MECHANICAL SPECIFICATION CONT:

SECTION 15900 CONTROLS AND SEQUENCES

10.4.3. BINARY INPUTS:

- 10.4.3.1. SUPPLY FAN STATUS
- 10.4.3.2. EXHAUST FAN STATUS
- 10.4.3.3. AIR FILTER STATUS
- 10.4.3.4. BUILDING FIRE ALARM STATUS
- 10.4.3.5. OUTSIDE AIR DAMPER POSITION (OPEN/CLOSED)

10.4.4. BINARY OUTPUTS

- 10.4.4.1. OUTSIDE AIR DAMPER OPEN/CLOSED
- 10.4.4.2. RELIEF AIR DAMPER OPEN/CLOSE
- 10.4.4.3. SUPPLY FAN START/STOP
- 10.4.4.4. EXHAUST FAN START/STOP

11. MAU-1 SEQUENCE OF OPERATION

11.1. THE SUPPLY FAN WILL BE STARTED UNDER THE FOLLOWING CONDITIONS:

- 11.1.1. THE SOFTWARE HAND-OFF-AUTO SWITCH (HOA) IS SWITCHED TO ON POSITION; OR,
- 11.1.2. THE SOFTWARE HAND-OFF-AUTO SWITCH (HOA) IS IN AUTO POSITION AND
- 11.1.3. THE BUILDING OCCUPANCY SCHEDULE IS INDICATING THAT THE SYSTEM SHOULD BE OPERATING; OR,
- 11.1.4. SPACE TEMPERATURE SENSOR INDICATES 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.
- 11.1.5. VENTILATION RATE SETBACK WILL ADJUST THE FAN SPEED.

11.2. WHEN A FIRE ALARM SIGNAL IS DETECTED, THE FAN WILL SHUT DOWN UNTIL THE FIRE ALARM SYSTEM IS RESET.

11.3. THE SPEED CONTROL PROGRAM WILL BE ENABLED WHENEVER THE SUPPLY FAN OUTPUT IS ON.

11.4. WHEN THE VFD IS ENABLED, THE SUPPLY FAN WILL HAVE A MINIMUM SPEED OF 30% (ADJUSTABLE)

11.5. THE STATIC PRESSURE AT THE FAN DISCHARGE WILL BE LIMITED TO THE DISCHARGE PRESSURE HIGH LIMIT SET POINT.

11.6. THE FOLLOWING CONDITIONS WILL CAUSE AN ALARM IN THE SYSTEM:

- 11.6.1. HIGH OR LOW DUCT STATIC PRESSURE
- 11.6.2. HIGH OR LOW DISCHARGE AIR STATIC PRESSURE
- 11.6.3. SUPPLY FAN FAILURE
- 11.6.4. EXHAUST FAN FAILURE
- 11.6.5. HIGH OR LOW DISCHARGE AIR TEMPERATURE
- 11.6.6. AIR FILTER TROUBLE

11.7. SUPPLY AIR TEMPERATURE CONTROL:

- 11.7.1. GAS FIRED HEAT EXCHANGER WILL MODULATE SUPPLY AIR TEMPERATURE TO ACCOMMODATE SPACE HEATING LOAD CHANGES.
- 11.7.2. ON SYSTEM SHUT DOWN GAS FIRED HEAT EXCHANGER WILL BE DISABLED AND OUTSIDE/EXHAUST AIR DAMPERS WILL GO TO FULLY CLOSE.

11.8. 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:

11.8.1. 1ST ALARM:

SUPPLY FAN IN MAU-1 WILL BE AT THE SPEED CARRYING 50% (ADJUSTABLE) DESIGN AIRFLOW TO REDUCE THE CO/ NO2 LEVEL.

11.8.2. 2ND ALARM:

- 11.8.2.1. 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)/1.4PPM(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.
- 11.8.2.2. TURN ON REMOTE HORNS/STROBES LOCATED IN AREA WHERE SECURITY OR MAINTENANCE PERSONNEL CAN BE WARNED OF HIGH CO NO2 CONCENTRATION.
- 11.8.2.3. NOTIFY HIGH ALARM LEVEL CONDITION TO THE BMS.

12. MISCELLANEOUS SYSTEMS MONITORING

12.1. PROVIDE THE FOLLOWING MONITORING POINTS:

12.1.1. PIT HIGH LEVEL ALARM

SECTION 15990 TESTING AND BALANCING OF MECHANICAL SYSTEMS

11. INDEPENDENT RECOGNIZED AIR BALANCE CONTRACTOR SHALL BE AABC CERTIFIED.

12. TEST AND BALANCE MAU-1 AND F-1 AIR SYSTEMS. TEST ALL NEW AND FIRE DAMPERS. INCLUDE FIRE DAMPER VERIFICATION REPORT IN TAB REPORT.

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	MANUFR.	MODEL	TRAP	PIPE CONNECTIONS DCW	DHW	TW	WASTE	VENT	REMARKS
TP-1	TRAP PRIMER	MIFAB	M2-500	-	15Ø (1/2")	-	-	-	-	PRESSURE DROP ACTIVATED BRASS TRAP SEAL PRIMER C/W VIEW HOLES AND REMOVABLE FILTER SCREEN AND SERVE UP TO 3 FLOOR DRAINS.
RD-1	ROOF DRAIN	ZURN	e	-	-	-	-	75Ø (3")	-	DURA-COATED CAST IRON BODY. "CONTROL-FLO" WEIR SHALL BE LINEAR FUNCTIONING WITH INTEGRAL MEMBRANE FLASHING CLAMP/GRAVEL GUARD AND POLY-DOME. ALL DATA SHALL BE VERIFIED PROPORTIONAL TO FLOW RATES. C/W ALUMINUM DOME AND WATERPROOFING FLANGE.
FD-1	FLOOR DRAIN	ZURN	FD-100-C	75Ø (3")	-	-	-	75Ø (3")	-	EPOXY-COATED CAST IRON FLOOR DRAIN WITH ANCHOR FLANGE, REVERSIBLE MEMBRANE CLAMP WITH PRIMARY AND SECONDARY WEEPHOLES, ADJUSTABLE NICKEL BRONZE ROUND HEAVY-DUTY STRAINER AND TRAP PRIMER CONNECTION.
FD-2	FLOOR DRAIN	ZURN	Z534	-	-	-	-	100ø (4")	-	305Ø DIAMETER PARKING DECK DRAIN, DURA-COATED CAST IRON BODY WITH BOTTOM OUTLET, HEAVY DUTY GASKETED DRAIN SUPPORT FLANGE, WITH HEAVY DUTY SLOTTED GRATE.

UNIT HEATER SCHEDULE

TAG	LOCATION	MODEL	HEATING INPUT (kW)	HEATING INPUT (MBH)	THERMAL EFF. (%)	AIR SIDE FLOW RATE (L/s)	FLOW RATE (CFM)	FAN MOTOR (W)	FAN MOTOR (HP)	FAN MOTOR (RPM)	ENT. TEMP. (°C)	ENT. TEMP. (°F)	COMBUST. AIR INLET (mm)	COMBUST. AIR INLET (in.)	GAS SIDE GAS CONNECTION (mm)	GAS CONNECTION (in.)	VENT DIA. (mm)	VENT DIA. (in.)	WEIGHT (kg.)	WEIGHT (lbs.)	NOTES
UH-1, 2	MAINTENANCE BAY 101	REZNOR MODEL UEAS 180	52.8	180	91	1,160	2,458	187	0.25	1050	15.6	60	152	6	13	0.50	102	4	111	245	1, 2, 3

NOTES:
1. UNIT HEATER SHALL HAVE OPEN FAN MOTOR AND PSC VENTER MOTOR.
2. UNIT HEATER MOUNTING HEIGHT SHALL BE 3.7m (12 ft.) MINIMUM .
3. UNIT HEATER SHALL HAVE BUILT-IN DISCONNECT SWITCH AND SUPPLIED WITH A REMOTE THERMOSTAT C/W GUARD AND LOCKING COVER.

FAN SCHEDULE

TAG	SERVICE	MANUFACTURER	TYPE	MODEL	RPM	AIR FLOW RATE (L/s)	AIR FLOW RATE (CFM)	E.S.P. (Pa)	E.S.P. (in.WC)	MOTOR (kW)	MOTOR (HP)	SONES	ACCESSORIES	NOTES
F-1	BUS TAIL PIPE EXHAUST	TWIN CITY	CENTRIFUGAL	ROB909	2,658	566	1,200	2250	9.00	3.73	5.00	-		1
F-2	WELDING EXHAUST	NEDERMAN	PORTABLE	FILTERBOX 12M	N/A	330	700	N/A	N/A	1.49	2.00	-		2

NOTES:
1. ROOF MOUNTED, CONSTRUCTION SUITABLE TO HANDLE 600 F DEG. VEHICLE ENGINE EXHAUST, BELT DRIVE, C/W WEATHER COVER AS REQUIRED. CONNECTED HOSE TO BE 150mm "PLYMOVENT" (TEMP. UP TO 1200 F).
2. MOBILE UNIT ON WHEELS. C/W INTEGRATED SILENCER, 3 M (10 FT.) EXTRACTION ARM NEX MD, HEPA FILTER (EFFICIENCY 99.95 %), ERGONOMIC HANDLE, SPARK PROTECTION, ETC.

GRILLE AND DIFFUSER SCHEDULE

TAG	EQUIPMENT TYPE	MFR.	MODEL	COLOR	MODULE SIZE [in x in]	MODULE SIZE [mm x mm]	MOUNTING	NOTES
S-1	HIGH CAPACITY DRUM LOUVER DIFFUSER	E.H.PRICE	HCD2	B12	REFER TO DWG.		DUCTWORK	
E-1	EGG CRATE FACE RETURN	E.H.PRICE	80	B12	REFER TO DWG.		DUCTWORK	
E-2	HEAVY DUTY GYM GRILLES	E.H.PRICE	91	B12	REFER TO DWG.		DUCTWORK	

NOTES:

PLUMBING PUMP SCHEDULE

TAG	MFR.	SERVICE	TYPE	SUCTION (mm)	SUCTION (in.)	DISCHARGE (mm)	DISCHARGE (in.)	FLOW RATE (LPS)	FLOW RATE (US GPM)	HEAD (kPa)	HEAD (ft.WC)	MOTOR (kW)	MOTOR (H.P.)	MOTOR RPM	NOTES
P-1A	LIBERTY	SEWAGE PIT	SUBMERSIBLE - LE100	-	-	75	3	1.26	20	105	35	0.75	1.00	-	1, 2
P-1B	LIBERTY	SEWAGE PIT	SUBMERSIBLE - LE100	-	-	75	3	1.26	20	105	35	0.75	1.00	-	1, 2

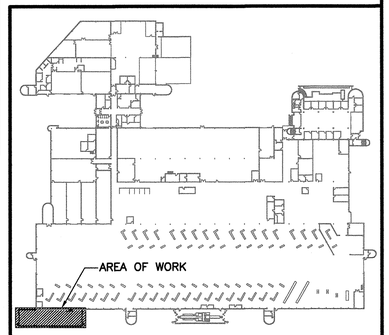
NOTES:
1. C/W 1050mm DIA./1700mm DEEP PACKAGED FIBERGLASS PIT. PROVIDE HEAVY DUTY SEALED STEEL COVER, GUIDERAIL SYSTEM AND ANTI-FLOATING CONCRETE PAD AS REQUIRED.
2. PROVIDE DUPLEX PUMP WITH CONTROLS PUMP #1 ON, PUMP #2 ON AND A HIGH WATER ALARM, MONITORED BY BMS.

AIR HANDLING UNIT SCHEDULE

TAG	MAU-01	
SERVICE	ARTICULATING BUS MAINTENANCE	
MODEL		
VOLT/PH/Hz	575/3/60	
SUPPLY FAN	VAV	
AIR FLOW RATE (L/s / CFM)	2,612	5,537
E.S.P. (Pa / in.WC)	200	0.80
TYPE	18/18 FC DIDW	
MOTOR TYPE	ODP - PREMIUM EFFICIENCY	
MOTOR SIZE (kW / HP)	3.73	5.00
MOTOR SPEED (RPM)		
OUTSIDE AIR		
MAX AIR FLOW RATE (L/s / CFM)	2,612	5,537
EXHAUST FAN	VAV	
AIR FLOW RATE (L/s / CFM)	2,612	5,537
E.S.P. (Pa / in.WC)	250	1.00
TYPE	18/18 FC DIDW	
MOTOR TYPE	ODP - PREMIUM EFFICIENCY	
MOTOR SIZE (kW / HP)	3.73	5.00
MOTOR SPEED (RPM)		
HEATING COIL		
MODEL		
TYPE	INDIRECT, GAS FIRED	
TURNDOWN (BURNER CONTROL)	15:1	
OUTPUT (Kw / MBH)	187.6	640
INPUT (Kw / MBH)	234.5	800
COOLING COIL	SPACE RESERVED FOR FUTURE	
FILTERS		
O/A FINAL FILTER DEPTH / TYPE	50mm / PLEATED	
O/A FINAL FILTER EFFICIENCY	MERV 8	
E/A FILTER DEPTH / TYPE	N/A	
E/A FILTER EFFICIENCY	N/A	
PHYSICAL DATA	APPROXIMATE	
WEIGHT (kg / lbs)	2,676	5,900
LENGTH (m / ft.)	5.15	16.90
WIDTH (m / ft.)	2.06	6.75
HEIGHT (m / ft.)	1.19	3.92
NOTES:	1. PROVIDE 600 (24") HIGH ROOF CURB. 2. CAP OPENING BETWEEN SUPPLY AND EXHAUST FOR FUTURE. 3. PROVIDE BACNET COMPATIBLE PACKAGED CONTROLLER.	

REFERENCE DRAWINGS

NO.	DESCRIPTION



KEY PLAN

NO.	DATE	DESCRIPTION	PREPARED	REVIEW	DESIGN	AUTHORIZE
00	14.01.17	ISSUED FOR CONSTRUCTION	DD	JS	TS	

REVISIONS/ISSUE — DRAFTING — ENGINEERING

SEAL: PROVINCE OF MANITOBA — T. SUN — 2014/04/9 — Member 33181 — REGISTERED PROFESSIONAL ENGINEER

PERMIT STAMP: APEGM Certificate of Authorization TETRA TECH WEI Inc. No. 5513 Date: April 30, 2014

DESIGNED BY:	PREPARED BY:	REVIEWED BY:
TS	EV	JS
AUTHORIZED BY:	DATE:	SCALE:
	13.11.20	AS NOTED

SUB-CONSULTANT(S):

CLIENT: Winnipeg — CITY OF WINNIPEG TRANSIT DEPARTMENT

TETRA TECH

PROJECT NAME: CITY OF WINNIPEG TRANSIT - FORT ROUGE GARAGE BUS MAINTENANCE ADDITION

DRAWING DESCRIPTION: MECHANICAL SPECIFICATIONS AND SCHEDULES

DRAWING NO: 1329720500-DWG-M0009 — REV: 00

A1 (841 x 594)

3D MODEL REF No: