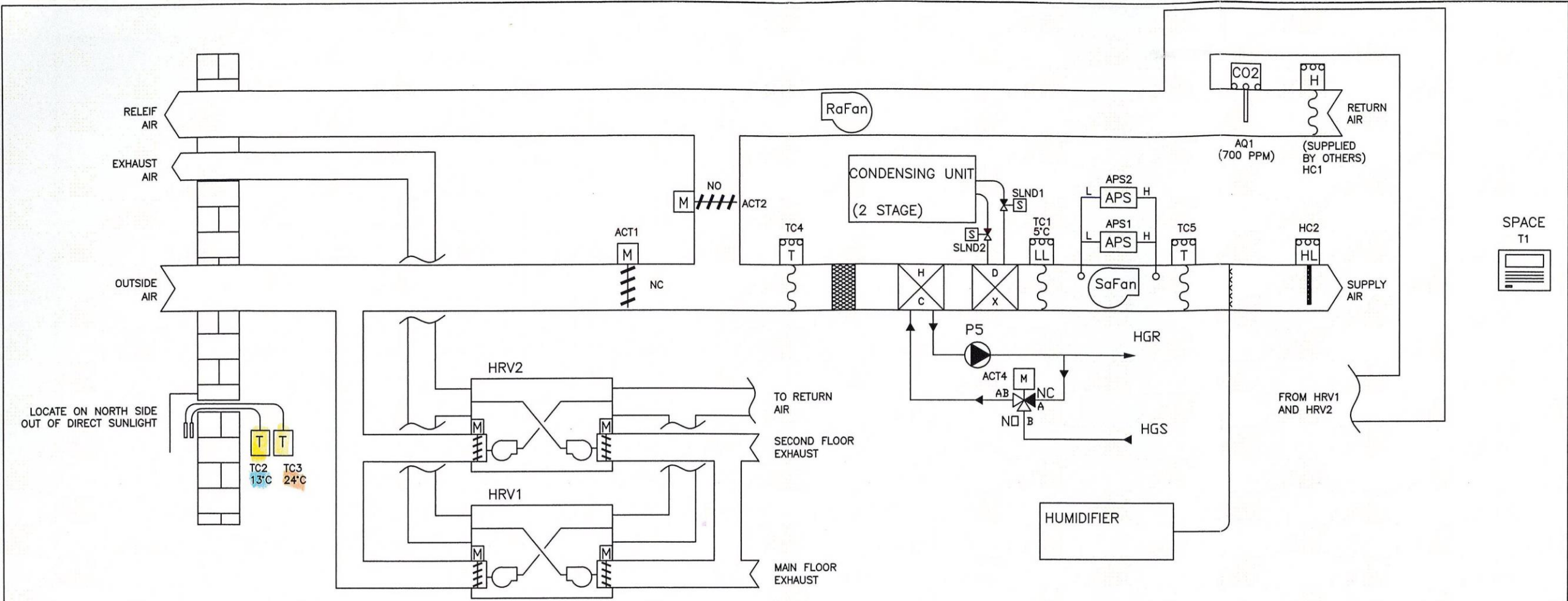


APPENDIX “A”
CONTROLS

This data and information in this appendix is provided for informational purposes only. The data and information is provided "as is" with no guarantee as to its accuracy.



SEQUENCE OF OPERATIONS

THE AIR HANDLER WILL RUN ON AN OCCUPANCY SCHEDULE, AS PROGRAMMED ON THE SPACE THERMOSTAT (T1).

OCCUPIED MODE – THE SUPPLY FAN WILL BE ENERGIZED, WHICH WILL ALSO ENERGIZE THE RETURN FAN VIA HARDWIRE INTERLOCK. HRV2 WILL ALSO BE ENERGIZED ON MEDIUM SPEED TO PROVIDE FRESH AIR TO THE SPACE. AN OUTDOOR AIR TEMPERATURE CONTROLLER (TC2) WILL PERFORM HEATING AND COOLING CHANGEOVER AT 13°C (ADJUSTABLE). HEATING MODE WILL BE ACTIVE AT TEMPERATURES BELOW SETPOINT, AND COOLING MODE WILL BE ACTIVE AT TEMPERATURES ABOVE SETPOINT.

HEATING MODE – THE MIXED AIR DAMPERS WILL REMAIN IN THEIR NORMAL POSITIONS (100% RETURN AIR). THE HEATING VALVE WILL MODULATE OPEN TO SATISFY SETPOINT, INITIALLY SET AT 21°C (ADJUSTABLE) AT THE DISCHARGE AIR TEMPERATURE CONTROLLER (TC5). ONCE THE CALL FOR HEAT HAS BEEN SATISFIED AT THE SPACE THERMOSTAT (T1), THE HEATING VALVE WILL CLOSE.

COOLING MODE – THE MIXED AIR DAMPERS WILL MODULATE OPEN TO PROVIDE MIXED AT SETPOINT AS SELECTED ON TEMPERATURE CONTROLLER (TC4). IF OUTDOOR AIR TEMPERATURES EXCEED 24°C (ADJUSTABLE) AT TEMPERATURE CONTROLLER (TC3), THE MIXING DAMPERS WILL RETURN TO THEIR NORMAL POSITIONS. IF THERE IS A CALL FOR COOLING FROM THE SPACE THERMOSTAT, THE CONDENSING UNIT WILL BE ENERGIZED IN ITS FIRST STAGE OF COOLING. ON AN ADDITIONAL CALL FOR COOLING, THE SECOND STAGE WILL ENERGIZE A LIQUID LINE SOLENOID VALVE TO INCREASE COOLING CAPACITY OF THE CONDENSING UNIT.

INDOOR AIR QUALITY – IF CARBON DIOXIDE (CO2) CONCENTRATIONS EXCEED THE HIGH LIMIT AT THE RETURN AIR CO2 SENSOR/CONTROLLER (AQ1) – INITIALLY SET AT 800 PPM, HRV1 WILL BE ENERGIZED IN ORDER TO EXCHANGE INDOOR AIR WITH FRESH OUTDOOR AIR. THE UNIT WILL REMAIN ENERGIZED UNTIL CONCENTRATIONS FALL BELOW SETPOINT.

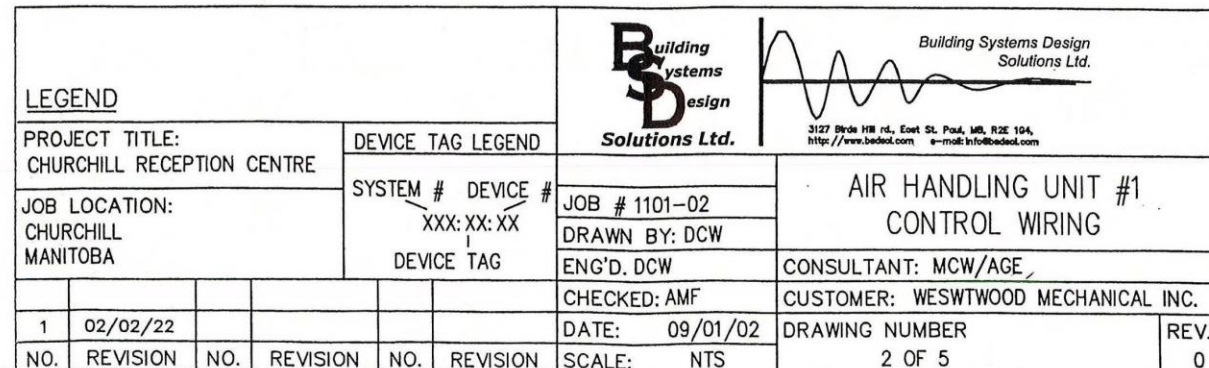
LOW LIMIT CONTROL – IF THE AIR LEAVING THE COIL SECTION OF THE AIR HANDLER SHOULD FALL BELOW 5°C, THE FREEZE STAT WILL SHUTDOWN THE ENTIRE SYSTEM. DURING SHUTDOWN, THE DAMPERS MOTORS WILL SPRING RETURN TO THEIR NORMAL POSITIONS, THE HEATING AND COOLING SYSTEMS WILL BE DISABLED, AS WELL, THE AIR HANDLER FANS AND HRV'S WILL BE DE-ENERGIZED. AN AUDIBLE ALARM WILL SOUND TO ALERT THE MAINTENANCE OPERATOR. THE SYSTEM WILL REMAIN IN SHUTDOWN UNTIL THE FREEZE STAT IS MANUALLY RESET BY THE OPERATOR. AT THIS TIME THE SYSTEM WILL START AS NORMAL, AND THE ALARM WILL BE SILENCED.

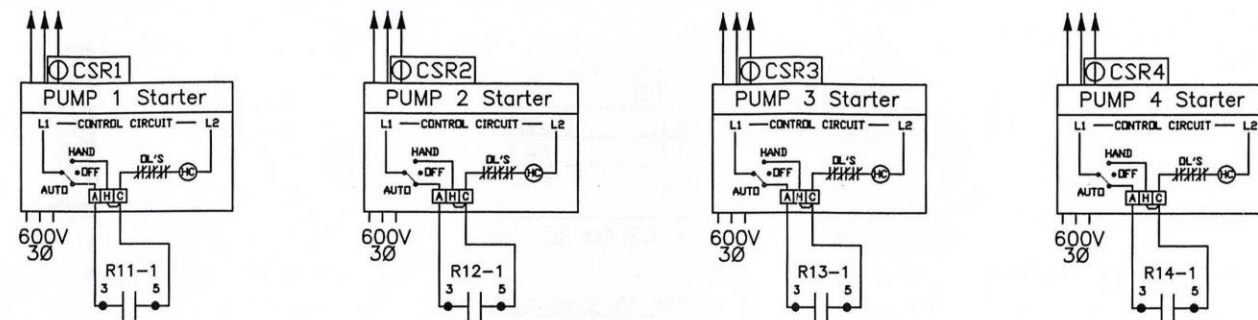
UNOCCUPIED MODE – THE HEATING AND COOLING SYSTEMS AND THE HRV'S WILL BE DISABLED. THE SUPPLY AND RETURN FAN WILL BE SHUTDOWN AFTER AN ADJUSTABLE TIME DELAY TO DISSIPATE ANY RESIDUAL HEAT. THE SYSTEM WILL REMAIN IN THIS STATE UNTIL THE NEXT SCHEDULED OCCUPANCY. OR IF THE SPACE THERMOSTAT DETECTS A 19°C TEMPERATURE AT WHICH TIME THE SYSTEM WILL CYCLE TO MAINTAIN THIS SETBACK TEMPERATURE. IF THE OVERRIDE BUTTON ON SPACE THERMOSTAT (T1) IS PRESSED DURING UNOCCUPANCY, THE SYSTEM WILL OPERATE FOR 3 HOURS (ADJUSTABLE) IN OCCUPIED MODE.

HUMIDIFIER CONTROL – THE HUMIDIFIER WILL BE ENERGIZED IN ORDER TO SATISFY SETPOINT DEMANDS AT THE RETURN AIR AIR DUCT HUMIDITY CONTROLLER (HC1). THE HUMIDIFIER WILL ONLY OPERATE IF AIR FLOW IS DETECTED AT THE SUPPLY AIR FAN. THE HUMIDIFIER WILL ALSO BE DISABLED IF A RELATIVE HUMIDITY OF 90% IS DETECTED AT THE SUPPLY AIR HIGH LIMIT CONTROLLER (HC2).

AS-BUILTS

LEGEND						AS BUILT DRAWINGS AUGUST 27, 2002		Building Systems Design Solutions Ltd.	
PROJECT TITLE: CHURCHILL RECEPTION CENTRE			DEVICE TAG LEGEND			JOB # 1101-02		AIR HANDLING UNIT #1 SYSTEM SCHEMATIC	
JOB LOCATION: CHURCHILL MANITOBA			SYSTEM # DEVICE # XXX:XX:XX DEVICE TAG			DRAWN BY: DCW		CONSULTANT: MCW/AGE	
2	12/02/03					ENG'D. DCW		CUSTOMER: WESWTHOOD MECHANICAL INC.	
1	02/02/22					CHECKED: AMF		DRAWING NUMBER	
NO.	REVISION	NO.	REVISION	NO.	REVISION	DATE: 09/01/02		1 OF 5	
SCALE: NTS						REV.#		2	

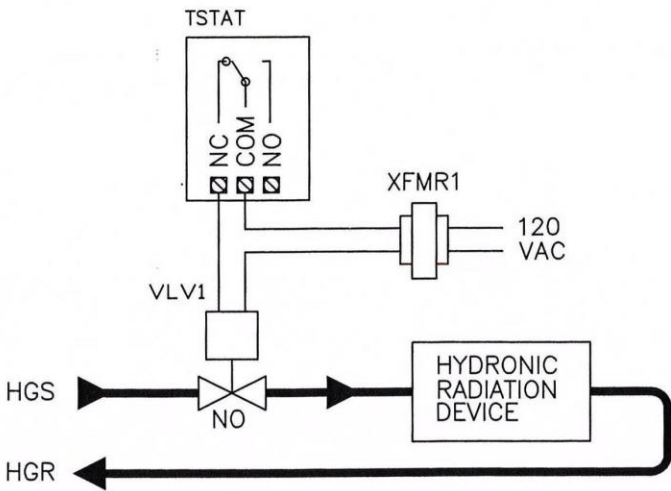




BILL OF MATERIALS INCLUDES PARTS FOR BOTH SYSTEMS.

DATE:	23/10/01
SCALE:	NTS

HYDRONIC RADIATION – CONTROL SCHEMATIC



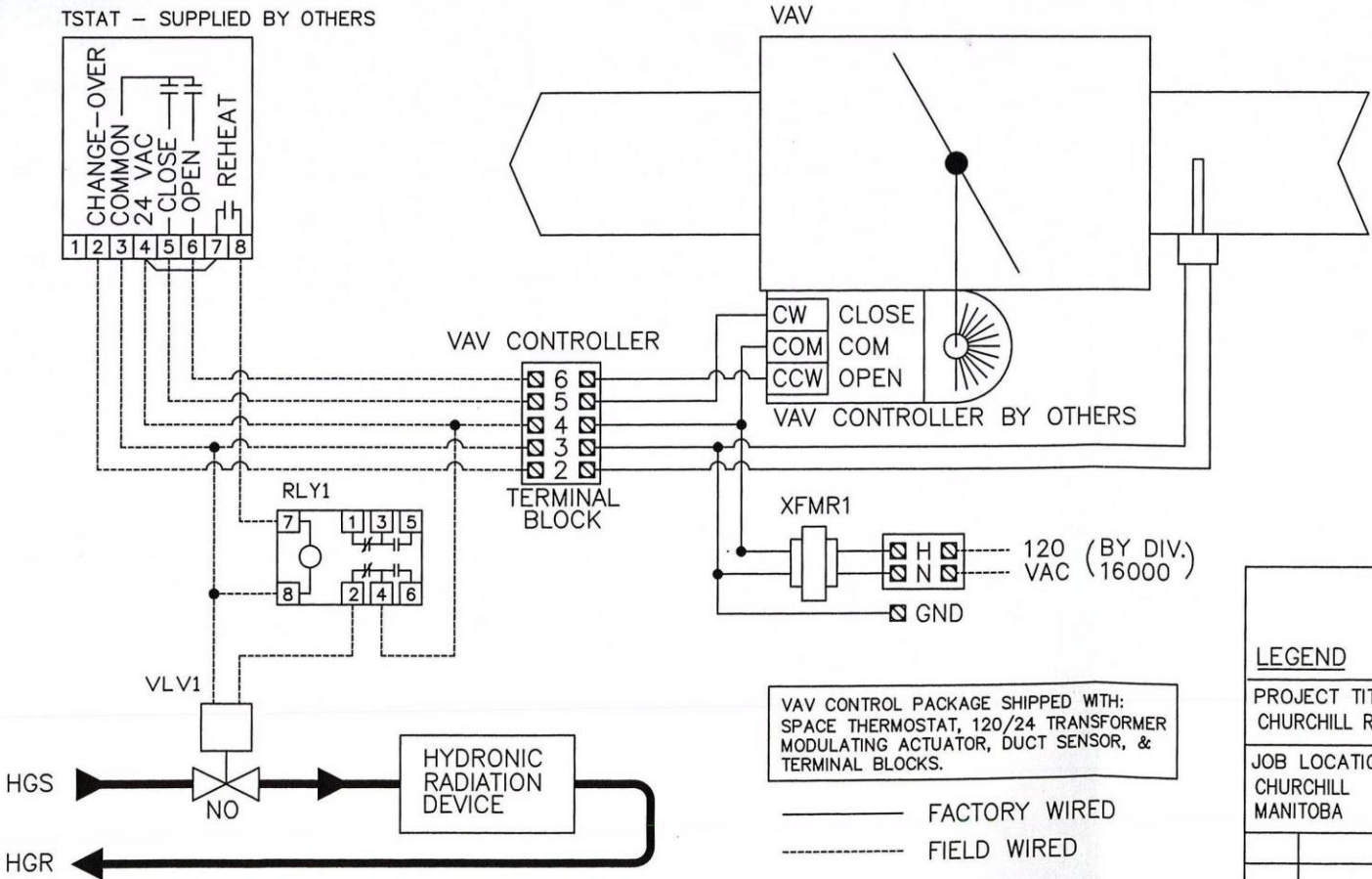
BILL OF MATERIALS SCHEDULE			
TAG ID	PART NO.	QTY	DESCRIPTION
TSTAT	T822C 1124	10	LOW VOLT. HEAT ONLY STAT
VLV1	V8043D 1073	10	3/4" NO 2 POSITION VALVE
XFMR	AT175F 1023	3	120/240/208/24VAC, 75VA CLASS 2 CONTROL TRANS.

BILL OF MATERIALS INCLUDES PARTS FOR ALL RADIATION SYSTEMS.

SEQUENCE OF OPERATIONS

THE NORMALLY OPEN VALVE WILL BE HELD CLOSED UNTIL THE SPACE TEMPERATURE FALLS BELOW THE SETPOINT (AS SELECTED ON THE THERMOSTAT DIAL). THE VALVE WILL REMAIN OPEN UNTIL SPACE TEMPERATURE SETPOINT IS SATISFIED.

VAV WITH HYDRONIC RADIATION – CONTROL SCHEMATIC



BILL OF MATERIALS SCHEDULE			
TAG ID	PART NO.	QTY	DESCRIPTION
VLV1	V8043D 1073	19	3/4" NO 2 POSITION VALVE
RLY1	LY2 AC24	19	DPDT-GENERAL PURPOSE CONTROL RELAY

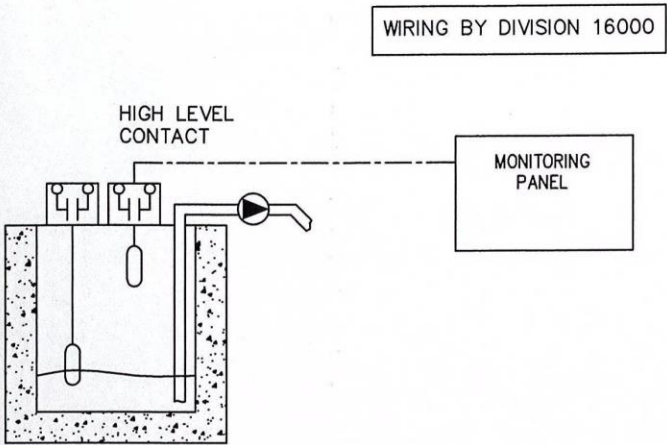
BILL OF MATERIALS INCLUDES PARTS FOR ALL VAV SYSTEMS.

SEQUENCE OF OPERATIONS

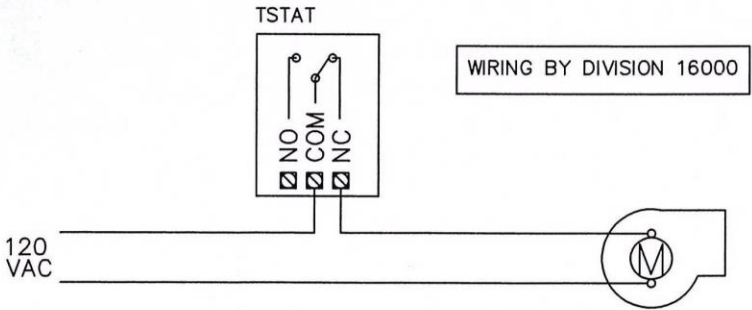
THE VAV WILL SUPPLY TEMPERED AIR TO THE CONTROLLED SPACE. A DUCT MOUNTED TEMPERATURE SENSOR WILL CHANGE THE OPERATION OF THE VAV FROM HEATING TO COOLING MODE ACCORDING TO THE FOLLOWING CONDITIONS: COOLING MODE: TEMPERED AIR < 24°C, HEATING MODE: TEMPERED AIR >26°C. COOLING MODE: IF THE SPACE TEMPERATURE IS ABOVE SETPOINT (AS SELECTED ON THERMOSTAT DIAL), THE VAV BOX WILL MODULATE OPEN. IF SPACE TEMPERATURE FALLS BELOW SETPOINT, THE VAV BOX WILL MODULATE CLOSED (TO A PREDETERMINED MINIMUM POSITION). THE RADIATION VALVE WILL BE REMAIN CLOSED WHILE IN COOLING MODE. HEATING MODE: IF THE SPACE TEMPERATURE IS ABOVE SETPOINT THE VAV BOX WILL MODULATE CLOSED (TO A PREDETERMINED MINIMUM POSITION). IF THE SPACE TEMPERATURE IS BELOW SETPOINT, THE VAV BOX WILL MODULATE OPEN & THE RADIATION VALVE WILL BE DRIVEN OPEN IN ORDER TO MAINTAIN SPACE TEMPERATURE SETPOINT.

AS BUILT DRAWINGS AUGUST 27, 2002						Building Systems Design Solutions Ltd.	
LEGEND						3127 Birds Hill rd., East St. Paul, MB, R2E 1G4, http://www.bsdsl.com e-mail: info@bsdsl.com	
PROJECT TITLE: CHURCHILL RECEPTION CENTRE			DEVICE TAG LEGEND			JOB # 1101-02	
JOB LOCATION: CHURCHILL MANITOBA			SYSTEM # DEVICE # XXX:XX:XX DEVICE TAG			DRAWN BY: DCW	
						ENG'D. DCW	
						CHECKED: AMF	
						DATE: 09/01/02	
NO. REVISION NO. REVISION NO. REVISION			SCALE: NTS			DRAWING NUMBER	
						4 OF 5	
						REV.#	
						n	

SUMP LEVEL MONITORING



ELECTRICAL ROOM EXHAUST



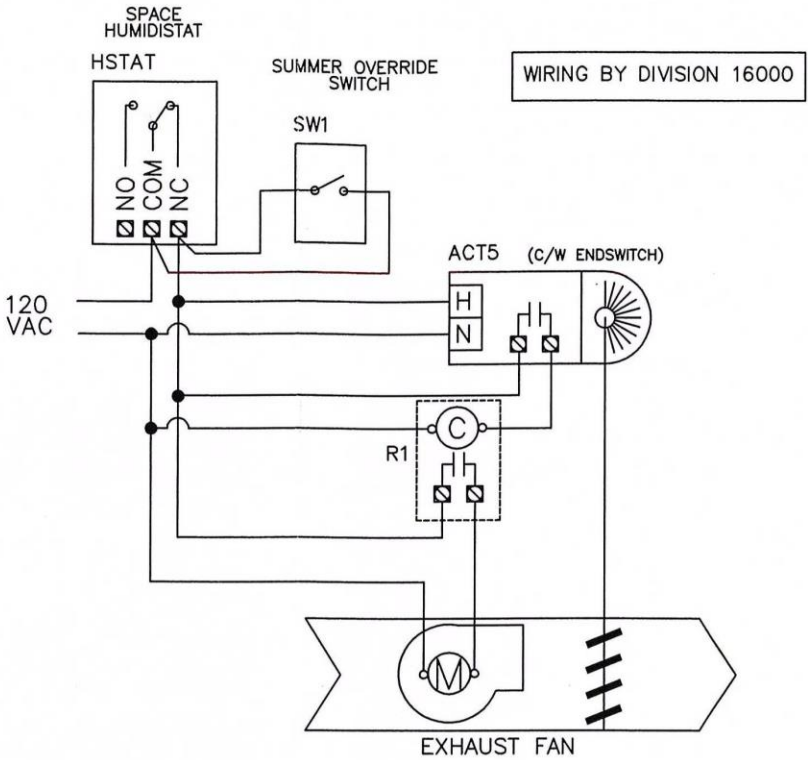
BILL OF MATERIALS SCHEDULE

TAG ID	PART NO.	QTY	DESCRIPTION
TSTAT	T6051	1	LINE VOLTAGE COOL ONLY THERMOSTAT

SEQUENCE OF OPERATIONS

UPON RISE ABOVE SETPOINT, THE SPACE MOUNTED THERMOSTAT WILL ENERGIZE THE CONTACT TO START THE EXHAUST FAN. UPON FALL BELOW SETPOINT, THE THERMOSTAT WILL DE-ENERGIZE THE EXHAUST FAN.

CRAWLSPACE VENTILATION



BILL OF MATERIALS SCHEDULE

TAG ID	PART NO.	QTY	DESCRIPTION
HSTAT	H46C	1	HUMIDISTAT , SPDT
ACT5	ML4195C1009	1	2 POS. 120VAC ACTUATOR C/W 2 END SWITCHES
SW1	N/A	2	SPST 15AMP SWITCH
R1	G7L	1	DPST 24VAC POWER RELAY

SEQUENCE OF OPERATIONS

IF THE SPACE HUMIDITY RISES ABOVE THE SETPOINT AS SELECTED ON THE SPACE MOUNTED HUMIDISTAT, THE EXHAUST AIR DAMPER WILL BE ENERGIZED. ONCE THE DAMPER HAS OPENED COMPLETELY, THE EXHAUST FAN WILL BE ENERGIZED. THE SYSTEM WILL REMAIN ENERGIZED UNTIL THE HUMIDISTAT IS SATISFIED. A SUMMER OVERRIDE SWITCH WILL ALSO ENERGIZE THE SYSTEM REGARDLESS OF HUMIDISTAT ACTION.

LEGEND

PROJECT TITLE:
CHURCHILL RECEPTION CENTRE

JOB LOCATION:
CHURCHILL
MANITOBA

NO.	REVISION	NO.	REVISION	NO.	REVISION
1	02/02/22				

AS BUILT DRAWINGS
AUGUST 27, 2002

DEVICE TAG LEGEND

SYSTEM # DEVICE #
XXX:XX:XX
DEVICE TAG

Building
Systems
Design
Solutions Ltd.

Building Systems Design
Solutions Ltd.
3127 Blyde Hill rd., East St. Paul, MB, R2E 1G4,
http://www.bsdsl.com e-mail:info@bsdsl.com

JOB # 1101-02

DRAWN BY: DCW

ENG'D: DCW

CHECKED: AMF

DATE: 09/01/02

SCALE: NTS

SPACE VENTILATION WIRING
CONTROL SCHEMATIC

CONSULTANT: MCW/AGE

CUSTOMER: WESWTWOOD MECHANICAL INC.

DRAWING NUMBER

5 OF 5

REV.#

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