

28TH JUNE 1994

**BRISBANE CITY COUNCIL
DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL BRANCH
ELECTROLYSIS SECTION
EAGLE FARM PUMPING STATION**

OPERATING MANUAL FOR:

**EAGLE FARM 54 INCH RISING MAIN
CATHODIC PROTECTION SYSTEM**

CLIENT:

**DEPARTMENT OF WATER SUPPLY AND SEWERAGE
SEWERAGE OPERATIONS SECTION**

MANUAL CONTENTS

- (1.0) Introduction
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DRAWINGS

JE02/104

(No Number)

Standard Rectifier Wiring Diagram

Monthly Maintenance Program.

(1.0) INTRODUCTION

Steel when immersed or covered in water has a tendency to corrode (or rust) as the oxidized form is more stable than the metal.

Because of this, precaution must be taken to stop or minimize the corrosion reaction to an acceptable level consistent with the design life of the structure. This is normally achieved by the use of protective coatings which control the corrosion reaction by isolating the steel from its surrounding environment.

However, it is not practical to achieve a perfect coating and coating damage will always occur with time. Because of this, corrosion may occur at imperfections in the paint coating, causing further deterioration in the coating as well as loss of metal.

As a result of this, the coating defects must be rectified by periodic maintenance or an additional method of protection used to prevent this deterioration and corrosion occurring. This additional protection is achieved by the cathodic protection system.

(2.0) CORROSION AND CATHODIC PROTECTION

Corrosion is an electrochemical process in that it is accompanied by a flow of electrical current.

Corrosion occurs on the surface of metals at active areas known as anodes, which are electrically continuous with less active or passive areas known as cathodes. The electric current flows from the anode through the electrolyte to the cathode, with the circuit being completed by the electrical continuity between the cathode and anode. In practice anodes and cathodes are generally part of the same metallic surface and individual anodic areas may be small.

In applying cathodic protection an external current is applied to the surface so that the entire surface to be protected acts as a cathode. This involves the use of an auxiliary anode and when the current flow from this anode is sufficient, no part of the structure acts as an anode.

An external source of direct current such as a transformer rectifier is used in conjunction with an anode consisting of material with a very slow corrosion rate.

While it is the flow of current which achieves the cathodic protection of the surface it is impractical to measure these currents over individual anodic areas to determine when cathodic protection has been achieved. However, with the flow of cathodic protection current, the structure becomes more negative with respect to the surrounding electrolyte. Because of this, it is possible to state values of metal/electrolyte potential at which corrosion does not occur. This metal/electrolyte potential is generally measured against a standard reference electrode which allows a reproducible potential at which corrosion does not occur to be quoted.

(3.0) MAINS DETAILS

Size: : Dia 54 Inch Mild Steel

Coating: Fibre Glass Enamel Coated

Length: 2.9km

Location: Violet St,Eagle Farm to Randle Rd,Pinkenba

Construction

Drawings: Not available

(4.0) **CATHODIC PROTECTION DETAILS**

- (4.1) Type of Cathodic Protection: Impressed Current.
- (4.2) Rectifier: Standard 32V Volt, 25 amp direct current output enclosed in a stainless steel switchboard. Rectifier has a 240V supply from a nearby SEQEB pillar box.
Rectifier is located outside CSR,Sugermill Rd,Pinkenba.
- (4.3) Cathode: The cathode point is located on the 54 inch dia. main in the easement off Sugermill Rd,approx 10m from the rectifier unit,where a coupon test point has been installed. The cathode point is where the cabling from the rectifier is attached to the structure under cathodic protection
- (4.4) Anodes: Two 1500 x 75mm silicone iron anode was installed approximately 300 metres from the trunk mains in a vertical bed. The anodes were firstly packaged with cokebreeze thereby improving anode - ground resistance. The anodes are identified by a marker post and label. Refer dwg no 2/14.213.
- (4.5) Test Points: Test points are installed on cathodically protected structures to enable testing to ensure full protection of the mains. On these mains five test points have been installed,plus the Eagle Farm Pumping Station, for details see dwg no 2/14.213.
- (4.6) Associated Drawings:
Cathodic Protection Details - 2/14.213
Cathodic Protection Test Point Details - 2/14.199
Standard Rectifier Wiring Diagram - JE02/104
- (4.7) Associated Standards:
AS 3000 1986 Australia Wiring Rules
AS 2832.1 1985 Pipes, Cables, Ducts, Guide to Cathodic Protection,
Part One.
- (4.8) Government Regulations:
Queensland Electricity Acts and Regulations.

(5.0) PERFORMED TESTING

- (1) Natural Potential Survey.
- (2) Testing of Insulated Flanges, Joints.
- (3) Soil Resistance Testing.
- (4) Current Drain Survey.
- (5) Pipe Coating Anomaly Survey.
- (6) Rectifier Loop Resistance.
- (7) Foreign Structure Interference Survey and Mitigation.
- (8) Final Potential Survey and Commissioning.

NOTE: Details of above testing have not been included in this manual but are available upon request.

(6.0) CONCLUSION

Full Cathodic protection has been achieved on this section of trunk mains. The cathodic protection system is registered with the Queensland Electricity Commission and has approval to operate.

(7.0) MAINTENANCE

The cathodic protection system is maintained on a monthly basis after commissioning. These checks involve testing rectifier operation and recording of pipe to soil potentials.

12th October 1992
Electrical Workshop
Cathodic Protection

CPS Monthly Maintenance Details.

Required:

- 1/ Notify plant operator and/or sign entry logs where necessary.
- 2/ Have appropriate keying.

Labour:

One tradesperson, one vehicle. 20 minutes per site.

Procedure:

- 1/ Identify installation.
- 2/ Check system for operation.
- 3/ Record voltmeter.
- 4/ Record ammeter.
- 5/ Comments.
- 6/ Log entry.

13th October 1992

Electrical Workshop
Cathodic Protection

CPS 6 Monthly Maintenance Details.

Required:

- 1/ Notify plant operator and/or sign entry logs where necessary.
- 2/ Have appropriate keying.
- 3/ Set of tools. (Electricians)
- 4/ Multimeter.
- 5/ DC clampmeter.
- 6/ Copper sulphate reference cell and leads.
- 7/ Cleaning equipment.
- 8/ Gatic cover lifters.

Labour:

One tradesperson electrical, one laborer, one vehicle.

Two hours per site.

Procedure:

- 1/ Identify system.
- 2/ Check system for operation.
- 3/ Record voltmeter.
- 4/ Record ammeter.
- 5/ Record "on" potentials for all test points.
- 6/ Record "instant off" potentials for all test points.
- 7/ Record "off" potentials for all test points.
- 8/ Perform loop resistance and record.
- 9/ Check and record anode string currents.
- 10/ Comments.
- 11/ Log entry.

13th October 1992
Electrical Workshop
Cathodic Protection

CPS 60 Monthly Maintenance Details.

Required:

- 1/ Notify plant operator and/or sign entry logs where necessary.
- 2/ Have appropriate keying.
- 3/ Set of tools. (Electricians)
- 4/ Multimeter.
- 5/ DC clampmeter.
- 6/ Copper sulphate reference cell and leads.
- 7/ Cleaning equipment.
- 8/ Gatic cover lifters.
- 9/ Rectifier load bank.
- 10/ PCS2000 Detection Equipment.

Labour:

One tradesperson electrical, one laborer, one vehicle.
Eight hours per site.

Procedure:

- 1/ Identify system.
- 2/ Check system for operation.
- 3/ Record voltmeter.
- 4/ Record ammeter.
- 5/ Record "on" potentials for all test points.
- 6/ Record "instant off" potentials for all test points.
- 7/ Record "off" potentials for all test points.
- 8/ Perform loop resistance and record.
- 9/ Check and record anode string currents.
- 10/ Load test rectifier for 10 minutes.
- 11/ Check all switchboard and testpoint terminals for tightness.
- 12/ Check all switchboard and testpoints are labelled and I.D. tags attached.
- 13/ Check plans are correctly drawn and modify if necessary.
- 14/ Remove and inspect anodes.
- 15/ Recheck all interference (CPS) bleeds.
- 16/ Pipecamp structure if applicable.
- 17/ Apply for "continue to operate" permit if applicable.

Brisbane City Council
Dept. W.S.& S.
Metropolitan Division
Eagle Farm Pump Station

Cathodic Protection System Loop Resistance

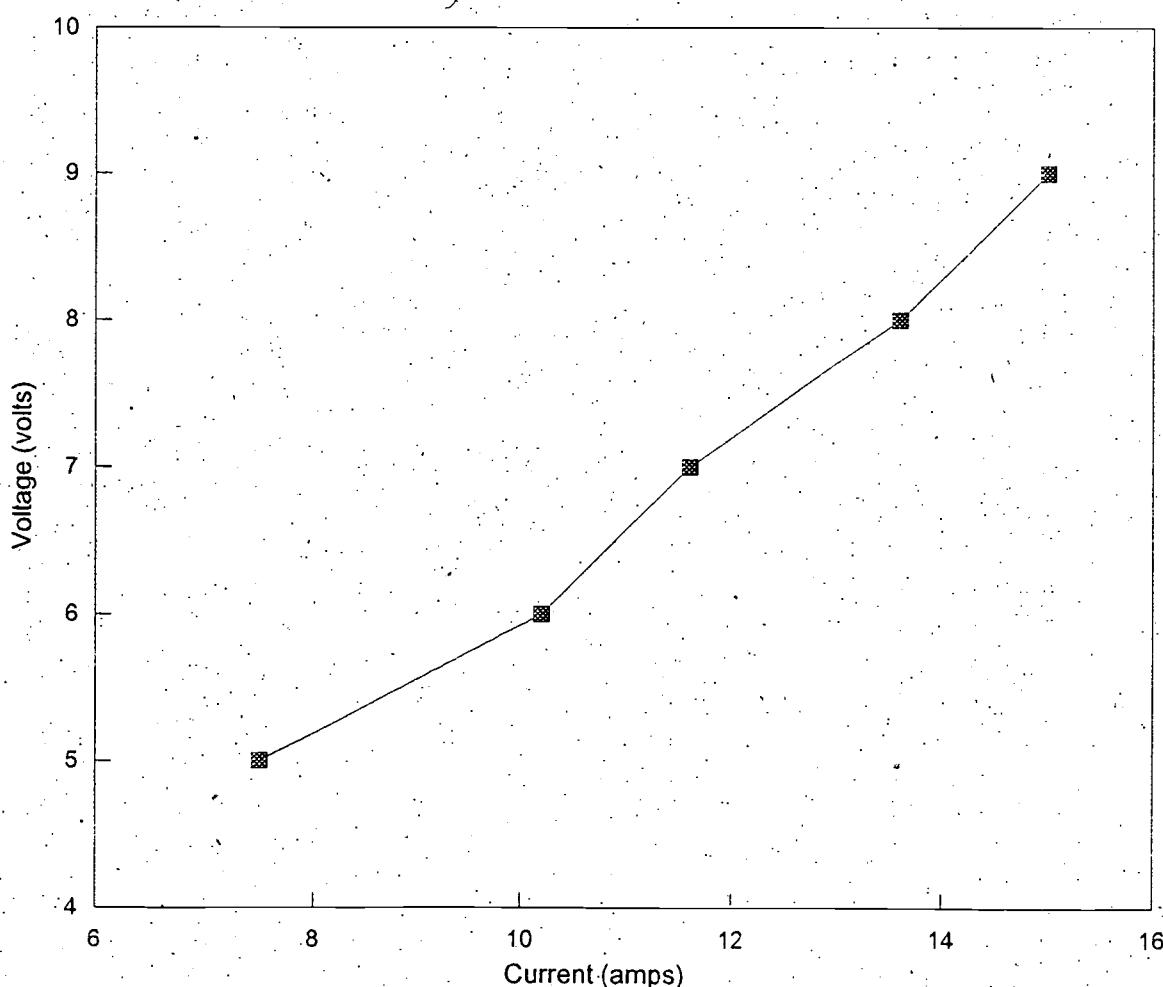
Date: 27th JUNE 1994

Cathodic Protection System: Eagle Farm Rising Main Stage 1

System Operating Volts: 10.5 System Operating amps: 17.5

Test Voltage: (volts)	Test Current: (amps)
5	7.5
6	10.2
7	11.6
8	13.6
9	15

Loop Resistance (ohms)
0.588235

Graph of System voltage vs current.

Brisbane City Council

Dept. W.S.& S.

Metropolitan Division

Eagle Farm Pumping Station

Date 28th June 1994

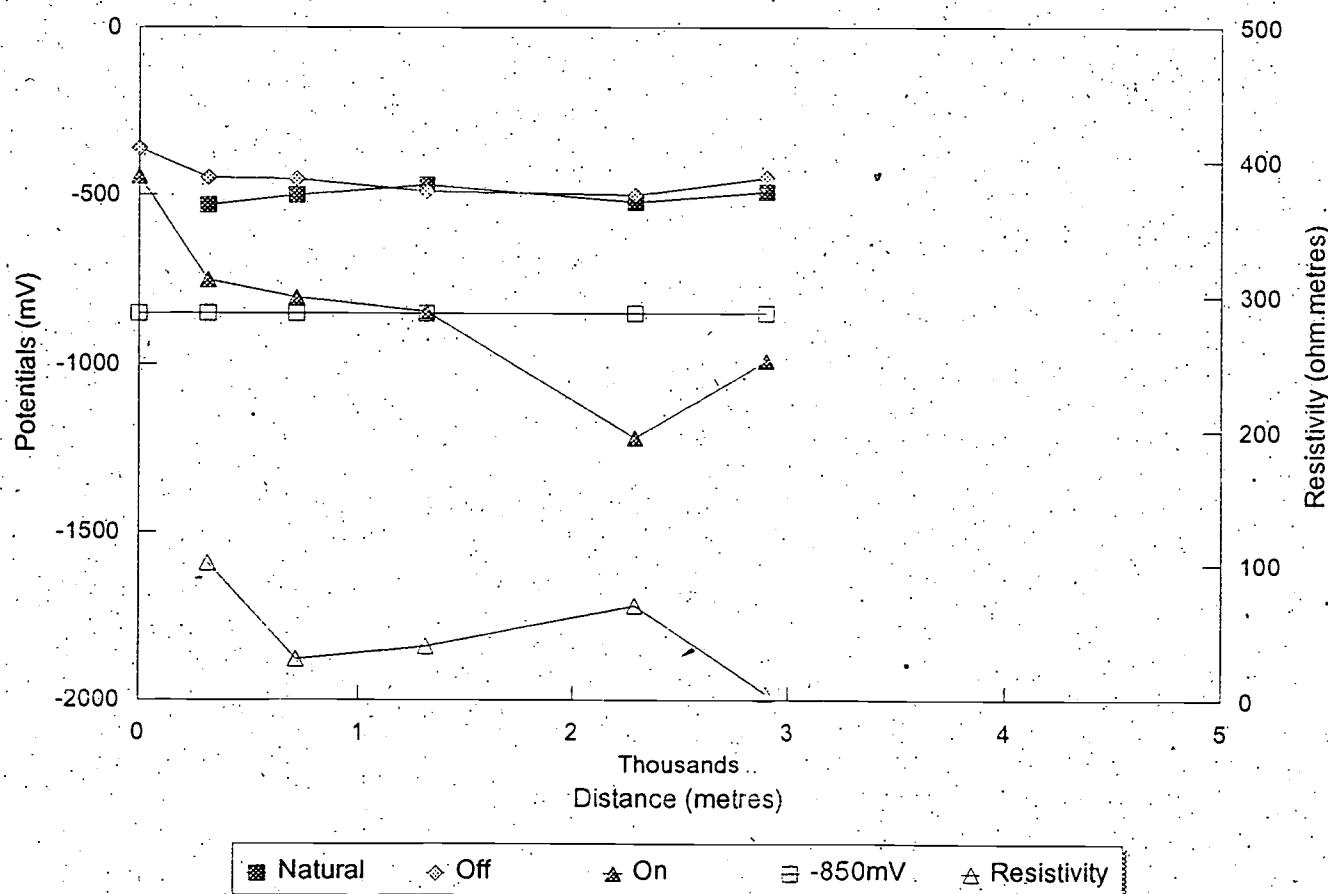
Electrical Workshop

System: Eagle Farm 54 Inch Rising Sewer Main.

Cathodic Protection System reference potential and earth resistivity graph.

Test Point number	Distances to T.P. (metres)	Potentials to CuSO ₄		Resistivities at 2 metres (ohm.metres)
		Natural (mV)	Off (mV)	
P/stn	0	-360	-443	
2	315.8	-530	-448	-750
3	710.6	-499	-451	-803
4	1316	-469	-488	-843
5	2289.8	-519	-498	-1220
6	2895	-490	-448	-990

Graph of potentials and resistivity vs pipelength



Rectifier located at 1300M.

BRISBANE CITY COUNCIL
DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL SECTION

INTERFERENCE SURVEY RESULTSJOB DESCRIPTION:-**EAGLE FARM RISING MAIN STAGE 1
(AMPOL)**28-12-94
UNIT READING:- .11V....19A.....

	READING	TEST POINT I.D.	LOCATION	SWING
ON	- 1185 mV	N°4	RECTIFIER UNIT, SUGARMILL ROAD	
OFF	- 872 mV			-813
ON	- 255 mV		SEQEB POLE N° 20972	
OFF	- 232 mV		SUGAR MILL RD	-23
ON	- 225 mV		SEQEB POLE N° 20971	
OFF	- 211 mV		SUGARMILL RD	-14
ON	- 103 mV		SEQEB POLE N° 20969	
OFF	- 103 mV		SUGARMILL RD	NIL
ON	- 546 mV		AMPOL FUEL PIPE	
OFF	- 590 mV		CALTEX STORAGE DEPOT	+50
ON	- 318 mV		SUB STATION EARTH BAR	
OFF	- 361 mV		EAGLE FARM PUMPING STATION	+43
ON	- 707 mV		AMPOL TEST POINT NEAR	
OFF	- 820 mV		FREEWAY EXIT.	+113
ON	- 389 mV		LIGHT POLE W 129655 NEAR	
OFF	- 353 mV		FREEWAY EXIT	-36
ON	- 348 mV		LIGHT POLE NEAR	
OFF	- 325 mV		FREEWAY EXIT (WRONG WAY GO BACK)	-23
ON	- 254 mV		SEQEB POLE N° 20926	
OFF	- 224 mV		LINK AVE SOUTH	-30
ON	- 248 mV		SEQEB POLE NEAR PUMP	
OFF	- 230 mV		STATION 142, LINKS AVE SOUTH	-18
ON	- 318 mV		SEQEB POLE N° 42097	
OFF	- 298 mV		COLLEN AVE EAST	-30

COMPILED BY: M. M. CORMICK...
Maurice McCormick

BRISBANE CITY COUNCIL
DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL SECTION

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION:-

28-12-94

EAGLE FARM RISING MAIN STAGE 1
(AMPOL)

UNIT READING: - 11V....19A.....

	READING	TEST POINT I.D.	LOCATION	SWING
ON	- 268 mV		SEQEB POLE 42098	
OFF	- 256 mV		CULLEN AVE EAST	-12
ON	- 144 mV		SEQEB POLE 28884	
OFF	- 132 mV		CULLEN AVE EAST	-12
ON	- 243 mV		SEQEB POLE 38910 NEAR PAD	
OFF	- 236 mV		MOUNT TRANSFORMER, CULLEN AVE	-7
ON	- 229 mV		SEQEB POLE 35590	
OFF	- 222 mV		CULLEN AVE EAST	-7
ON	- 127 mV		SEQEB POLE	
OFF	- 127 mV		CULLEN AVE EAST	NIL
ON	- 152 mV		SEQEB POLE 35580	
OFF	- 152 mV		CULLEN AVE EAST	NIL
ON	- 815 mV		AMPOL TEST POINT, OPPOSITE	
OFF	- 848 mV		HARBIC PRODUCTS PTY LTD	+33
ON	- 257 mV		SEQEB POLE NO 33360	
OFF	- 257 mV		HARVEY ST	NIL
ON	- 339 mV		LIGHT POLE NO 840455	
OFF	- 339 mV		LINKS AVE	NIL
ON				
OFF				
ON				
OFF				

COMPILED BY: M. McCormick

Moore McCormick

Cathodic Protection System - Eagle Farm - Rising Main - 54 Inch - OM Manual
BRISBANE CITY COUNCIL
MEMORANDUM

To	File No.
From	Date 28/12/94
Subject: INTERFERENCE TESTING WITH AMPOL FROM EAGLE FARM RISING MAIN STAGE 1	

RECTIFIER SET AT	11V	19A
ZN TO PIPE	-64 mVon	+314 mVoff
ZN TO PRO COUPON	-67 mVon	+315 mVoff
ZN TO UNPRO COUPON	+563 mVon	+523 mVoff
CuSO ₄ TO PIPE	-1185 mVon	-372 mVoff
CuSO ₄ TO PRO COUPON	-1055 mVon	-372 mVoff
CuSO ₄ TO UNPRO COUPON	-553 mVon	-156 mVoff
ZN TO CuSO ₄	-1130 mVon	

BRISBANE CITY COUNCIL
MEMORANDUM

To	File No.
From	Date 28/4/94
Subject Sugarmill Rd 54" Dia MSCL Eagle Farm Sewerage Rising main St. 1	

on off Potentials

Test Point: Sugarmill Rd

Rect unit 10v 20Amps

on GPF

CuSO₄ - pipe -1300 mV -592 mV

Zn - CuSO₄ 12.80

Zn - pipe -022 mV +430 mV

CuSO₄ - Protected CouPon -5.64 mV -312 mV

CuSO₄ - unprotected CouPon -119.5 mV -616 mV

BRISBANE CITY COUNCIL
DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL SECTION

INTERFERENCE SURVEY RESULTSJOB DESCRIPTION:-

SUGARMILL RD.

UNIT READING:- 16V at 18.5A

	READING	TEST POINT I.D.	LOCATION	SWING
ON	-307mV		RANDLE ST	
OFF	-306mV		SEQEB POLE NO 20992	-1mV
ON	-218mV		FENCE POST	
OFF	-217mV		BEHIND JOES DINER	-1mV
ON	-864mV		CALTEX SIGN POST	
OFF	-864mV		BEHIND JOES DINER	0
ON	-330mV		FIRE HYDRANT	
OFF	-330mV		AT JOES DINER	0
ON	-315mV		KINGSFORD SMITH DRIVE	
OFF	-312mV		SEQEB POLE NO 20943	-3mV
ON	-305mV		937 KINGSFORD SMITH DRIVE	
OFF	-305mV		SEQEB POLE NO 32407	0
ON	-347mV		901 KINGSFORD SMITH DRIVE	
OFF	-348mV		SEQEB POLE NO 30154	+1mV
ON	-324mV		KINGSFORD SMITH DRIVE	
OFF	-325mV		SEQEB POLE NO 20940	+1mV
ON	-312mV		SUGARMILL RD	
OFF	-301mV		SEQEB POLE NO 20971	-11mV
ON		SEE SKETCH	SUGARMILL RD	
OFF			HIGH PRESSURE FUEL PIPE LINE	
ON				
OFF				

COMPILED BY: *D. J. Davies**7/3/94*

Brisbane City Council

Dept of Water Supply and Sewerage

Eagle Farm Pump Station

Electrical Workshop

Date:

Site Plan for: TP AT END SUGARMILL RD FOR
HIGH PRESSURE FUEL PIPELINE

ON - 1555 MV

OFF - 1428 MV

SWING - 127 MV

ON - 504 MV

OFF - 504 MV

SWING - NIL

8

ON - 1560 MV

OFF - 1430 MV

SWING - 130 MV

ON - 305 MV

OFF - 305 MV

SWING - NIL

BRISBANE JUH

TELEPHONE: 860 4644

HIGH PRESSURE FUEL PIPE LINE

INTERFERENCE RESULTS

Cathodic Protection System - Eagle Farm - Rising Main - 54 Inch - OM Manual

DATE:- 24-3-94

UNIT READING: 10V at 185A

COMPILED BY: *A. Preysa*

CPS 14

BRISBANE CITY COUNCIL
DEPT WATER SUPPLY AND SEWERAGE
EAGLE FARM PUMPING STATION

CATHODIC PROTECTION BLEED POINT DETAILS

CPB NUMBER:-

CPB14

DATE INSTALLED:- 24-3-94

BCC CATHODIC PROTECTION SYSTEM IDENTIFICATION:- SUGARMILL RD

FOREIGN STRUCTURE OWNER:- HUMES PIPES

F.S. LOCATION:- HUMES FENCE SUGARMILL RD

F.S. IDENTIFICATION:- FENCE

REFERENCE POTENTIALS TO F.S. PRIOR TO BLEED CONNECTION:-

REFERENCE TYPE:- CuSO₄

POTENTIAL OFF:- -55mV ON:- -51.3mV SW:- +38mV

BLEED TYPE:- MAGNESIUM

BLEED MATERIAL:- MAGNESIUM

BLEED WEIGHT:- 10 Kg

BLEED O/C POTENTIAL:-

BLEED CURRENT OFF:- 2.8mA ON:- 2.8mA

REFERENCE POTENTIALS AFTER CONNECTION TO FOREIGN STRUCTURE:-

BOND OFF (RECTIFIER OFF)		BLEED ON			RESULTANT SWING
BLEED OFF	BLEED ON	SW	BOND OFF	BOND ON	
-55mV	-74.6mV	-195 mV	-74.6mV	-71.5mV	+31 mV

FOREIGN STRUCTURE OWNER AGREEABLE WITH MITIGATION? (Y/N)

IDENTIFICATION TAG INSTALLED? (Y/N)
COMMENTS:-

INSTALLED/TESTED BY:-

L. Greaves

NOTE: PLEASE FILE ONE COPY AND FORWARD SECOND COPY TO CORROSION TECH
OFFICER.

BRISBANE ELECTRICAL System - Eagle Farm - Rising Main - 54 Inch - OM Manual
MEMORANDUM

To	File No.
From	Date 22/6/92
Subject: LUGGAGE POINT STAGE Kingsford Smith Drive Section Pipe Camo	

Rectifier Set To 11 Volts
Anode Current 19.2 Amps

ITEM	Distance	Gradient	Total	%
TP Josseline	00	Swing 450.mv		
TP Harley St	96 m	Swing 325.mv		
Defect	9906 m	40 + 39 + 7 + 1	83	25.5%
Scour Value S.54)	1200 m	30 + 20 + 5	50	54.0%
S 55)				
TP Pump Station	1282 m	Swing 110.mv		

BRISBANE CITY COUNCIL
MEMORANDUM

To	File No.
From	Date 8/10/94
Subject EAGLE FARM RISING MAIN NON-POLARIZED POTENTIALS	

RECT. SET AT 11.5V..... 32A

Zn TO PIPE	+151 mVon	-503 mV off
Zn TO PRO COUPON	+231 mVon	-604 mV off
Zn TO UNPRO COUPON	+566 mVon	-563 mV off
CuSO ₄ TO PIPE	-1055 mVon	-364 mV off
CuSO ₄ TO PRO COUPON	-932 mVon	-381 mV off
CuSO ₄ TO UNPRO COUPON	-633 mVon	-409 mV off
Zn TO CuSO ₄	-1202 mVon	-1045 mV off

EAGLE FARM PIS

HEADER CHAMBER N°1 STATION

CuSO₄ TO PIPE -366 mVon -266 mV off

HEADER CHAMBER N°2 STATION

CuSO₄ TO PIPE -361 mVon -297 mV off

TEST POINT N°1 (KINGSFORD SMITH DRIVE - OPPOSITE TSA)

Zn TO PIPE -56 mVon +75 mV off

CuSO₄ TO PIPE -686 mVon -415 mV offZn TO CuSO₄ -626 mVon

TEST POINT N°2 (KINGSFORD SMITH DRIVE - OPPOSITE IDEAL ELECTRICS)

Zn TO PIPE -279 mVon +559 mV off

CuSO₄ TO PIPE -108 mVon -432 mV offZn TO CuSO₄ -986 mVon

TEST POINT N°3 (KINGSFORD SMITH DRIVE - BEHIND JOE'S DINER)

Zn TO PIPE -217 mVon +556 mV off

CuSO₄ TO PIPE -238 mVon -432 mV offZn TO CuSO₄ -1057 mVon

BRISBANE CITY COUNCIL
MEMORANDUM

To	File No.	
From	Date	
Subject: EAGLE FARM RISING MAIN NON-POLARIZED POTENTIALS		

TEST POINT N°5 (SANDLE RD IN COW RADDICK - PIPE ABOVE GROUND)

Zn TO PIPE + 333 mV OR + 43.1 mV SP

CUSO₄ TO PIPE - 900 mV OR - 462 mV SP

Zn TO CUSO₄ - 1239 mV OR

BRISBANE CITY COUNCIL

MEMORANDUM

To	File No.
From	Date 15/12/93
Subject PINKENBA RISING SEWER MAIN	

SUGARMILL RD
LOOP RESISTANCE

2.0V at 2.1A
 3.0V at 5.0A
 4.0V at 6.5A
 5.0V at 7.5A
 6.0V at 10.2A
 7.0V at 11.6A
 8.0V at 13.6A
 9.0V at 15.0A

Natural Potential CuSO₄ to Pipe - 502 mV

Unit Reading 8.5V at 14.2A

Cu SO ₄ to Pipe	Zinc to Pipe
on - 1000 mV	on + 325 mV
off - 590 mV	off + 620 mV

Cu SO₄ to Red Coupon
 on - 920 mV
 off - 524 mV

Cu SO₄ to White Coupon
 on - 630 mV
 off - 435 mV

Anode Current 13.34 A. { (1) 6.95 A
 { (1) 6.46 A

Cathodic Protection System - Eagle Farm - Rising Main - 54 Inch - OM Manual
BRISBANE CITY COUNCIL
MEMORANDUM

To	File No.
From	Date
Subject: PINKENBA RISING SEWER MAIN.	

END OF LINE

CuSO₄ to Pipe

on = 840 mV

off = 562 mV

Zinc to Pipe

on + 400 mV

off + 460 mV

Behind Joes Diner

CuSO₄ to Pipe

on = 802 mV

off = 499 mV

Zinc to Pipe

on + 340 mV

off + 630 mV

Kingsford Smith Drive
opp Ideal Elect.

CuSO₄ to Pipe

on = 784 mV

off = 560 mV

Zinc to Pipe

on + 418 mV

off + 638 mV

Kingsford Smith Drive
opp Bradmans

CuSO₄ to Pipe

on = 737 mV

off = 528 mV

Zinc to Pipe

on = 0

off + 120 mV

Brisbane City Council

Dept. W.S.& S.

Metropolitan Division

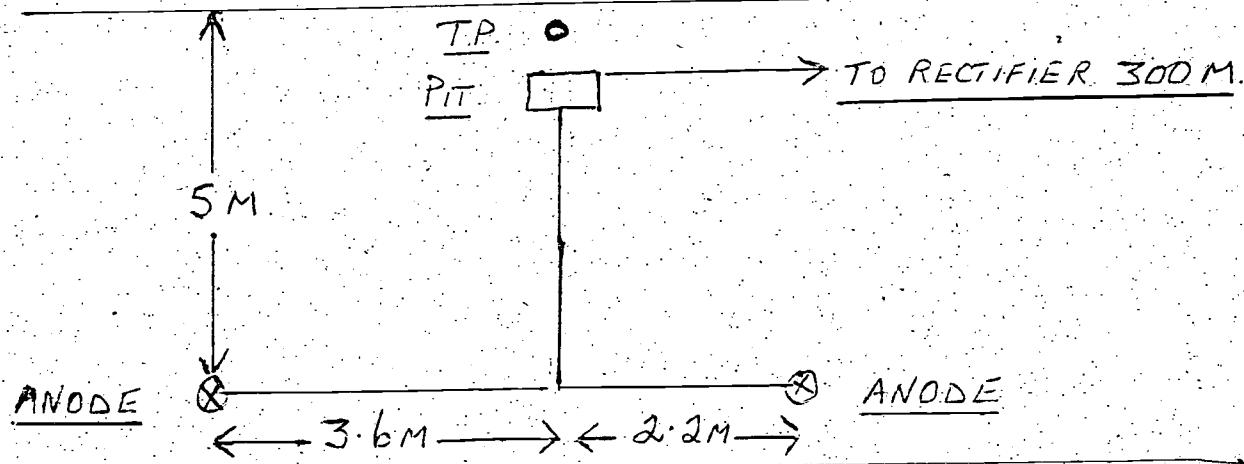
Eagle Farm Pump Station

Electrical Workshop

Cathodic Protection Anode Bed Testing

Date:	15-12-93	Structure:	VIOLET ST TO SERPENTINE RD RISING MAIN
Anode material:	SILICON IRON	Anode size/weight:	1500mm x 75mm
Packaging:	CANISTER	Burial:	VERTICAL
Depth:	5M.	Resistivity:	3M reading 0.33Ω = 6.2Ω/m 5M " 0.09Ω = 2.8Ω/m
Test Point type:	POST	Signage:	YES
Resistance to ground:			
Anode 1	0.9Ω	Anode 2	0.95Ω
		Anode 3	1.42Ω
			0.56Ω
Tested by:		Anode 4	
L.J. Greaves		Anode 5	
Locality Plan:			

ANODE LOCATIONS IN SUGARMILL RD



BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 25-10-93

LOCATION: KINGSFORD SMITH DRIVE
MAINS SIZE: BEHIND JOES DINER

TEST POINT TYPE: B

54"

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): 0.15v.

ZINC REFERENCE TO PIPE: + 636 mV

CuSO₄ REFERENCE TO PIPE: - 469 mVZINC TO CuSO₄: - 1106 mVEARTH TESTING

PIN SPACING: 2 M. MEGGER READING: 3.2.2 RESISTIVITY: 40.1v/metre

PIN SPACING: MEGGER READING: RESISTIVITY:

SACRIFICIAL ANODE
(IF INSTALLED)

ANODE TYPE:

ANODE SIZE:

ANODE TO PIPE POTENTIAL:

ZINC REF TO PIPE:

(ANODE CONNECTED)

CuSO₄ REF TO PIPE:

(ANODE CONNECTED)

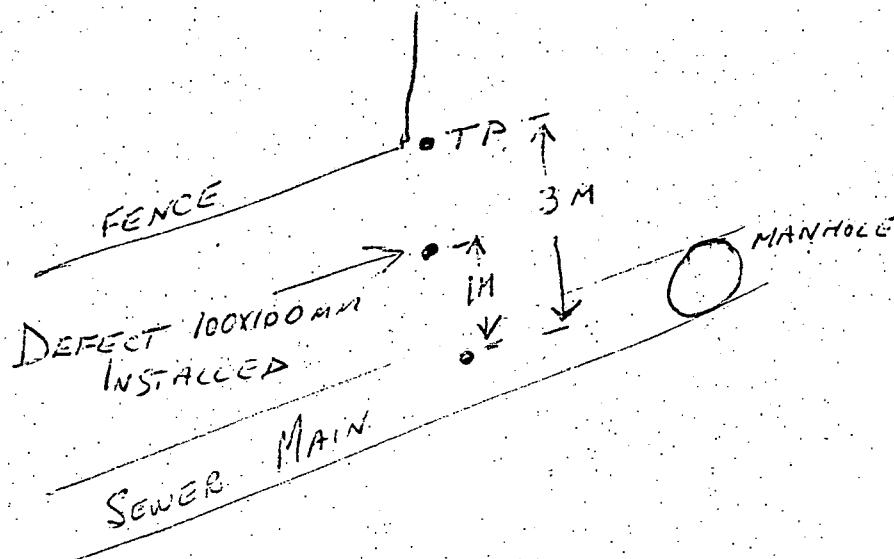
SACRIFICIAL ANODE CURRENT:

BLEED RESISTOR SIZE:

(IF INSTALLED)

INSTALLED BY:

COMMENTS:

1 COPY TO FILE
1 COPY TO T.O.

BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 25-10-93

LOCATION: KINGSFORD SMITH DRIVE
MAINS SIZE: OPP IDEAL ELECT
54"

TEST POINT TYPE: B

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): 0.15V

ZINC REFERENCE TO PIPE: +634 mV

CuSO₄ REFERENCE TO PIPE: -499 mVZINC TO CuSO₄: -1134 mVEARTH TESTING

PIN SPACING: 2 M. MEGGER READING: 2.45 RESISTIVITY: 30.7Ω/metre

PIN SPACING: MEGGER READING: RESISTIVITY:

SACRIFICIAL ANODE
(IF INSTALLED)

ANODE TYPE:

ANODE SIZE:

ANODE TO PIPE POTENTIAL:

ZINC REF TO PIPE:

(ANODE CONNECTED)

CuSO₄ REF TO PIPE:

(ANODE CONNECTED)

SACRIFICIAL ANODE CURRENT:

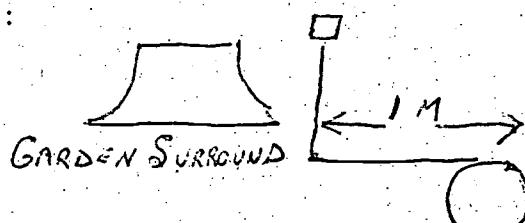
BLEED RESISTOR SIZE:

(IF INSTALLED)

INSTALLED BY:

L. J. Greaves

COMMENTS:



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BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 10-9-93

LOCATION: PINKENBA END OF SEWER
MAINS SIZE: 54" MAIN

TEST POINT TYPE: B

54"

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE):

ZINC REFERENCE TO PIPE: + 494 mV

CuSO₄ REFERENCE TO PIPE: - 490 mVZINC TO CuSO₄: - 995 mVEARTH TESTING

PIN SPACING: 2M MEGGER READING: 0.4 RESISTIVITY: 5.0 ohm/metre

PIN SPACING: MEGGER READING: RESISTIVITY:

SACRIFICIAL ANODE
(IF INSTALLED)

ANODE TYPE:

ANODE SIZE:

ANODE TO PIPE POTENTIAL:

ZINC REF TO PIPE:

(ANODE CONNECTED)

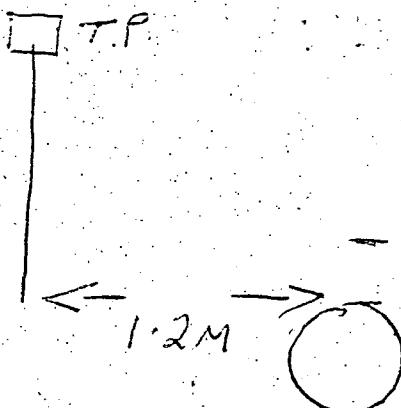
CuSO₄ REF TO PIPE:
(ANODE CONNECTED)

SACRIFICIAL ANODE CURRENT:

BLEED RESISTOR SIZE:
(IF INSTALLED)

INSTALLED BY: J. Greaves

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BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 14-9-93
TEST POINT TYPE: B

LOCATION: KINGSFORD SMITH DRIVE.
MAINS SIZE: OPP. TOTAL STEEL
54 "

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE):
ZINC REFERENCE TO PIPE: + 130 mV
CuSO₄ REFERENCE TO PIPE: - 530 mV
ZINC TO CuSO₄: - 665 mV.

EARTH TESTING

PIN SPACING: 24 MEGGER READING: 8.1 RESISTIVITY: 101 Ω/metre

PIN SPACING: MEGGER READING: RESISTIVITY:

SACRIFICIAL ANODE
(IF INSTALLED)

ANODE TYPE:
ANODE SIZE:
ANODE TO PIPE POTENTIAL:
ZINC REF TO PIPE:
(ANODE CONNECTED)
CuSO₄ REF TO PIPE:
(ANODE CONNECTED)

SACRIFICIAL ANODE CURRENT:

BLEED RESISTOR SIZE:
(IF INSTALLED)

INSTALLED BY: Checked by J. Greaves

COMMENTS:

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BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 13-7-93

LOCATION: SUGAR MILLS RD
MAINS SIZE: 54"

TEST POINT TYPE: Coupon

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): 0.2 N

ZINC REFERENCE TO PIPE: + 50341 V

CuSO₄ REFERENCE TO PIPE: - 519 mVZINC TO CuSO₄: - 1025 mVEARTH TESTING

PIN SPACING: 2 M MEGGER READING: 5.6 RESISTIVITY: 70.3 ohm/metre

PIN SPACING: MEGGER READING: RESISTIVITY:

SACRIFICIAL ANODE

(IF INSTALLED)

ANODE TYPE:

ANODE SIZE:

ANODE TO PIPE POTENTIAL:

ZINC REF TO PIPE:

(ANODE CONNECTED)

CuSO₄ REF TO PIPE:

(ANODE CONNECTED)

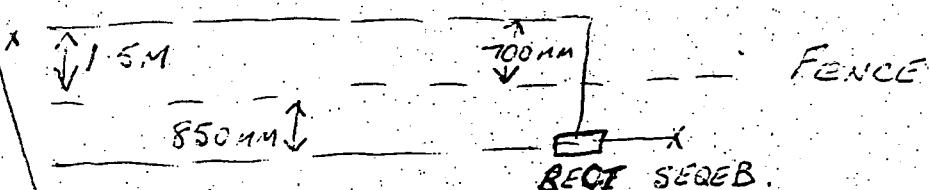
SACRIFICIAL ANODE CURRENT:

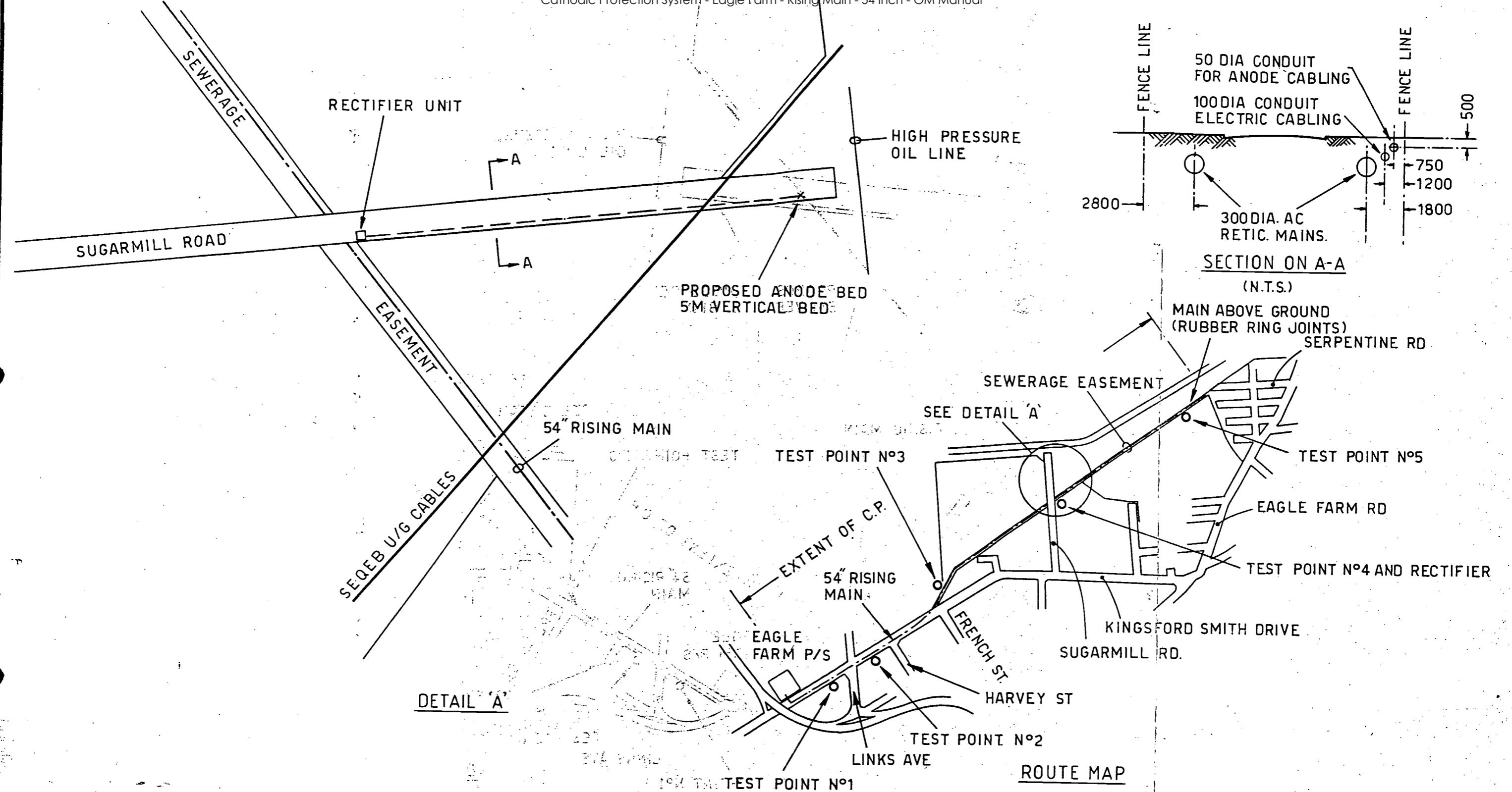
BLEED RESISTOR SIZE:

(IF INSTALLED)

INSTALLED BY: J. Greaves

COMMENTS:

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		MANAGER	DIRECTOR OF PLANNING & DESIGN	DESIGN	J.S.	18-8-93	PROJECT	EAGLE FARM P/S		BRISBANE CITY COUNCIL
		DATE	DATE	DRAWN	R.L.	18-8-93	SERPENTINE RD. C.P. SYSTEM	VIOLET ST. TO SERPENTINE RD.		DEPARTMENT OF WATER SUPPLY & SEWERAGE
		DIRECTOR OF CONSTRUCTION	DIRECTOR OF M. & E. SERVICES	DIR. OF SEW. OPERATIONS/W.S. DISTRIBUTION	CHK'D.	<i>AS</i>	19-8-93	TITLE	EAGLE FARM SEWERAGE	PLANNING & DESIGN BRANCH
0	8-93	AS BUILT	R.L.		ENGINEER IN CHARGE	<i>AS BUILT</i>		RISING MAIN STAGE 1	54' DIA. M.S.C.L.	Brisbane City
NO DATE	AMENDMENT	INITIALS	DATE	DATE	SUPERVISING ENGINEER	<i>AS BUILT</i>	19-8-93	A.H.DATUM		SCALE N.T.S. NO. OF SHEETS
										DRAWING NO. AMEND.
										486/7/8-SQ1C0004E 0

Brisbane Water Engineering Services

Electrical Engineering Unit

Cathodic Protection Interference Results Form

CP Form No. 29

Project LP-EF Stg 1.

Unit Reading 12 Volt 21 Amp

Date 31-5 - 99

TESTED BY

for you too

Brisbane Water Engineering Services

CP Form No. 27

Electrical Engineering Unit**Cathodic Protection Interference Survey Results Form**Project E.F. - LP Stg.1 Unit Reading 2.1 Amperes Date*Interference to Ampol Product line TPS*

	Reading	Test Point I. D.	Location	TPS
On	-1034	TP @ Pole 42327	Pamela & Kirra Sts. UBD 142 K8	-1
Off	-1035			
On	-1040	TP @	Farrer St	
Off	-1023	Rail/cross	UBD 142 A14	-17
On	-986	TP	Savage & Curtin	
Off	-972		UBD 141 Q15	-14
On	-913	TP	48 Lavarack Ave	
Off	-931		UBD 141 J15	+28
On	-528	TP @ Mobil	Comslie & Lyton Rds	
Off	-536		UBD 161 F5	+8
On	-603	TP	Lyton Rd	
Off	-601		Qld News 161 K5	-2
On	-8.5	TP	Gateway Bridge Exit	
Off	-904		UBD 141 E16	+39
On	-900	TP	Cullen Ave West	
Off	-940		UBD 141 D16	+40
On	-922	TP	Theodore St	
Off	-964		UBD 141 C16	+42
On				
Off				
On				
Off				
On				
Off				
On				
Off				
On				
Off				
On				
Off				
On				
Off				

TESTED BY *J Taylor*

Brisbane Water Engineering Services

CP Form No. 27

Electrical Engineering Unit

Cathodic Protection Interference Survey Results Form

Project EF-LP stg 1 Unit Reading 21 Amps Date 11-6-99

Instrument 1N11

Page 1

Interference to Ampol Product Line

	Reading	Test Point I.D.	Location	Swing
On	-1076	Fence	Sugarmill Rd.	
Off	-902		ads' to Anode bed.	-174
On	-351	HP	" "	
Off	-364		" "	+83
On	-535	Light Pole	Airport Rd @ end of Sugarmill Rd.	
Off	-562			+27
On	-671	Fence	@ Gate near Rectifier Sugarmill Rd	
Off	-675			+4
On	-223	Air Brake Pole 20969	Sugarmill Rd.	00
Off	-223			
On	-542	Fence	@ ABOVE	
Off	-542		" "	00
On	-423	Light Pole		
Off	-405		801726 Sugarmill Rd.	-18
On	-177	HP	@ above	
Off	-175		" "	-2
On	-520	Fence	Energex Switch Yds	
Off	-518		@ Rail crossing Kingsford	-2
On	-545	Radio Pole	" "	
Off	-546		" "	+1
On	-310	Railway Rails	" "	
Off	-312		" "	+2
On	-547	Fence	Sub stn Bld	
Off	-547			00
On	-513	Air brake Pole	Rail Crossing	
Off	-514		Kingsford Smith drive	+1
On	-509	Air brake Pole 49804	" "	
Off	-509		" "	00
On	-593	Air brake Pole 49803	" "	
Off	-593		" "	00

TESTED BY J Taylor

Brisbane Water Engineering Services

CP Form No. 27

Electrical Engineering Unit

Cathodic Protection Interference Survey Results Form

Project EF-LP Stg 1.....

Unit Reading 21 Amps.....

Date 11-6-99.....

Instrument IN11

Pge 2.

Interference to Ampol Product line

	Reading	Test Point I.D.	Location	Swing
On	-483	MEN Pole 49802	Lavarack Ave	00
Off	-483			
On	-920	BP oil Pipe Line	Lavarack Ave @ Creek	00
Off	-920			
On	-409	H P	@ Above	00
Off	-409			
On	-463	MEN Transformer Pole 261462	Lavarack Ave	00
Off	-463			
On	-234	Fence Energetics Sv. Yards	Fision St	-26
Off	-208			
On	-546	Light Pole 545629	"	-9
Off	-537			
On	-480	Water meter	" Energetics Sub	+21
Off	-501			
On	-589	MEN Pole 35362	"	-18
Off	-571			
On	-562	Light Pole	"	-29
Off	-533			
On	-307	Pipe Line Mobil	"	00
Off	-307			
On				
Off				
On				
Off				
On				
Off				
On				
Off				
On				
Off				
On				
Off				

TESTED BY *J Taylor*