



Standard Specification CCTV Stormwater Inspections



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Introduction

Reinforced Concrete Pipes (RCPs) and other drainage products that make up a system of drainage are key assets in the management of stormwater.

The City of Gosnells is concerned with the service life and durability of these key assets, particularly in relation to damage and defects sustained during construction and the subsequent possibility of a reduced asset life.

The City of Gosnells intends to address these concerns with the implementation of a Standard Specification for the CCTV inspection of drainage assets.

The CCTV inspection of drainage assets provides the City of Gosnells with a baseline condition assessment enabling the City to better determine and plan its maintenance requirements.

CCTV inspections will provide visual evidence of the quality of installation. Inspections will identify major faults such as localised damage due to impacts, debris remaining in the pipeline, rubber rings so severely displaced they are visible inside the pipeline and the existence and number of cracks.

The Standard Specification will address the following key requirements:

- CCTV inspections
- Inspection methods
- Reporting
- Repairs and rectification

The installation of drainage systems will always be consistent with the City of Gosnells Standard Drawings and will be constructed in accordance with the manufacturers' recommendations and in compliance with the Consulting Engineers Standard Specification for Drainage.

CCTV Inspections

Inspections will be carried out for all RCPs within a closed drainage system, regardless of the pipe size and class.

Inspections may be carried out at the discretion of the contractor in regards to timing, however inspections will not occur prior to the placement and compaction of the sub-base material (usually limestone, for example) at the earliest.

All CCTV inspections should be completed prior to the Works Completion Inspection with the City, where feasible.

The inspection of other drainage products within the drainage system, such as PVC and HDPE pipes, for example, will be carried out in accordance with the written instruction of the City of Gosnells.

The City of Gosnells will be notified when all CCTV inspections are occurring.



CCTV Inspection Method

The CCTV inspection of all drainage systems will be carried out by an agency which specialises in the activity of conducting CCTV surveys.

The agency will use the appropriate equipment, tools and supporting technology to accurately capture the drainage system condition. Inspections should be carried out from maintenance structure to maintenance structure and reported as such.

All CCTV Surveys must be recorded in line with Water Services Association of Australia current Conduit Inspection Reporting Code of Australia. (WSA 05-2020)

The camera must be of a high definition quality with a 360 degree rotating function. The camera must be mounted on a self-propelled crawler system.

The CCTV survey must capture the entire length of all drainage lines between maintenance structures.

Each maintenance structure must be scanned using the pan/tilt and zoom functions of the CCTV camera and the video footage recorded as part of the overall CCTV survey.

All pipe joints and lot connection points should be scanned by a 360 degree pan.

A number of general photographs must be taken along the drainage system surveyed as a minimum to satisfy the requirements of this standard:

- One photograph in each maintenance structure showing the condition of the structure above the pipe overt level
- One photograph showing each pipe joint and lot connection
- Photographs of all defects and observations



Reporting

All CCTV reports must be prepared in accordance with the latest version of WSA 05-2020.

CCTV reports should be prepared using the WinCan software or a comparable product. See example report format attached in Appendix 1. The report must clearly identify the drainage line, making reference to all of the relevant details including but not limited to:

- Date, time, location etc
- Type, size, length and class of pipe
- Operator details

The report should have a linear representation on the cover page of the drainage line being inspected. Any notes relating to the condition of the survey should be made on this page. The report should make comment of the inspection results for each drainage system in accordance with the rating system and, where required, make recommendations for treatments or rectification requirements.

The City of Gosnells requires a colour-coded note system for ease of identification, for example:

- Green: no action
- Orange: item of concern
- Red: defect of concern or repair required

Defects should be assessed in accordance with WSA 05-2020.

Repairs and Rectifications

The City of Gosnells is aware that there are a number of repair and remediation options currently available to suit a wide range of defects associated with RCPs.

The City of Gosnells will review all recommendations from the contractor and their inspecting agency and liaise with the Consulting Engineer responsible for the project prior to making a final determination on any repair methods.

All approved repairs will be carried out in accordance with the manufacturers' guidelines and recommendations.

The City of Gosnells must be notified when repairs are being carried out and a follow-up CCTV inspection and report must be provided of the repairs upon completion.



PROJECT: **CCTV EXAMPLE**






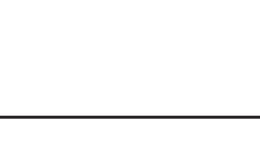



Section Inspection - 10/09/2024 - MA1429-MA1428

Date of inspection 10/09/2024	Time of inspection 9:48 AM	Land ownership Public land	Pipe Asset ID MA1429-MA1428	Nr. 29
Project name 2024-25 ROUTINE INSPECTION	Contractor's Job Number	Coding Standard WSA 2020	Name of operator David Dwyer	Job ID 01

Suburb MADDINGTON	US MH MA1428	Unit Length 0.00 m
Address WILLOW WAY	Direction Upstream	GIS length 48.00 m
Location type In verge beside a road (Nature Stri	DS MH MA1429	Inspected Length [m] 42.80 m
Operation Gravity	Use A drain designed to carry only surface wa	Year Laid
Profile 225mm	Purpose of inspection Routine inspection of condition	
Lining material	Method of inspection Inspection by means of a remotely controlled television camera passed through the	
Lining type	Precipitation	
Dia/Height 225 mm	Cleaning The conduit was not cleaned prior to the inspection	
Material Concrete reinforced	Flow control No measures taken	


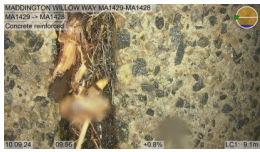









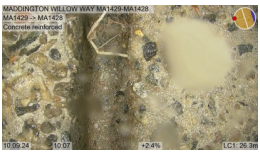

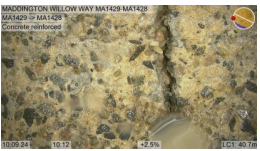


General comment

1:238	m+	Code	Observation Text	Grade	
MA1429	0.60	STMC	Start node, maintenance chamber, Nodename: MA1429		
	0.60	WLFC	Water flow at constant depth, clear water, 5-10%		STMC - 0.60
	0.60	S01 SCS	Surface damage concrete, spalling of the concrete conduit including localised chipping from 12 o'clock to 12 o'clock, Start		
	6.20	SCH	Surface damage concrete, localised hole in wall at 9 o'clock	5	
	6.20	SV	Soil visible through defect	4	
	6.70	JDL	Joint displaced longitudinally, 20mm	1	
	9.10	RRB	Recently cut interwoven mass of mostly fine roots leaving a beard of roots, Obstruction: 10%, at joint from 7 o'clock to 9 o'clock	1	
	11.20	RRT	Recently cut tap roots, a small number of cut major roots (10mm or greater) is evident, Obstruction: 20%, at joint from 7 o'clock to 10 o'clock		
	13.60	RRF	Recently cut fine roots-a relatively small number of cut minor roots remain, Obstruction: 10%, at joint from 10 o'clock to 2 o'clock	1	
	18.60	RRF	Recently cut fine roots-a relatively small number of cut minor roots remain, Obstruction: 10%, at joint from 10 o'clock to 2 o'clock	1	
	21.10	RRB	Recently cut interwoven mass of mostly fine roots leaving a beard of roots, Obstruction: 20%, at joint from 9 o'clock to 3 o'clock	1	
	22.70	CI	A connecting conduit is projecting into the conduit being inspected and is obstructing the cross sectional area at 10 o'clock, magnitude of intrusion:	3	
	23.90	RRB	Recently cut interwoven mass of mostly fine roots leaving a beard of roots, Obstruction: 10%, at joint from 8 o'clock to 5 o'clock	1	
	25.80	CNOU	Connection, unlined, connection appears to be open, Height/Diameter (mm): 90 at 10 o'clock		
	26.30	JDL	Joint displaced longitudinally, 20mm	1	



Section Inspection - 10/09/2024 - MA1429-MA1428

Date of inspection 10/09/2024	Time of inspection 9:48 AM	Land ownership Public land	Pipe Asset ID MA1429-MA1428	Nr. 29
Project name 2024-25 ROUTINE INSPECTION	Contractor's Job Number	Coding Standard WSA 2020	Name of operator David Dwyer	Job ID 01

1:238	m+	Code	Observation Text	Grade	
	28.40	RT	Tap roots, reduction in cross sectional area, Obstruction: 10%, at joint at 1 o'clock		 MA1429 - MA1428 Concrete reinforced 10/09/24 09:50 +1.3% LCI: 6.76
	33.80	JDL	Joint displaced longitudinally, 20mm	1	JDL - 6.70  MA1429 - MA1428 Concrete reinforced 10/09/24 09:50 +0.8% LCI: 9.56
	40.70	CC	Circumferential cracking, width: 4mm from 3 o'clock to 9 o'clock	3	RRB - 9.10  MA1429 - MA1428 Concrete reinforced 10/09/24 09:50 +0.8% LCI: 9.56
	43.40	F01 SCS	Surface damage concrete, spalling of the concrete conduit including localised chipping from 12 o'clock to 12 o'clock, Finish	2	RRB - 9.10  MA1429 - MA1428 Concrete reinforced 10/09/24 09:50 +0.8% LCI: 9.56
	43.40	FHMC	Finish node, maintenance chamber, Nodename: MA1428		
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 09:51 +2.2% LCI: 11.26 RRT - 11.20
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 09:58 +1.5% LCI: 13.68 RRF - 13.60
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:01 +1.3% LCI: 18.68 RRF - 18.60
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:02 +3.3% LCI: 21.16 RRB - 21.10
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:03 +1.2% LCI: 22.76 CI - 22.70
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:04 +8.4% LCI: 23.98 RRB - 23.90
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:06 +2.1% LCI: 25.88 CNOU - 25.80
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:07 +2.4% LCI: 26.96 JDL - 26.30
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:08 +5.1% LCI: 28.86 RT - 28.40
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:12 +2.5% LCI: 40.38 CC - 40.70
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:14 +2.5% LCI: 43.48 SCS - 43.40
					 MADNINGTON WILLOW WAY MA1429-MA1428 MA1429 - MA1428 Concrete reinforced 10/09/24 10:14 +2.9% LCI: 43.48 FHMC - 43.40



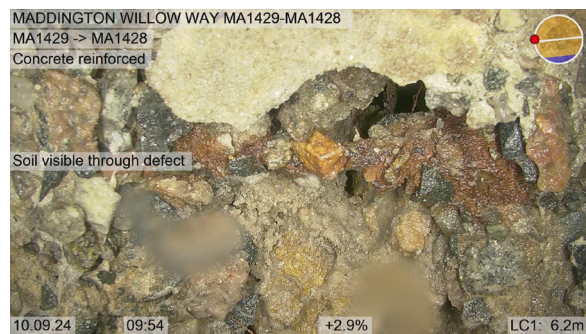
Section Pictures - 10/09/2024 - MA1429-MA1428

Suburb	Address/Location	Date of inspection	Pipe Asset ID	Job ID
MADDINGTON	WILLOW WAY	10/09/2024	MA1429-MA1428	01



MA1429-MA1428_3eee685e-6986-445e-9e4d-76d4a8ebd707_20240910_094802_112.jpg, 00:00:00, 0.60
Start node, maintenance chamber, Nodename:, MA1429

MA1429-MA1428_cd280af0-c390-4890-b992-abce1ba52fde_20240910_094932_976.jpg, 00:01:09, 0.60
Water flow at constant depth, clear water, 5-10%



MA1429-MA1428_8d249dfc-b3f4-4b81-8e0f-8882d939a1de_20240910_094959_338.jpg, 00:01:11, 0.60
Surface damage concrete, spalling of the concrete conduit including localised chipping from 12 o'clock to 12 o'clock, Start

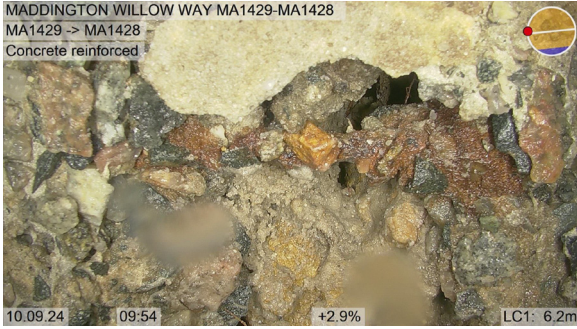
MA1429-MA1428_9c184860-22cc-4b3d-b5ed-2693c3d382c3_20240910_095434_344.jpg, 00:04:50, 6.20
Surface damage concrete, localised hole in wall at 9 o'clock



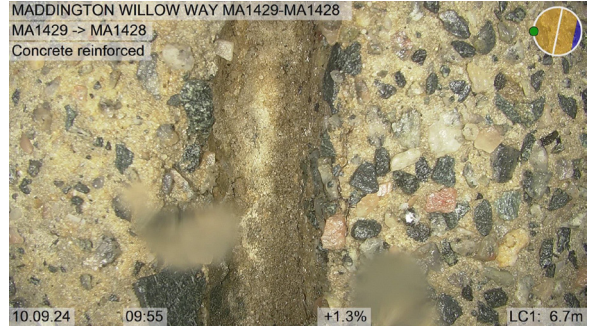
CITY OF GOSNELLS

Section Pictures - 10/09/2024 - MA1429-MA1428

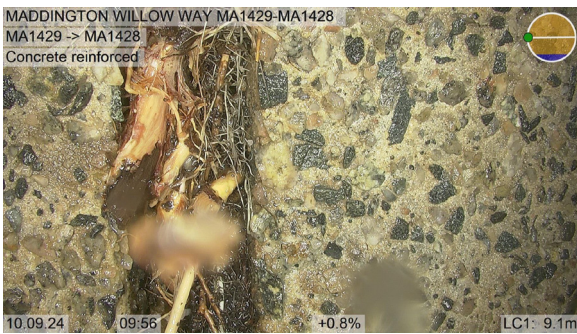
Suburb	Address/Location	Date of inspection	Pipe Asset ID	Job ID
MADDINGTON	WILLOW WAY	10/09/2024	MA1429-MA1428	01



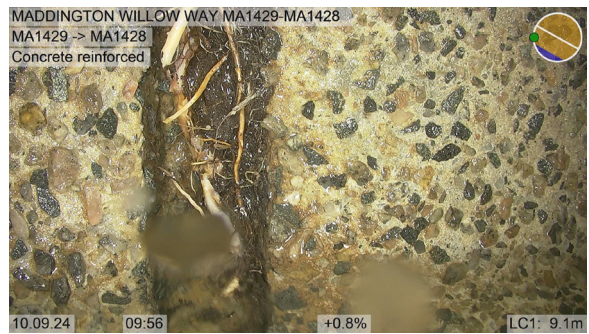
MA1429-MA1428_c759d337-2642-44e4-90c9-ec14f0bc887_20240910_095429_427.jpg, 00:04:52, 6.20
Soil visible through defect



MA1429-MA1428_5b8eded4-5ad5-444d-8ca2-678f18c7794b_20240910_095537_607.jpg, 00:05:56, 6.70
Joint displaced longitudinally, 20mm



MA1429-MA1428_10a5535a-1a28-4794-907d-295de9346e48_20240910_095637_793.jpg, 00:06:40, 9.10
Recently cut interwoven mass of mostly fine roots leaving a beard of roots, Obstruction: 10%, at joint from 7 o'clock to 9 o'clock



MA1429-MA1428_64e03d28-a118-4fe6-985b-aa2389376e7b_20240910_095642_755.jpg, 00:06:40, 9.10
Recently cut interwoven mass of mostly fine roots leaving a beard of roots, Obstruction: 10%, at joint from 7 o'clock to 9 o'clock



Section Pictures - 10/09/2024 - MA1429-MA1428

Suburb	Address/Location	Date of inspection	Pipe Asset ID	Job ID
MADDINGTON	WILLOW WAY	10/09/2024	MA1429-MA1428	01



MA1429-MA1428_a05fe89a-3092-4720-a548-5f72f5b2b79f_2_0240910_095715_589.jpg, 00:07:01, 11.20
 Recently cut tap roots, a small number of cut major roots (10mm or greater) is evident, Obstruction: 20%, at joint from 7 o'clock to 10 o'clock



MA1429-MA1428_6f346f7b-4b3d-4e14-b05a-f59bc15156c7_2_0240910_095859_550.jpg, 00:08:31, 13.60
 Recently cut fine roots-a relatively small number of cut minor roots remain, Obstruction: 10%, at joint from 10 o'clock to 2 o'clock



MA1429-MA1428_53558f7d-7d27-49e3-99e6-1b59f5815b5f_2_0240910_100113_097.jpg, 00:10:31, 18.60
 Recently cut fine roots-a relatively small number of cut minor roots remain, Obstruction: 10%, at joint from 10 o'clock to 2 o'clock



MA1429-MA1428_36046084-1a0b-47c0-932c-a0a5ad31acae_20240910_100215_836.jpg, 00:11:12, 21.10
 Recently cut interwoven mass of mostly fine roots leaving a beard of roots, Obstruction: 20%, at joint from 9 o'clock to 3 o'clock



Section Pictures - 10/09/2024 - MA1429-MA1428

Suburb	Address/Location	Date of inspection	Pipe Asset ID	Job ID
MADDINGTON	WILLOW WAY	10/09/2024	MA1429-MA1428	01



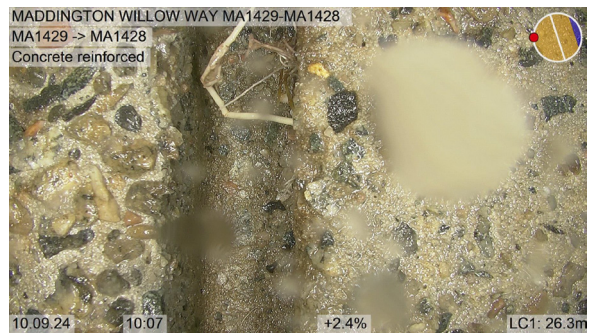
MA1429-MA1428_f1d63ef2-2b51-4b91-94d8-6f753c2a891c_20240910_100308_850.jpg, 00:11:46, 22.70
A connecting conduit is projecting into the conduit being inspected and is obstructing the cross sectional area at 10 o'clock, magnitude of intrusion: 10%



MA1429-MA1428_e0912fb9-4600-429c-af7e-9c2cccd9786a_20240910_100449_386.jpg, 00:13:12, 23.90
Recently cut interwoven mass of mostly fine roots leaving a beard of roots, Obstruction: 10%, at joint from 8 o'clock to 5 o'clock



MA1429-MA1428_e49bd966-94cd-45a2-9ad9-66848dfed0ea_20240910_100641_616.jpg, 00:13:44, 25.80
Connection, unlined, connection appears to be open, Height/Diameter (mm): 90 at 10 o'clock



MA1429-MA1428_2b6c5210-687b-4b91-9101-a4691f2d51e8_20240910_100739_582.jpg, 00:14:30, 26.30
Joint displaced longitudinally, 20mm

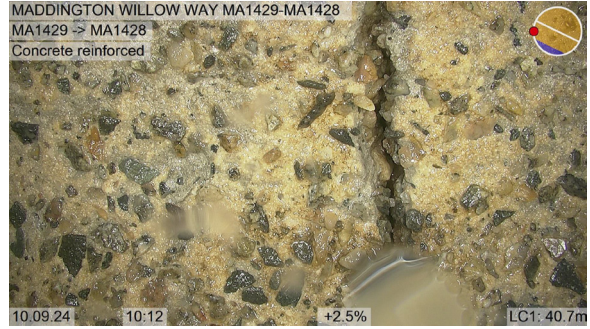


Section Pictures - 10/09/2024 - MA1429-MA1428

Suburb	Address/Location	Date of inspection	Pipe Asset ID	Job ID
MADDINGTON	WILLOW WAY	10/09/2024	MA1429-MA1428	01



MA1429-MA1428_f41b46cf-80de-45af-8aa8-25456dc3bfc2_2
0240910_100814_200.jpg, 00:14:52, 28.40
Tap roots, reduction in cross sectional area, Obstruction: 10%,
at joint at 1 o'clock



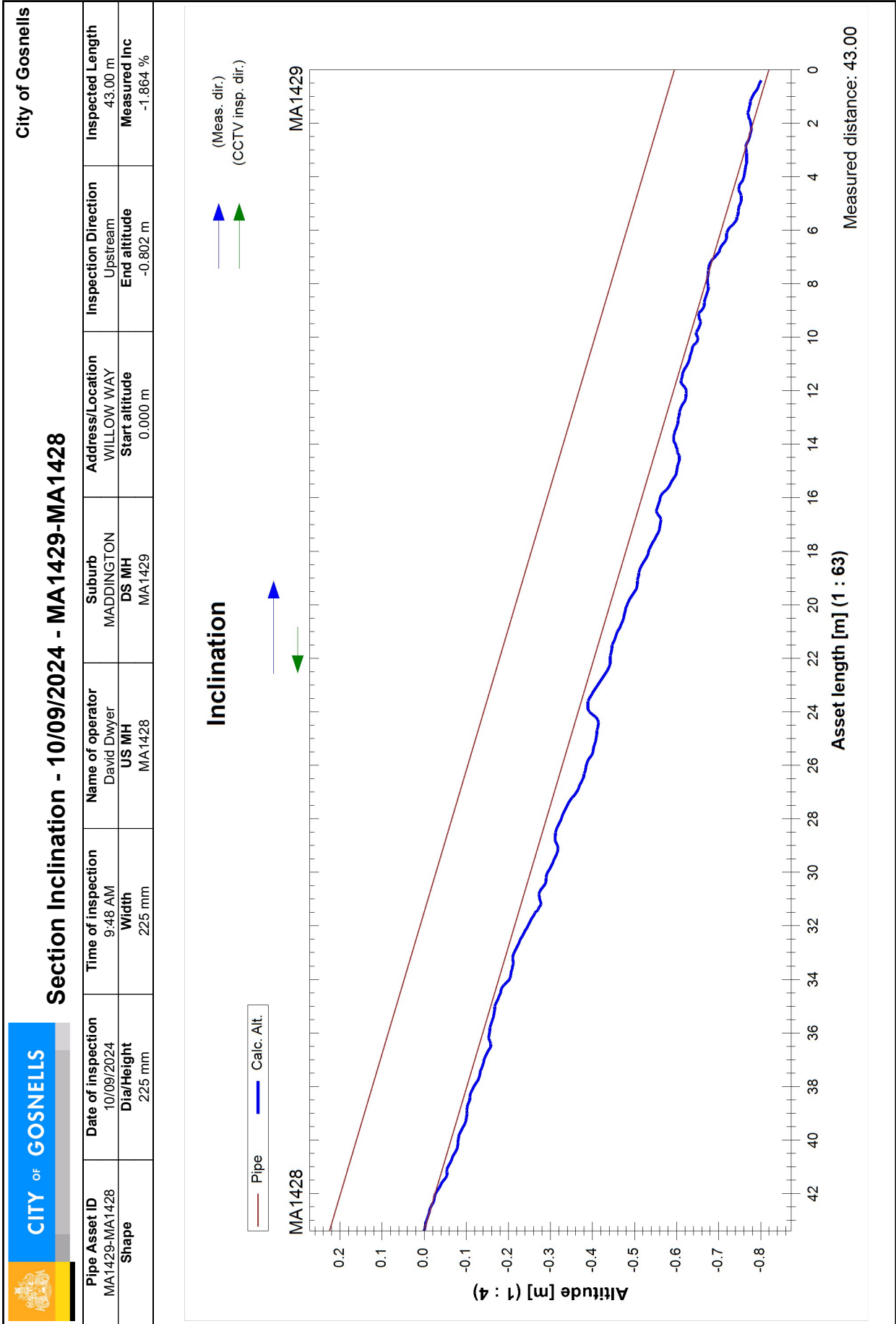
MA1429-MA1428_4f92477e-83eb-48c7-a22b-9b6af27bb95f_2
0240910_101257_512.jpg, 00:19:07, 40.70
Circumferential cracking, width: 4mm from 3 o'clock to 9
o'clock



MA1429-MA1428_da65eb16-e39b-435d-a734-6d1ae6917588
_20240910_101432_836.jpg, 00:20:31, 43.40
Surface damage concrete, spalling of the concrete conduit
including localised chipping from 12 o'clock to 12 o'clock,
Finish



MA1429-MA1428_3002bd45-befa-4c54-b667-4618f866f53c_2
0240910_101451_674.jpg, 00:20:38, 43.40
Finish node, maintenance chamber, Nodename:, MA1428







City of Gosnells
PO Box 662
Gosnells WA 6990

9397 3000
info@gosnells.wa.gov.au
gosnells.wa.gov.au

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