	225		1200 DIA - TYPE 2	B125	600x600	-	551035100	169082038
S.03	66.440	64.200	2.240	2.015	225		1200 DIA - TYPE 2	B125	600x600	VENTED MANHOLE COVER	551025417	169086805
S.04	63.300	60.925	2.375	2.075	225	300	1200 DIA - TYPE 2	B125	600x600	CATCHPIT MANHOLE	551005752	169103575
S.05	61.990	60.070	1.920	1.545	375	300	1500 DIA - TYPE 2	D400	600x600	HYDROBRAKE - DESIGN HEAD: 0.8m, FLOW: 3l/s	551002478	169121395
S.06	61.900	60.055	59.230	2.670	300	375	1350 DIA - TYPE 2	D400	600x600	BACKDROP MANHOLE	550998502	169120652
S.07	62.000	60.440	1.560	1.185	375		1350 DIA - TYPE 2	D400	600x600	VENTED MANHOLE COVER	551046051	169168530
S.08	62.000	60.195	1.805	1.355	300	375	1350 DIA - TYPE 2	D400	600x600	-	551024617	169142516
S.09	62.150	60.165	1.985	1.535	450		1350 DIA - TYPE 2	D400	600x600	-	551033723	169135134
S.10	62.250	60.120	2.130	1.680	450	375	1800 DIA - TYPE 2	D400	600x600	CATCHPIT MANHOLE	551023115	169122043

PHASE 2 - SURFACE WATER MANHOLE SCHEDULE												
REF	COVER LEVEL	INVERT LEVEL	MAX DEPTH TO INVERT	MIN COVER TO SOFFIT	PIPE DIA (mm)		MANHOLE TYPE	COVER GRADE	MIN COVER SIZE (mm)	COMMENTS	EASTINGS	NORTHINGS
S.05	61.990	60.070	1.920	1.545	375	300	1500 DIA - TYPE 2	D400	600x600	HYDROBRAKE DESIGN HEAD: 1.17m, FLOW: 33.9l/s	551002478	169121395
S.20	62.900	61.675	1.225	1.075	150		1200 DIA - TYPE 2	C250	600x600	-	551109572	169202242
S.21	62.000	61.080	0.920	0.770	150		1200 DIA - TYPE 2	C250	600x600	-	551091155	169217420
S.22	62.000	60.775	1.225	1.000	150	225	1200 DIA - TYPE 2	D400	600x600	-	551082308	169206685
S.23	62.000	60.625	1.375	1.150	225	300	1200 DIA - TYPE 2	D400	600x600	-	551071429	169193485
S.24	62.000	60.560	1.440	1.140	150	300	1200 DIA - TYPE 2	D400	600x600	-	551058801	169178162
S.25	62.000	60.460	1.540	1.240	300		1200 DIA - TYPE 2	D400	600x600	-	551049620	169172861
S.26	64.000	62.060	1.940	1.715	150	225	1200 DIA - TYPE 2	D400	600x600	-	551116799	169178260
S.27	64.200	61.810	2.390	2.165	150	225	1200 DIA - TYPE 2	D400	600x600	-	551107956	169163382
S.28	63.500	61.955	1.545	1.395	150		1200 DIA - TYPE 2	D400	600x600	-	551080339	169160412

PHASE 2 DRAINAGE IN ABEYANCE & NOT ISSUED FOR CONSTRUCTION

C5	18.12.20	FOUL MANHOLE SCHEDULE REVISED AS HIGHLIGHTED.	M.H	R.C
C4	30.11.20	MANHOLE F16 INVERT LEVEL REVISED.	M.H	R.C
C3	21.10.20	FOUL WATER MANHOLE SCHEDULE UPDATED TO SHOW SETTING OUT INFORMATION OF INTERNAL DRAINAGE. F14, F17 LOCATION REVISED.	M.H	R.C
C2	20.08.20	MANHOLE SCHEDULES UPDATED AS SHOWN.	M.H	R.C
C1	07.08.20	PHASE 1 FOUL WATER AND SURFACE WATER MANHOLE SCHEDULES UPDATED TO REFLECT LATEST LAYOUTS. ISSUED FOR CONSTRUCTION.	M.H	L.D.W
P.02	16.07.20	FOUL MANHOLE SCHEDULE UPDATED.	M.H	L.D.W
P.01	25.06.20	ISSUED FOR INFORMATION/APPROVAL.	M.H	L.D.W
Rev	Date	Comment	By	Check

Status Code	Drawing Status		
<b>A</b>	<b>CONSTRUCTION</b>		
This drawing may only be used for construction/manufacture if status is CONSTRUCTION			
 <b>Furness Partnership</b> Consulting Structural/Civil Engineers London 20 Britton Street, London, EC1M 5TX tel: 020 7490 4353 fax: 020 7490 4354 e-mail: info@furnesspartnership.com Bradford The Paper Hall, Anne Gate, Bradford, BD1 4EQ tel: 01274 392092 e-mail: mail@furnesspartnership.com			
Project			
<b>WHITE OAKS LEISURE CENTRE SEVENOAKS</b>			
Drawing Title			
<b>PROPOSED MANHOLE SCHEDULES</b>			
FP Job No.	Drawn	Date	Checked
L2394	M.H	JUN '20	L.D.W
Scale @ A1	N/A		
PROJECT	OPERATOR	ZONE / VOLUME	LEVEL / LOCATION
1689	FUR	XX	XX
FILE TYPE	ROLE	SHEET No.	Rev.
DR	D	0933	C5

## APPENDIX C – CCTV DRAINAGE REPORTS



**Project**

**Project Name:** Universal Piling Ltd - Swanley - BR8 7BT - PJ00393574  
**Project Status:** Complete  
**Project Date:** 06/01/2021



**Lanes  
Group plc**

## Table of Contents

**Project Name**

Universal Piling Ltd - Swanley - BR8 7BT - PJ00393574

**Project Date**

06/01/2021

Project Information .....	P-1
Project Pictures .....	P-3
Section Profile .....	P-5
Section: 1; S07 > S08 (S07X) .....	1
Section: 2; S08 > S09 (S08X) .....	3
Section: 3; S09 > S10 (S09X) .....	5
Section: 4; F17 > F17A (F17X) .....	6
Section: 5; S10 > Pipe A (S10X) .....	8
Section: 6; S05B > S05A (S05BX) .....	10
Section: 7; S05A > S05 (S05AX) .....	11
Section: 8; S05 > S106 (S05X) .....	12
Section: 9; S01 > S02 (S01X) .....	14
Section: 10; S02 > S03 (S02X) .....	16
Section: 11; S03 > S04 (S03X) .....	18
Section: 12; S04 > S05B (S04X) .....	20
Section: 13; Pipe A > F11 (PipeAX) .....	21
Section: 14; F11 > F06 (F11X) .....	23

## Project Information

**Project Name**

Universal Piling Ltd - Swanley - BR8 7BT - PJ00393574

**Project Date**

06/01/2021

### Client

**Company:** Universal Piling and Conctruction Ltd  
**Description:** 1st Floor Ashbrook House  
**Contact:** Sean  
**Department:** Arthur  
**Street:** Forest Street  
**Town or City:** Sutton in Ashfield  
**County:** Notts  
**Post Code:** NG17 1BE  
**Mobile:** 07948 081843  
**Email:** sean.arthur@universal-group.uk

### Site

**Company:** White Oaks Leisure Centre  
**Contact:** Alex Parvan  
**Street:** Hilda May Avenue  
**Town or City:** Swanley  
**County:** Kent  
**Post Code:** BR8 7BT  
**Mobile:** 07791 776595

### Contractor

**Company:** Lanes Group Plc  
**Contact:** Simon Sheridan  
**Department:** CCTV Supervisor  
**Street:** Unit 8 Mill Place, Platt Ind' Est'  
**Town or City:** Maidstone Rad, Platt  
**County:** Kent  
**Post Code:** TN15 8FD  
**Phone:** 01732 783110  
**Email:** southeastops@lanesgroup.co.uk



## Project Information

**Project Name**

Universal Piling Ltd - Swanley - BR8 7BT - PJ00393574

**Project Date**

06/01/2021

### Project Notes

F15 - Unable to survey due to a high water level

F14 - Unable to survey due to water backing up from F15

S10 - Unable to survey Pipe B in manhole due to offset line

F11 d.st F06 - F06 manhole not fully installed.

## Project Pictures

Project Name  
Universal Piling Ltd - Swanley - BR8 7BT - PJ00393574

Project Date  
06/01/2021



Site Area 1



Site Area 2



Site Area 3



Site Area 4



Site Area 5



F15



## Project Pictures

**Project Name**  
Universal Piling Ltd - Swanley - BR8 7BT - PJ00393574

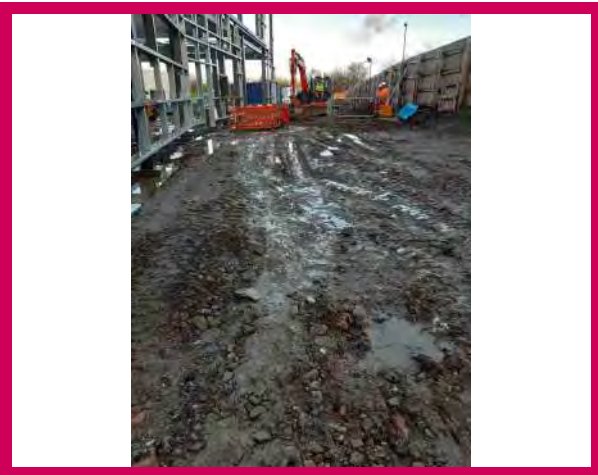
**Project Date**  
06/01/2021



F14



S10



Site Area 6



Site Area 7

## Section Profile

Project Name  
Universal Piling Ltd - Swanley - BR8 7BT - PJ00393574

Project Date  
06/01/2021

### Circular, 100 mm

Section	Upstream Node	Downstream Node	Date	Road	Asset Material	Total Length	Inspected Length
13	Pipe A	F11	06/01/2021	Hilda May Avenue	Plastic (smooth)	23.00 m	21.19 m
14	F11	F06	06/01/2021	Hilda May Avenue	Plastic (smooth)	15.00 m	9.58 m

**Total: 2 Inspections x Circular 100 mm = 38.00 m Total Length and 30.77 m Inspected Length**

### Circular, 225 mm

Section	Upstream Node	Downstream Node	Date	Road	Asset Material	Total Length	Inspected Length
4	F17	F17A	06/01/2021	Hilda May Avenue	Plastic (smooth)	3.02 m	3.02 m
9	S01	S02	06/01/2021	Hilda May Avenue	Plastic (ribbed)	31.55 m	31.55 m
10	S02	S03	06/01/2021	Hilda May Avenue	Plastic (ribbed)	9.25 m	9.25 m
11	S03	S04	06/01/2021	Hilda May Avenue	Plastic (ribbed)	24.95 m	24.95 m

**Total: 4 Inspections x Circular 225 mm = 68.77 m Total Length and 68.77 m Inspected Length**

### Circular, 300 mm

Section	Upstream Node	Downstream Node	Date	Road	Asset Material	Total Length	Inspected Length
6	S05B	S05A	06/01/2021	Hilda May Avenue	Vitrified clay	1.77 m	1.77 m
8	S05	S106	06/01/2021	Hilda May Avenue	Plastic (ribbed)	9.27 m	9.27 m
12	S04	S05B	06/01/2021	Hilda May Avenue	Plastic (ribbed)	2.42 m	2.42 m

**Total: 3 Inspections x Circular 300 mm = 13.46 m Total Length and 13.46 m Inspected Length**

### Circular, 375 mm

Section	Upstream Node	Downstream Node	Date	Road	Asset Material	Total Length	Inspected Length
1	S07	S08	06/01/2021	Hilda May Avenue	Plastic (ribbed)	33.09 m	32.84 m
5	S10	Pipe A	06/01/2021	Hilda May Avenue	Plastic (ribbed)	5.17 m	5.17 m
7	S05A	S05	06/01/2021	Hilda May Avenue	Plastic (ribbed)	2.51 m	2.51 m

**Total: 3 Inspections x Circular 375 mm = 40.77 m Total Length and 40.52 m Inspected Length**

### Circular, 450 mm

Section	Upstream Node	Downstream Node	Date	Road	Asset Material	Total Length	Inspected Length
2	S08	S09	06/01/2021	Hilda May Avenue	Plastic (ribbed)	11.34 m	10.24 m
3	S09	S10	06/01/2021	Hilda May Avenue	Plastic (ribbed)	15.52 m	15.52 m

**Total: 2 Inspections x Circular 450 mm = 26.86 m Total Length and 25.76 m Inspected Length**

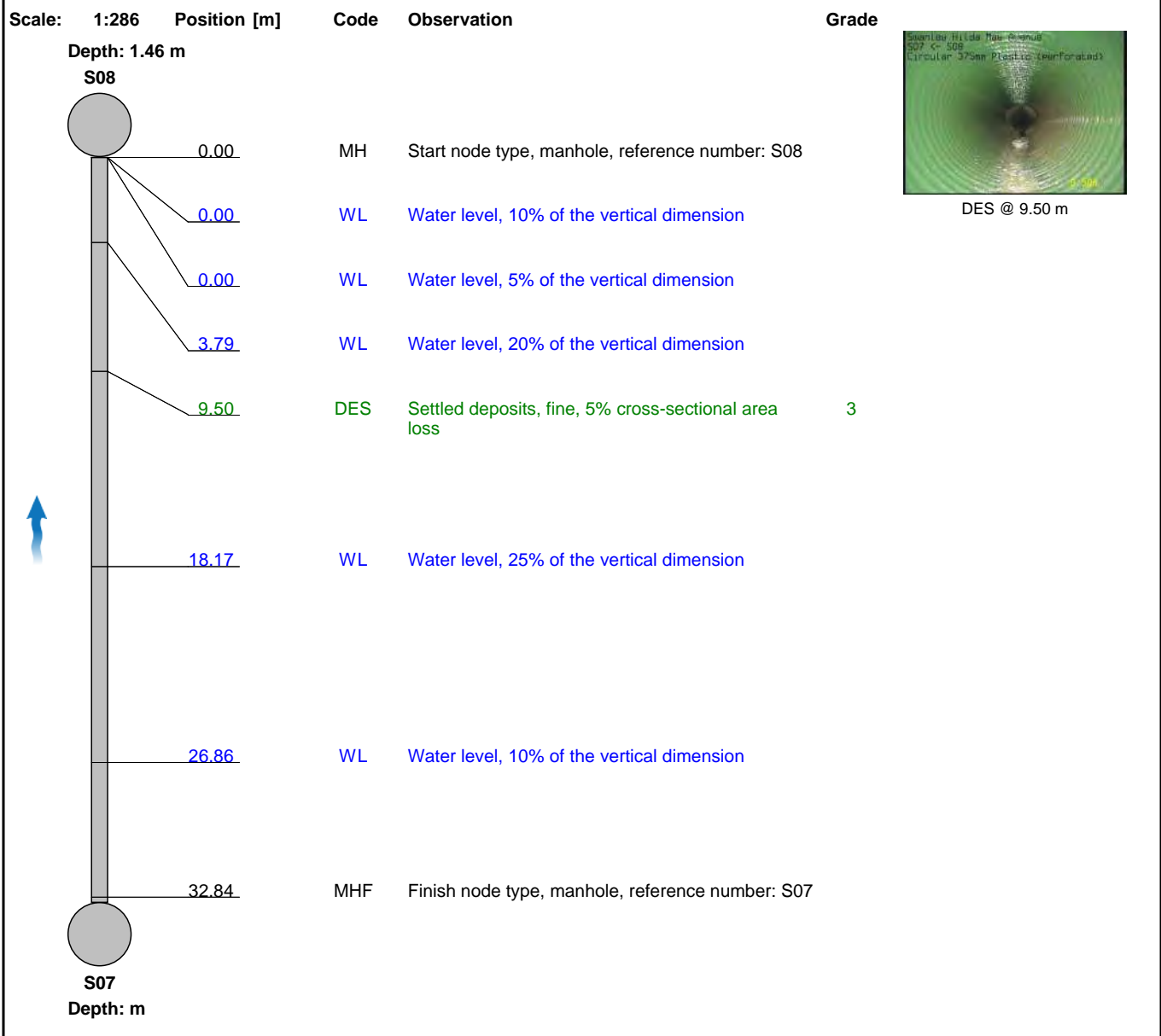
**Total: 14 Inspections = 187.86 m Total Length and 179.28 m Inspected Length**

## Completed section inspection

Section <b>1</b>	Inspection <b>1</b>	Date <b>06/01/21</b>	Time <b>10:31</b>	Lanes Job Number <b>PJ00393574</b>	Weather <b>Dry</b>	Pre Cleaned <b>No</b>	PLR <b>S07X</b>
Operator <b>Keir Mayo</b>		Asset Location: <b>Building site</b>		Camera <b>Small Crawler</b>	Preset Length <b>Not Specified</b>	Legal Status <b>Private Drain</b>	Alternative ID <b>Not Specified</b>

Town or Village: <b>Swanley</b>	Inspection Direction: <b>Upstream</b>	Upstream Node: <b>S07</b>
Road: <b>Hilda May Avenue</b>	Inspected Length: <b>32.84 m</b>	Upstream Pipe Depth: <b>0</b>
Post Code: <b>BR8 7BT</b>	Total Length: <b>33.09 m</b>	Downstream Node: <b>S08</b>
Surface Type: <b>Soil</b>	Joint Length: <b>0.00 m</b>	Downstream Pipe Depth: <b>1.46 m</b>
Asset Use: <b>Surface waste</b>	Asset Shape: <b>Circular</b>	
Asset Type: <b>Gravity drain/sewer</b>	Dia/Height: <b>375 mm</b>	
Asset Owner: <b>Private</b>	Asset Material: <b>Plastic (ribbed)</b>	
Year Constructed: <b>Not Specified</b>	Lining Type: <b>No Lining</b>	
Inspection Purpose: <b>Condition survey</b>	Asset Lining Material: <b>No Lining</b>	

Comments: **Video text should read Ribbed Ridgidrain Smooth Inner Liner**



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	0.1	2.0	3.0

## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
1	Upstream	S07X	1	PJ00393574



1, 00:00:49, 9.50 m  
Settled deposits, fine, 5% cross-sectional area loss

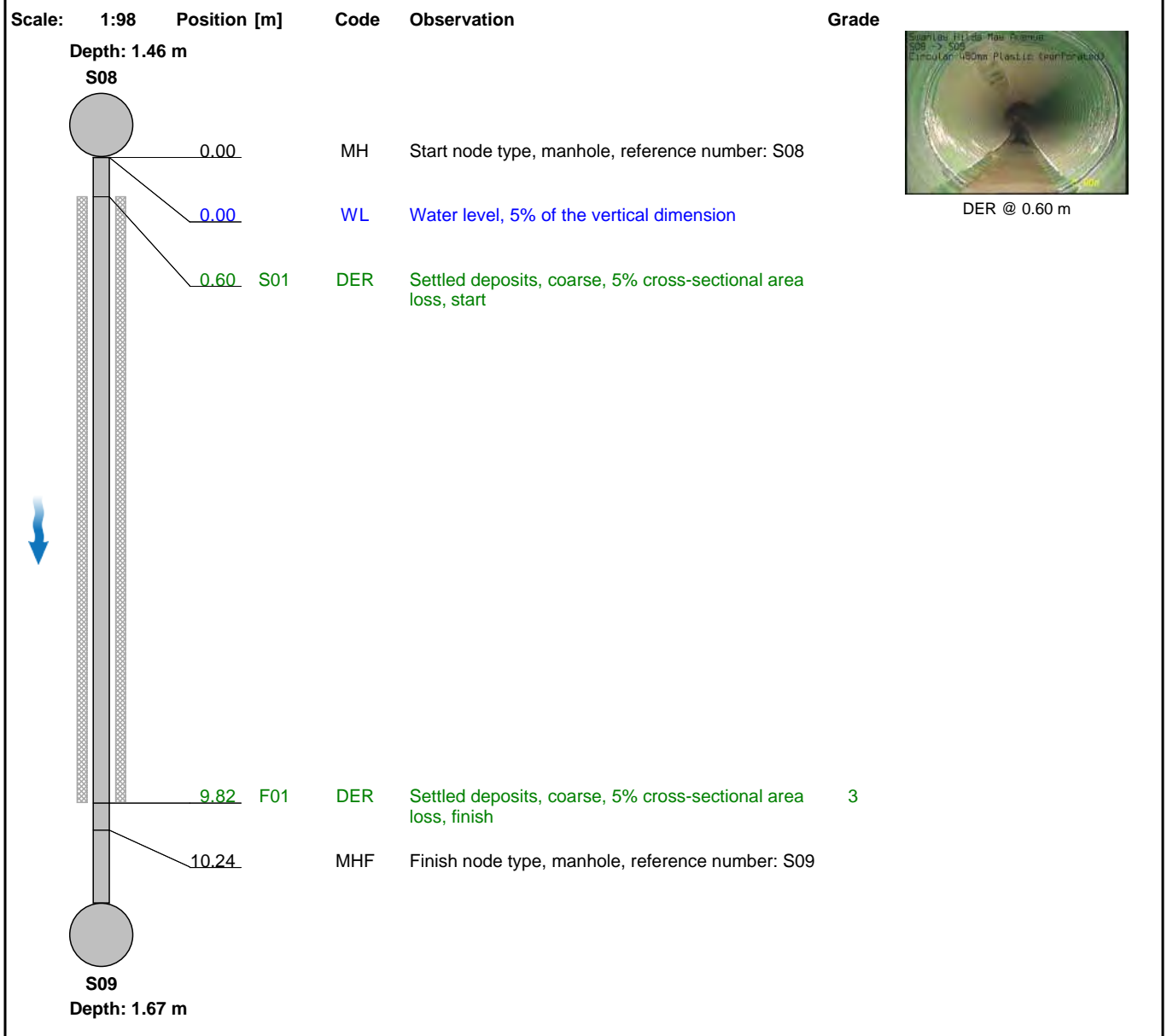
## Completed section inspection

Section <b>2</b>	Inspection <b>1</b>	Date <b>06/01/21</b>	Time <b>10:44</b>	Lanes Job Number <b>PJ00393574</b>	Weather <b>Dry</b>	Pre Cleaned <b>No</b>	PLR <b>S08X</b>
Operator <b>Keir Mayo</b>		Asset Location: <b>Building site</b>		Camera <b>Small Crawler</b>	Preset Length <b>Not Specified</b>	Legal Status <b>Private Drain</b>	Alternative ID <b>Not Specified</b>

Town or Village: <b>Swanley</b>	Inspection Direction: <b>Downstream</b>	Upstream Node: <b>S08</b>
Road: <b>Hilda May Avenue</b>	Inspected Length: <b>10.24 m</b>	Upstream Pipe Depth: <b>1.46 m</b>
Post Code: <b>BR8 7BT</b>	Total Length: <b>11.34 m</b>	Downstream Node: <b>S09</b>
Surface Type: <b>Soil</b>	Joint Length: <b>0.00 m</b>	Downstream Pipe Depth: <b>1.67 m</b>
Asset Use: <b>Surface waste</b>	Asset Shape: <b>Circular</b>	
Asset Type: <b>Gravity drain/sewer</b>	Dia/Height: <b>450 mm</b>	
Asset Owner: <b>Private</b>	Asset Material: <b>Plastic (ribbed)</b>	
Year Constructed: <b>Not Specified</b>	Lining Type: <b>No Lining</b>	
Inspection Purpose: <b>Condition survey</b>	Asset Lining Material: <b>No Lining</b>	

Comments: **Video text should read Ribbed Ridgidrain Smooth Inner Liner**

Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	0.0	0.2	2.0	1.0

## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
2	Downstream	S08X	2	PJ00393574



1, 00:00:02, 0.60 m  
Settled deposits, coarse, 5% cross-sectional area loss, start

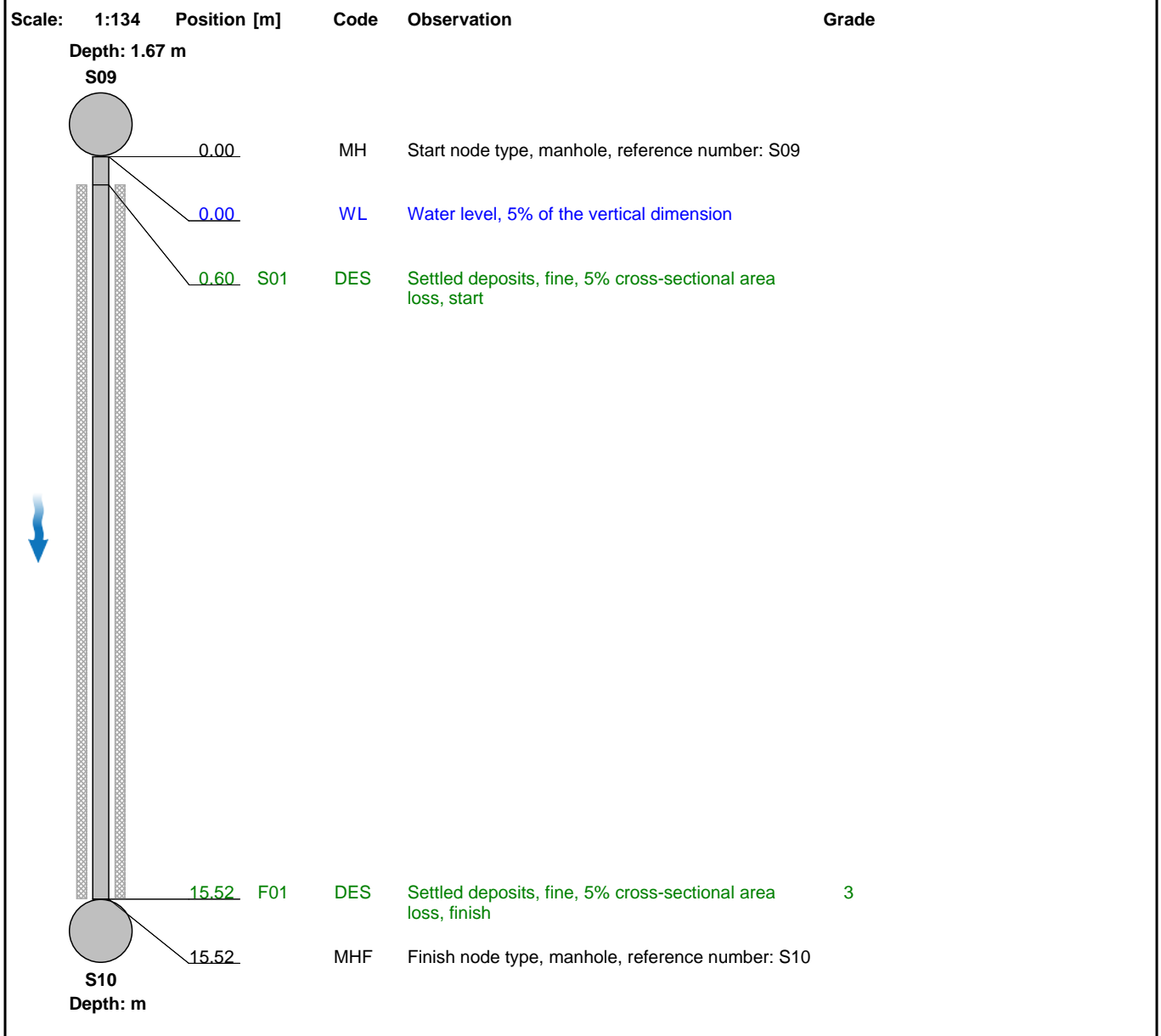
## Completed section inspection

Section 3	Inspection 1	Date 06/01/21	Time 10:53	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S09X
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village: Swanley	Inspection Direction: Downstream	Upstream Node: S09
Road: Hilda May Avenue	Inspected Length: 15.52 m	Upstream Pipe Depth: 1.67 m
Post Code: BR8 7BT	Total Length: 15.52 m	Downstream Node: S10
Surface Type: Soil	Joint Length: 0.00 m	Downstream Pipe Depth: 0
Asset Use: Surface waste	Asset Shape: Circular	
Asset Type: Gravity drain/sewer	Dia/Height: 450 mm	
Asset Owner: Private	Asset Material: Plastic (ribbed)	
Year Constructed: Not Specified	Lining Type: No Lining	
Inspection Purpose: Condition survey	Asset Lining Material: No Lining	

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner

CLICK TO OPEN THIS SECTION



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	1.9	30.0	3.0

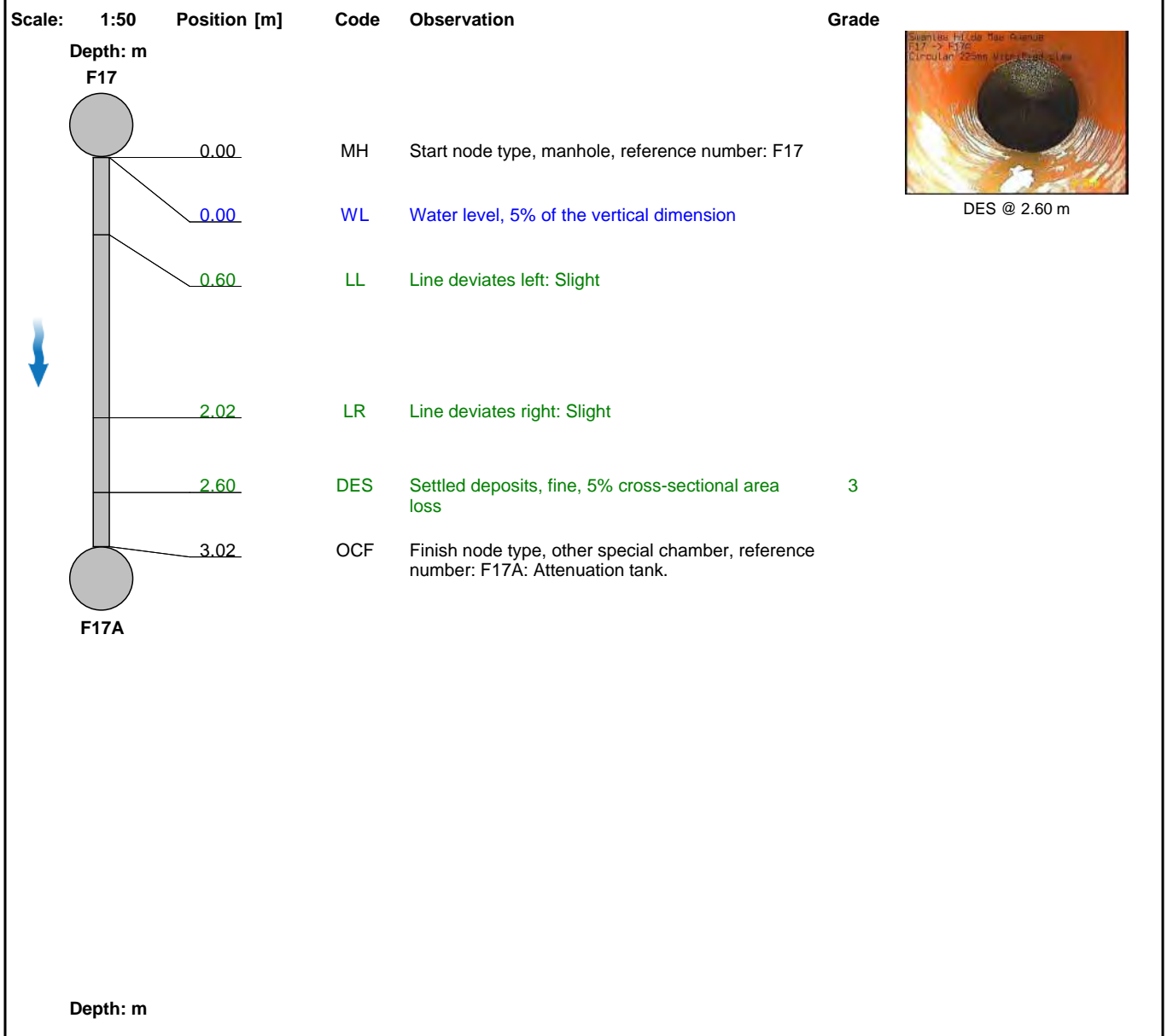
## Completed section inspection

Section <b>4</b>	Inspection <b>1</b>	Date <b>06/01/21</b>	Time <b>11:08</b>	Lanes Job Number <b>PJ00393574</b>	Weather <b>Dry</b>	Pre Cleaned <b>No</b>	PLR <b>F17X</b>
Operator <b>Keir Mayo</b>		Asset Location: <b>Building site</b>		Camera <b>Small Crawler</b>	Preset Length <b>Not Specified</b>	Legal Status <b>Private Drain</b>	Alternative ID <b>Not Specified</b>

Town or Village: <b>Swanley</b>	Inspection Direction: <b>Downstream</b>	Upstream Node: <b>F17</b>
Road: <b>Hilda May Avenue</b>	Inspected Length: <b>3.02 m</b>	Upstream Pipe Depth: <b>0</b>
Post Code: <b>BR8 7BT</b>	Total Length: <b>3.02 m</b>	Downstream Node: <b>F17A</b>
Surface Type: <b>Soil</b>	Joint Length: <b>0.00 m</b>	Downstream Pipe Depth: <b>0</b>
Asset Use: <b>Surface waste</b>	Asset Shape: <b>Circular</b>	
Asset Type: <b>Gravity drain/sewer</b>	Dia/Height: <b>225 mm</b>	
Asset Owner: <b>Private</b>	Asset Material: <b>Plastic (smooth)</b>	
Year Constructed: <b>Not Specified</b>	Lining Type: <b>No Lining</b>	
Inspection Purpose: <b>Condition survey</b>	Asset Lining Material: <b>No Lining</b>	

Comments: **Backwash attenuation tank (F17A). Video should read Polypipe Underground Drainage Smooth**

Recommendations:

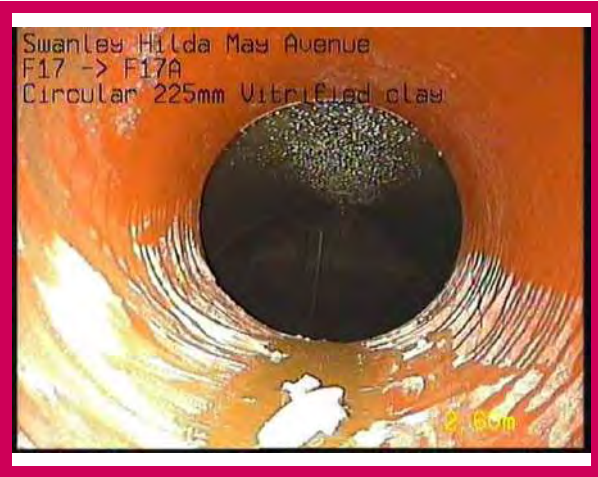


Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	0.7	2.0	3.0



## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
4	Downstream	F17X	4	PJ00393574



1, 00:00:35, 2.60 m  
Settled deposits, fine, 5% cross-sectional area loss

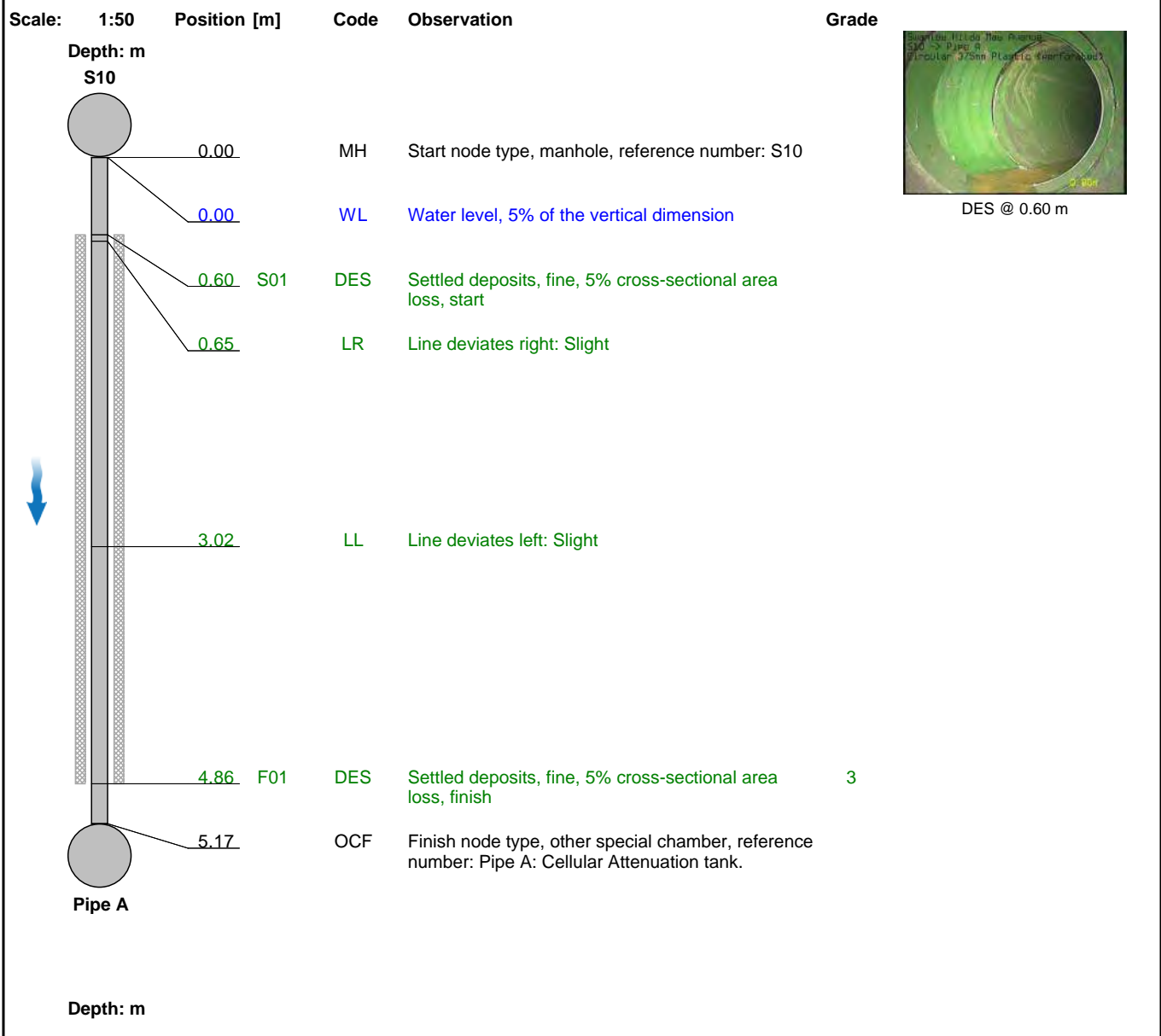
## Completed section inspection

Section <b>5</b>	Inspection <b>1</b>	Date <b>06/01/21</b>	Time <b>11:56</b>	Lanes Job Number <b>PJ00393574</b>	Weather <b>Dry</b>	Pre Cleaned <b>No</b>	PLR <b>S10X</b>
Operator <b>Keir Mayo</b>		Asset Location: <b>Building site</b>		Camera <b>Small Crawler</b>	Preset Length <b>Not Specified</b>	Legal Status <b>Private Drain</b>	Alternative ID <b>Not Specified</b>

Town or Village: <b>Swanley</b>	Inspection Direction: <b>Downstream</b>	Upstream Node: <b>S10</b>
Road: <b>Hilda May Avenue</b>	Inspected Length: <b>5.17 m</b>	Upstream Pipe Depth: <b>0</b>
Post Code: <b>BR8 7BT</b>	Total Length: <b>5.17 m</b>	Downstream Node: <b>PIPE A</b>
Surface Type: <b>Soil</b>	Joint Length: <b>0.00 m</b>	Downstream Pipe Depth: <b>0</b>
Asset Use: <b>Surface waste</b>	Asset Shape: <b>Circular</b>	
Asset Type: <b>Gravity drain/sewer</b>	Dia/Height: <b>375 mm</b>	
Asset Owner: <b>Private</b>	Asset Material: <b>Plastic (ribbed)</b>	
Year Constructed: <b>Not Specified</b>	Lining Type: <b>No Lining</b>	
Inspection Purpose: <b>Condition survey</b>	Asset Lining Material: <b>No Lining</b>	

Comments: **Video text should read Ribbed Ridgidrain Smooth Inner Liner**

Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	1.9	10.0	3.0

## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
5	Downstream	S10X	5	PJ00393574



1, 00:00:02, 0.60 m  
Settled deposits, fine, 5% cross-sectional area loss, start

## Abandoned section inspection

Section 6	Inspection 1	Date 06/01/21	Time 12:25	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S05BX
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Swanley	Inspection Direction:	Downstream	Upstream Node:	S05B
Road:	Hilda May Avenue	Inspected Length:	1.77 m	Upstream Pipe Depth:	0
Post Code:	BR8 7BT	Total Length:	1.77 m	Downstream Node:	S05A
Surface Type:	Soil	Joint Length:	0.00 m	Downstream Pipe Depth:	0
Asset Use:	Surface waste	Asset Shape:	Circular		
Asset Type:	Gravity drain/sewer	Dia/Height:	300 mm		
Asset Owner:	Private	Asset Material:	Vitrified clay		
Year Constructed:	Not Specified	Lining Type:	No Lining		
Inspection Purpose:	Condition survey	Asset Lining Material:	No Lining		

Comments: Video should read S05B D.st S05A

Recommendations: WEB PROJECT  
CLICK TO OPEN THIS SECTION

Scale:	1:50	Position [m]	Code	Observation	Grade																								
<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>Depth: m</p> <p>S05B</p> </div> <table border="1" style="border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">0.00</td> <td style="width: 10%;"></td> <td style="width: 15%;">MH</td> <td colspan="3">Start node type, manhole, reference number: S05</td> </tr> <tr> <td style="text-align: center;">0.00</td> <td></td> <td>WL</td> <td colspan="3">Water level, 5% of the vertical dimension</td> </tr> <tr> <td style="text-align: center;">1.77</td> <td></td> <td>LD</td> <td colspan="3">Line deviates down: Sharp</td> </tr> <tr> <td style="text-align: center;">1.77</td> <td></td> <td>SA</td> <td colspan="3">Survey abandoned: Due to a sharp line deviation</td> </tr> </table> </div>						0.00		MH	Start node type, manhole, reference number: S05			0.00		WL	Water level, 5% of the vertical dimension			1.77		LD	Line deviates down: Sharp			1.77		SA	Survey abandoned: Due to a sharp line deviation		
0.00		MH	Start node type, manhole, reference number: S05																										
0.00		WL	Water level, 5% of the vertical dimension																										
1.77		LD	Line deviates down: Sharp																										
1.77		SA	Survey abandoned: Due to a sharp line deviation																										
Construction Features					Miscellaneous Features																								
Structural Defects					Service & Operational Observations																								
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade																				
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0																				

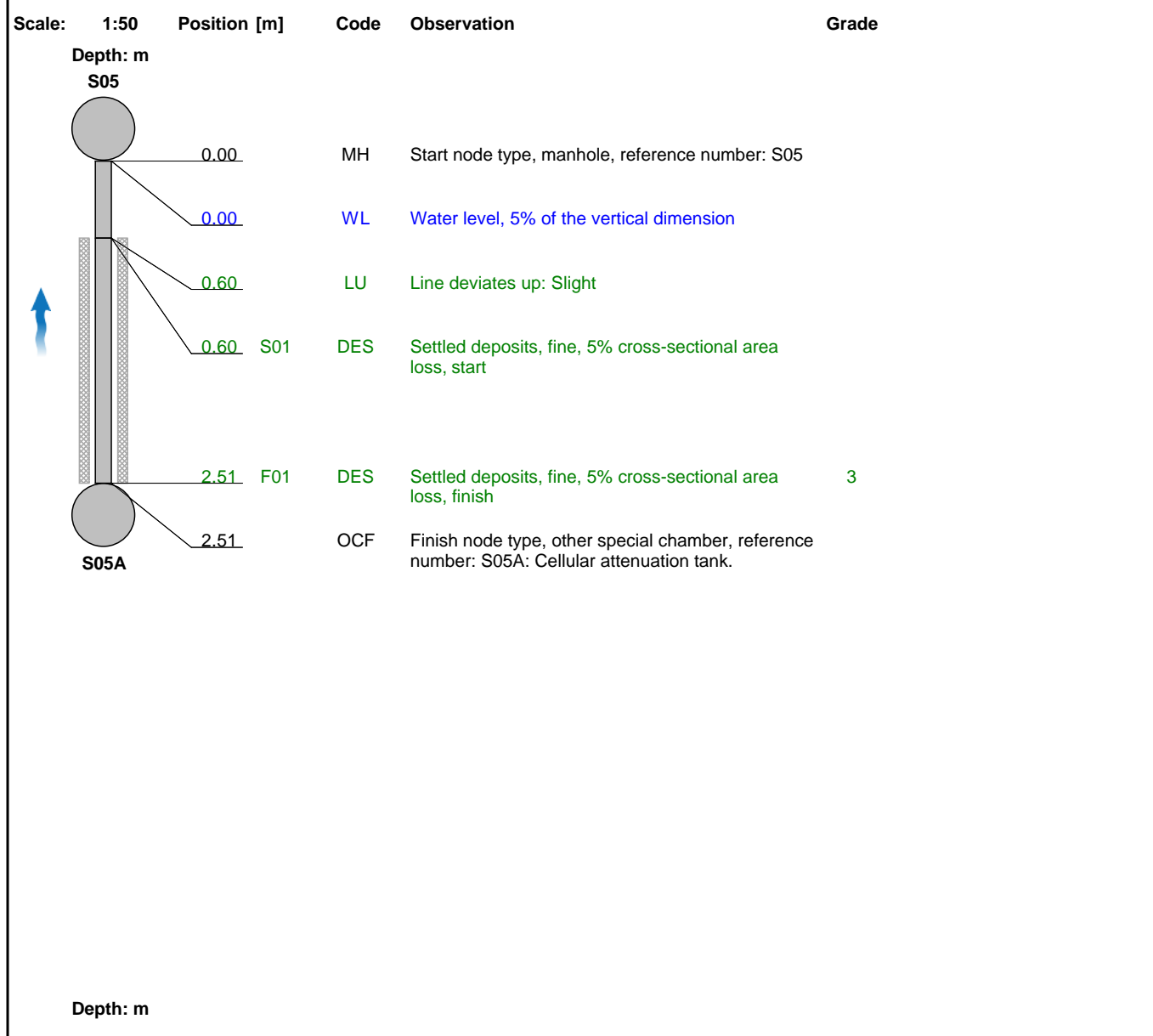
## Completed section inspection

Section 7	Inspection 1	Date 06/01/21	Time 12:45	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S05AX
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Swanley	Inspection Direction:	Upstream	Upstream Node:	S05A
Road:	Hilda May Avenue	Inspected Length:	2.51 m	Upstream Pipe Depth:	0
Post Code:	BR8 7BT	Total Length:	2.51 m	Downstream Node:	S05
Surface Type:	Soil	Joint Length:	0.00 m	Downstream Pipe Depth:	0

Asset Use:	Surface waste	Asset Shape:	Circular
Asset Type:	Gravity drain/sewer	Dia/Height:	375 mm
Asset Owner:	Private	Asset Material:	Plastic (ribbed)
Year Constructed:	Not Specified	Lining Type:	No Lining
Inspection Purpose:	Condition survey	Asset Lining Material:	No Lining

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner



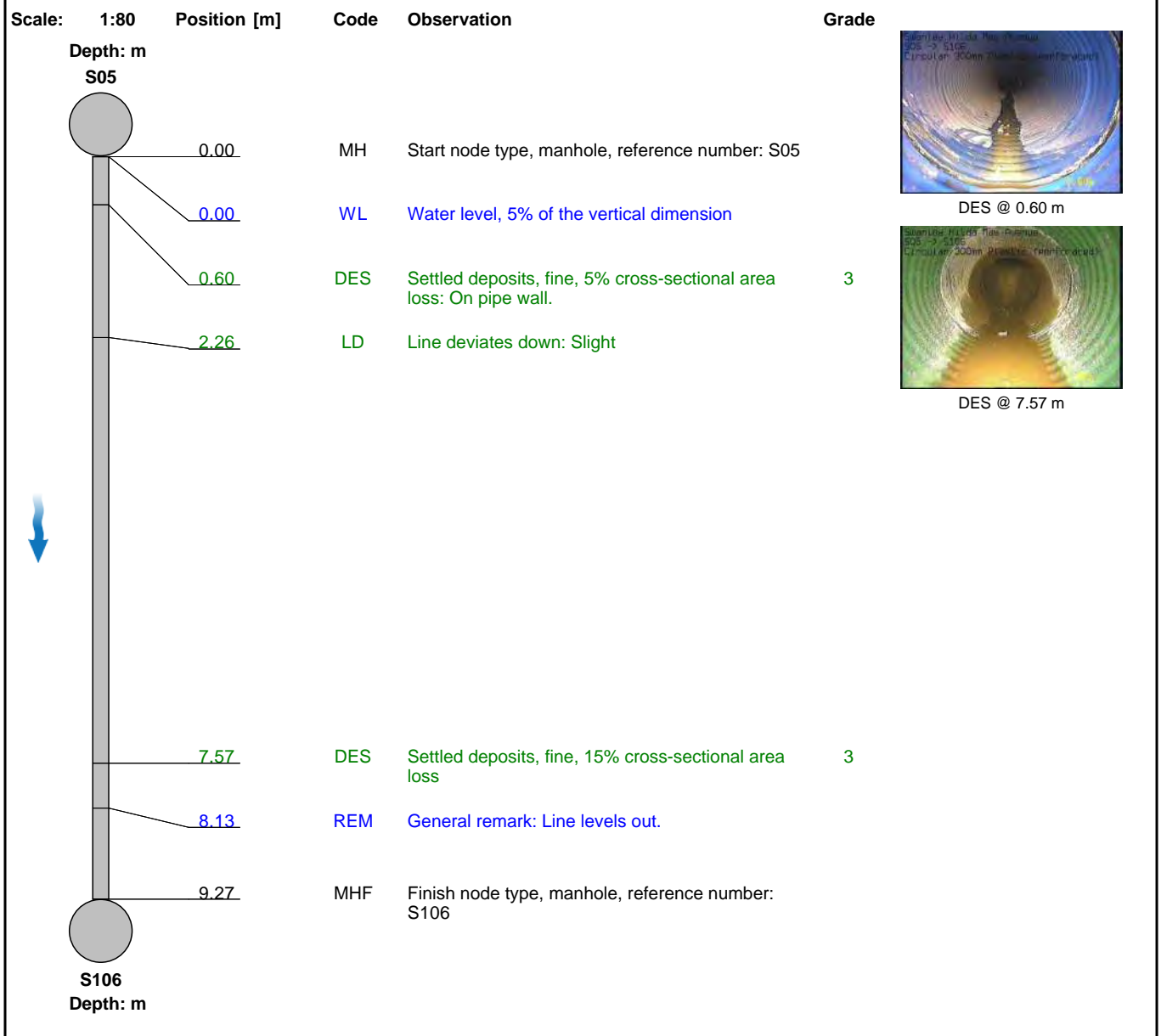
Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	1.6	4.0	3.0

## Completed section inspection

Section 8	Inspection 1	Date 06/01/21	Time 12:48	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S05X
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village: Swanley	Inspection Direction: Downstream	Upstream Node: S05
Road: Hilda May Avenue	Inspected Length: 9.27 m	Upstream Pipe Depth: 0
Post Code: BR8 7BT	Total Length: 9.27 m	Downstream Node: S106
Surface Type: Soil	Joint Length: 0.00 m	Downstream Pipe Depth: 0
Asset Use: Surface waste	Asset Shape: Circular	
Asset Type: Gravity drain/sewer	Dia/Height: 300 mm	
Asset Owner: Private	Asset Material: Plastic (ribbed)	
Year Constructed: Not Specified	Lining Type: No Lining	
Inspection Purpose: Condition survey	Asset Lining Material: No Lining	

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	2	2.0	0.4	4.0	3.0

## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
8	Downstream	S05X	8	PJ00393574



1, 00:00:01, 0.60 m  
Settled deposits, fine, 5% cross-sectional area loss, On pipe wall.



2, 00:00:31, 7.57 m  
Settled deposits, fine, 15% cross-sectional area loss

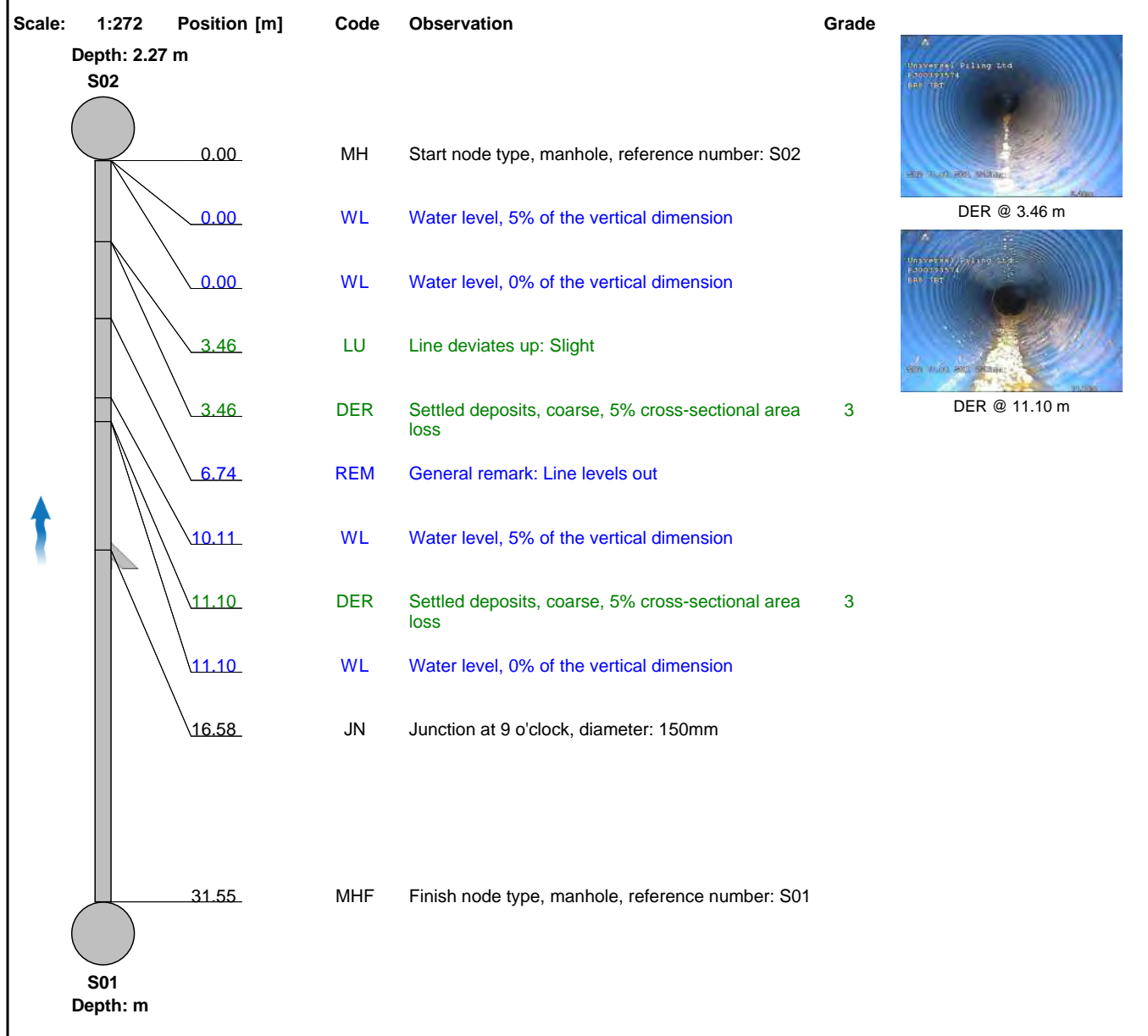
## Completed section inspection

Section 9	Inspection 1	Date 06/01/21	Time 12:34	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S01X
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village: Swanley	Inspection Direction: Upstream	Upstream Node: S01
Road: Hilda May Avenue	Inspected Length: 31.55 m	Upstream Pipe Depth: 0
Post Code: BR8 7BT	Total Length: 31.55 m	Downstream Node: S02
Surface Type: Soil	Joint Length: 0.00 m	Downstream Pipe Depth: 2.27 m

Asset Use: Surface waste	Asset Shape: Circular
Asset Type: Gravity drain/sewer	Dia/Height: 225 mm
Asset Owner: Private	Asset Material: Plastic (ribbed)
Year Constructed: Not Specified	Lining Type: No Lining
Inspection Purpose: Condition survey	Asset Lining Material: No Lining

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner



Construction Features					Miscellaneous Features					
Structural Defects					Service & Operational Observations					
STR No.	Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0		0.0	0.0	0.0	1.0	2	2.0	1.2	4.0	3.0



## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
9	Upstream	S01X	9	PJ00393574



1, 00:00:19, 3.46 m  
Settled deposits, coarse, 5% cross-sectional area loss



2, 00:00:58, 11.10 m  
Settled deposits, coarse, 5% cross-sectional area loss

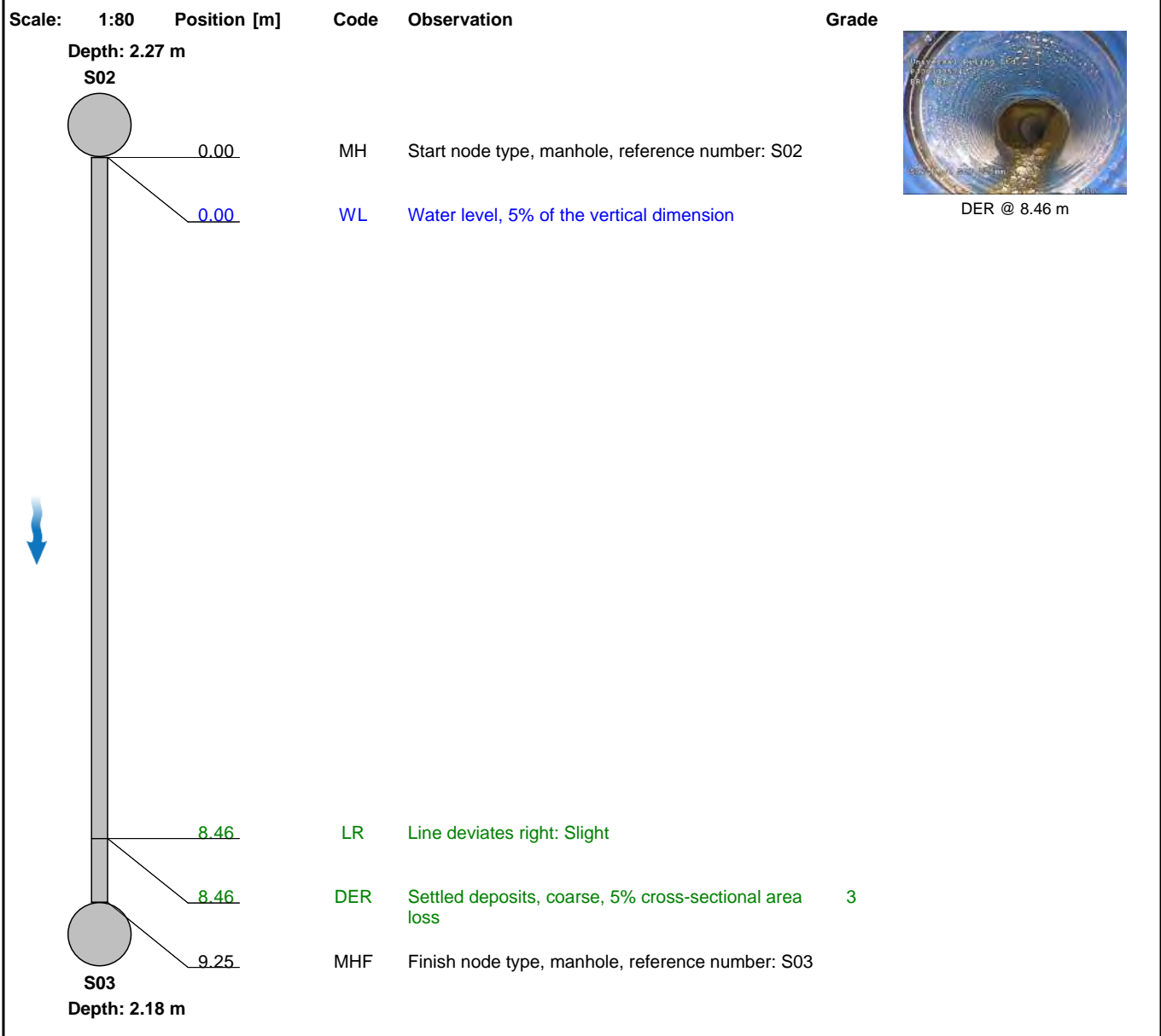
## Completed section inspection

Section 10	Inspection 1	Date 06/01/21	Time 12:41	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S02X
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village: Swanley	Inspection Direction: Downstream	Upstream Node: S02
Road: Hilda May Avenue	Inspected Length: 9.25 m	Upstream Pipe Depth: 2.27 m
Post Code: BR8 7BT	Total Length: 9.25 m	Downstream Node: S03
Surface Type: Soil	Joint Length: 0.00 m	Downstream Pipe Depth: 2.18 m
Asset Use: Surface waste	Asset Shape: Circular	
Asset Type: Gravity drain/sewer	Dia/Height: 225 mm	
Asset Owner: Private	Asset Material: Plastic (ribbed)	
Year Constructed: Not Specified	Lining Type: No Lining	
Inspection Purpose: Condition survey	Asset Lining Material: No Lining	

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner

Recommendations:



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	0.2	2.0	3.0

## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
10	Downstream	S02X	10	PJ00393574



1, 00:00:43, 8.46 m  
Settled deposits, coarse, 5% cross-sectional area loss

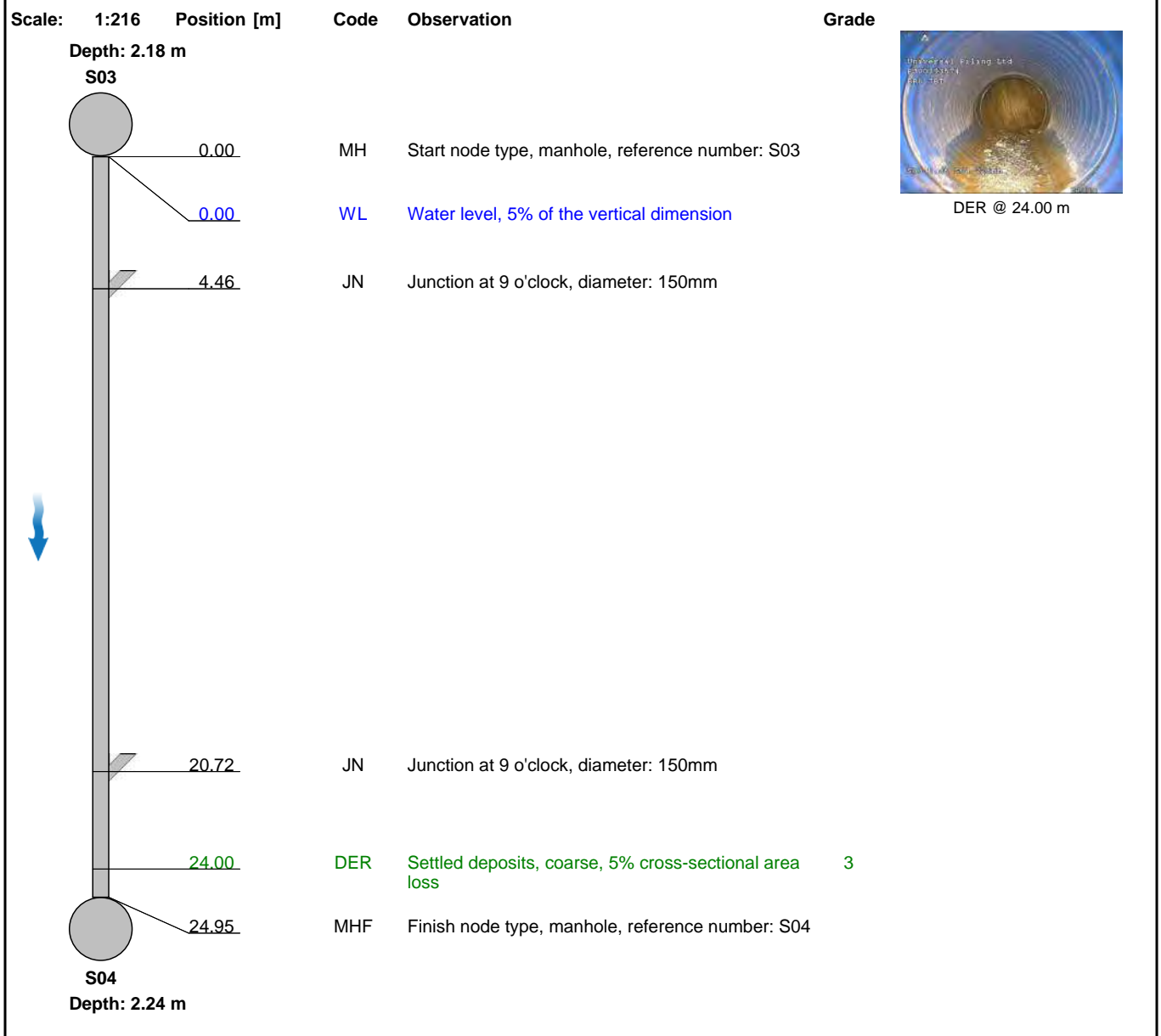
## Completed section inspection

Section 11	Inspection 1	Date 06/01/21	Time 12:45	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S03X
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village: Swanley	Inspection Direction: Downstream	Upstream Node: S03
Road: Hilda May Avenue	Inspected Length: 24.95 m	Upstream Pipe Depth: 2.18 m
Post Code: BR8 7BT	Total Length: 24.95 m	Downstream Node: S04
Surface Type: Soil	Joint Length: 0.00 m	Downstream Pipe Depth: 2.24 m
Asset Use: Surface waste	Asset Shape: Circular	
Asset Type: Gravity drain/sewer	Dia/Height: 225 mm	
Asset Owner: Private	Asset Material: Plastic (ribbed)	
Year Constructed: Not Specified	Lining Type: No Lining	
Inspection Purpose: Condition survey	Asset Lining Material: No Lining	

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner

Recommendations: WEB PROJECT  
CLICK TO OPEN THIS SECTION



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	0.1	2.0	3.0

## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
11	Downstream	S03X	11	PJ00393574



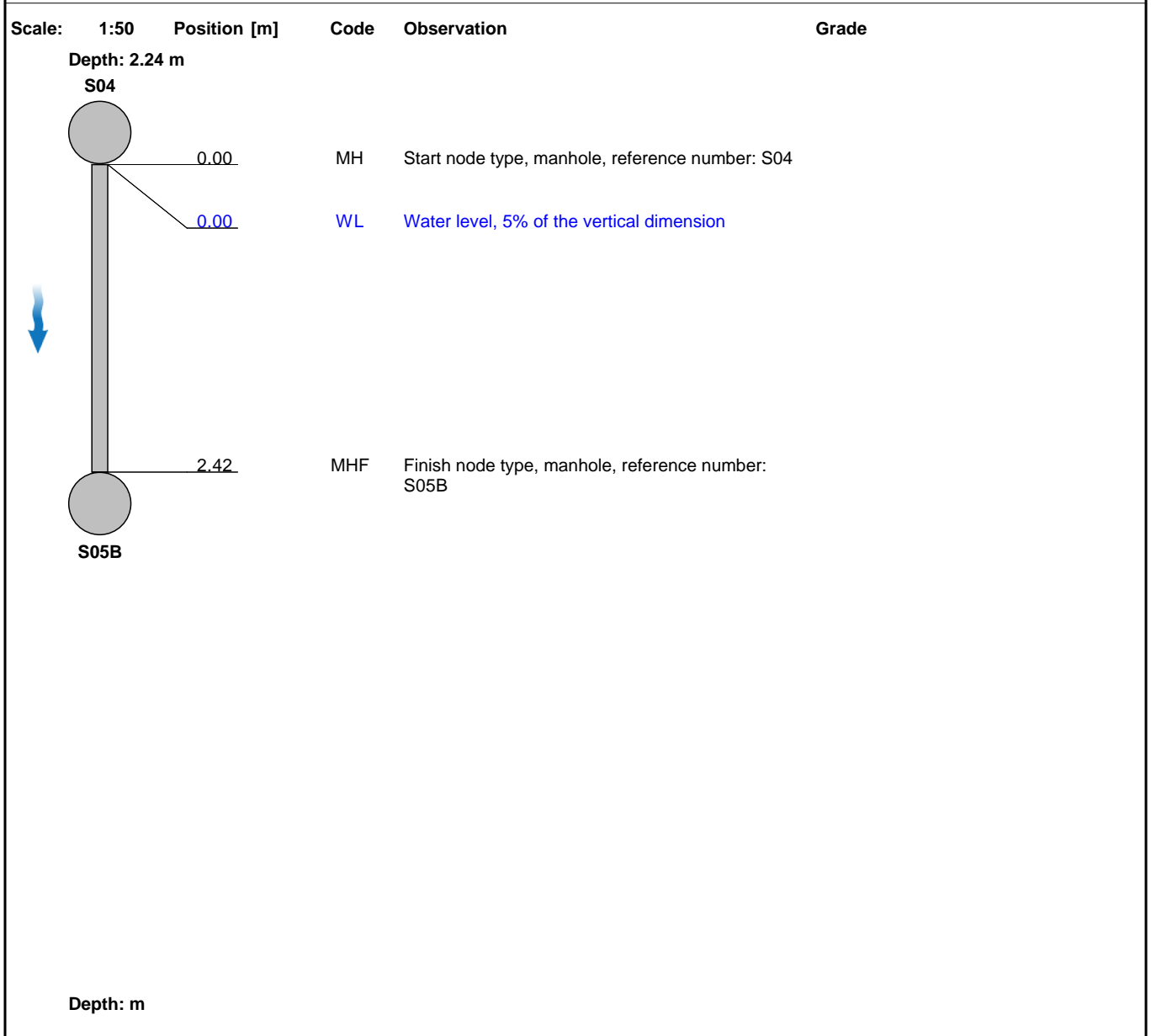
1, 00:01:58, 24.00 m  
Settled deposits, coarse, 5% cross-sectional area loss

## Completed section inspection

Section 12	Inspection 1	Date 06/01/21	Time 12:50	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR S04X
Operator Keir Mayo		Asset Location: Building site		Camera Small Crawler	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village: Swanley	Inspection Direction: Downstream	Upstream Node: S04
Road: Hilda May Avenue	Inspected Length: 2.42 m	Upstream Pipe Depth: 2.24 m
Post Code: BR8 7BT	Total Length: 2.42 m	Downstream Node: S05B
Surface Type: Soil	Joint Length: 0.00 m	Downstream Pipe Depth: 0
Asset Use: Surface waste	Asset Shape: Circular	
Asset Type: Gravity drain/sewer	Dia/Height: 300 mm	
Asset Owner: Private	Asset Material: Plastic (ribbed)	
Year Constructed: Not Specified	Lining Type: No Lining	
Inspection Purpose: Condition survey	Asset Lining Material: No Lining	

Comments: Video text should read 300mm & Ribbed Ridgidrain Smooth Inner Liner



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

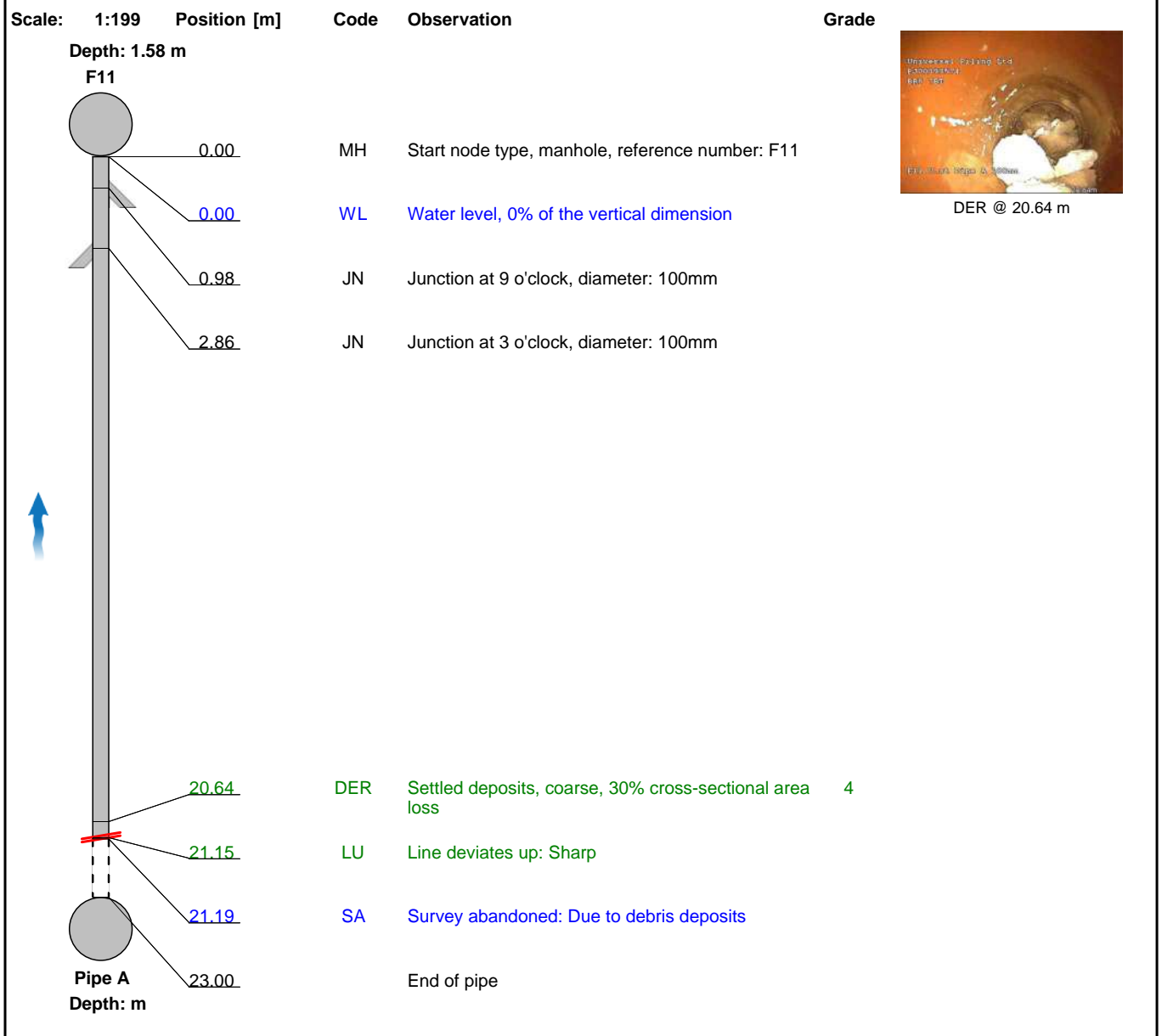
## Abandoned section inspection

Section 13	Inspection 1	Date 06/01/21	Time 12:52	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR PIPE AX
Operator Keir Mayo		Asset Location: Building site		Camera Push Rod	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village: Swanley	Inspection Direction: Upstream	Upstream Node: PIPE A
Road: Hilda May Avenue	Inspected Length: 21.19 m	Upstream Pipe Depth: 0
Post Code: BR8 7BT	Total Length: 23.00 m	Downstream Node: F11
Surface Type: Soil	Joint Length: 0.00 m	Downstream Pipe Depth: 1.58 m
Asset Use: Foul waste	Asset Shape: Circular	
Asset Type: Gravity drain/sewer	Dia/Height: 100 mm	
Asset Owner: Private	Asset Material: Plastic (smooth)	
Year Constructed: Not Specified	Lining Type: No Lining	
Inspection Purpose: Condition survey	Asset Lining Material: No Lining	

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner

Recommendations: WEB PROJECT  
CLICK TO OPEN THIS SECTION



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	5.0	0.2	5.0	4.0

## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
13	Upstream	PIPE AX	13	PJ00393574



1, 00:01:05, 20.64 m  
Settled deposits, coarse, 30% cross-sectional area loss

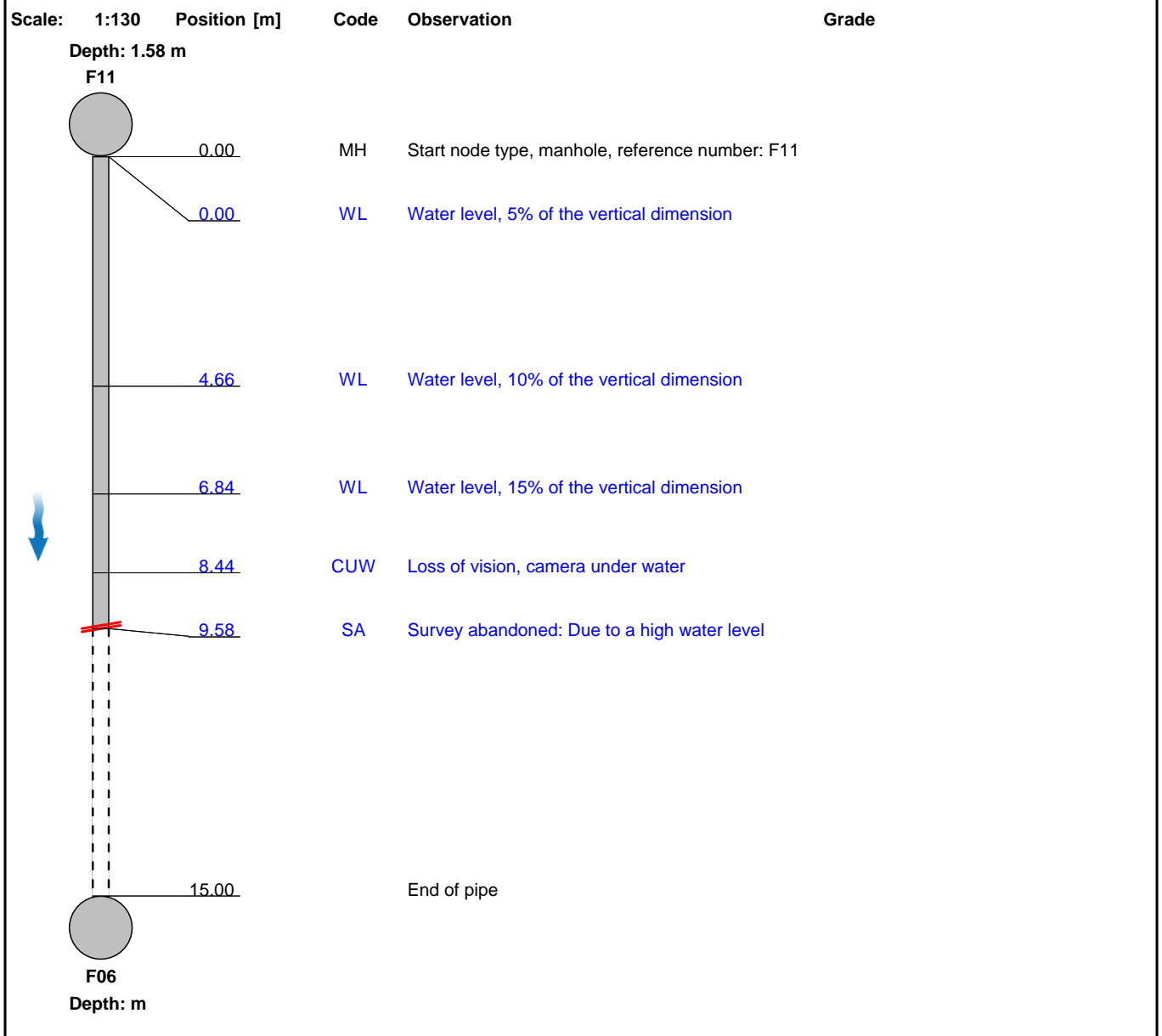


## Abandoned section inspection

Section 14	Inspection 1	Date 06/01/21	Time 12:58	Lanes Job Number PJ00393574	Weather Dry	Pre Cleaned No	PLR F11X
Operator Keir Mayo		Asset Location: Building site		Camera Push Rod	Preset Length Not Specified	Legal Status Private Drain	Alternative ID Not Specified

Town or Village:	Swanley	Inspection Direction:	Downstream	Upstream Node:	F11
Road:	Hilda May Avenue	Inspected Length:	9.58 m	Upstream Pipe Depth:	1.58 m
Post Code:	BR8 7BT	Total Length:	15.00 m	Downstream Node:	F06
Surface Type:	Soil	Joint Length:	0.00 m	Downstream Pipe Depth:	0
Asset Use:	Foul waste	Asset Shape:	Circular	Asset Type:	Gravity drain/sewer
Asset Type:	Gravity drain/sewer	Dia/Height:	100 mm	Asset Owner:	Private
Asset Owner:	Private	Asset Material:	Plastic (smooth)	Year Constructed:	Not Specified
Year Constructed:	Not Specified	Lining Type:	No Lining	Inspection Purpose:	Condition survey
Inspection Purpose:	Condition survey	Asset Lining Material:	No Lining		

Comments: Video text should read Ribbed Ridgidrain Smooth Inner Liner



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



**Project**

**Project Name:** Universal Piling - Swanley - BR8 7BT - PJ00422335  
**Project Status:** Complete  
**Project Date:** 08/10/2021



**Lanes  
Group plc**



## Table of Contents

**Project Name**

Universal Piling - Swanley - BR8 7BT - PJ00422335

**Project Date**

08/10/2021

Project Information .....	P-1
Section Profile .....	P-3
Section: 1; S 10 > S06A (S 10X) .....	1

## Project Information

**Project Name**

Universal Piling - Swanley - BR8 7BT - PJ00422335

**Project Date**

08/10/2021

### Client

**Company:** Universal Piling and Contracting Ltd  
**Department:** 1st Floor Ashbrook House  
**Street:** Forest Street  
**Town or City:** Sutton in Ashfield  
**County:** Nottinghamshire  
**Post Code:** NG17 1BE

### Site

**Company:** Universal Piling and Contracting Ltd  
**Street:** Hilda Way Avenue  
**Town or City:** Swanley  
**County:** Kent  
**Post Code:** BR8 7BT

### Contractor

**Company:** Lanes Group Plc  
**Contact:** Jake Wheeler  
**Department:** CCTV Operative  
**Street:** Unit 8 Mill Place, Platt Industrial Estate  
**Town or City:** Maidstone Road, Platt  
**County:** Kent  
**Post Code:** TN15 8FD  
**Email:** Sevenoaksops@lanesgroup.co.uk

## Project Information

**Project Name**

Universal Piling - Swanley - BR8 7BT - PJ00422335

**Project Date**

08/10/2021

## Project Summary

Dear Customer,

As requested, we have recently carried out a drainage CCTV survey at the site location and our full and detailed findings are contained in the attached CCTV report which you can review at your leisure.

No further works are required at this time but please feel free to contact us should you require any further assistance or clarification in relation to this survey and its contents.

We would like to take this opportunity to thank you for using Lanes Group plc and I hope we can be of service to you again soon. Please visit our website for full details of all services we can provide, follow us on social media or even share details of your customer experience with us:

[www.lanesgroup.co.uk](http://www.lanesgroup.co.uk)

If you require any technical assistance understanding the findings of the CCTV report then please contact us at:

[cctv.reports@lanesfordrains.co.uk](mailto:cctv.reports@lanesfordrains.co.uk)

Kind regards,  
Lanes Group plc



### Section Profile

**Project Name**

Universal Piling - Swanley - BR8 7BT - PJ00422335

**Project Date**

08/10/2021

#### Circular, 400 mm

Section	Upstream Node	Downstream Node	Date	Road	Asset Material	Total Length	Inspected Length
1	S 10	S 06 A	08/10/2021	Hilda way Avenue	Plastic (ribbed)	6.48 m	6.48 m

**Total: 1 Inspection x Circular 400 mm = 6.48 m Total Length and 6.48 m Inspected Length**

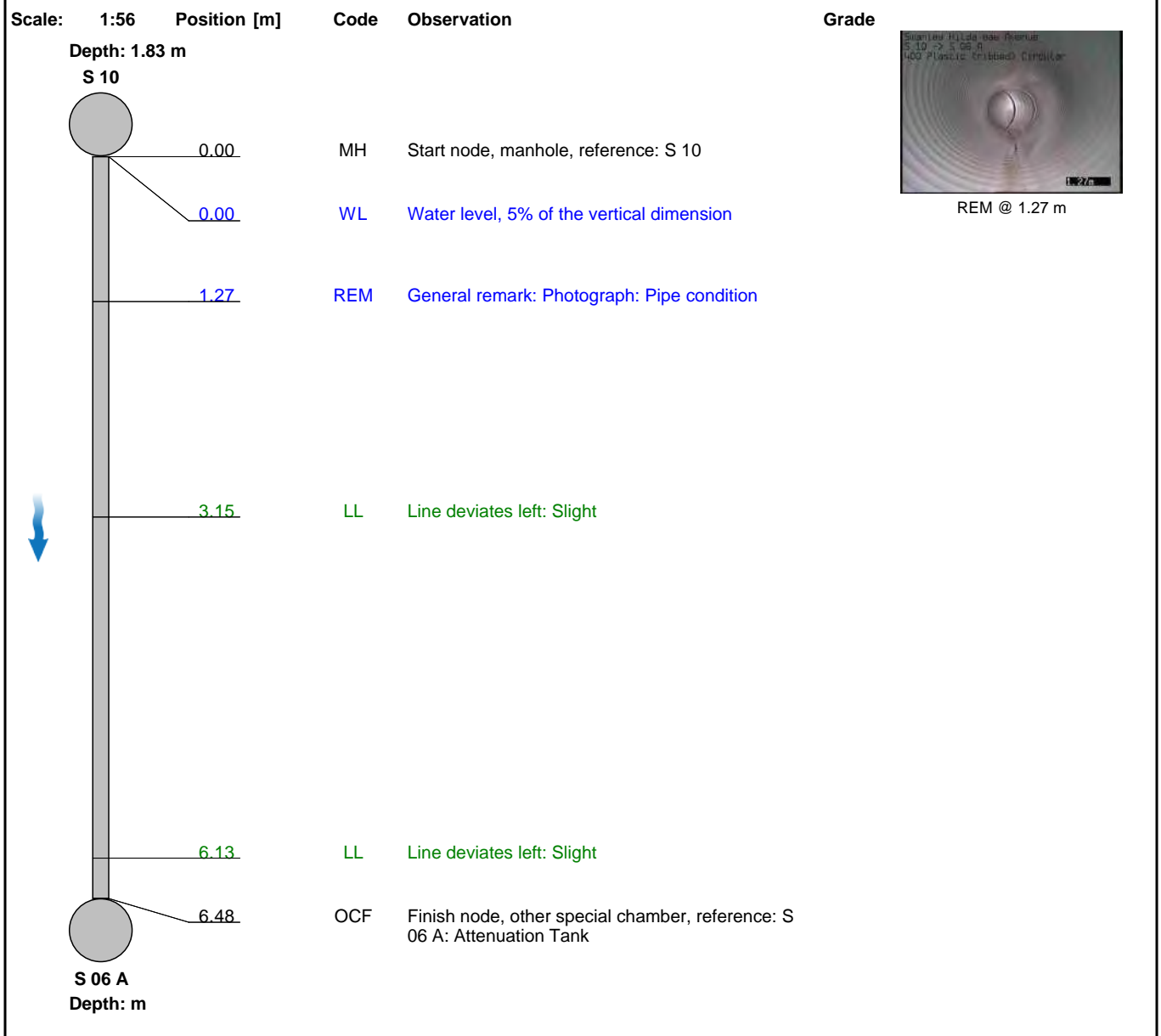
**Total: 1 Inspection = 6.48 m Total Length and 6.48 m Inspected Length**

## Completed section inspection

Section <b>1</b>	Inspection <b>1</b>	Date <b>08/10/21</b>	Time <b>9:43</b>	Lanes Job Number <b>PJ00422335</b>	Weather <b>Dry</b>	Pre Cleaned <b>Yes</b>	PLR <b>S 10X</b>
Operator <b>K. Mayo</b>		Asset Location: <b>Building site</b>		Camera <b>Crawler</b>	Preset Length <b>Not Specified</b>	Legal Status <b>Private Drain</b>	Alternative ID <b>Not Specified</b>

Town or Village: <b>Swanley</b>	Inspection Direction: <b>Downstream</b>	Upstream Node: <b>S 10</b>
Road: <b>Hilda Way Avenue</b>	Inspected Length: <b>6.48 m</b>	Upstream Pipe Depth: <b>1.83 m</b>
Post Code: <b>BR8 7BT</b>	Total Length: <b>6.48 m</b>	Downstream Node: <b>S 06 A</b>
Surface Type: <b>Stone/Soil</b>	Joint Length: <b>0.00 m</b>	Downstream Pipe Depth: <b>0</b>
Asset Use: <b>Surface waste</b>	Asset Shape: <b>Circular</b>	
Asset Type: <b>Gravity drain/sewer</b>	Dia/Height: <b>400 mm</b>	
Asset Owner: <b>Private</b>	Asset Material: <b>Plastic (ribbed)</b>	
Year Constructed: <b>Not Specified</b>	Asset Lining Type: <b>No Lining</b>	
Inspection Purpose: <b>Condition survey</b>	Asset Lining Material: <b>No Lining</b>	

**Comments:** Depth is outlet pipe, Depth of manhole is 2.25m  
**Recommendations:**



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0



## Section Pictures

Section	Inspection Direction	PLR	Inspection	Lanes Job Number
1	Downstream	S 10X	1	PJ00422335

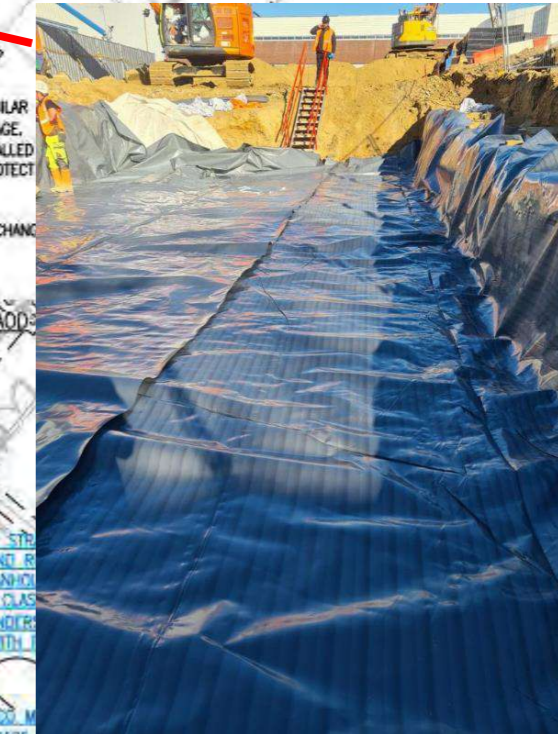
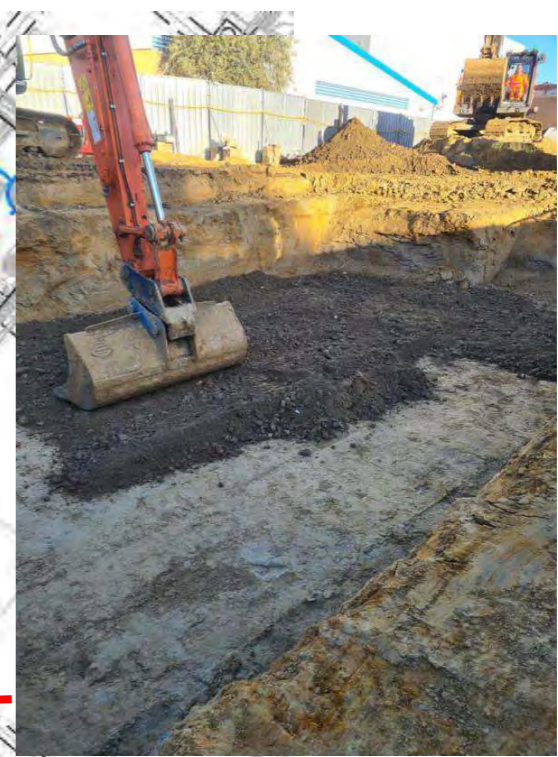
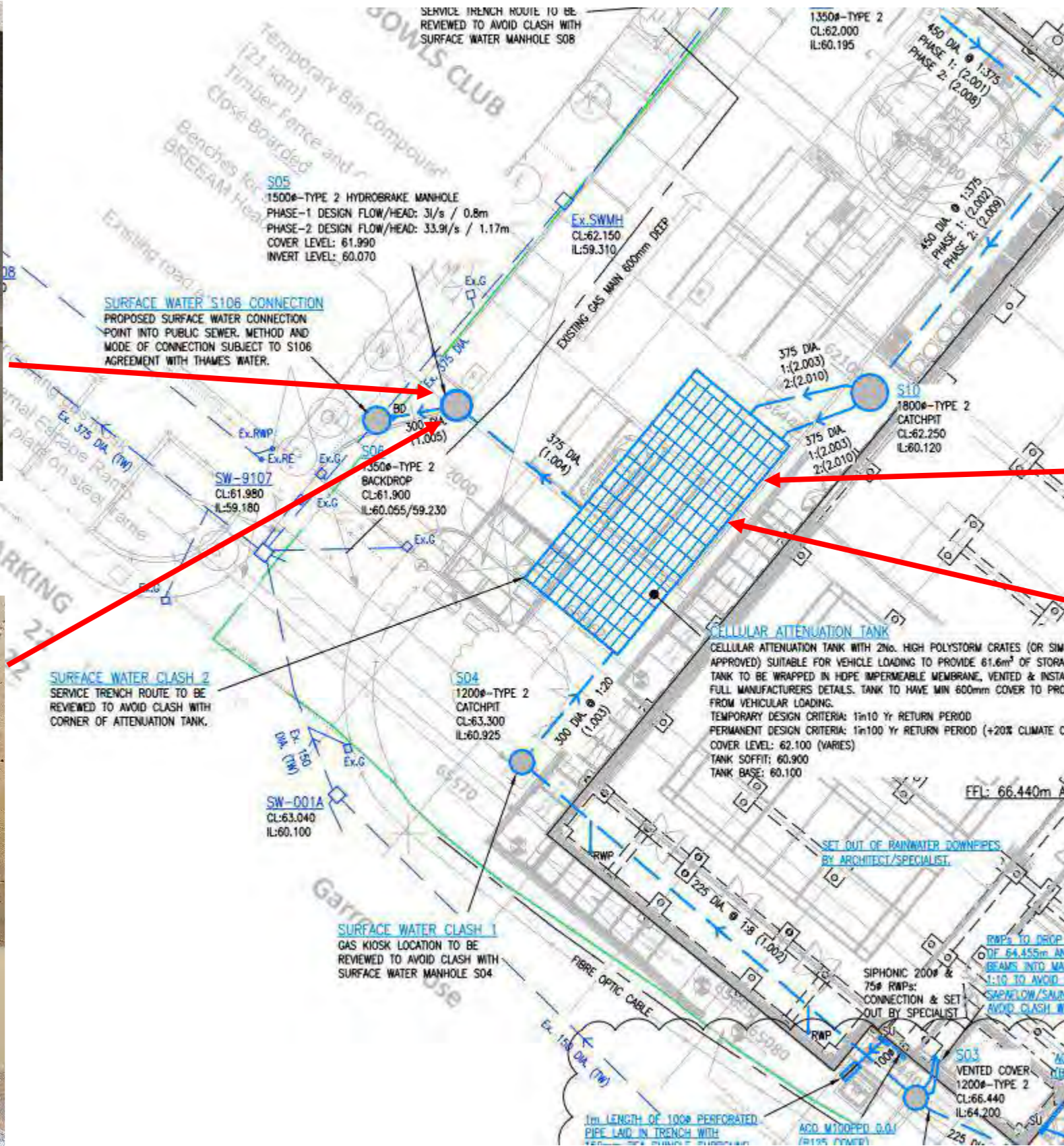


1, 00:00:08, 1.27 m  
General remark, Photograph: Pipe condition



APPENDIX D – SITE PHOTOGRAPHS &  
ANNOTATED PLAN

**WOLC ANNOTATED PLAN SHOWING CRITICAL SURFACE WATER DRAINAGE ASSETS**





*Fig D.1 – Orifice Plate Installation 1*



*Fig D.2 – Orifice Plate Installation 2*



**White Oak Leisure centre – Surface water drainage pictures**

ISG

Surface water Attenuation  
tank excavation



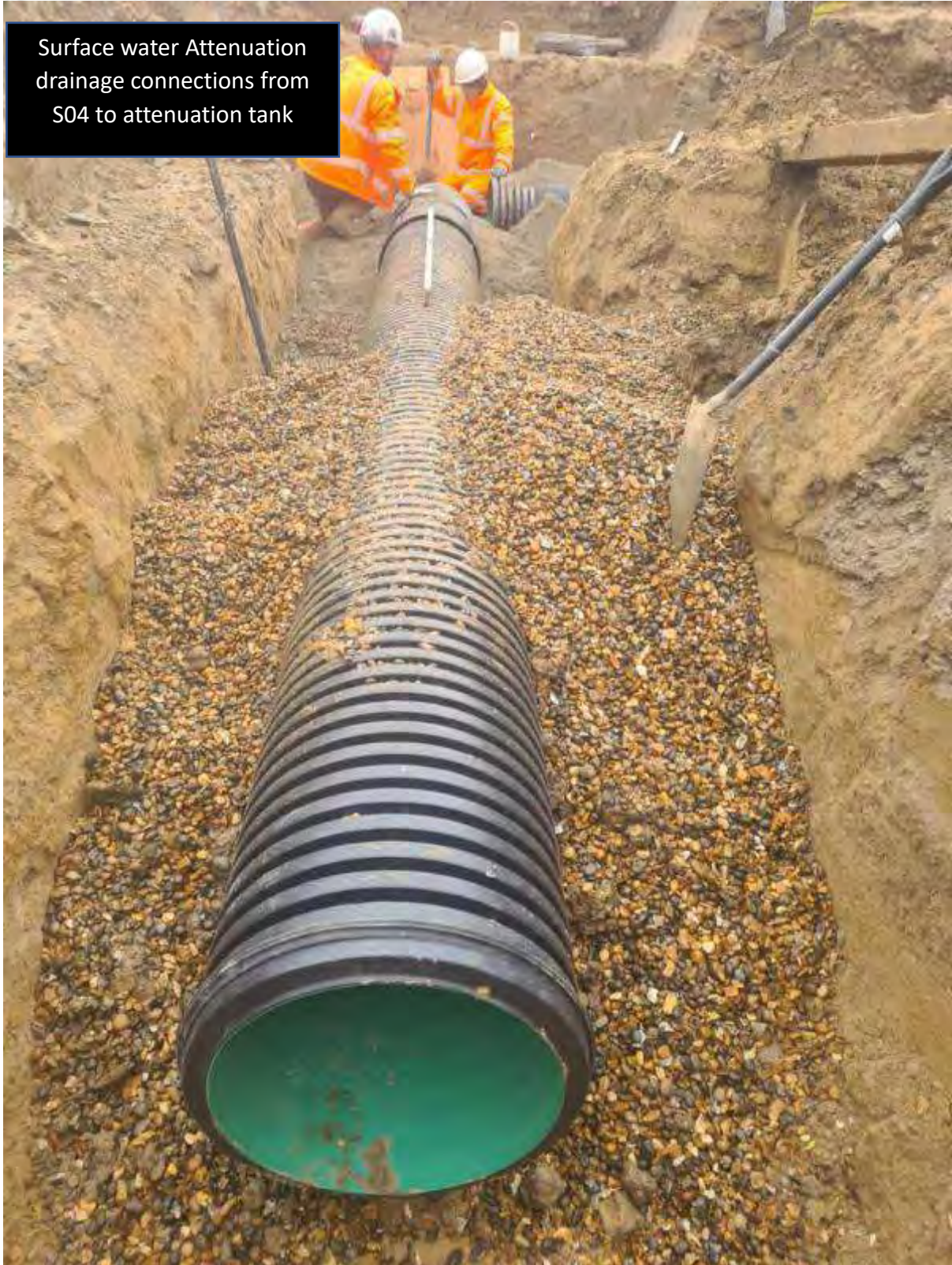
ISG

Surface water Attenuation  
membrane



ISg

Surface water Attenuation  
drainage connections from  
S04 to attenuation tank



ISG

Surface water Attenuation  
drainage connections from  
S04 to attenuation tank





Surface water drainage from  
attenuation tank to S05



ISG

Surface water manhole S08



Surface water drainage from attenuation tank to S05



Surface water to S09 manhole before manhole is installed



Surface water drainage from attenuation tank to S05



Surface water drainage from attenuation tank to S05



ISG

Surface water Attenuation  
drainage to S10 manhole



ISG

S04 manhole





ISG

Base prep before attenuation tank was installed.



ISg

S08 – S07 drainage



ISG

S04 manhole



S03- S04 drainage and manholes



ISg

S03- S04 drainage and  
manholes



ISG

S03- S04 drainage and  
manholes



ISG

S05 manhole before hydro  
brake installation



ISG

S09 manhole benching





ISG

S10 manhole



ISG

S05 manhole before hydro  
brake installation



ISG

Surface water 106  
connection manhole



ISG

Surface water 106  
connection before manhole  
installed. Showing existing  
pipe connection.



ISG

Surface water 106  
connection manhole



ISg

S10 manhole



ISG

S10 manhole



ISG

RWP drainage connections  
to S01





ISG

S07 manhole



RWP drainage connections  
to S01



ISG

Surface water 106 connection  
manhole



ISg

S03 vented cover



ISG

S08 – S09 manholes



ISG

S08 manhole



ISg

S02 manhole



ISG

RWP drainage  
connections by reception  
lobby.





Orifice plate inside  
manhole S05



## APPENDIX E – PRODUCT DATA SHEETS

PRODUCT GUIDE

# TwinWall

Surface and Stormwater  
Drainage





# Wavin TwinWall

**TwinWall Surface and Stormwater Drainage System**



## Contents

🕒 Introduction	2-3
🕒 Product Details	4-11
🕒 Jointing	12
🕒 General Information	13-14
🕒 Notes	15-16

# TwinWall Introduction

## TwinWall Surface and Stormwater Drainage System

# TwinWall Surface and Stormwater Drainage System

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

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

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

### Range Introduction

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

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

The TwinWall construction helps to maintain flexibility and reduce the possibility of impact damage on site.

A comprehensive range of push fit components are also available for each diameter. Road gullies and non-entry inspection chambers for use with TwinWall also available.



### System Overview

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

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

TwinWall has a Stiffness Class of SN6 (6kN/m<sup>2</sup>).

# TwinWall Surface and Stormwater Drainage System

## TwinWall Applications

### Application

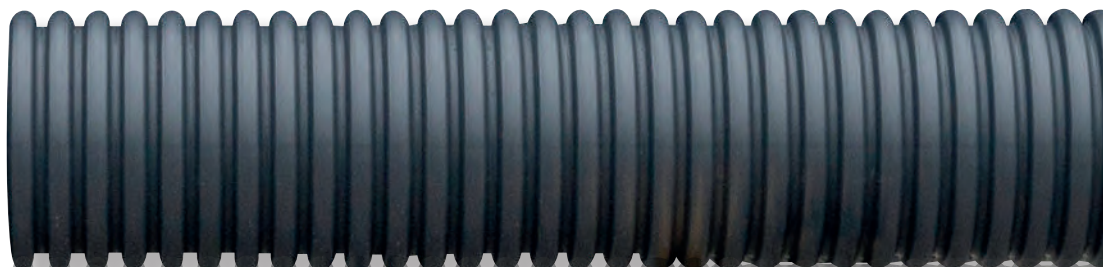
The TwinWall range is designed for use in gravity surface and stormwater drainage applications. Adaptors and reducers are available for connection to traditional materials. Uses include: highways filter drains, carrier drains, golf course land drainage, surface water / main culverts, catchpits, landfill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

### System Benefits

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

### Quality Assurance

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



# Product Details

## TwinWall Surface and Stormwater Drainage System

### Pipe



#### P/E Pipe 6.0m Unperforated

Material: PE

Nominal Size (mm) ID	OD	Part Number	N°. of Slots Per Dwel	Permeable Area mm <sup>2</sup> m <sup>-1</sup>
150	173	6TW076	–	–
225	260	9TW076	–	–
300	348	12TW076	–	–
375	429	375TW076	–	–
450	514	450TW076	–	–
500	572	500TW076	–	–
600	683	600TW076	–	–



#### P/E Pipe 6.0m Perforated

Material: PE

Nominal Size (mm) ID	OD	Part Number	N°. of Slots Per Dwel	Permeable Area mm <sup>2</sup> m <sup>-1</sup>
150	173	6TW176	4	6120 - 10200
225	260	9TW176	4	4680 - 11700
300	348	12TW176	4	5120 - 12800
375	429	375TW086	4	6266 - 10935
450	514	450TW086	4	6327 - 10333
500	572	500TW086	4	6687 - 10402
600	683	600TW086	4	6747 - 10121



#### P/E Pipe 6.0m Half Perforated

Material: PE - HD

Nominal Size (mm) ID	OD	Part Number	N°. of Slots Per Dwel	Permeable Area mm <sup>2</sup> m <sup>-1</sup>
150	173	6TW276	3	4590 - 7650
225	260	9TW276	3	3510 - 8775
300	348	12TW276	3	3840 - 9600
375	429	375TW096	2	3133 - 5468
450	514	450TW096	2	3164 - 5167
500	572	500TW096	2	3344 - 5201
600	683	600TW096	2	3374 - 5061



#### S/S Pipe 6.0m Unperforated

Material: PP

Nominal Size (mm) ID	OD	Part Number	N°. of Slots Per Dwel	Permeable Area mm <sup>2</sup> m <sup>-1</sup>
375	429	375TW046	–	–
450	514	450TW046	–	–
500	572	500TW046	–	–
600	683	600TW046	–	–





### S/S Pipe 6.0m Perforated

Material: PP

Nominal Size (mm) ID	OD	Part Number	N°. of Slots Per Dwell	Permeable Area mm <sup>2</sup> m <sup>-1</sup>
375	429	375TW066	4	6266 - 10935
450	514	450TW066	4	6327 - 10333
500	572	500TW066	4	6687 - 10402
600	683	600TW066	4	6747 - 10121



### S/S Pipe 6.0m Half Perforated

Material: PP

Nominal Size (mm) ID	OD	Part Number	N°. of Slots Per Dwell	Permeable Area mm <sup>2</sup> m <sup>-1</sup>
375	429	375TW056	2	3133 - 5468
450	514	450TW056	2	3164 - 5167
500	572	500TW056	2	3344 - 5201
600	683	600TW056	2	3374 - 5061

## Couplers



### D/S Pipe Coupler

- For joining TwinWall Pipe

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

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

## Adaptors



### S/S Adaptor

- Connector to BS EN 295 thinwall clay spigot

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW129

# Product Details

## TwinWall Surface and Stormwater Drainage System



### S/S Adaptor

- 6TW socket x 160mm BS EN 1401 spigot

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW141



### D/S Adaptor

- 6TW socket x 160mm BS EN 1401 socket

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW142



### S/S Adaptor

Material: PVC - U

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

## Reducers



### D/S Level Invert Reducer

- 6TW socket x 4TW socket

Material: PP

Nominal Size (mm)	Part Number
150	6TW097



### S/S Level Invert Reducer

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

Material: PVC - U

Nominal Size (mm)	Part Number
150	6TW099S



### S/S Level Invert Reducer

Material: PP

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

## Short Radius Bends



### D/S Bend – 87.5° ◆

Material: PP

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



### D/S Bend – 45° ◆

Material: PP

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

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

# Product Details

## TwinWall Surface and Stormwater Drainage System



### D/S Bend – 30° ♦

Material: PP

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



### D/S Bend – 15° ♦

Material: PP

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

## Junctions



### Equal Junction – 45° ♦

- D/S Junction to TwinWall spigot

Material: PP

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

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



### Equal Junction – 90°

- D/S Junction to TwinWall spigot

Material: PP

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



### S/S Junction to TwinWall spigot

Material: PP

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



### Unequal Junction – 45° ♦

- D/S Junction to TwinWall spigot

Material: PP

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

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

# Product Details

## TwinWall Surface and Stormwater Drainage System



### S/S Junction to TwinWall spigot – 45°

Material: PP

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



### Unequal Junction – 90°

- S/S Junction to TwinWall spigot

Material: PP

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

## End Caps



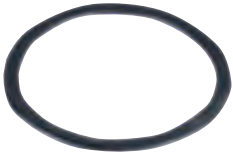
### End Cap

- For TwinWall spigot

Material: PP

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

## Ring Seal



### Ring Seal

- For TwinWall socket

Material: Rubber

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

---

## Road Gullies



### P/E Road Gully

Material: PE

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

# Jointing

## TwinWall Surface and Stormwater Drainage System

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

The major advantages of the TwinWall jointing method are:

- ④ There is no need to chamfer pipe ends
- ④ The ring seal cannot be displaced during jointing

### Preparation

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

### Cutting

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

### Jointing Sequence

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

The force required to push the pipe home will vary according to pipe size and ambient temperature. Whatever method is used to apply the necessary force, care must be taken to ensure that there is no risk of damaging the pipe ends. The most convenient method is to use a lever ensuring the pipe end is protected.

A good technique is to lift the pipe up by passing a rope underneath. This makes it easier to align the spigot into the socket.

Figure 1: Correct cutting position

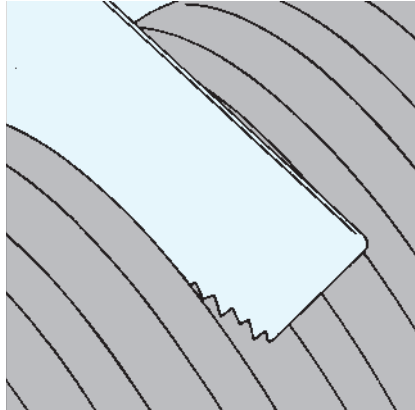


Figure 2: TwinWall Sealing Ring

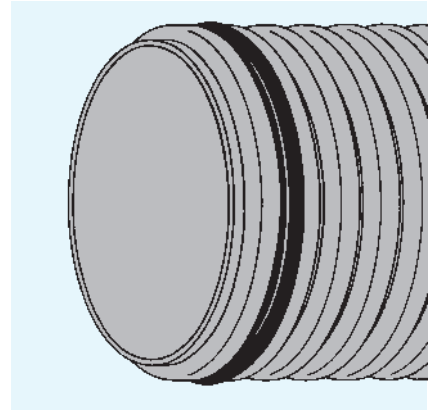


Figure 3: Applying the lubricant

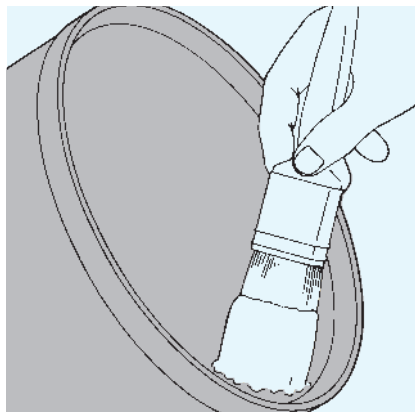


Figure 4: Protecting the pipe end

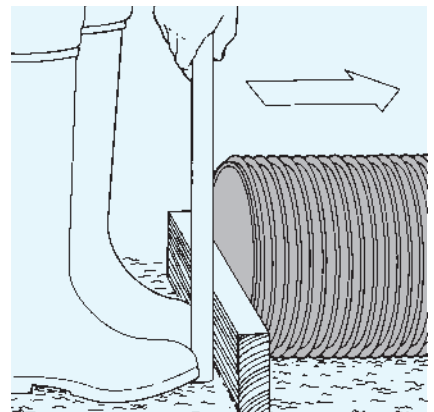
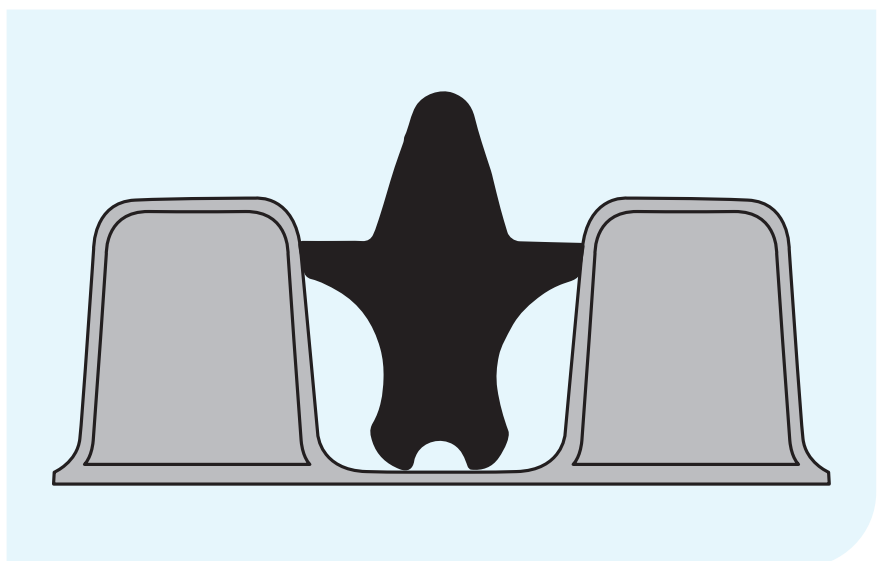


Figure 5: Placement of Ring Seal, between 1st and 2nd ribs





# General Information

## TwinWall Surface and Stormwater Drainage System

### Materials

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

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

### Quality, Standards and Approvals

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

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

### Acceptance

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

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



### Environment

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

### Health and Safety

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

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

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

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

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

### Abbreviations

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

### Supply

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

### Sealing Rings

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

# General Information

## TwinWall Surface and Stormwater Drainage System

### Conditions of Sale

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

### Technical advice

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

Contact Wavin Technical Design Department:

Tel: 0844 856 5165

Email: [technical.design@wavin.co.uk](mailto:technical.design@wavin.co.uk) or via online enquiry at [wavin.co.uk](http://wavin.co.uk)

### Literature

#### General

- 🔗 [Wavin Below Ground & Civils System: Trade Price List](#)

#### Stormwater Management Systems

- 🔗 [Wavin AquaCell System: Product and Installation Manual](#)
- 🔗 [Wavin Q-Bic Plus: Product and Installation Manual](#)
- 🔗 [Wavin AquaGrid: Product and Installation Manual](#)
- 🔗 [Wavin Vortex Valves: Product Overview](#)
- 🔗 [Wavin Civils Channel Systems: Product and Installation Manual](#)

#### Gravity Drain and Sewer Systems

- 🔗 [OsmaDrain System: Product and Installation Manual](#)
- 🔗 [Osma UltraRib System: Product and Installation Manual](#)
- 🔗 [Osma and Wavin Inspection Chamber Range: Product and Installation Manual](#)

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

#### Literature Request

Tel: 01249 766333

Email: [literature@wavin.co.uk](mailto:literature@wavin.co.uk)

#### Technical Design

Tel: 0844 856 5165

Email: [technical.design@wavin.co.uk](mailto:technical.design@wavin.co.uk)

#### Wavin Online

The complete range of Wavin/Osma product and installation guides are also available online at: [wavin.co.uk](http://wavin.co.uk)

# Notes

## **TwinWall Surface and Stormwater Drainage System**

# Notes

## **TwinWall Surface and Stormwater Drainage System**



## Discover our broad portfolio at [www.wavin.co.uk](http://www.wavin.co.uk)

Hot & Cold Water

Foul Water

Gas & Water Mains

Indoor Climate

Storm Water

Geotextiles

Soil & Waste



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



**Wavin Limited** | Registered Office | Edlington Lane | Doncaster | DN12 1BY  
Tel. 0844 856 5152 | [www.wavin.co.uk](http://www.wavin.co.uk) | [info@wavin.co.uk](mailto:info@wavin.co.uk)

Wavin operates a programme of continuous product development, and therefore reserves the right to modify or amend the specification of their products without notice. All information in this publication is given in good faith, and believed to be correct at the time of going to press. However, no responsibility can be accepted for any errors, omissions or incorrect assumptions.

© 2021 Wavin Wavin reserves the right to make alterations without prior notice. Due to continuous product development, changes in technical specifications may change. Installation must comply with the installation instructions.

## **AquaCrate Installation Instructions**

### **Pre-installation notes:**

For attenuation systems: position the inflow and outflow connections level with the base of the AquaCrate structure

For infiltration systems: position the inflow connection at the top of the AquaCrate structure.

### **Installation Instructions:**

1/. Excavate to the required length, width and depth and level the base. Make sure that the area is enough to allow plant access around sides to compact the backfill material (500mm minimum and 750mm minimum if HGVs being used over the tank).

Ensure the base is smooth and level with no sharp protrusions. Check that the slopes are cut back to a safe angle or adequately supported and that a safe access is possible to allow site personnel to enter the excavation.

2/. Inspect the base for soft spots and if any are present, excavate and replace with compacted granular fill material.

3/. Lay 75mm sharp sand bedding layer to the base of the excavation and level off. Lay the geotextile protection fleece (180g non woven, needle punched type GT1900), ensuring a minimum 150mm overlap. This is required for both attenuation and infiltration structures.

4/. Lay the geomembrane (if tank is for water storage) over the geotextile and sand bedding layer and up the sides of the excavation. Examine the geomembrane for damage and test all welds if apparent.

5/. Assemble the AquaCrate units (1m x 1m x 0.4m High) and install within the void in accordance with the installation schedule for correct positioning. Special clips are provided to join the units to prevent displacement (single clips for adjacent units (3 per unit) and double clips for all multi layer applications (1per unit)).

6/. Complete the geotextile and/or geomembrane encapsulation to the sides and top of the installation, ensuring that the protection fleece (if attenuation) has sufficient to overlap by 150mm minimum. The geomembrane should be welded with double seams and inspected for damage, testing the welds as required.

7/. Connect the drainage connections to the installation using proprietary adaptors. Alternatively for infiltration systems use flange adaptors and attach them to the AquaCrate units with self tapping screws. For attenuated systems, it is recommended that all connections and air vent installations are achieved using sealed drainage connections into a preformed socket using proprietary seals "top hats" available to order.

8/. Backfill around the installation with Type 1 or 2 sub base, compacting in 150mm layers, in accordance with the Specification for Highway Works.

9/. Place a 75mm sharp sand protection layer if required over the top of units and continue to backfill as follows:

*For trafficked areas (car parks etc):*

Type 1 or 2 sub base material compacted in 150mm layers in accordance with the Specification for Highway Works. Compaction equipment on top of the system not to exceed 2,300kg per sq.metre.

Backfill the sides with granular material (not cohesive)

*For landscaped and non-trafficked areas:*

Selected "as dug" material with a unit size no more than 75mm compacted to 90% maximum dry density. Compaction equipment on top of the system not to exceed 2,300kg per sq.metre.

10/. Finalise the pavement construction / landscaping over the Aquacrate system.

## **Pennine Manufacturing Ltd**

Fold Mill, Bradley Lane, Little Lever, Bolton BL2 6RR

Tel 44(0) 1204 361547 Fax 44 (0) 1204 380872

eMail [sales@pennineindustries.com](mailto:sales@pennineindustries.com)

# AquaCrate510

## Loadbearing underground water storage/attenuation system

### The Advantages of AquaCrate

- # Assembled ready to install with up to 72M<sup>3</sup> on a full load
- # Available in different configurations to meet specific load requirements
- # Available with high load-bearing capability (up to 100tonnes/m<sup>2</sup> vertical) able for HGV traffic
- # Simple and fast to install with 2.5 units per M<sup>3</sup>
- # Modular size of 1m x 1m plan x 400mm height ensures great versatility in both size and shape of storage
- # Lightweight units under 25kg removes need for mechanical handling



### Uses

- # For permeable infiltration schemes, AquaCrate units should be wrapped in a non-woven needle punched geotextile which allows water discharge through the subsurface whilst preventing the ingress of soil or sand particles
- # For water storage, impermeable geomembrane is used between the geotextile & the crate assembly

### Why use Aquacrates?

- # Prevents extreme peak flows to main drainage and water purification systems
- # Rainwater is "cleaned" by the geotextile surround
- # Decreases possibility of flooding during heavy rain falls
- # Allows development of difficult sites by using attenuation / water storage
- # Decreases environment problems caused by development
- # For water storage for subsequent use in toilets, watering plants, cleaning vehicles and other grey water usages

**Installation Service  
with certified  
geomembrane  
welding available**

### Design

- # Following assessment of the required water to be stored (see CIRIA C522, R156 & BRE 365) the total number of Aquacrate units can be calculated using 2.5 /m<sup>3</sup> (1000 litres). Decide on the best configuration for the characteristics of the site in question and create the "box" accordingly using the length and width dimensions allowing for a 95% void ratio.
- # Aquacrate is suitable for landscaped and car park areas as well as heavier duty use. As a guide, units require a minimum 0.5m of cover in landscaped areas and 0.75m cover in vehicular areas and need 75mm sharp sand base.
- # Use a silt trap to minimise ingress into the tank and this should be inspected regularly. CCTV/back-jetting points are recommended.

**Inspectable systems available**



#### PRODUCT DATA

	<b>AquaCrate510</b>
NOMINAL SIZE	1000 x 1000 x 400mm
CAPACITY	400Litres(2.5 per cu.metre)
UNIT WEIGHT	18.9kg
VOID RATIO	94.7%
COMPRESSIVE STRENGTH	>260+KN/m <sup>2</sup>
LATERAL STRENGTH	>70+KN/m <sup>2</sup>

**Made from recycled polypropylene & can be recycled at end of use**

**MADE IN UK TO ISO9001 QUALITY STANDARDS**

**Pennine Manufacturing Ltd**

Fold Mill, Bradley Lane, Little Lever, Bolton BL2 6RR

Tel 44(0) 1204 361547 Fax 44 (0) 1204 380872

eMail sales@pennineindustries.com



## APPENDIX F – SuDS MAINTENANCE SCHEDULE

Project Title:	White Oaks Leisure Centre		
Planning Ref:	N/A		
Furness Ref:	L2394	Date:	19 <sup>th</sup> Feb 2019

### Proposed Maintenance Schedule

Maintenance schedules below to be used as a guide. Final maintenance agreements to be confirmed between client & maintenance contractor. **The following maintenance schedule has been produced in line with CIRIA C753 'The SuDS Manual' recommendations as an example for White Oaks Leisure Centre. A full maintenance agreement should be put in place by the operator prior to the completion of construction works.**

Table 1 – Pipe, Manhole & Gully Maintenance Schedule

Maintenance Schedule	Action	Frequency
Regular Maintenance	Cleaning of gutters and filters on downpipes and brushing/sweeping of leaves debris that may cause blockages in gullies.	Annually
	Inspect for sediment and debris in pre-treatment components (i.e. catchpits and gully silt traps), and inside manhole rings.	Annually (or as required)
Occasional Maintenance	Remove sediment/debris from pre-treatment components (i.e. catchpits).	As required, based on regular inspections
Remedial Actions	Trimming of roots that may be causing blockages and patch repair of pipework that has cracked or deformed.	As required
	Repair/rehabilitate manhole and gully inlets & outlets.	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in 1 <sup>st</sup> year, then annually
	Check to ensure gullies and manholes are emptying fully.	Annually

Table 2– Cellular Attenuation Tank Maintenance Schedule

Maintenance Schedule	Action	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually.
	Remove debris from the catchment surface (where it may cause risks to performance [i.e. leaves]).	Monthly (or as required)
	Remove sediment from pre-treatment structures (i.e catchpits)	Annually (or as required)
Remedial Actions	Repair/rehabilitate inlets, outlets and vents.	As required
Monitoring	Inspect/check all inlets, outlets and vents to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of tank for sediment build-up and remove if necessary.	Every 5 years (or as required)

Table 3 – Oil Separator Maintenance Schedule

<i>Maintenance Schedule</i>	<i>Action</i>	<i>Frequency</i>
Routine Maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six Monthly.
	Remove sediment, oil, grease and floatables.	As necessary - indicated by system inspections or immediately following significant spill
Remedial Actions	Replace malfunctioning parts or structures.	As required
Monitoring	Inspect for evidence of poor operation.	Six Monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

APPENDIX G – ASSET RECORD SHEETS

## Appendix D. Drainage Asset Record Sheet for Verification Report

IDENTIFICATION	Type of Structure or Feature	CELLULAR ATTENUATION TANK
	Location Name	CAR PARK TO WEST OF SPORTS HALL
	Drawing Identifier	1689-FUR-XX-XX-DR-D-0921
MANAGEMENT/ OWNERSHIP	Owners Name / Company	SEVENOAKS DISTRICT COUNCIL - OWNER (MANAGED BY EVERYONE ACTIVE)
	Address of owner	EVERYONE ACTIVE 2 WATLING DRIVE, SKETCHLEY MEADOWS, MINCKLEY, LE10 3EY
	Owners Contact Number	01825 890 294 (MOODY)
	Maintained By	MOODY SEWERAGE LTD
	Adoption proposed	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	Name of Adopting Authority	N/A
	Estimated Date of Adoption	N/A
ASSET DETAILS	National Grid Reference (NGR)	TQ 51013 69116
	Cover Level	62.100
	Invert Level	60.100
	Max volume	61.6m <sup>3</sup>
	Height	0.8m
	Diameter/Width	6m
	Length	14m
	Depth	2m
	Designed Flow Rate	N/A
	Any Additional Uses	N/A

## Appendix D. Drainage Asset Record Sheet for Verification Report

IDENTIFICATION	Type of Structure or Feature	FLOW CONTROL STRUCTURE - ORIFICE PLATE
	Location Name	MANHOLE S-05
	Drawing Identifier	1689-FUR-XX-XX-DR-0-0921
MANAGEMENT/ OWNERSHIP	Owners Name / Company	SEVENOAKS DISTRICT COUNCIL - OWNER (MANAGED BY EVERYONE ACTIVE)
	Address of owner	EVERYONE ACTIVE 2 WATLING DRIVE, SKETCHLEY MEADOWS, MINKLEY, LE10 3EY
	Owners Contact Number	01825 890 294 (MOODY)
	Maintained By	MOODY SEWERAGE LTD.
	Adoption proposed	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
	Name of Adopting Authority	N/A
	Estimated Date of Adoption	N/A
ASSET DETAILS	National Grid Reference (NGR)	TQ 51002 69121
	Cover Level	61.990
	Invert Level	60.070
	Max volume	N/A
	Height	N/A
	Diameter/Width	1.5m $\phi$ MANHOLE, 40mm $\phi$ ORIFICE
	Length	N/A
	Depth	1.92m
	Designed Flow Rate	3 l/s
	Any Additional Uses	N/A