

MECHANICAL SPECIFICATION

MECHANICAL SPECIFICATION

PART 1 - GENERAL

- 1.1 DRAWING AND SPECIFICATIONS
1. DO NOT SCALE DRAWINGS.
2. THE INSTALLER IS REQUIRED TO VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO PROCEEDING WITH DEMOLITION AND NEW INSTALLATION OF EQUIPMENT OUTLINED IN THE MECHANICAL DRAWINGS SET.

- 1.2 WARRANTY
1. THIS MECHANICAL TRADE CONTRACTOR SHALL WARRANTY ALL THEIR WORK FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR, UNLESS NOTED OTHERWISE, AFTER FINAL ACCEPTANCE OF WORK BY THE OWNER, THIS MECHANICAL TRADE CONTRACTOR SHALL WARRANTY ALL WORK AND EQUIPMENT SUPPLIED BY THEM TO WORK QUIETLY AND SATISFACTORILY AND TO ACCOMPLISH THE WORK FOR WHICH IT WAS INSTALLED DURING THE LIFE OF THE ABOVE WARRANTY, AT ANY TIME DURING THIS PERIOD, THE MECHANICAL CONTRACTOR SHALL MAKE ANY NECESSARY CHANGES AND ADJUSTMENTS OR REPLACEMENTS, TO ACCOMPLISH THIS AT THEIR OWN EXPENSE.

- 1.3 PERMITS AND REGULATIONS
1. ALL MECHANICAL TRADE CONTRACTORS SHALL COMPLY WITH ALL REGULATIONS OF AUTHORITIES HAVING JURISDICTION (AHJ).
2. OBTAIN AND PAY FOR ANY PERMITS REQUIRED BY THE LOCAL CODES AND REGULATIONS, INCLUDING ARRANGEMENTS FOR INSPECTION. PROVIDE THE OWNER WITH A FINAL INSPECTION CERTIFICATE AS REQUIRED.

- 1.4 SHOP DRAWINGS
1. THIS MECHANICAL TRADE CONTRACTOR SHALL PREPARE CLEAR AND CONCISE ELECTRONIC PDF SHOP DRAWINGS FOR ALL MECHANICAL EQUIPMENT AND SYSTEMS FOR THIS PROJECT. ALL SHOP DRAWINGS MUST BE FIRST QUALITY REPRODUCTIONS WITH ALL DETAILS, LETTERING, ETC. DISTINCT AND LEGIBLE. MODEL NUMBERS, ITEMS AND OPTIONS MUST BE CLEARLY IDENTIFIED.

- 1.5 STANDARDS OF WORKMANSHIP
1. DO NOT SUBSTITUTE THE SPECIFIED MATERIALS WITHOUT APPROVAL IN WRITING. INSTALL AND CONCEAL MECHANICAL SYSTEMS IN THE SAME MANNER AS THE EXISTING MECHANICAL SYSTEMS WITHIN THE BUILDING.

- 1.6 CUTTING AND PATCHING
1. CUTTING AND PATCHING TO BE PERFORMED BY THE MECHANICAL TRADE CONTRACTOR.
2. MAKE EVERY EFFORT TO MINIMIZE CUTTING AND PATCHING AND PROVIDE DIMENSIONS, LOCATIONS AND OTHER DATA FOR BASES, SLEEVES, BOXES, ETC., TO BE BUILT IN AS CONSTRUCTION PROCEEDS. SET SLEEVES AND MAKE OPENINGS IN CONCRETE FORMS AND MASONRY BEFORE PLACING CONCRETE AND MASONRY.

- 1.7 PENETRATIONS OF FIRE SEPARATIONS
1. WHERE PIPES OR DUCTS PASS THROUGH WALLS OR FLOORS WHICH PROVIDE FIRE SEPARATIONS, SEAL AROUND OPENINGS WITH ULC CLASSIFIED FIRE STOP MATERIAL. MATERIAL SHALL BE INSTALLED BY MANUFACTURERS' RECOMMENDATIONS AND SHALL PROVIDE A FIRE RATING EQUAL TO THAT OF THE SEPARATION WHICH HAS BEEN PENETRATED.

- 1.8 CLEANING MECHANICAL EQUIPMENT BEFORE USE
1. CLEAN INTERIOR AND EXTERIOR OF ALL SYSTEMS INCLUDING STRAINERS.

- 1.9 RECORD DRAWINGS
1. MAINTAIN PROJECT "AS-BUILT" RECORD DRAWINGS AND ACCURATELY RECORD SIGNIFICANT DEVIATIONS FROM THE CONTRACT DOCUMENTS, CAUSED BY SITE CONDITION OR CONTRACT CHANGE. MARK CHANGES ON WHITE PRINTS IN "RED" AS CONSTRUCTION PROGRESSES. AT THE COMPLETION OF THE PROJECTS, AND PRIOR TO FINAL INSPECTION, NEATLY TRANSFER "AS-BUILT" CORRECTIONS AND NOTATIONS TO FINAL WHITE PRINTS, AND SUBMIT TO THE CONSULTING CONSULTANT FOR REVIEW.

- 1.10 RENOVATIONS
1. CO-ORDINATE THE REMOVAL OR SHUTDOWN OF EXISTING SERVICES WITH THE OWNER OR THE OWNER'S REPRESENTATIVE. INSTEAD OF DISCONNECTING EXISTING SERVICES OR EQUIPMENT, BEFORE REMOVAL OF EQUIPMENT PROVIDE OWNER WITH FIRST RIGHT OF REFUSAL BEFORE DISCARDING EQUIPMENT.

- 1.11 IDENTIFICATION
1. IDENTIFY MEDIUM IN PIPING WITH (MARKERS OR) STENCILS SHOWING NAME AND SERVICE INCLUDING TEMPERATURE AND PRESSURE AND DIRECTIONAL FLOW ARROWS WHERE RELEVANT.
2. MATCH EXISTING BUILDING STANDARDS.

PART 2 - PRODUCTS

- 2.1 PIPING
1. SPRINKLER PIPING
1. FERROUS: TO NFPA 13, ROLL GROOVED; TO ASTM A795, STEEL, AND SCHEDULE 10 FOR SIZES UP TO 10"/250 MM.
2. WELDED, THREADED OR CUT GROOVED: SCH. 40 FOR SIZES LESS THAN 8"200 MM, SCH. 30 FOR 8"200 MM AND OVER.

- .6 ALL GROOVED PRODUCTS FOR SYSTEMS TO BE ULC LISTED.
.7 ALL GROOVED COUPLINGS TO BE COMPLETE WITH ANGLE BOLT PADS TO PROVIDE A RIGID JOINT, EQUAL TO VICTAULIC STYLE 005 FIRELOCK.
.8 ALL GROOVED PRODUCTS BY ONE MANUFACTURER.

- 2.2 PIPE HANGERS
1. EQUIVALENT TO FOLLOWING:
.1 SPRINKLER PIPING HANGERS TO NFPA 13 REQUIREMENTS.
2.3 DI-ELECTRIC UNIONS
1. ALL CONNECTIONS BETWEEN STEEL AND COPPER OR BRASS FOR PIPE 2"/50MM AND SMALLER SHALL BE MADE OF DI-ELECTRIC UNIONS, EXCEPT ON ALL CLOSED SYSTEMS, ON PIPE 2 1/2"/ 63MM AND LARGER USE FLANGED CONNECTIONS WITH NON-METALLIC GASKET AND PLASTIC SLEEVES FOR BOLTS.

- 2.4 FIRE PROTECTION - SPRINKLERS
1. PROVIDE ALL LABOUR, MATERIAL, PRODUCTS, EQUIPMENT AND SERVICES TO SUPPLY AND INSTALL THE SPRINKLER SYSTEM MODIFICATIONS AS INDICATED ON DRAWINGS. PROVIDE CERTIFICATE OF COMPLIANCE.
2. THE SPRINKLER CONTRACTOR SHALL HYDRAULICALLY DESIGN ALL NEW AND MODIFIED FIRE PROTECTION SYSTEMS AND SHALL BECOME THE ENGINEER OR RECORD FOR THE SPRINKLER DESIGN.
3. PROVIDE ADDITIONAL HEADS AS REQUIRED BY CODE TO ACHIEVE A FULLY SPRINKLERED BUILDING CENTRE HEADS BOTH WAYS IN CEILING TILES.

- 2.5 DUCTWORK
1. GENERAL:
.1 ALL DUCTWORK AND HANGERS SHALL BE CONSTRUCTED TO ASHRAE AND SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS.

- 2.6 FLEXIBLE DUCTWORK
1. UL LISTED FOR CLASS 1 AIR DUCT MATERIAL, UL181.
2. IN ACCORDANCE WITH NFPA STANDARD 90A.
3. CONSTRUCTED OF CORROSION RESISTANT, COATED SPRING WIRE BONDED TO A WOVEN FIBRE GLASS IMPREGNATED FABRIC OR 22 MIL P.V.C. CLOTH.

- 2.7 VEHICLE EXHAUST HOSE
1. SIZES UP TO 200mm TO BE NEOPRENE COATED HIGH TEMPERATURE FABRIC WITH INTERNAL STEEL HELIX.
2. INTERNAL SPIRAL TO BE GALVANIZED STEEL.
3. HOSE THICKNESS MINIMUM 0.4mm.
4. HOSE MINIMUM LENGTH 6000mm.

- 2.8 BALANCING DAMPERS
1. SINGLE BLADE DAMPERS: OF SAME MATERIAL AS DUCT, BUT ONE SHEET METAL THICKNESS HEAVIER, V-GROOVE STIFFENED.
2. SIZE AND CONFIGURATION TO RECOMMENDATIONS OF SMACNA.
3. LOCKING QUADRANT WITH SHAFT EXTENSION TO ACCOMMODATE INSULATION THICKNESS.

- 2.9 EXHAUST FAN
1. PERFORMANCE RATING: CONFORM TO ANSI/AMCA STANDARDS 210 AND 300. FANS MUST BE TESTED IN ACCORDANCE TO AMCA PUBLICATIONS 211 AND 311 IN AN AMCA ACCREDITED LABORATORY AND CERTIFIED FOR AIR PERFORMANCE.
2. CLASSIFICATION FOR SPARK RESISTANT CONSTRUCTION SHALL CONFORM TO ANSI/AMCA STANDARD 99.

- 2.10 HEAT TRACE
1. REPLACEMENT OF HEAT TRACE COMPONENTS AND CABLING TO CONFORM TO ZONE 2 APPLICATION.
2. CONSTRUCTION:
.1 NICKEL-PLATED COPPER BUS WIRES (14 AWG).
2. NICKEL-PLATED COPPER Braid.
3. FLUOROPOLYMER OVERLACKET

PART 3 - EXECUTION

- 3.1 PIPE INSTALLATION
1. INSTALL STRAIGHT, PARALLEL AND CLOSE TO WALLS AND CEILINGS, WITH SPECIFIED PITCH.
2. USE STANDARD FITTINGS FOR DIRECTION CHANGES.
3. ALL PIPING SHALL BE RUN CONCEALED IN PIPE SPACES, CHASES AND CEILING SPACES WHERE POSSIBLE. PIPING THAT IS RUN EXPOSED IN FINISHED AREAS SHALL BE LOCATED IN CORNERS, AND BOXED IN, WHERE NOT BOXED IN, PIPING TO BE CHROME PLATED.

- 3.2 PIPE HANGERS
1. FURNISH AND INSTALL ALL HANGERS REQUIRED FOR THE PROPER SUPPORT OF PIPING IN THIS BUILDING.
2. SPACE HANGERS FOR HORIZONTAL STEEL AND COPPER PIPING AS FOLLOWS:
.1 NOMINAL DUPE SIZE UP TO 1.1/4"/32MM HANGER ROD 3/8" / 10MM AT MAX. SPACING 7'-0"/2.1M STEEL, 6'-0"/1.8M COPPER.

- 3.3 FIRE PROTECTION SYSTEM
1. ALL INSTALLATION WORK TO BE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE FIRE MARSHAL'S OFFICE, LOCAL AHJ AND NFPA 13.
2. ALL PIPING TO RUN CONCEALED EXCEPT WHERE NOTED ON DRAWINGS. ALL MAIN LINES TO BE OPEN TO AIR EXCEPT WHERE NOTED ON DRAWINGS. SEE NOTES REGARDING PIPING ON DRAWINGS.

- 3.4 FIRE PROTECTION - FIELD QUALITY CONTROL
1. TEST SYSTEMS IN ACCORDANCE WITH THE APPROPRIATE NFPA CODE AND REQUIREMENTS OF THE OFFICE OF THE FIRE MARSHAL AND OR AHJ.
3.5 DUCTWORK
1. DUCTWORK AT ALL OTHER LOCATIONS WHERE MOISTURE MAY COLLECT, SHALL BE WELDED OR MADE SUITABLY WATER TIGHT. AT THESE PLACES DUCTWORK SHALL BE SLOPED TOWARDS A LOW POINT WHERE A 1.1/4"/32MM DRAIN WITH A DEEP SEAL TRAP SHALL BE PROVIDED, DISCHARGING THROUGH A COPPER PIPE TO A FUNNEL FLOOR DRAIN.

- .7 ALL DUCT JOINTS SHALL BE COATED WITH DUCT SEALER APPLIED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS BEFORE ASSEMBLING.
.8 ALL DUCTWORK SHALL BE SECURELY HUNG FROM THE BUILDING STRUCTURE USING APPROVED HANGERS.
1. ROUND DUCTWORK:
.1 WHERE SPACE PERMITS ROUND DUCTS OF EQUAL AIR CARRYING CAPACITY MAY BE USED IN PLACE OF RECTANGULAR DUCTS.

- 3.6 FLEXIBLE CONNECTIONS
1. WHERE SHOWN ON THE DRAWINGS AND ON THE INLET AND OUTLET CONNECTIONS OF EACH FAN AND OUTLET OF EACH UNIT, THERE SHALL BE INSTALLED A FLEXIBLE CONNECTION FLEXIBLE CONNECTIONS SHALL PROVIDE A MINIMUM 3"/75MM OF FABRIC BETWEEN THE METAL ENDS WHETHER THE EQUIPMENT IS ON OR OFF AND A GROUND STRAP.
2. FLEXIBLE DUCTWORK SHALL NOT HAVE MORE THAN A 15' CHANGE IN DIRECTION. FOR CHANGES IN DIRECTION MORE THAN 15' USE RIGID DUCTWORK FOR THE CHANGE.

- 3.7 GRILLES, REGISTERS AND DIFFUSERS
1. ALL GRILLES AND REGISTERS SHALL BE SUPPLIED AND INSTALLED BY THIS SUB-CONTRACTOR. ALL DOOR GRILLES WILL BE SUPPLIED BY THIS SUB-CONTRACTOR AND INSTALLED BY THE MILLWORK OR HOLLOW METAL SUB-CONTRACTOR.
2. ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE FREE OF FLUTTERING, CHATTERING AND VIBRATION. A FELT OR SPONGE RUBBER GASKET SHALL BE PROVIDED BEHIND EACH OUTLET AND INLET AND ADEQUATE FASTENING PROVIDED TO PREVENT LEAKING AND DIRT STREAKS BETWEEN THE OUTLET OR INLET AND THE DUCT WALL OR CEILING.

- 3.8 BALANCING DAMPERS
1. INSTALL BALANCING DAMPERS IN ACCORDANCE WITH RECOMMENDATIONS OF SMACNA AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. INSTALL BALANCING DAMPERS WHERE INDICATED ON THE DRAWINGS. IN ADDITION TO LOCATIONS INDICATED, BALANCING DAMPERS ARE TO BE INSTALLED AT ALL TEE'S IN MAIN DUCTS, BRANCH TAKE-OFFS FROM MAIN DUCTS AND IN ALL BRANCH DUCTS TO GRILLES, DIFFUSERS AND TERMINAL DEVICES.

- 3.9 BALANCING
1. UPON COMPLETION OF THE INSTALLATION OF THE SYSTEM THE CONTRACTOR SHALL BALANCE THE SYSTEMS:
.1 BALANCE SUPPLY AIR, RETURN AIR AND EXHAUST SYSTEMS TO OBTAIN AIR QUANTITIES AS SHOWN ON THE DRAWINGS (+/- 5%)
2. SUBMIT A COPY OF THE BALANCING REPORT TO THE OFFICE OF THE OWNER AND TO THE CONSULTANT.

BUILDING AUTOMATION SYSTEM

- 1. ALL CONTROLS SHALL BE SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR. PROVIDE ALL HARDWARE, SOFTWARE, WIRING AND ANY OTHER HARDWARE AS REQUIRED TO BY A COMPLETE AND FULLY FUNCTIONING CONTROL SYSTEM COMPATIBLE WITH THE EXISTING EQUIPMENT AND JOHNSON CONTROLS METASYS SYSTEM.
a. ALL CONTROLS MUST BE ABLE TO INTERFACE WITH METASYS CONTROL SYSTEM.
b. CONTROLS CONTRACTOR TO PROVIDE COMMISSIONING SHEETS FOR ALL NEW AND EXISTING SYSTEMS OUTLINED IN THIS SPECIFICATION

CO/NO2 GAS DETECTION SYSTEM (EXISTING)

- a. EXISTING SYSTEM TO REMAIN. PANEL IS INTERLOCKED WITH MAU-01 SUPPLY/EXHAUST FAN.
b. EXISTING SETPOINTS:
b.a. 1ST/ ALARM SETPOINT: CO @50 PPM / NO2 @ 0.7 PPM
b.b. 2ND/ ALARM SETPOINT: CO @ 100 PPM / NO2 @2.0 PPM
c. CONTRACTOR TO TEST AND COMMISSION EXISTING GAS DETECTION SYSTEM AT END OF CONSTRUCTION AND ENSURE SETPOINTS AND ALARMS ARE FUNCTIONAL.

3. GAS- FRIED UNIT HEATERS (EXISTING)

- a. PROVIDE NEW INTERLOCK FOR BOTH GAS FIRED UNIT HEATERS WITH HYDROGEN DETECTION SYSTEM. GAS-FIRED UNIT HEATERS SHALL STOP UPON ALARM FROM HYDROGEN DETECTION SYSTEM.
4. MAKE-UP AIR UNIT (EXISTING)
a. MAU-1 IS AN EXISTING 100% FRESH AIR UNIT THAT PROVIDES VENTILATION AND EXHAUST TO THE SPACE. THE UNIT IS EQUIPPED WITH VARIABLE SPEED DRIVES AND AN INDIRECT GAS FIRED HEAT EXCHANGER. THE EXISTING UNIT AND SEQUENCE OF OPERATION TO REMAIN, WITH THE MODIFICATIONS NOTED HERE WITHIN.

6. OTHER:

- a. A VISUAL AND AUDIBLE ALARM WITHIN THE SPACE TO BE PROVIDED AND TO OPERATE WHEN MAU-1 IS NOT OPERATING. ALARM TO BE PROVIDED AT BAS FOR OPERATOR.
7. VEHICLE EXHAUST SYSTEM:
a. VEHICLE TAIL EXHAUST FANS (F-1 AND F-3)
a.a. EXHAUST FANS SHALL BE ACTIVATED BY WALL MOUNTED MANUAL SWITCHES.
a.b. INPUT/OUTPUT POINTS F-1 AND F-3
a.b.a. BINARY INPUTS: EXHAUST FAN STATUS
a.b.b. BINARY OUTPUTS: EXHAUST FAN ON/OFF

- f.a.o. THE SOFTWARE HAND-OFF-AUTO SWITCH (HOA) IS SWITCHED TO ON POSITION; OR,
f.a.b. THE SOFTWARE HAND-OFF-AUTO SWITCH (HOA) IS IN AUTO POSITION AND
f.a.c. THE BUILDING OCCUPANCY SCHEDULE IS INDICATING THAT THE SYSTEM SHOULD BE OPERATED; OR,
f.a.d. SPACE TEMPERATURE SENSOR INDICATED SPACE TEMPERATURE FALLING BELOW UNOCCUPIED SET POINT. IN THIS CASE THE SUPPLY FAN WILL RUN UNTIL THE NIGHT SETBACK TEMPERATURE PLUS 1'C (ADJUSTABLE) IS ACHIEVED.
f.a.e. VENTILATION RATE SETBACK WILL ADJUST THE FAN SPEED.
f.b. WHEN A FIRE ALARM SIGNAL IS DETECTED, THE FAN WILL SHUT DOWN UNTIL THE FIRE ALARM SYSTEM IS RESET.
f.c. THE SPEED CONTROL PROGRAM WILL BE ENABLED WHENEVER THE SUPPLY FAN OUTPUT IS ON.

- f.d. WHEN THE VFD IS ENABLED, THE SUPPLY FAN WILL HAVE A MINIMUM SPEED OF 30% (ADJUSTABLE).
f.e. THE STATIC PRESSURE AT THE FAN DISCHARGE WILL BE LIMITED TO THE DISCHARGE PRESSURE HIGH LIMIT SET POINT.
f.f. THE FOLLOWING CONDITIONS WILL CAUSE AN ALARM IN THE SYSTEM:
f.f.a. HIGH OR LOW DUCT STATIC PRESSURE
f.f.b. HIGH OR LOW DISCHARGE AIR STATIC PRESSURE
f.f.c. SUPPLY FAN FAILURE
f.f.d. EXHAUST FAN FAILURE
f.f.e. HIGH OR LOW DISCHARGE AIR TEMPERATURE
f.f.f. AIR FILTER TROUBLE
f.g. SUPPLY AIR TEMPERATURE CONTROL:
f.g.a. GAS FIRED HEAT EXCHANGER WILL MODULATE SUPPLY AIR TEMPERATURE TO ACCOMMODATE SPACE HEATING LOAD CHANGES.
f.g.b. ON SYSTEM SHUT DOWN GAS FIRED HEAT EXCHANGER WILL BE DISABLED AND OUTSIDE/EXHAUST AIR DAMPERS WILL GO TO FULLY CLOSE.

f.h. EXHAUST/SUPPLY AIRFLOW CONTROL:

- THE NEW ADDITION HAS LOW/HIGH SETPOINTS OF CO AND NO2 CONCENTRATION (REFER TO THE PARAGRAPH OF "GAS DETECTION"). WHEN ANY CONCENTRATION EXCEEDS A THRESHOLD (PPM LEVEL IN AIR) THE FOLLOWING SHALL HAPPENED:
f.h.a. 1ST/ ALARM:
SUPPLY FAN IN MAU-1 WILL BE AT THE SPEED CARRYING 50% (ADJUSTABLE) DESIGN AIRFLOW TO REDUCE THE CO/NO2 LEVEL.
f.h.b. 2ND/ ALARM:
f.h.b.a. USE THE ANALOG OUTPUT OF GAS DETECTION PANEL ASSOCIATED WITH THE SUPPLY FAN IN MAU-1 TO RAMP UP THE VFD BETWEEN FIRST ALARM SETPOINTS AND 125PPM(CO)/14PPM(NO2) PROPORTIONALLY TO THE DESIGN AIRFLOW. IF CONCENTRATIONS ARE REDUCED AND LOWER THAN FIRST ALARM SETPOINTS, SUPPLY FAN VFD WILL BE BACK TO MINIMUM SPEED AT 35% OF DESIGN AIRFLOW.
f.h.b.b. TURN ON REMOTE HORNS/STROBES LOCATED IN AREA WHERE SECURITY OR MAINTENANCE PERSONNEL CAN BE WARNED OF HIGH CO NO2 CONCENTRATION.
f.h.b.c. NOTIFY HIGH ALARM LEVEL CONDITION TO THE BMS AND FIRE ALARM. COORDINATE WITH DIVISION 16.
f.h.c. 3RD/ALARM
f.h.c.a. FIRE ALARM SYSTEM TO CALL FIRE DEPARTMENT. COORDINATE WITH DIVISION 16

g. REVISIONS TO EXISTING SEQUENCE OF OPERATION

- g.a. THE SUPPLY AIR FAN WILL HAVE A MINIMUM SPEED OF 55% (1400 L/S) UNDER ALL OPERATING CONDITIONS.
g.b. EXHAUST/SUPPLY AIRFLOW CONTROL: AT 1ST/ ALARM FROM GAS DETECTION SYSTEM FOR CO/NO2 OR HYDROGEN SYSTEM, SUPPLY FAN IN MAU-1 TO REMAIN AT 55% SPEED.
g.c. EXHAUST/SUPPLY AIRFLOW CONTROL: AT 2ND/ ALARM FROM HYDROGEN GAS DETECTION SYSTEM; EXHAUST FAN IN MAU-1 TO OPERATE AT 100% SPEED. SUPPLY FAN TO STOP AND OVERHEAD DOORS TO OPEN.
g.d. PROVIDE NEW MANUAL EMERGENCY SHUTOFF FOR MAU-1 SYSTEM AND ALARM TO BAS IN EVENT OF ACTIVATION. REFER TO MECHANICAL FLOOR PLANS FOR LOCATION.

5. HYDROGEN GAS DETECTION SYSTEM (NEW):

- a. GAS DETECTORS ARE CONNECTED TO A MAIN CONTROL PANEL WITH TWO LEVEL ALARM OUTPUTS. REFER TO ELECTRICAL DRAWINGS FOR COORDINATION.
b. FIRST ALARM:
b.a. WARNING AUDIBLE AND VISUAL ALARM PROVIDE WITHIN SPACE
b.b. ALARM NOTIFICATION AT BUILDING AUTOMATION SYSTEM
c. SECOND ALARM: 25% LEL
c.a. PROVIDE DISTINCT AUDIBLE AND VISUAL ALARM WITHIN SPACE
c.b. ALARM NOTIFICATION AT BUILDING AUTOMATION SYSTEM
c.c. EXHAUST FAN IN MAU-1 TO OPERATE AT 100% AND OVERHEAD DOORS TO OPEN (REFER TO MAU-1 SEQUENCE)
c.d. DEACTIVATION OF EXISTING GAS-FIRED UNIT HEATERS
c.e. SIGNAL TO EXISTING BUILDING FIRE ALARM PANEL

6. OTHER:

- a. A VISUAL AND AUDIBLE ALARM WITHIN THE SPACE TO BE PROVIDED AND TO OPERATE WHEN MAU-1 IS NOT OPERATING. ALARM TO BE PROVIDED AT BAS FOR OPERATOR.

7. VEHICLE EXHAUST SYSTEM:

- a. VEHICLE TAIL EXHAUST FANS (F-1 AND F-3)
a.a. EXHAUST FANS SHALL BE ACTIVATED BY WALL MOUNTED MANUAL SWITCHES.
a.b. INPUT/OUTPUT POINTS F-1 AND F-3
a.b.a. BINARY INPUTS: EXHAUST FAN STATUS
a.b.b. BINARY OUTPUTS: EXHAUST FAN ON/OFF

CA, PW WORKING DIRECTORY PROJECTS 2023 DILLON\_40744.DWS28250\_236412-07-MECH-CON.DWG

ISSUED FOR TENDER
NOT FOR CONSTRUCTION

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
Dillon Consulting Limited (MB)
No. 1789 Date: 2023.10.06

LOCATION APPROVED UNDERGROUND STRUCTURES
SUPPLY, U/G STRUCTURES DATE
NOTE: LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST AVAILABLE BUT NO GUARANTEE IS GIVEN THAT THE GIVEN LOCATIONS ARE EXACT. DETERMINATION OF EXISTING OR NEW LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE ORIGINAL DRAWING BEFORE PROCEEDING WITH CONSTRUCTION.

Table with columns: NO., REVISIONS, DATE, BY.
1 ISSUED FOR ADDENDUM 1 2023/11/10 CAL
0 ISSUED FOR TENDER 2023/10/06 JCY

DESIGNED BY JCY
DRAWN BY HL
CHECKED BY JCY
APPROVED BY JCY
HOR. SCALE N.T.S.
VERTICAL



ENGINEER'S SEAL
ORIGINAL SEALED BY J. YABLECKI ON 2023/10/06

THE CITY OF WINNIPEG TRANSIT DEPARTMENT
WINNIPEG TRANSIT ARTIC ROOM MODIFICATIONS
MECHANICAL SPECIFICATION & CONTROL SEQUENCE
CITY DRAWING NUMBER P-XXXX- SHEET 13 OF 21
CONSULTANT DRAWING NUMBER M6
DATE: NOVEMBER 10, 2023