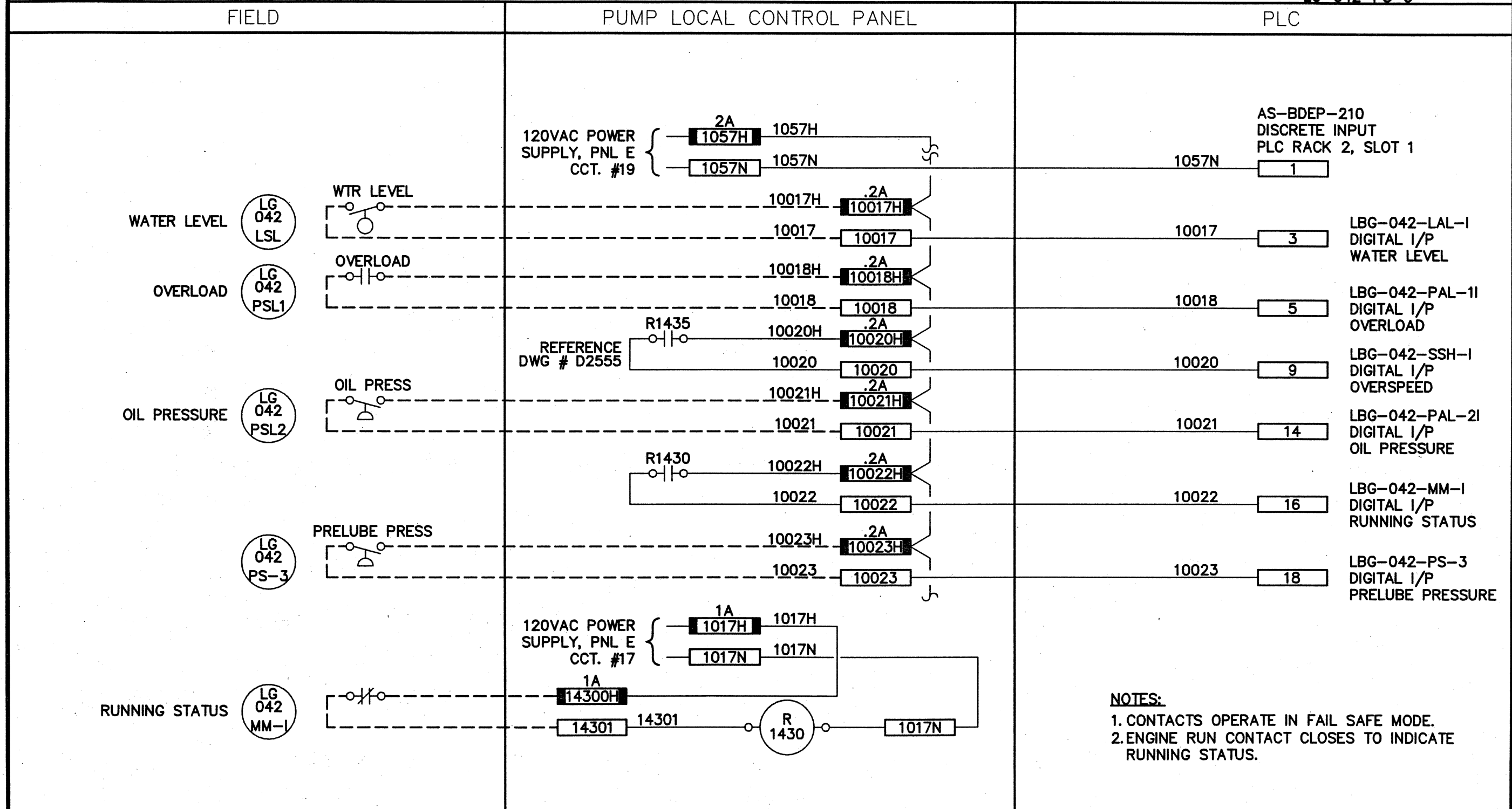





APPENDIX E

Electrical Reference Drawings

INSTRUMENT LOOP DIAGRAM LOOP NO.

LG-042-LS-1 LG-042-PSL-2
 LG-042-PSL-1 LG-042-MM-1
 LG-042-PS-3



NOTE:			JOB NO. 3153 FILENAME D2552	 THE CITY OF WINNIPEG REGIONAL WATER SUPPLY SYSTEM SUPERVISORY CONTROL AND DATA ACQUISITION	SCALE _____ DATE 94.07.29 DES PL DWN LFB CKD DN APP LK																	
				MacLEAN REGIONAL PUMPING STATION - LCP22 GAS PUMP #22 ENGINE DRIVE (SHT. 2 OF 4)	DRAWING NO. D-2552																	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th> <th>REVISION</th> <th>APP.</th> </tr> </thead> <tbody> <tr> <td>97.02.03</td> <td>2 RCPL RECORD DRAWING</td> <td>PS</td> </tr> </tbody> </table>	DATE	REVISION	APP.	97.02.03	2 RCPL RECORD DRAWING	PS	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th> <th>REVISION</th> <th>APP.</th> </tr> </thead> <tbody> <tr> <td>95.07.11</td> <td>1 AS-BUILT</td> <td>PL</td> </tr> <tr> <td>94.08.12</td> <td>0 ISSUED FOR CONST.</td> <td>PL</td> </tr> <tr> <td>94.07.29</td> <td>A ISSUED FOR APPROVAL</td> <td>PL</td> </tr> </tbody> </table>	DATE	REVISION	APP.	95.07.11	1 AS-BUILT	PL	94.08.12	0 ISSUED FOR CONST.	PL	94.07.29	A ISSUED FOR APPROVAL	PL		
DATE	REVISION	APP.																				
97.02.03	2 RCPL RECORD DRAWING	PS																				
DATE	REVISION	APP.																				
95.07.11	1 AS-BUILT	PL																				
94.08.12	0 ISSUED FOR CONST.	PL																				
94.07.29	A ISSUED FOR APPROVAL	PL																				

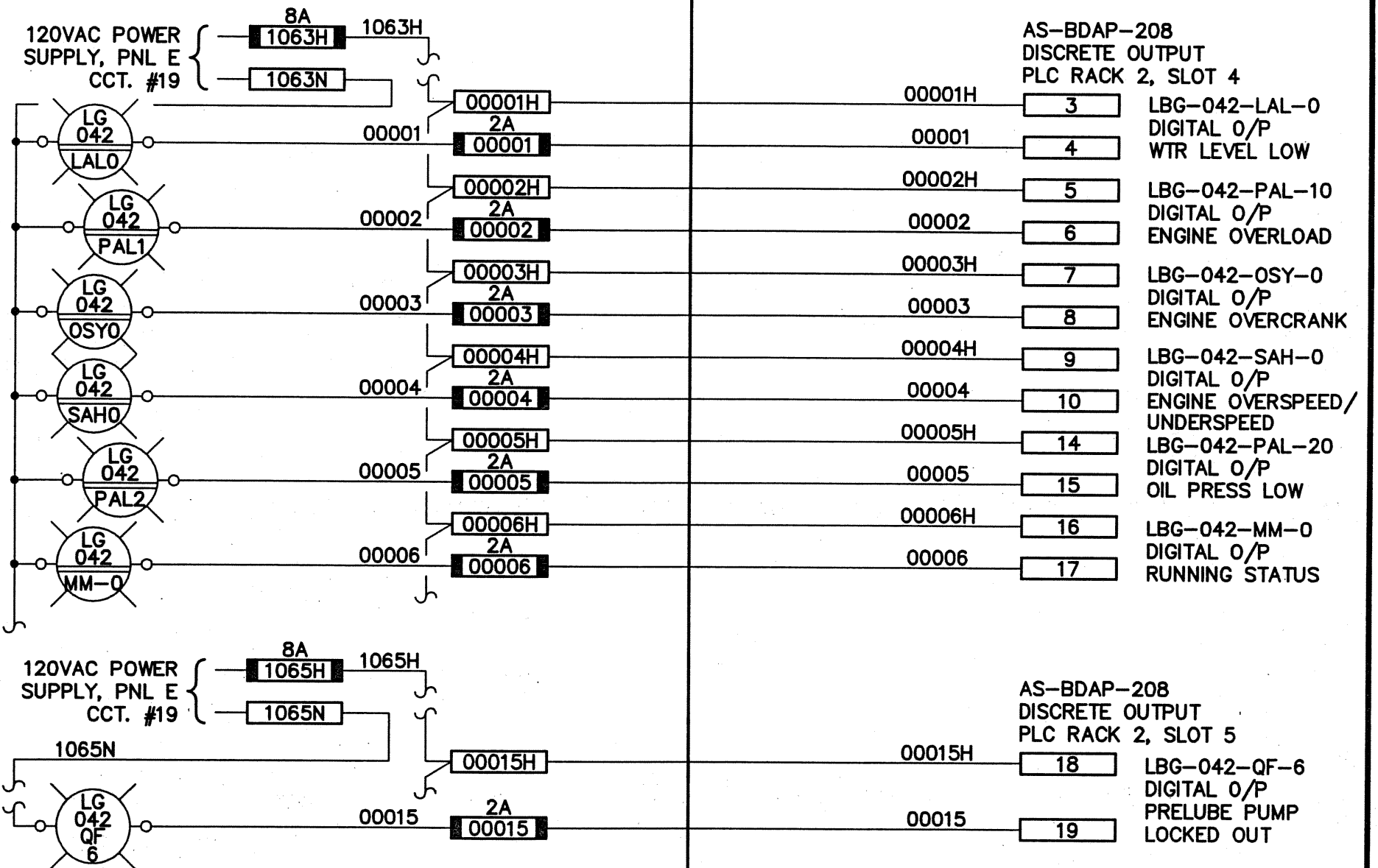
INSTRUMENT LOOP DIAGRAM

LOOP NO. **LG-042-LAL-0** **LG-042-SAH-0** **LG-042-QF-6**
LG-042-PAL1 **LG-042-PAL2**
LG-042-OSY-0 **LG-042-MM-0**

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

1. "ENG RUNNING" STATUS ● MacLEAN IS PROVIDED BY THE "CRANK SPEED SWITCH" (MOMENTARY CONTACT)

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Calgary, Alberta

JOB NO. 3153
FILENAME D2553



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

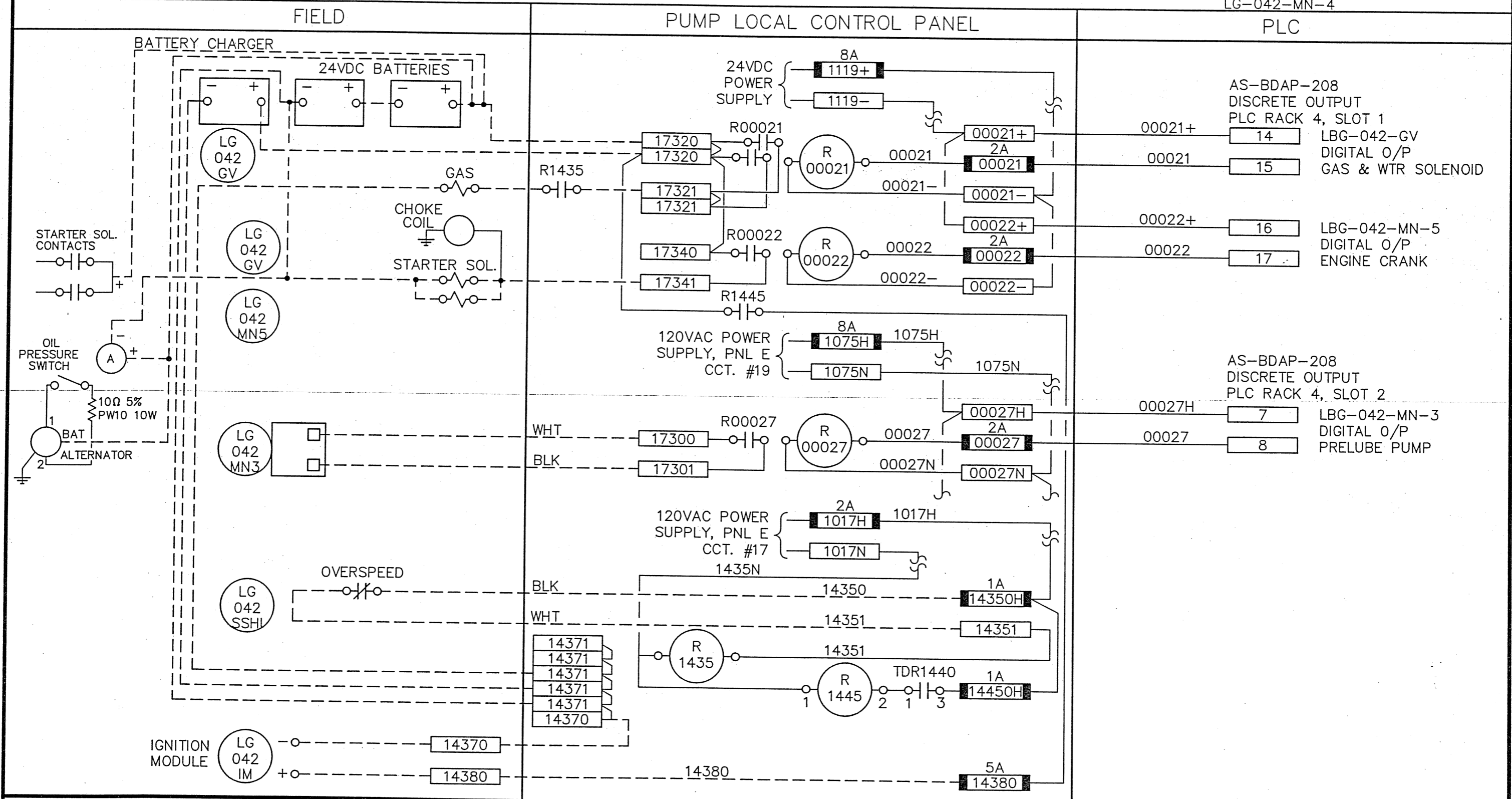
DATE	REVISION	APP.	DATE	REVISION	APP.
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94.08.12	0		ISSUED FOR CONST.		PL
94.07.29	A		ISSUED FOR APPROVAL		PL
97.02.03	2		RCPL RECORD DRAWING		PS

MacLEAN REGIONAL PUMPING STATION - LCP22
GAS PUMP #22 ENGINE DRIVE (SHT. 3 OF 4)

DRAWING NO.
D-2553

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-042-GV LG-042-MN-5
 LG-042-MN-3 LG-042-SSHI
 LG-042-MN-4



- NOTE:**
- "ENG RUNNING" STATUS @ MacLEAN IS PROVIDED BY THE "CRANK SPEED SWITCH" (MOMENTARY CONTACT)
 - TDR1440 - REFER TO DWG. D-2555
 - R 1445 - 2 POLE 30AMP 120VAC COIL RELAY

		Consulting Engineers Calgary, Alberta	
00.10.20	3	REVISED TO DATE	WKT
97.02.03	2	RCPL RECORD DRAWING	PS
DATE		REVISION	APP.

JOB NO.	3153		
FILENAME	D2554		
95.07.11	1	AS-BUILT	PL
94.08.12	0	ISSUED FOR CONST.	PL
94.07.29	A	ISSUED FOR APPROVAL	PL
DATE		REVISION	APP.

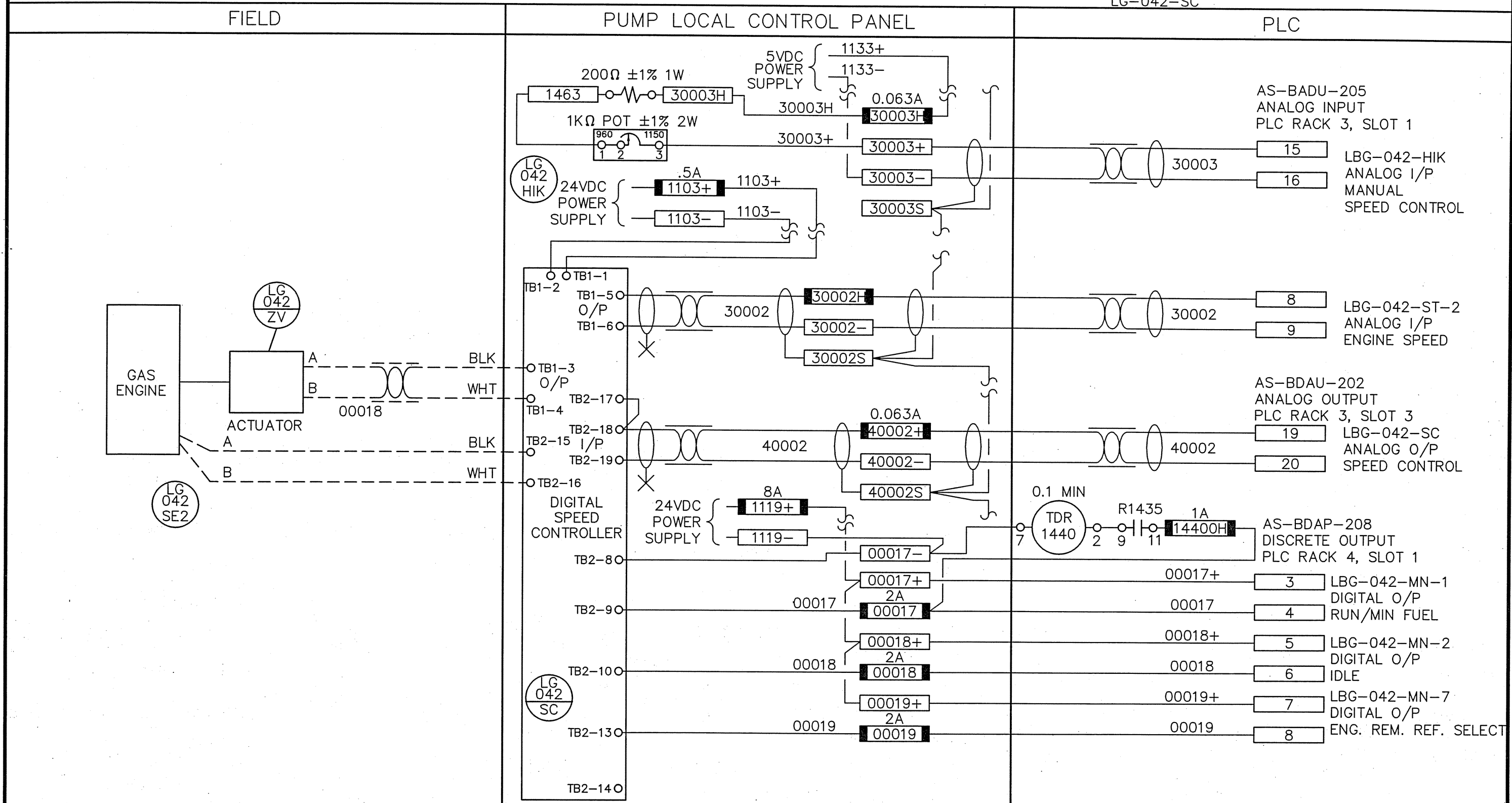
THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

MacLEAN REGIONAL PUMPING STATION - LCP22
 GAS PUMP #22 ENGINE DRIVE (SHT. 4 OF 4)

SCALE	
DATE	94.07.29
DES	PL DWN LFB
CKD	DN APP LK
DRAWING NO.	D-2554

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-042-HIK LG-042-ZV
LG-042-SE-2
LG-042-SC



NOTE:
 1. R1435 - REFER TO DWG. D-2554
 2. TDR1440 - OMRON H3CR-H POWER OFF DELAY TIMER

Reid Crowther Consulting Engineers		kenonic controls ltd. Calgary, Alberta		JOB NO. 3153	FILENAME D2555		
95.07.11	1	AS-BUILT	PL				
00.10.30	3	REVISED TO DATE	WKT	94.08.12	0	ISSUED FOR CONST.	PL
97.02.03	2	RCPL RECORD DRAWING	PS	94.07.29	A	ISSUED FOR APPROVAL	PL
DATE		REVISION	APP.	DATE		REVISION	APP.

THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

MacLEAN REGIONAL PUMPING STATION - LCP22
 GAS PUMP #22 DIGITAL SPEED CONTROL
 (SHT. 1 OF 2)

SCALE _____
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK
 DRAWING NO.
D-2555

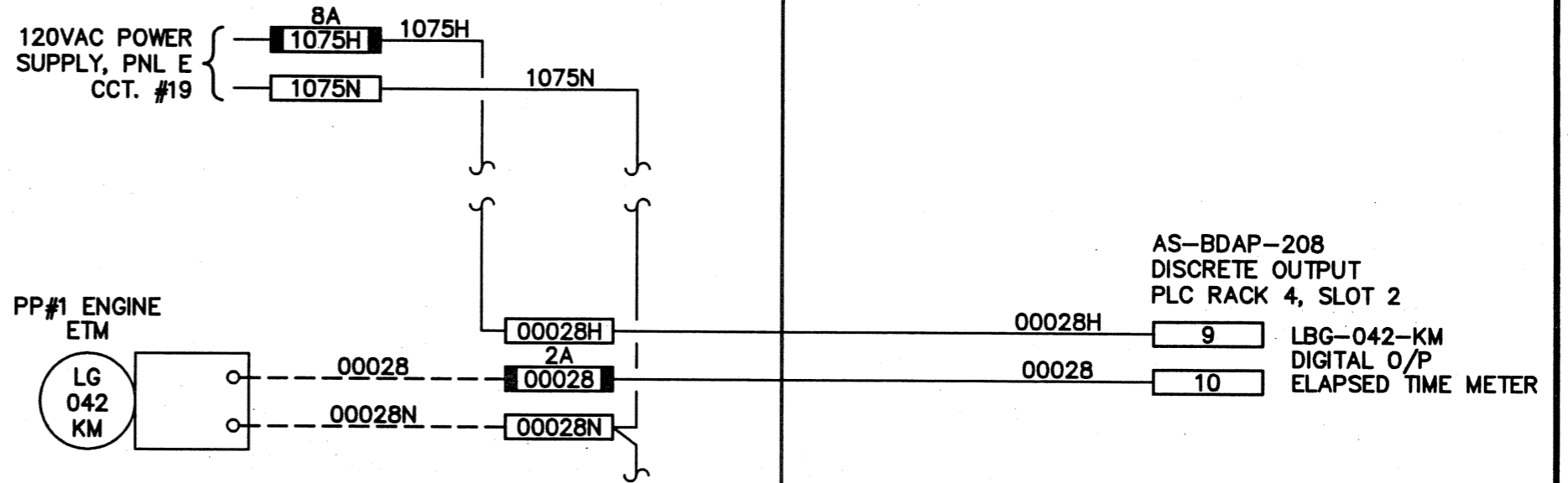
INSTRUMENT LOOP DIAGRAM

LOOP NO. **LG-042-KM**

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

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Calgary, Alberta

JOB NO. 3153
FILENAME D2557



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
			95.07.11	1 AS-BUILT	PL
			94.08.12	0 ISSUED FOR CONST.	PL
97.02.03	2 RCPL RECORD DRAWING	PS	94.07.29	A ISSUED FOR APPROVAL	PL

MacLEAN REGIONAL PUMPING STATION - LCP22
PUMP #22 ELAPSED TIME METER

DRAWING NO.
D-2557

INSTRUMENT LOOP DIAGRAM

LOOP NO.

LBG-042-QF-2

FIELD

PUMP LOCAL CONTROL PANEL

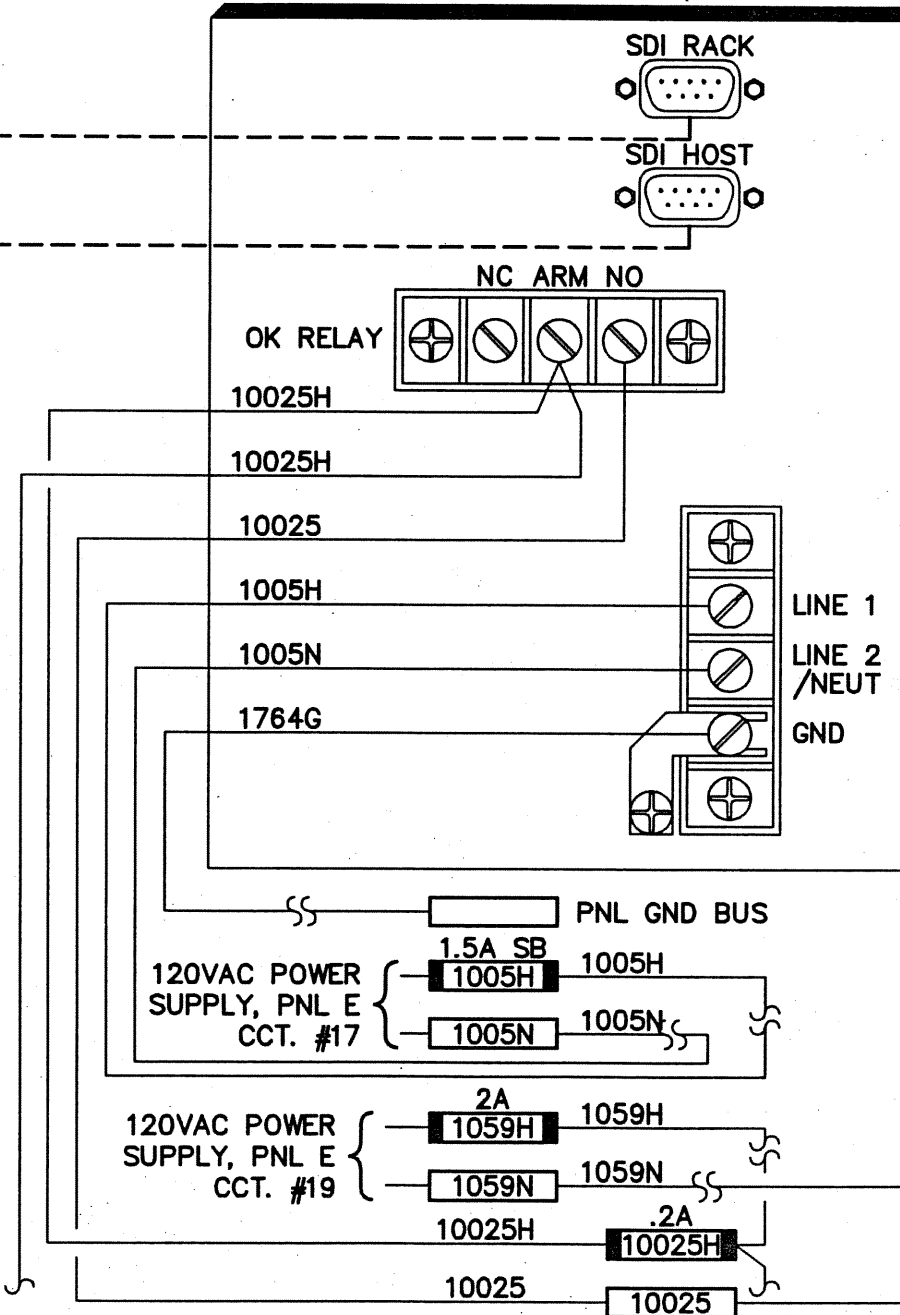
PLC

RS-422
TO NEXT RACK

RS-422
FROM HOST
(OR PREVIOUS RACK)

BENTLY NEVADA
RACK POSITION 1
3300/12

BENTLY NEVADA
RACK POSITION 2
3300/03



AS-BDEP-210
DISCRETE INPUT
PLC RACK 2, SLOT 2

1059N

1

LBG-042-QF-2
DIGITAL I/P
MONITOR FAIL

10025

3

CONT'D ON
D2559

NOTE:

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Calgary, Alberta

JOB NO. 3153
FILENAME D2558



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1		AS-BUILT		PL
94.08.12	0		ISSUED FOR CONST.		PL
97.02.03	2	RCPL RECORD DRAWING	PS	94.07.29	A

MacLEAN REGIONAL PUMPING STATION - LCP22
GAS PUMP #22 TEMP / VIB MONITOR (SHT 1 OF 6)

DRAWING NO.
D-2558

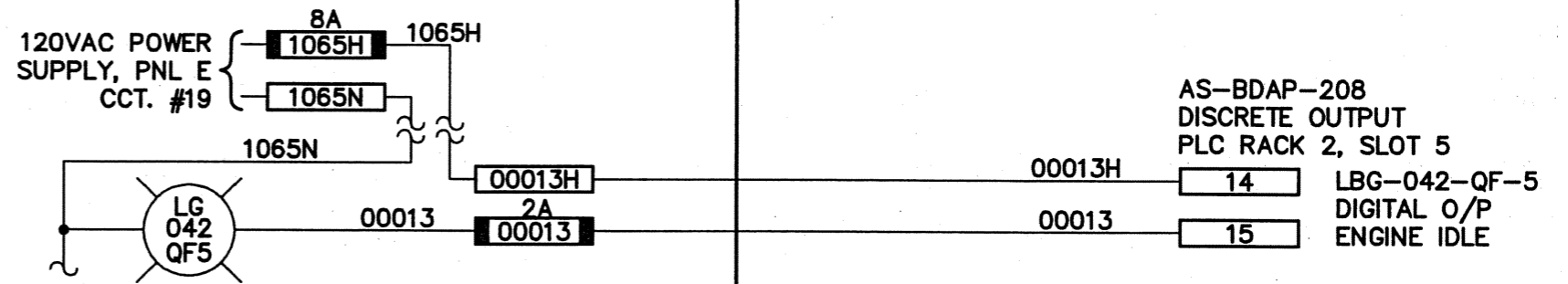
INSTRUMENT LOOP DIAGRAM

LOOP NO. LE-042-SSL-0
LE-042-QF5

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

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Calgary, Alberta

JOB NO. 3153
FILENAME D2556

THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.28
DES PL DWN LFB
CKD DN APP LK

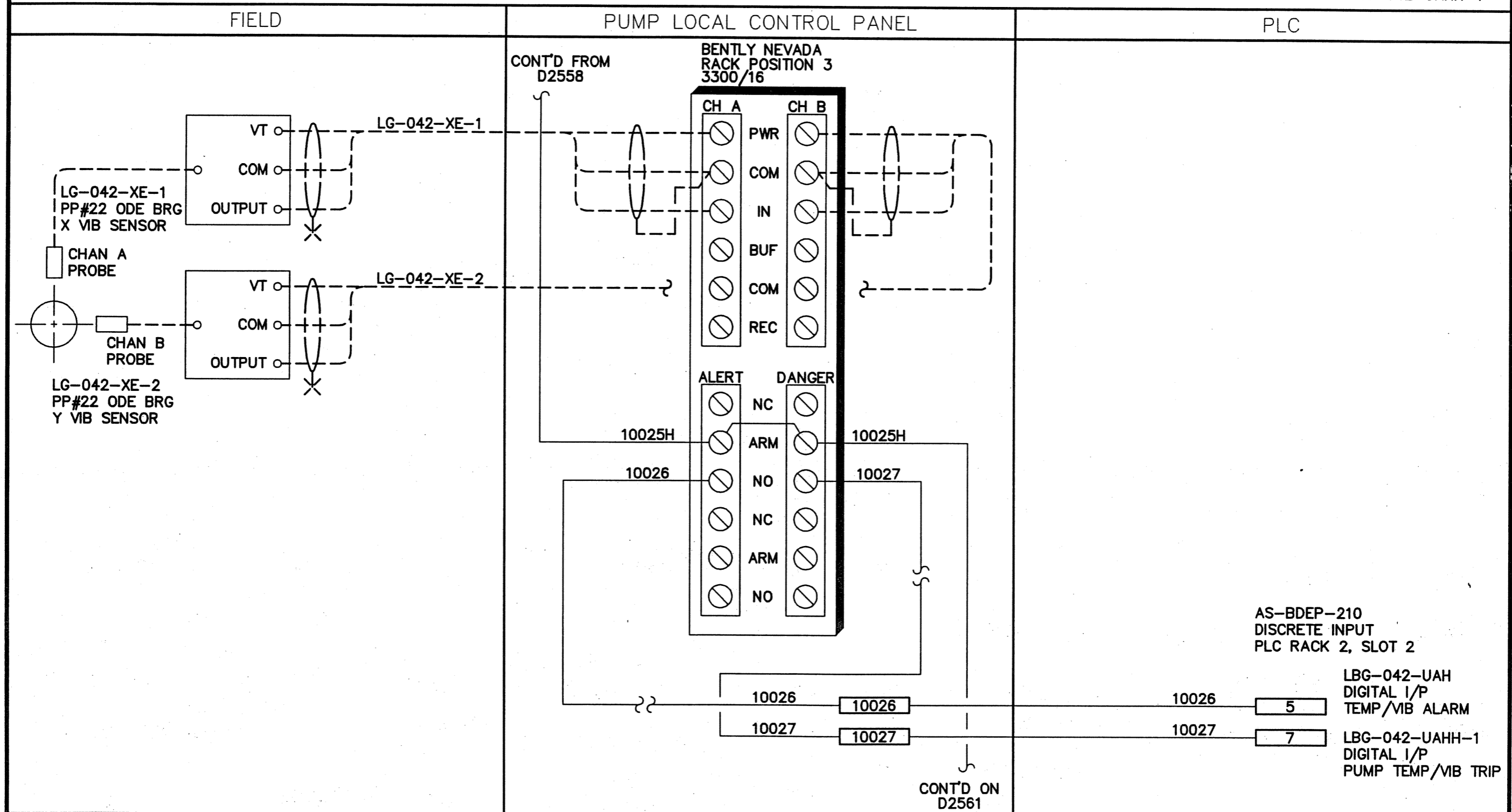
DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1		94.07.28	A	
			94.08.12	0	
97.02.03	2	PS			

MacLEAN REGIONAL PUMPING STATION - LCP22
GAS PUMP #22 DIGITAL SPEED CONTROL
(SHEET 2 OF 2)

DRAWING NO.
D-2556

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-042-XE-1
LG-042-XE-2 LAG-042-UAH
LAG-042-UAHH-1



NOTE:

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JOB NO. 3153
FILENAME D2559



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1		AS-BUILT		PL
94.08.12	0		ISSUED FOR CONST.		PL
97.02.03	2	RCPL RECORD DRAWING	PS	94.07.07	2
				AS BUILT	
					PL

**MacLEAN REGIONAL PUMPING STATION - LCP22
GAS PUMP #22 TEMP / VIB MONITOR (SHT. 2 OF 6)**

DRAWING NO.
D-2559

INSTRUMENT LOOP DIAGRAM

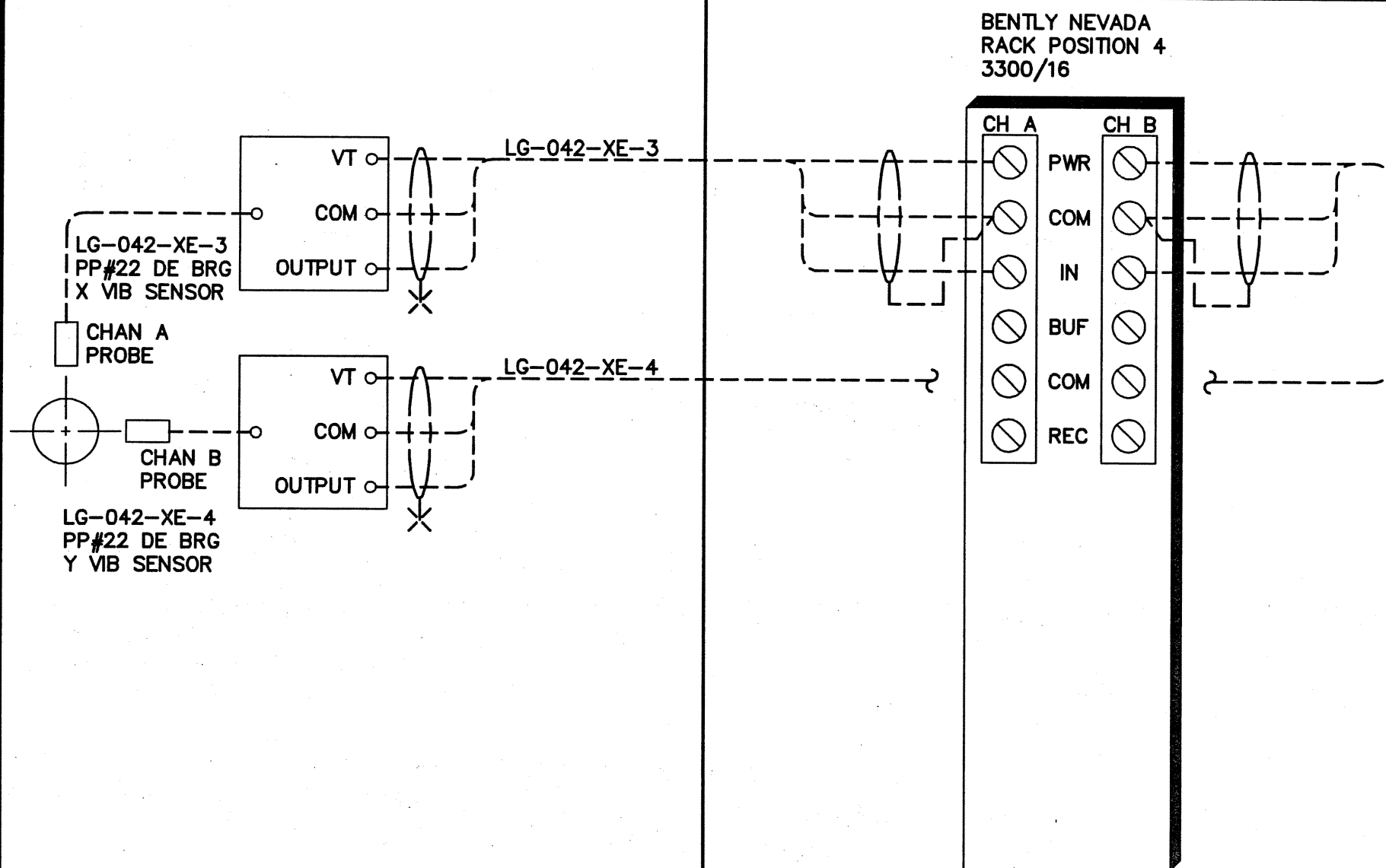
LOOP NO.

LG-042-XE-3
LG-042-XE-4

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

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Calgary, Alberta

JOB NO. 3153
FILENAME D2560



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
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94.08.12	0			ISSUED FOR CONST.	PL
97.02.03	2	RCPL RECORD DRAWING PS	94.07.29	A	ISSUED FOR APPROVAL PL

MacLEAN REGIONAL PUMPING STATION – LCP22
GAS PUMP #22 TEMP / VIB MONITOR (SHT. 3 OF 6)

DRAWING NO.
D-2560

INSTRUMENT LOOP DIAGRAM

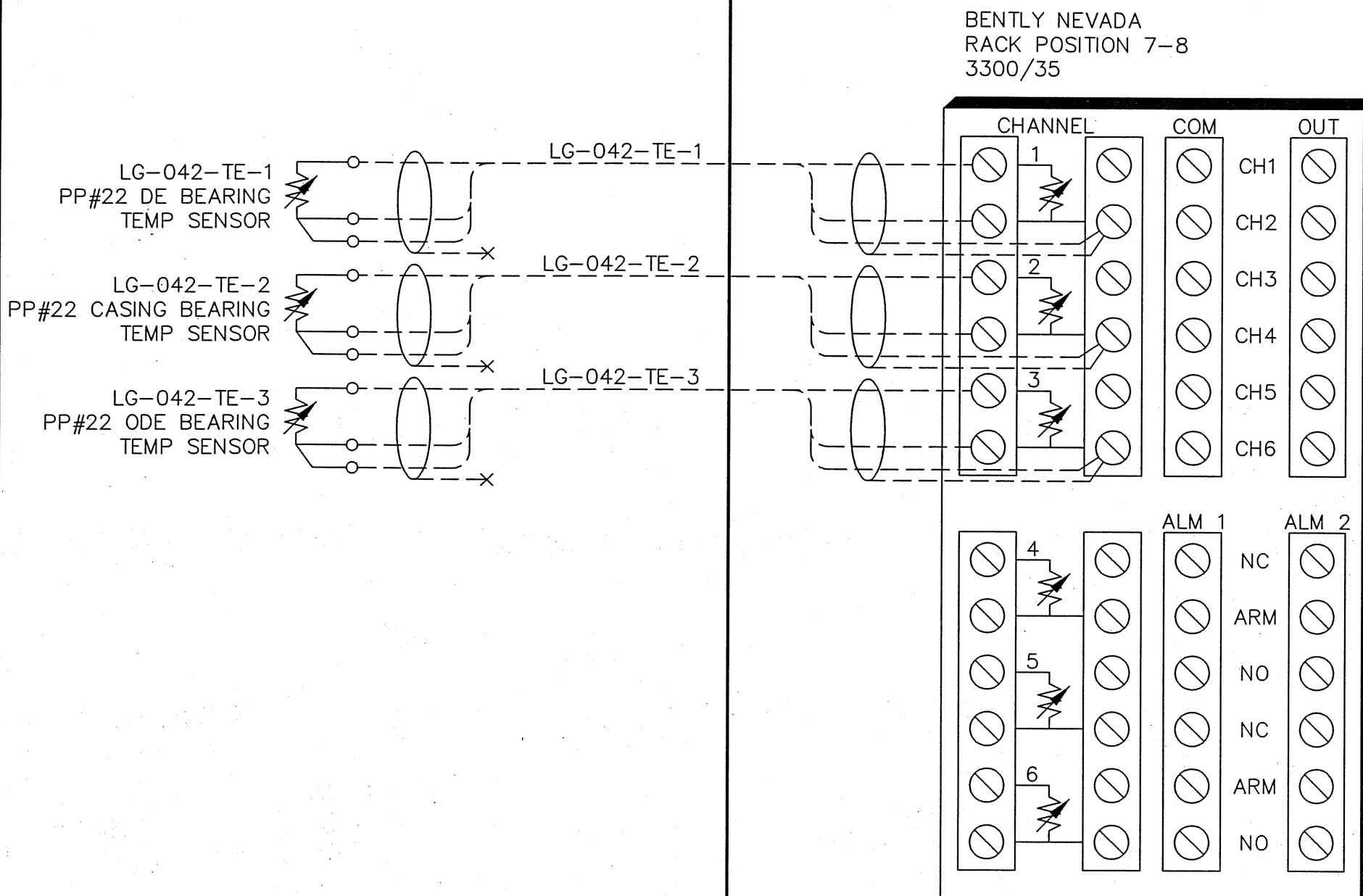
LOOP NO.

LG-042-TE-1
 LG-042-TE-2
 LG-042-TE-3

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:
 1. RED = A
 BLK = B
 WHT = C

Reid Crowther
 Consulting Engineers

DATE	REVISION	APP.
97.02.03	2 RCPL RECORD DRAWING	PS

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 Calgary, Alberta

JOB NO. 3153
 FILENAME D2562

DATE	REVISION	APP.
95.07.11	1 AS-BUILT	PL
94.08.12	0 ISSUED FOR CONST.	PL
94.07.29	A ISSUED FOR APPROVAL	PL

THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

MaCLEAN REGIONAL PUMPING STATION - LCP22
 GAS PUMP #22 TEMP / VIB MONITOR (SHT. 5 OF 6)

SCALE _____
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK

DRAWING NO.
 D-2562

INSTRUMENT LOOP DIAGRAM

LOOP NO.

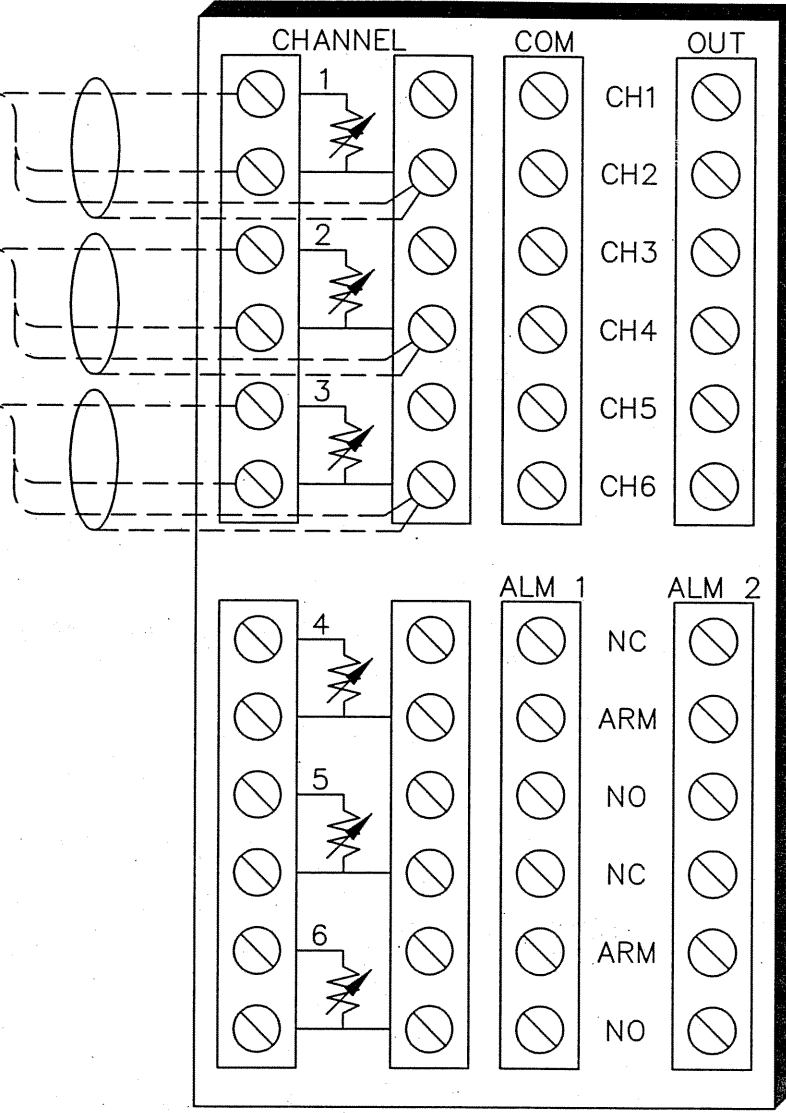
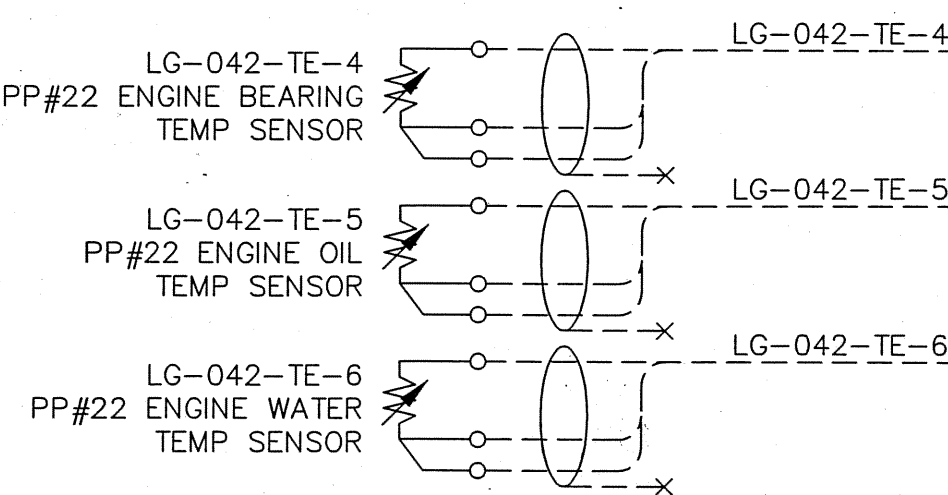
LG-042-TE-4
LG-042-TE-5
LG-042-TE-6

FIELD

PUMP LOCAL CONTROL PANEL

PLC

BENTLY NEVADA
RACK POSITION 9-10
3300/35



NOTE:
1. RED = A
BLK = B
WHT = C

Reid Crowther
Consulting Engineers

DATE	REVISION	APP.
97.02.03	2 RCPL RECORD DRAWING	PS

kenonic controls Ltd.
Calgary, Alberta

DATE	REVISION	APP.
95.07.11	1 AS-BUILT	PL
94.08.12	0 ISSUED FOR CONST.	PL
94.07.29	A ISSUED FOR APPROVAL	PL

JOB NO. 3153
FILENAME D2563

THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

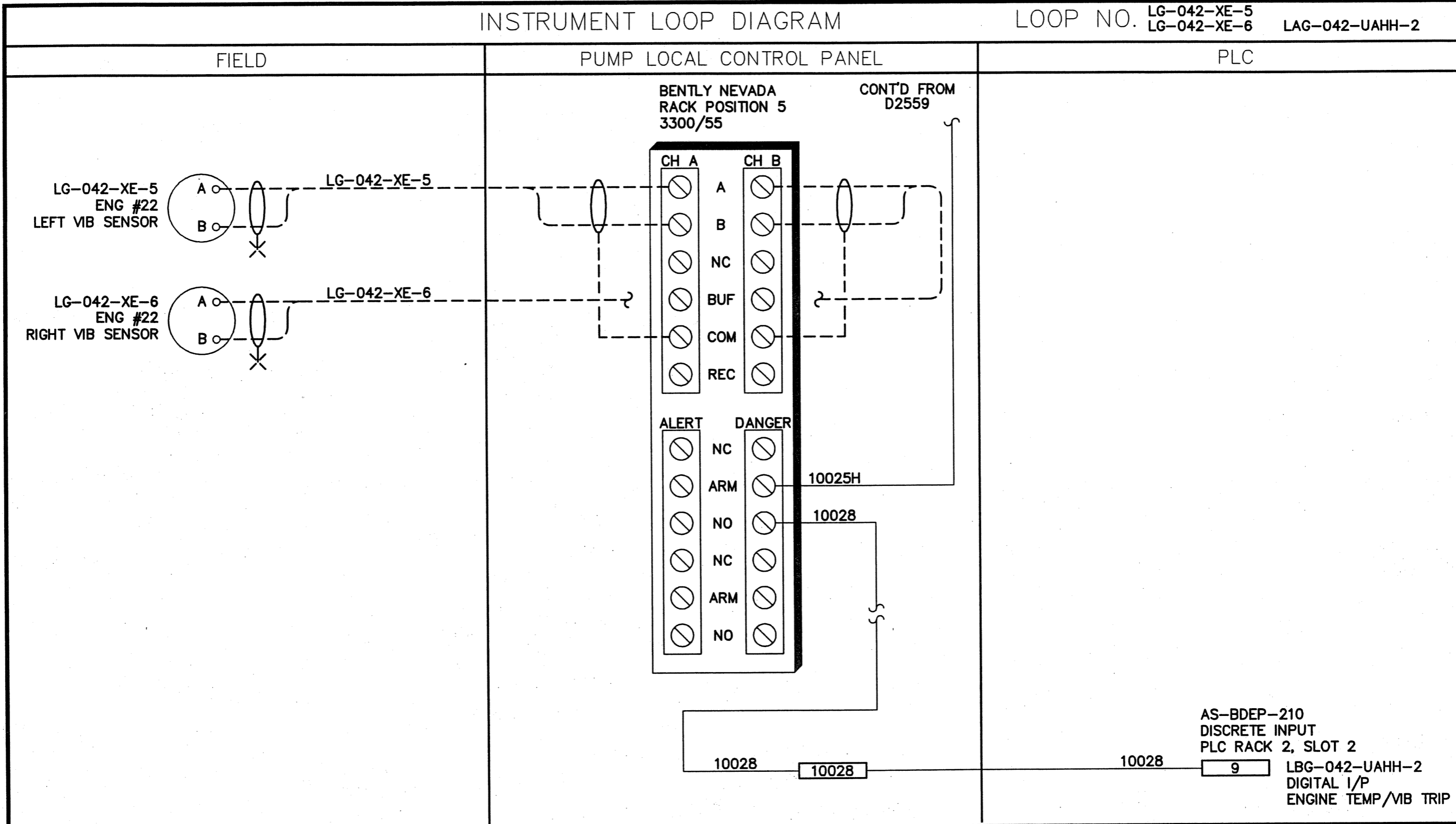
MacLEAN REGIONAL PUMPING STATION - LCP22
GAS PUMP #22 TEMP / VIB MONITOR (SHT. 6 OF 6)

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DRAWING NO.
D-2563

INSTRUMENT LOOP DIAGRAM

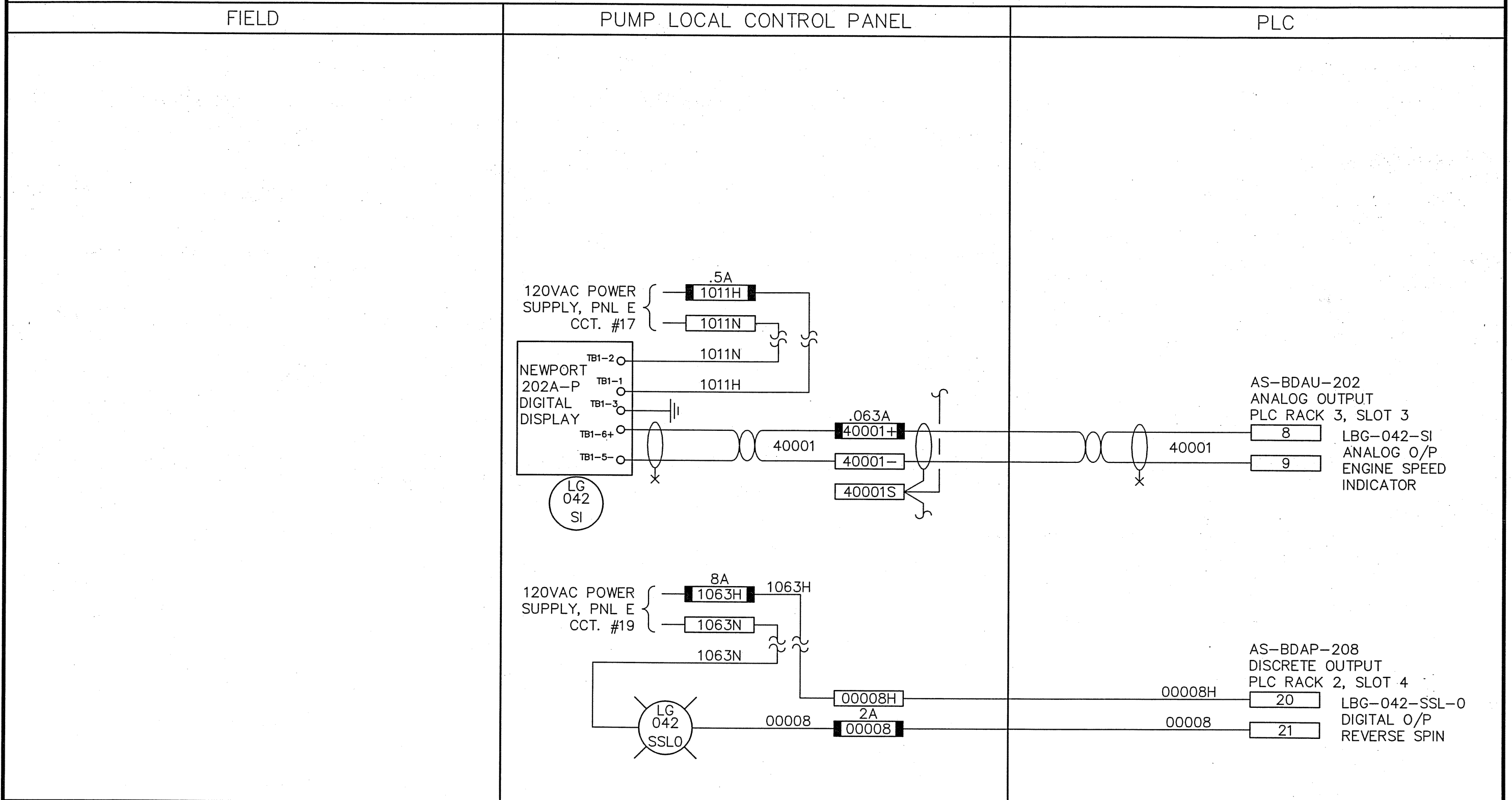
LOOP NO. LG-042-XE-5
 LG-042-XE-6 LAG-042-UAHH-2



NOTE:	Reid Crowther Consulting Engineers		kenonic controls ltd. Calgary, Alberta		JOB NO. 3153	THE CITY OF WINNIPEG REGIONAL WATER SUPPLY SYSTEM SUPERVISORY CONTROL AND DATA ACQUISITION	SCALE _____
					FILENAME D2561		DATE 94.07.29
			95.07.11	1 AS-BUILT	PL		CKD DN APP LK
			94.08.12	0 ISSUED FOR CONST.	PL		
			94.07.29	A ISSUED FOR APPROVAL	PL		
DATE	REVISION	APP.	DATE	REVISION	APP.		
						MacLEAN REGIONAL PUMPING STATION - LCP22 GAS PUMP #22 TEMP / VIB MONITOR (SHT. 4 OF 6)	DRAWING NO. D-2561

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-042-SLL-0 LG-042-SI



NOTE:

Reid Crowther Consulting Engineers		kenonic controls ltd. Calgary, Alberta		JOB NO. 3153	FILENAME D2565
00.06.29	3	REVISD TO DATE	GMZ	94.08.12	0 ISSUED FOR CONST.
97.02.03	2	RCPL RECORD DRAWING	PS	94.07.29	A ISSUED FOR APPROVAL
DATE		REVISION	APP.	DATE	REVISION

THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

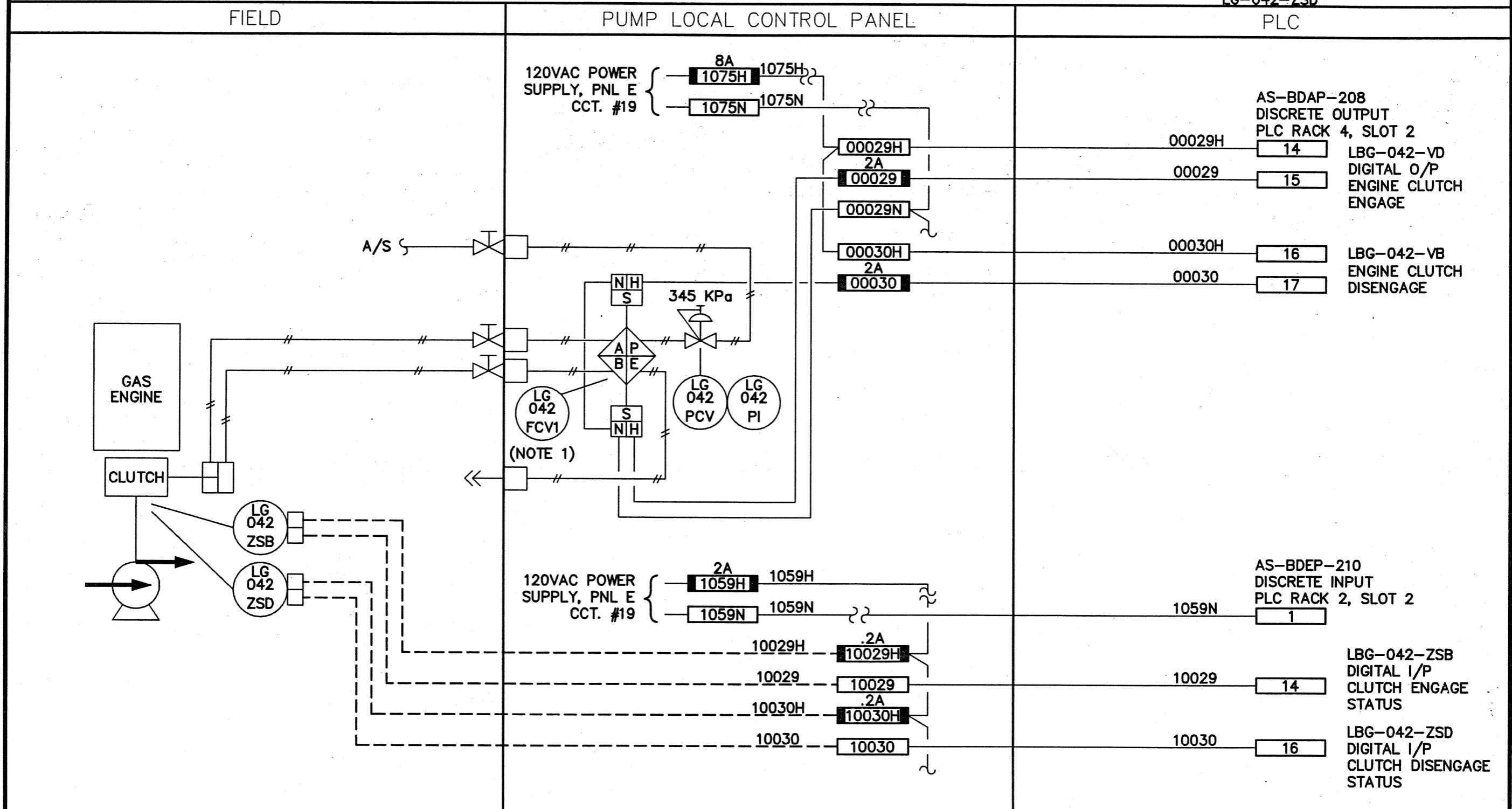
MacLEAN REGIONAL PUMPING STATION - LCP22
GAS PUMP #22 SPEED MONIT. LOOP (SHT. 2 OF 2)

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DRAWING NO.
D-2565

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-042-PCV LG-042-FCV-1
 LG-042-ZSB LG-042-FCV-2
 LG-042-ZSD



NOTE:
 1. CLUTCH SHALL DISENGAGE WHEN SOLENOID VALVE DE-ENERGIZES.

				JOB NO.	3153
				FILENAME	D2566
95.07.11	1	AS-BUILT		PL	
94.08.12	0	ISSUED FOR CONST.		PL	
97.02.03	2	RCPL RECORD DRAWING	PS	94.07.29	A
DATE	REVISION	APP.	DATE	REVISION	APP.

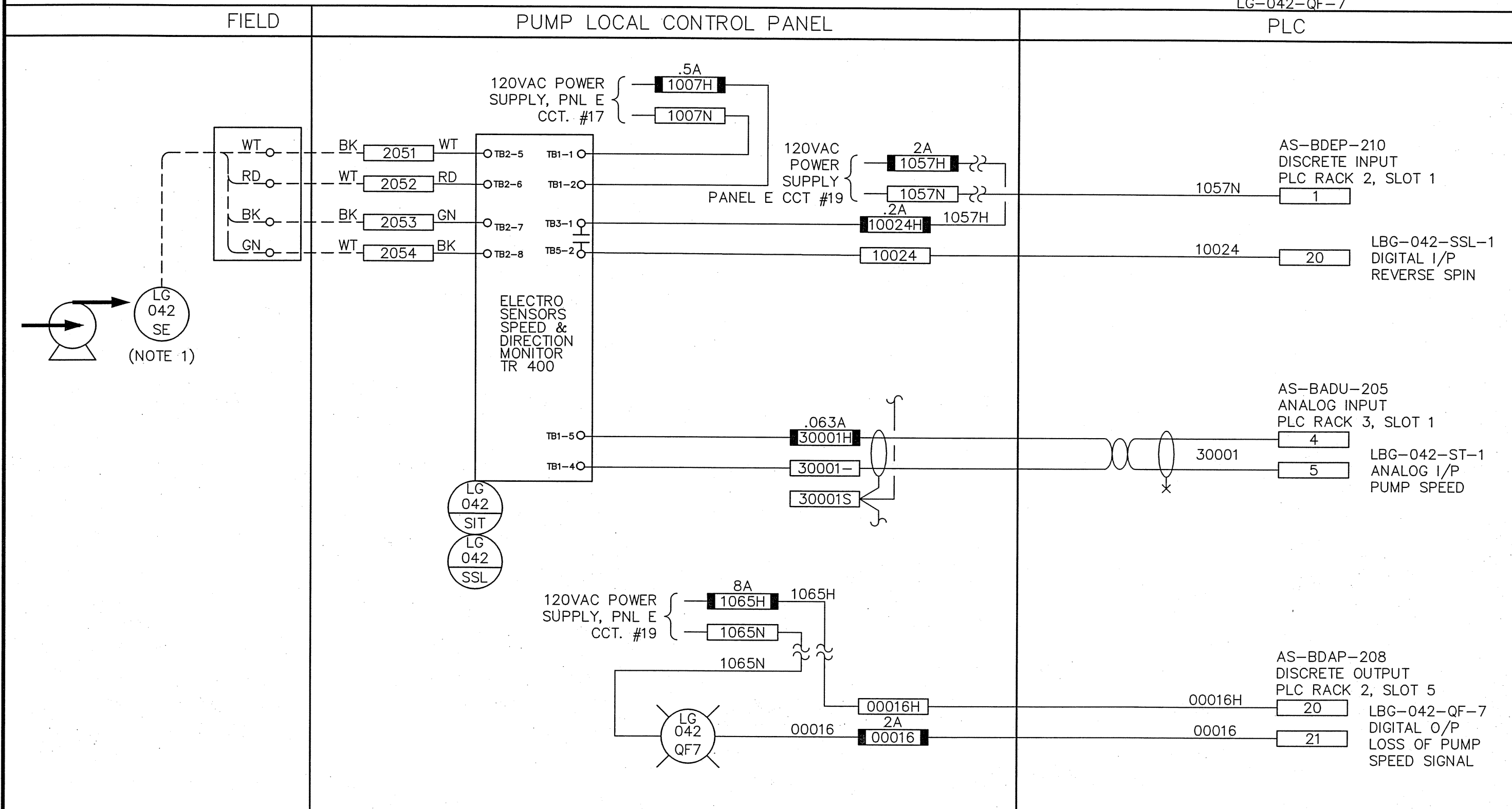
THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

MacLEAN REGIONAL PUMPING STATION – LCP22
GAS PUMP #22 ENGINE CLUTCH CONTROL

SCALE	
DATE	94.07.29
DES	PL DWN LFB
CKD	DN APP LK
DRAWING NO.	D-2566

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-042-SSL-1 LG-042-SSL
 LG-042-SE LG-042-SIT
 LG-042-QF-7



NOTE:
 1. SPEED ELEMENT CONSISTS OF ONE MAGNETIC DISK AND ONE TRANSDUCER.

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 Calgary, Alberta

JOB NO. 3153
 FILENAME D2564



THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE N.T.S.
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
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99.11.22	3	GMZ	94.08.12	0	PL
					ISSUED FOR CONST.
97.02.03	2	PS	94.07.29	0	PL
					ISSUED FOR APPROVAL

MacLEAN REGIONAL PUMPING STATION - LCP22
 GAS PUMP #22 SPEED MONIT. LOOP (SHT. 1 OF 2)

DRAWING NO.
 D-2564

INSTRUMENT LOOP DIAGRAM

LOOP NO.

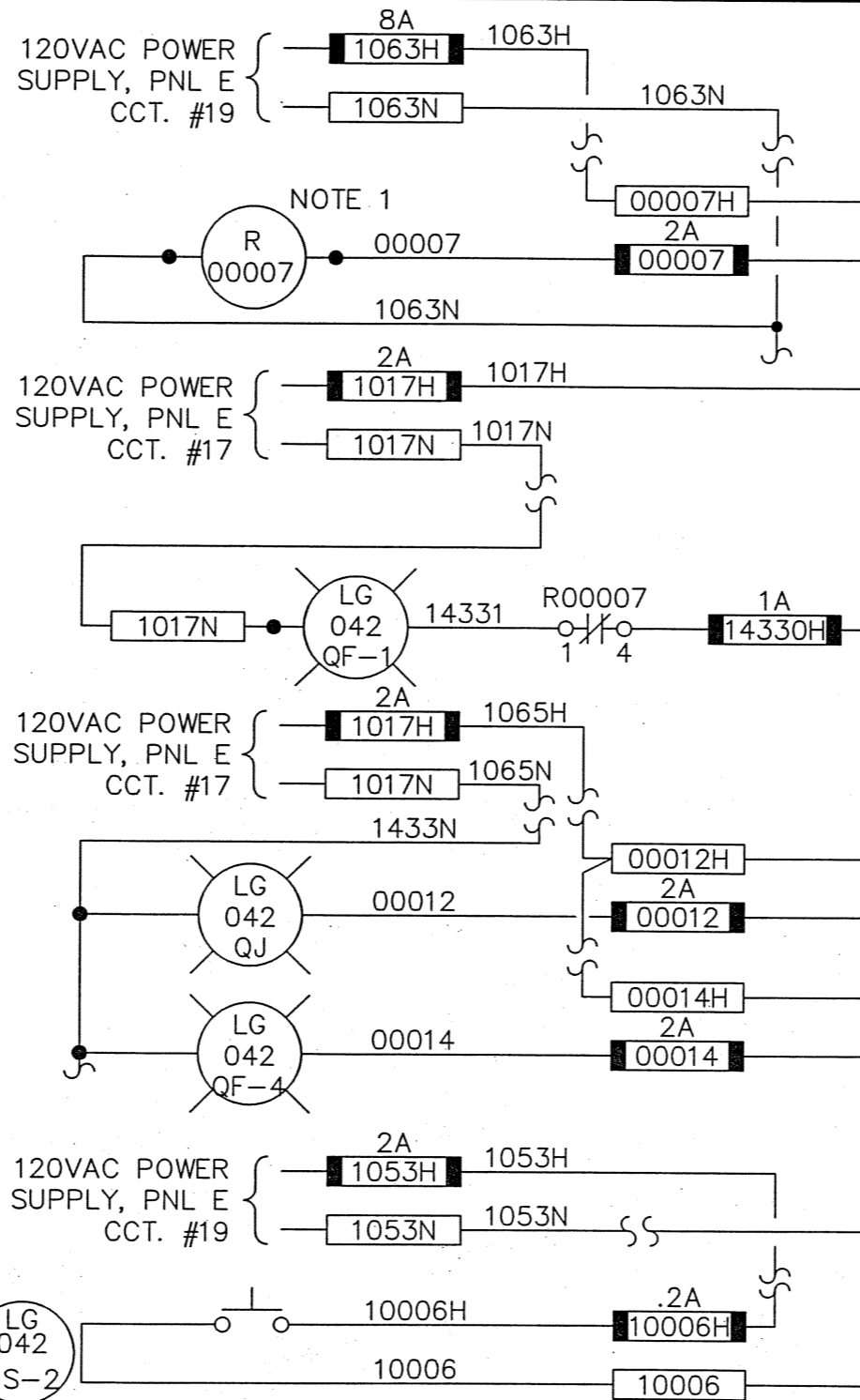
LG-042-HS-2

LG-042-QJ
 LG-042-QF-1
 LG-042-QF-4

FIELD

PUMP LOCAL CONTROL PANEL

PLC



AS-BDAP-208
 DISCRETE OUTPUT
 PLC RACK 2, SLOT 4

00007H [19] LBG-042-QF-1
 00007 [20] DIGITAL O/P
 PLC FAIL

AS-BDAP-208
 DISCRETE OUTPUT
 PLC RACK 2, SLOT 5

00012H [9] LBG-042-QJ
 00012 [10] DIGITAL O/P
 READY TO START
 00014H [16] LBG-042-QF-4
 00014 [17] DIGITAL O/P
 SEQUENCE FAIL

AS-BDEP-210
 DISCRETE INPUT
 PLC RACK 1, SLOT 4

1053N [1] AS-BDEP-210
 DISCRETE INPUT
 PLC RACK 1, SLOT 4
 10006 [16] LBG-042-HS-2
 DIGITAL I/P
 ALARM RESET

NOTE:
 1. PLC FAIL RELAY IS NORMALLY ENERGIZED.

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Calgary, Alberta

JOB NO. 3153
 FILENAME D2567



THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
			95.07.11	1 AS-BUILT	PL
			94.08.12	0 ISSUED FOR CONST.	PL
97.02.03	2 RCPL RECORD DRAWING	PS	94.07.29	A ISSUED FOR APPROVAL	PL

MacLEAN REGIONAL PUMPING STATION - LCP22
 GAS PUMP #22 PLC FAIL / RESET

DRAWING NO.
 D-2567

INSTRUMENT LOOP DIAGRAM

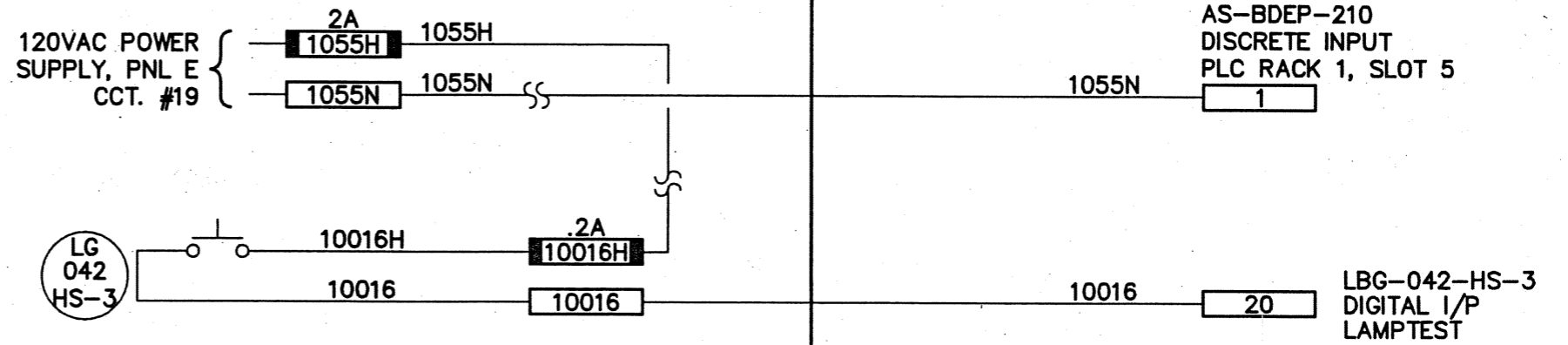
LOOP NO.

LG-042-HS-3

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

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Calgary, Alberta

JOB NO. 3153
FILENAME D2568



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

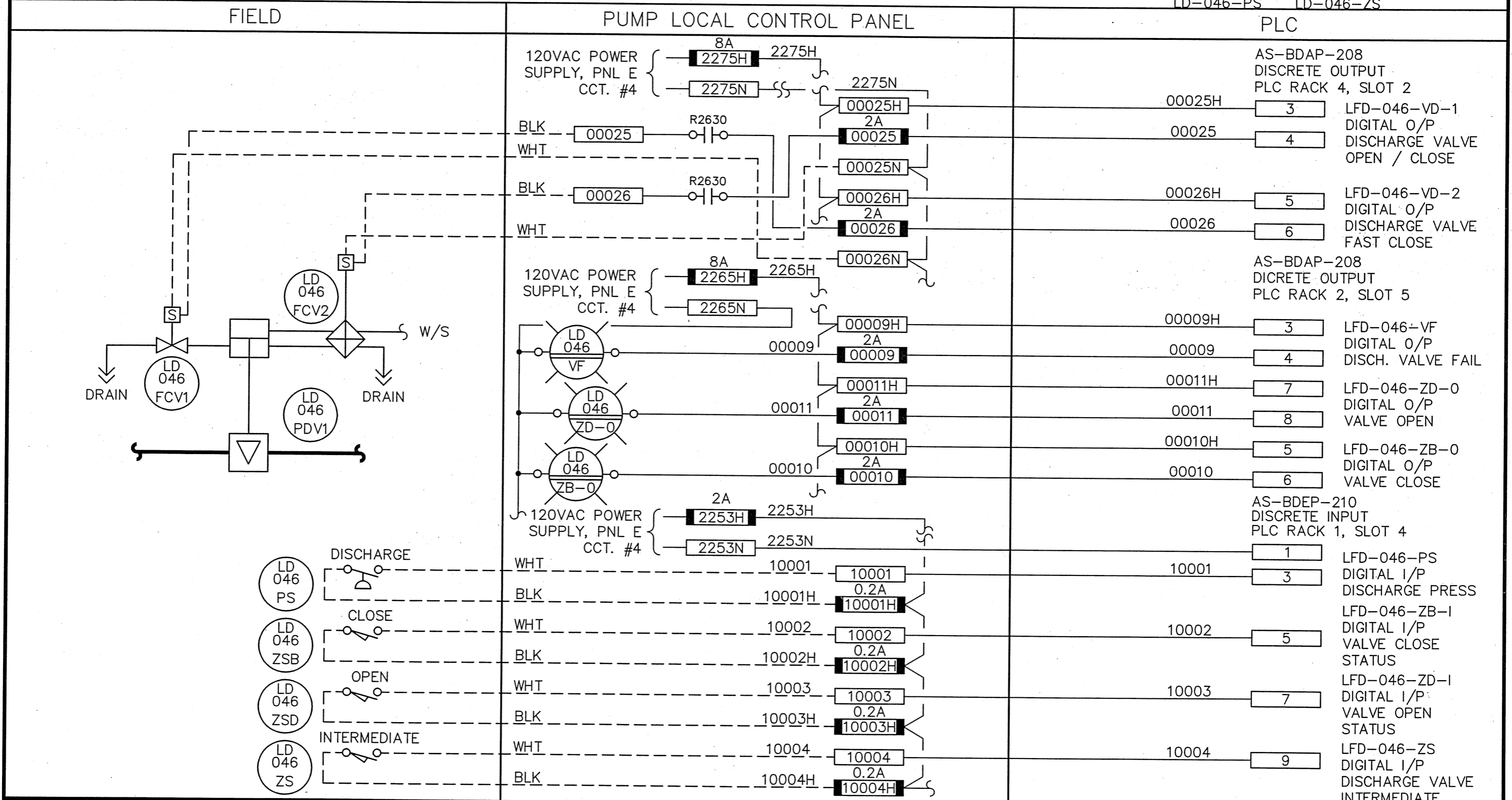
DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1		95.07.11	1	
97.02.03	2	PS	94.07.29	A	PL

MacLEAN REGIONAL PUMPING STATION - LCP22
GAS PUMP #22 LAMPTEST

DRAWING NO.
D-2568

INSTRUMENT LOOP DIAGRAM

LOOP NO. LD-046-FCV-1 LD-046-ZD-0 LD-046-ZSB LD-046-VF
LD-046-FCV-2 LD-046-ZB-0 LD-046-ZSD LD-046-PDV1
LD-046-PS LD-046-ZS



NOTE:

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kenonic controls Ltd.
Calgary, Alberta

JOB NO. 3153
FILENAME D2620



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

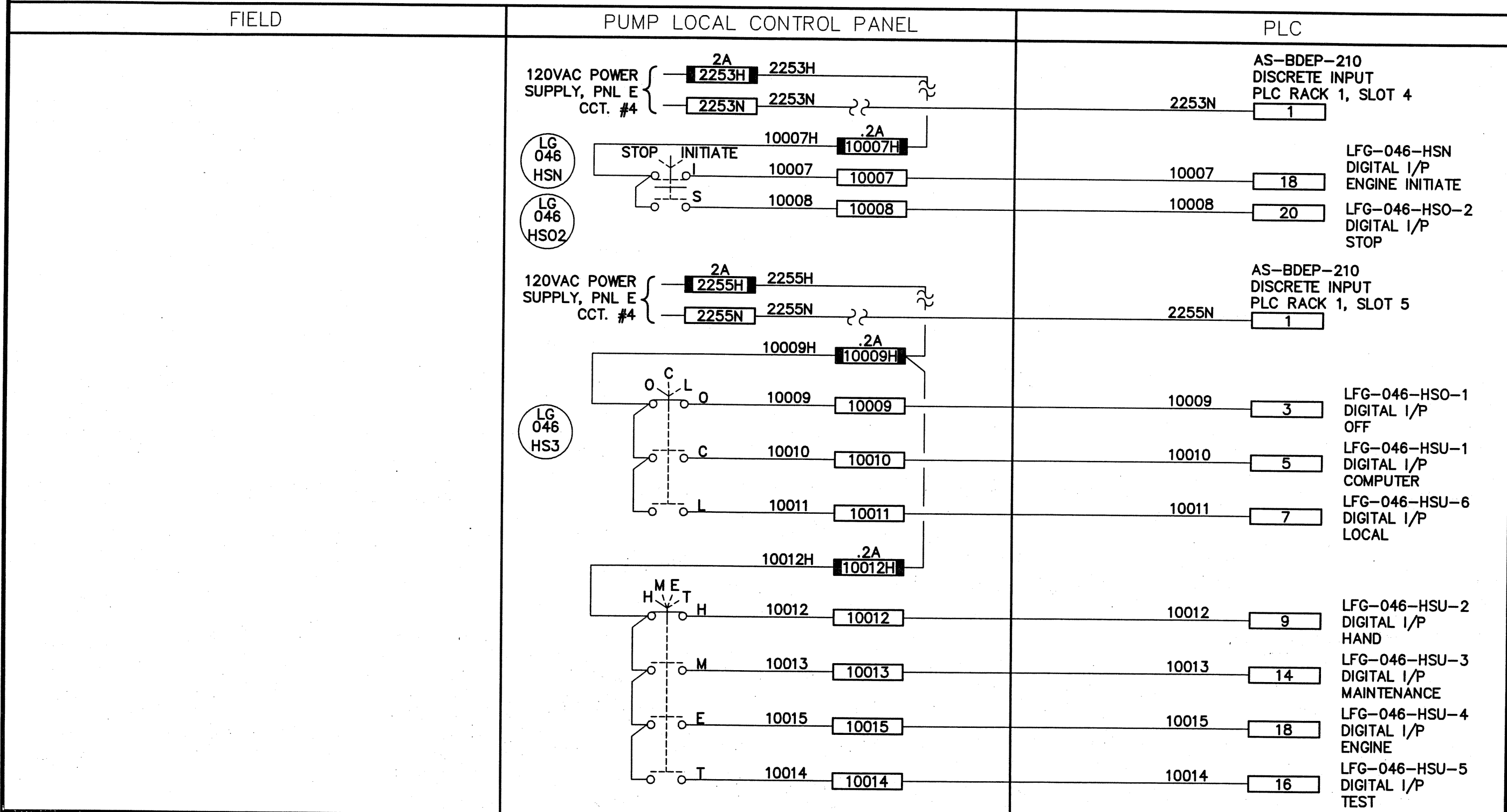
DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1			AS-BUILT	PL
00.06.30	3	GMZ	94.08.12	0	PL
97.02.03	2	PS	94.07.29	A	PL
				ISSUED FOR CONST.	
				ISSUED FOR REVIEW	

MacLEAN REGIONAL PUMPING STATION - LCP26
PUMP #26 DISCHARGE VALVE CONTROL/POS. STATUS

DRAWING NO.
D-2620

INSTRUMENT LOOP DIAGRAM

LOOP NO. **LG-046-HSN** **LG-046-HSO-2** **LG-046-HS-3**



NOTE:

Reid Crowther

Consulting Engineers

kenonic controls Ltd.
Calgary, Alberta

JOB NO. 3153

FILENAME D2621



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

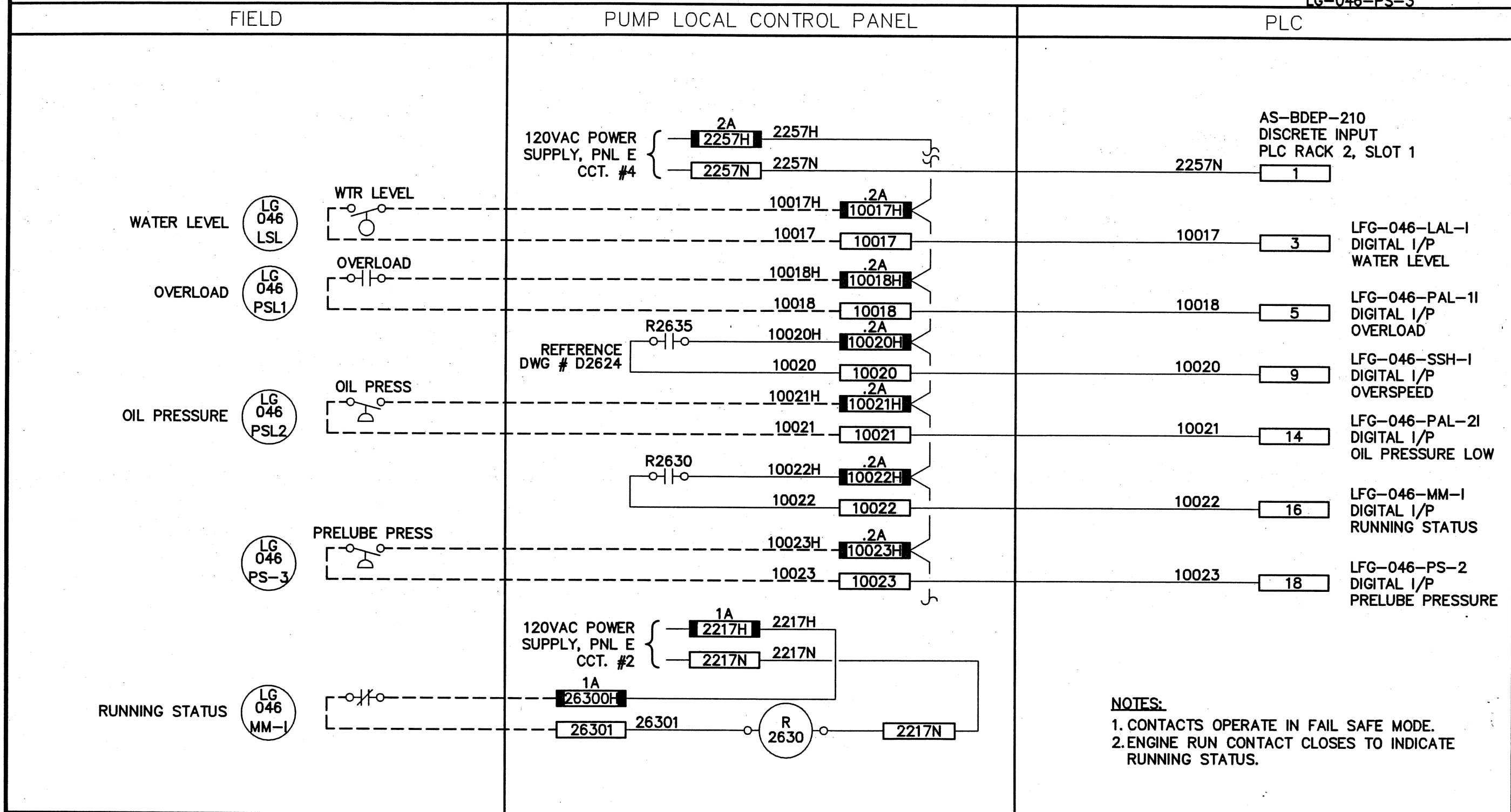
DATE	REVISION	APP.	DATE	REVISION	APP.
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94.08.12	0		ISSUED FOR CONST.		PL
97.02.03	2	RCPL RECORD DRAWING	PS	94.07.29	A

MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 SELECTOR SWITCH (SHT. 1 OF 4)

DRAWING NO.
D-2621

INSTRUMENT LOOP DIAGRAM LOOP NO.

LG-046-LS-1
LG-046-PSL-1
LG-046-PSL-2
LG-046-MM-1
LG-046-PS-3



NOTE:

Reid Crowther Consulting Engineers		
DATE	REVISION	APP.
97.02.03	2 RCPL RECORD DRAWING	PS

kenonic controls Ltd. Calgary, Alberta		JOB NO. 3153
		FILENAME D2622
DATE	REVISION	APP.
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94.08.12	0 ISSUED FOR CONST.	PL
94.07.29	A ISSUED FOR APPROVAL	PL

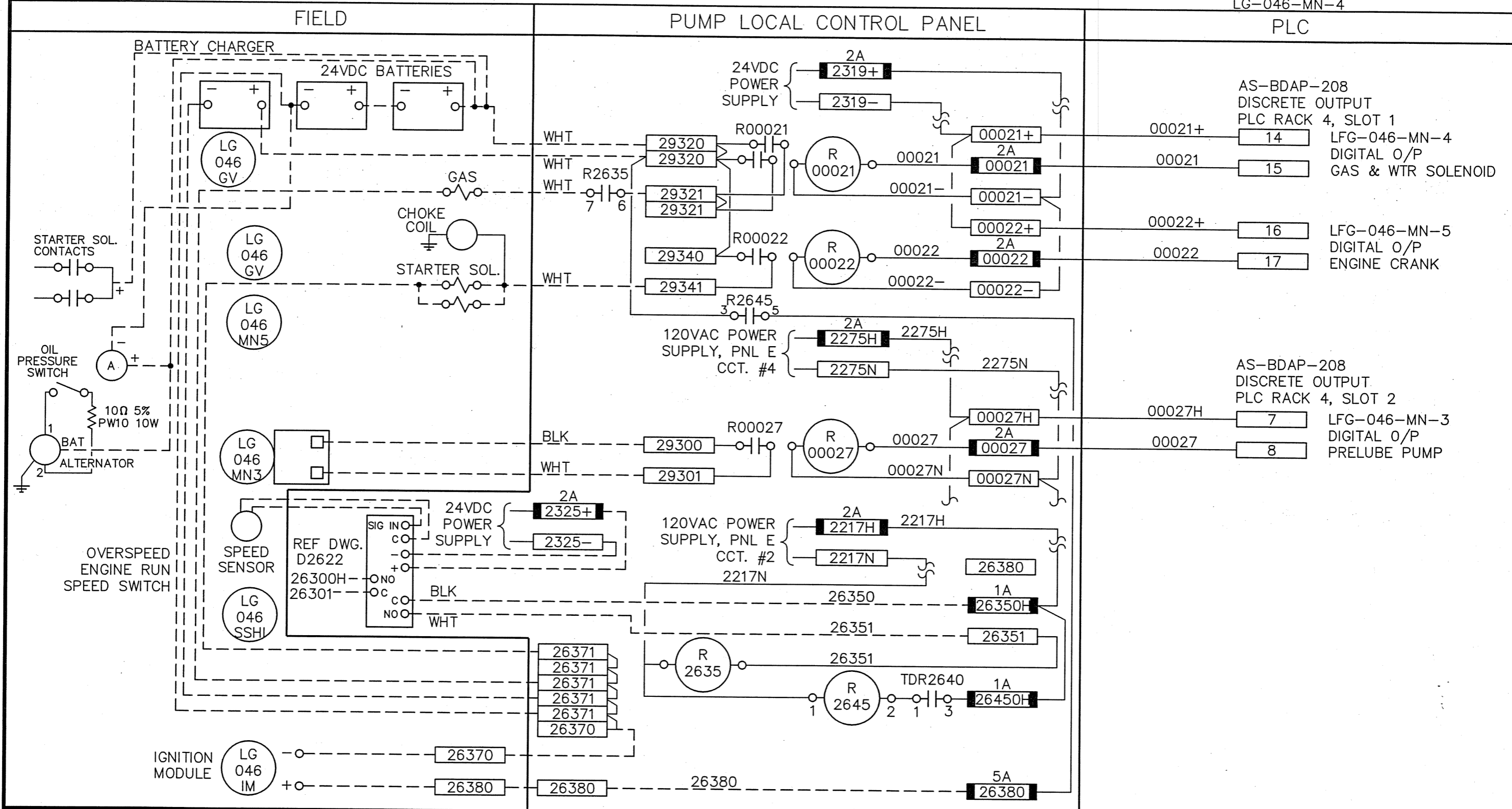
THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 ENGINE DRIVE (SHT. 2 OF 4)

SCALE	DATE 94.07.29
DES PL DWN LFB	CKD DN APP LK
DRAWING NO. D-2622	

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-046-GV LG-046-MN-5
 LG-046-MN-3 LG-046-SSHI
 LG-046-MN-4



- NOTE:**
- "ENG RUNNING" STATUS @ MacLEAN IS PROVIDED BY THE "CRANK SPEED SWITCH" (MOMENTARY CONTACT)
 - TDR2640 - REFER TO DWG. D-2625
 - R 2645 - 2 POLE 30AMP 120VAC COIL RELAY

Reid Crowther
 Consulting Engineers

kenonic controls ltd.
 Calgary, Alberta

JOB NO. 3153
 FILENAME D2624



THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK

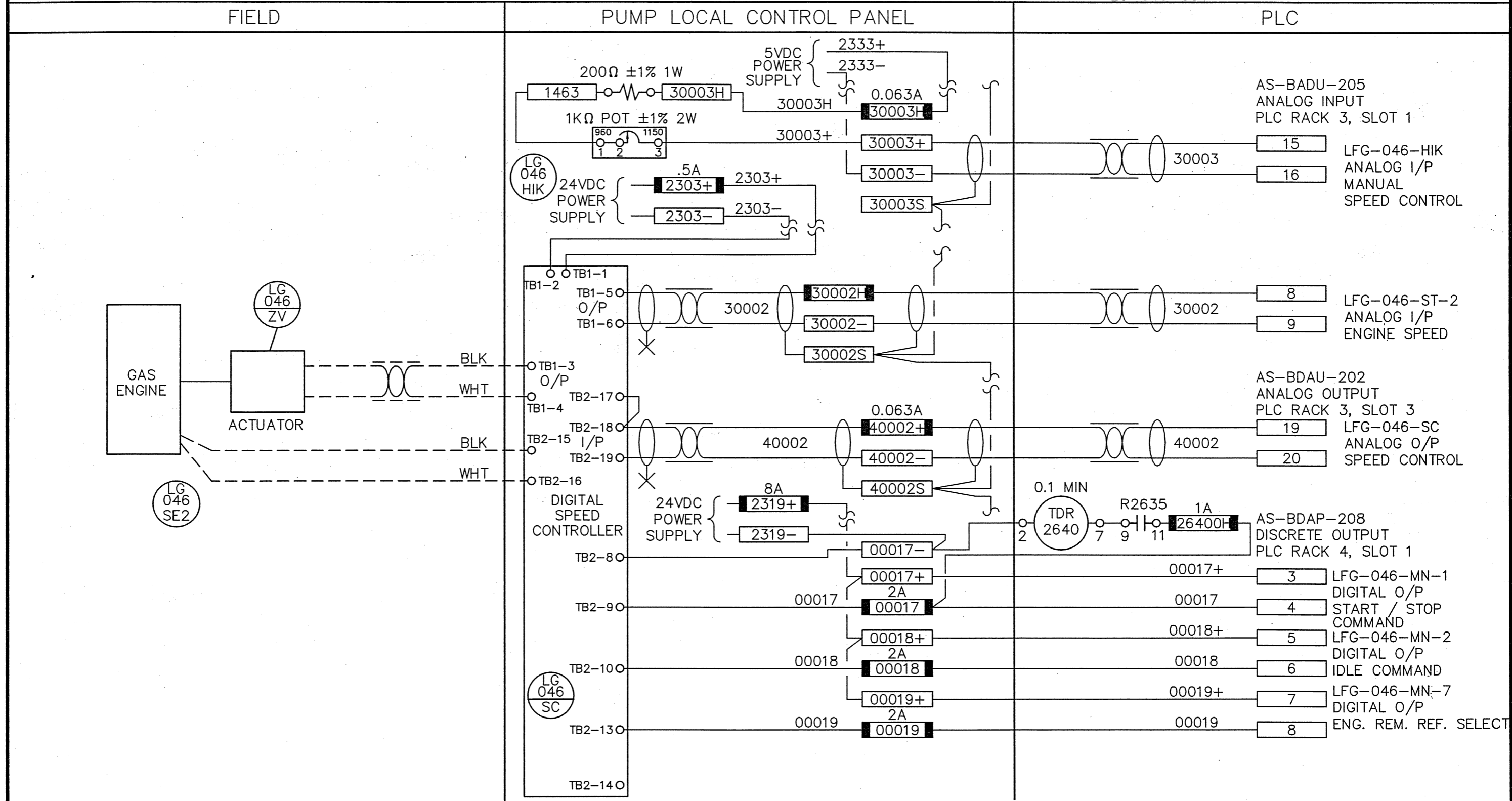
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97.02.03	2	PS	94.08.12	0	PL
			94.07.29	A	PL

MacLEAN REGIONAL PUMPING STATION - LCP26
 GAS PUMP #26 ENGINE DRIVE (SHT. 4 OF 4)

DRAWING NO.
 D-2624

INSTRUMENT LOOP DIAGRAM

LOOP NO. LG-046-HIK
LG-046-SE-2
LG-046-SC LG-046-ZV



- NOTE:**
- R2635 - REFER TO DWG. D-2624
 - TDR2640 - OMRON H3CR-H POWER OFF DELAY TIMER

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Calgary, Alberta

JOB NO. 3153
 FILENAME D2625



THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1	AS-BUILT	94.08.12	0	ISSUED FOR CONST.
97.02.03	2	RCPL RECORD DRAWING	94.07.29	A	ISSUED FOR APPROVAL
00.10.30	3	REVISED TO DATE			

MacLEAN REGIONAL PUMPING STATION - LCP26
 GAS PUMP #26 DIGITAL SPEED CONTROL
 (SHT. 1 OF 2)

DRAWING NO.
 D-2625

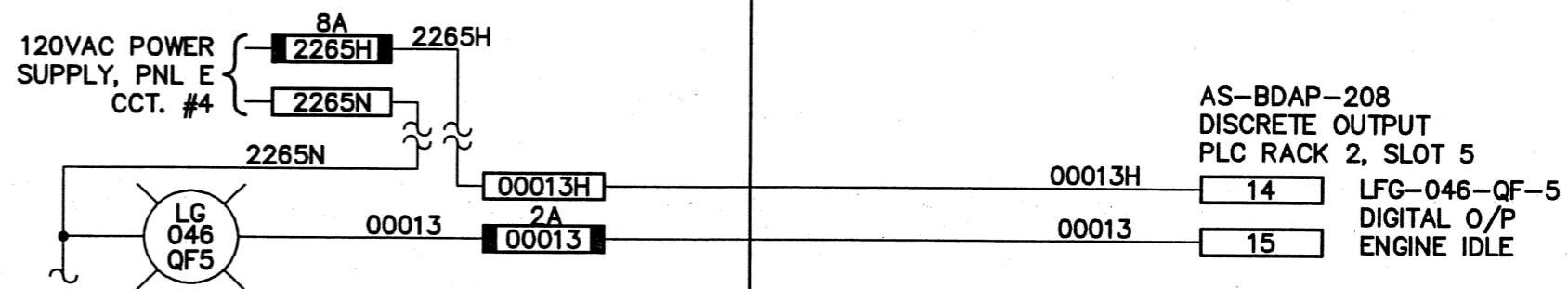
INSTRUMENT LOOP DIAGRAM

LOOP NO. LE-046-SSL-0
LE-046-QF5

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

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Calgary, Alberta

JOB NO. 3153
FILENAME D2626



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.28
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
97.02.03	2	RCPL RECORD DRAWING PS	94.07.28	A	ISSUED FOR APPROVAL PL
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MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 DIGITAL SPEED CONTROL
(SHEET 2 OF 2)

DRAWING NO.
D-2626

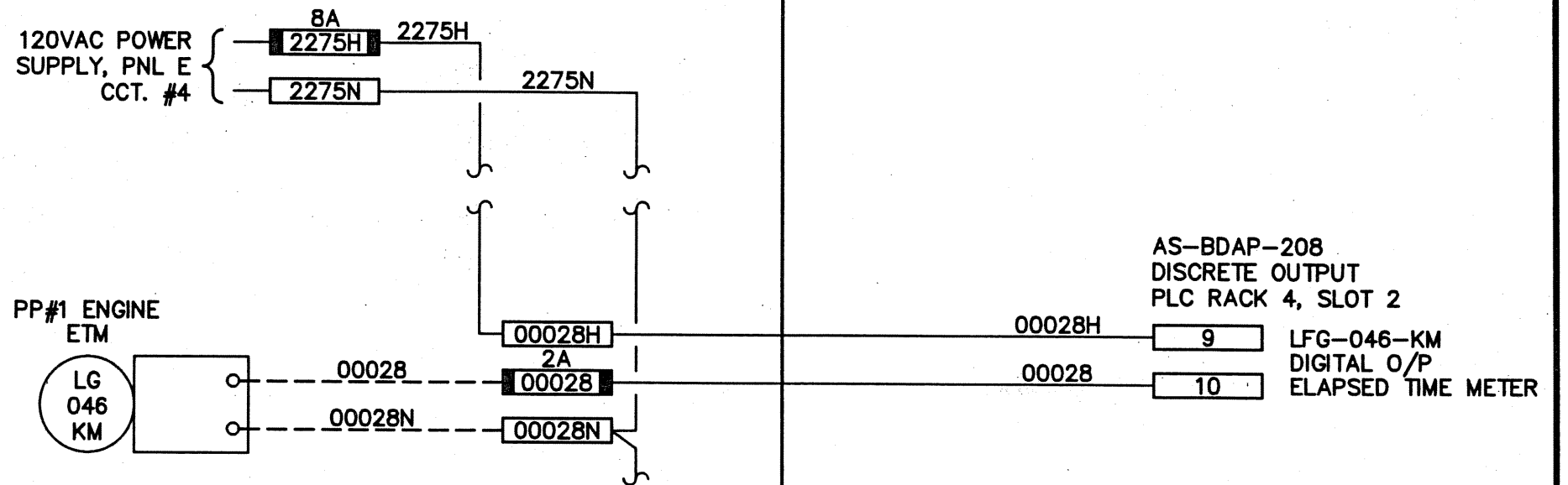
INSTRUMENT LOOP DIAGRAM

LOOP NO. **LG-046-KM**

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

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Calgary, Alberta

JOB NO. 3153
FILENAME D2627



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
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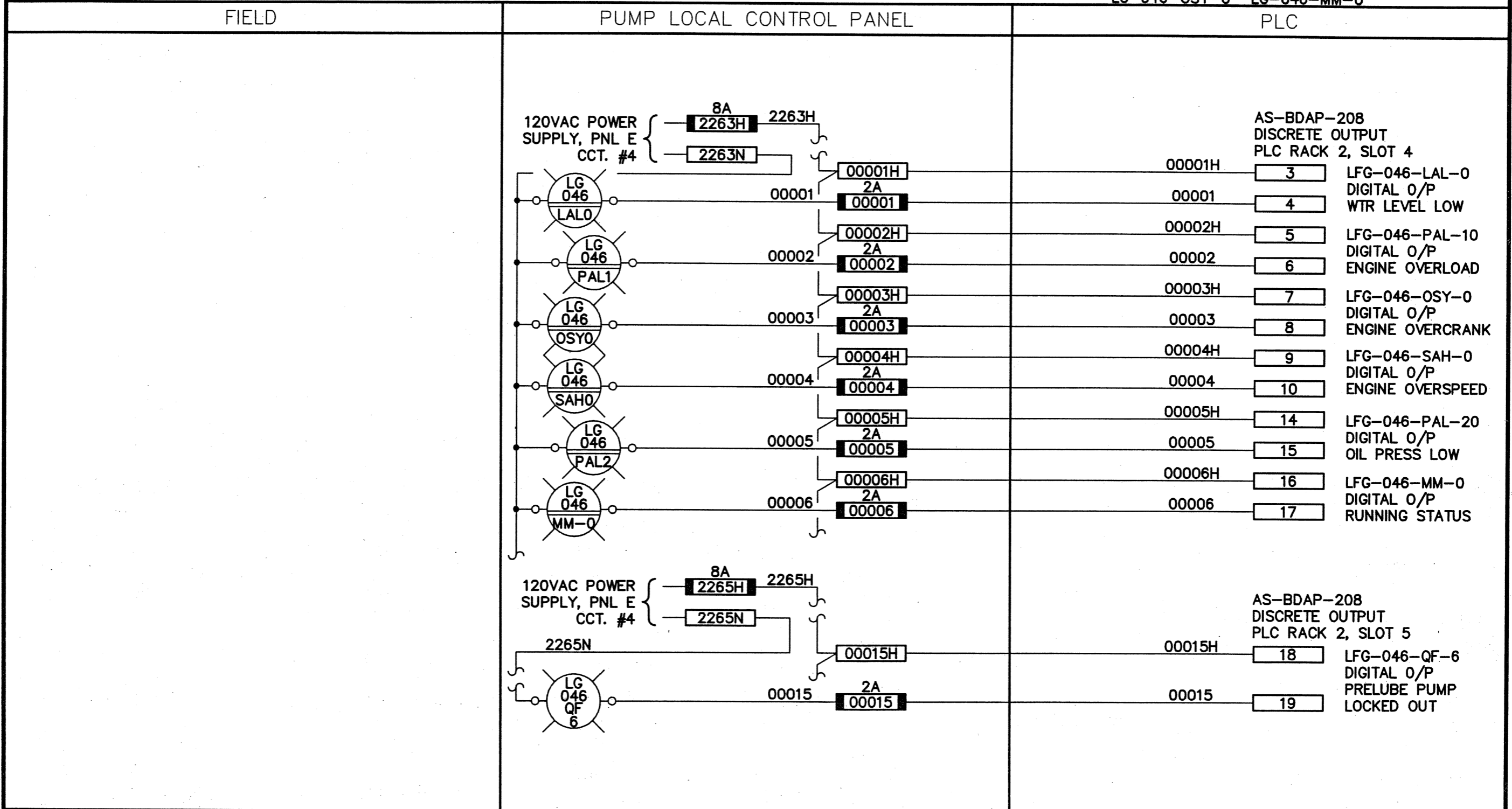
MacLEAN REGIONAL PUMPING STATION - LCP22
PUMP #22 ELAPSED TIME METER

DRAWING NO.
D-2627

INSTRUMENT LOOP DIAGRAM

LOOP NO.

LG-046-LAL-0	LG-046-SAH-0	LG-046-QF-6
LG-046-PAL1	LG-046-PAL2	
LG-046-OSY-0	LG-046-MM-0	



NOTE:
1. "ENG RUNNING" STATUS • MacLEAN IS PROVIDED BY THE "CRANK SPEED SWITCH" (MOMENTARY CONTACT)



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JOB NO. 3153
FILENAME D2623

THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1			AS-BUILT	PL
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97.02.03	2	PS	94.07.29	A	PL
				ISSUED FOR APPROVAL	PL

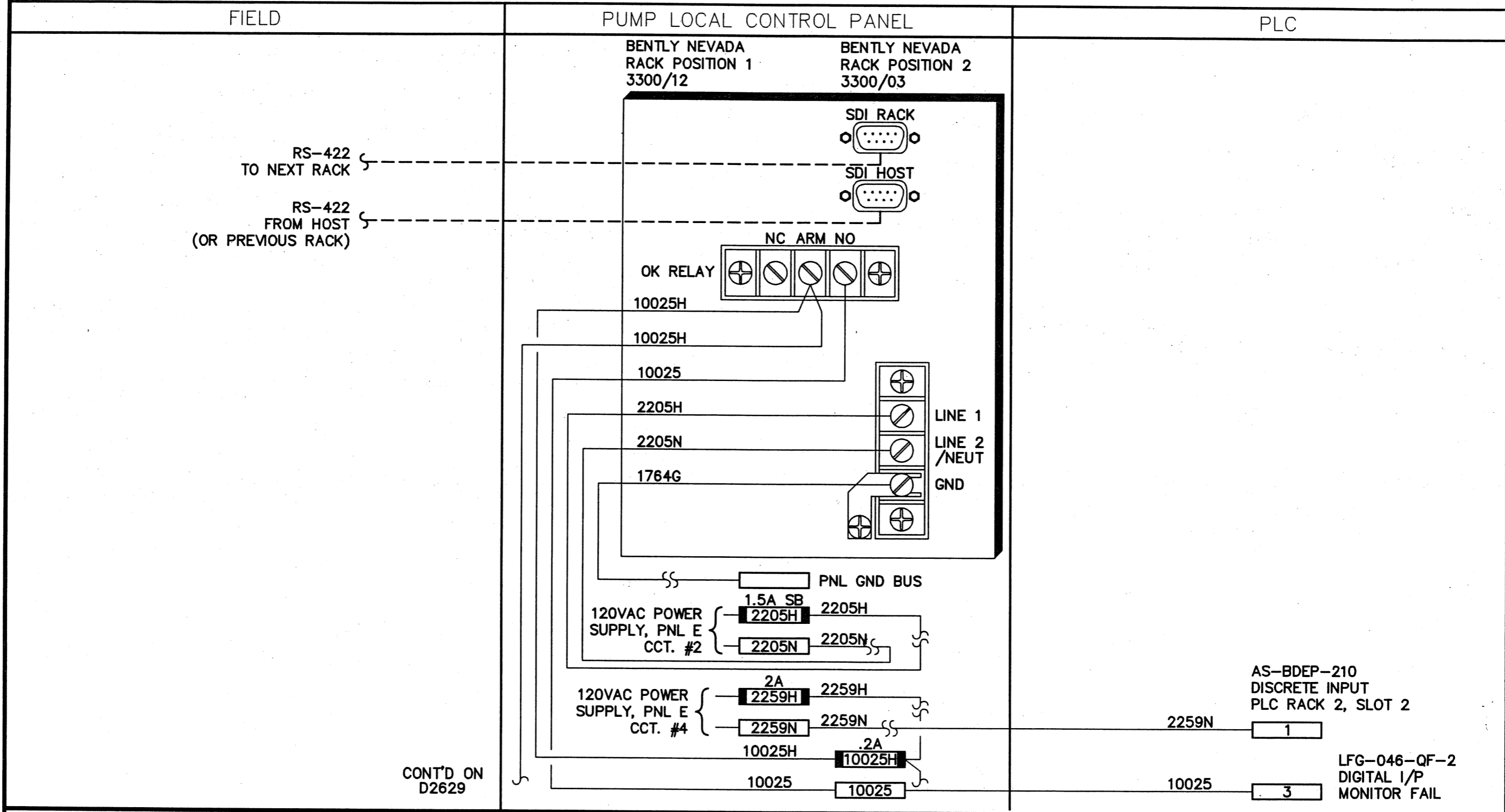
**MacLEAN REGIONAL PUMPING STATION – LCP26
GAS PUMP #26 ENGINE DRIVE (SHT. 3 OF 4)**

DRAWING NO.
D-2623

INSTRUMENT LOOP DIAGRAM

LOOP NO.

LBG-046-QF-2



CONT'D ON
D2629

NOTE:	<p style="font-size: small;">Consulting Engineers</p>	<p style="font-size: x-small;">Calgary, Alberta</p>	JOB NO. 3153 FILENAME D2628	<p style="font-weight: bold;">THE CITY OF WINNIPEG</p> <p style="font-size: x-small;">REGIONAL WATER SUPPLY SYSTEM SUPERVISORY CONTROL AND DATA ACQUISITION</p>	SCALE _____ DATE 94.07.29 DES PL DWN LFB CKD DN APP LK																							
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94.08.12	0	ISSUED FOR CONST.	PL																									
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DATE	REVISION	APP.																										

INSTRUMENT LOOP DIAGRAM

LOOP NO.

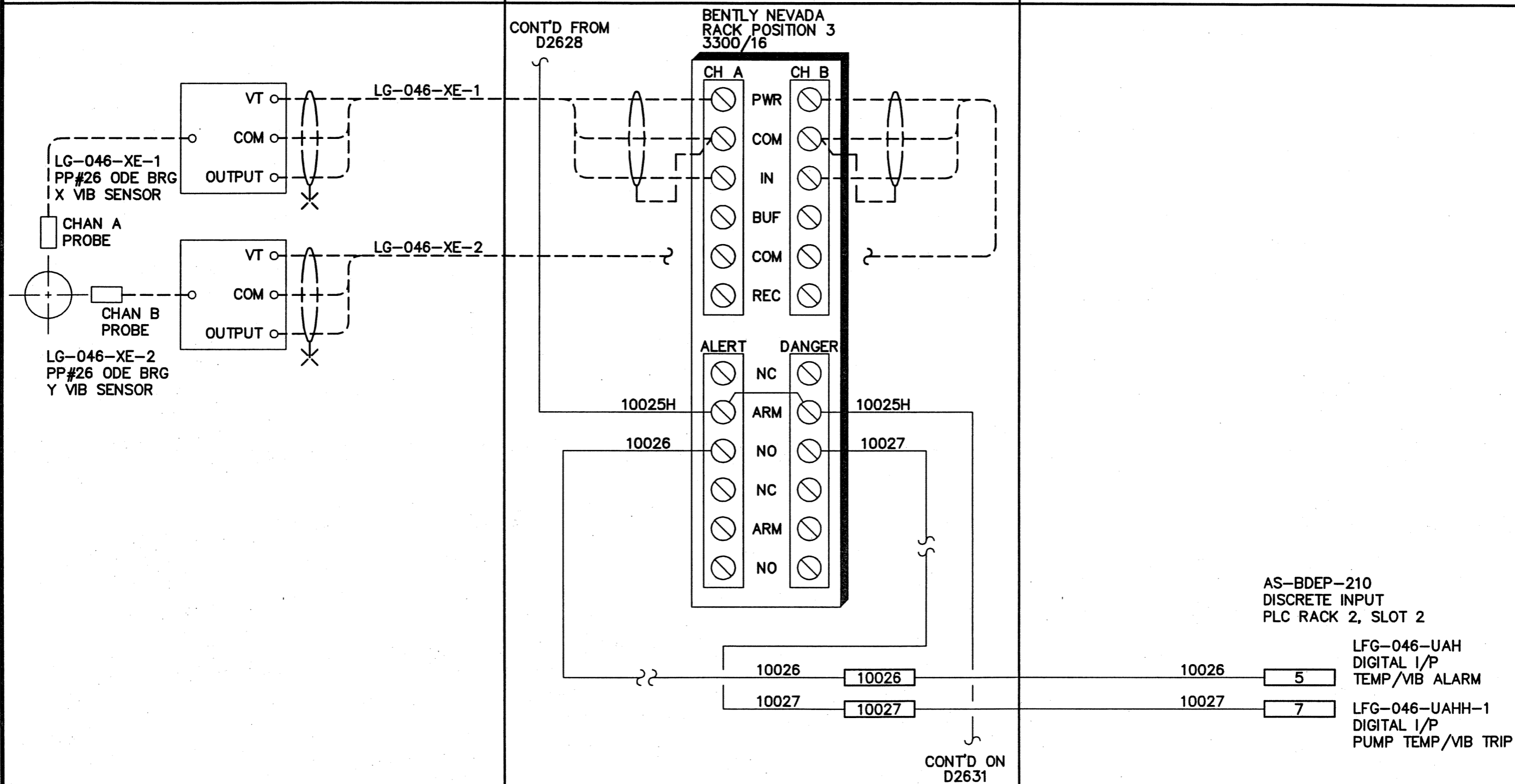
LG-046-XE-1
LG-046-XE-2

LAG-046-UAH
LAG-046-UAHH-1

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

Reid Crowther
Consulting Engineers

kenonic controls ltd.
Calgary, Alberta

JOB NO. 3153
FILENAME D2629



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1	AS-BUILT			PL
94.08.12	0	ISSUED FOR CONST.			PL
97.02.03	2	RCPL RECORD DRAWING	94.07.07	2	AS BUILT

MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 TEMP / VIB MONITOR (SHT. 2 OF 6)

DRAWING NO.
D-2629

INSTRUMENT LOOP DIAGRAM

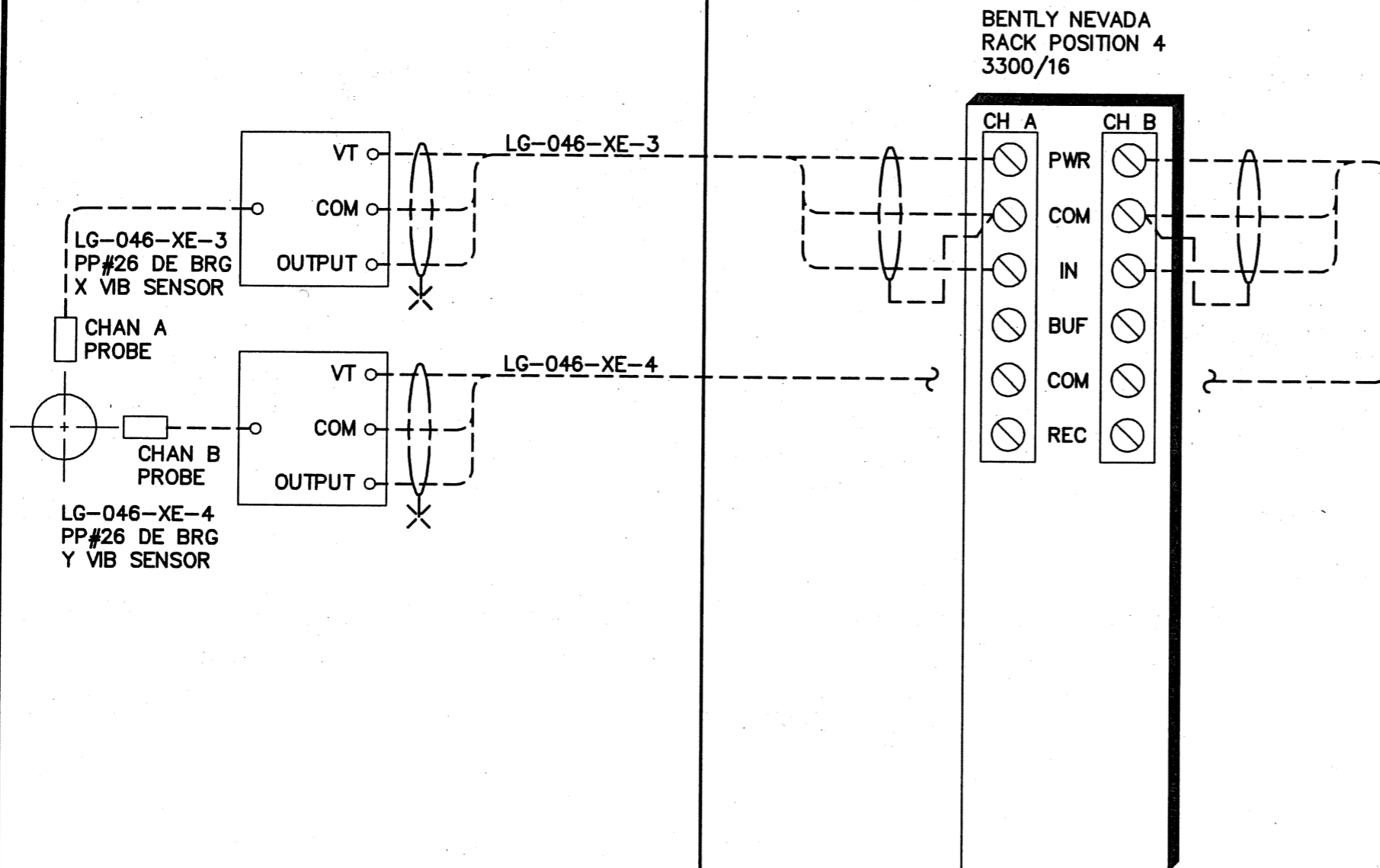
LOOP NO.

LG-046-XE-3
LG-046-XE-4

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

Reid Crowther

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Calgary, Alberta

JOB NO. 3153
FILENAME D2630



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

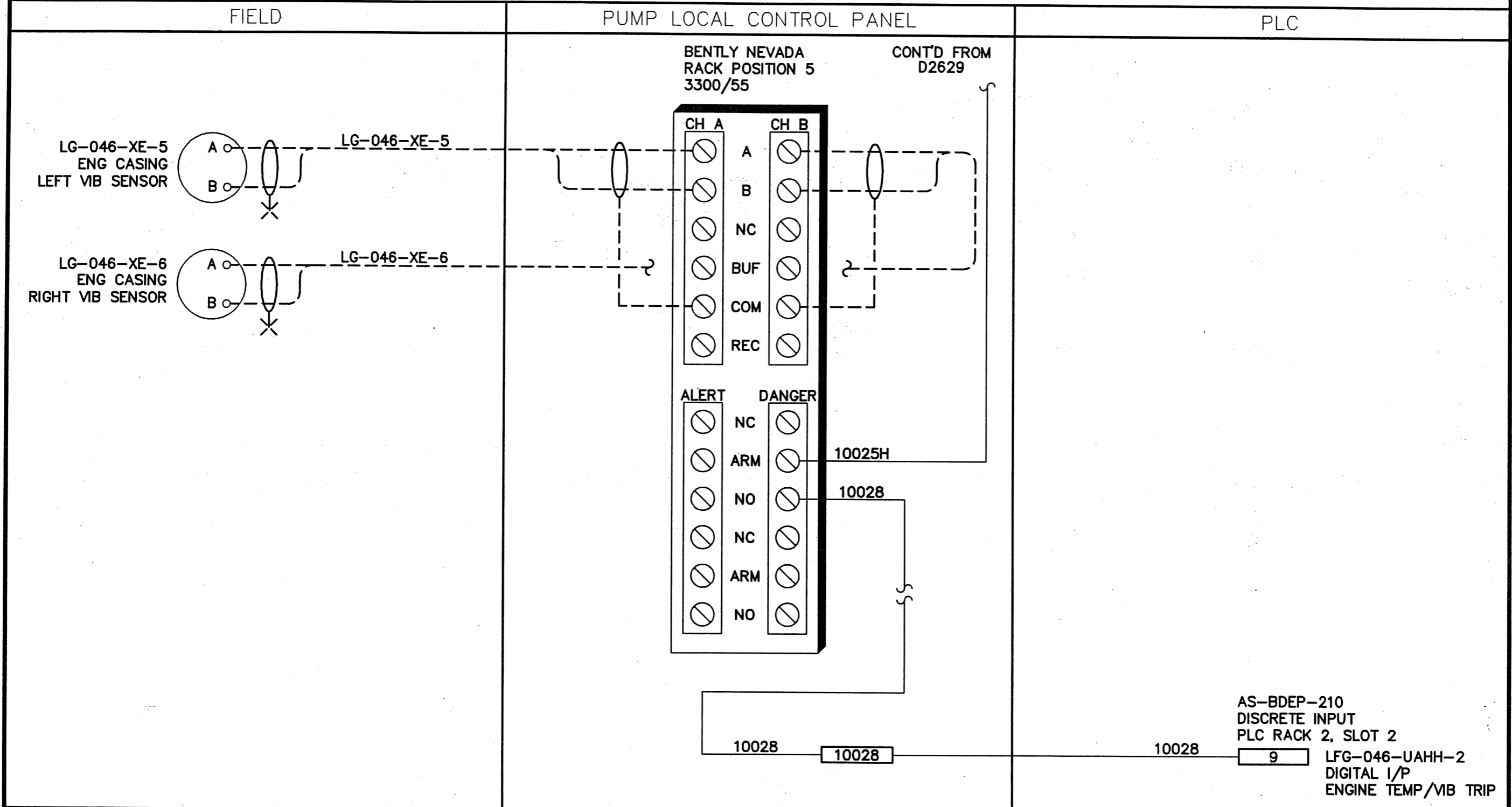
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94.08.12	0		ISSUED FOR CONST.		PL
97.02.03	2	PS	RCPL RECORD DRAWING		
94.07.29	A		ISSUED FOR APPROVAL		PL

MacLEAN REGIONAL PUMPING STATION – LCP26
GAS PUMP #26 TEMP / VIB MONITOR (SHT. 3 OF 6)

DRAWING NO.
D-2630

INSTRUMENT LOOP DIAGRAM

LOOP NO. **LG-046-XE-5**
LG-046-XE-6 **LAG-046-UAHH-2**



NOTE:	Reid Crowther <small>Consulting Engineers</small>	kenonic controls Ltd. <small>Calgary, Alberta</small>	JOB NO. 3153	THE CITY OF WINNIPEG REGIONAL WATER SUPPLY SYSTEM SUPERVISORY CONTROL AND DATA ACQUISITION	SCALE _____
			FILENAME D2631		DATE 94.07.29
			95.07.11 1 AS-BUILT PL		DES PL DWN LFB
			94.08.12 0 ISSUED FOR CONST. PL		CKD DN APP LK
	97.02.03 2 RCPL RECORD DRAWING PS	94.07.29 A ISSUED FOR APPROVAL PL		MacLEAN REGIONAL PUMPING STATION - LCP26 GAS PUMP #26 TEMP / VIB MONITOR (SHT. 4 OF 6)	DRAWING NO. D-2631
	DATE REVISION APP.	DATE REVISION APP.			

INSTRUMENT LOOP DIAGRAM

LOOP NO.

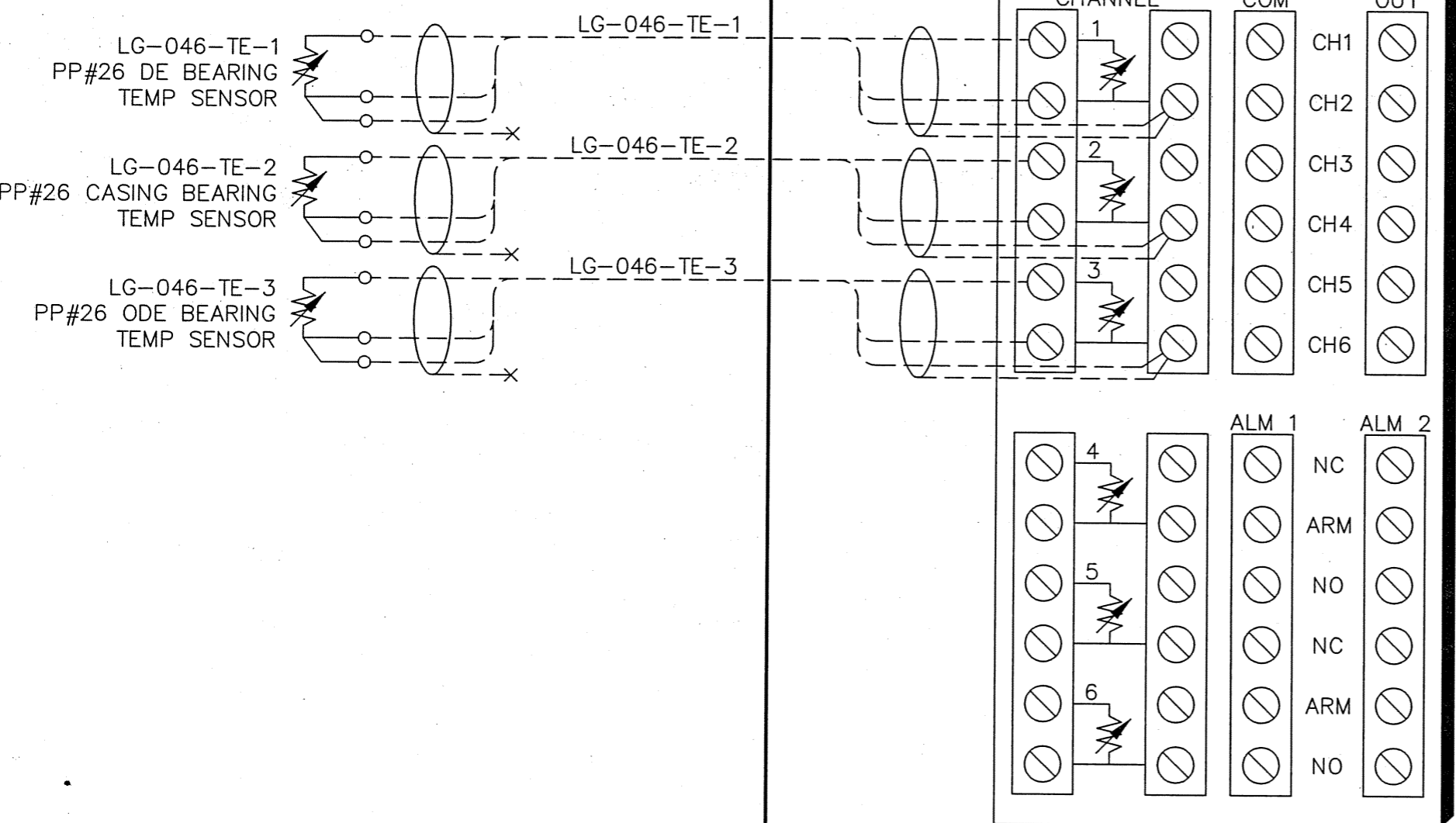
LG-046-TE-1
LG-046-TE-2
LG-046-TE-3

FIELD

PUMP LOCAL CONTROL PANEL

PLC

BENTLY NEVADA
RACK POSITION 7-8
3300/35



NOTE:
1. RED = A
BLK = B
WHT = C

Reid Crowther
Consulting Engineers

DATE	REVISION	APP.
97.02.03	2 RCPL RECORD DRAWING	PS

kenonic controls ltd.
Calgary, Alberta

DATE	REVISION	APP.
95.07.11	1 AS-BUILT	PL
94.08.12	0 ISSUED FOR CONST.	PL
94.07.29	A ISSUED FOR APPROVAL	PL

JOB NO. 3153
FILENAME D2632

THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

MaCLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 TEMP / VIB MONITOR (SHT. 5 OF 6)

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DRAWING NO.
D-2632

INSTRUMENT LOOP DIAGRAM

LOOP NO.

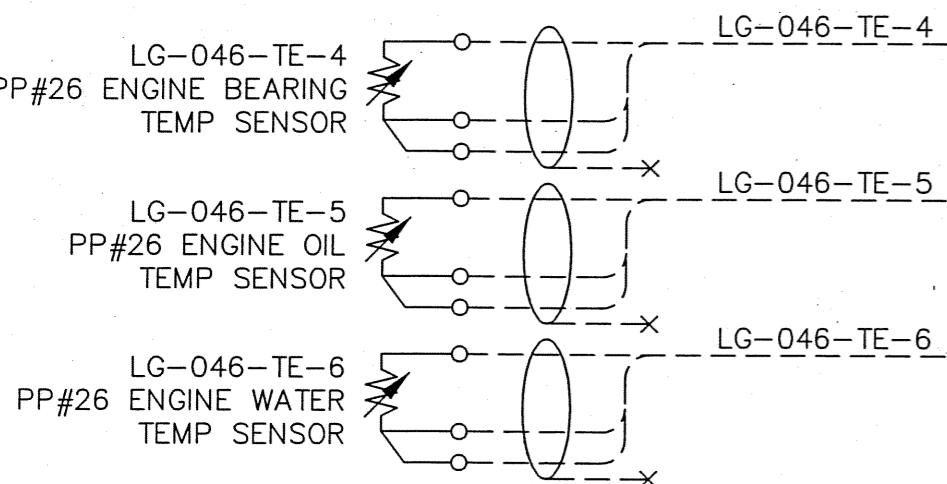
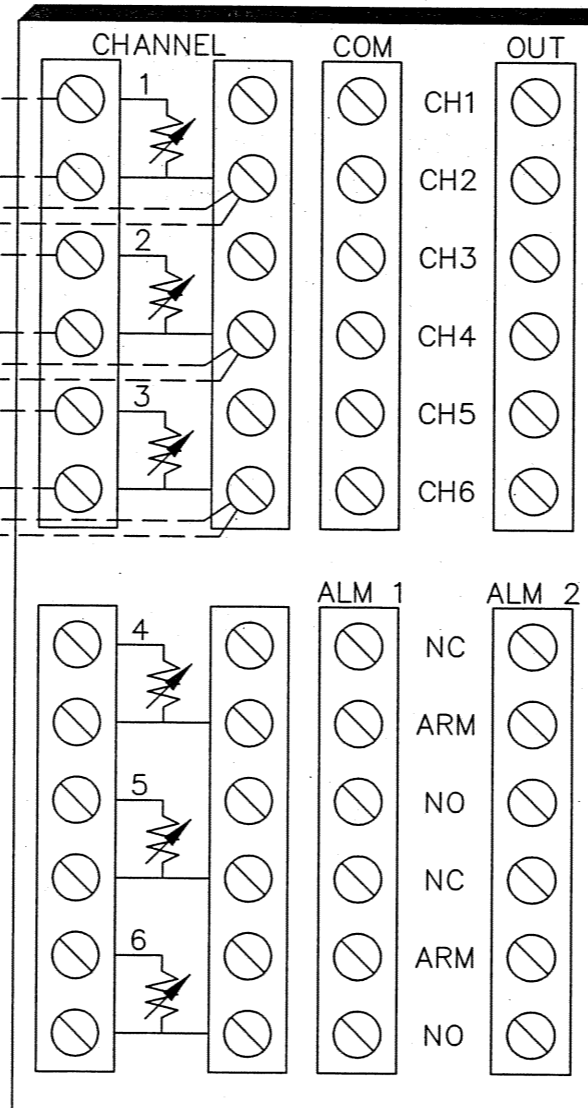
LG-046-TE-4
LG-046-TE-5
LG-046-TE-6

FIELD

PUMP LOCAL CONTROL PANEL

PLC

BENTLY NEVADA
RACK POSITION 9-10
3300/35



NOTE:
1. RED = A
BLK = B
WHT = C

Reid Crowther
Consulting Engineers

DATE	REVISION	APP.
97.02.03	2 RCPL RECORD DRAWING	PS

kenonic controls ltd.
Calgary, Alberta

DATE	REVISION	APP.
95.07.11	1 AS-BUILT	PL
94.08.12	0 ISSUED FOR CONST.	PL
94.07.29	A ISSUED FOR APPROVAL	PL

JOB NO. 3153
FILENAME D2633

THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 TEMP / VIB MONITOR (SHT. 6 OF 6)

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DRAWING NO.
D-2633

INSTRUMENT LOOP DIAGRAM

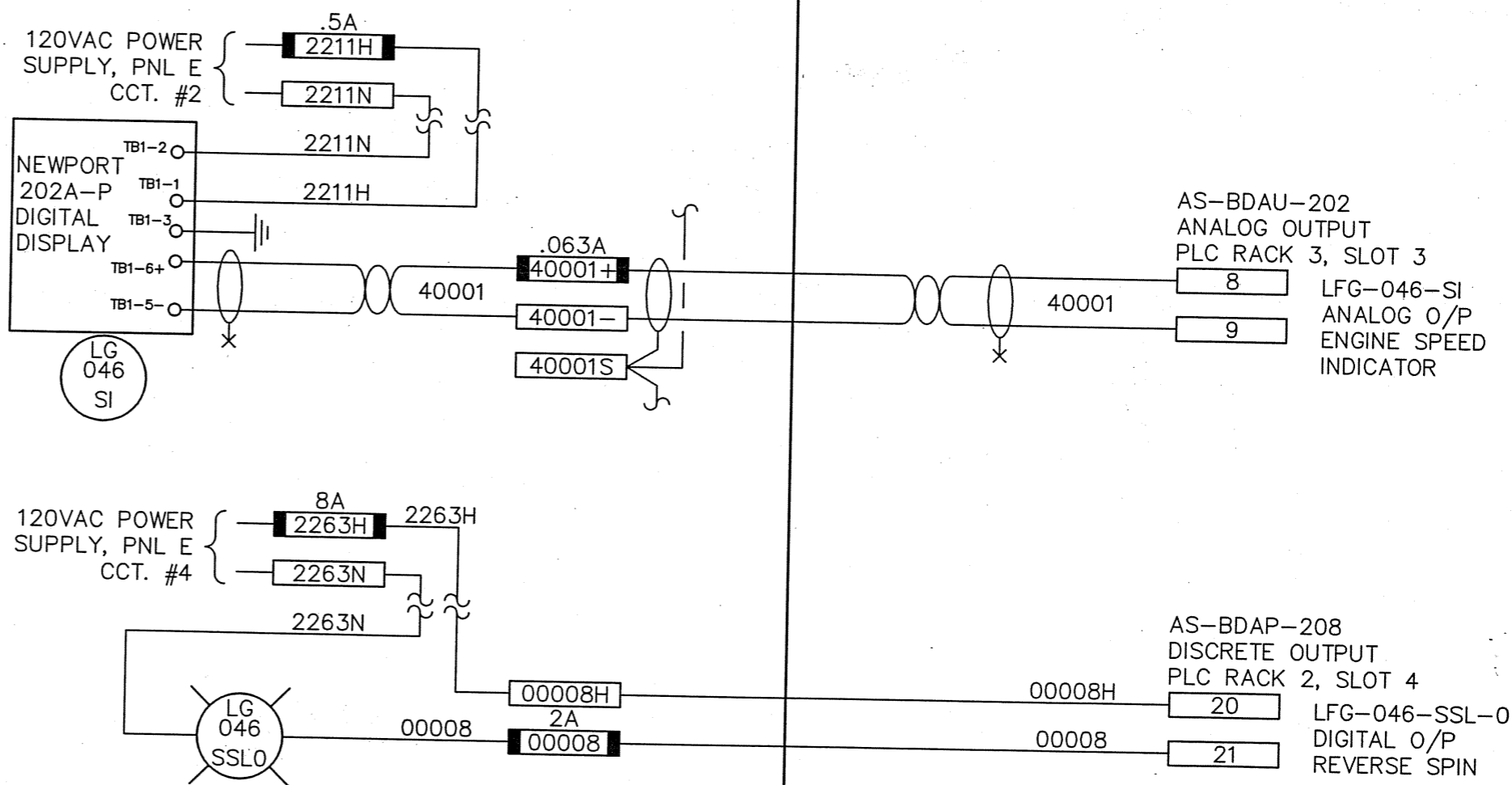
LOOP NO. LG-046-SLL-0

LG-046-SI

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

Reid Crowther
Consulting Engineers

kenonic controls Ltd.
Calgary, Alberta

JOB NO. 3153
FILENAME D2635



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1			AS-BUILT	PL
94.08.12	0			ISSUED FOR CONST.	PL
94.07.29	A			ISSUED FOR APPROVAL	PL
00.06.30	3	GMZ		REVISED TO DATE	
97.02.03	2	PS		RCPL RECORD DRAWING	

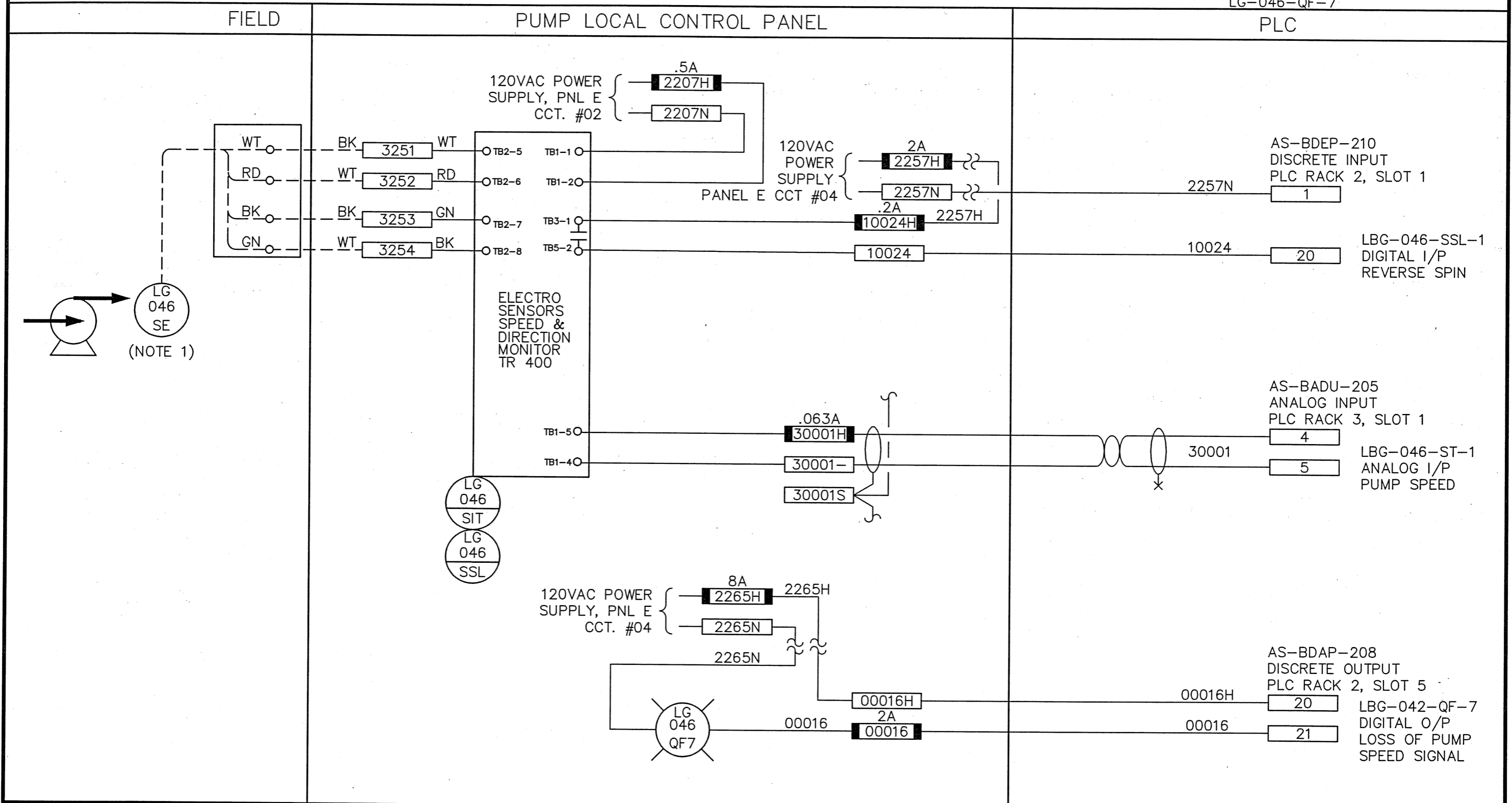
MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 SPEED MONIT. LOOP (SHT. 2 OF 2)

DRAWING NO.
D-2635

INSTRUMENT LOOP DIAGRAM

LOOP NO.

LG-046-SSL-1 LG-046-SSL
 LG-046-SE LG-046-SIT
 LG-046-QF-7



NOTE:
 1. SPEED ELEMENT CONSISTS OF ONE MAGNETIC DISK AND ONE TRANSDUCER.

						JOB NO. 3153	
						FILENAME D2564	
00.06.30	4	REVISED TO DATE	GMZ	95.07.11	1	AS-BUILT	PL
99.11.22	3	TR-400 MONITOR ADDED	GMZ	94.08.12	0	ISSUED FOR CONST.	PL
97.02.03	2	RCPL RECORD DRAWING	PS	94.07.29	0	ISSUED FOR APPROVAL	PL
DATE		REVISION	APP.	DATE		REVISION	APP.

THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

MacLEAN REGIONAL PUMPING STATION - LCP26
 GAS PUMP #26 SPEED MONIT. LOOP (SHT. 1 OF 2)

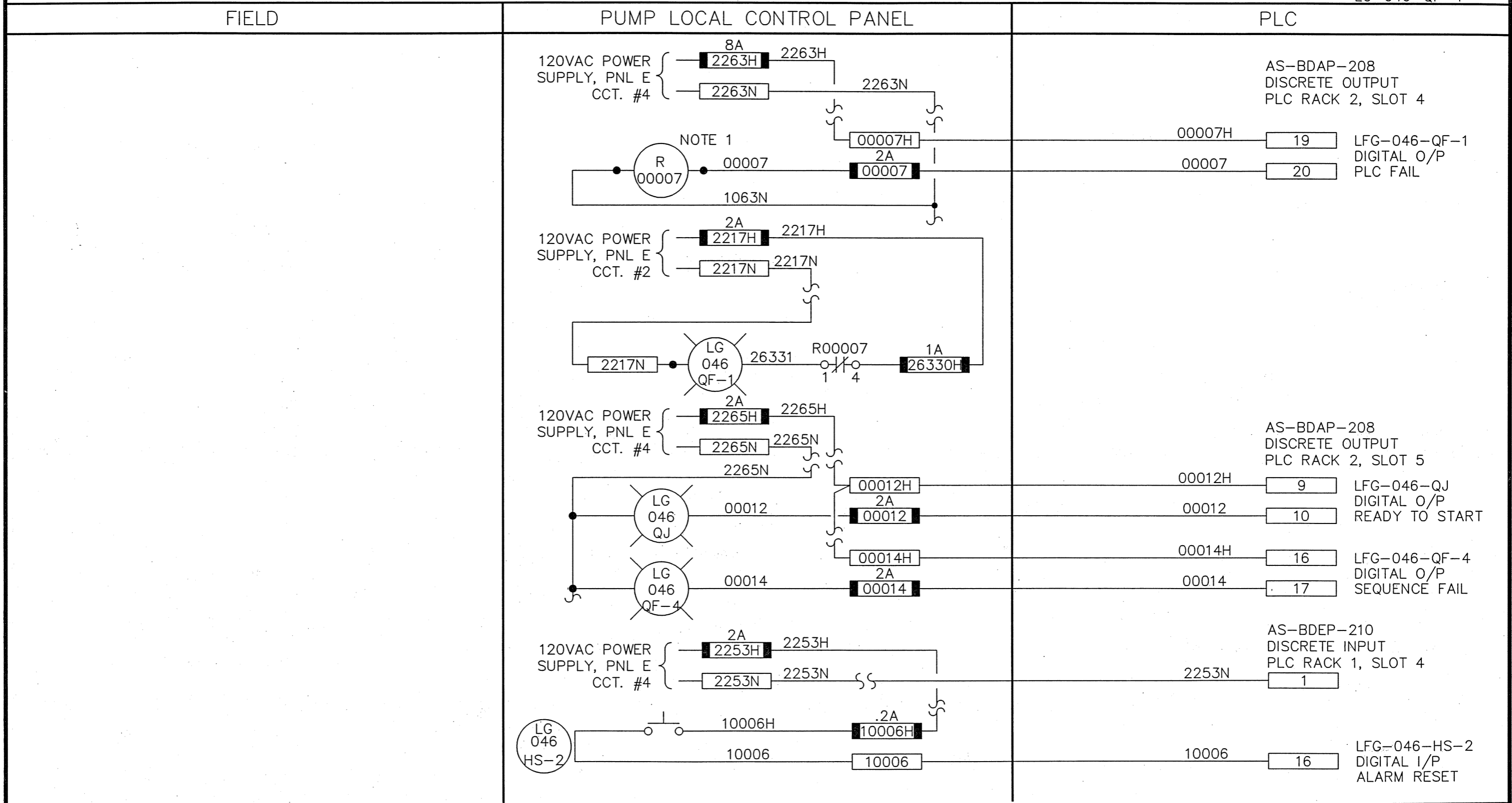
SCALE N.T.S.
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK

DRAWING NO.
D-2634

INSTRUMENT LOOP DIAGRAM

LOOP NO.

LG-046-HS-2 LG-046-QJ
 LG-046-QF-1
 LG-046-QF-4



NOTE:
1. PLC FAIL RELAY IS NORMALLY ENERGIZED.

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Calgary, Alberta

JOB NO. 3153
FILENAME D2637



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
			95.07.11	1 AS-BUILT	PL
			94.08.12	0 ISSUED FOR CONST.	PL
97.02.03	2 RCPL RECORD DRAWING	PS	94.07.29	A ISSUED FOR APPROVAL	PL

MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 PLC FAIL / RESET

DRAWING NO.
D-2637

INSTRUMENT LOOP DIAGRAM

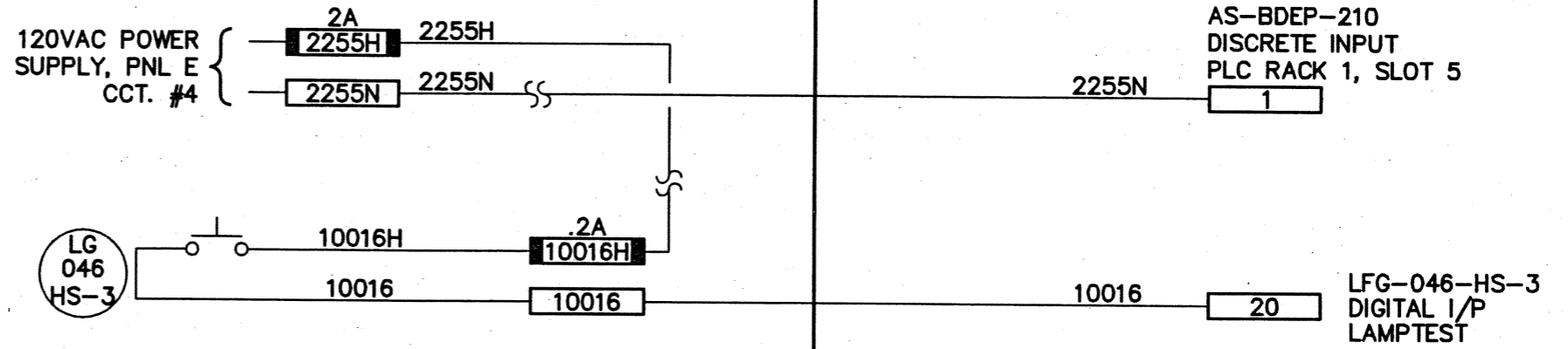
LOOP NO.

LG-046-HS-3

FIELD

PUMP LOCAL CONTROL PANEL

PLC



NOTE:

Reid Crowther

Consulting Engineers



JOB NO. 3153
FILENAME D2638



THE CITY OF WINNIPEG
REGIONAL WATER SUPPLY SYSTEM
SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
DATE 94.07.29
DES PL DWN LFB
CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1			AS-BUILT	PL
94.08.12	0			ISSUED FOR CONST.	PL
97.02.03	2	PS	94.07.29	A	PL
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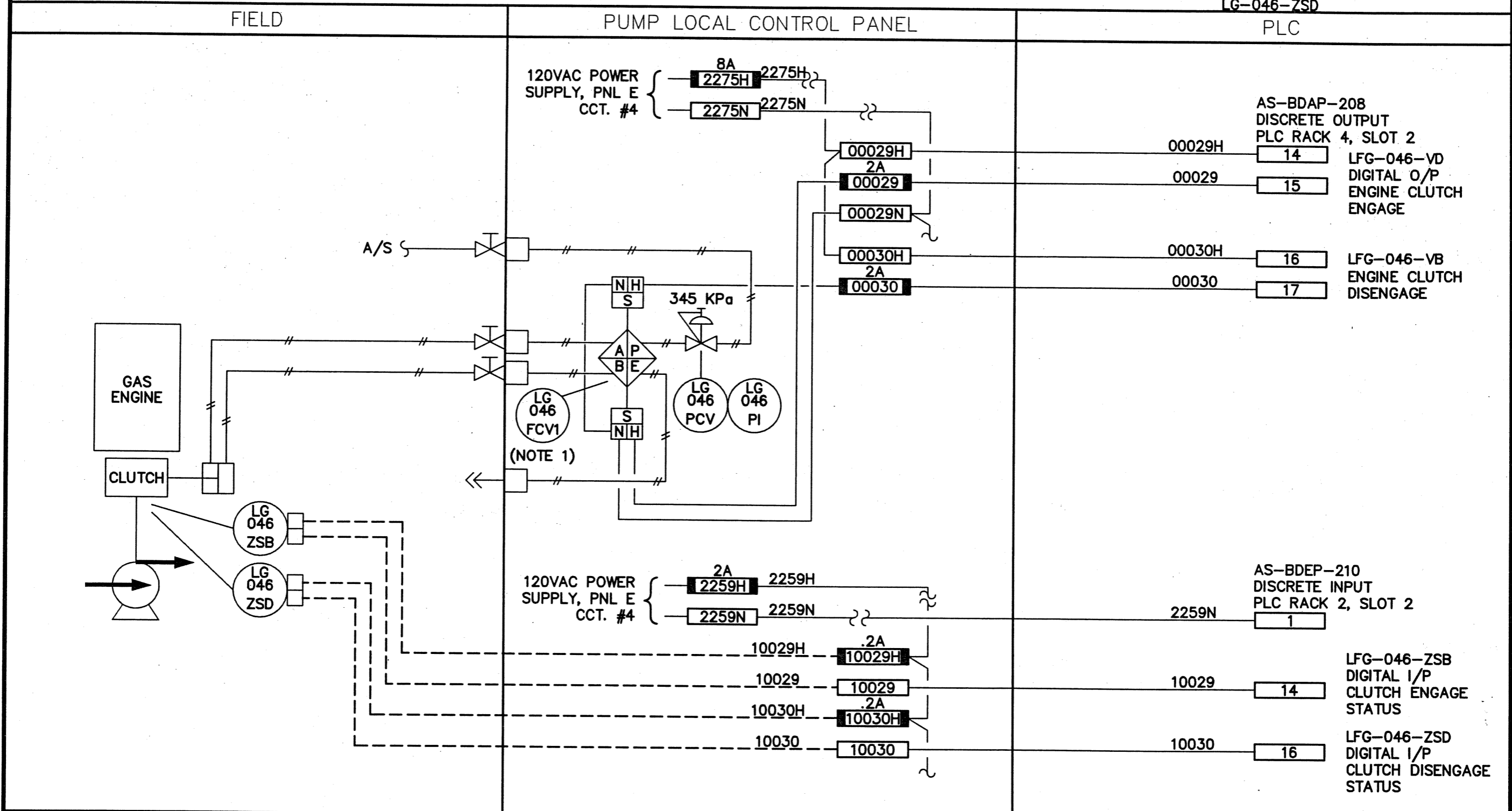
MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 LAMPTEST

DRAWING NO.
D-2638

INSTRUMENT LOOP DIAGRAM

LOOP NO.

LG-046-PCV
 LG-046-ZSB
 LG-046-ZSD
 LG-046-FCV-1
 LG-046-FCV-2



NOTE:
 1. CLUTCH SHALL DISENGAGE WHEN SOLENOID VALVE DE-ENERGIZES.

Reid Crowther
 Consulting Engineers

kenonic controls Ltd.
 Calgary, Alberta

THE CITY OF WINNIPEG
 REGIONAL WATER SUPPLY SYSTEM
 SUPERVISORY CONTROL AND DATA ACQUISITION

SCALE _____
 DATE 94.07.29
 DES PL DWN LFB
 CKD DN APP LK

DATE	REVISION	APP.	DATE	REVISION	APP.
95.07.11	1				
94.08.12	0				
97.02.03	2				

MacLEAN REGIONAL PUMPING STATION - LCP26
GAS PUMP #26 ENGINE CLUTCH CONTROL

DRAWING NO.
D-2636