

BILL OF MATERIALS - BREATHING AIR PACKAGE

JOB: NW1986-SK
 CLIENT: CANADIAN NUCLEAR LABORATORIES
 LOCATION: CHALK RIVER, ON
 PO# 480884
 DOCUMENT #: NW1986BOM
 REV.0



ISSUED FOR APPROVAL

ITEM	QTY.	DESCRIPTION	PART #
K-101	1	Compressor, KOBELCO KNWA1-B/X, Oil Free, Variable Speed, Rotary Screw, max 468 SCFM @ 130 PSIG, c/w 150HP motor, 3600 RPM 575V/3PH/60Hz, ODP motor, Air Cooled, CRN Included	KNWA1-B/X
V-102	1	Air Receiver (Wet), Manchester, 400 gal, Vertical c/w skirt, 36" O.D. x 93" long, rated for a MAWP of 200 PSIG @ 400°F, ASME labelled, CRN Included	302433
F-103	1	Pre-Filter, Airtek Coalescer 0.01 Micron	JC0800-C
BAP-104	1	Breathing Air Purifier, Nano NBA41200, 432scfm inlet, 324scfm outlet, 115V/1 PH/60Hz electrical supply, CRN Included	NBA41200
BBR-105	1	Backup Bottle Rack, Breathing Air Systems, c/w 12 cascade bottles	CG-12A-GL
AH-106	9	Air Hoses, 1" ID, 150' Long, c/w quick disconnect, CRN included	642-150
BB-107	9	Breather Boxes, Nano, c/w 4 1/4" outlets, CRN included	BAC100CP-S
BAH-108	10	Breathing Air Hoses, 3/8" ID, 250' Long, c/w 1/4" quick disconnect	LPH425
3BA-101	2	Ball Valve, WKM, 3" RF 150#, FP, CS, Filled PTFE	3F-B110-CS-42-CS-WR
3BA-102	1	Ball Valve, KF, 3" RF 150#, FP, SS	E2154-A922G21
3CH-101	1	Check Valve (Swing), Bonney Forge, 3" RF, 150#, FP, SS	1-68S-RF-3
1BA-101	11	Ball Valve, MA Stewart, 1", 2000# WOG, G2, SS	1-G2
1/2BA-101	3	Ball Valve, MA Stewart, 1/2", 2000# WOG, G2, SS	1/2-G2
PSV-101	1	Relief Valve, Farris, 1" NPT x 1-1/2" NPT, Rated for 644 SCFM, Set @ 150 PSI, CS Body, CS Bonnet, 316SS Nozzle, 316SS Disc, 316SS Guide, Chrome Alloy Spring, CRN registration Certificate included (Wet Receiver)	27EA34-M70
1/4NV-101	1	Needle Valve, WGI, CS, 10000 PSI, 1/4" M/F, -40 TO 250°C, PIFE Teflon soft seat (Wet Receiver)	WN1632
PG-101	1	Pressure Gauge, WGI, 2-1/2" dial x 1/4" NPT, back mounted, liquid filled, 0-200 PSI (Wet Receiver)	WJ7454P
1STR-101	1	YS3000 Y-Strainer, Carbon Steel 1" FNPT, Threaded ALTA Y Strainer, CS body NACE	YS3000 1"
LCV-101/102	2	Auto Drain, ASCO, 3/8" 2-way, Timed electronic Solenoid Valve, 120 VAC, SS, Rated for 300 PSIG MAWP c/w timer assembly and power cord	SD8263H193 / 106086-001 / 106096-001
PDG-101	1	Differential Pressure Indicator, c/w F-103	OEM Standard
1/2CH-101	1	Conrader bronze inline check valve, nickel plated, 1/2" FNPT, 38 SCFM, Max. 250PSI, Max. 450°F	GV12-NP
BH-109	1	Electrical Heater, Caloritech, 10kW, 575V/3PH/60Hz, c/w Contactor & Thermostat, GP	GE108CT
EF-110	1	Canarm 12" Exhaust Fan 120V/1ph/0.25HP 1725RPM, General Purpose, c/w building	OEM Standard
BLDG	1	Building, self-framing, Galvanized Steel, Gable style, 21' x 13' x 11' eave, 4:12 slope, ice rakes, 1 - double door w/ canopy, 1 - 40"x40" slider window c/w bug screen & latch, 1-48"x48" intake louver w/ storm hood, 1 - 48"x48" discharge louver, ducting & manual recirc. w/ storm hood, 1 - full length 6" throat ridge vent c/w chain operated damper & birdscreen, R12 walls & R20 roof, 6 mil poly barrier. Building anchors, fasteners, flashing & cutouts, 2" containment lip flashing Exterior Color: Galvanized Double Door: Grey Interior Walls - White Fluted aluminium lining	N/A
NW1986SK	1	Structural Skid, 21' x 13', W12x40, 1/4" checkerplate decking, (4x) lifting lugs, 2" drip rim & grated sump with drain, under-skid 3" R21 fire-retardant urethane spray foam insulation	NW1986SK

☒ ACCEPTED AS NOTED
 ☐ ACCEPTED
 ☐ NOT ACCEPTED

Signature	Representing	Date
	D.F.	DEC. 14/2016

CAUTION:
 Acceptance by CNL is subject to the terms and conditions of the purchase order and in no way relieves Contractor from its responsibility thereunder. Without in anyway limiting the generality of the foregoing, CNL specifically advises that dimensions, tolerance, location and fit are not reviewed by CNL prior to acceptance.


PROVIDE STAMPED ENG. DWG

BREATHING AIR PACKAGE LINELIST			REV	DESCRIPTION	DATE	BY	CHK
CLIENT	CANADIAN NUCLEAR LABORATORIES LTD		0	ISSUED FOR APPROVAL	2016/08/08	HAY	SK
LOCATION	CHALK RIVER, ON		1	REVISED PER CLARIFICATION AND RE-ISSUED FOR APPROVAL	2016/10/06	HAY	SK
LSD	N/A						
JOB	NW1986-SK						
DOCUMENT #	NW1986LL						
REV	1						

LINE LIST																			
LINE TAG#	PIPE SPEC	SIZE	LINE CLASS / ASME RATING	START POINT	END POINT	DESIGN CODE	SCH	C.A. (mm)	MAT'L	DESIGN H/L TEMP.[°C]	OPER. TEMP.[°C]	DESIGN PRESS.[PSI]	OPER. PRESS.[PSI]	TEST MEDIUM	TEST PRESS.[PSI]	X-RAY (min %)	STRESS RELIEF	NOTES	REFERENCE DRAWING
LT1	N/A	3"	150#	K-101	V-101	B31.1	40	0	SA106-B	45 / -29	20	150	130	HYDRO	426	5%	NO	1,3,4	NW1986PF
LT2	N/A	3"	150#		F-101	B31.1	40	0	SA106-B	45 / -29	20	150	130	HYDRO	426	5%	NO	1,3,4	NW1986PF
LT3	N/A	3"	150#	BAP-101	BBR-101, SKID EDGE (1BA-101)	B31.1	40	0	SA312/316L	45 / -45	20	150	130	HYDRO	426	5%	NO	1,3,4	NW1986PF
LT4	N/A	1/2" / 1"	2000#	K-101	SKID EDGE (COND. DRAIN)	B31.1	80	0	SA106-B	45 / -29	20	150	130	AIR	165	N/A	NO	2,3,4	NW1986PF
LT5	N/A	1/2"	2000#	V-101	LT4	B31.1	80	0	SA106-B	45 / -29	20	150	130	AIR	165	N/A	NO	2,3,4	NW1986PF
LT6	N/A	3/8"	2000#	LCV-101	LT4	B31.3	0.035"	0	SA312/316SS	45 / -29	20	150	130	AIR	165	N/A	NO	2,3,4	NW1986PF
LT7	N/A	3/8"	2000#	LCV-102	LT4	B31.3	0.035"	0	SA312/316SS	45 / -29	20	150	130	AIR	165	N/A	NO	2,3,4	NW1986PF

PSV DATA:					
DESIGNATION	MAKE	MODEL	SIZE	SET @ PSIG (kPag)	SPECIFICATION
PSV-101	FARRIS	27EA34-M70	1" NPT X 1-1/2" NPT	150 (1034)	ORIFICE: E, 0.223 IN^2 (API), CAPACITY: 644SCFM, BASIS: BLOCKED FLOW

GENERAL NOTES :
1. Welded line (BW).
2. Threaded line.
3. All welded & threaded lines in accordance with Baxter's Welding Inc. Quality Management System Reg.# AQP-21550, welding procedures as per ASME B31.1.
4. Operating temperature will change based on actual conditions.
Material Spec:
Pipe (LT1,LT2,LT4,LT5): SA106-B
Fittings/Flanges (LT1, LT2, LT4, LT5): SA105-N
Pipe (LT3): SA312/316L
Fittings/Flanges (LT3): SA312/316L
Gaskets: RF Spiral Wound 304SS
Bolts & Nuts: A193-B7M/A194-2HM
Specifications: ASME B31.1-2014




Canadian Nuclear Laboratories

Laboratoires Nucléaires Canadiens

☒ACCEPTED AS NOTED

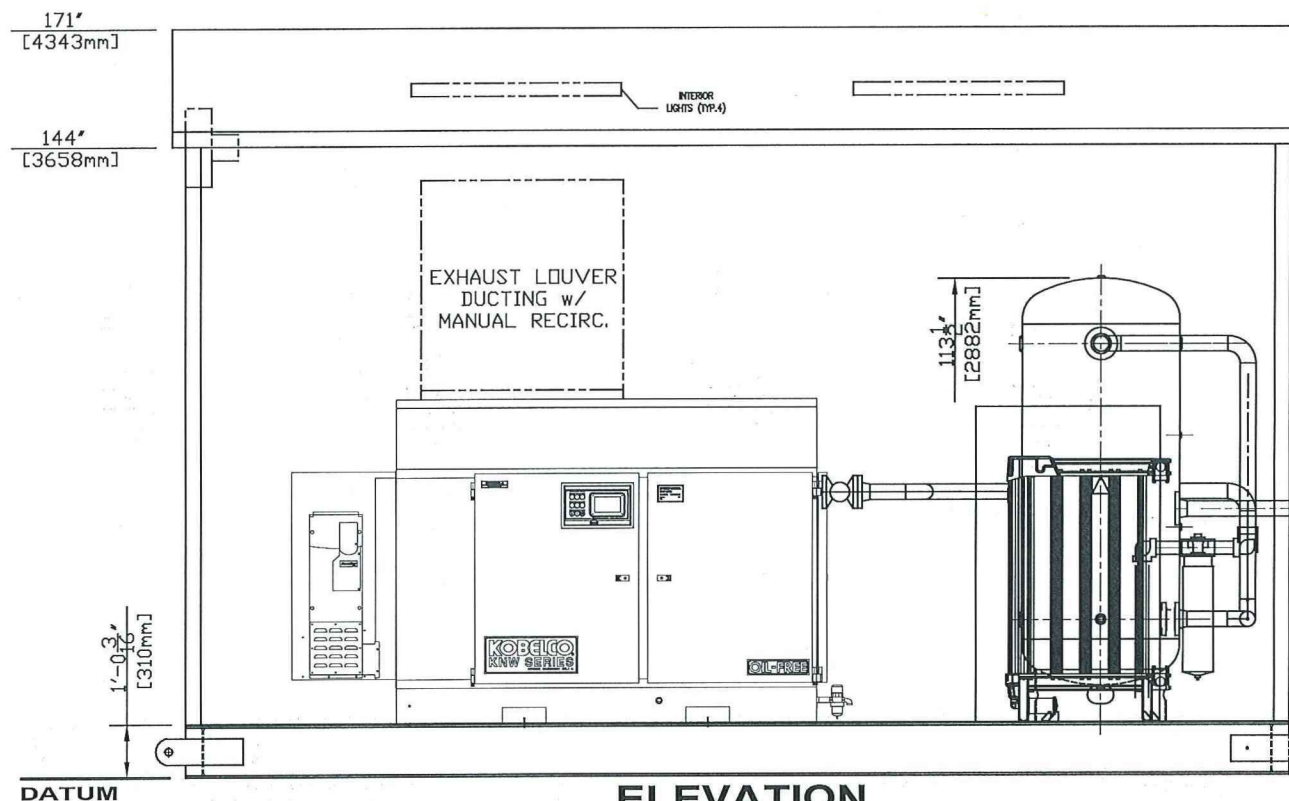
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☐NOT ACCEPTED

Signature	Representing	Date
	D.F.	DEC.14/2016

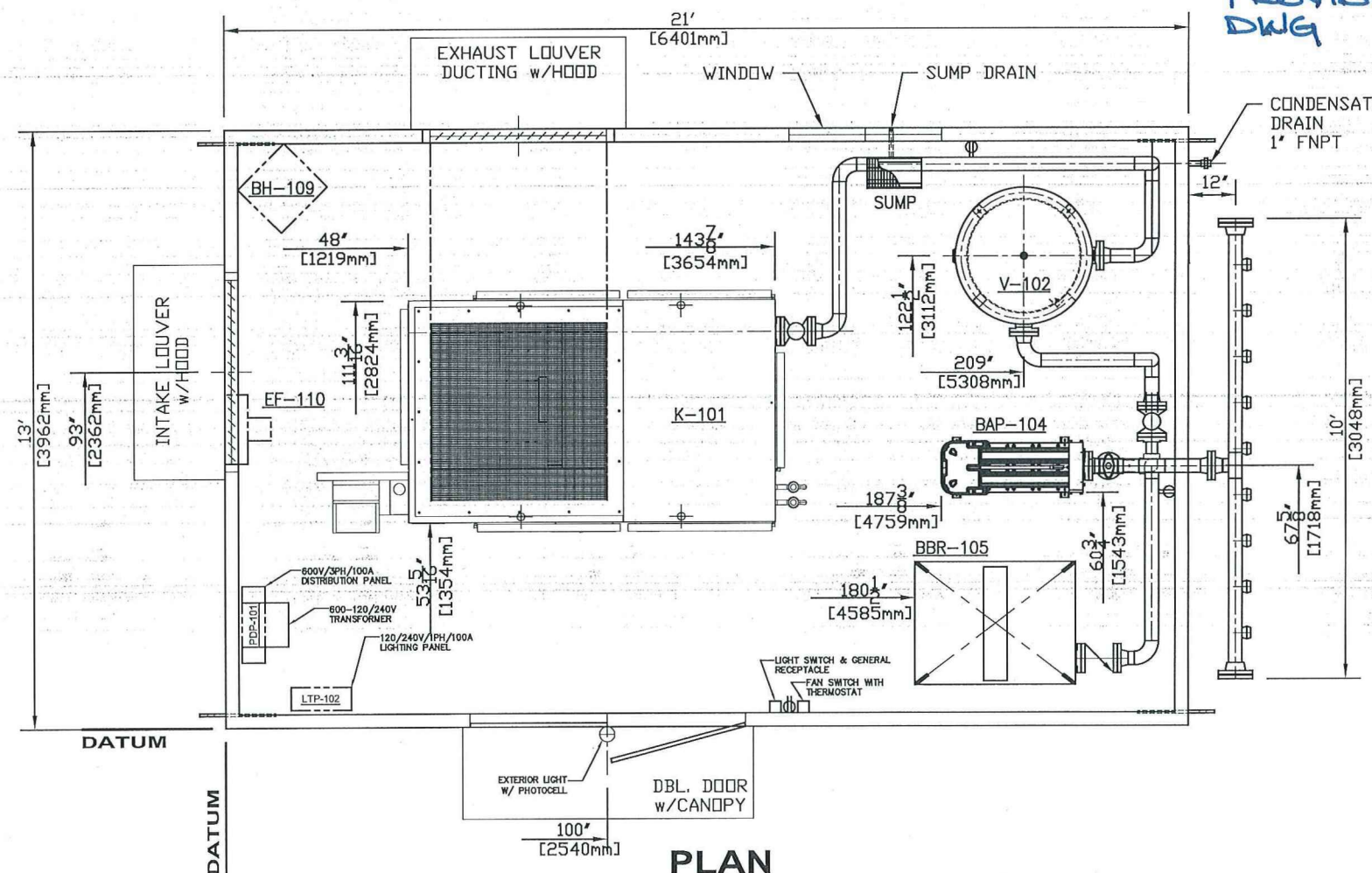
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PROVIDE STAMPED ENGINEERING DWG



ELEVATION

SOME DETAILS
OMITTED FOR CLARITY



PLAN

SOME DETAILS
OMITTED FOR CLARITY

MAJOR EQUIPMENT LIST

TAG NO.	QTY.	DESCRIPTION	LBS.
K-101	1	KOBELCO KNWA1-B/X, 150 HP C/W VFD DRIVE, MAX 468 SCFM @ 130 PSIG, 575V/3PH/60Hz	6390
V-102	1	WET AIR RECEIVER, MANCHESTER 302433, 400GAL, VERTICAL	881
F-103	1	PRE-FILTER, COALESCING, AIRTEK JC0800-C	35
BAP-104	1	BREATHING AIR PURIFIER, NANO NBA41200, 432SCFM INLET, 324OUTLET	800
BBR-105	1	BACKUP BOTTLE RACK, C/W 12 CASADE BOTTLES	2500
BH-106	1	BUILDING HEATER, CALORITECH, 10KW, 575V/3/60, GENERAL PURPOSE	59
EF-107	1	EXHAUST FAN, 12" WALL MOUNTED, 0.25HP, 120V/1PH/60Hz	36
BLDG	1	BUILDING, GALVANIZED EXTERIOR, GABLE 4:12 SLOPE, 21' X 13' X 9' EAVE, ICE RAKES	4800
NW1986SK	1	STRUCTURAL SKID, W12 x 40 FLANGE	10000
		PIPING & MISC.	1500
(APPROX.) TOTAL WEIGHT			27001



Canadian Nuclear Laboratories
Laboratoires Nucléaires Canadiens

☒ ACCEPTED AS NOTED ☐ ACCEPTED ☐ NOT ACCEPTED

Signature: *[Signature]* Representing: D.F. Date: Dec. 14/2016

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PROVIDE STAMPED ENG DWG

GENERAL NOTES:

- THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS STAMPED 'ISSUED FOR CONSTRUCTION'.
- ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.
- AIR RECEIVERS AND CS PIPING PAINTED AS PER NWE SPEC: (1) COAT PRIMER, (2) COATS ENAMEL WARM GREY. DO NOT PAINT SS PIPING.
- AIR RECEIVERS SSPC-SP3 PREPARATION.
- REFER TO DWG# NW1986PF FOR GENERAL PIPING NOTES.

0	ISSUED FOR APPROVAL	2016-08-08	HAY	SK
REV	DESCRIPTION	DATE	DWN	CHK



GENERAL ARRANGEMENT BREATHING AIR PACKAGE

CLIENT	CANADIAN NUCLEAR LABORATORIES LTD	SCALE	1:30
LOCATION	CHALK RIVER, ON	DWN BY	HC
LSD	N/A	DATE	2016-08-08
JOB	DWG	SHEET	REV
NW1986-SK	NW1986GA	1 / 1	0

600V/3Ø/60 Hz
(CUSTOMER SUPPLIED)

L1 L2 L3

N

L3

L2

L1

L3

L2

L1

COMPRESSOR
TAG# K-101

300A BREAKER

15A BREAKER

10 KW BUILDING HEATER (BH-109)

TRANSFORMER L1

TRANSFORMER L2

25A BREAKER

DISTRIBUTION PANEL
400 AMP, 600V THREE PHASE, NEMA 1
PDP - 101

X0

10 KVA
600V
120/240V

100A BREAKER

PURIFIER & PRE-FILTER
AUTO DRAIN RECEPTACLE 1 15A 15A 2 INTERIOR LIGHTING

GENERAL RECEPTACLE 3 15A 15A 4 EXHAUST FAN

AUTO DRAIN
RECEPTACLES 5 15A 15A 6 EXTERIOR LIGHTING

SPARE 7 15A 15A 8 SPARE

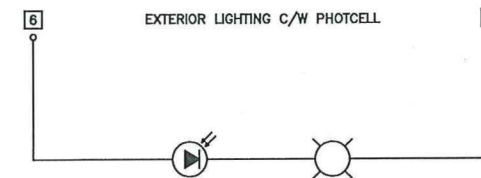
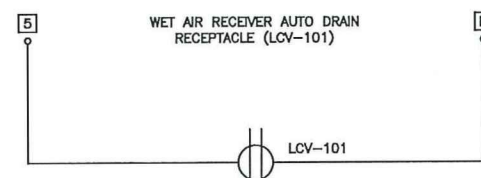
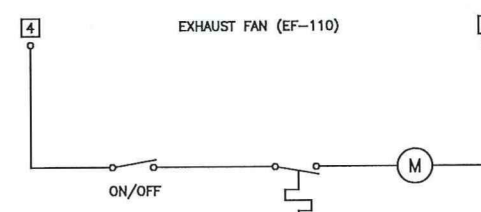
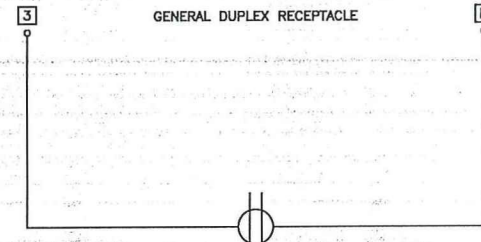
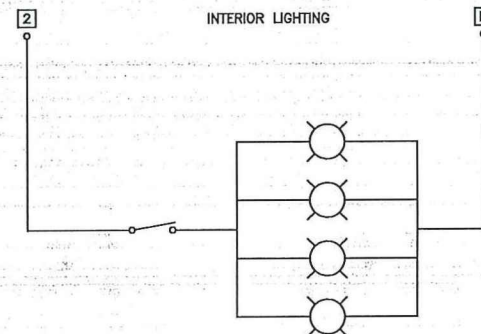
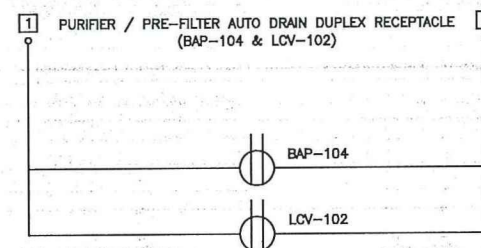
SPARE 9 15A 15A 10 SPARE

SPARE 11 15A 15A 12 SPARE

LIGHTING PANEL
100 AMP, 12 CCTS, 120/240V SINGLE PHASE, NEMA 1
LTP - 102

NOTES

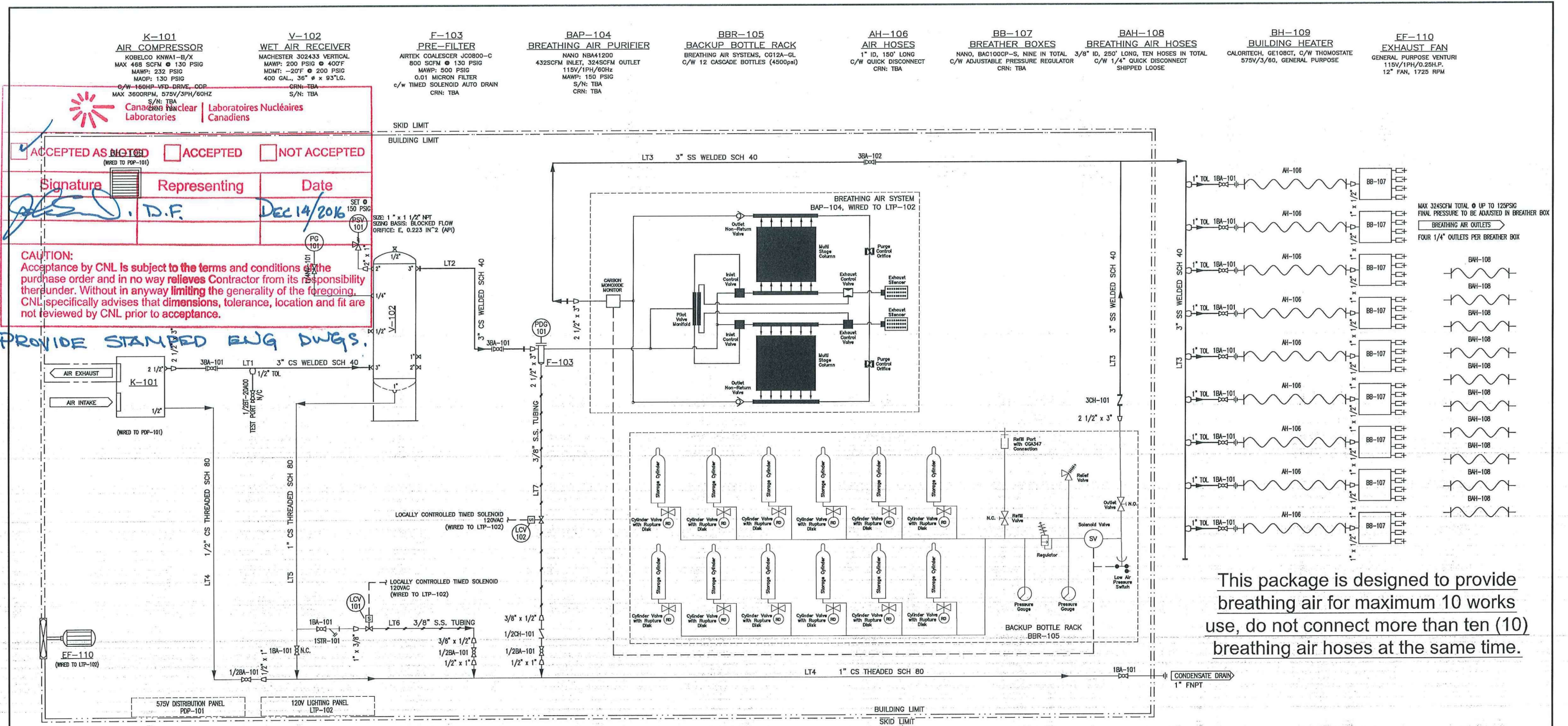
1. TWO 2/0 SERVIC POSTS ON BUILDING EXTERIOR FRAME.
2. ALL CONDUIT WILL BE EMT, ALL UNISTRUT SUPPORTS ARE GALVANIZED STEEL.
3. ALL MATERIALS ARE CSA APPROVED.
4. SKID LAMICOID AND CSA ELECTRICAL CERTIFICATION IS INCLUDED.
5. ALL WIRING METHODS ARE NEMA 1.



**NORTHWEST
EQUIPMENT LTD.**
A SWIFT INDUSTRY COMPANY

BUILDING ELECTRICAL WIRING DIAGRAM BREATHING AIR PACKAGE

CLIENT	CANADIAN NUCLEAR LABORATORIES LTD	SCALE	NTS
LOCATION	CHALK RIVER, ON	DWN BY	HAY
LSD	N/A	DATE	2016-08-15
JOB	DWG	SHEET	REV
NW1986-SK	NW1986EL1	1 / 1	0



- GENERAL NOTES:
- ALL PIPING TO BE DESIGNED IN ACCORDANCE WITH ASME B31.1.
 - MAXIMUM ALLOWABLE WORKING PRESSURE IS 150 PSIG.
 - MAXIMUM ALLOWABLE WORKING TEMPERATURE IS 120°F.
 - SYSTEM DESIGN PRESSURE: 150 PSIG
 - SYSTEM DESIGN TEMPERATURE: 45°C / -29°C (INDOOR), 45°C / -45°C (OUTDOOR)
 - AIR TEST PRESSURE IS 165 PSIG.
 - LINE 1, 2, 4 & 5 PIPE TO BE A106-B, ENAMEL PAINTED (WARM GREY), PREP: SSPC-SP3.
 - LINE 1, 2, 4 & 5 PIPE FITTING TO BE A105-N, ENAMEL PAINTED (WARM GREY), PREP: SSPC-SP3.
 - LINE 3 PIPE TO BE A312/316L, DO NO PAINT.
 - DRAIN TUBING TO BE A312/316SS (0.035" WALL) WITH 316SS FITTINGS.
 - COMPRESSOR, PURIFIER AND BACKUP BOTTLE RACK PAINTED AS PER MANUFACTURER STANDARDS.
 - ALL COMPONENTS TO HAVE VALID CRN'S IN THE PROVINCE OF ONTARIO IF APPLICABLE.
 - PACKAGE PIPING SYSTEM TO BE REGISTERED WITH TSSA.
 - REFER TO NW1986LL (LINELIST) FOR MORE PIPING SYSTEM DETAILS.
 - AIR ANALYSIS TO BE DONE BY A THIRD PARTY, THE AIR QUALITY TO BE COMPLIANCE WITH CSA Z180.1. THE ANALYSIS REPORT TO BE PROVIDED TO CNL PRIOR TO SHIP.

REV	DESCRIPTION	DATE	DWN	CHK
1	REVISED AS PER CLARIFICATION AND RE-ISSUED FOR APPROVAL	2016-10-06	HAY	SK
0	ISSUED FOR APPROVAL	2016-08-08	HAY	SK



PROCESS & INSTRUMENT DIAGRAM BREATHING AIR PACKAGE			
CLIENT	CANADIAN NUCLEAR LABORATORIES LTD	SCALE	NTS
LOCATION	CHALK RIVER, ON	DWN BY	HAY
LSD	N/A	DATE	2016-08-08
JOB	NW1986-SK	DWG	NW1986PF
SHEET	1 / 1	REV	1