

## SEQUENCE OF OPERATION

## MUA-1 INTERLOCKS WITH EF-1, GAS DETECTION SYSTEM, BUILDING PRESSURE CONTROL PANEL, AND THERMOSTAT:

THE FOLLOWING HVAC CONTROL SYSTEM SHALL BE DESIGNED BY A CONTROLS CONTRACTOR WORKING WITH THE MUA VENDOR AND THE DEPARTMENT OF LABOUR (CONTACT SHAWN PERRY) TO MEET ALL REQUIREMENTS.

VENDOR CONTROLS PROVIDED WITH MUA-1 TO CONTROL HEATING AND MUA MOTORIZED DAMPERS. COORDINATE DETAILS WITH VENDOR. CONTROLS CONTRACTOR SHALL PROVIDE CONTROL WIRING TO INTERLOCK MUA-1 WITH EF-1, THE EXISTING GAS DETECTION SYSTEM, THE BUILDING PRESSURE CONTROL PANEL, AND THE WALL THERMOSTAT. PROVIDE ACTUATORS FOR MOTORIZED DAMPERS ON MUA-1 TO SUIT CONTROL REQUIREMENTS.

MUA-1 AND EF-1 SHALL OPERATE TO HEAT AND VENTILATE THE NORTH SHOP TO 65 DEG F AS FOLLOWS:

- 1. DURING NORMAL OPERATION, MUA-1 WILL BE OFF WITH THE OUTSIDE AIR DAMPERS CLOSED AND EF-1 OFF.
- ON A CALL FOR HEATING FROM THE THERMOSTAT, THE MUA-1 RETURN AIR DAMPER WILL OPEN, OUTSIDE AIR DAMPER WILL CLOSE, EF-1 SHALL BE OFF, AND MUA-1 SHALL START AND RUN TO MAINTAIN SPACE TEMPERATURE.
- 3. ON A CALL FOR VENTILATION FROM THE GAS DETECTION SYSTEM WHEN EITHER THE CO LEVELS EXCEED 25 PPM OR THE NO2 LEVELS EXCEED 1 PPM, THE MUA OUTSIDE AIR DAMPER WILL OPEN, RETURN AIR DAMPER WILL CLOSE, MUA—1 AND EF—1 SHALL START AND RUN UNTIL GAS LEVELS RETURN WITHIN ACCEPTABLE LIMITS. EF—1 SHALL BE INTERLOCKED TO MUA—1 SO THAT IT WILL NOT START UNTIL CONFIRMATION THAT THE OUTSIDE AIR DAMPER IS FULLY OPEN AND THERE IS AIRFLOW FROM THE AIR PROVING SWITCH IN THE SUPPLY AIRSTREAM OF MUA—1. THE MUA CONTROL PANEL WILL MONITOR EF—1 BY MEANS OF A CURRENT SENSING RELAY SO THAT ANY TIME EF—1 IS RUNNING, THE OUTSIDE AIR DAMPER AT MUA—1 MUST BE OPEN AND AIR PROVING SWITCH CONFIRMS AIRFLOW, OTHERWISE EF—1 WILL SHUT OFF.
- 4. ON A CALL FOR FREE COOLING WHEN OUTDOOR ENTHALPY PERMITS, MUA-1 WILL OPERATE IN ECONOMISER MODE WITH THE RETURN AIR AND FRESH AIR DAMPERS MODULATING AS REQUIRED AND EF-1 OFF. AIR SHALL BE RELIEVED OUT THE BACKDRAFT DAMPER AT EF-1.
- 5. A BUILDING PRESSURE SENSOR WILL MONITOR GARAGE PRESSURE RELATIVE TO OUTSIDE. IF PRESSURE IN THE GARAGE DROPS BELOW -0.05" W.C. FOR 120 SECONDS, THE AUDIBLE AND VISIBLE ALARM WILL TURN ON, MUA-1 AND EF-1 WILL SHUT OFF.
- 6. MUA-1 TO COME EQUIPPED WITH A MANUAL OVERRIDE SWITCH WITH COUNTDOWN TIMER. WHEN SWITCH IS OPERATED, EF-1 AND MUA-1 WILL OPERATE IN VENTILATION MODE FOR 15 MINUTES.

## **LEGEND:**

LEGEND.			
- <del>1</del>	AIR FLOW DIRECTION		
	CONTROL WIRING		
MUA-	MAKEUP AIR UNIT		
EF-	EXHAUST FAN		
BD ///	BACKDRAFT DAMPER		
T	SPACE THERMOSTAT		
CO/NO <sub>2</sub>	GAS DETECTION SYSTEM (EXISTING)		
PS	DIFFERENTIAL PRESSURE SENSOR		
<del>-</del>	AUDIBLE/VISIBLE PRESSURE ALARM		
F	AIRFLOW PROVING SWITCH		
M ///	MOTORIZED DAMPER		
H C	INDIRECT-FIELD GAS BURNER		
LS	LIMIT SWITCH		
CSR	CURRENT SENSING RELAY		
TE	OUTDOOR TEMPERATURE SENSOR		

NORTH WALL)

(PROVIDE SUN SHIELD, INSTALL ON

**APEGIN** 

Certificate of Authorization

KGS Group

No. 245

OUTDOOR HUMIDITY SENSOR (PROVIDE SUN SHIELD)

NOTES:

THESE DRAWINGS SHALL NOT BE SCALED.

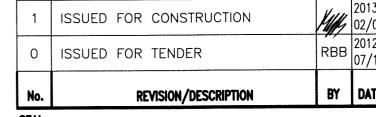
THE CONTRACTOR SHALL VISIT THE SITE AND SATISFY ONESELF ALL DIMENSIONS, DATUM, AN DETAILED INFORMATION SHOWN ARE CORRECT.

THE CONTRACTOR IS TO REVIEW AND COORDINATE ALL MECHANICAL, ELECTRICAL AND STRUCTURAL DRAWINGS FOR ADDITIONAL OPENINGS THROUGH FLOORS, WALLS, AND CEILINGS FOR DUCT, PIPE & ELECTRICAL RISERS AND ALL OPENINGS NOT SHOWN ON DRAWINGS

ALL PRODUCTS AND MATERIALS TO BE USED AND INSTALLED SHALL CONFORM WITH MANUFACTURER'S SPECIFICATIONS & APPLICABLE CODES.

THE CONTRACTOR SHALL BE RESPONSIBLE TO PATCH AND MAKE GOOD ALL EXISTING CONSTRUCTION AFFECTED BY THE REMOVAL OF ALL ITEMS FORMING THE PART OF THE RENOVATION WORK.

DRAWING LIST				
SHEET No:	SHEET TITLE			
M01	NORTH SHOP - EXISTING HVAC DEMOLITION PLAN			
M02	NORTH SHOP - NEW HVAC RENOVATION PLAN			
M03	NORTH SHOP - SECTION & DETAILS			
M04	MECHANICAL CONTROLS SCHEMATIC			
M05	MECHANICAL SPECIFICATIONS			





DRAWN RLR	CHECKED	RLG <b>DESIGNED</b>	APPROVED RBB
<b>DATE</b> 2012.04.16	USER APPROVAL	•	



THE CITY OF WINNIPEG
PLANNING, PROPERTY AND
DEVELOPMENT DEPARTMENT
MUNICIPAL ACCOMMODATIONS DIVISION
3-65 GARRY STREET, R3C 4K4

ROJECT
NORTH SHOP 2170 MAIN STREET
HVAC UPGRADE

MECHANICAL
CONTROLS SCHEMATIC

SCALE PROJECT No: SHEET No: M