

11TH NOVEMBER, 1992

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

OPERATING MANUAL FOR:

NORTON ST. UPPER MT GRAVATT 600MM-750MM DIAMETER TRUNK WATER
MAIN CATHODIC PROTECTION SYSTEM.

CLIENT:

DEPARTMENT OF WATER SUPPLY AND SEWERAGE
WATER MAINTENANCE SECTION

MANUAL CONTENTS

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- (2.0) Corrosion and Cathodic Protection
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DRAWINGS

JE02/104

Standard Rectifier Wiring Diagram

(No Number)

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 750 – Dia 600 mild steel cement lined.

Coating: Fibreglass enamel coated.

Length: 2.3 km

Location: Logan Rd, near Mt. Gravatt showground to Kessels Rd, opposite Garden city shopping centre.

Construction Drawings: Not available.

(4.0) CATHODIC PROTECTION DETAILS

(4.1) Type of Cathodic Protection: Impressed Current.

(4.2) Rectifier: Standard 32V Volt, 15 amp direct current output enclosed in a stainless steel switchboard. Rectifier has a 240V supply from a nearby SEQEB pole number
Rectifier is located outside number 42 Wishart Rd. Mt. Gravatt.

(4.3) Cathode: The cathode point is located on the 750 dia. main in the easement off Wishart Rd. 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: One 1500 x 75mm silicone iron anode was installed approximately 130 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 six test points have been installed 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/ Pipcamp 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

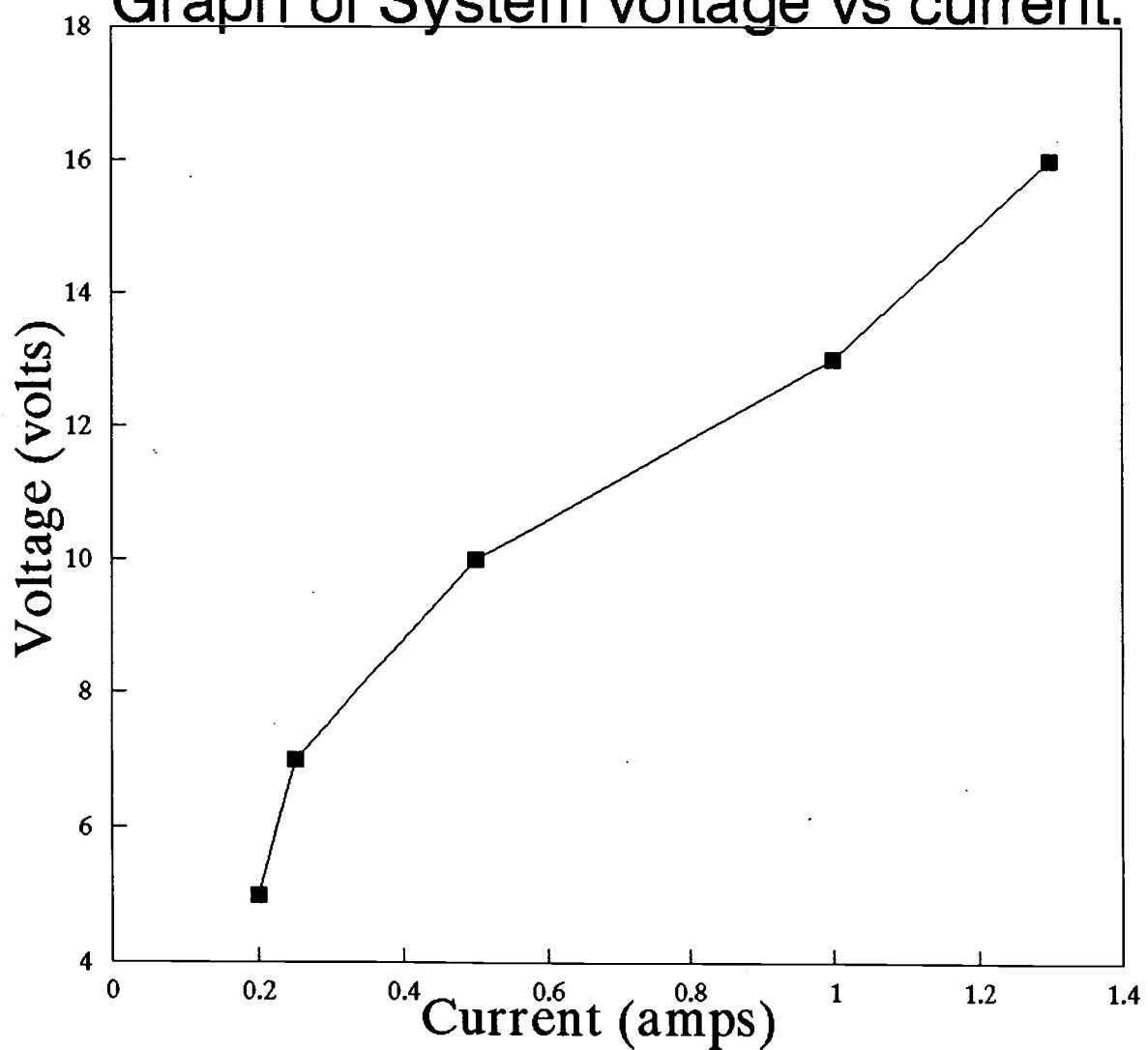
Date: 22nd April 1993

Cathodic Protection System: Norton St. Mt. Gravatt 600mm to 750mm dia. trunk main.

System Operating Volts: 25 System Operating amps 2.2

Test Voltage: (volts)	Test Current: (amps)
5	0.2
7	0.25
10	0.5
13	1
16	1.3

Loop Resistance (ohms)
7.5

Graph of System voltage vs current.

Brisbane City Council

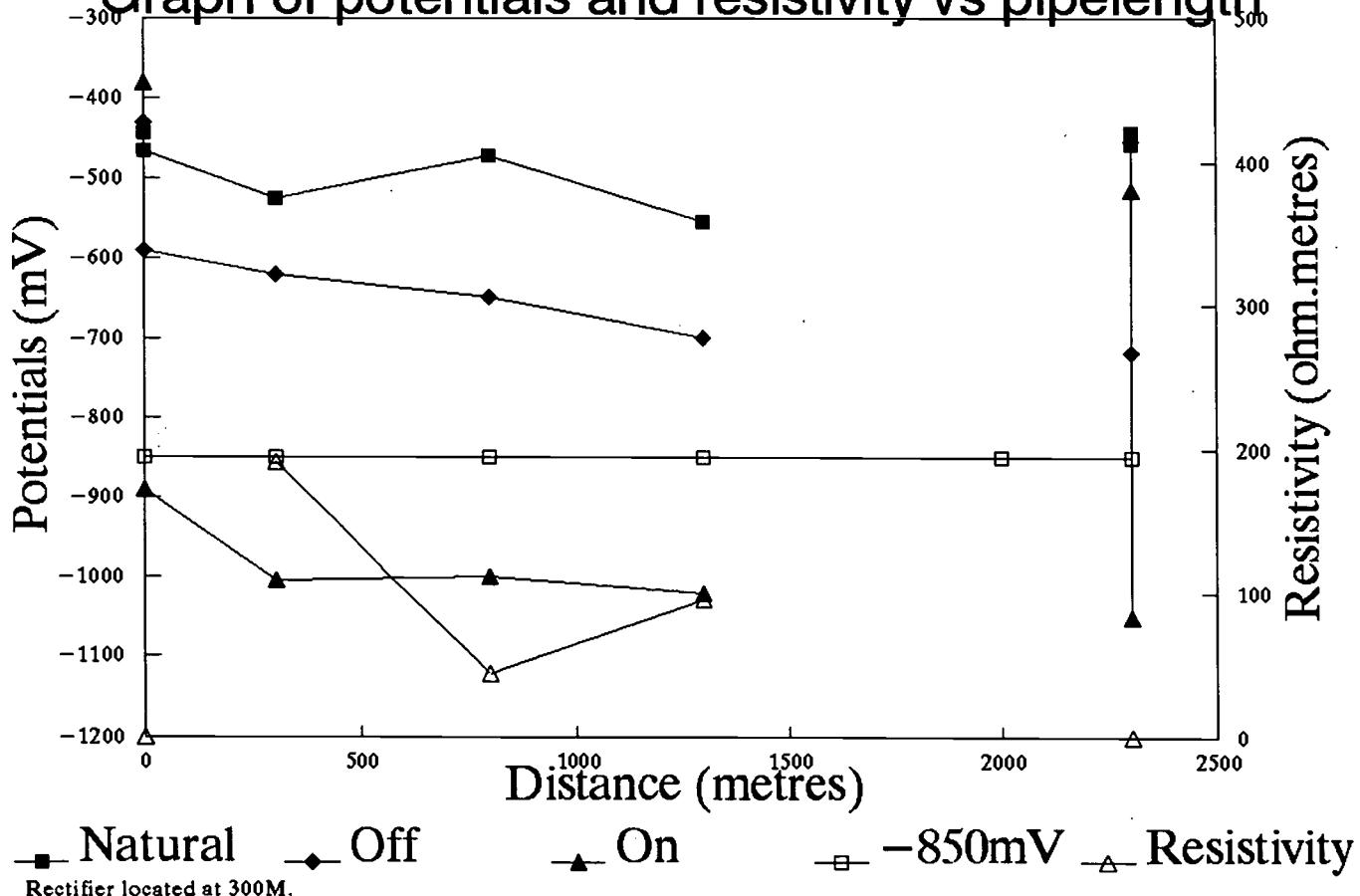
Dept. W.S.& S.

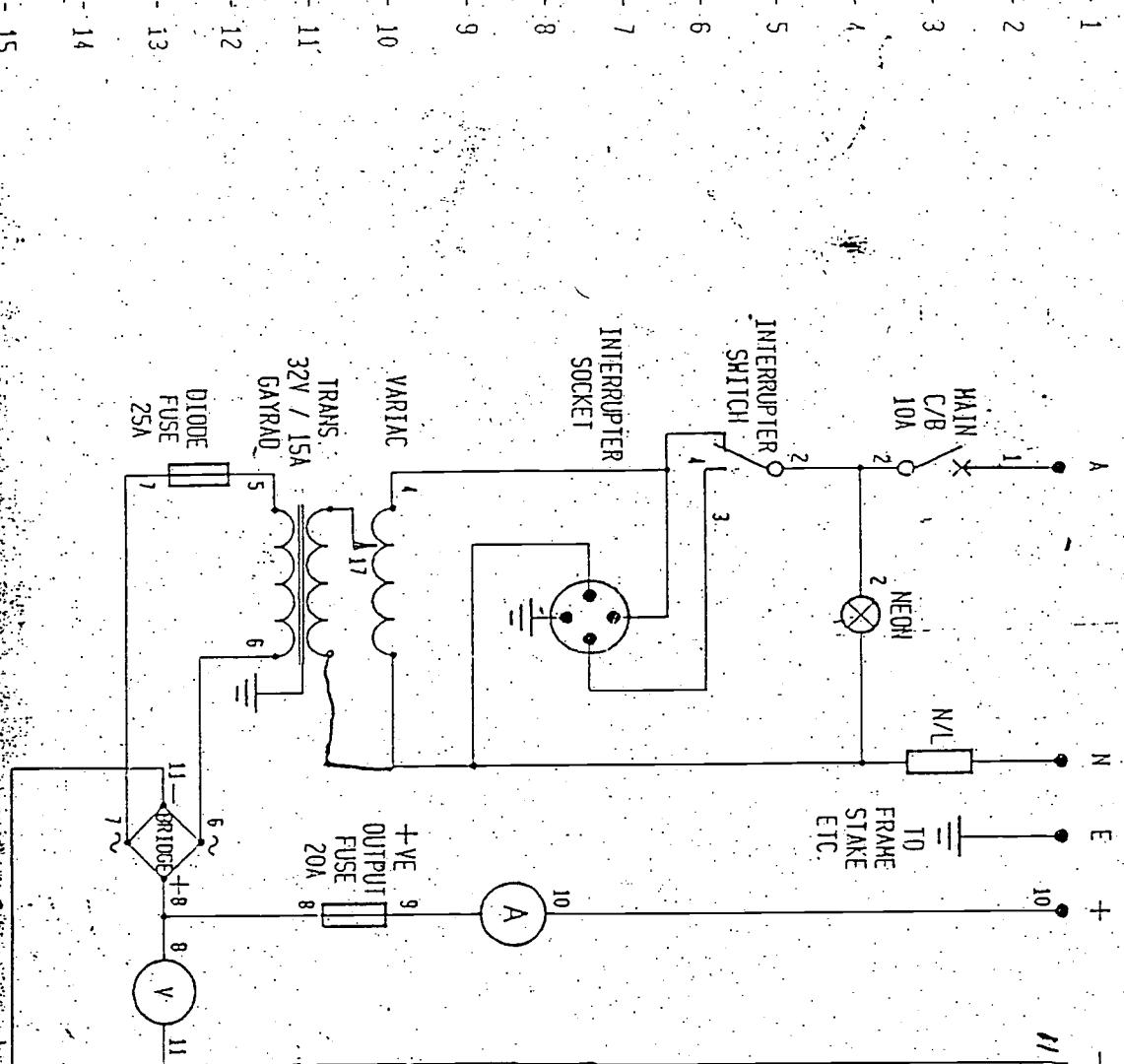
Metropolitan Division**Eagle Farm Pumping Station**

Date: 30th April 1993

Electrical Workshop**System:** Norton St. Mt. Gravatt 600mm to 750mm diameter trunk 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)	On (mV)	
1	0	-443	-430	-380	unprotected
1	0	-465	-590	-890	
2	300	-525	-620	-1004	191
3	800	-471	-650	-1000	43
4	1300	-556	-700	-1020	95
5	2000				
6	2300	-456	-719	-1050	
6	2300	-442	-454	-516	unprotected
8					
9					
10					
11					
12					
13					
14					

Graph of potentials and resistivity vs pipelength



OUTPUT TERMINALS

PROTECTED STRUCTURE

REFERENCE

FOREIGN STRUCTURE

REFERENCE

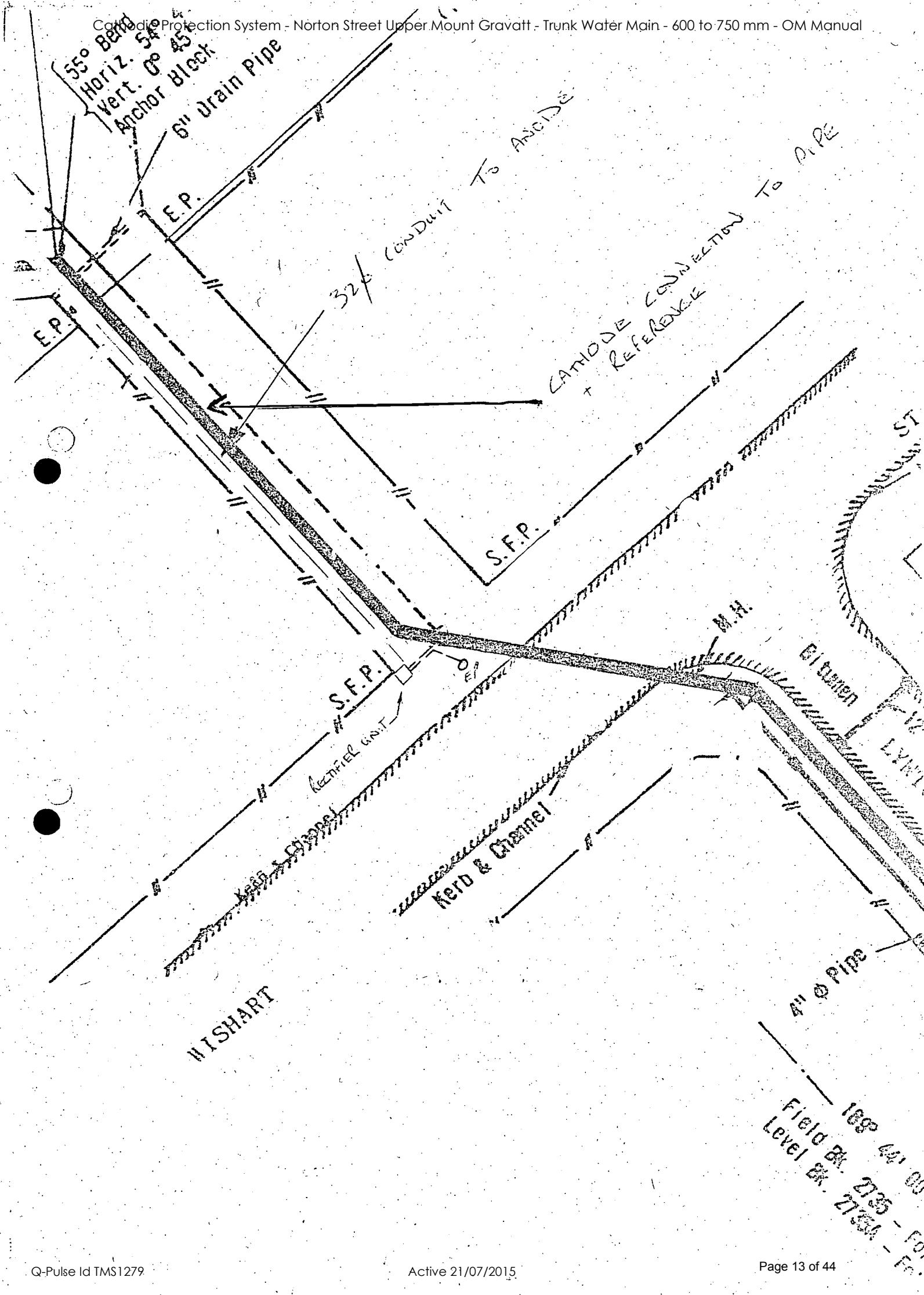
TEST POINT TERMINALS
(ON FRONT PANEL)PROTECTED PIPE
UNPROTECTED PIPE

NOTE:

+ POSITIVE TO BE RED

- NEGATIVE TO BE BLACK

32V AC WIRING TO BE 4mm^2 DC WIRING TO BE 4mm^2 240V WIRING TO BE 1.5mm^2



BRISBANE CITY COUNCIL
MEMORANDUM

To	File No.
From	Date
Subject NORTON STREET TRUNK MAIN :- NATURAL POTENTIALS	

TEST POINT N°1:- MT GRAVATT SHOW GROUNDS (VALVE PIT)

- INSULATED VALVE PIT, TYPE D

- LOCATED INSIDE MT GRAVATT SHOW GROUNDS

NEAR LOGAN RD.

PROTECTED:- -465 mV to CuSO_4

UNPROTECTED:- -443 mV to CuSO_4

TEST POINT N°2:- RECTIFIER, WISHART RD

Zn to pipe 596 mV

Zn to unprotected coupon (white) 423 mV

Zn to protected coupon (red/blue) 598 mV

CuSO_4 to pipe -525 mV

CuSO_4 to unprotected coupon (white) -695 mV

CuSO_4 to protected coupon (red/blue) -526 mV

Zn to CuSO_4 -1119 mV

Pipe cathode to cathode return 0.3 Ω

Coupon cathode to coupon cathode return 0.8 Ω

soil resistivity (270 K)

$$2\pi \times 1.5 \times 2 \times 1 = 2 \times 3.1416 \times 2 \times 1.5 \times 2 = 191.00 \Omega \cdot \text{m}$$

$$3 \times 1.6 \times 1 = 2 \times 3.1416 \times 3 \times 1.6 = 113.09 \Omega \cdot \text{m}$$

To	File No.
From	Date 18/11/92
Subject NORTON STREET TRUNK MAIN - NATURAL POTENTIALS	

TEST POINT N°3 :- WANDA STREET TYPE C

Zn to pipe 607 mV

CuSO₄ to pipe -471 mV

Zn to CuSO₄ -1079 mV

soil resistivity (2πaR)

2m - 3.14 x 0.1 $2 \times 3.1416 \times 2 \times 3.46 = 43.48 \Omega\text{m}$

3m - 20.2 x 0.1 $2 \times 3.1416 \times 3 \times 2.02 = 38.08 \Omega\text{m}$

TEST POINT N°4 :- DAWSON ROAD / WHEELER STREET TYPE C

Zn to pipe 558 mV

CuSO₄ to pipe -556 mV

Zn to CuSO₄ -1122 mV

soil resistivity (2πaR)

2m - 7.6 x 1 $2 \times 3.1416 \times 2 \times 7.6 = 95.50 \Omega\text{m}$

3m - 27 x 0.1 $2 \times 3.1416 \times 2 \times 2.7 = 50.89 \Omega\text{m}$

note :- main is located in the centre of
the road : test were done on
the footpath

TEST POINT N°5 :- UPPER MT GRAVATT - CAPALABA RD /
SANDERS ST (VALVE PIT) TYPE C

NOTE :- no tested were done due to
the valve's location is the
centre of the road
- surrounding footpath were
concrete

To	File No.
From	Date 18/11/92
Subject: NORTON STREET TRUNK MAIN - NATURAL POTENTIAL	

TEST POINT NO. 6 : - KESSELS ROAD / LOGAN ROAD (VAVLE PIT) TYPE D

NOTE:- cables from valve pit brought out to concrete pit (small) in footpath

LOCATION OF CABLE PIT:- opposite ANZ bank & between the bus stop & gum tree

RED WIRE -442 mV to CuSO_4

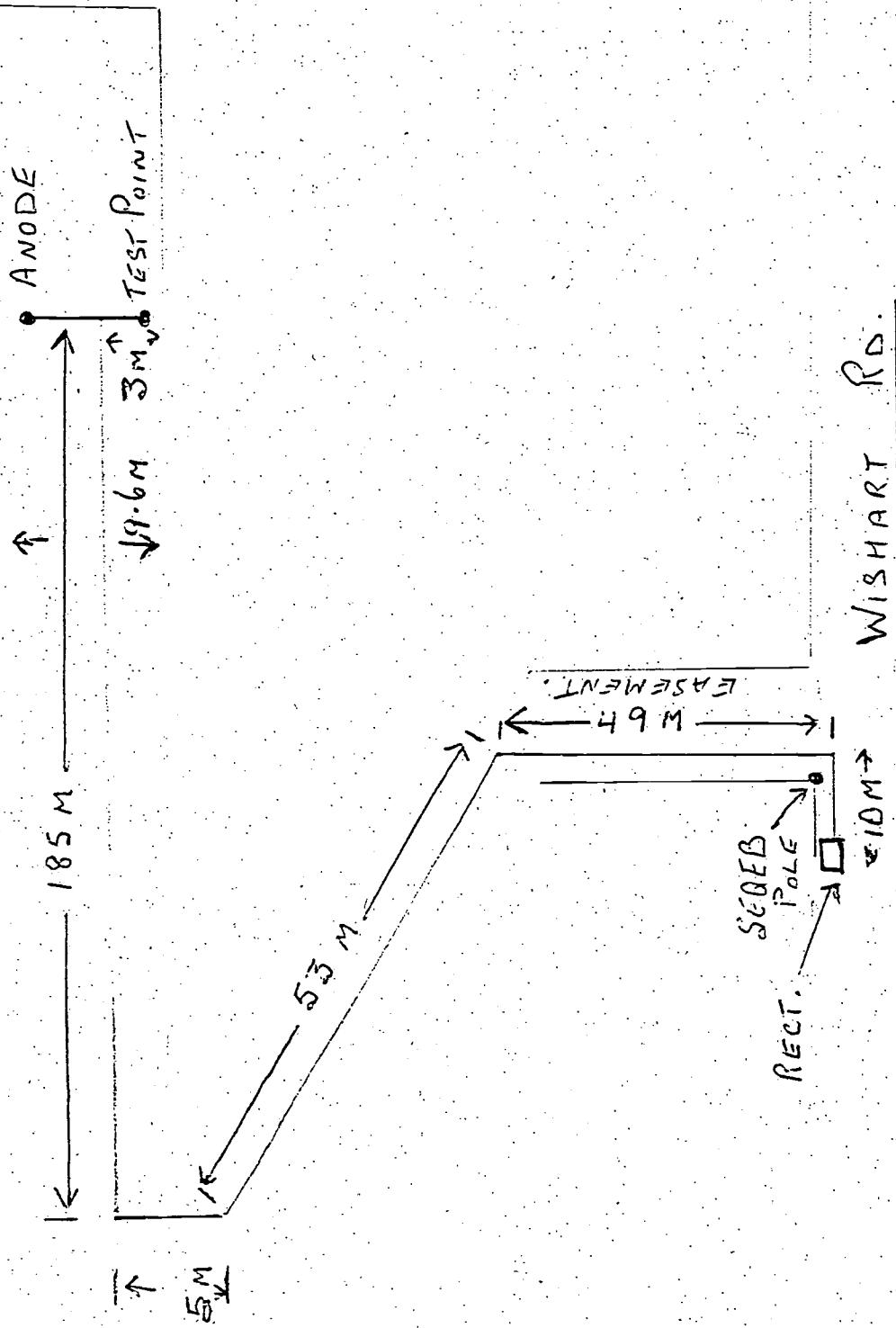
BLACK WIRE -456 mV to CuSO_4

Merv McCormick

ANODE CABLEING & LOCATION IN MT. GRAVATT SHOW GROUND

AS INSTALLED MEASUREMENTS.

MT GRAVATT SHOW GROUND



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

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION:-

Norton St to upper Mt Gravatt
 & mains.

UNIT READING: - 24.5V.....2.5amp.

	READING	TEST POINT I.D.	LOCATION	SWING
ON OFF	-450 -460	Segels Pole no A6316	48 Wishart	-6
ON OFF	-417 -406	Water main	48 Wishart	+11
ON OFF	-510 -515	Water main	50 Wishart	-5
ON OFF	-440 -434	Segels Pole no 30644	Lynmouth	+6
ON OFF	-77 -77	Water main	Cnr Lynton St Lynmouth	0
ON OFF	-385 -400	Segels Pole no 31031	20 Lynton St	-15
ON OFF	-174 -170	Water main	61 Wanda St	-4
ON OFF	-306 -336	Water main	64 Wanda St	-30
ON OFF	-353 -344	Water main	66 Hartford St	-9
ON OFF	-200 -250	Segels Pole no 26633	66 Hartford St	-50
ON OFF	-370 -378	Segels Pole no 27897	Wheeler St	-8
ON OFF	-310 -322	Segels Pole no 31113	Wheeler St	-12

COMPILED BY:... Plyth.....

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

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION:

Norton St to upper Mt Gravatt
 + mains UNIT READING: - 24V...2.5E.m.s.e

	READING	TEST POINT I.D.	LOCATION	SWING
ON	-82	Segels Pole no A3478	Wheeler St	
OFF	-87			-5
ON	-312	main water	3c Norton	
OFF	-280			-32
ON	-380	Segels Pole no A3482	12 Sanders St	0
OFF	-380			
ON	-273	water	14 Sanders St	0
OFF	-273	main		
ON	-501	Segels Pole no 27947	12 Sanders St	-9
OFF	-510			
ON	-82	main earth	Temp Sw Board 1 Show Grounds	0
OFF	-82			
ON	-430	main earth	Temp Sw Board 4 Show Grounds	0
OFF	-430			
ON	-340	main	Temp Sw Board 3 Show Grounds	+3
OFF	-337	earth		
ON	-418	main	Temp Sw Board 2 Show Grounds	-10
OFF	-428	earth		
ON	-30	main	Temp Sw Board 7 Show Grounds	0
OFF	-30	earth		
ON	-20	main	Temp Sw Board 10 Show Grounds	0
OFF	-20	earth		
ON	-310	main	Temp Sw Board 12 Show Grounds	-20
OFF	-330	earth		

COMPILED BY: ... D.L.G.

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

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION:

JOB DESCRIPTION:-
Norton st to upper fit Gravell
& mains.

UNIT READING:- 24V... 2.5A

COMPILED BY: *D. G. F.*

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

CATHODIC PROTECTION BLEED POINT DETAILS

CPB NUMBER:- CPB 11

DATE INSTALLED:- 12/3/93.

BCC CATHODIC PROTECTION SYSTEM IDENTIFICATION:-

FOREIGN STRUCTURE OWNER:- TELECOM.

F.S. LOCATION:- WISHART RD MT. GRAVATT.

F.S. IDENTIFICATION:- CABLES (LEAD).

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

REFERENCE TYPE:-

POTENTIAL OFF:- + .092 ON:- + .115 SW:- +23mV

BLEED TYPE:- DIRECT.

BLEED MATERIAL:- 1.5Ω 5W RESISTOR.

BLEED WEIGHT:- n/a.

BLEED O/C POTENTIAL:- n/a

BLEED CURRENT OFF:- 65mA ON:- 425mA.

REFERENCE POTENTIALS AFTER CONNECTION TO FOREIGN STRUCTURE:-

BOND OFF (RECTIFIER OFF)		BLEED ON			RESULTANT SWING	
BLEED OFF	BLEED ON	SW	BOND OFF	BOND ON	SW	
+ .086	+ .095	+9	+ .095	+ .086	-9	ZERO.

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

IDENTIFICATION TAG INSTALLED? (Y/N)

COMMENTS:-

INSTALLED/TESTED BY:- P. Smyth.

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

Norton St. telecom bleed.

Rectifier.



BCC fitted 1.5 Ω Resistor Return
from 6m Black to cathode
Now +10 mV swing

Wishart

6m Black
Bleed wire. Telecom pit.

Telecom made connection
onto lead cable.

+ 50 ft

Facsimile Message

TO:

Facsimile No.:

Name:

Address:

Phone:

268 0847

KERRY MCGOVERIN

BCC WS&S

268 0838

FROM:

Name:

JOHN LAMBERT

Phone:

838 0122

Fax No.:

852 2229

DETAILS:

If you do not receive 4 pages
(including this page) please contact
the sender immediately.

Date: 15/2/1992 Time 1127 am/pm

SUBJECT: MT GRAVATT
INTERFERENCE TESTS

NOTES:

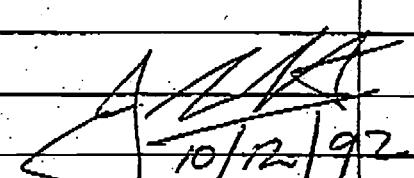
COPY OF PREVIOUS TESTS &
COPY OF RETEST TODAY.

LINE & CUSTOMER SUPPORT BRANCH
144 Arthur Street
FORTITUDE VALLEY QLD 4006



AUSTRALIAN & OVERSEAS
TELECOMMUNICATIONS CORPORATION
LIMITED
ACN 051 775 558

ATTENDING AUTHORITY BRISBANE CITY COUNCIL
VOLTS 32.0 AMPS 3.5A TESTED BY J. LAMBERT DATE 10/12/92

TP	TYPE	LOCATION	DIST ANODE CATHODE	BOND OFF	BOND ON	SWING (mV)
AA	TELECOM CABLES	M/H RHS WISHART RD ** CNR WEMVERN ST		+130	+130	NIL
AB	"	M/H RHS WISHART RD DIRECTLY OPPOSITE WAY ST		+130	+060	-70mV
AC	"	M/H RHS WISHART RD ** CNR LYNTON ST		+092	+115	+23mV
AD	"	M/H RHS WISHART RD DIST CNR LOGAN RD o/s QATB		+060	+060	NIL
AE	"	M/H RHS DAWSON RD 50M DIST WHEELER ST		+128	+140	+12mV
AF	"	M/H LHS MT GRAVATT - CAPALABA RD ** CNR SANDERS ST		+040	+050	+10mV
AG	GT FENCE	TELECOM DEPOT FENCE FRONT EAST CNR POSI WISHART RD		-660	-660	NIL
AH	GT FENCE	TELECOM DEPOT FENCE FRONT WEST CNR POSI WISHART RD		-250	-250	NIL
TESTS	AA TO AF PERFORMED WITH LEAD SLUG					
TESTS	AG AND AH PERFORMED WITH Cu/CuSO ₄ 1/2 CELL					
		 10/12/92				

VOLTS. 32.0. AMPS. 3.5A. TESTED BY: J. LAMBERT. DATE: 10/12/92

FURTHER FOLLOW UP TESTS AT AE AND
AF FOLLOWING BLEED INSTALLATION


J. H. K.
10/12/92

ATTENDING AUTHORITY BRISBANE CITY COUNCIL

VOLTS 24.0V AMPS 2.5A TESTED BY J. LAMBERT DATE 15/2/93

TP	TYPE	LOCATION	DIST ANODE CATHODE	BOND OFF	BOND ON	SWING (mV)
AC	TELESTOR CABLES	M/H RHS WISHART RD CNR LYNTON ST		-0.53	+0.88	+35V
<p><u>NOTE:</u> TESTS PERFORMED WITH LEAD SLUG AND BCC UNIT OUTPUT LOWERED FROM THAT USED IN TESTS ON 10/12/92</p>						
<p>2 SLIGHT POLARISATION OF 5 TO 6 MILLIVOLTS POSITIVE OCCURS WHILE THE BCC UNIT IS OPERATIONAL DURING TESTING. (5 SEC OFF / 25 SEC ON).</p>						
<p><i>J.A. Lambert</i> J.A. LAMBERT 15/2/93</p>						

INSULATED JOINT DETAILS

DATE: 7-2-91...

NUMBER -

MAINS DETAILS -

LOCATION:-

SIZE:-

MATERIAL:-

COATING:-

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE - 750

all bolts more than 200^r
to flange
flange to flange 50 ohms
- 148 mv across flange

COATING -

FLANGE SIZE -

BOLT NO. -

BOLT SIZE -

TEST POINT:- SIZE -

TYPE -

CuSO₄ trunk main side of
flange - 480 mv
other side of
flange - 460 mv

INSTALLED TESTING:-

INSTALLED DATE -

VOLTAGE -

CURRENT

PROTECTED SIDE CuSO₄ REFON
OFF

full gasket
installed

UNPROTECTED SIDE CuSO₄ REFON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS -

TESTED BY -

Clayton

INSULATED JOINT DETAILS

DATE: 7-2-91.....

NUMBER -

MAINS DETAILS -

LOCATION:-

SIZE:-

MATERIAL:-

COATING:-

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE - 750 mm

all Bolts more than 200^r
 go flange
 flange to flange 1-5 ohms.
 - 37 mV across flange

COATING -

FLANGE SIZE -

BOLT NO. -

BOLT SIZE -

TEST POINT:- SIZE -

TYPE -

INSTALLED TESTING:-

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuS04 REF

ON
OFFfull gasket
installed

UNPROTECTED SIDE CuS04 REF

ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS -

TESTED BY -

Olneyth

INSULATED JOINT DETAILS

DATE: 12-2-91

NUMBER : LOCATION POINT # 11.

MAINS DETAILS : LOCATION:- CNR LOGAN RD AND CAPALABA RD MT. GRAVATT.

SIZE:-

MATERIAL:- M S CL

COATING:- FIBRE GLASS ENAMEL

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE :-

300d TAKEOFF FROM
600d TRUNK MAINS.

COATING :-

ALL BOLTS > 200-2
ARE ACROSS FLANGES 6-2
& 63mm with -ve TO
PROTECTED PIPE.

FLANGE SIZE :-

BOLT NO. :-

BOLT SIZE :-

TEST POINT:- SIZE :-

TESTED WITH NEW I.J.
TESTER, INDICATED JOINT
OK.

TYPE :-

INSTALLED TESTING:-

INSTALLED DATE :-

CURRENT

VOLTAGE

PROTECTED SIDE CuS04 REF ON
OFFUNPROTECTED SIDE CuS04 REF ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS - OK.

TESTED BY - Kirwan

INSULATED JOINT DETAILS

DATE: 20-2-91

LOCATION POINT #7
NUMBER - CAR WHEELER & PERKINS ST. MT. GRAVATT

MAINS DETAILS -

LOCATION:-

300 ft CCL takeoff from
750 ft NSCL mains.

SIZE:-

MATERIAL:-

COATING:-

FIBRE GLASS ENAMEL

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE -

(1) ALL BOLTS >200N TO FLANGE.

COATING -

(2) 8m across FLANGES ONE DIREC
2m " " OTHER "

FLANGE SIZE -

(3) CHECKED WITH NEW I.T. TESTER
WHICH INDICATED OK

BOLT NO. -

(4) 48m across FLANGE -ve
TO PROT PIPE

TEST POINT:- SIZE -

(5) CuS04 TO UNPROT. -475m

TYPE -

CuS04 TO PROT -527m

INSTALLED TESTING:-

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuS04 REF ON
OFFUNPROTECTED SIDE CuS04 REF ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS

OK

TESTED BY

J.W.J

INSULATED JOINT DETAILS

DATE: 6-12-90

NUMBER -

MAINS DETAILS -

LOCATION:-

SIZE:-

MATERIAL:-

COATING:-

19 dynton st
mt. gravatt.

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE -

COATING -

FLANGE SIZE -

BOLT NO. -

BOLT SIZE -

TEST POINT:-

SIZE -

TYPE -

INSTALLED TESTING:-

INSTALLED DATE -

all bolts > 200n to flange.
 20n across joint one way
 50n across joint opp way
 81 mv across joint to protected pipe
 610mv from prot side to CuSO₄
 529mv from unprot side to CuSO₄

CURRENT

VOLTAGE

PROTECTED SIDE CuSO₄ REF ON
OFF

full gasket installed

UNPROTECTED SIDE CuSO₄ REF ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS -

TESTED BY -

L.J. Greaves.

INSULATED JOINT DETAILS

DATE: 16-1-91

NUMBER -

MAINS DETAILS - LOCATION:- 015 61 HANN WANDA BT RD.

SIZE:- MT GRAVATT.

MATERIAL:- MSCL

COATING:- FIBRE GLASS ENAMEL

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE -

COATING -

VALVE TESTED IN GROUND.

FLANGE SIZE -

ALL BOLTS > 200N TO FLANGE

FLANGE - FLANGE > 200N

BOLT NO. -

45mV ACROSS FLANGES

BOLT SIZE -

TUE TO MS TRUNK MAIN

TEST POINT:- SIZE -

TYPE -

INSTALLED TESTING:-

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE Cus04 REF ON
OFFUNPROTECTED SIDE Cus04 REF ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS - PASSED 015 TEST POINT INSTALLED.

TESTED BY -

Kinjani

16-1-91

INSULATED JOINT DETAILS

DATE: 28-2-91...

NUMBER - 8

MAINS DETAILS -

LOCATION: MT GRAVATT - CARALABA RD & SANDERST.

SIZE: - 300⁴ TAKE OFF FROM 750⁴ TRUNK MAINS.

MATERIAL: - MS & CI

COATING: - N/A

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE -

all bolts >200² to flange
8² across joint one way
or other direction
modl 702 IT chuck OK
105 mm across joint - vr to
prot. pipe.

COATING -

CuSO₄ to prot. pipe - 6.45 m
CuSO₄ to unprot. pipe - 5.45 m

FLANGE SIZE -

BOLT NO. -

BOLT SIZE -

TEST POINT: -

SIZE -

TYPE -

INSTALLED TESTING:-

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuSO₄ REF ON
OFFUNPROTECTED SIDE CuSO₄ REF ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS - OK

TESTED BY - Kirby

DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL BRANCH
METROPOLITAN DIVISION
EAGLE FARM PUMPING STATION

ELECTRICAL WORKSHOP

INSULATED JOINT TESTING DETAILS:

DATE 14-4-91

DESCRIPTION

MAINS DETAILS:- 600" VALVE 801
LOCATIONS:- KESSELS RD. MT. GRAVATT.
SIZE:- 600"
MATERIAL:- NSCL
COATING:- FG. ENAMEL
NUMBER:- V 801. LOCATION # 11.

IN GROUND TESTING

BOLT TO FLANGE RESISTANCE:- ALL GREATER THAN 200Ω
NUMBER OF BOLT:-
FLANGE TO FLANGE RESISTANCE:- 10Ω
INSULATION CHECKER MODEL 702:- 20Ω SLOWLY FALLING
POTENTIAL DIFFERENCE TO REFERENCE CELL
PROTECTED SIDE:- } VALUE IN MIDDLE OF BURY RD.
UNPROTECTED SIDE:- }

ABOVE TESTING

BOLT TO FLANGE RESISTANCE:-
NUMBER OF BOLTS:- } N/A
FLANGE TO FLANGE RESISTANCE:- }

COMMENTS

PASSED OLR.

TESTED BY



DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL BRANCH
METROPOLITAN DIVISION
EAGLE FARM PUMPING STATION

ELECTRICAL WORKSHOP

INSULATED JOINT TESTING DETAILS:

DATE 13-8-91

DESCRIPTION

MAIN'S DETAILS:-
LOCATIONS:- MT GRAVATT-CAPABWA RD NEAR SANDERS ST
SIZE:- 600 MM
MATERIAL:- MILD STEEL
COATING:- /
NUMBER:- /

IN GROUND TESTING

BOLT TO FLANGE RESISTANCE:- MORE THAN 200Ω
NUMBER OF BOLT:- 16
FLANGE TO FLANGE RESISTANCE:- 2 ~
INSULATION CHECKER MODEL 702:-
POTENTIAL DIFFERENCE TO REFERENCE CELL
PROTECTED SIDE:-
UNPROTECTED SIDE:-

ABOVE TESTING

BOLT TO FLANGE RESISTANCE:-
NUMBER OF BOLTS:-
FLANGE TO FLANGE RESISTANCE:-

COMMENTS

TESTED BY

1. Greaves

DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL BRANCH
METROPOLITAN DIVISION
EAGLE FARM PUMPING STATION

ELECTRICAL WORKSHOP

INSULATED JOINT TESTING DETAILS:

DATE 16-3-91

DESCRIPTION

Main Valve Pitt. 600 ft
Mt Gravatt Show Ground Near
Logan Rd
MAINS DETAILS:-
LOCATIONS:-
SIZE:- 600 ft
MATERIAL:- Mild Steel
COATING:-
NUMBER:- 1

IN GROUND TESTING

BOLT TO FLANGE RESISTANCE:- more than 200 R
NUMBER OF BOLT:- 16
FLANGE TO FLANGE RESISTANCE:- 2 R
INSULATION CHECKER MODEL 702:- OK
POTENTIAL DIFFERENCE TO REFERENCE CELL
PROTECTED SIDE:- -443 mV Cusot
UNPROTECTED SIDE:- -443 mV Cusot

ABOVE TESTING

BOLT TO FLANGE RESISTANCE:-
NUMBER OF BOLTS:-
FLANGE TO FLANGE RESISTANCE:-

COMMENTS

Dugay

TESTED BY

1 2 3 4 5 6 7 8 9 10 11 12

