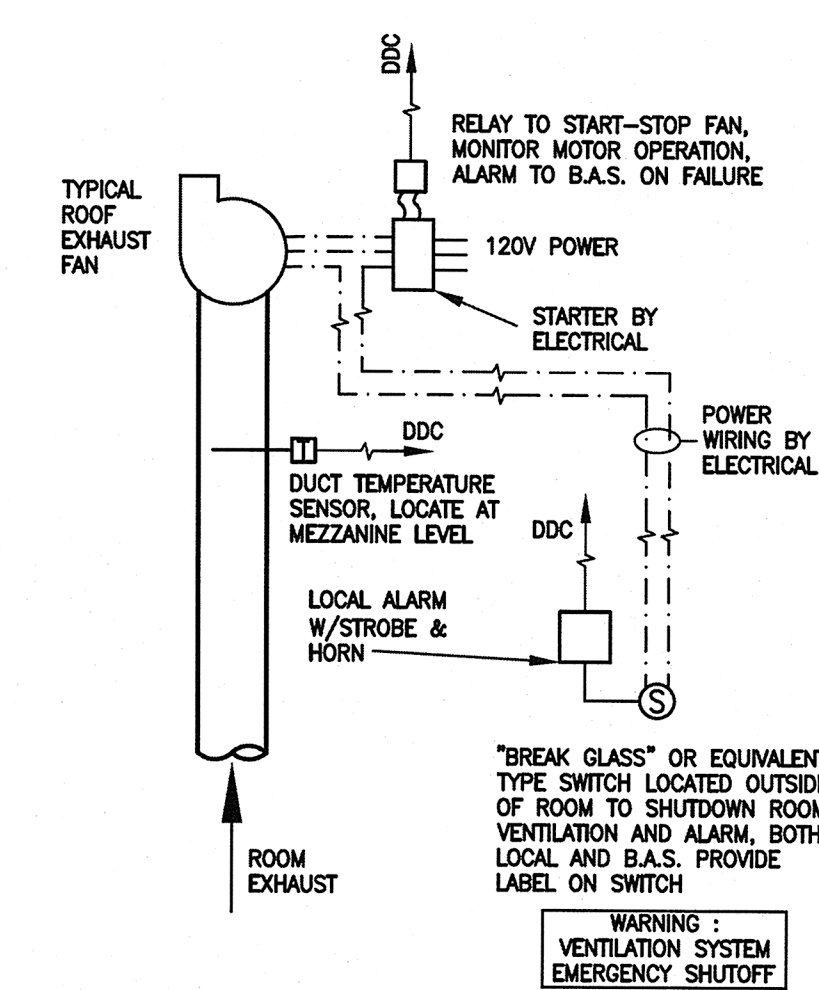
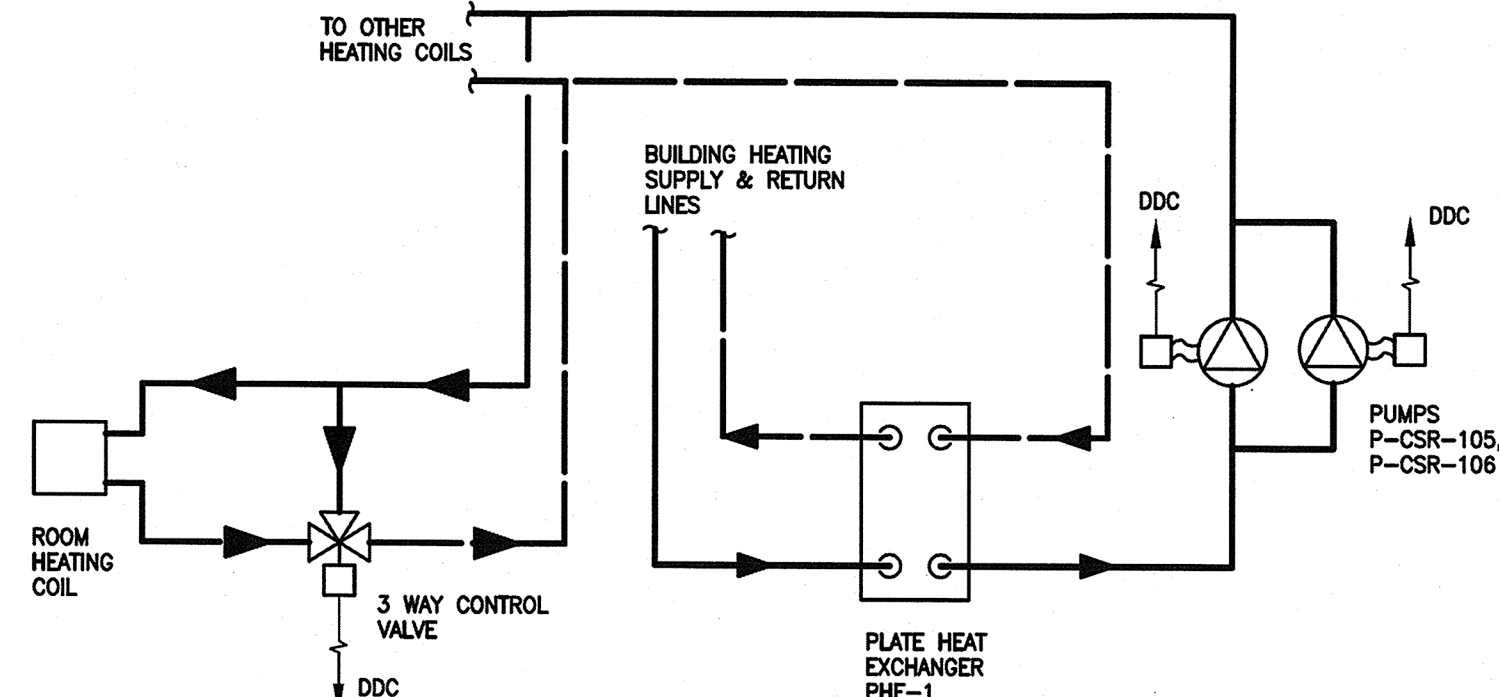


1 HEATING FLOW DIAGRAM  
SCALE: N.T.S.



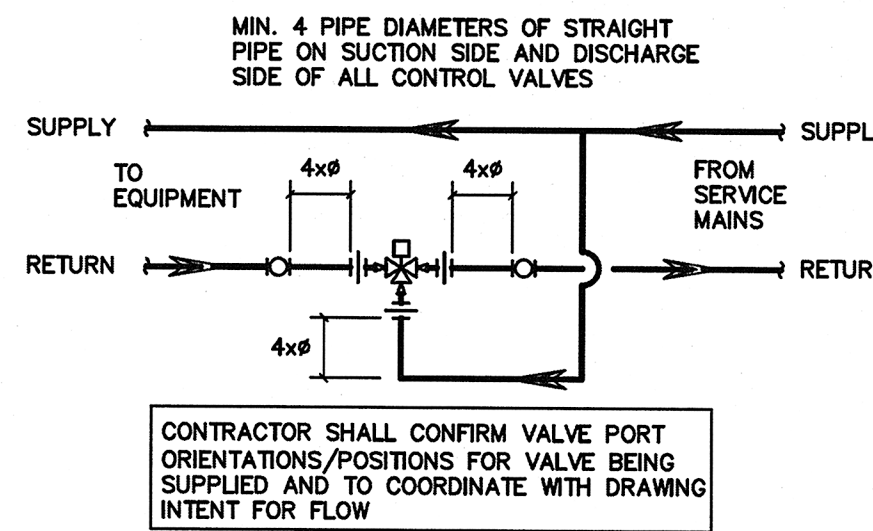
3 VENTILATION CONTROL DIAGRAM - TYPICAL  
SCALE: N.T.S.



**CONTROL SEQUENCE**  
NEW PLATE HEAT EXCHANGER TO BE FULL WATER FLOW FROM BUILDING HEATING SYSTEM  
GLYCOL HEATING SIDE OF HEAT EXCHANGER TO BE FULL FLOW  
NEW CIRC PUMPS P-CSR-105, P-CSR-106 TO START-STOP ON SIGNAL FROM B.A.S., PUMPS TO ALTERNATE  
3 WAY CONTROL VALVE ON HEATING COILS - TO BYPASS TO MAINTAIN EXHAUST TEMPERATURE SET POINT, CONTROL FROM DUCT MOUNT TEMPERATURE SENSOR  
DUCT MOUNT TEMPERATURE SENSOR TO SHUTDOWN ROOM EXHAUST FAN AND ALARM ON LOW TEMPERATURE (PRESET)

2 HEATING CONTROL DIAGRAM  
SCALE: N.T.S.

5 TYPICAL PIPE TAKEOFF DETAIL  
SCALE: N.T.S.



4 TYPICAL CONTROL VALVE PIPE DETAIL  
SCALE: N.T.S.

#### FAN SCHEDULE (F)

FAN No.	DUTY	DESCRIPTION	AIR FLOW L/S	STATIC PRESSURE Pa.	FAN RPM	ELECTRICAL
F-CRE-1661	1661 VOLATILE STORAGE	CENTRIFUGAL FIBERGLASS EXHAUST AIR FAN, 247mm (9.75in) WHEEL, CURVE BLADE	94	186	1463	187WATT 1PH 120 VOLT, 1750 RPM MOTOR
F-CRE-1662	1662 HAZARDOUS WASTE	CENTRIFUGAL FIBERGLASS EXHAUST AIR FAN, 247mm (9.75in) WHEEL, CURVE BLADE	94	186	1463	187WATT 1PH 120 VOLT, 1750 RPM MOTOR
F-CRE-1663	1663 COMPRESSED GAS	CENTRIFUGAL FIBERGLASS EXHAUST AIR FAN, 247mm (9.75in) WHEEL, CURVE BLADE	94	186	1463	187WATT 1PH 120 VOLT, 1750 RPM MOTOR
F-CRE-1664	1664 ACIDS	CENTRIFUGAL FIBERGLASS EXHAUST AIR FAN, 247mm (9.75in) WHEEL, CURVE BLADE	94	186	1463	187WATT 1PH 120 VOLT, 1750 RPM MOTOR
F-CRE-1665	1665 BATTERY STORAGE	CENTRIFUGAL FIBERGLASS EXHAUST AIR FAN, 247mm (9.75in) WHEEL, CURVE BLADE	94	186	1463	187WATT 1PH 120 VOLT, 1750 RPM MOTOR

ACCEPTABLE MANUFACTURER OR "APPROVED EQUIVALENT" - M.K. PLASTICS MODEL CNW SIZE 160

#### FAN NOTES :

F-CRE-1661, F-CRE-1662, F-CRE-1663, F-CRE-1664, F-CRE-1665 ALL FIBER-REINFORCED PLASTIC (FRP) FAN CONSTRUCTION, WHEEL & HOUSING, UV INHIBITORS FOR OUTDOOR INSTALLATION. SHAFT TO BE 316 STAINLESS STEEL. FAN AND ARE TO BE BAKED POLYESTER COATED, BUILT-IN ACCESS DOOR TO ACCESS MOTOR, DRIVE & ELECTRICAL JUNCTION BOX. FAN TO BE BELT DRIVE, TOP ANGULAR UP DISCHARGE. PROVIDE ROUND SLIP INLET & DISCHARGE CONNECTION, UNDRILLED.

SOUND POWER LEVEL								SOUND PRESSURE LEVEL dB(A)							
1	2	3	4	5	6	7	8	1	3	5	10	15	50	100	150
74	72	71	74	69	66	64	64	75	78	68	64	58	54	44	38

#### FILTER SCHEDULE (FL)

FILTER NUMBER	DUTY	DESCRIPTION	AIR FLOW L/S	FACE AREA M2	FACE VELOCITY M/S
FL-100	1661 VOLATILE STORAGE	PLEATED PANEL FILTER, MERV 8 RATING, NOMINAL 500W x 300W x 25 THICK	94	0.15 (1.66 FT2)	0.602 (120 FPM)
FL-101	1662 HAZARDOUS WASTE	PLEATED PANEL FILTER, MERV 8 RATING, NOMINAL 500W x 300W x 25 THICK	94	0.15 (1.66 FT2)	0.602 (120 FPM)
FL-102	1663 COMPRESSED GAS	PLEATED PANEL FILTER, MERV 8 RATING, NOMINAL 500W x 300W x 25 THICK	94	0.15 (1.66 FT2)	0.602 (120 FPM)
FL-103	1664 ACIDS	PLEATED PANEL FILTER, MERV 8 RATING, NOMINAL 500W x 300W x 25 THICK	94	0.15 (1.66 FT2)	0.602 (120 FPM)
FL-104	1665 BATTERY STORAGE	PLEATED PANEL FILTER, MERV 8 RATING, NOMINAL 500W x 300W x 25 THICK	94	0.15 (1.66 FT2)	0.602 (120 FPM)

ACCEPTABLE MANUFACTURER OR "APPROVED EQUIVALENT" - CAMFIL MODEL 30/30  
PROVIDE FOR EACH FILTER NOTED 2 SETS OF SIDE SLIDEOUT FRAMES, AND HINGED ACCESS PANEL SUCH THAT FILTERS MAY BE ALTERNATED BETWEEN SUMMER AND WINTER USE (SUMMER UPSTREAM OF HEATING COIL, WINTER DOWNSTREAM OF HEATING COIL)  
PROVIDE SET OF FILTERS FOR SYSTEM STARTUP, AND ONE SET OF FILTERS UPON

#### HEATING COIL SCHEDULE (GHC/HG)

COIL NUMBER	DUTY	DESCRIPTION	AIR FLOW L/S	FACE AREA M2	FACE VELOCITY M/S	APD Pa.	EAT °C	LAT °C	LIQUID FLOW L/S	EWL °C	LWT °C	WPD Pa.	HTG CAPACITY Kw
GHC-100	1661 VOLATILE STORAGE	4 ROW, 14 FINS/IN, NOMINAL 400W x 300W 50/50 GLYCOL/WATER MIX	94	0.120 (1.3 FT2)	0.75 (150 FPM)	18	-40	30	0.0945	57.22	34.72	29.8	7.61
GHC-101	1662 HAZARDOUS WASTE	4 ROW, 14 FINS/IN, NOMINAL 400W x 300W 50/50 GLYCOL/WATER MIX	94	0.120 (1.3 FT2)	0.75 (150 FPM)	18	-40	30	0.0945	57.22	34.72	29.8	7.61
GHC-102	1663 COMPRESSED GAS	4 ROW, 14 FINS/IN, NOMINAL 400W x 300W 50/50 GLYCOL/WATER MIX	94	0.120 (1.3 FT2)	0.75 (150 FPM)	18	-40	30	0.0945	57.22	34.72	29.8	7.61
GHC-103	1664 ACIDS	4 ROW, 14 FINS/IN, NOMINAL 400W x 300W 50/50 GLYCOL/WATER MIX	94	0.120 (1.3 FT2)	0.75 (150 FPM)	18	-40	30	0.0945	57.22	34.72	29.8	7.61
GHC-104	1665 BATTERY STORAGE	4 ROW, 14 FINS/IN, NOMINAL 400W x 300W 50/50 GLYCOL/WATER MIX	94	0.120 (1.3 FT2)	0.75 (150 FPM)	18	-40	30	0.0945	57.22	34.72	29.8	7.61

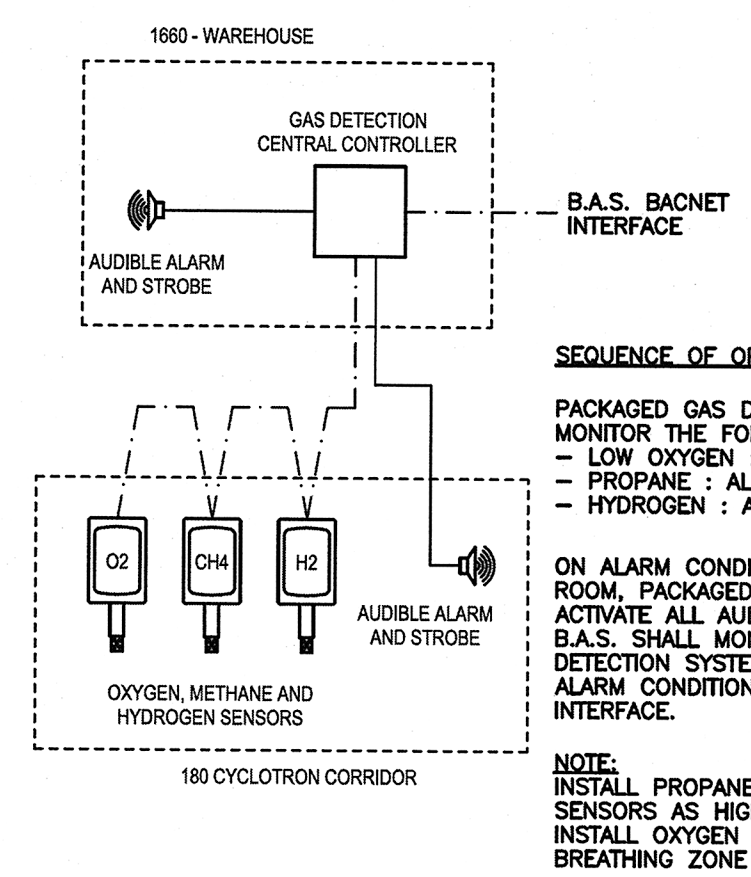
ACCEPTABLE MANUFACTURER OR "APPROVED EQUIVALENT" - DAIKIN McQUAY MODEL 5WH1404B, HORIZONTAL MOUNTED

#### PUMP SCHEDULE (P)

FILTER NUMBER	DUTY	DESCRIPTION	FLOW L/S	HEAD KPa.	ELECTRICAL	NOTE
P-CSR-106, P-CSR-106	GLYCOL HEATING SYSTEM CIRC	INLINE BOOSTER PUMP, 3IN IMPELLER, 50/50 WATER/ETHYLENE GLYCOL SOLUTION	0.4725	83.66	186.5 W 1 PH 120 VOLTS 3300 MOTOR RPM, PUMPS ON E/POWER	1 PUMP TO OPERATE (1 PUMP ON STANDBY), CONTROL FROM B.A.S.
P-CSR-107	GLYCOL SYSTEM FILL	PACKAGED MAKE-UP WATER ASSEMBLY WITH PUMP, BARREL, LID	0.06	345 KPA	0.7 AMP W 1 PH 120 VOLTS, PLUG-IN POWER CONNECTION	SELF CONTAINED UNIT

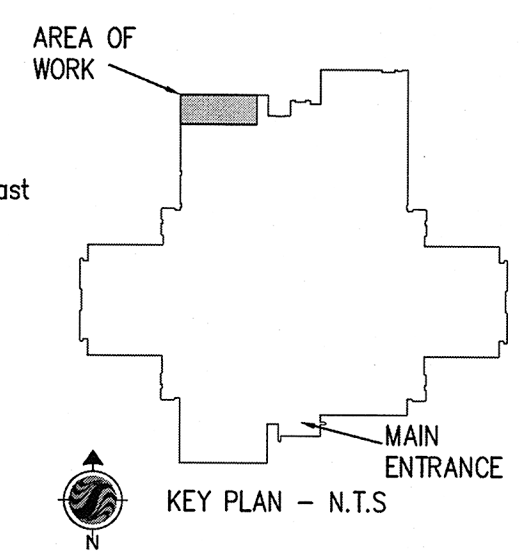
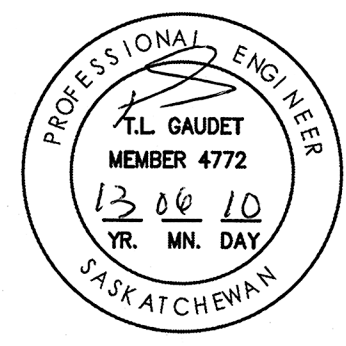
ACCEPTABLE MANUFACTURER OR "APPROVED" EQUIVALENT : BELL & GOSSETT MODEL PL-36

ACCEPTABLE MANUFACTURER OR "APPROVED" EQUIVALENT : AXIOM INDUSTRIES SF-100



**SEQUENCE OF OPERATION**  
PACKAGED GAS DETECTION SYSTEM SHALL MONITOR THE FOLLOWING GASES :  
- LOW OXYGEN : ALARM @ 19.5% O1  
- PROPANE : ALARM @ 10% LEL  
- HYDROGEN : ALARM @ 10% LEL  
ON ALARM CONDITION FOR ANY GAS IN ANY ROOM, PACKAGED DETECTION SYSTEM SHALL ACTIVATE ALL AUDIBLE ALARM & STROBES. B.A.S. SHALL MONITOR PACKAGED GAS DETECTION SYSTEM FOR GAS LEVELS AND ALARM CONDITION THROUGH BACNET INTERFACE.  
NOTE: INSTALL PROPANE AND HYDROGEN SENSORS AS HIGH AS POSSIBLE, INSTALL OXYGEN SENSOR IN BREATHING ZONE @ ±1650 AFF

6 GAS DETECTION CONTROL SCHEMATIC RM 1663  
SCALE: N.T.S.



#### CHEMICAL ROOM ACID STORAGE RETROFIT

10_06_2013	TENDER	Drawn/Dessine	JBA	Date/Date	2013.04.10	NATIONAL HYDROLOGY RESEARCH CENTRE	Environment Canada Property Management District 2	Environnement Canada Gestion de l'immobilier District 2	#11 INNOVATION BLVD SASKATOON, SK. S7N 3H5	DWG # / DESSIN #
24_05_2013	100% REVIEW	DWG. Title/Titre Dessin	MECHANICAL SCHEDULES	NONE	M4					
10_05_2013	50% REVIEW	DATE	REVISION							