

DAIRY SWAMP ROAD

CATHODIC PROTECTION

14TH APRIL 1993

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

OPERATING MANUAL FOR:

WYNNUN ROAD TO OLD CLEVELAND RD TRUNK WATER MAIN
CATHODIC PROTECTION SYSTEM.

CLIENT:

DEPARTMENT OF WATER SUPPLY AND SEWERAGE
WATER MAINTENANCE SECTION

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DRAWINGS

JE02/104	Standard Rectifier Wiring Diagram
2/14.215	Cathodic Protection Details
(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 and 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 1200 – Dia 750 mild steel cement lined.
- Coating:** Fibreglas enamel coated outer coating.
- Length:** 4.1 km
- Location:** From Scrub Rd. Belmont to Dairy Swamp Rd. to New Cleveland Rd. Manly Rd. to Wynnum Rd. UBD 2809 to UBD 29D1.
- Construction Drawings:**

(4.0) CATHODIC PROTECTION DETAILS

- (4.1)** Type of Cathodic Protection: Impressed Current.
- (4.2)** Rectifier: Standard 32V Volt, 10 amp direct current output enclosed in a stainless steel switchboard. Rectifier has a 240V supply from a nearby SEQEB electricity pole #23612.
Rectifier is located nearby SEQEB pole #23612 in New Cleveland Rd. opposite Dairy Swamp Rd. Tingalpa.
- (4.3)** Cathode: The cathode point is located adjacent to the trunk mains at the rectifier site where a type B 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 21.0 metres from the trunk mains in a horizontal bed. The anode was first backfilled with cokebreeze thereby improving anode – ground resistance. The anodes are identified by a marker post and label. Refer dwg no 2/14.215.
- (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 seven test points have been installed for details see dwg no 2/14.215.
- (4.6)** Associated Drawings:
- | | |
|--|------------|
| Cathodic Protection Details | - 2/14.215 |
| 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: 22nd April 1993

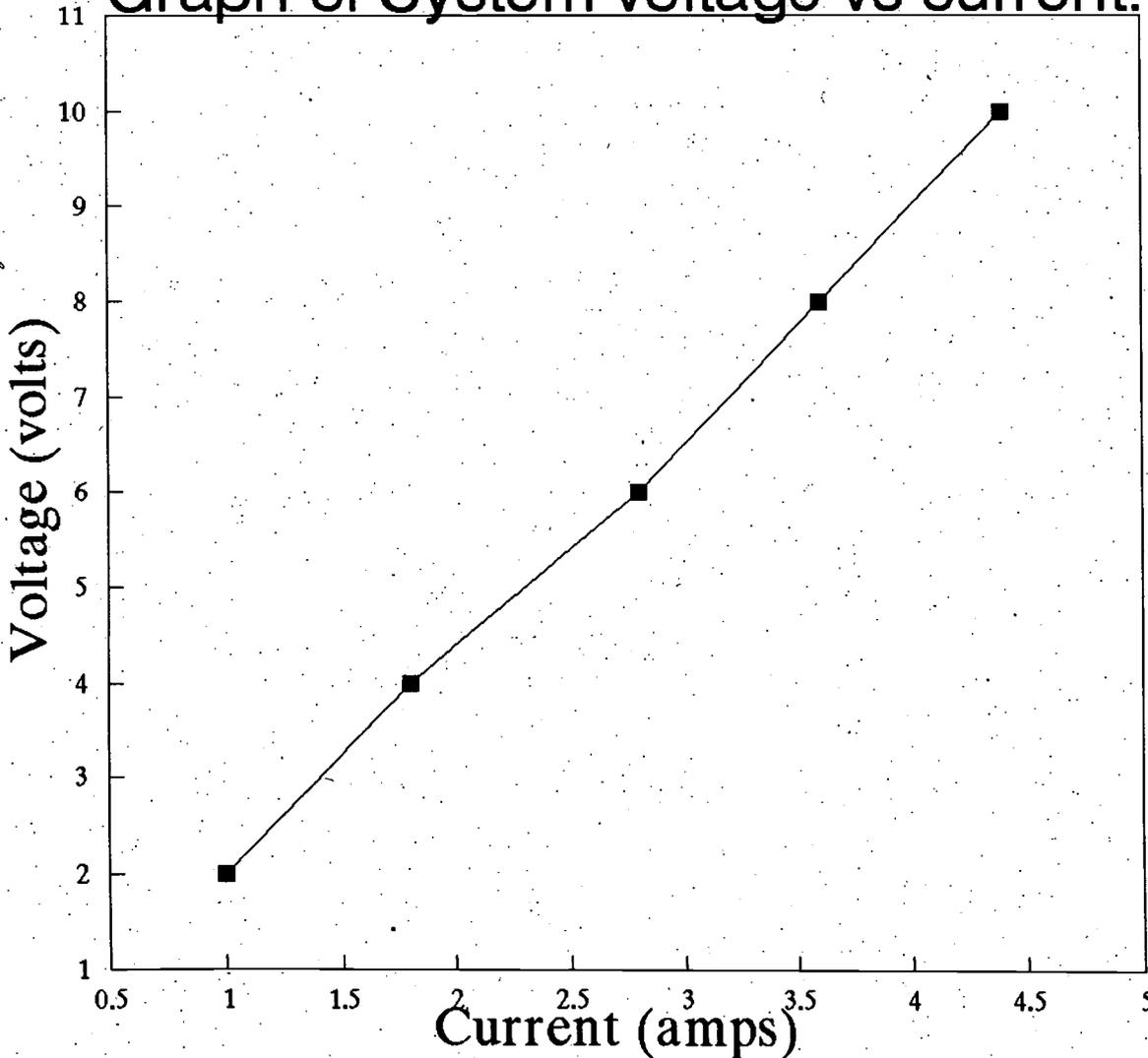
Cathodic Protection System: Dairyswamp Rd. 750mm to 1200mm diameter trunk main.

System Operating Volts: 6.5 System Operating amps 3

Test Voltage:		Test Current:	
(volts)		(amps)	
2		1	
4		1.8	
6		2.8	
8		3.6	
10		4.4	

Loop Resistance (ohms)
2.5

Graph of System voltage vs current.



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

Date: 30th April 1993

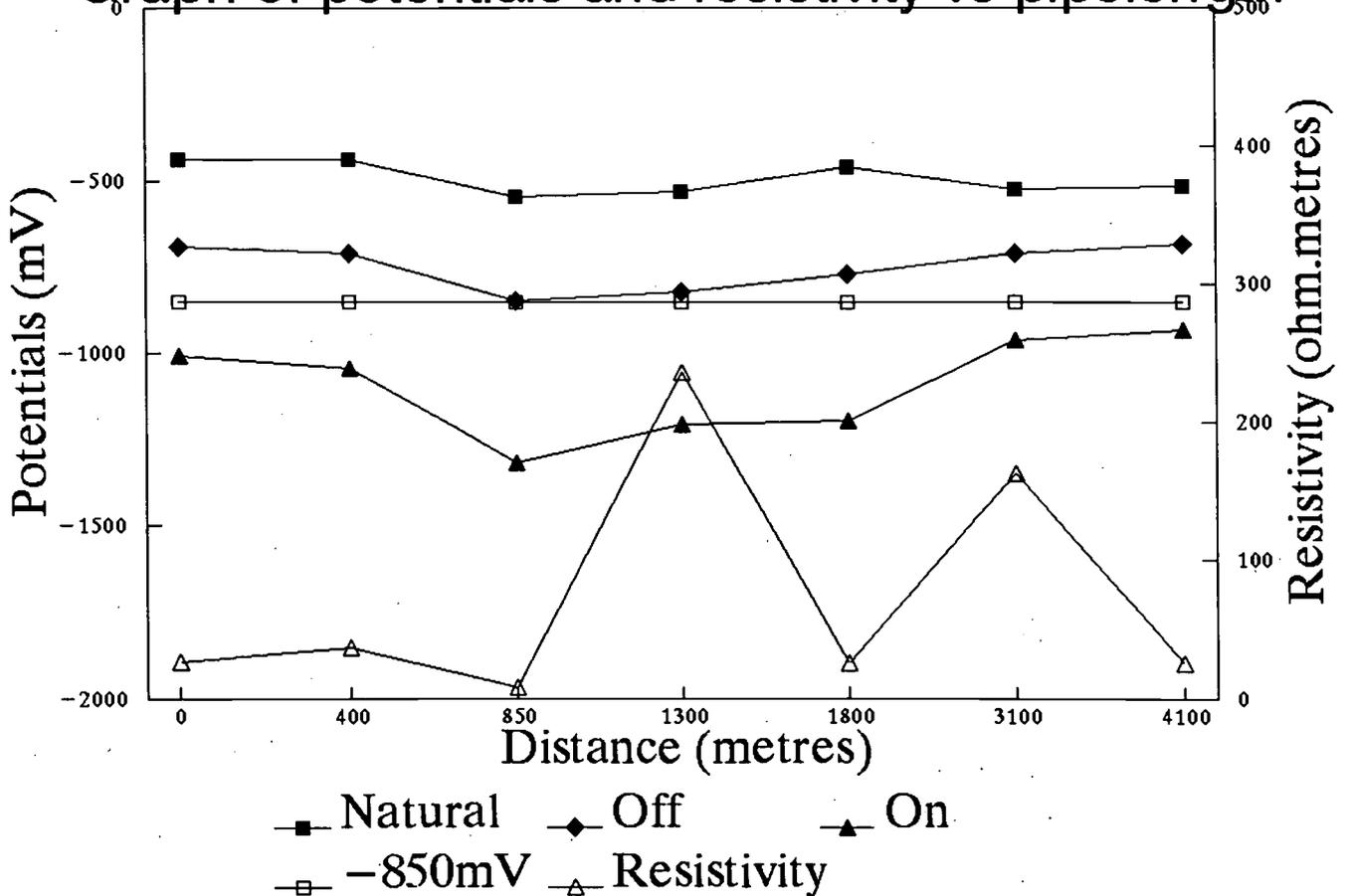
Electrical Workshop

System: Dairyswamp Rd. 750mm to 1200mm diameter trunk main.

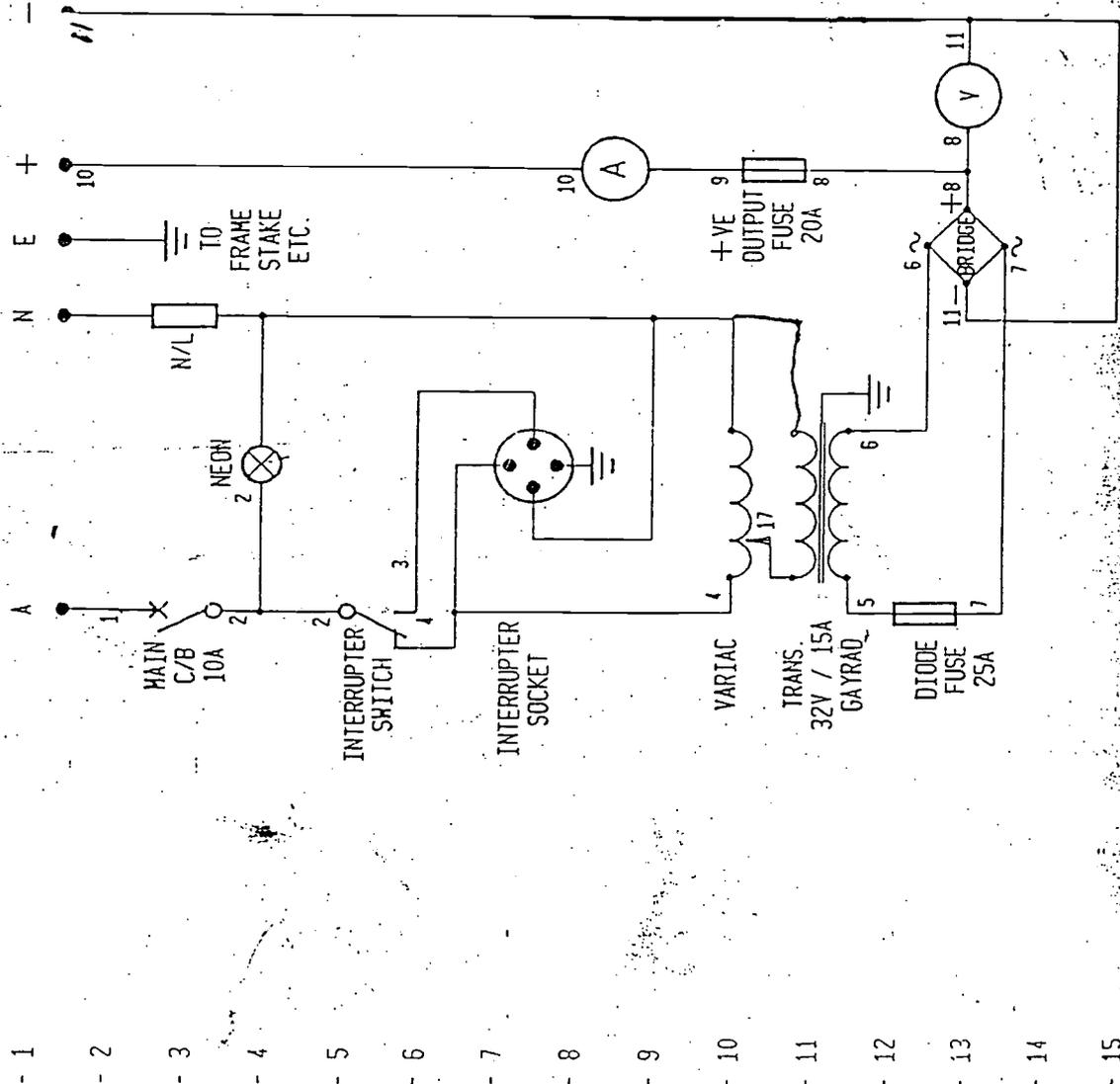
Cathodic Protection System reference potential and earth resistivity graph.

Test Point number	Distances to T.P. (metres)	Potentials to CuSO4			Resistivities at 2 metres (ohm.metres)
		Natural	Off	On	
		(mV)	(mV)	(mV)	
1	0	-438	-690	-1010	27
2	400	-441	-710	-1045	37
3	850	-545	-845	-1320	8
4	1300	-532	-820	-1210	236
5	1800	-462	-770	-1198	26
6	3100	-523	-710	-960	163
7	4100	-515	-685	-930	26
8					
9					
10					
11					
12					
13					
14					

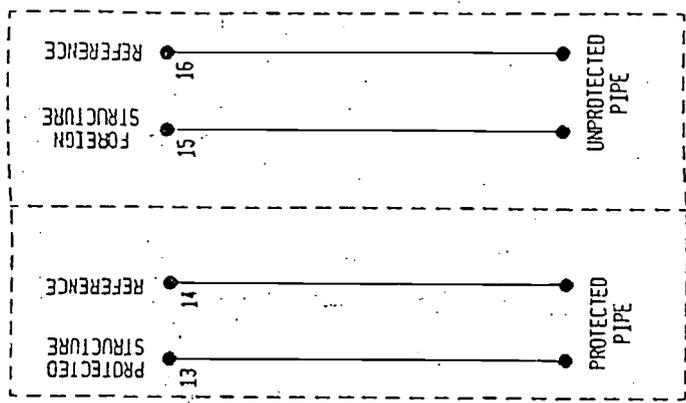
Graph of potentials and resistivity vs pipelength



Rectifier located at 1300M.



OUTPUT TERMINALS



TEST POINT TERMINALS (ON FRONT PANEL)

NOTE:

- + POSITIVE TO BE RED
- NEGATIVE TO BE BLACK
- 32V AC WIRING TO BE 4mm²
- DC WIRING TO BE 4mm²
- 240V WIRING TO BE 1.5mm²



file : DAIRY1

BRISBANE CITY COUNCIL
DEPARTMENT OF WATER SUPPLY & SEWERAGE
MECHANICAL & ELECTRICAL

12 JULY 90

MEMORANDUM : ELECTROLYSIS SECTION
 EAGLE FARM PUMP STATION

HELLERS HILL TO MAINLY - DAIRY SWAMP ROAD.
TRUNK MAINS
CATHODIC PROTECTION

LENGTH OF MAIN - 4.1 KM

JOB CODE : RL 0069 G (INSTALLATION)
 RL 0069 C (MATERIALS)

TO ALLOW INSTALLATION OF CATHODIC PROTECTION OF THE ABOVE WATER TRUNK MAIN, INSULATION OF THE TRUNK MAIN INCLUDING ALL TEE OFF BRANCHES IS TO BE PERFORMED BY WATER MAINTENANCE , AS PER ATTACHED MEMO.

WE HAVE ASKED WATER MAINTENANCE TO INSULATE ALL IN LINE FLANGES FIRST , ALLOWING A CURRENT DRAIN SURVEY TO CARRIED OUT PRIOR TO COMPLETE INSULATION OF THE MAIN. AFTER SUCH TESTS ARE PERFORMED INSULATION OF THE REMAINING TEE OFF POINTS WILL TAKE PLACE.

PLEASE CONDUCT THE FOLLOWING :

A / IN CONJUNCTION WITH CONSTRUCTION AND BEFORE BACKFILLING THE TRENCH WHERE INSULATION FLANGES ARE INSTALLED :

- 1 TEST INSULATION POINTS.

- 2 INSTALLATION OF TEST POINTS, AS LISTED ON ATTACHED SCHEDULE.

B / BEFORE ANY INSULATION OF TRUNK MAIN BY WATER MAINTENANCE :

1. SOIL RESISTIVITY ALONG LENGTH OF MAIN.
2. ~~A NATURAL POTENTIAL SURVEY~~ ← LEAVE UNTIL TESTS POINTS ARE INSTALLED
3. A CURRENT DRAIN SURVEY
(TO COMPARE WITH CURRENT DRAIN AFTER INSULATION)

C / AFTER INSTALLATION AND TESTING OF THE IN LINE INSULATION POINTS :
(LOCATION : 1 , 2 , 5 , 9 & 15)

1. A CURRENT DRAIN SURVEY.

D / AFTER INSULATION OF ALL IN LINE AND TEE OFF FLANGES.
(LOCATION : 1 TO 15)

1. A CURRENT DRAIN SURVEY.
(NOTE LOCATION AND MAGNITUDE OF DEFECTS)

2. A NATURAL POTENTIAL SURVEY.

THE PURPOSE OF THE THREE CURRENT DRAIN SURVEYS IS TO DOCUMENT THE EFFECT OF INSULATION OF THE IN LINE FLANGES AND SUBSEQUENT INSULATION OF THE DRAW OFF PIPES.

JEFF SAY
TECH OFFICER
M & E SERVICES
225 4207.

APPROVED - 
M. JUKES SEPD.

WELLERS HILL TO MANLY TRUNK MAINS
DAIRY SWAMP ROAD.

MAIN INSTALLED - 1981/82
LENGTH OF MAIN - 1.5 KM + 2.6 KM. TOTAL 4.1 KM.
USD MAP 29 - 28.

DRAW OFF VALVES OR IN LINE FLANGES ARE LOCATED AT THE FOLLOWING LOCATIONS :
DRAW OFF POINTS - 4 + 5 - 9.
IN LINE FLANGES - 5 + 1 - 6.

LOCATION POINT	VALVE No.	SIZE (MM)	VALVE PIT	LOCATION	BETWEEN / NEAR	WATER SUPPLY ZONING PLAN	TEST POINTS
1 *	919	750	YES	WYNNUM RD	MANLY RD	108	0
2 *	920	300	YES	WYNNUM RD	MANLY RD	108	B ON TEE
3 #	921	600	YES	MANLY RD	NEW CLEVELAND RD	108	SHORT
4 @	TEE OFF	750	NO	MANLY RD	NEW CLEVELAND RD	108	-
5 *	922	900	YES	MANLY RD	NEW CLEVELAND RD	108	0
6 @	TEE OFF	300	NO	MANLY RD	NEW CLEVELAND RD	108	-
7 @	TEE OFF	300	NO	DAIRY SWAMP RD	NEW CLEVELAND RD	121	-
8 @	TEE OFF	300	NO	DAIRY SWAMP RD	HARWOOD ST	121	-
9 *	897	300/1200	YES	DAIRY SWAMP RD	ERMELO RD	121	0
10 @	TEE OFF	300	NO	DAIRY SWAMP RD	ERMELO RD	121	-
11 @	TEE OFF	300	NO	DAIRY SWAMP RD	GRASSDALE RD	121	-
12 @	TEE OFF	300	NO	DAIRY SWAMP RD	WRIGHT ST	121/133	0
13 @	TEE OFF	300	NO	WRIGHT ST	REYNOLDS ST	132	-
14 @	TEE OFF	300	NO	PAST WRIGHT ST		132	-
15 *	790	1200	YES	PAST WRIGHT ST		132	0

INSULATION BOLTS ARE REQUIRED TO BE INSTALLED ON THE IN LINE FLANGES WHERE '*' APPEARS.
INSULATION BOLTS ARE REQUIRED TO BE INSTALLED ON THE DRAW OFF PIPES WHERE '@' APPEARS.

ELECTRICAL BRIDGES ARE REQUIRED AT THE FLANGES WHERE '#' APPEARS.

To	File No.	Page 1
From	Date	22/4/92.
Subject DAIRY SWAMP RD. TESTING OF TEST POINTS.		

AT. RECTIFIER UNIT. TP. N°4. NEW CLEVELAND RD.
LOOP RESISTANCE

2V at 1.0 amp
4V at 1.8 amp
6V at 2.8 amp
8V at 3.6 amp
10V at 4.4 amp.

Limit Reading

6.5V at 2.9 amp.

	Start of Readings	End of Readings
CuSO ₄ to Pipe	- 1206 MV on	- 1292 MV on
	- 695 MV off.	- 770 MV off.

Anode Draws 2.54 Amp.

AT ERMELO RD AND DAIRY SWAMP RD T.P. N°5

CuSO₄ to Pipe - 1201 MV on
- 650 MV off.

Printed on 100% recycled paper

To	File No. <i>Page 2.</i>
From	Date <i>22/4/92</i>
Subject <i>DAIRY SWAMP RD.</i>	

AT WRIGHT ST T.P. N°6

CuSO₄ to Pipe - 659 mV on
- 572 mV off

CuSO₄ to Blue - 657 mV on
- 571 mV off

CuSO₄ to White - 622 mV

Zn to Pipe + 586 mV on
+ 671 mV off

AT SCRUB RD. T.P. N°7

CuSO₄ to Pipe - 610 mV on
- 507 mV off

Zn to Pipe + 620 mV on
+ 720 mV off

CuSO₄ to Pipe - 377 mV UNPROTECTED SIDE

To	File No. Page 3
From	Date 20/4/92
Subject DAIRY SWAMP RD.	

AT NEW CLEVELAND RD. T.P. N°3.

CuSO₄ to Pipe - 1460 mV on
- 850 mV off

Zn to Pipe - 85 mV on
+ 270 mV off.

AT MANLY RD. TP. N°2

CuSO₄ to Pipe - 583 mV on
- 365 mV off

CuSO₄ to Blue - 575 mV on
- 362 mV off

CuSO₄ to White - 691 mV

Zn to Pipe + 539 mV on
+ 757 mV off

AT WYNUM RD TP. N°1

Cu SO₄ to Pipe - 621 mV on
- 425 mV off

Zn to Pipe + 555 mV on
+ 770 mV off.

INTERRUPTER: - ~~20~~ ⁵ SECS OFF
~~40~~ SECS ON
 25

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

INTERFERENCE SURVEY RESULTS

CuSO₄ to Pipe ON - 1205 mV
 OFF - 730 mV

JOB DESCRIPTION: - *DAIRY SWAMP RD.*

UNIT READING: - *10V at 4.9 amp*

	READING	TEST POINT I.D.	LOCATION	SWING
ON	-520 mV		EARTH STAKE	-118 mV
OFF	-402 mV		RECTIFIER UNIT.	
ON	-497 mV		POLE N° 23613	-106 mV
OFF	-391 mV		NEW CLEVELAND RD	
ON	-384 mV		POLE N° 23616	-30 mV
OFF	-354 mV		NEW CLEVELAND RD	
ON	-391 mV		POLE N° 64328	-11 mV
OFF	-380 mV		ERMELO RD	
ON	-355 mV		POLE N° 33694	+50 mV
OFF	-405 mV		DAIRY SWAMP RD	
ON	-452 mV		POLE NO 60955	-15 mV
OFF	-437 mV		DAIRY SWAMP RD	
ON	-419 mV		POLE N° 15534	-3 mV
OFF	-416 mV		ERMELO RD	
ON	-382 mV		POLE N° 23377	+32 mV
OFF	-414 mV		WRIGHT ST.	
ON	-296 mV		POLE N° 23368	+61 mV
OFF	-357 mV		WRIGHT ST	
ON	-555 mV		POLE NO 22594	+6 mV
OFF	-561 mV		WYNNUM RD	
ON	-444 mV		POLE N° 33899	+5 mV
OFF	-449 mV		MANLY RD	
ON	-538 mV		POLE N° 23601	+39 mV
OFF	-577 mV		NEW CLEVELAND RD	

COMPILED BY: *L. Greaves*

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

16-6-92

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION:- DAIRY SWAMP RD

CuSO4.
- 1200 mV on - 550 mV off

UNIT READING:- 4.0 amp 8.0 Volts

	READING	TEST POINT I.D.	LOCATION	SWING
ON OFF	-351 mV -381 mV	SEQEB MEN	WRIGHT ST. SEQEB POLE N° 23377	+30 mV
ON OFF	-271 mV -327 mV	SEQEB MEN	WRIGHT ST. SEQEB POLE N° 23368	+56 mV
ON OFF	-502 mV -570 mV	SEQEB MEN	MANLY RD. SEQEB POLE N° 23461	+68 mV
ON OFF	-566 mV -605 mV	SEQEB MEN	NEW CLEVELAND RD SEQEB POLE N° 23601	+39 mV
ON OFF	-345 mV -406 mV	SEQEB MEN	DAIRY SWAMP RD SEQEB POLE N° 33694	+61 mV
ON OFF				

COMPILED BY:.....

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DEPARTMENT OF WATER SUPPLY AND SEWERAGE
MECHANICAL AND ELECTRICAL SECTION

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION:- INTERFERENCE TESTING WITH TELECOM
(ALL RESULTS LEAD TO CABLE)

UNIT READING:- .6:5V...2:9A.....

	READING	TEST POINT I.D.	LOCATION	SWING
ON OFF	-590 -560		CNR NEW CLEVELAND ROAD & INGLESTON ROAD	-30mV
ON OFF	-730 -620		OUTSIDE N° 364 NEW CLEVELAND ROAD	-110
ON OFF	-680 -650		OUTSIDE N° 308 NEW CLEVELAND RD	-30mV
ON OFF	-1040 -1120		CNR, NEW CLEVELAND ROAD & MANLY ROAD (OPPOSITE NURSERY)	+80mV
ON OFF	-500 -500		MANLY ROAD:- OUTSIDE BRYAN BYRT FORD	NIL
ON OFF	-410 -410		MANLY RD:- NEXT TO SEQES POLE 33899	NIL
ON OFF	-540 -540		MANLY RD:- OPPOSITE B.C.C. TEST POINT	NIL
ON OFF	-740 -780		MANLY RD:- OPPOSITE NURSERY	+40
ON OFF	-220 -210		CNR WRIGHT ST & OLD CLEVELAND RD	-10
ON OFF				
ON OFF				
ON OFF				

COMPILED BY: *Murray McConville*

17-09-92

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

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION: - INTERFERENCE TESTING: TELECOM TO B.C.C.
(ALL READINGS C₆SO₄ TO STRUCTURE)
UNIT READING: - ...10V.....4:6A.....

	READING	TEST POINT I.D.	LOCATION	SWING
ON OFF	-800 mV -800 mV		WATER COX - 910 MANLY RD	NIL
ON OFF	-418 -473	N ^o 4	RECTIFIER BOX NEW CLEVELAND RD	+55mV
ON OFF	-332 -338		WATER COX - 396 NEW CLEVELAND RD	+6mV
ON OFF	-482 -536	N ^o 5	DAIRY SWAMP RD	+54mV
ON OFF	-572 -622	N ^o 6	WRIGHT ST :- OUTSIDE CARAVAN PARK	+50mV
ON OFF	-578 -530	N ^o 3	NEW CLEVELAND ROAD -OPPOSITE WICKERS	-40mV
ON OFF	-472 -543	N ^o 2	MANLY RD - NEXT TO BRIDGE	+71mV
ON OFF	-418 -493	N ^o 1	WYNNUM RD - OPPOSITE SQUASH COURTS	+75mV
ON OFF				

COMPILED BY: *Mary McCormick*

**INTERRUPTER:- 20 SECS OFF
10 SECS ON**

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

INTERFERENCE SURVEY RESULTS

JOB DESCRIPTION:- INTERFERENCE TESTING :- BCC TO ALLGAS

UNIT READING:- 6.5V...2.9A

	READING	TEST POINT I.D.	LOCATION	SWING
ON OFF	-1987 -1983		ERMELO RD - OFF OF DAIRY SWAMP RD (REDLAND BAY MAIN)	-4mV
ON OFF	-1004 -1003		MANLY RD - NEAR BRIDGE OPPOSITE SIDE OF CREEK TO TEST POINT N2	-1mV
ON OFF				

COMPILED BY: *M. M. Cormick*

ALLGAS USES SACRIFICIAL SYSTEM

INTERFERENCE RESULTS

DATE: 23-6-92

CuSO₄ - 1180 MV ON.
- 520 MV OFF.

UNIT READING: 8 V at 3.8 A.

TYPE OF BLEED	CURRENT IN BLEED	TEST POINT NUMBER	BOND OFF			BLEED ON			RESULTANT SWING
			BLEED OFF	BLEED ON	SWING	BOND OFF	BOND ON	SWING	
ZINC	2.4 mA	SEQEB POLE No 23377	- 312 MV	- 883 MV	- 57 mV	- 883 MV	- 879 MV	+ 4 MV	- 567 MV
ZINC	1.8 mA	SEQEB POLE No 23368	- 355 MV	- 588 MV	- 233 MV	- 588 MV	- 552 MV	+ 36 MV	- 192 MV
ZINC	7.7 mA	SEQEB POLE No 23694	- 369 MV	- 470 MV	- 101 MV	- 420 MV	- 448 MV	+ 22 MV	- 79 MV
ZINC	7.5 mA	SEQEB POLE No 23461	- 530 MV	- 690 MV	- 160 MV	- 690 MV	- 653 MV	+ 37 MV	- 123 MV
ZINC	4.5 mA	SEQEB POLE No 23601	- 539 MV	- 774 MV	- 135 MV	- 774 MV	- 766 MV	+ 12 MV	- 123 MV

COMPILED BY: A. Greaves

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

CATHODIC PROTECTION BLEED POINT DETAILS



CPB NUMBER:- CPB1

DATE INSTALLED:- 16-7-92

BCC CATHODIC PROTECTION SYSTEM IDENTIFICATION:-

FOREIGN STRUCTURE OWNER:- SEQEB.

F.S. LOCATION:- SEQEB POLE N° 23368. WRIGHT ST.

F.S. IDENTIFICATION:- MEN.

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

REFERENCE TYPE:- $CuSO_4$

POTENTIAL OFF:- -355mV ON:- -300mV SW:- +55mV

BLEED TYPE:-

BLEED MATERIAL:- ZINC

BLEED WEIGHT:- 400 grams

BLEED O/C POTENTIAL:-

BLEED CURRENT OFF:- 1.8mA. ON:- 1.8mA.

REFERENCE POTENTIALS AFTER CONNECTION TO FOREIGN STRUCTURE:-

BOND OFF (RECTIFIER OFF)			BLEED ON			RESULTANT SWING
BLEED OFF	BLEED ON	SW	BOND OFF	BOND ON	SW	
-355mV	-588mV	-233 mV	-588mV	-552mV	+36 mV	-192mV

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

IDENTIFICATION TAG INSTALLED? (Y/N) *yes*

COMMENTS:- *on PIMMS*

INSTALLED/TESTED BY:- *L. Greaves*

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

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

CATHODIC PROTECTION BLEED POINT DETAILS

CPB NUMBER:- *CPB2*

DATE INSTALLED:- *16-7-92*



BCC CATHODIC PROTECTION SYSTEM IDENTIFICATION:-

FOREIGN STRUCTURE OWNER:- *SEQEB*

F.S. LOCATION:- *SEQEB POLE N° 23377 WRIGHT ST*

F.S. IDENTIFICATION:- *MEN*

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

REFERENCE TYPE:- *CuSO4*

POTENTIAL OFF:- *-312mV* ON:- *-291mV* SW:- *+21mV*

BLEED TYPE:-

BLEED MATERIAL:- *ZINC*

BLEED WEIGHT:- *400 grams*

BLEED O/C POTENTIAL:-

BLEED CURRENT OFF:- *2.4mA* ON:- *2.4mA*

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	
<i>-312mV</i>	<i>-883mV</i>	<i>-571mV</i>	<i>-883mV</i>	<i>-879mV</i>	<i>+4</i>	<i>-567mV</i>

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

IDENTIFICATION TAG INSTALLED? (Y/N) *yes*

COMMENTS:- *ON PIMMS*

INSTALLED/TESTED BY:- *L. Greaves*

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

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

CATHODIC PROTECTION BLEED POINT DETAILS

CPB NUMBER:- **CP 83**

DATE INSTALLED:- **16-7-92**

BCC CATHODIC PROTECTION SYSTEM IDENTIFICATION:-

FOREIGN STRUCTURE OWNER:- **SEQEB**

F.S. LOCATION:- **SEQEB POLE N° 33694 DAIRY SWAMP RD**

F.S. IDENTIFICATION:- **MEN.**

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

REFERENCE TYPE:- **CuSO₄**

POTENTIAL OFF:- **-369mV** ON:- **-340mV** SW:- **+29mV**

BLEED TYPE:-

BLEED MATERIAL:- **ZINC**

BLEED WEIGHT:- **400 grams**

BLEED O/C POTENTIAL:-

BLEED CURRENT OFF:- **7.2mA** ON:- **7.7mA**

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	
-369mV	-470mV	-101mV	-420mV	-448mV	+22mV	-79mV

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

IDENTIFICATION TAG INSTALLED? (Y/N) **yes**

COMMENTS:- **ON PIMMS.**

INSTALLED/TESTED BY:- **L. Greaves.**

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

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

CATHODIC PROTECTION BLEED POINT DETAILS

CPB NUMBER:- **CPB 4**

DATE INSTALLED:- **16-7-92**

BCC CATHODIC PROTECTION SYSTEM IDENTIFICATION:

FOREIGN STRUCTURE OWNER:- **SEQEB**

F.S. LOCATION:- **SEQEB POLE NO 23601 NEW CLEVELAND RD**

F.S. IDENTIFICATION:- **MEN**

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

REFERENCE TYPE:- **CO₂SO₄**

POTENTIAL OFF:- **-539MV** ON:- **-515MV** SW:- **+24MV**

BLEED TYPE:-

BLEED MATERIAL:- **ZINC**

BLEED WEIGHT:- **400 grams**

BLEED O/C POTENTIAL:-

BLEED CURRENT OFF:- **4.2MA** ON:- **4.5MA**



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	
-539MV	-774MV	-135MV	-774MV	-766MV	+12MV	-123MV

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

IDENTIFICATION TAG INSTALLED? (Y/N) **yes**

COMMENTS:- **on PIMMS**

INSTALLED/TESTED BY:- **A Greaves**

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

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

CATHODIC PROTECTION BLEED POINT DETAILS

CPB NUMBER:- **C P B 5**

DATE INSTALLED:- **16-7-92**

BCC CATHODIC PROTECTION SYSTEM IDENTIFICATION:- **on PIMMS**

FOREIGN STRUCTURE OWNER:- **SEQEB**

F.S. LOCATION:- **SEQEB Pole No 23461 MANKY RD**

F.S. IDENTIFICATION:- **MEN.**

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

REFERENCE TYPE:- **CoSO₄**

POTENTIAL OFF:- **-530 mV** ON:- **-472 mV** SW:- **+58 mV**

BLEED TYPE:-

BLEED MATERIAL:- **ZINC**

BLEED WEIGHT:- **400 grams.**

BLEED O/C POTENTIAL:-

BLEED CURRENT OFF:- **6.5 mA** ON:- **7.5 mA**

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	
-530 mV	-690 mV	-160 mV	-690 mV	-653 mV	+37 mV	-123 mV

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

IDENTIFICATION TAG INSTALLED? (Y/N) **yes**

COMMENTS:- **on PIMMS**

INSTALLED/TESTED BY:- **A. Greaves**

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

**BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION**

TEST POINT N°1

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 1-4-92
TEST POINT TYPE: TYPE B

LOCATION: WYNNUM RD OFF
MAINS SIZE: TINGALPA SQUASH
750MM COURTS.

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): 0.1Ω
ZINC REFERENCE TO PIPE: +446 mV
CuSO₄ REFERENCE TO PIPE: -438 mV
ZINC TO CuSO₄: -885 mV

EARTH TESTING

PIN SPACING: 2M	MEGGER READING: 22X-1	RESISTIVITY: 27.63 Ω/metre
PIN SPACING: 3M	MEGGER READING: 15X-1	RESISTIVITY: 28.26 Ω/metre
PIN SPACING: 4M	MEGGER READING: 5X-1	RESISTIVITY: 12.56 Ω/metre

**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. Greaves

COMMENTS:

1 COPY TO FILE
1 COPY TO T.O.

TEST POINT N°2

BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 2-4-92
TEST POINT TYPE: COUPON

LOCATION: MANLY RD between
MAINS SIZE: Belmont & New Cleveland
750M Rds

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): 0.15V
ZINC REFERENCE TO PIPE: +338mV
CuSO₄ REFERENCE TO PIPE: -441mV
ZINC TO CuSO₄: -765mV

CuSO₄ to white - 655mV
CuSO₄ to Red/Blue - 443mV
Zinc to white +114mV
Zinc to Red/Blue +337mV

EARTH TESTING

PIN SPACING: 2M
PIN SPACING: 3M
PIN SPACING: 4M

MEGGER READING: 30x.1
MEGGER READING: 16x.1
MEGGER READING: 8x.1

RESISTIVITY: 37.68Ω/metre
RESISTIVITY: 30.14Ω/metre
RESISTIVITY: 20.09Ω/metre

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. Greaves

COMMENTS:

1 COPY TO FILE
1 COPY TO T.O.

BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

TEST POINT N° 3

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE:
TEST POINT TYPE: *TYPE B*

LOCATION: *MANLY RD & NEW*
MAINS SIZE: *CLEVELAND RD*
750 MM

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): *0.1Ω*
ZINC REFERENCE TO PIPE: *+157 mV*
CuSO₄ REFERENCE TO PIPE: *-545 mV*
ZINC TO CuSO₄: *-702 mV*

EARTH TESTING

PIN SPACING: *2M*
3M
PIN SPACING: *4M*

MEGGER READING: *6x0.1*
MEGGER READING: *4x0.1*
4x0.1

RESISTIVITY: *7.53 Ω/metre*
RESISTIVITY: *7.53 Ω/metre*
10.04 Ω/metre

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: *A. Greaves*
COMMENTS:

1 COPY TO FILE
1 COPY TO T.O.

BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

TEST POINT N°4.

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE:
TEST POINT TYPE: *Coupon Type*

LOCATION: *NEW CLEVELAND RD*
MAINS SIZE: *IN RECT. UNIT.*
750MM

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): *0.35V*
ZINC REFERENCE TO PIPE: *+716 mV*
CuSO₄ REFERENCE TO PIPE: *-532 mV*
ZINC TO CuSO₄: *-1248 mV*

Cu SO₄ to white - 632 mV
Cu SO₄ to Red/Blue - 532 mV
Zn to white + 613 mV
Zn to Red/Blue + 716 mV

EARTH TESTING

PIN SPACING: *2M*
3M
PIN SPACING: *4M*

MEGGER READING: *188x.1*
114x.1
MEGGER READING: *51x.1*

RESISITIVITY: *236.125V/metre*
214.775V/metre
138.165V/metre

~~SILICONE IRON~~ ANODE
(IF INSTALLED)

ANODE TYPE: *SILICONE IRON*
ANODE SIZE: *1500 x 75*
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. Geaves*

COMMENTS:

1 COPY TO FILE
1 COPY TO T.O.

BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

TEST POINT N°5

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 24-3-92
TEST POINT TYPE: TYPE B.

LOCATION: DAIRY SWAMP RD 7
MAINS SIZE: ERMERO RD.
750MM

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): 0.1Ω
ZINC REFERENCE TO PIPE: - 750 mV
CuSO₄ REFERENCE TO PIPE: - 462 mV
ZINC TO CuSO₄: - 1214 mV

EARTH TESTING

PIN SPACING: 2M MEGGER READING: 213 X 0.01 RESISITIVITY: 26.75 Ω/metre
PIN SPACING: 3M MEGGER READING: 411 X 0.01 RESISITIVITY: 77.43 Ω/metre
PIN SPACING: 4M MEGGER READING: 60 X 0.01 RESISITIVITY: 15.07 Ω/metre

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. Greaves

COMMENTS:

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BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

TEST POINT N^o 6.

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 8-4-92
TEST POINT TYPE: Coupon

LOCATION: WRIGHT ST opp.
MAINS SIZE: CARAVAN PARK.
750MM.

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE): 0.1Ω
ZINC REFERENCE TO PIPE: +483mV
CuSO₄ REFERENCE TO PIPE: -523mV
ZINC TO CuSO₄: +1002mV

CuSO₄ to White -607mV
CuSO₄ to Red/Blue -521mV
Zinc to White +396mV
Zinc to Red/Blue +483mV

EARTH TESTING

PIN SPACING: 2M
3M
PIN SPACING: 4M

MEGGER READING: 130x.1
60x.1
MEGGER READING: 35x.1

RESISTIVITY: 163.28 Ω/metre
113.04 Ω/metre
87.92 Ω/metre

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. Greaves

COMMENTS:

1 COPY TO FILE
1 COPY TO T.O.

BRISBANE CITY COUNCIL
EAGLE FARM PUMP STATION
CORROSION SECTION

TEST POINT N° 7.

STANDARD CATHODIC PROTECTION TEST POINT DATA GATHERING

DATE: 26-3-92
TEST POINT TYPE: VALVE PIT.

LOCATION: SCRUB RD BELMONT
MAINS SIZE: BEHIND SEQERS SUB,
750MM

POTENTIAL TESTING

CATHODE TO CATHODE RETURN (RESISTANCE):
ZINC REFERENCE TO PIPE: + 617 mV
CuSO₄ REFERENCE TO PIPE: - 515 mV
ZINC TO CuSO₄: -1135 mV

EARTH TESTING

PIN SPACING: 2 M MEGGER READING: 210 X .01 RESISITIVITY: 26.37 Ω/metre
3 M MEGGER READING: 750 X .01 RESISITIVITY: 141.3 Ω/metre
4 M MEGGER READING: 631 X .01 RESISITIVITY: 158.5 Ω/metre

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. Greaves.
COMMENTS:

1 COPY TO FILE
1 COPY TO T.O.

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

ELECTRICAL WORKSHOP

INSULATED JOINT TESTING DETAILS: DAIRY SWAMP RD TRUNK MAINS.

DATE 10-4-91

DESCRIPTION

MAINS DETAILS:- 750-600 ϕ .
LOCATIONS:- WYNNUM RD 015 SQUASH COURTS.
SIZE:- VALVE 919
MATERIAL:-
COATING:- LOCATION # 1.
NUMBER:-

IN GROUND TESTING

BOLT TO FLANGE RESISTANCE:- ALL BOLTS $> 200\Omega$ TO FLANGE
NUMBER OF BOLT:-
FLANGE TO FLANGE RESISTANCE:- 50Ω ACROSS JOINT.
INSULATION CHECKER MODEL 702:- 40 ON SCALE & STEADY.
POTENTIAL DIFFERENCE TO REFERENCE CELL UNABLE TO CHECK
PROTECTED SIDE:-
UNPROTECTED SIDE:-

ABOVE TESTING

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

COMMENTS

PASSED OIC.
EXISTING OLD TYPE TEST POINT
INSTALLED.

TESTED BY



INSULATED JOINT DETAILS

DATE: 22-11-90

NUMBER - Takeoff from trunk mains end
 MAINS DETAILS - LOCATION: - Manly Rd and New Cleveland Rd.
 SIZE: - 300mm takeoff from 1200mm
 MATERIAL: -
 COATING: -

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE -
 COATING -
 FLANGE SIZE -
 BOLT NO. -
 BOLT SIZE -
 TEST POINT: - SIZE
 TYPE -
 INSTALLED TESTING: -
 INSTALLED DATE -

all bolts > 200mm to flange
 36Ω across joint one direction
 8Ω across other direction
 127mV across joint
 +ve to protect pipe

CURRENT

VOLTAGE -

PROTECTED SIDE	CuSO4	REF	ON
			OFF
UNPROTECTED SIDE	CuSO4	REF	ON
			OFF

below

ABOVEGROUND TESTING: - READING (OHMS) - see above
 COMMENTS - from specification 77.A.10 joint is
 TESTED BY - ⁰¹⁹ [Signature]

INSULATED JOINT DETAILS

DATE: 27-11-90

NUMBER -

MAINS DETAILS -

LOCATION:- Wlynum Rd road
SIZE:- Squash & fitness entire
MATERIAL:-
COATING:-

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE -

COATING -

FLANGE SIZE -

BOLT NO. -

BOLT SIZE -

TEST POINT:-

SIZE -

TYPE -

INSTALLED TESTING:-

INSTALLED DATE -

all bolts > 200Ω to flange
8Ω across joint one direction
0Ω across joint opp. direction
54mV across joint + to protected pipe
-529 mV from prot side of pipe to CuSO4
-572 mV from unprot pipe to CuSO4.

CURRENT

VOLTAGE -

PROTECTED SIDE CuSO4 REF

ON
OFF

UNPROTECTED SIDE CuSO4 REF

ON
OFF

note:- not full gasket installed
existing flange sandblasted to clean joint.

BELOW

ABOVEGROUND TESTING:- READING (OHMS) - see above.

COMMENTS - from specification 77.A.101 joint is OK

TESTED BY - K. J. Ford

INSULATED JOINT DETAILS

DATE: 15-11-90

NUMBER - 11

MAINS DETAILS - LOCATION:- DAIRY SWAMP RD NEAR GRASSDALE RD

SIZE:- 1200 mm

MATERIAL:- M S

COATING:- FUSION BONDED POLY

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE - 300 mm

COATING -

FLANGE SIZE -

BOLT NO. - 12 OFF

BOLT SIZE - > 1 M 2
BOLT TEST

TEST POINT:- SIZE -

TYPE -

INSTALLED TESTING:- 25 Ω

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuS04 REF ON OFF

UNPROTECTED SIDE CuS04 REF ON OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS - NEW FULL GASKET FITTED TO FLANGE

TESTED BY -



INSULATED JOINT DETAILS

DATE: 13-11-90

NUMBER - 12

MAINS DETAILS - LOCATION:- WRIGHT ST - OUTSIDE CARAVAN PARK
SIZE:- 1200 mm
MATERIAL:- MS
COATING:- FUSION BONDED POLY

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE - 300 mm

COATING -

FLANGE SIZE -

BOLT NO. - 12 OFF

BOLT SIZE - 20 mm
BOLT TEST > 1 MΩ

TEST POINT:- SIZE -

TYPE -

INSTALLED TESTING:- 20 Ω

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuS04 REF ON
OFF

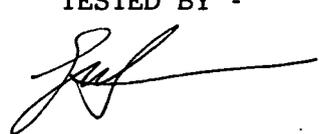
UNPROTECTED SIDE CuS04 REF ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS -

See off pipe cut & new full gasket fitted between flanges

TESTED BY -



INSULATED JOINT DETAILS

DATE: 5-11-90

NUMBER - 13 A

MAINS DETAILS - LOCATION:- WRIGHT ST NEAR OLD CLEVELAND RD
SIZE:- 1200 mm
MATERIAL:- MS
COATING:- FUSION BONDEN POLY

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE - 150 mm

COATING -

FLANGE SIZE -

BOLT NO. - 8 OFF

BOLT SIZE - 16 mm

BOLT TEST > 1 mΩ

TEST POINT:- SIZE -

TYPE -

INSTALLED TESTING:- 6 Ω (AFTER RAIN)

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuSO4 REF ON
OFF

UNPROTECTED SIDE CuSO4 REF ON
OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS - Tee off pipe cut + new full gasket fitted between flanges

TESTED BY -

[Signature]

INSULATED JOINT DETAILS

DATE: 1-11-90

NUMBER - 13

MAINS DETAILS - LOCATION:- WRIGHT ST CNR OLD CLEVELAND RD & REYNOLDS ST.
SIZE:- 1200 mm
MATERIAL:- MS
COATING:- FUSION BONDED POLY

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE - 300 mm

COATING -

FLANGE SIZE -

BOLT NO. - 12 OFF

BOLT SIZE - 20 mm
BOLT TEST > 1 M Ω

TEST POINT:- SIZE -

TYPE -

INSTALLED TESTING:- 35 Ω

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuSO4 REF ON OFF

UNPROTECTED SIDE CuSO4 REF ON OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS - Tee off pipe cut & new full gasket fitted between flanges

TESTED BY -



INSULATED JOINT DETAILS

DATE: 24-10-90

NUMBER - 14

MAINS DETAILS -

LOCATION:- PAST WRIGHT ST ON EMBANKMENT

SIZE:- 1200 mm

MATERIAL:- MS

COATING:- FUSION BONDED POLY

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE -

300 mm

COATING -

FLANGE SIZE -

BOLT NO. -

12 OFF

BOLT SIZE -

20 mm

BOLT TEST

> 1 MΩ

TEST POINT:-

SIZE -

TYPE -

INSTALLED TESTING:-

> 200 Ω

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuS04 REF ON OFF

UNPROTECTED SIDE CuS04 REF ON OFF

ABOVEGROUND TESTING:- READING (OHMS)

COMMENTS -

See off pipe cut & new full gasket fitted between flanges.

TESTED BY -

[Signature]

INSULATED JOINT DETAILS

DATE: 25-9-90

NUMBER - 10

MAINS DETAILS - LOCATION:- DAIRY SWAMP RD NEAR ERNELO RD.
SIZE:- 1200 mm
MATERIAL:- MS
COATING:- FUSION BONDED POLY

INSULATED SIDE

UNINSULATED SIDE

PIPE SIZE - 300 mm

COATING -

FLANGE SIZE -

BOLT NO. - 12 OFF

BOLT SIZE - 20 mm

BOLT TEST > 1 MΩ

TEST POINT:- SIZE -

TYPE -

INSTALLED TESTING:- > 20 Ω

INSTALLED DATE -

CURRENT

VOLTAGE -

PROTECTED SIDE CuSO4 REF ON OFF

UNPROTECTED SIDE CuSO4 REF ON OFF

ABOVEGROUND TESTING:- READING (OHMS)

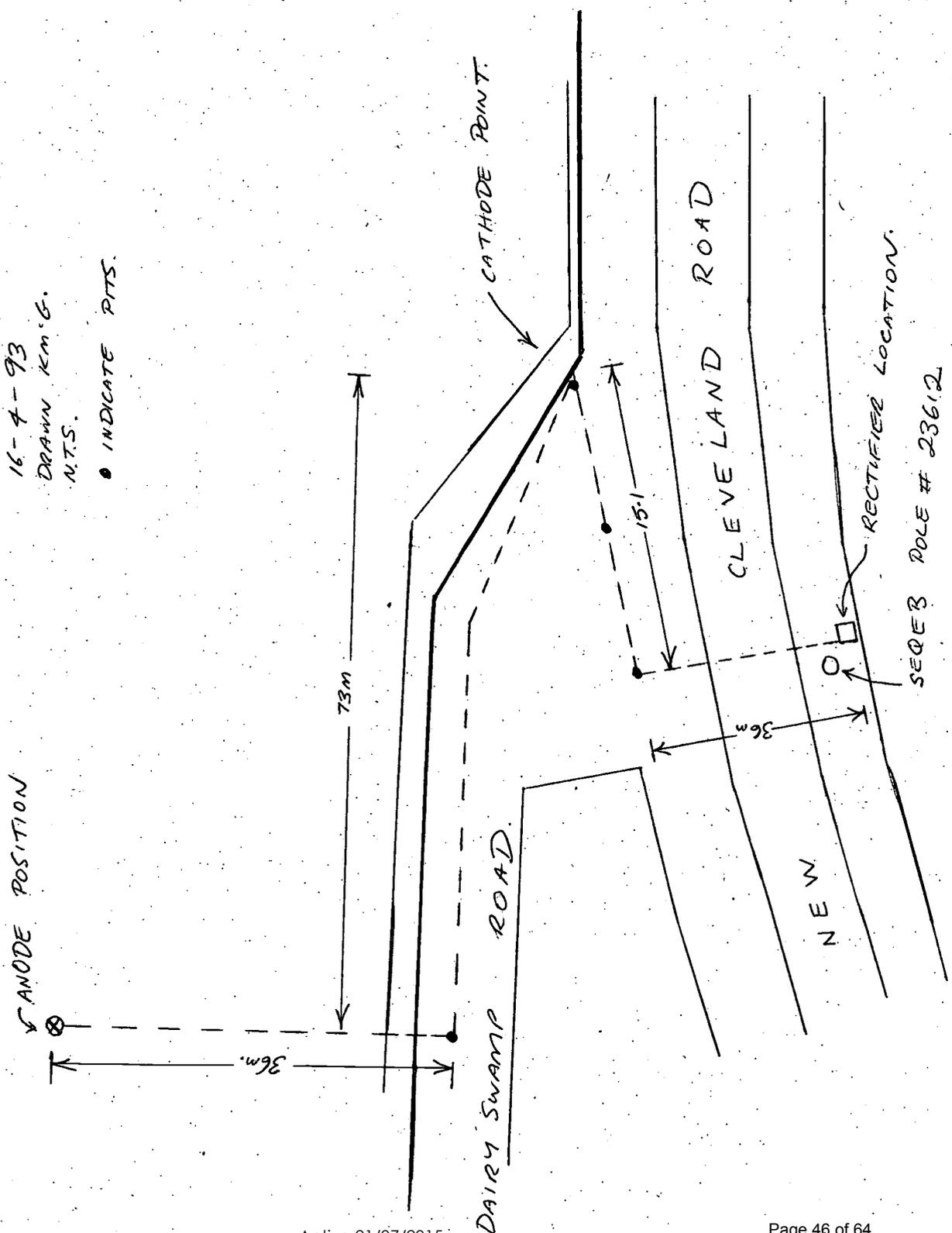
COMMENTS - Flange not removed; half gasket fitted originally; corrosion between gaskets removed w/- hacksaw blade;

TESTED BY - gap sealed w/- silicon sealant

DAIRY SWAMP RD RECTIFIER,
ANODE & CATHODE LOCATION.

16-4-93
DRAWN K.M.G.
N.T.S.

● INDICATE PITS.



 SEQEB The South East Queensland Electricity Board	APPLICATION FOR THE SUPPLY OF ELECTRICITY	
	City Office	
	150 Charlotte Street, Brisbane, 4000 G.P.O. Box 1461, Brisbane, 4001	
	NOTE: (i) PLEASE CONSULT TELECOM DIRECTORY FOR LOCAL OFFICES (ii) PLEASE PRINT AND COMPLETE ALL SECTIONS OF THIS FORM	
	PLEASE NOTE: LODGEMENT OF A SECURITY DEPOSIT IS REQUIRED PRIOR TO TAKING OVER SUPPLY. APPLICATION FOR DOMESTIC PREMISES REQUIRES CUSTOMERS TO PROVIDE PROOF OF IDENTITY, OR A HIGHER AMOUNT OF SECURITY DEPOSIT (\$150) MAY BE CHARGED.	
OFFICE USE ONLY		
Where application lodged?	Customer Account No.	
Date lodged / /	Security Deposit \$	
Staff I.D.	Premises Identity No.	
I.D. Verified <input type="checkbox"/> YES <input type="checkbox"/> NO	F/S No.	

1. NAME(S) OF APPLICANT(S)

CHRISTIAN OR GIVEN NAMES SURNAME

MR MRS
MISS MS
MR MRS
MISS MS
MR MRS
MISS MS

*B. C. C. W. S. & S. DEPT.
MECH. & ELECT. BRANCH.
MUNYA ST., EAGLE FARM.*

BUSINESS NAME

2. CONTACT TELEPHONE NO(S)

~~PRIVATE~~ BUSINESS 225 4207

3. ADDRESS WHERE SUPPLY IS REQUIRED

UNIT/FLAT/SHOP NO HOUSE/STREET NO. LOT NO.

STREET NEW CLEVELAND RD (OPP. DAILY SWAMP RD)

LOCALITY TINGALPA POST CODE

4. DATE OF TAKING OVER SUPPLY OF ELECTRICITY

PROPERTY NAME CATHOLIC PROTECTION RECTIFIED UNIT

25/3/92 5. TARIFF IF KNOWN 21 6. IS SUPPLY CONNECTED NOW?
 YES NO

7. POSTAL ADDRESS FOR ACCOUNTS (IF SAME WRITE AS ABOVE)

B. C. C. W. S. & S. DEPT.
MECH. & ELECT. BRANCH,
MUNYA ST., EAGLE FARM. POST CODE

8. NATURE OF PREMISES (DOMESTIC/COMMERCIAL/ INDUSTRIAL/FARMING)

9. DOG ON PREMISES? YES NO
BREED

10. NAME OF LAST CUSTOMER

11. NAME AND ADDRESS OF OWNER OR AGENT OF PREMISES

12. PLEASE STATE THE NAME & ADDRESS OF YOUR EMPLOYER

13. PLEASE STATE YOUR PREVIOUS ADDRESS

14. IS A FINAL READING REQUIRED AT YOUR OLD ADDRESS?
 YES NO
DATE REQUIRED 1/1/
(48 HRS ADVICE REQUIRED)

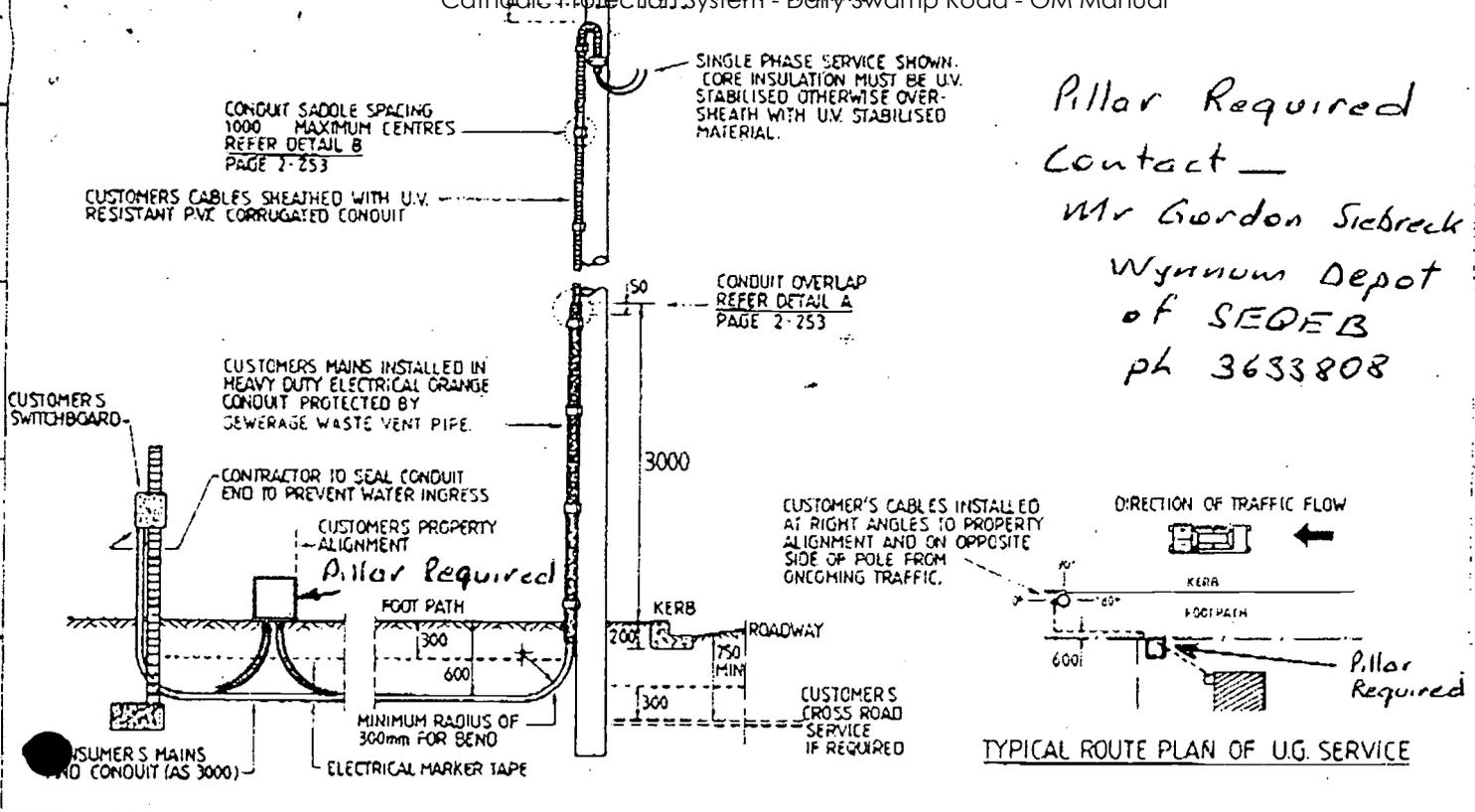
15. I/WE JOINTLY AND SEVERALLY, HEREBY MAKE APPLICATION FOR THE SUPPLY OF ELECTRICITY TO THE PREMISES UNDER THE TERMS SET OUT UNDER THE ELECTRICITY ACT 1976-1986 AND ITS REGULATIONS.

SIGNATURES OF APPLICANTS

[Signature]

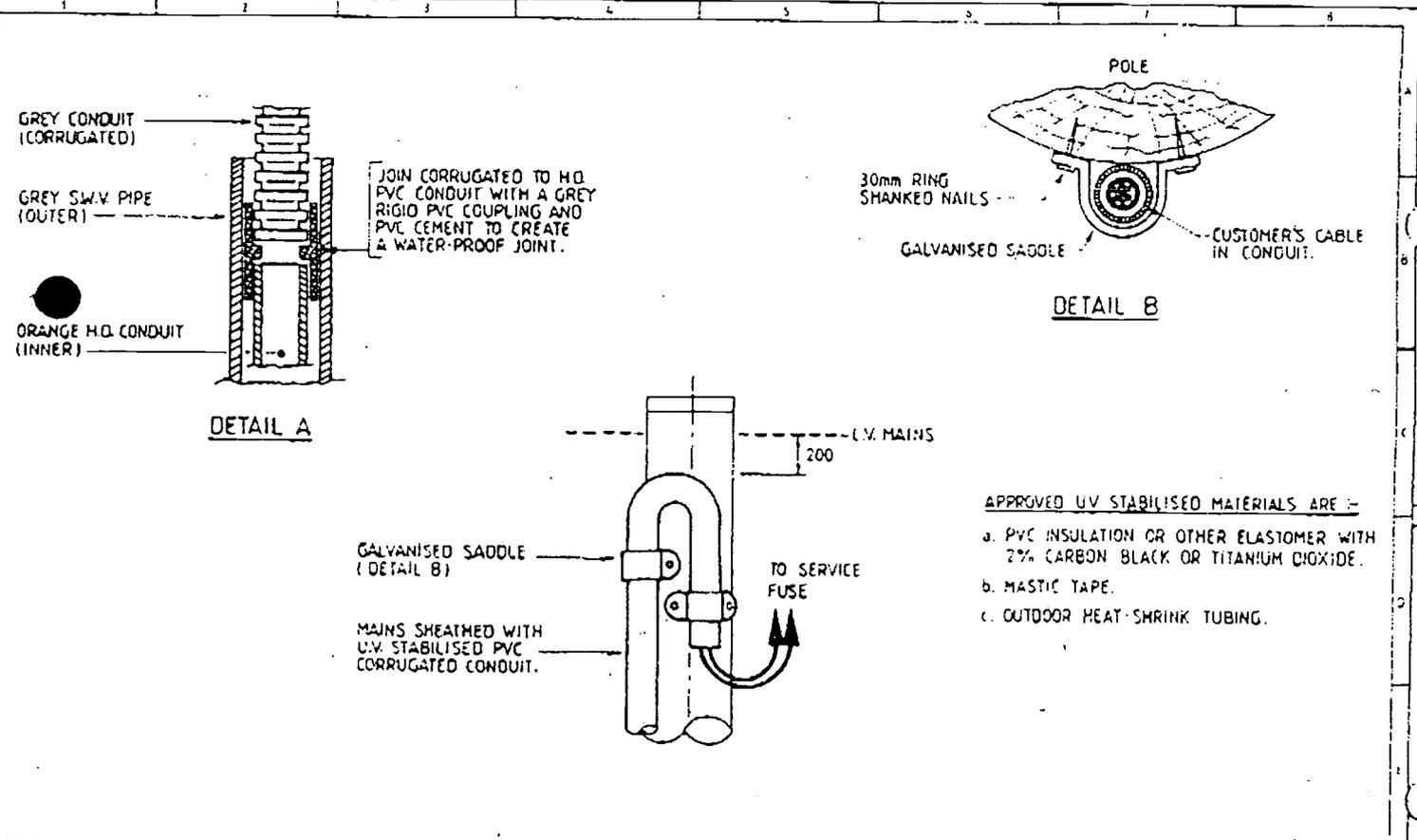
DATE 17/3/92

FORM 95 (5/7/88 (11N 20815))



Pillar Required
Contact
Mr Gordon Siebreck
Wynnum Depot
of SEQEB
ph 3633808

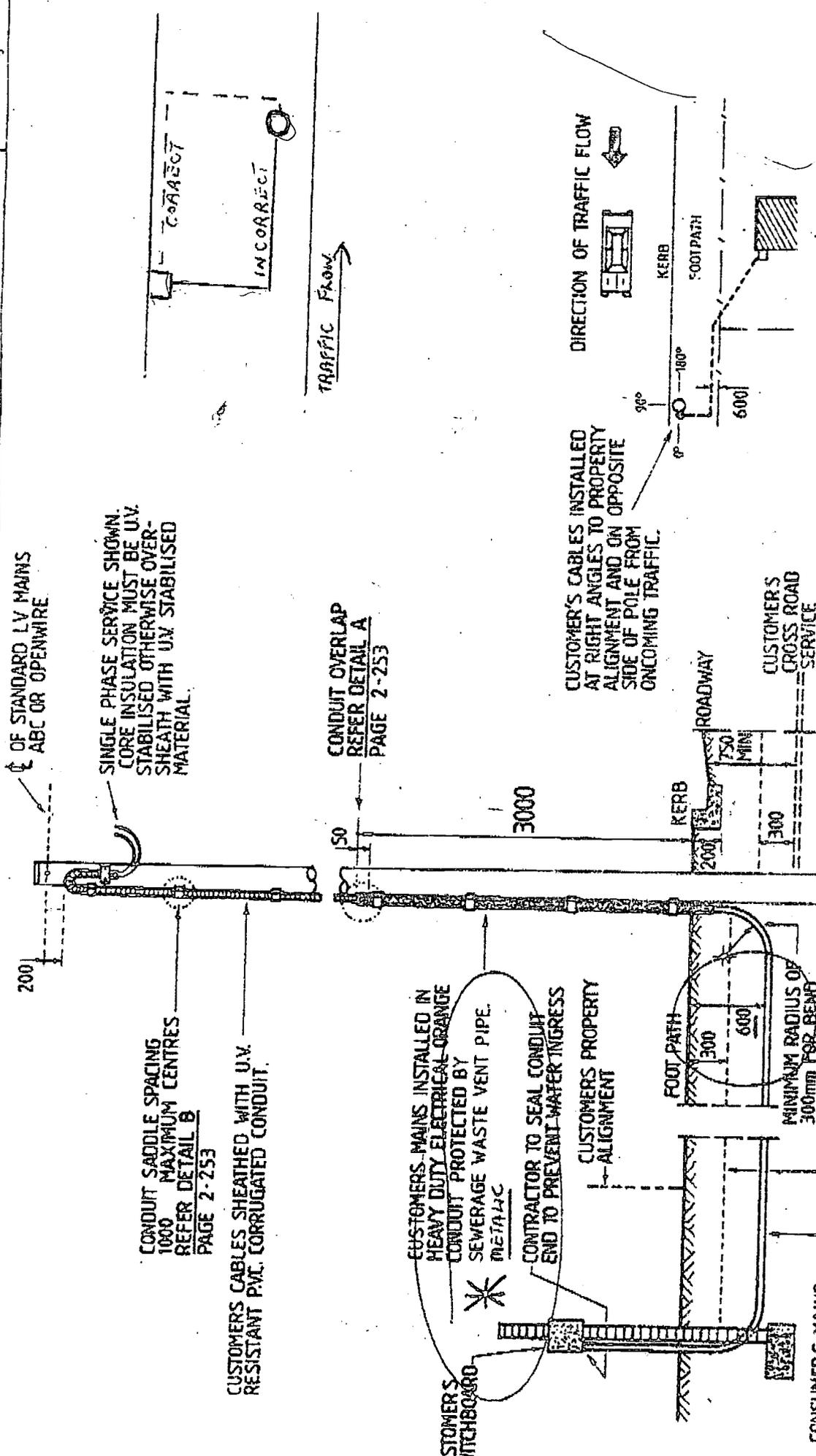
A	ORIGINAL ISSUE	THE SOUTH EAST QUEENSLAND ELECTRICITY BOARD OVERHEAD MANUAL MASTER DRAWING		APP'D <i>G. Palmer</i>	CODE NO 110-69
		SERVICES		DATE 9 NOV 88	4813-A3
		O.H. TO U.G. SUPPLY - CUSTOMER'S SERVICE		REC'D <i>P. Smith</i>	SHEET 250 - NEXT SHEET -
				DATE <i>G. Palmer</i>	A
				BY <i>MW</i>	SECT 2
					PAGE 255



A	ORIGINAL ISSUE	THE SOUTH EAST QUEENSLAND ELECTRICITY BOARD OVERHEAD MANUAL MASTER DRAWING		APP'D <i>G. Palmer</i>	CODE NO 110-69
		SERVICES		DATE 9 NOV 88	4813-A3
		O.H. TO U.G. CUSTOMER'S SUPPLY GENERAL REQUIREMENTS		REC'D <i>P. Smith</i>	SHEET 250 - NEXT SHEET -
				DATE <i>G. Palmer</i>	A
				BY <i>MW</i>	SECT 2
					PAGE 253

APP'D: <i>W. H. ...</i>	CODE NO 170-69
DATE 9 Nov 88	4813 - A3
REC'D: <i>C. ...</i>	SHEET 235 - NEG SHEET -
BY: <i>G. ...</i>	A
	SECT
	PAGE

TYPICAL ROUTE PLAN OF U.G. SERVICE

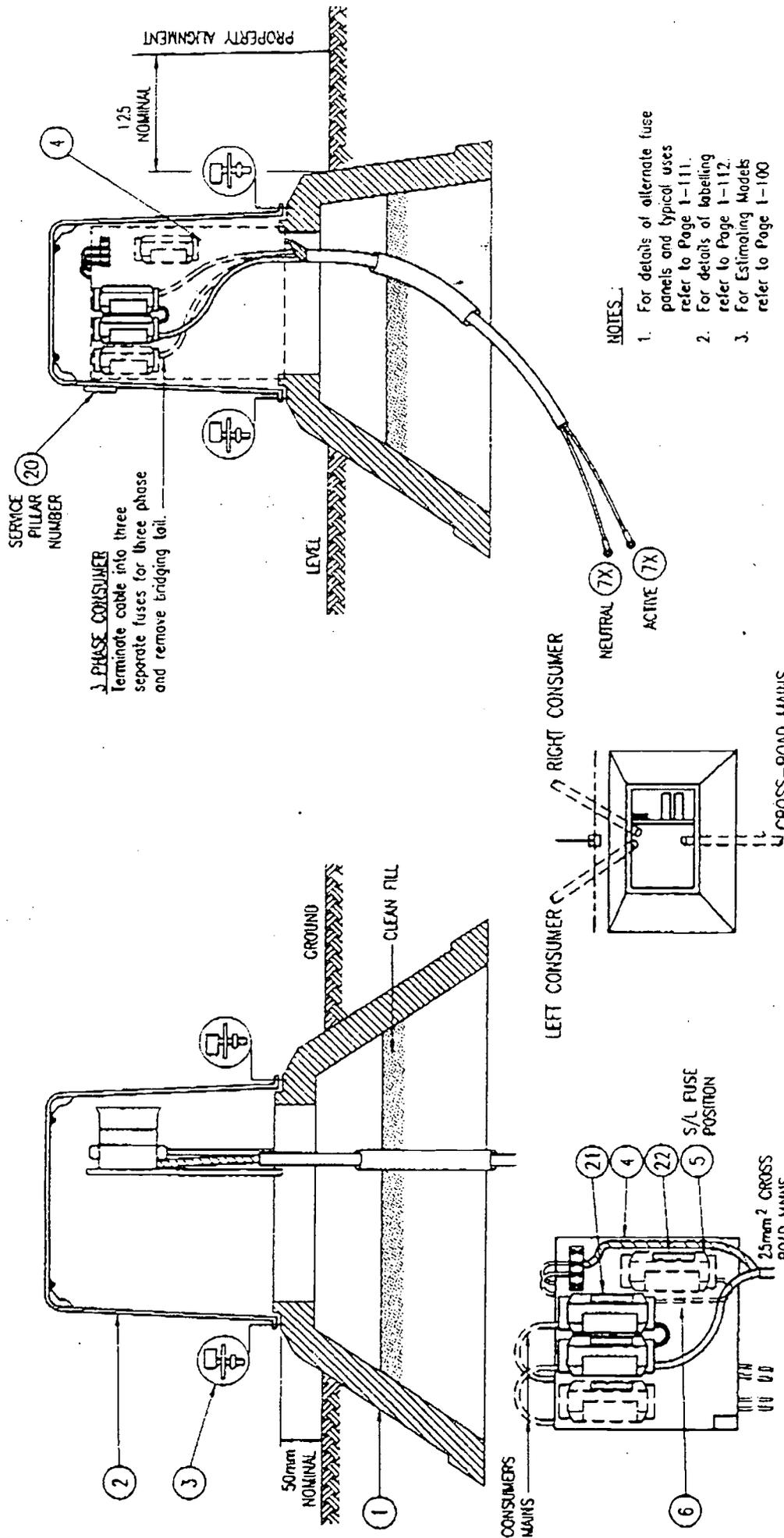


THE SOUTH EAST QUEENSLAND ELECTRICITY BOARD
OVERHEAD MANUAL MASTER DRAWING

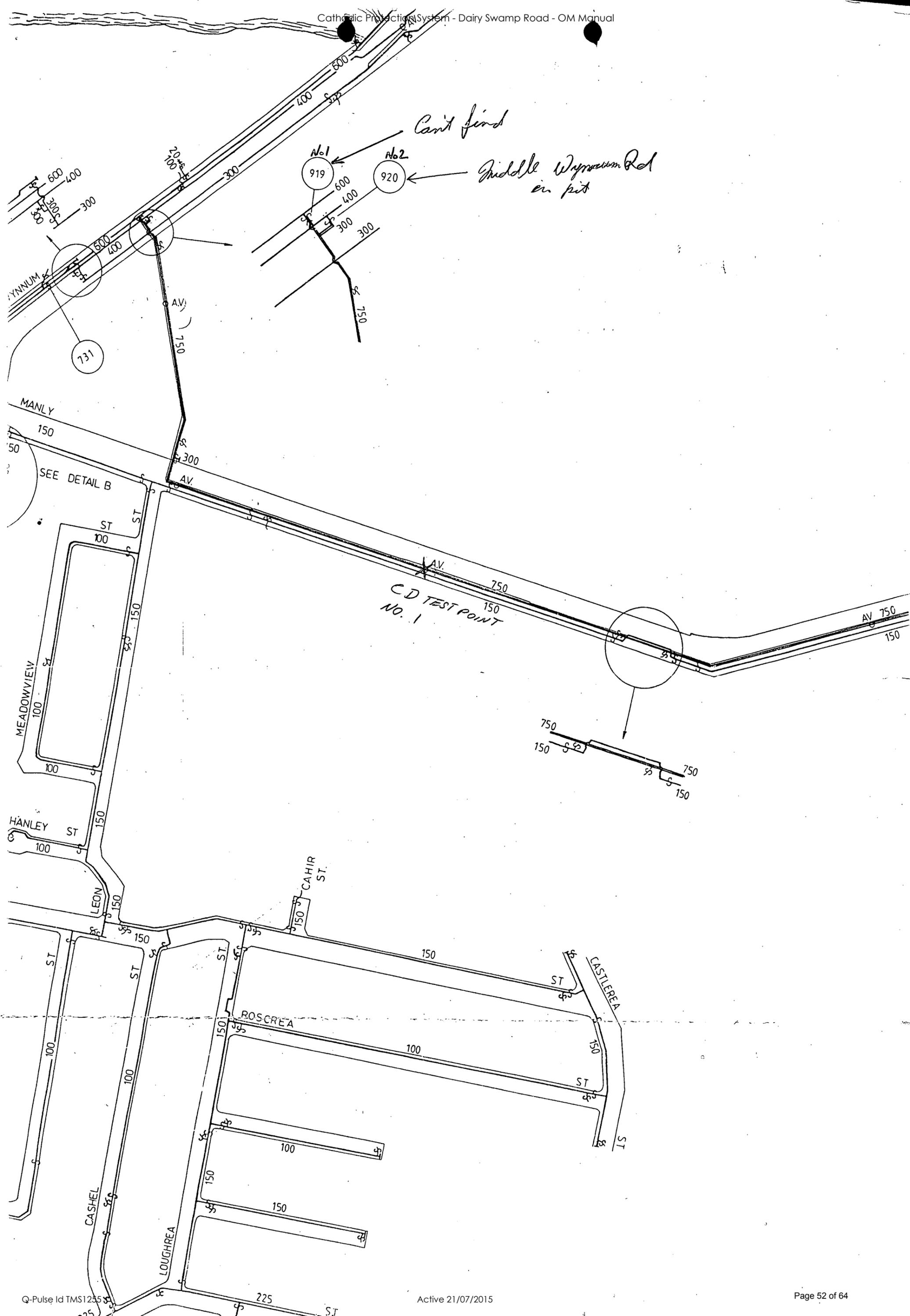
SERVICES

O.H. TO U.G. SUPPLY -
MICROMED'S SERVICE

ORIGINAL ISSUE



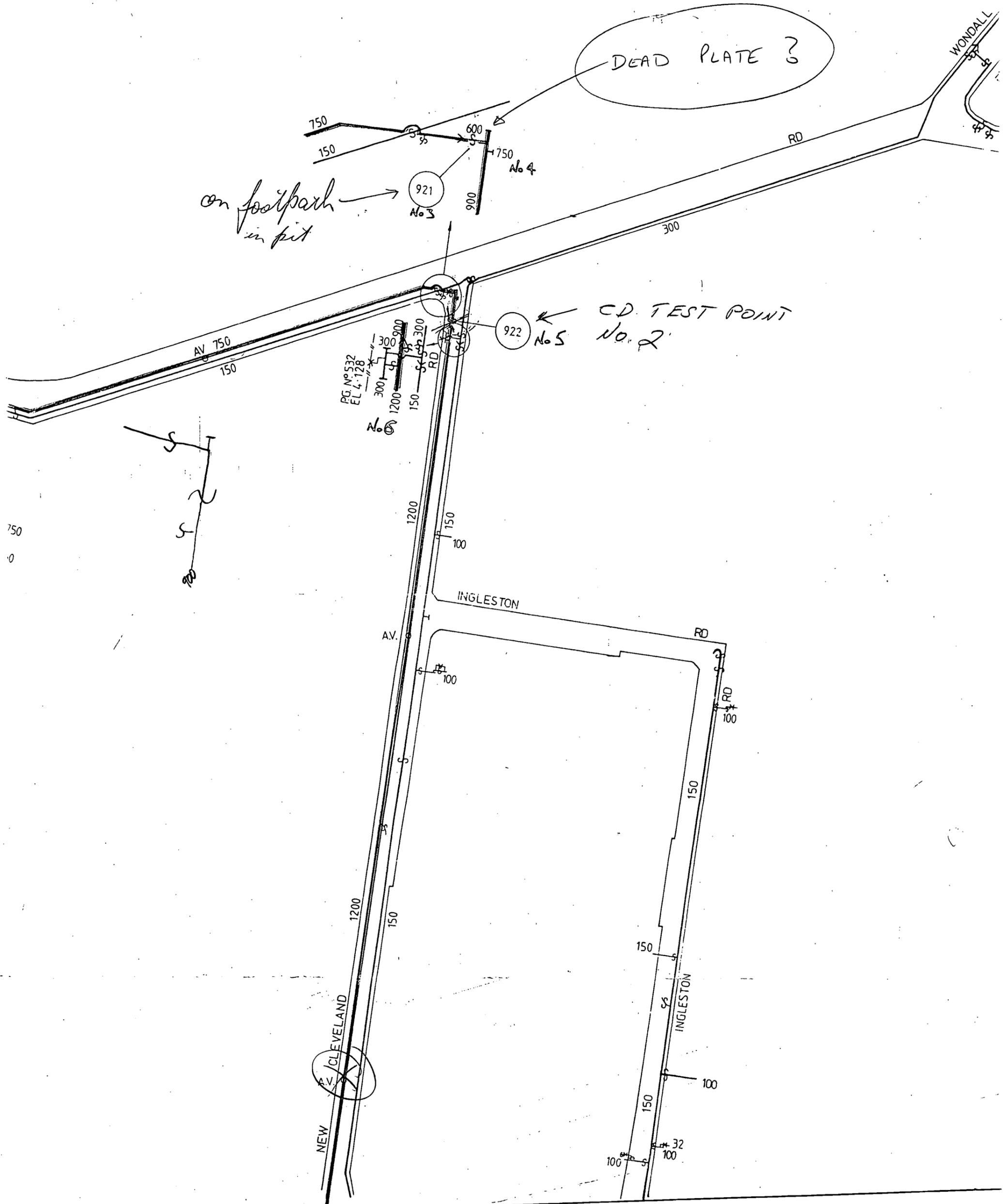
ORIGINAL ISSUE	A	THE SOUTH EAST QUEENSLAND ELECTRICITY BOARD UNDERGROUND JOINTING MANUAL		APPRO <i>AB</i>	MAINS C.A.D.
		L.V. SUPPLY PILLAR - SINGLE 2 and 4 COND. 25mm ² Cu CHN CABLE CROSS ROAD MODELS		DATE 23.10.91	7032-A3 A
© COPYRIGHT 1991 SEQEB This drawing must not be reproduced in part or whole without author's permission from SEQEB		REVISIONS		CHK <i>J. Taylor</i>	SECT 1
		DWN		M.N.	PAGE 105
					SHEET 2 OF 2
					FILE 7032A3-2.dwg



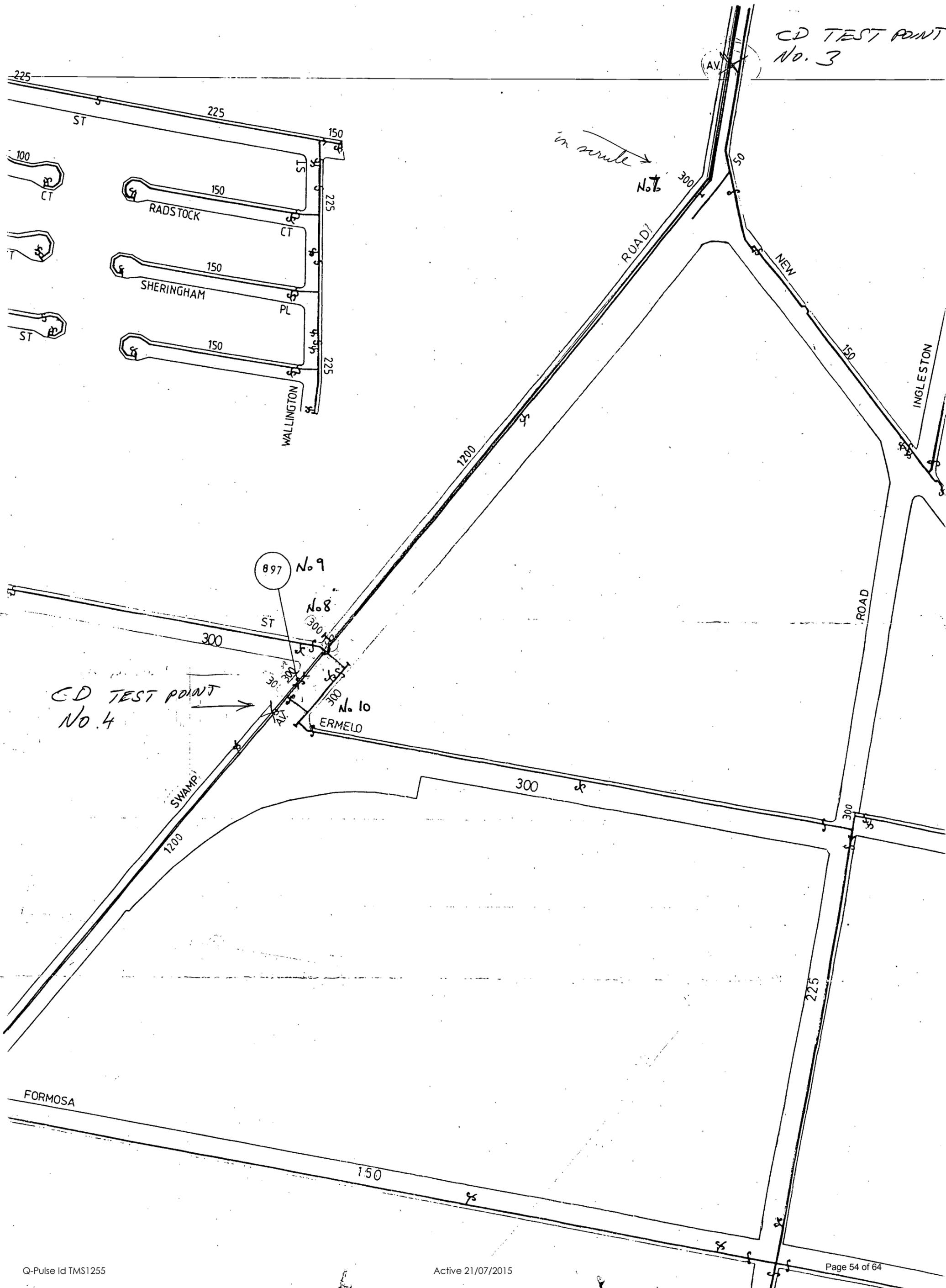
Can't find

Middle Wymann Rd
in pit

C.D TEST POINT
NO. 1



ZONES



CD TEST POINT
No. 3

in route →

CD TEST POINT
No. 4

897 No. 9

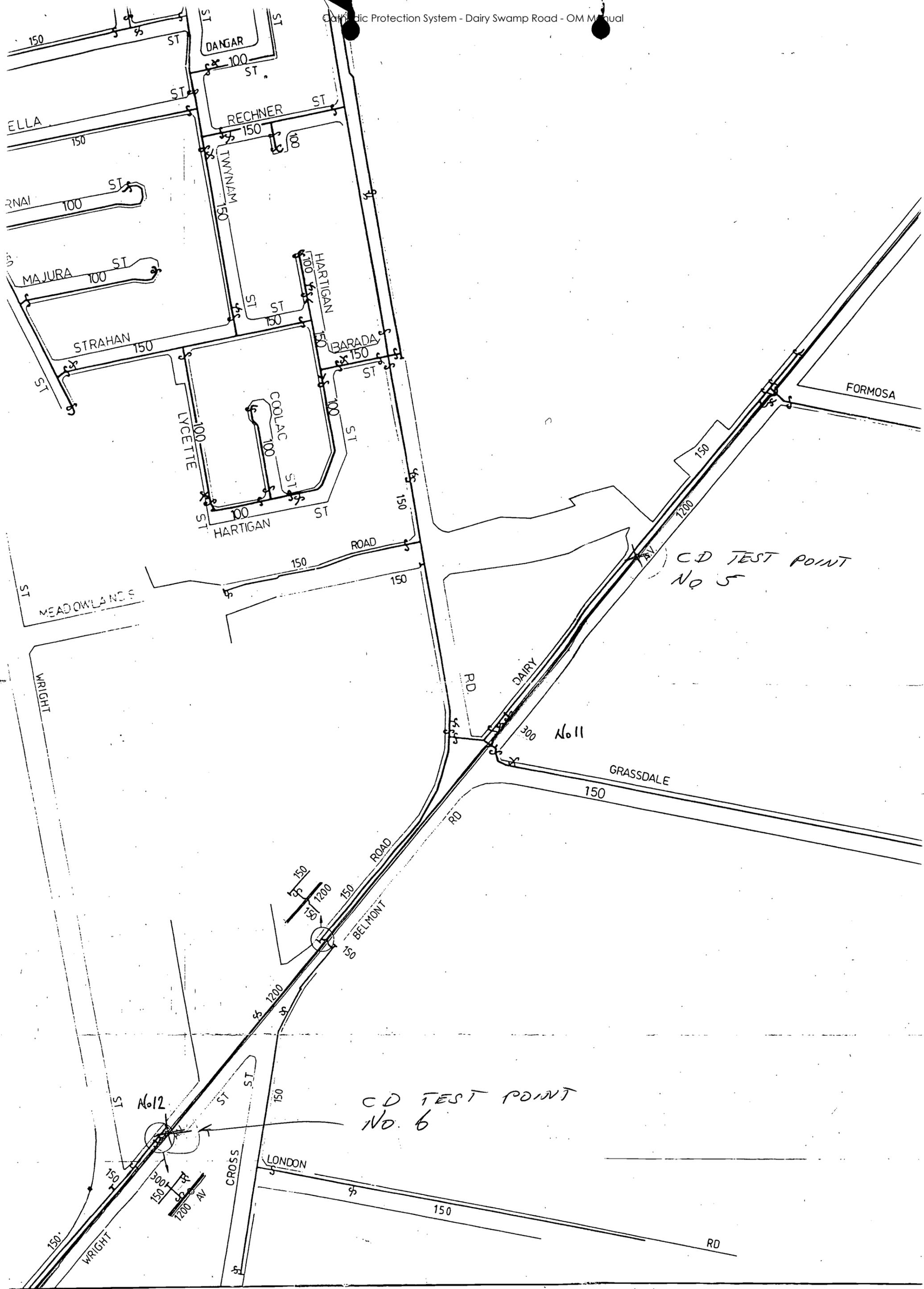
No. 8

No. 10

ERMELD

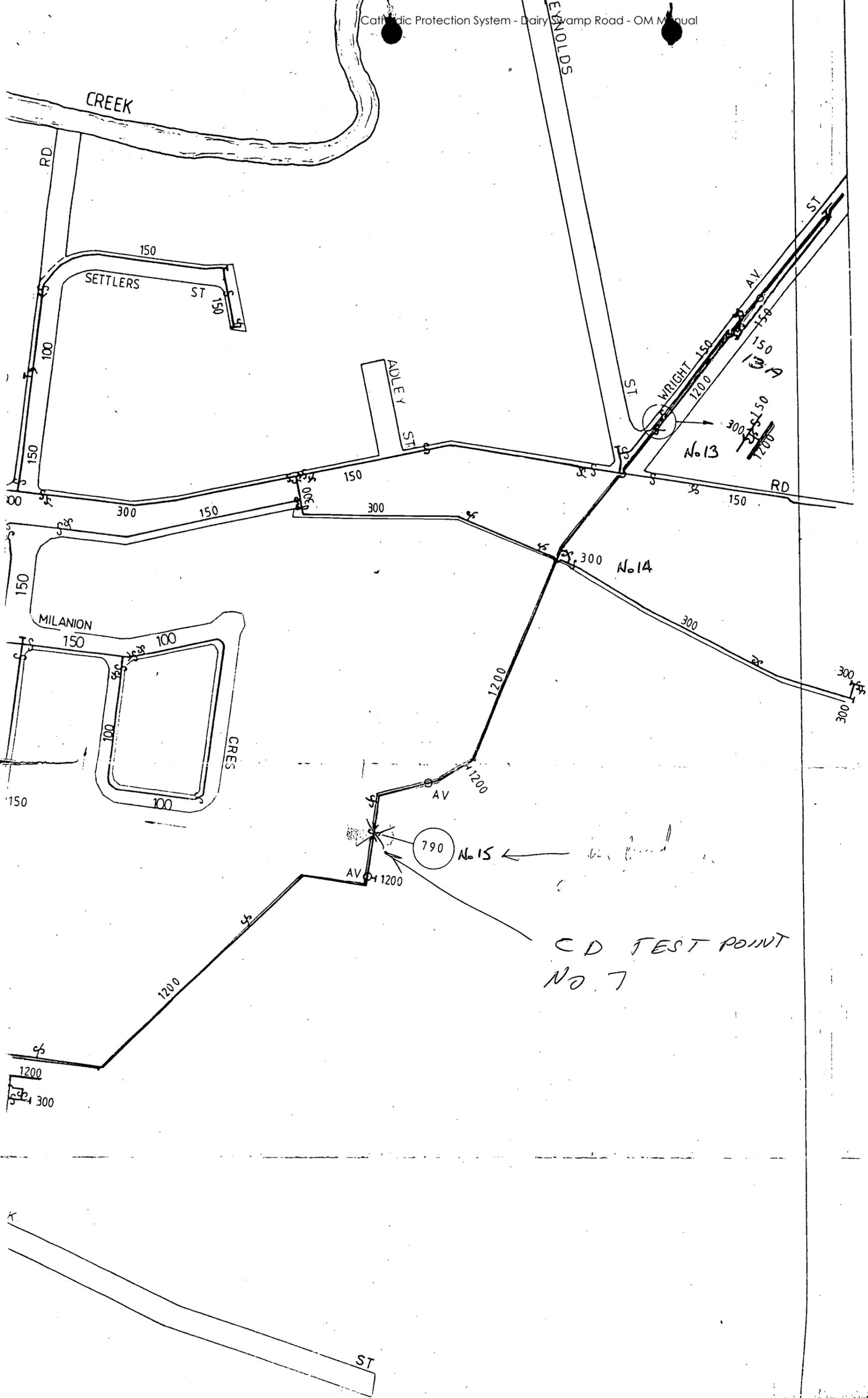
FORMOSA

INGLESTON



RESERVOIR	CAPACITY (ML.)	T.W.L.	EFF. DEPTH
WELLERS HILL No 1	68.20	58.31	10.46

RESERVOIR	CAPACITY (ML.)	TW
TARRAGINDI	60.80	78.7





OF BRISBANE
4 CHAINS TO AN INCH

27-12-90

Closest to Manly Rd Cur.
I/S bridged

~~Residual~~ -760 mV
NATURAL

-900 mV 0.3A @ 15V
-1.18 V 2A @ 40V

Manly Rd side

~~Residual~~ -816 mV
NATURAL -890 mV 0.3A @ 15V

New Cleveland Rd side

~~Residual~~ -730 mV
NATURAL -910 mV 0.3A @ 15V

Manly Rd

~~Resolved~~

NATURAL

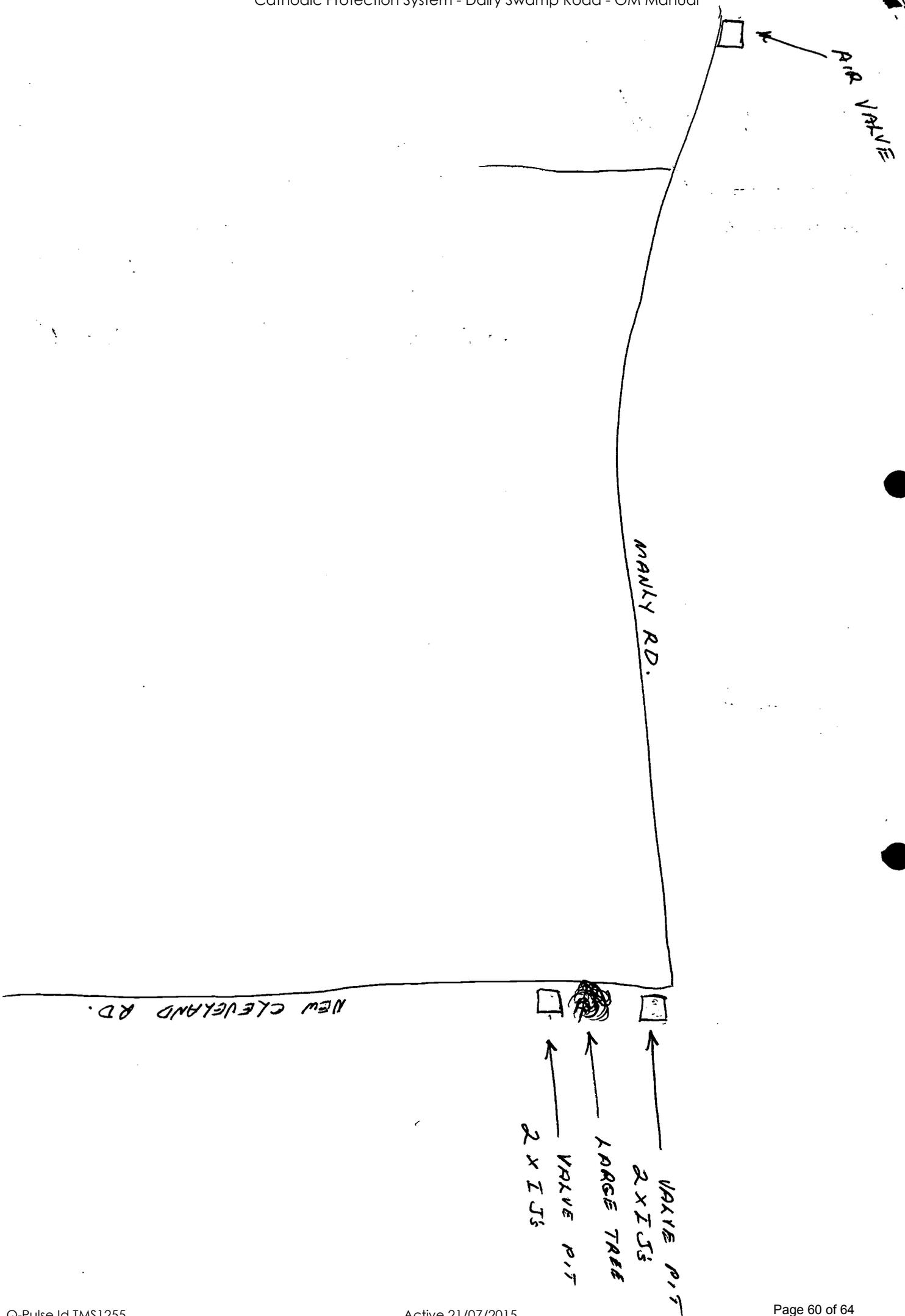
- 458 mV

- 483 0.3A 15V

- 520 2A 40V

Wynnum Rd

~~Resolved~~



CURRENT DRAIN TESTS

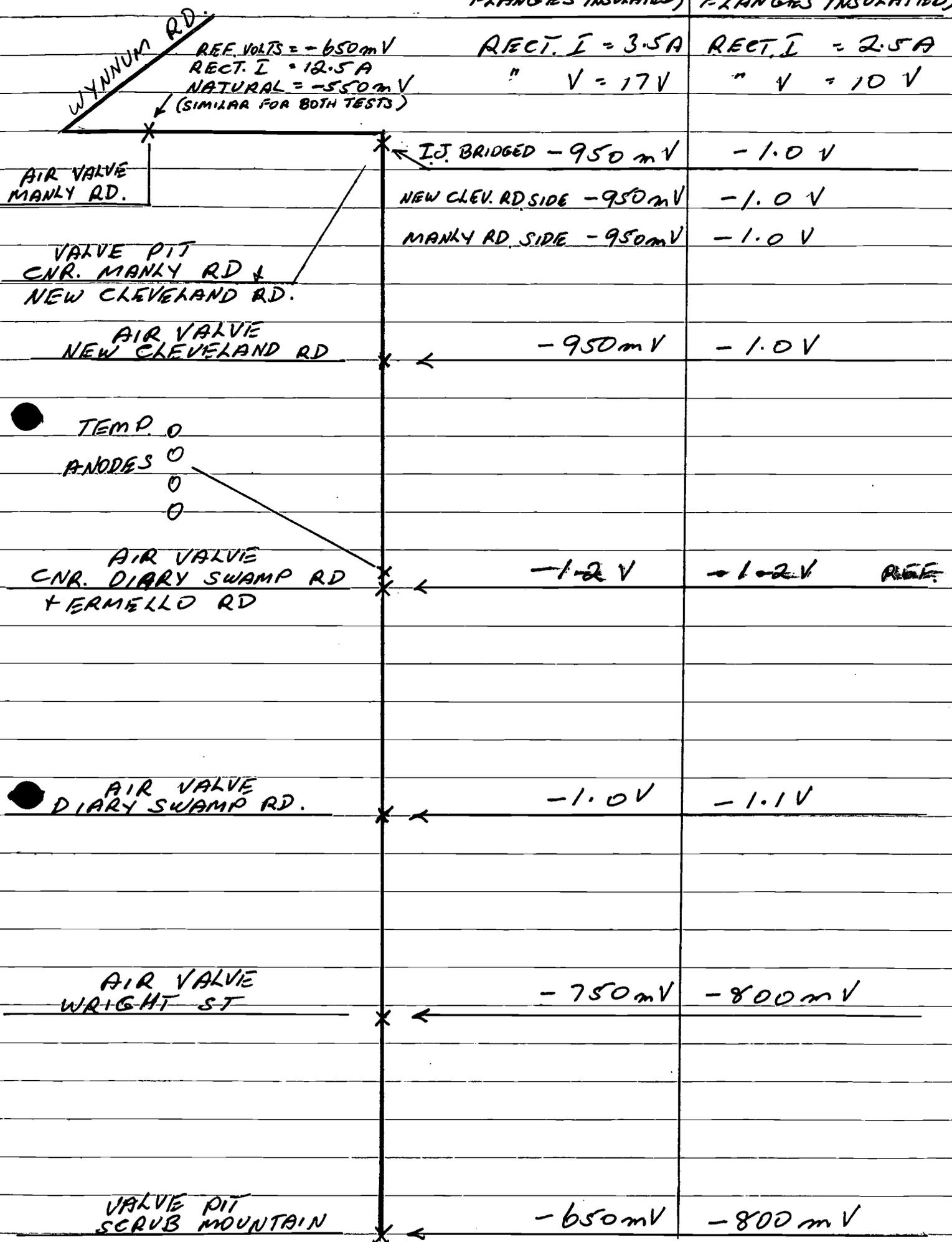
29-8-90

18-12-90

DAIRY SWAMP RD.

1ST TEST
(BEFORE TEE OFF
FLANGES INSULATED)

2ND TEST
(AFTER TEE OFF
FLANGES INSULATED)



ALL POTENTIALS W/ REF. TO Cu/CuSO4

CURRENT DRAIN TESTS

Cathodic Protection System - Dairy Swamp Rd. - QM Manual

2908-90

18-12-90

DAIRY SWAMP RD.

1ST TEST
(BEFORE TEE OFF
FLANGES INSULATED)

2ND TEST
(AFTER TEE OFF
FLANGES INSULATED)

WYNNHAM RD.

REF. VOLTS = -650mV
RECT. I = 12.5 A
NATURAL = -550mV
(SIMILAR FOR BOTH TESTS)

RECT. I = 4.5 A
" V = 20V

RECT. I = 3 A
" V = 11V

AIR VALVE
MANKY RD.

I.J. BRIDGED -1.3 V -1.1 V

VALVE PIT
CNR. MANKY RD +
NEW CLEVELAND RD

NEW CLEV. RD. SIDE -1.3V -1.1V

MANKY RD. SIDE -1.3V -1.1V

AIR VALVE
NEW CLEVELAND RD.

-1.3V -1.1V

TEMP. 0
ANODES 0
0

AIR VALVE
CNR. DAIRY SWAMP RD +
ERMELLO RD.

-1.6V -1.3V

AIR VALVE
DAIRY SWAMP RD.

-1.4V -1.2V

AIR VALVE
WRIGHT ST.

-990mV -900mV

VALVE PIT
SCRUB MOUNTAIN

-900mV -900mV REF.

CURRENT DRAIN TESTS

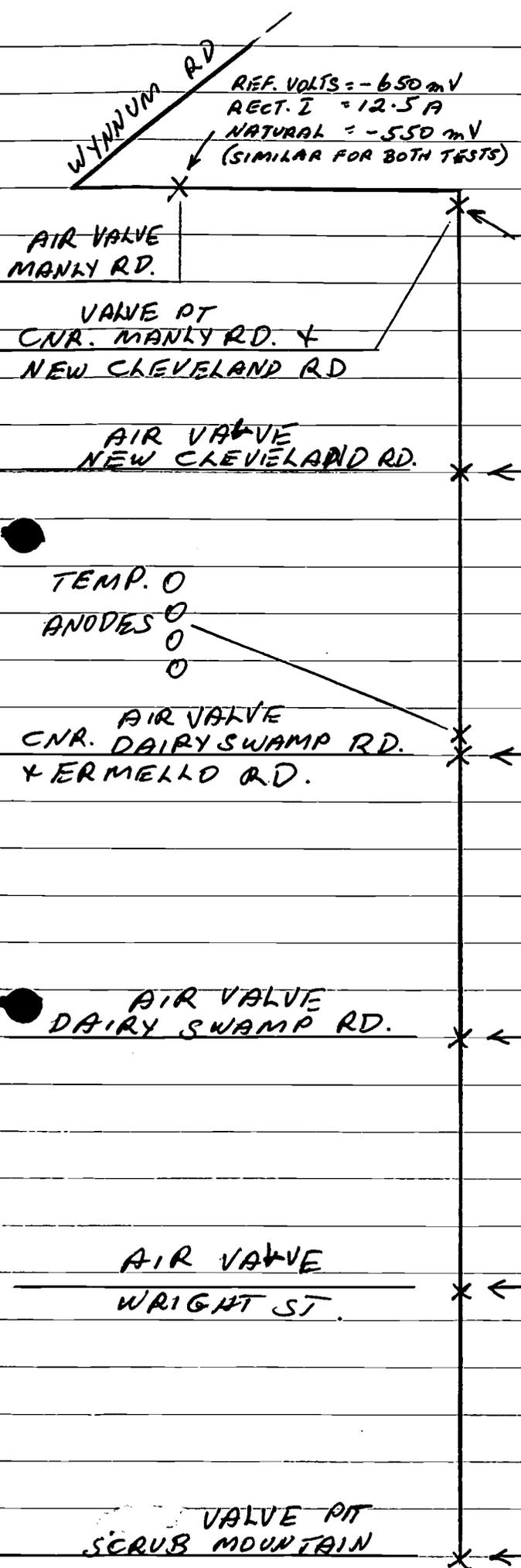
29-8-90

18-12-90

DAIRY SWAMP RD.

1ST. TEST
(BEFORE TEE OFF FLANGES INSULATED)

2ND TEST
(AFTER TEE OFF FLANGES INSULATED)



REF. VOLTS = -650 mV
RECT. I = 12.5 A
NATURAL = -550 mV
(SIMILAR FOR BOTH TESTS)

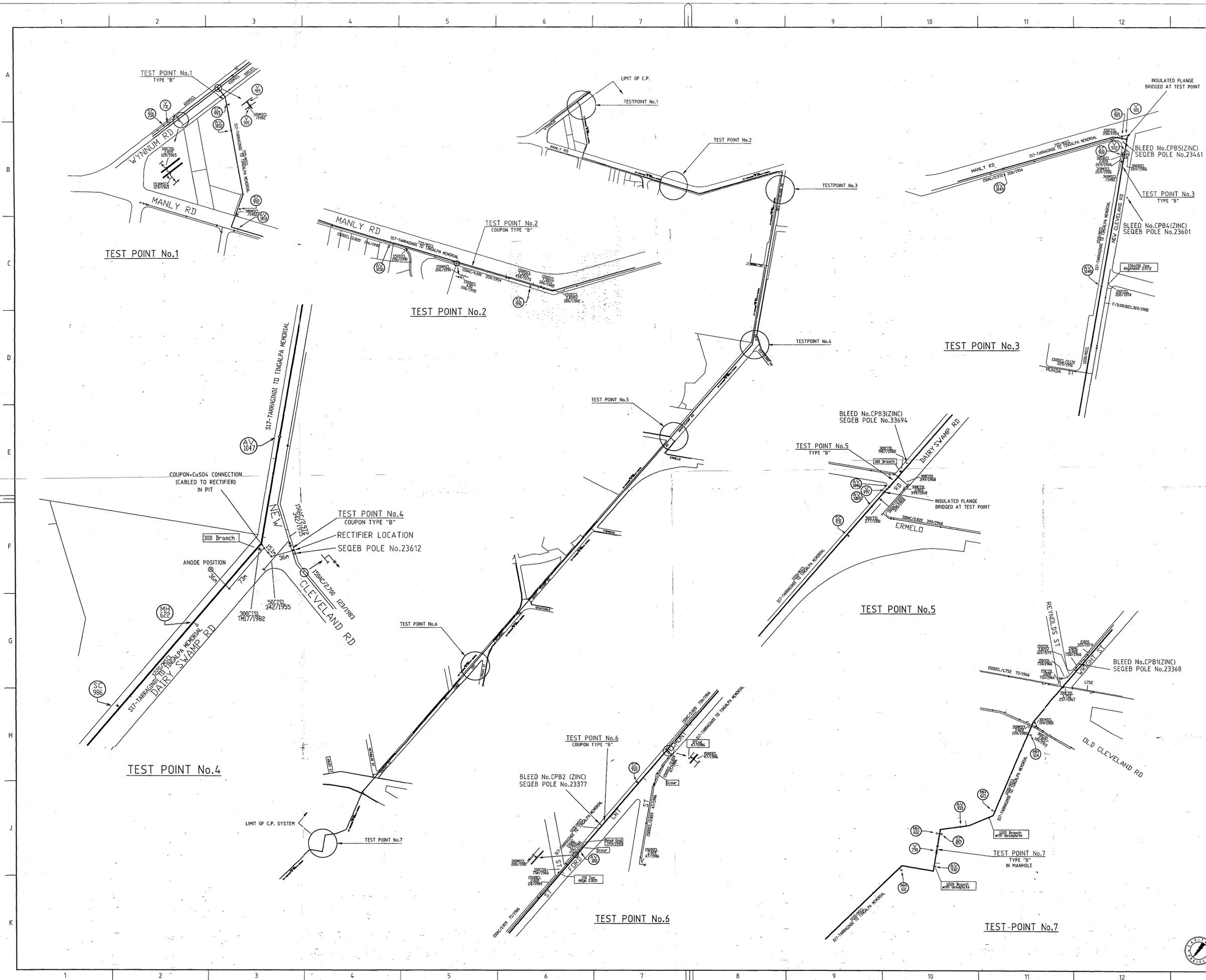
RECT. I = 2.5 A
" V = 12 V

RECT. I = 1.5 A
" V = 6 V

	-720 mV	-750 mV
AIR VALVE MANLY RD.	NATURAL = -650 mV	-620 mV
VALVE AT CNR. MANLY RD. & NEW CLEVELAND RD.		
AIR VALVE NEW CLEVELAND RD.	-720 mV	-750 mV
	NATURAL = -500 mV	-540 mV
TEMP. 0 ANODES 0 0 0		
AIR VALVE CNR. DAIRY SWAMP RD. & ERMELLO RD.	-900 mV	-900 mV REF.
	NATURAL = -500 mV	-550 mV
AIR VALVE DAIRY SWAMP RD.	-750 mV	-850 mV
	NATURAL = -500 mV	-520 mV
AIR VALVE WRIGHT ST.	-550 mV	-650 mV
	NATURAL = 537 mV	-500 mV
VALVE AT SCRUB MOUNTAIN	-520 mV	-650 mV
	NATURAL = 520 mV	-500 mV

ALL POTENTIALS W/ REF. TO Cu/CuSO4

NOTES



0	17.3.94	AS BUILT	R.L.
No	DATE	AMENDMENT	INITIALS

AMENDMENT & ISSUE REGISTER

MANAGER	DIRECTOR OF PLANNING & DESIGN
DATE:	DATE:

DIRECTOR OF CONSTRUCTION	DIRECTOR OF SERVICES	DIRECTOR OF SEW. OPERATIONS/W.S. DISTRIBUTION
DATE:	DATE:	DATE:

DESIGN	JRS	17.3.94	ENGINEER IN CHARGE
DRAWN	R.L.	17.3.94	SUPERVISING ENGINEER

TRACED			SENIOR ENGINEER
CHECKED	A	6.4.94	ENGINEER

AUTOCAD FILE No.	REFERENCES
A66C09E	

BRISBANE CITY COUNCIL
DEPARTMENT OF WATER SUPPLY & SEWERAGE
MECHANICAL & ELECTRICAL SERVICES

PROJECT
WELLERS HILL TO MANLY T/M CATHODIC PROTECTION

TITLE
NEW CLEVELAND RD C.P. SYSTEM
WYNNUM ROAD
TO OLD CLEVELAND ROAD

SCALE: NTS	No. 1 OF 1 SHEETS	B1
DRAWING No.	486/6/6-VN1C0009E	
AMEND.	0	

