

Plot C2 Millbay Plymouth

Archaeological Watching Brief



for
WRW Construction Ltd

CA Project: 880071
CA Report: 17355

June 2017



Plot C2
Millbay
Plymouth

Archaeological Watching Brief

CA Project: 880071
CA Report: 17355



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SUMMARY

Project Name:	Plot C2, Millbay
Location:	Plymouth, Devon
NGR:	246986 054182
Type:	Watching Brief
Date:	24–26 May and 5 July 2017
Planning Reference:	4/01448/OUT
Location of Archive:	N/A
Site Code:	BCMP 17

In May and July 2017, Cotswold Archaeology (CA) carried out an archaeological watching brief during the excavation of ground investigation test pits at Plot C2, Millbay, Plymouth. One test pit contained a silty clay layer, possibly representing a deposit associated with the Sourpool, a large area of marshland recorded in early documents and which was drained in the 16th century.

A culvert was recorded within the site. This had been much rebuilt/repared, with sections of the structure being built of masonry, brick, cast iron and concrete.

The test pits generally contained modern made ground deposits to depth. Several structures were cut into these deposits; some of these structures were clearly late 20th century in date; others may also be modern, or post-medieval.



1. INTRODUCTION

- 1.1 In May and July 2017, Cotswold Archaeology (CA) carried out an archaeological watching brief for WRW Construction Ltd at Plot C2, Millbay, Plymouth (centred at NGR: 246986 054182; Fig. 1).
- 1.2 The Plot C2 site forms one part of the ongoing Millbay Regeneration project. Planning permission for the project was granted by Plymouth City Council conditional on a programme of archaeological work (Planning Ref.: 14/01448/OUT; Condition 20). The present watching brief was undertaken during initial geotechnical investigation works. The watching brief results will inform the decision on the need for and scope of any further archaeological works which may be required at the site.
- 1.3 The watching brief was carried out in accordance with a Written Scheme of Investigation (WSI) produced by CA (2015) and approved by Rachel Broomfield, (Historic Environment Officer, Plymouth City Council). The fieldwork also followed *Standard and guidance for an archaeological watching brief* (ClfA 2014). It was monitored by John Salvatore (Historic Environment Officer, Plymouth City Council), including a site visit on 24 May.

The site

- 1.4 The Plot C2 site is approximately 0.33ha in extent, and comprises a former car park. The site is bounded by Dock Road and Millbay Road to the north; a further development site to the south-west; and Brunel Way to the south-east. The site drops gently downward to the south-west.
- 1.5 The underlying bedrock geology of the area is mapped as Torpoint Formation mudstone and siltstone of the Devonian Period (BGS 2015). Parallel faults in the rock, orientated north-west/south-east, have been affected by coastal erosion to form the tidal pond (the 'Sourpool'). The Sourpool is still visible as a depression to the north-east of Millbay. The dock was created by partial infilling around the edge of the Sourpool and the ground beneath the quays is therefore generally made ground.

2. ARCHAEOLOGICAL BACKGROUND

- 2.1 The historic development of Millbay has been summarised as follows (CA 2011): Millbay originated as a natural inlet, lying to the south of a large area of marshland recorded in early documents as the Sourpool. The earliest documentary sources record the erection of a mill at the neck between the Sourpool and the inlet in the 12th century. This mill appears to be the origin of the name Millbay, and probably remained in existence until the 18th century.
- 2.2 The Sourpool was drained in the 16th century, concurrently with the construction of Union Street across the former marshland.
- 2.3 Drake's Leat, constructed in the late 16th century, brought fresh water to Plymouth from the River Meavy, to the north. The course of the leat extended from the river. It was tapped by several mills and emptied into the Millbay inlet, probably along the eastern quay, within the site.
- 2.4 Plymouth was besieged as a Parliamentary stronghold during the civil war. The town's other harbours further east (Sutton Harbour and the River Cattewater) were within range of the Royalist batteries on Mount Batten, to the south. Millbay was the nearest natural harbour out of range of the batteries. Hollar's 1643 map of the Civil War siege-works is the earliest documentary evidence for Millbay's use as a harbour, and it remained in use throughout the war. No port features or jetties are recorded on the 1643 map, and it is likely that any such features were temporary.
- 2.5 Following the end of the Civil War, the main flow of marine traffic reverted to the traditional harbours to the east, and Millbay returned to being a small inlet. The south-western area of the inlet (approximately in the area of the north-west corner of the Inner Basin) was used as a dockyard during the construction of the Eddystone lighthouse in the late 18th century. The south-western side was further developed for small marine traffic during the construction of the Georgian Longroom and the Marine barracks, which lie to the west of the site.
- 2.6 The earliest evidence for substantial dock development at Millbay is from Elliott's 1825 map of Plymouth, which records the 'Union Dock' in the north-eastern area of Millbay, bordered by Martin and Phoenix Streets. This dock appears to have been short lived, and was filled in by 1849. Dockyard development also took place along

the eastern quay, which was made necessary by continuing limestone quarrying at West Hoe, requiring barges to transport the extracted mineral. The quarry owner opened an access channel in the south-eastern area, near to what is now the Trinity Pier, and established a canal and some limited dock facilities. This facility was filled in during the 1870s. The Millbay Pier was constructed in 1844 at the entrance to the bay, the first of the large steamship piers at Millbay, which was later joined by Trinity Pier and Brunel's pontoon. Millbay Pier is situated outside of the site, to the south.

- 2.7 In the mid and late 19th century, a large floating harbour and dry (graving) dock were constructed, as well as associated piers and jetties. The installation of railway lines to all parts of the dock was completed by 1880.
- 2.8 The harbour saw significant use during WWII, and was heavily bombed. A large area of the western floating harbour was infilled after the war. A modern ferry terminal was constructed in the western area of the outer dock (partly over the site of the graving dock) in the late 20th century.

3. AIMS AND OBJECTIVES

- 3.1 The objectives of the archaeological works were:
- to monitor groundworks, and to identify, investigate and record any significant buried archaeological deposits thus revealed;
 - to produce an integrated project archive and a report setting out the project results and the archaeological conclusions that can be drawn from the recorded data.
- 3.2 The watching brief results will inform the decision on the need for and scope of any further archaeological works which may be required at the site.

4. METHODOLOGY

- 4.1 The fieldwork followed the methodology set out within the WSI (CA 2015). On 24–26 May 2017 an archaeologist was present during geotechnical investigation groundworks, which comprised the excavation of 14 test pits and two boreholes (Fig. 2; TPs 1–16). The test pits were generally 3m long and 0.6m wide, and were

excavated to a depth of 0.8m–3.5m below present ground level (bpgl); the boreholes were 0.3m in diameter and were excavated to depth of 0.9m–1.2m bpgl.

- 4.2 On 5 July 2017, an archaeologist was present during groundworks designed to investigate a buried culvert at the site. These works comprised the re-excavation (deeper and wider) of TP14 and the excavation of a further test pit (TP17) on the line of the culvert.
- 4.3 Written, graphic and photographic records were compiled in accordance with *CA Technical Manual 1: Fieldwork Recording Manual*.
- 4.4 A summary of information from this project, as set out in Appendix B, will be entered onto the OASIS online database of archaeological projects in Britain.
- 4.5 As no significant archaeological features were identified during the archaeological watching brief, no archive will be prepared. The results of the fieldwork will be held by Plymouth City Council in the form of this report and the OASIS entry.

5. RESULTS

- 5.1 Appendix A gives full details of the deposits/structures recorded in each test pit. The following text presents a brief summary of this information.
- 5.2 TP17 revealed a silty clay deposit with mudstone inclusions (1704) at 2.8m bpgl. It is possible that this represented the natural substrate. It was sealed by 0.5m of brown/grey silty clay (1703), which may represent a deposit associated with the Sourpool (see Discussion, below).
- 5.3 TP6 revealed an alluvial sandy silt deposit (604) at 3.2m bpgl. It is possible that this was a naturally-deposited alluvial layer, although this is not certain.
- 5.4 A culvert was exposed in TPs 13, 14 and 17. This culvert was aligned north-east/south-west. The top of this structure was exposed 2.4m bpgl in the north-eastern part of the site (T13 and T17), deepening to 3.1m bpgl as it moved south-westwards (T14). It was not possible to investigate the culvert in detail due to the deep and unstable nature of the groundworks. A CCTV inspection of the culvert was

carried out by Draintech Surveys Ltd; the CCTV report is appended to this watching brief report (Appendix C). In summary, the CCTV survey established that the length of the culvert is divided into sections of different construction: an arched, flat-bottomed culvert constructed of randomly-coursed masonry; a circular cast-iron culvert; and an egg-shaped brick-built culvert. There are also several areas of concrete repair/rebuild.

- 5.5 All other test pits contained a series of modern made-ground deposits to depth. Several modern concrete, stone and brick structures were variously cut into and sealed by these layers.

6. DISCUSSION

- 6.1 The monitored test pits were excavated to depths of between 0.8m and 3.5m bpgl. In only two instances were possible natural deposits revealed: TP6 (possible natural alluvial layer at 3.2m bpgl) and TP17 (silty clay deposit with mudstone inclusions at 2.8m bpgl).
- 6.2 TP17 contained a brown/grey silty clay layer (1703) overlying the natural substrate. This may represent a deposit associated with the Sourpool, a large area of marshland recorded in early documents and which was drained in the 16th century.
- 6.3 The majority of the test pits featured deep deposits of modern made ground to depth. It is known that Millbay Dock was created by partial infilling around the edge of the Sourpool, and the ground beneath the quays is therefore generally made ground.
- 6.4 The alignment of the culvert exposed in TPs 13, 14 and 17 suggests that it is unlikely to be a later expression of the 16th-century Drake's Leat, although it may have fed into the leat. The culvert had been much rebuilt/repared, with sections of the structure being built of masonry, brick, cast iron and concrete.
- 6.5 Several modern structures were also recorded. Most of these were concrete-built and were clearly later 20th century in date. Test Pits 4 and 11 contained red brick walls and Test Pits 3 and 12 contained limestone walls; these occupied similar stratigraphic positions to the concrete structures and are presumably also 20th

century in date, although it is possible that they are associated with earlier, post-medieval activity at the site.

7. CA PROJECT TEAM

7.1 The watching brief fieldwork was undertaken by George Gandham. This report was written by Derek Evans. The report illustrations were prepared by Esther Escudero. The project was managed for CA by Derek Evans.

8. REFERENCES

BGS (British Geological Survey) 2015 *Geology of Britain Viewer* <http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>
Accessed 11 November 2015

CA (Cotswold Archaeology) 2011 *Millbay Docks, Millbay Road, Plymouth: Archaeological Watching Brief and Historic Building Recording* CA typescript report **10188**

CA (Cotswold Archaeology) 2015 *Plot C2, Millbay, Plymouth: Written Scheme of Investigation for an Archaeological Watching Brief*



APPENDIX A: CONTEXT DESCRIPTIONS

Test pit 1; depth 0.9m				
Context No.	Type	Context interpretation	Description	Thickness (m)
100	Layer	Modern ground surface	Stone/gravel	0.3
101	Layer	Modern made ground	Made ground: gravel and ash	0.55
102	Layer	Made ground	Pale brown mixed stone, gravel and sand	

Test pit 2; depth 3.5m				
Context No.	Type	Context interpretation	Description	Thickness (m)
200	Layer	Modern ground surface	Tarmac	0.2
201	Structure	Modern structure	Concrete curb	0.2
202	Structure	Modern structure	Concrete slab	0.2
203	Layer	Made ground	Pale brown-grey stone/gravel	0.4
204	Layer	Made ground	Black ash/gravel/slag	0.3
205	Layer	Made ground	Red-brown redeposited shillet clay	0.6
206	Layer	Made ground	Grey redeposited shillet clay	

Test pit 3; depth 3.5m				
Context No.	Type	Context interpretation	Description	Thickness (m)
300	Layer	Modern ground surface	Tarmac	0.2
301	Structure	Modern structure	Limestone wall	
302	Layer	Made ground	Grey-brown mixed shillet/clay/gravel/silt	0.5
303	Layer	Made ground	Black ash/gravel/slag	0.4
304	Layer	Made ground	Red-brown redeposited shillet clay	0.4
305	Layer	Layer	Grey redeposited shillet clay	

Stone wall 301 was founded on ashy made ground deposit 303. The upper surface of this wall lay 0.2m bpgl, immediately beneath the modern ground surface. This wall was constructed of limestone blocks.

Test pit 4; depth 2.6m				
Context No.	Type	Context interpretation	Description	Thickness (m)
400	Layer	Modern ground surface	Tarmac, cobbles, concrete	0.3
401	Layer	Made ground	Hardcore	0.2
402	Layer	Service	Modern service	
403	Structure	Modern structure	Concrete block	
404	Structure	Modern structure	Fragmentary remains of red brick structure	
405	Layer	Layer	Red-brown redeposited shillet clay	
406	Structure	Modern structure	Concrete structure	

Part of a concrete structure was exposed at the base of the test pit (2.6m bpgl). It was apparently sealed by redeposited natural layer 405. The upper surface of this redeposited natural layer (0.5m bpgl) was cut by the fragmentary remains of red brick wall 404.

Test pit 5; depth 3.5m				
Context No.	Type	Context interpretation	Description	Thickness (m)
500	Layer	Modern ground surface	Tarmac, cobbles, concrete	0.3
501	Layer	Made ground	Redeposited red-brown shillet/silt/gravels	
502	Structure	Structure	Drain	
503	Structure	Modern structure	Concrete block	
Part of a concrete structure was exposed at the base of TP5 (3.5m bpgl). It was apparently sealed by redeposited natural layer 501. The upper surface of this redeposited natural layer (0.3m bpgl) was cut by drain 502.				

Test pit 6; depth 3.5m				
Context No.	Type	Context interpretation	Description	Thickness (m)
600	Layer	Modern ground surface	Tarmac	0.2
601	Layer	Made ground	Hardcore	0.3
602	Layer	Made ground	Redeposited red-brown shillet/silt/gravels	0.9
603	Layer	Made ground	Redeposited alluvial sandy silt	1.8
604	Layer	Natural?	Alluvial sandy silt	

Test pit 7; depth 1.2m				
Context No.	Type	Context interpretation	Description	Thickness (m)
700	Layer	Modern ground surface	Tarmac	0.3
701	Layer	Made ground	Concrete	0.3
702	Layer	Made ground	Redeposited red-brown shillet/silt/gravels	

Test pit 8; depth 1.6m				
Context No.	Type	Context interpretation	Description	Thickness (m)
800	Layer	Modern ground surface	Tarmac	0.2
801	Structure	Modern structure	Granite blocks – possible remnants of surface	0.5
802	Layer	Made ground	Redeposited red-brown shillet/silt/gravels	0.9
803	Structure	Modern structure	Concrete surface	
Concrete surface 803 was exposed at the base of TP8 (1.6m bpgl). It was sealed by redeposited natural layer 802. Layer 802 was sealed by granite blocks 801, which apparently represented the remnants of a surface.				

Test pit 9; depth 3.5m				
Context No.	Type	Context interpretation	Description	Thickness (m)
900	Layer	Modern ground surface	Tarmac	0.2
901	Structure	Made ground	Redeposited red-brown shillet/silt/gravels	0.3
902	Structure	Modern structure	Concrete	
903	Layer	Made ground	Redeposited yellow-brown shillet/sand, including cement fragments	0.6
904	Layer	Made ground	Redeposited red-brown shillet	
Concrete structure 902 was present along the eastern edge of the test pit. This structure was founded on made ground 904 (1.1m bpgl); its upper surface lay 0.5m bpgl.				

Test pit 10; depth 2m				
Context No.	Type	Context interpretation	Description	Thickness (m)
1000	Service	Modern service	Water pipe	
1001	Layer	Made ground	Redeposited red-brown shillet/silt/gravels	0.5
1002	Layer	Made ground	Black ash/gravel	0.5
1003	Layer	Made ground	Redeposited red-brown shillet/sand	

Test pit 11; depth 2.6m				
Context No.	Type	Context interpretation	Description	Thickness (m)
1100	Layer	Made ground	Light grey-brown stone/gravel	0.3
1101	Structure	Modern structure	Red brick wall	
1102	Layer	Made ground	Mixed silt/sand/stone/brick/ash	0.9
1103	Layer	Made ground	Redeposited red-brown shillet/sand	
Red brick wall ran along the south-eastern edge of TP11. This wall was founded on redeposited natural layer 1103 (1.2m bpgl); its upper surface lay 0.3m bpgl.				

Test pit 12; depth 0.8m				
Context No.	Type	Context interpretation	Description	Thickness (m)
1200	Layer	Modern surface	Tarmac	0.2
1201	Structure	Modern structure	Limestone wall	
1202	Layer	Made ground	Mixed silt/sand/stone/brick/ash/concrete	
1203	Layer	Made ground	Same as 1203	
The upper surface of limestone wall 1201 was exposed beneath the modern ground surface (0.2m bpgl). Its base was not exposed in the test pit (0.8m bpgl).				

Test pit 13; depth 2.4m				
Context No.	Type	Context interpretation	Description	Thickness (m)
1300	Layer	Modern surface	Tarmac	0.3
1301	Layer	Modern surface	Concrete surface	0.3
1302	Layer	Made ground	Mid brown clayey silt with redeposited natural shillet	
1303	Structure	Culvert	Culvert	
The upper surface of culvert 1303 was exposed at the base of the test pit (2.4m bpgl). It was apparently constructed of limestone or granite and appeared to be vaulted, but it was not possible to investigate due to the depth and restricted size of the test pit.				

Test pit 14; depth 3.1m				
Context No.	Type	Context interpretation	Description	Thickness (m)
1400	Layer	Modern surface	Tarmac	0.2
1401	Layer	Modern surface	Concrete surface	0.2
1402	Layer	Made ground	Mid brown clayey silt with redeposited natural shillet	
1403	Structure	Culvert	Culvert	

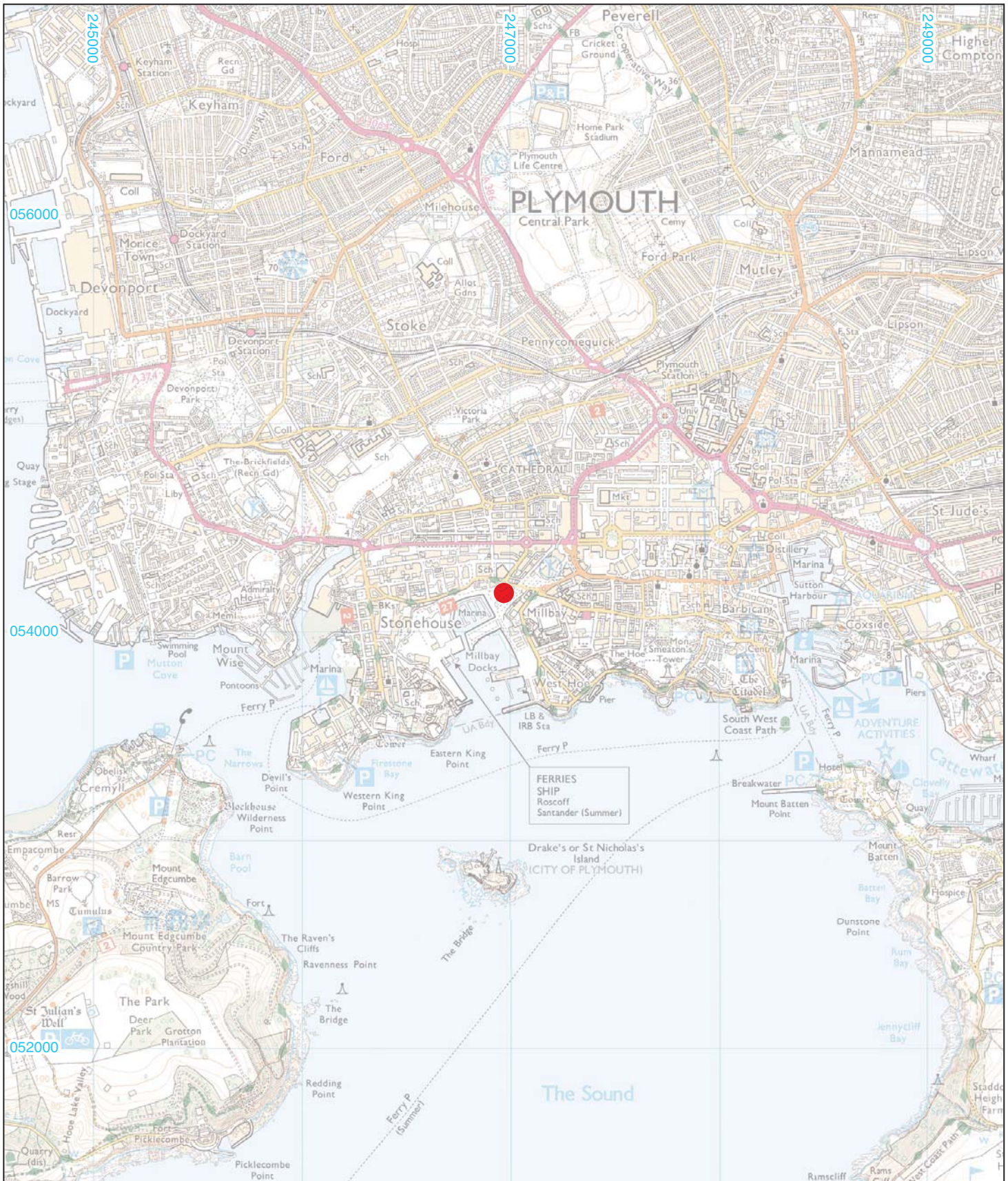
Test pit 15; depth 3m				
Context No.	Type	Context interpretation	Description	Thickness (m)
1500	Layer	Modern surface	Tarmac	0.2
1501	Layer	Made ground	Mixed rubble, silt, ash	0.3
1502	Structure	Modern structure	Reinforced concrete structure	
1503	Layer	Made ground	Mid brown clayey silt with redeposited natural shillet Possibly limestone/granite	
Concrete structure 1502 was founded on/cut into made ground layer 1503 and sealed by made ground layer 1501.				

Test pit 16; depth 3.5m				
Context No.	Type	Context interpretation	Description	Thickness (m)
1600	Layer	Made ground	Hardcore	0.2
1601	Layer	Made ground	Mixed rubble, silt, ash	1.3
1602	Layer	Made ground	Red clayey silt with redeposited shillet	1
1603	Layer	Made ground	Grey sand/gravel/stone	

Test pit 17; depth 3.7m				
Context No.	Type	Context interpretation	Description	Thickness (m)
	Structure	Culvert	Culvert	
	Layer	Made ground	Concrete	0.2
	Layer	Made ground	Stone/rubble in a clayey matrix	2.1
	Layer	Natural silting?	Green-brown/grey silty clay with limestone inclusions	0.5
	Layer	Natural?	Grey-brown silty clay with mudstone inclusions	

APPENDIX B: OASIS REPORT FORM

PROJECT DETAILS		
Project name	Plot C2, Millbay, Plymouth: Archaeological Watching Brief	
Short description	<p>In May and July 2017, Cotswold Archaeology (CA) carried out an archaeological watching brief during the excavation of ground investigation test pits at Plot C2, Millbay, Plymouth.</p> <p>One test pit contained a silty clay layer, possibly representing a deposit associated with the Sourpool, a large area of marshland recorded in early documents and which was drained in the 16th century.</p> <p>A culvert was recorded within the site. This had been much rebuilt/repared, with sections of the structure being built of masonry, brick, cast iron and concrete.</p> <p>The test pits generally contained modern made ground deposits to depth. Several structures were cut into these deposits; some of these structures were clearly late 20th century in date; others may also be modern, or post-medieval.</p>	
Project dates	24–26 May and 5 July 2017	
Project type	Watching brief	
Previous work	Watching Brief and Historic Building Recording (Cotswold Archaeology 2011)	
Future work	Unknown	
PROJECT LOCATION		
Site location	Plot C2, Millbay, Plymouth	
Study area (m ² /ha)		
Site co-ordinates	246986 054182	
PROJECT CREATORS		
Name of organisation	Cotswold Archaeology	
Project brief originator	N/A	
Project design (WSI) originator	Cotswold Archaeology	
Project Manager	Derek Evans	
Project Supervisor	George Gandham	
MONUMENT TYPE		
	None	
SIGNIFICANT FINDS		
	None	
PROJECT ARCHIVES		
	Intended final location of archive	Content
Physical	N/A	N/A
Paper	N/A	N/A
Digital	N/A	N/A
BIBLIOGRAPHY		
Cotswold Archaeology 2017 <i>Plot C2, Millbay, Plymouth: Archaeological Watching Brief</i> CA typescript report 17355		



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PROJECT TITLE

Block C2, Millbay, Plymouth, Devon

FIGURE TITLE

Site location plan

DRAWN BY	EE	PROJECT NO.	880071	FIGURE NO.
CHECKED BY	DJB	DATE	15/06/2017	1
APPROVED BY	DE	SCALE@A4	1:25,000	



- Site boundary
- Test pit
- Structural feature
- Modern service



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PROJECT TITLE
Block C2, Millbay, Plymouth, Devon

FIGURE TITLE
The site, showing monitored groundworks

DRAWN BY CHECKED BY APPROVED BY	EE DJB DE	PROJECT NO. 880071 DATE 16/06/2017 SCALE@A3 1:250	FIGURE NO. 2
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Test Pit 2, looking south-east (1m scale)



Test Pit 4 showing cobbled surface 400, looking east (1m scale)



Test Pit 11 showing brick wall 1101, looking south-east



Borehole Test Pit 7



Test Pit 17, showing culvert 1700



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PROJECT TITLE

Block C2, Millbay, Plymouth, Devon

FIGURE TITLE

Test Pit 17; photograph

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CHECKED BY DJB DATE 16/06/2017
APPROVED BY DE SCALE@A4 NA

FIGURE NO.

4

APPENDIX C: CCTV REPORT

$\Sigma \emptyset$ / Main sections

 Project name :
7261-PN1 MILLBAY PLYMOUTH

 Project number :
7261-PN1

Contact :

 Date :
21/05/2017

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
1	MH 1	NODE	21/05/2017	PLOT CS MILLBAY		Masonry - randomly coursed	10.30	10.30

Pipe size: ARCHED (WITH FLAT BOTTOM) 650/1100 = 10.3 m (10.3 m)

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
2	CAP END	MH 1	22/05/2017	PLOT CS MILLBAY		Masonry - randomly coursed	32.60	32.60

Pipe size: ARCHED (WITH FLAT BOTTOM) 900/1100 = 32.6 m (32.6 m)

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
3	FWMH 1	FWMH 4	22/05/2017	MILLBAY ROAD		Cast iron	73.10	73.10

Pipe size: CIRCULAR 750 = 73.1 m (73.1 m)

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
4	FWMH2	FWMH-3	24/05/2017	MILLBAY ROAD		Brick	80.40	80.40

Pipe size: EGG SHAPED 1200/1800 = 80.4 m (80.4 m)

All sections = 196.4 m (196.4 m)

Service / Operational Defects (SRM 4)

 Project name :
7261-PN1 MILLBAY PLYMOUTH

 Project Number :
7261-PN1

Contact :

 Date :
21/05/2017

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	MH 1X	D	S	A 650/1100	21/05/2017	MAR	10.30	10.30	-	0	1	0	0
2	CAP ENDX	U	S	A 900/1100	22/05/2017	MAR	32.60	32.60	-	0	1	0	0
3	FWMH 1X	U	F	C 750	22/05/2017	CI	73.10	73.10	3	6	4	0.99	72.2
4	FWMH2X	U	F	E 1200/1800	24/05/2017	BR	80.40	80.40	4	2	3	0.02	2

Structural Defects (SRM 4)

 Project name :
7261-PN1 MILLBAY PLYMOUTH

 Project Number :
7261-PN1

Contact :

 Date :
21/05/2017

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	MH 1X	D	S	A 650/1100	21/05/2017	MAR	10.30	10.30	-	0	1	0	0
2	CAP ENDX	U	S	A 900/1100	22/05/2017	MAR	32.60	32.60	-	10	2	9.97	325
3	FWMH 1X	U	F	C 750	22/05/2017	CI	73.10	73.10	3	40	3	0.55	40
4	FWMH2X	U	F	E 1200/1800	24/05/2017	BR	80.40	80.40	-	0	1	0	0

Project-information

 Project name :
7261-PN1 MILLBAY PLYMOUTH

 Project Number :
7261-PN1

Contact :

 Date :
21/05/2017

 Client: **WRW Construction**

 Contact Name: **Nick Berry**

Department:

Road:

Town:

County:

Telephone:

Fax:

Mobile:

E-mail:

 Site: **Draintech Surveys Ltd**

 Contact Name: **Jordan Kibble**

 Department: **Team Leader**

 Road: **Millbay**

 Town: **Plymouth**

County:

Telephone:

Fax:

 Mobile: **07921874309**

 E-mail: **jordan.draintech@hotmail.com**

 Contractor **Draintech Surveys Ltd**

 Contact Name: **Brent O'Neill**

 Department: **Operations Director**

 Road: **Atlantic House, Charnwood Park**

 Town: **Bridgend**

 County: **CF31 3PL**

 Telephone: **01656 767001**

 Fax: **01656 762839**

 Mobile: **07973488001**

 E-mail: **brent.oneill@draintech.co.uk**

Inspection report

Date : 21/05/2017	Job number :	Weather : no rain or snow	Operator : DRAINTECH JK	Section number : 1	PLR SUFFIX: X
Weather no rain or snow	Vehicle : CU63 EEB	Camera :	Preset :	Cleaned : no	Operator : DRAINTECH JK

Place : Road : Location Inspection	PLYMOUTH PLOT CS MILLBAY Other (state in comments) MH 1 (D/S) NODE	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	MH 1 4.2 NODE
Direction Use:	Surface water	Pipe shape :	Arched (with flat bottom)	
Year laid :		Pipe size :	650 mm	
Purpose :	Routine inspection of condition	Pipe material :	Masonry - randomly coursed	
Total length :	10.30 m	Lining :		

Comment :

1:90	Position	Code	Observation	MPEG	Photo	Grade
Depth: 4.2						
	0.00	MH	Start node type, manhole, reference number : MH 1	00:00:00		(Constr) 0
	0.00	WL	Water level, 0% of the vertical dimension	00:00:11		(Serv) 0
	1.00	REM	General remark Remarks: PIPE HEAVILY SILTED	00:00:20		(Misc) 0
	10.30	SA	Survey abandoned Remarks: UNABLE TO CONTINUE DUE TO A BUILD UP SILT	00:02:51	1_4A	(Misc) 0


Structural Defects
Constructional Features
Service Defects
Miscellaneous Features

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	1	0	0	0	0	1

Inspection picturesPlace :
PLYMOUTHRoad :
PLOT CS MILLBAYDate :
21/05/2017Section number :
1PLR Suffix :
X

Photo: 1_4A, 00:02:51
10.3m, Survey abandoned

Inspection report

Date : 22/05/2017	Job number :	Weather : no rain or snow	Operator : DRAINTECH JK	Section number : 2	PLR SUFFIX: X
Weather no rain or snow	Vehicle : CU63 EEB	Camera :	Preset :	Cleaned : no	Operator : DRAINTECH JK

Place : Road : Location Inspection	PLYMOUTH PLOT CS MILLBAY Other (state in comments) MH 1 (U/S) CAP END	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	CAP END MH 1 4.2
Direction Use: Year laid : Purpose : Total length :	Surface water Routine inspection of condition 32.60 m	Pipe shape : Pipe size : Pipe material : Lining :	Arched (with flat bottom) 900 mm Masonry - randomly coursed	

Comment :

1:270	Position	Code	Observation	MPEG	Photo	Grade
Depth: 4.2						
	0.00	MH	Start node type, manhole, reference number : MH 1	00:00:06		(Constr) 0
	0.00	WL	Water level, 0% of the vertical dimension	00:00:06		(Serv) 0
	0.00	S01 MM	Missing mortar, from 7 to 5 o'clock, between 5mm and 15mm, Start	00:00:06		(Struct) 2
	32.50	F01 MM	Missing mortar, from 7 to 5 o'clock, between 5mm and 15mm, End	00:00:06		(Struct) 2
	32.60	MHF	Finish node type, manhole reference number: CAP END Remarks: LINE IS CAPPED	00:02:52	2_3A	(Constr) 0

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	10	9.97	325	2	0	0	0	0	1

Inspection picturesPlace :
PLYMOUTHRoad :
PLOT CS MILLBAYDate :
22/05/2017Section number :
2PLR Suffix :
X

Photo: 2_3A, 00:02:52
32.6m, Finish node type, manhole reference number: CAP END

Inspection report

Date : 22/05/2017	Job number :	Weather : no rain or snow	Operator : DRAINTECH JK	Section number : 3	PLR SUFFIX: X
Weather no rain or snow	Vehicle : CU63 EEB	Camera :	Preset :	Cleaned : no	Operator : DRAINTECH JK

Place : Road : Location Inspection	PLYMOUTH MILLBAY ROAD Road FWMH 4 (U/S) FWMH 1	Location details: Catchment: Tape number : Pipe Length	U/S MH : FWMH 1 U/S Depth : 3.52 D/S MH : FWMH 4 D/S Depth : 4.41
Direction Use: Year laid : Purpose : Total length :	Foul Routine inspection of condition 73.10 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 750 mm Cast iron

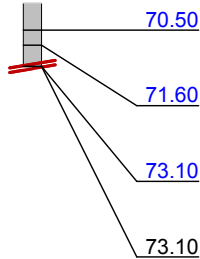
Comment :

1:540 Depth: 4.41	Position	Code	Observation	MPEG	Photo	Grade
	0.00	MH	Start node type, manhole, reference number : FWMH 4	00:00:11		(Constr) 0
	0.00	WL	Water level, 10% of the vertical dimension	00:00:11		(Serv) 0
	19.80	MC	Material changes, concrete	00:01:15	4_3A	(Misc) 0
	19.80	FC	Fracture, circumferential, from 7 to 5 o'clock	00:01:21		(Struct) 3
	20.80	FCJ	Fracture, circumferential at joint, from 2 to 5 o'clock	00:01:47	4_5A	(Struct) 3
	23.00	REM	General remark Remarks: DEPTH OF SOND RECORDED 3.7M	00:02:16		(Misc) 0
	23.40	MC	Material changes, cast iron	00:02:21	4_7A	(Misc) 0
	25.20	DER	Settled deposits, coarse, 5% cross-sectional area loss	00:02:35		(Serv) 3
	35.20	REM	General remark Remarks: THIS LINE IS RUNNING THROUGH MANHOLE 1 CORRODED HATCHBOX PRESENT	00:03:36	4_9A	(Misc) 0
	35.20	F01	DES Settled deposits, fine, 10% cross-sectional area loss, End	00:06:27		(Serv) 3
	49.30	S01	DES Settled deposits, fine, 10% cross-sectional area loss, Start	00:05:04		(Serv) 3
	49.30	S02	DER Settled deposits, coarse, 5% cross-sectional area loss, Start	00:05:06		(Serv) 3
	55.20	F02	DER Settled deposits, coarse, 5% cross-sectional area loss, End	00:05:29		(Serv) 3
	64.20	DER	Settled deposits, coarse, 5% cross-sectional area loss	00:06:00		(Serv) 3
	68.10	DER	Settled deposits, coarse, 5% cross-sectional area loss	00:06:15		(Serv) 3

Inspection Report

Date : 22/05/2017	Job number :	Weather : no rain or snow	Operator : DRAINTECH JK	Section number : 3	PLR : X
Weather no rain or snow	Vehicle : CU63 EEB	Camera :	Preset :	Cleaned : no	Grade:

1:540	Position	Code	Observation	MPEG	Photo	Grade
	70.50	DER	Settled deposits, coarse, 10% cross-sectional area loss	00:06:26		(Serv) 3
	71.60	DER	Settled deposits, coarse, 20% cross-sectional area loss	00:06:35		(Serv) 4
	73.10	DER	Settled deposits, coarse, 40% cross-sectional area loss	00:06:53	4_18A	(Serv) 4
	73.10	SA	Survey abandoned Remarks: UNABLE TO PASS DEBRIS IN LINE	00:06:57		(Misc) 0



Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
1	40	0.55	40	3	8	6	0.99	72.2	4

Inspection pictures

 Place :
PLYMOUTH

 Road :
MILLBAY ROAD

 Date :
22/05/2017

 Section number :
3

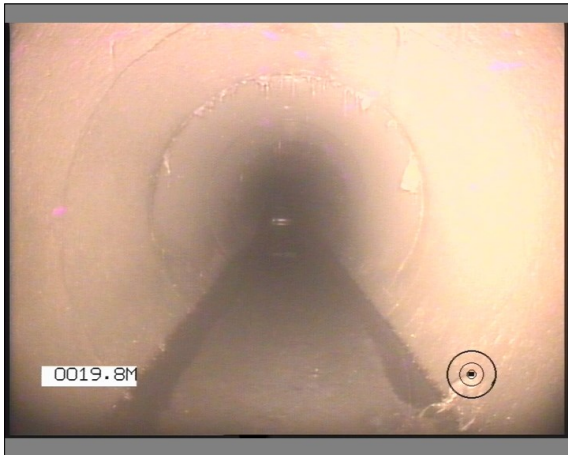
 PLR Suffix :
X


Photo: 4_3A, 00:01:15
 19.8m, Material changes, concrete



Photo: 4_5A, 00:01:47
 20.8m, Fracture, circumferential at joint, from 2 to 5 o'clock



Photo: 4_7A, 00:02:21
 23.4m, Material changes, cast iron



Photo: 4_9A, 00:03:36
 35.2m, General remark

Inspection pictures

 Place :
PLYMOUTH

 Road :
MILLBAY ROAD

 Date :
22/05/2017

 Section number :
3

 PLR Suffix :
X

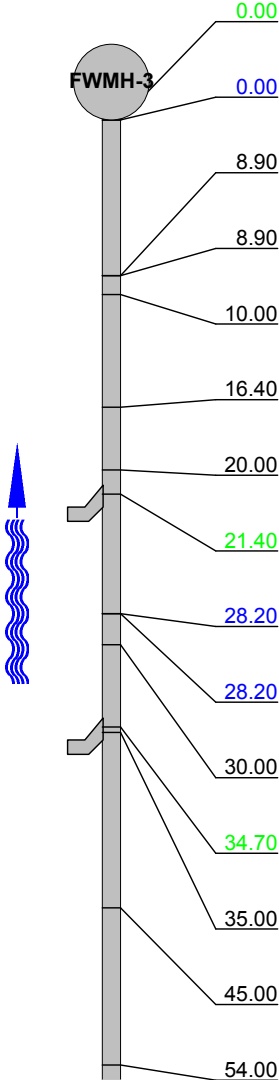

Photo: 4_18A, 00:06:53
 73.1m, Settled deposits, coarse, 40% cross-sectional area
 loss

Inspection report

Date : 24/05/2017	Job number :	Weather : no rain or snow	Operator : DRAINTECH JK	Section number : 4	PLR SUFFIX: X
Weather no rain or snow	Vehicle : CU63 EEB	Camera :	Preset :	Cleaned : no	Operator : DRAINTECH JK

Place : Road : Location Inspection	PLYMOUTH MILLBAY ROAD Verge FWMH-3 (U/S) FWMH2	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	FWMH2 5.97 FWMH-3 7.16
Direction Use: Year laid : Purpose : Total length :	Foul Z Routine inspection of condition 80.40 m	Pipe shape : Pipe size : Pipe material : Lining :	Egg shaped 1200 mm Brick	

Comment :

1:432 Position Depth: 7.16	Code	Observation	MPEG	Photo	Grade
	MH	Start node type, manhole, reference number : FWMH-3	00:00:06		(Constr) 0
0.00	WL	Water level, 10% of the vertical dimension	00:00:07		(Serv) 0
8.90	REM	General remark Remarks: CONCRETE REPAIR TO THE TOP OF THE PIPE	00:01:08	5_3A	(Misc) 0
8.90	SC	Dimension changes, 900mm high, 900mm wide	00:01:17		0
10.00	REM	General remark Remarks: GROUND TO SONDE AT HIS POINT IS 7.370M = 7.830M TO THE INVERT, THIS LOCATION IS IN THE VERGE	00:07:58		(Misc) 0
16.40	REM	General remark Remarks: END OF THE REPAIR	00:01:56		(Misc) 0
20.00	REM	General remark Remarks: GROUND TO THE SONDE AT THIS POINT IS 7.300M = 7.760M TO THE INVERT, LOCATION IS IN THE VERGE	00:08:32		(Misc) 0
21.40	JN	Junction, at 2 o'clock, diameter 150mm	00:02:33		(Constr) 0
28.20	DEG	Attached deposits, grease, from 7 to 8 o'clock, 5% cross-sectional area loss	00:03:20		(Serv) 3
28.20	IR	Infiltration, running, at 4 o'clock	00:03:23		(Serv) 0
30.00	REM	General remark Remarks: GROUND TO THE SONDE AT THIS POINT IS 7.000M = 7.460M TO THE INVERT, LOCATION IS IN THE ROAD	00:08:32		(Misc) 0
34.70	JN	Junction, at 2 o'clock, diameter 150mm	00:04:00		(Constr) 0
35.00	REM	General remark Remarks: GROUND TO THE SONDE AT THIS POINT IS 7.200M = 7.660M TO THE INVERT, LOCATION IS IN THE VERGE	00:08:32		(Misc) 0
45.00	REM	General remark Remarks: GROUND TO THE SONDE AT THIS POINT IS 6.480M = 6.940M TO THE INVERT, LOCATION IS IN THE SITE	00:08:32		(Misc) 0
54.00	REM	General remark Remarks: GROUND TO THE SONDE AT THIS POINT IS 6.430M = 6.890M TO THE INVERT, LOCATION IS IN THE SITE	00:08:32		(Misc) 0

Inspection Report

Date : 24/05/2017	Job number :	Weather : no rain or snow	Operator : DRAINTECH JK	Section number : 4	PLR : X
Weather no rain or snow	Vehicle : CU63 EEB	Camera :	Preset :	Cleaned : no	Grade:

1:432	Position	Code	Observation	MPEG	Photo	Grade
	64.00	REM	General remark Remarks: GROUND TO THE SONDE AT THIS POINT IS 6.040M = 6.300M TO THE INVERT, LOCATION IS IN THE SITE	00:08:32		(Misc) 0
	74.00	REM	General remark Remarks: GROUND TO THE SONDE AT THIS POINT IS 5.640M = 5.900M TO THE INVERT, LOCATION IS IN THE SITE	00:08:32		(Misc) 0
	77.10	JN	Junction, at 2 o'clock, diameter 150mm	00:07:56		(Constr) 0
	77.10	IR	Infiltration, running, from 3 to 4 o'clock	00:07:58		(Serv) 0
	80.40	MHF	Finish node type, manhole reference number: FWMH2	00:08:32		(Constr) 0

Depth: 5.97

Structural Defects					Constructional Features				
Service Defects					Miscellaneous Features				
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	1	1	2	0.02	2	3

Inspection pictures

Place :
PLYMOUTHRoad :
MILLBAY ROADDate :
24/05/2017Section number :
4PLR Suffix :
X

Photo: 5_3A, 00:01:08
8.9m, General remark

Andover Office

Stanley House
Walworth Road
Andover
Hampshire
SP10 5LH

t: 01264 347630

Cirencester Office

Building 11
Kemble Enterprise Park
Cirencester
Gloucestershire
GL7 6BQ

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Exeter Office

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Yeoford Way
Marsh Barton Trading Estate
Exeter
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t: 01392 826185

Milton Keynes Office

41 Burners Lane South
Kiln Farm
Milton Keynes
Buckinghamshire
MK11 3HA

t: 01908 564660