

I.A. = 70.6 AMPS
 I.B. = 45.860 AMPS
 S.F. = 1.00
 C.O.D. = 27 SEC
 I.F. = 93%

SAFE START TIME
 HOT = 27 SEC
 COLD = 93%

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NOTES:

- AS BUILT AS PER CONTRACTOR'S MARKUPS
- ISSUED FOR CONSTRUCTION
- CONCEPTUAL DESIGN
- ISSUED FOR MCC BID
- PRELIMINARY

PERMIT

ENGINEER



PIONEER
 MULTISERVICES CANADA INC.
 CHINCHAGA GAS PLANT
 C-32-H/94-H-8
 4160 VOLT SINGLE LINE DIAGRAM

SCALE NONE
 PROJECT NO. 226200
 DWG. NO. A1-2262-S-100
 REV 2

LEGEND

14	DETECTORS
15	SPEED BREAKER
16	UNDERVOLTAGE RELAY
17	UNDERVOLTAGE RELAY
18	UNDERVOLTAGE RELAY
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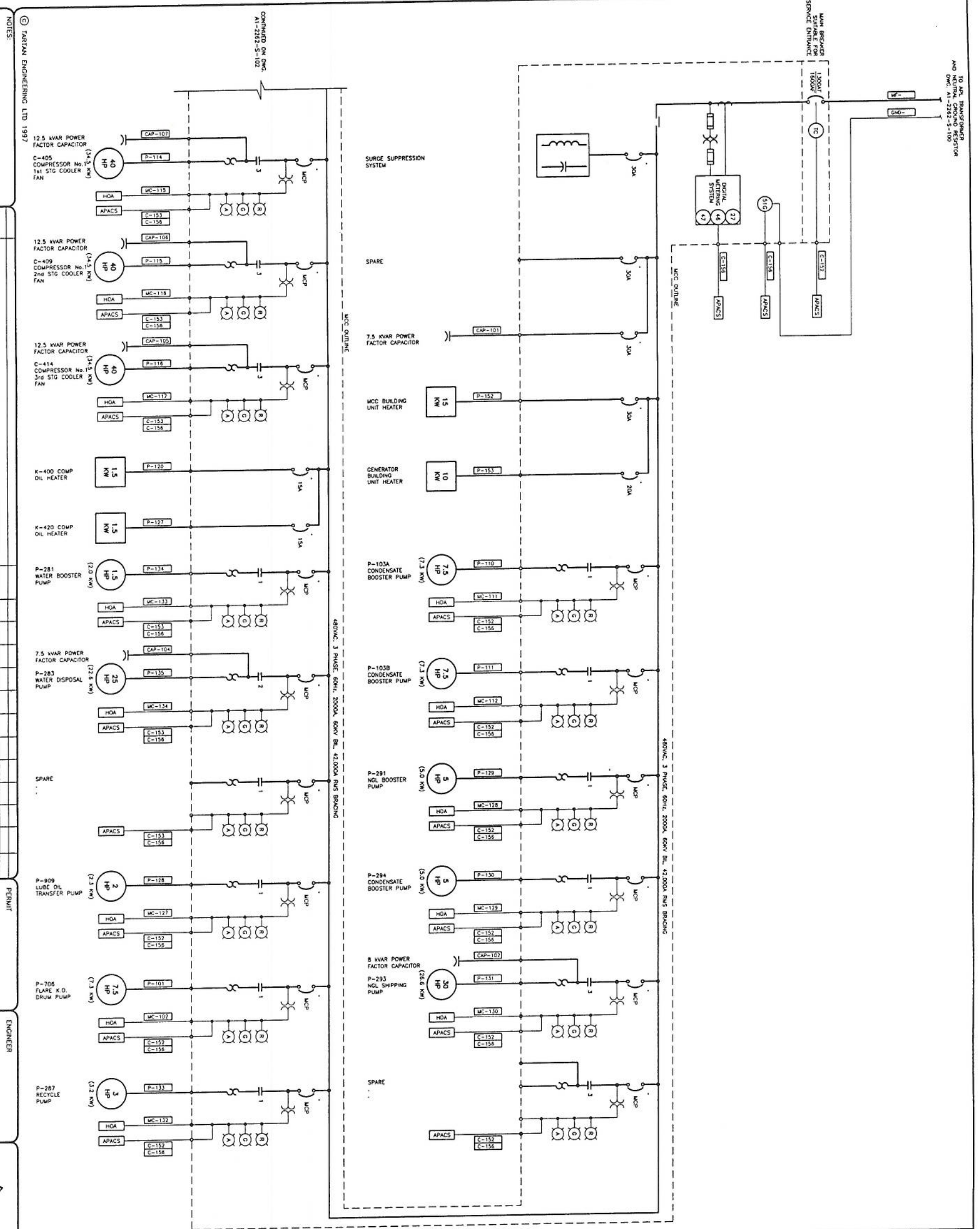
- NOTES**
- EQUIPMENT SHALL CONFORM TO APPLICABLE CSA AND IEC STANDARDS.
 - EQUIPMENT WILL BE HOUSED IN ROOMS IN A CONCRETE BASEMENT AREA.
 - ALL CONTROL WIRING SHALL BE IN PULVED COPPER AND LABELED ON BOTH ENDS.
 - EQUIPMENT SHALL BE EXPOSED TO TRACE H2S ENVIRONMENT.
 - POWER FEEDERS LUGS SHALL BE DESIGNED FOR BOTTOM ENTRY FOR MAIN TWO (2) PER PHASE 2/0 AWG CABLES.
 - ALL RFD'S WILL BE 100 OHM PLAINWAVE.
 - MOTOR FEEDER AND CONTROL CABLES SHALL ENTER THROUGH THE BOTTOM OF THE SWITCHGEAR.
 - EACH MOTOR STARTER SHALL INCLUDE 1 - 2500C INTERLOCKING RELAYS FOR CUSTOMER P.A.C. INTERLOCKING.
 - MATERIAL RELAYS TO INCLUDE REAR SERIAL PORT WITH LOGIC'S RTU PROTOCOL AND MATERIAL RELAY OPEN CONTACT OUTPUTS FOR TEMP. ALARM, ALV 1 & ALV 2.
 - ALL LUGS TO BE DOUBLE BOLTED.
 - ALL PILOT LUGS TO BE CANCELED LED'S.
 - MOTOR FEEDER CABLES WILL BE ONE (1) PER PHASE 3 AWG. INTERLOCK APPROXIMATELY 40 METERS LONG.

SMITHSHEET DATA

MANUFACTURER: _____
 MODEL: SHIP No. _____
 FABRICATION DATE: _____
 TARTAN P.O. No. _____

TOTAL CONNECTED LOAD

468.0 MW



NOTES:

AS BUILT AS PER CONTRACTOR'S MARKUPS

ISSUED FOR CONSTRUCTION

ISSUED FOR MCC CONSTRUCTION

CONCEPTUAL DESIGN

ISSUED FOR MCC BID

PRELIMINARY

REVISION

DATE

BY

APP

CIVIL

MCC

ELEC

INST

SYST

PROJ

O.A.

OWNER

OWNER

1	AS BUILT AS PER CONTRACTOR'S MARKUPS	99.10.20	KL
2	ISSUED FOR CONSTRUCTION	98.01.27	DFR
3	ISSUED FOR MCC CONSTRUCTION	97.12.23	CPW
4	CONCEPTUAL DESIGN	97.12.15	KA
5	ISSUED FOR MCC BID	97.11.20	CPW
6	PRELIMINARY	97.10.15	CPW
7	REVISION		

LEGEND

14	SPRING
17	UNDERDRIVE RELAY
21	ANNUNCIATOR
22	UNDERDRIVE RELAY
23	UNDERDRIVE RELAY
24	UNDERDRIVE RELAY
25	UNDERDRIVE RELAY
26	UNDERDRIVE RELAY
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94	UNDERDRIVE RELAY

NOTES

- EQUIPMENT SHALL CONFORM TO APPLICABLE CSA AND EMC STANDARDS
- EQUIPMENT WILL BE HOUSED INDOORS IN A CONTROL PURPOSE AREA
- ALL CONTROL WIRING SHALL BE IN PLAIN COPPER AND LABELLED ON BOTH ENDS
- EQUIPMENT SHALL BE EXPOSED TO TRACE H2S ENVIRONMENT
- EQUIPMENT SHALL BE SUITABLY PROTECTED
- WALL MOUNTING SECTION SHALL BE DESIGNED FOR BOTTOM ENTRY FOR MAIN POWER FEEDERS. LUGS SHALL BE INCLUDED TO ACCOMMODATE FIVE (5) PER PHASE 500 MCM CABLES.

MOTOR CONTROL CENTER DATA

MANUFACTURER: _____

MODEL: _____

SHIP NO.: _____

FABRICATION DATE: _____

TARTAN P.O. No.: _____

TOTAL CONNECTED LOAD: 856 KW

SCALE: NONE

PROJECT NO: 226200

DMC No: A1-2262-S-101

REV: 2

PIONEER

MANUAL RESOURCES CANADA INC.

CHINCHAGA GAS PLANT

C-32-H/94-H-8

480 VOLT SINGLE LINE DIAGRAM

Tartan ENGINEERING ALBERTA

NOTES:

- CONTRACTOR SHALL DISCONNECT ALL EXISTING MOTORS FROM EXISTING STARTERS AND RECONNECT TO NEW STARTERS.
- CONTRACTOR SHALL DETERMINE IN FIELD IF EXISTING CABLES CAN BE RE-USED.

AS-BUILT (CONCRETE DESIGN #778.04)

REV	DATE	BY	CHKD	APP	PROC	MECH	ELEC	INST	SYST	ENG	PROJ	QA	CHND	OWNER
A	97.10.15	CPM												
B	97.11.20	CPM												
C	97.12.23	CPM												
D	98.01.22	DBR												
E	98.10.20	2												
F	01.11.19	LG												
G	01.12.21	LG												

PERMIT

ENGINEER

Tartan
ENGINEERING
SOLUTIONS
ADELPHI

SCALE: NONE

PROJECT No: 226200

DWG. No: A1-2262-S-102

REV: 5

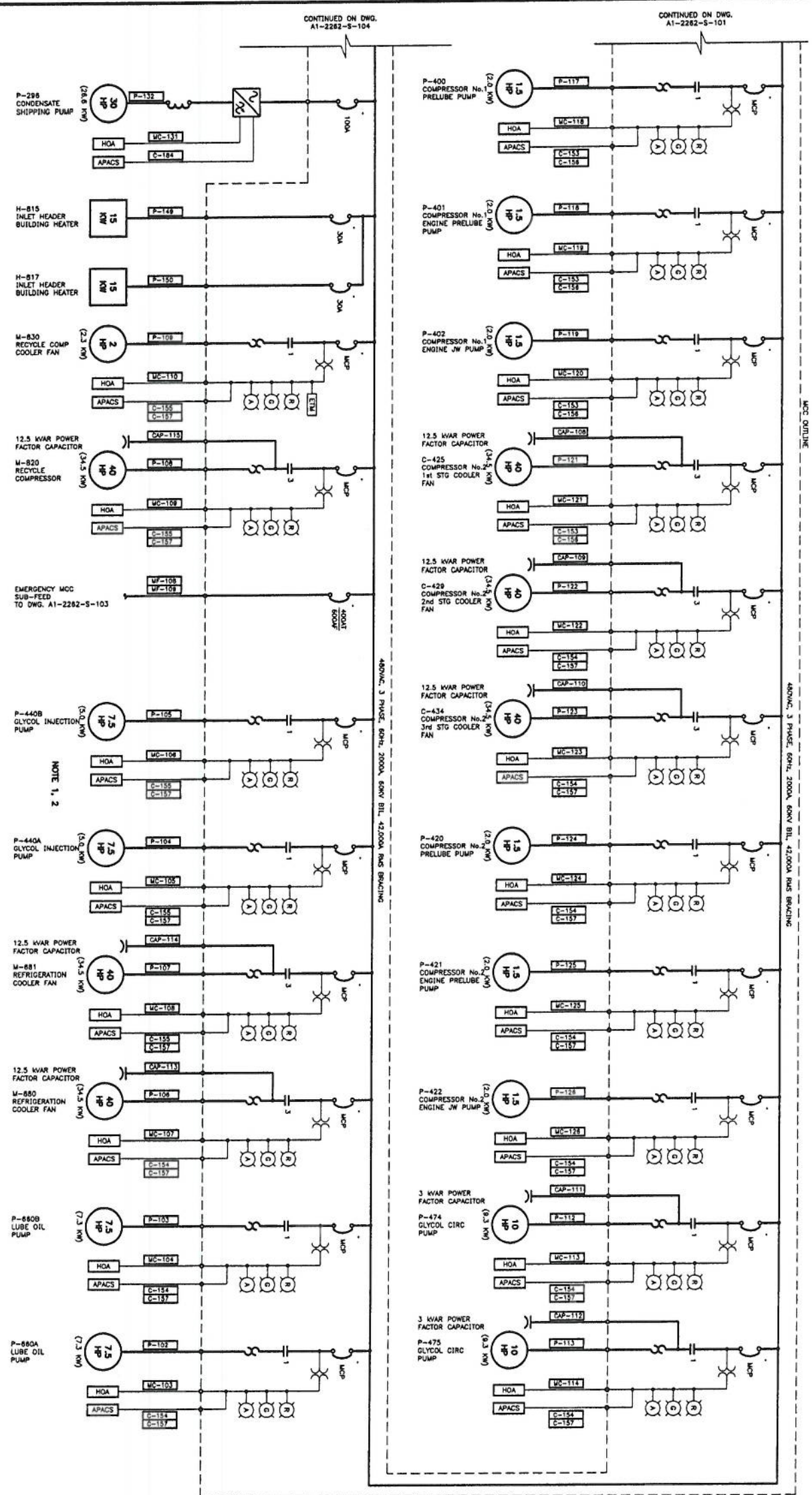
CHINCHAGA GAS PLANT
C-32-H/94-H-8
480 VOLT SINGLE LINE DIAGRAM

PIONEER
INDUSTRIAL SERVICES COMPANY INC.
Engineering Services
306 7th St. S. Dept. 1701, St. Paul, MN 55102
(612) 337-7188 Fax: (612) 337-7188

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NOTE

- CONTRACTOR SHALL DISCONNECT ALL EXISTING MOTORS FROM EXISTING STARTERS AND RECONNECT TO NEW STARTERS.
- CONTRACTOR SHALL DETERMINE IN FIELD IF EXISTING CABLES CAN BE RE-USED.



CONTINUED ON DWG. A1-2262-S-104

CONTINUED ON DWG. A1-2262-S-101

NOTE 1, 2

480VAC, 3 PHASE, 60Hz, 2000A, 60KV BIL, 42000A RMS BRACING

480VAC, 3 PHASE, 60Hz, 2000A, 60KV BIL, 42000A RMS BRACING

MOTOR CONTROL CENTER DATA

MANUFACTURER: _____

NAME, SHOP No.: _____

FABRICATION DATE: _____

TARTAN P.O. No.: _____

TOTAL CONNECTED LOAD
808 KW

LEGEND

ITEM	DESCRIPTION
14	SPEED SERVICE
27	UNDERVOLTAGE RELAY
30	ANNUNCIATOR
31	ANNUNCIATOR POWER RELAY
34	MASTER STOP/STOP RELAY
35	UNDERCURRENT / MINIMUM LOAD
36	MOTOR / LOAD BEARING OVERTEMPERATURE
37	LOSS OF FIELD (PROVISE VWF) RELAY
38	REMAINING CIRCUIT BREAKER
40	REMAINING PHASE STOP/STOP RELAY
42	REMAINING PHASE STOP/STOP RELAY
44	REMAINING PHASE STOP/STOP RELAY
48	MULTIPLE START/LOADED MOTOR
49	SLAVO WINDING OVERTEMPERATURE
50/2/1	INSTANTANEOUS/TIME OVERCURRENT RELAY
50/2/2	INSTANTANEOUS/TIME OVERCURRENT RELAY
50/2/3	INSTANTANEOUS/TIME OVERCURRENT RELAY
50/2/4	INSTANTANEOUS/TIME OVERCURRENT RELAY
52	CIRCUIT BREAKER
53	OVERVOLTAGE RELAY
54	PRESSURE SWITCH
55	THURING GOVERNOR CONTROL
56	GOVERNOR BREAKER CLOSING RELAY
57	LOCKOUT RELAY
58	GENERATOR DIFFERENTIAL PROTECTION RELAY
59	GENERATOR AUTOMATIC VALVE REGULATOR
60	GENERATOR BREAKER TRIPPING RELAY
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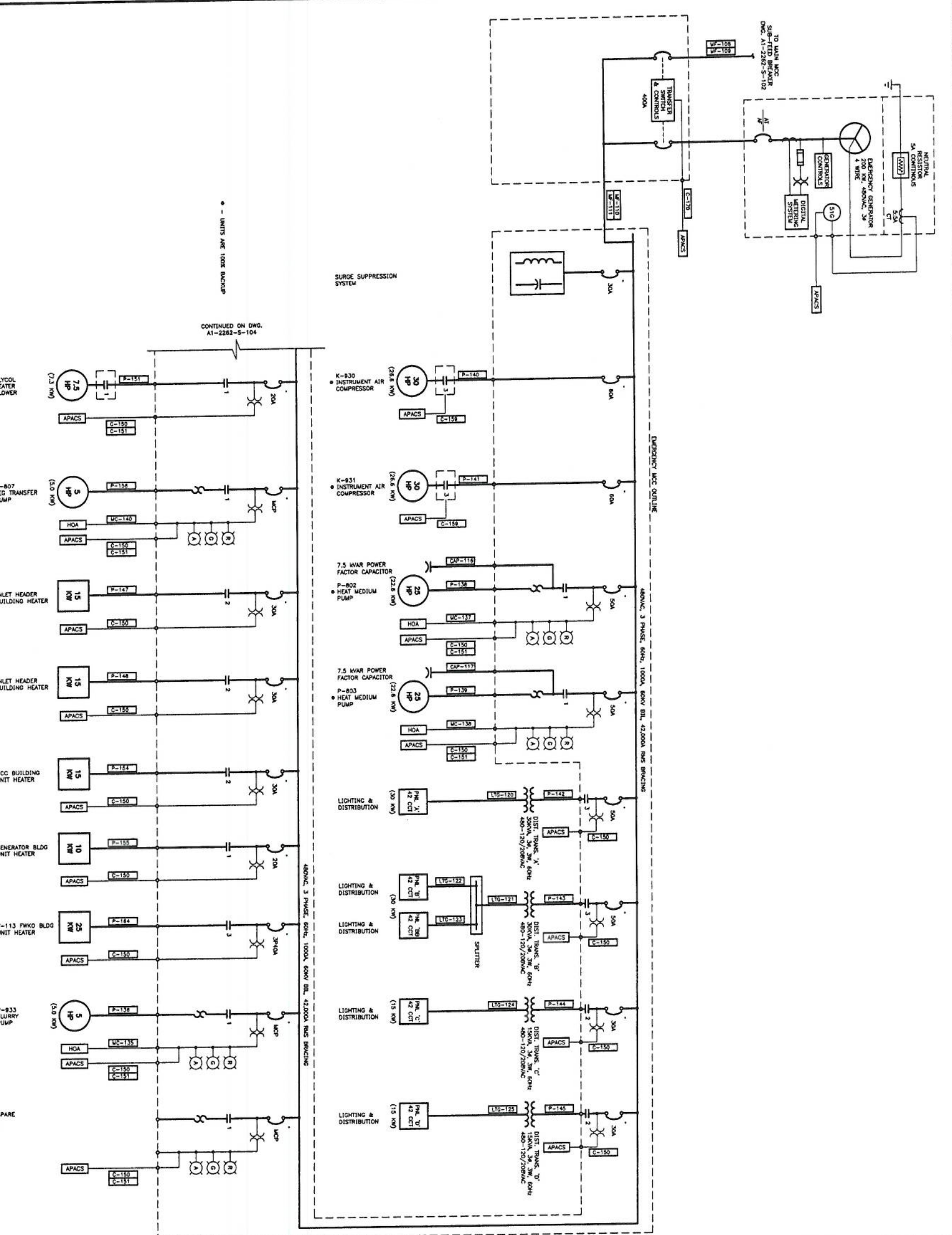
NOTES

- EQUIPMENT SHALL CONFORM TO APPLICABLE CSA AND IEC STANDARDS.
- EQUIPMENT WILL BE HOUSED INBOARDS IN A GENERAL PURPOSE ASB.
- ALL CONTROL WIRING SHALL BE TIN PLATED COPPER AND LABELLED ON BOTH ENDS.
- EQUIPMENT SHALL BE PROTECTED AGAINST OVERCURRENT.
- EQUIPMENT SHALL BE PROTECTED AGAINST SHORT CIRCUIT.
- POWER FEEDING LINES SHALL BE DESIGNED FOR BOTTOM ENTRY FOR MAIN FEEDING LINES.
- MAIN FEEDING LINES SHALL BE INCLUDED TO ACCOMMODATE FIVE (5) PER PHASE 500 MVA CABLES.

NOTES:	
1	AS-BUILT (CONCRETE DESIGN #778.04)
2	AS BUILT AS PER CONTRACTOR'S MARKUPS
3	ISSUED FOR MCC CONSTRUCTION
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Tartan
 ENGINEERING
 480 VOLT SINGLE LINE DIAGRAM

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CONCRETE DESIGN #778.04

CHINCHAGA GAS PLANT
 C-32-H/94-H-8
 480 VOLT SINGLE LINE DIAGRAM

PROJECT No: 226200
 DWG No: A1-2262-S-103

PIONEER
 INDUSTRIAL SERVICES COMPANY INC.

Concise Design
 Engineering Services

300, 7th St. Calgary, Alberta T2P 2M1 Telephone: (403) 237-7100 Fax: (403) 237-7100

MANUFACTURE: _____
 MODEL: _____
 FABRICATION DATE: _____
 TARTAN P.O. No.: _____

MOTOR CONTROL CENTER DATA

TOTAL CONNECTED LOAD
 290 KW

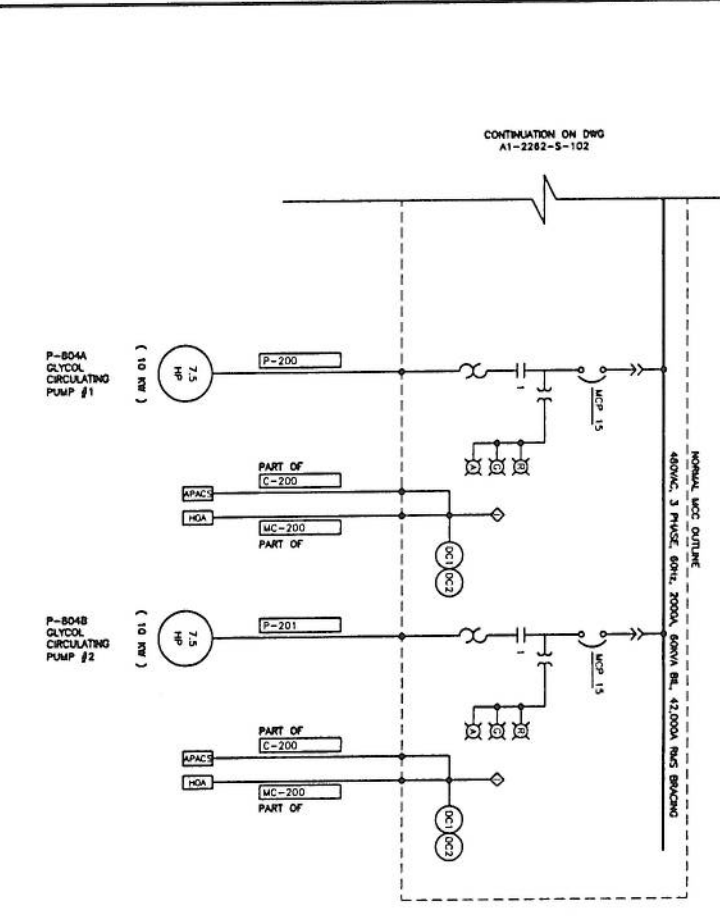
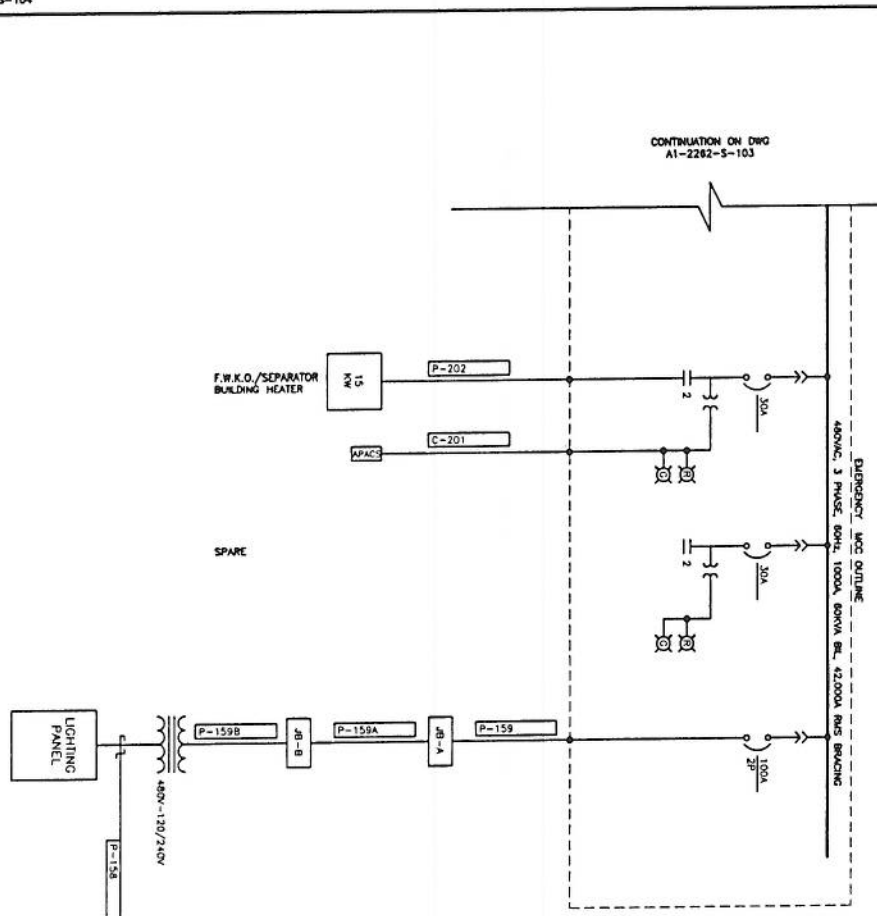
NOTES

- EQUIPMENT SHALL CONFORM TO APPLICABLE CSA AND IEC STANDARDS.
- EQUIPMENT WILL BE HOUSED INDOORS IN A GENERAL PURPOSE AREA.
- ALL CONTROL WIRING SHALL BE TIN PLATED COPPER AND LABELED ON BOTH ENDS.
- EQUIPMENT WILL BE FORCED TO TRUCK FOR ENVIRONMENT.
- EQUIPMENT SHALL BE STRIPPED FOR PROTECTION.
- MAIN INCOMING SECTION SHALL BE DESIGNED FOR BOTTOM ENTRY FOR MAIN POWER (L1, L2, L3) PHASE WEA CABLES.

LEGEND

14	SPEED DEVICE RELAY
15	ANNUNCIATOR
16	DIRECTIONAL POWER RELAY
17	MASTER SEQUENCE DEVICE
18	MOTOR / LOAD SEQUENCE MONITOR
19	MECHANICAL CONDITION MONITOR
20	LOSS OF FIELD (OVERCURRENT) RELAY
21	NEGATIVE PHASE SEQUENCE RELAY
22	PHASE - SEQUENCE VOLTAGE RELAY
23	PHASE - SEQUENCE VOLTAGE RELAY
24	PHASE - SEQUENCE VOLTAGE RELAY
25	PHASE - SEQUENCE VOLTAGE RELAY
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92	PHASE - SEQUENCE VOLTAGE RELAY
93	PHASE - SEQUENCE VOLTAGE RELAY
94	PHASE - SEQUENCE VOLTAGE RELAY
95	PHASE - SEQUENCE VOLTAGE RELAY
96	PHASE - SEQUENCE VOLTAGE RELAY
97	PHASE - SEQUENCE VOLTAGE RELAY
98	PHASE - SEQUENCE VOLTAGE RELAY
99	PHASE - SEQUENCE VOLTAGE RELAY
100	PHASE - SEQUENCE VOLTAGE RELAY

DRAWING NUMBER	DRAWING NAME	REFERENCE DRAWINGS



REV	DATE	BY	APP	DESCRIPTION
1	09/03/20	RE		AS BUILT 1998 PLANT ACCORDING TO PER NON-TECH SYSTEM LTD. DRAWINGS
0	09/02/15	RE		ISSUED FOR CONSTRUCTION

DRAWN BY	CHECKED BY	DATE	PROJECT NO.	SHEET NO.
RE		09/03/20	PNR101-8	1

1998/99 BC CHINCHUKA GAS DEVELOPMENT

CHINCHUKA GAS PLANT

C-32-H/94-H-8

480 VOLT SINGLE DIAGRAM

PIONEER

NATURE RESOURCES CANADA INC.

PNR101-8

A1-2262-S-104

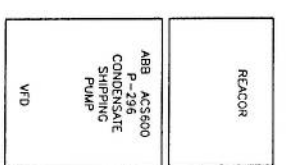
NOTES

1. EQUIPMENT SHALL CONFORM TO APPLICABLE CSA AND ENEC STANDARDS
2. EQUIPMENT IS HOUSED IN ROOMS IN GENERAL PURPOSE AREA.
3. ALL CONTROL WIRING SHALL BE IN PLATED COPPER AND LABELED ON BOTH ENDS.
4. EQUIPMENT SHALL BE EXPOSED TO TRACE HCS ENVIRONMENT.
5. EQUIPMENT SHALL BE SHOCK PROTECTED.

LEGEND

ITEM	DESCRIPTION

1	2	3	4	5	6	7	8	9	10
	SURGE SUPPRESSION SYSTEM	P-291 NGL BOOSTER PUMP 5 HP FNR SIZE 1 P-294 CONDENSATE BOOSTER PUMP 5 HP FNR SIZE 1 P-293 NGL SHIPPER 30 HP FNR SIZE 1	C-405 COMPRESSOR No. 1 1st STAGE COOLER FAN 40 HP FNR SIZE 3 C-409 COMPRESSOR No. 1 COOLER FAN 40 HP FNR SIZE 3 C-414 COMPRESSOR No. 1 3rd STAGE COOLER FAN 40 HP FNR SIZE 3 M-681 REFRIGERATION COOLER FAN 40 HP FNR SIZE 3	K-400 COMP. OIL HEATER 1.5 KW K-420 COMP. OIL HEATER 1.5 KW 15A BKR 15A BKR P-280 WATER PUMP 1.5 HP FNR SIZE 1 P-283 WATER DISPOSAL PUMP 25 HP FNR SIZE 2 P-296 LUBE OIL TRANSFER PUMP 2 HP FNR SIZE 1 P-306 LUBE OIL DRUM PUMP 7.5 HP FNR SIZE 1	P-287 REACTOR PUMP 3 HP FNR SIZE 1 P-400 COMPRESSOR No. 1 PRELUDE PUMP 1.5 HP FNR SIZE 1 P-401 COMPRESSOR No. 1 ENGINE PRELUDE PUMP 1.5 HP FNR SIZE 1 C-425 COMPRESSOR No. 2 1st STAGE COOLER FAN 40 HP FNR SIZE 1	C-429 COMPRESSOR No. 2 COOLER FAN 40 HP FNR SIZE 3 C-434 COMPRESSOR No. 2 3rd STAGE COOLER FAN 40 HP FNR SIZE 3 P-430 PRELUDE PUMP 1.5 HP FNR SIZE 1 P-431 COMPRESSOR No. 2 ENGINE PRELUDE PUMP 1.5 HP FNR SIZE 1	P-422 COMPRESSOR No. 2 ENGINE 1.5 HP FNR SIZE 1 P-474 GLYCOL CIRC PUMP 10 HP FNR SIZE 1 P-475 GLYCOL CIRC PUMP 10 HP FNR SIZE 1 H-815 INLET HDR BLOC HTR 15 KW H-817 INLET HDR BLOC HTR 15 KW FNR SIZE 1 M-830 RECYCLE COMPRESSOR COOLER FAN 2 HP FNR SIZE 1 M-830 RECYCLE COMPRESSOR 40 HP FNR SIZE 3	P-440B GLYCOL INJECTION PUMP 5 HP FNR SIZE 1 M-680 REFRIGERATION COOLER FAN 40 HP FNR SIZE 3 P-804B GLYCOL CIRCULATING PUMP 7.5 HP FNR SIZE 1	P-804A GLYCOL CIRCULATING PUMP 7.5 HP FNR SIZE 1 P-608 LUBE OIL PUMP 7.5 HP FNR SIZE 1



480V MCC LAYOUT

1	2	3	4	5
P-933 SURGE PUMP 5 HP FNR SIZE 1 K-930 1/4 COMP 30 HP K-931 1/4 COMP 30 HP FNR SIZE 1 60A BKR 60A BKR SURGE SUPPRESSION SYSTEM	P-802 HEAT MEDIUM PUMP 7.5 HP FNR SIZE 1 P-803 HEAT MEDIUM PUMP 7.5 HP FNR SIZE 1 500A BKR SIZE 1 DISTRIBUTION TRANSFORMER A 30 KVA DISTRIBUTION TRANSFORMER B 30 KVA 50A BKR FNR SIZE 3	DISTRIBUTION TRANSFORMER D 15 KVA 30A BKR TEO TRANSFER PUMP 5 HP FNR SIZE 1 INLET HEADER BUILDING HEATER 15 KW 30A BKR SIZE 2 INLET HEADER BUILDING HEATER 15 KW 30A BKR SIZE 2	F.W.K./SEPARATOR BUILDING HEATER 15 KW SPARE 30A BKR SIZE 2 RESERVE TRANSFORMER FEEDER 100A BKR	GLYCOL INLET BUILDING HEATER 7.5 HP 20A BKR SIZE 1

480V EMERGENCY LAYOUT

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NOTES:

- AS BUILT AS PER CONTRACTOR'S MARKUPS
- AS BUILT 1999 PLANT ADDITION (AS PER NON-TECH SYSTEM MARKUPS)
- ISSUED FOR 1999 PLANT ADDITION CONSTRUCTION
- ISSUED FOR CONSTRUCTION

PRELIMINARY

REV

NO.	DATE	BY	CHKD	APP
1	98.01.21	CPW		
2	98.01.21	KI		
3	98.05.20	KI		
4	99.10.08	KI		

REV	DATE	BY	CHKD	APP	DESC
A	98.01.21	CPW			PRELIMINARY
1	98.01.21	CPW			ISSUED FOR CONSTRUCTION
2	98.01.21	KI			ISSUED FOR 1999 PLANT ADDITION CONSTRUCTION
3	98.05.20	KI			AS BUILT 1999 PLANT ADDITION (AS PER NON-TECH SYSTEM MARKUPS)
4	99.10.08	KI			AS BUILT AS PER CONTRACTOR'S MARKUPS

PERMIT	ENGINEER
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SCALE	1:10
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ALBERTA

PIONEER
NATURAL RESOURCES CONSULTING

CHINCHAGA GAS PLANT
C-32-H/94-H-8
480 VOLT MCC LAYOUTS

PROJECT No. 2262
DWC No. A1-2262-S-200

SCALE 1:10
PROJECT No. 2262
DWC No. A1-2262-S-200
REV 4