

FAN SCHEDULE													
TAG NO.	SYSTEM SERVICED	AIR FLOW (L/s)	STATIC (Pa.)	MOTOR KW.	RPM	ELECTRICAL			NON-FUSED DISCONNECT	FIRESTAT	MOTORIZED DAMPER	MOUNTING	REMARKS
						VOLTAGE	PH.	HZ.					
EF-1	KITCHEN HOOD EXHAUST	1300	125	0.55	1725	208	3	60	REQ'D	N/A	N/A	ROOF MOUNTED	C/W NEMA-1 COMBINATION MAGNETIC STARTER W/ H.O.A., GAL. VENTILATED ROOF CURB MODEL GPVY-30-G20, GREASE TRAP AND HEAT BAFFLE, FAN MTD. DISCONNECT

MAKE-UP AIR UNIT SCHEDULE																	
UNIT No.	AREA SERVICED	DESIGN AIRFLOW	HEATING COIL DATA					FAN DATA					DX COOLING COIL DATA				ACCESSORIES/COMMENTS
			TOTAL (KW)	ENTERING AIR	LEAVING AIR	ELECTRICAL		MOTOR	RPM	TOTAL STATIC	ELECTRICAL		COOLING CAPACITY (KW)		EAT (°C)		
						POWER	AMPS				POWER	FLA	TOTAL	SENSIBLE	DB	WB	
MUA-1	KITCHEN	1180 L/S	53	-15.5°C	21°C	575/60/3	53.22	1.5 KW	1725	303 Pa	575/60/3	2.7	26	18	26	19	MULTISTAGE HEATING COIL, SCR CONTROLLER. MUA UNIT TO OPERATE AT FULL AIRFLOW WHEN EXHAUST FAN IS ON. WHEN EXHAUST FAN IS OFF, MUA UNIT WILL OPERATE AT A REDUCED AIRFLOW WHEN SPACE IS CALLING FOR HEATING/COOLING. SEE SPECIFICATION FOR MORE DETAILS ON UNIT. SEE SEQUENCE OF OPERATION ON DRAWING FOR OPERATION DETAILS.

GRILLE / REGISTER & DIFFUSER SCHEDULE						ACCESSORIES/COMMENTS
TYPE	NOMINAL PANEL SIZE OR SLOT LENGTH	DISCHARGE PATTERN	NUMBER OF SLOTS OR CONES	CEILING TYPE		
SA1	600X600	AS SHOWN	-	T-BAR	C/W O.B.D. OFF WHITE FINISH, ADAPTER KIT, BLANK-OFF SECTORIZING BAFFLES (AS INDICATED)	
SA2	1200X600	VERTICAL	-	T-BAR	C/W O.B.D. OFF WHITE FINISH, ADAPTER KIT	

OUTDOOR AIR COOLED CONDENSING UNIT									
UNIT TAG	UNIT LOCATION	COMPRESSOR RLA (AMPS)	CONDENSOR FAN FLA (AMPS)	ELECTRICAL DATA					REMARKS
				MCA	MOCp	V	PH	HZ	
CU-3	G10 ROOF	8	2	13	20	575	3	60	REFRIGERANT R-410A, CONDENSER SHALL BE SUPPLIED WITH FACTORY DISCONNECT. CONNECT TO DX COOLING COIL IN MUA-1 (SEE SCHEDULE). REFRIGERANT LIQUID LINE 16MM; SUCTION LINE 28.5MM. 2 STAGE COOLING, SINGLE COMPRESSOR. 26KW TOTAL COOLING CAPACITY.

#### SEQUENCE OF OPERATION

THE NEW MAKEUP AIR SYSTEM CONSISTS OF A 100% FRESH AIR UNIT (MUA-1); FRESH AIR INTAKE; MULTI-STAGE ELECTRIC HEATING COIL; MOTORIZED DAMPER; DIRECT EXPANSION (DX) COOLING COIL AND OUTDOOR CONDENSER; AND SUPPLY FAN WITH A VARIABLE SPEED DRIVE (VSD). THE NEW ROOFTOP EXHAUST DISCHARGES KITCHEN HOOD EXHAUST AIR THROUGH THE PENTHOUSE ROOF AND WHEN THE EXHAUST FAN IS STARTED, THE MAKEUP AIR SYSTEM IS ALSO COMMANDED ON. THE SEQUENCE OF OPERATION OUTLINED BELOW DETAILS THE SYSTEM AND HOW THE EQUIPMENT IS CONTROLLED AND MAINTAINS THE SPACE TEMPERATURE (SpAT) FOR THE KITCHEN AREA.

WHERE POSSIBLE, EXISTING CONTROL WIRING FOR THE ECOLOGY UNIT (WHICH IS BEING REMOVED) CAN BE USED. ALL NEW CONTROL WIRING, SENSORS AND ALL CONTROL DEVICES TO BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR. (REFER TO GENERAL NOTE 9 ON DRAWING H-2 FOR DETAILS ON CONTROLS INTEGRATION).

THE NEW MAKEUP AIR UNIT (MUA-1) SHALL BE CONTROLLED BY THE EXISTING EMCS SYSTEM AND SHALL BE COMMANDED ON WHEN THE NEW ROOFTOP KITCHEN HOOD EXHAUST FAN (EF-1) STARTS. MUA-1 CAN ALSO BE COMMANDED ON BY THE NEW ROOM THERMOSTAT WHEN THERE IS A CALL FOR HEATING OR COOLING.

SHOULD MUA-1 UNIT BE SHUTDOWN DUE TO MECHANICAL FAILURE, MAINTENANCE, OR COMMANDED OFF BY THE EMCS SYSTEM, THE START UP SEQUENCE WILL BE AS FOLLOWS: ON A START SIGNAL FROM THE EMCS, THE FRESH AIR DAMPER (FAD) WILL BE COMMANDED OPEN AND WHEN THE FAD IS AT LEAST 50% OPEN BY THE ACTUATOR END-SWITCH, THE SUPPLY FAN IN MUA-1 WILL BE PERMITTED TO START. IF THE SUPPLY FAN STATUS (SFS) IS NOT PROVEN TRUE AFTER A SHORT TIME DELAY (DEFAULT 20 SECONDS, BUT USER ADJUSTABLE) AN ALARM WILL BE GENERATED AND DISPLAYED ON THE OPERATORS WORK STATION (OWS) GRAPHIC. ALL ALARMS GENERATED SHALL REMAIN UNTIL THEY ARE MANUALLY RESET BY THE OPERATOR OF THE OWS. THIS WILL INCLUDE ALARMS FOR THE SUPPLY FAN; HEATING COIL, AND COOLING COIL SHOULD THE ACTUAL STATUS NOT MATCH THAT COMMANDED BY THE EMCS.

#### MUA-1 OPERATION MODES

COMMANDED ON WHEN EF-1 STARTS:  
WHEN EF-1 IS SWITCHED ON, MUA-1 SHALL ALSO BE COMMANDED ON. IN THIS OPERATING MODE, MUA-1 WILL SUPPLY 1180 L/S FRESH AIR AND THE HEATING COIL (HC) OR COOLING COIL (CC) WILL TEMPER THE AIR AS REQUIRED TO MAINTAIN THE SpAT (USER ADJUSTABLE, NEW ROOM THERMOSTAT). THE OUTDOOR AIR TEMPERATURE (OAT) SHALL BE USED TO DETERMINE THE AMOUNT OF HEATING OR COOLING TO BE APPLIED TO THE INCOMING FRESH AIR TO MAINTAIN THE DESIRED KITCHEN SPACE TEMPERATURE. THE HC SCR SHALL CONTROL THE HEATING COIL STAGING AND THE OUTDOOR CONDENSER SHALL MODULATE TO PROVIDE MORE / LESS COOLING TO THE SUPPLY AIR. THE NEW SUPPLY AIR TEMPERATURE SENSOR (SAT) SHALL BE INSTALLED DOWNSTREAM OF THE HEATING AND COOLING COILS AND MONITOR THE TEMPERATURE OF AIR DELIVERED TO THE SPACE.

HEATING MODE (WHEN OUTDOOR AIR TEMPERATURE (OAT) IS LESS THAN 8°C):  
IN THIS MODE, THE OUTDOOR CONDENSER WILL BE LOCKED OUT AND THERE WILL BE NO COOLING PROVIDED. THE NEW ROOM THERMOSTAT SHALL MODULATE THE HC TO ENERGIZE STAGES AS REQUIRED TO MAINTAIN THE DESIRED SpAT. DEPENDING ON OAT, THIS COULD BE A SINGLE STAGE OR ALL STAGES. IF EF-1 IS NOT RUNNING, THE SPEED OF SUPPLY FAN (SF) IN MUA-1 WILL BE REDUCED THROUGH THE VARIABLE SPEED DRIVE (VSD) WHICH WILL ALSO DECREASE THE AMOUNT OF HEATING REQUIRED. IN HEATING MODE, THE SAT WILL BE SET TO 25°C AND ONCE THE SpAT IS SATISFIED, THE HC WILL DE-ENERGIZE.

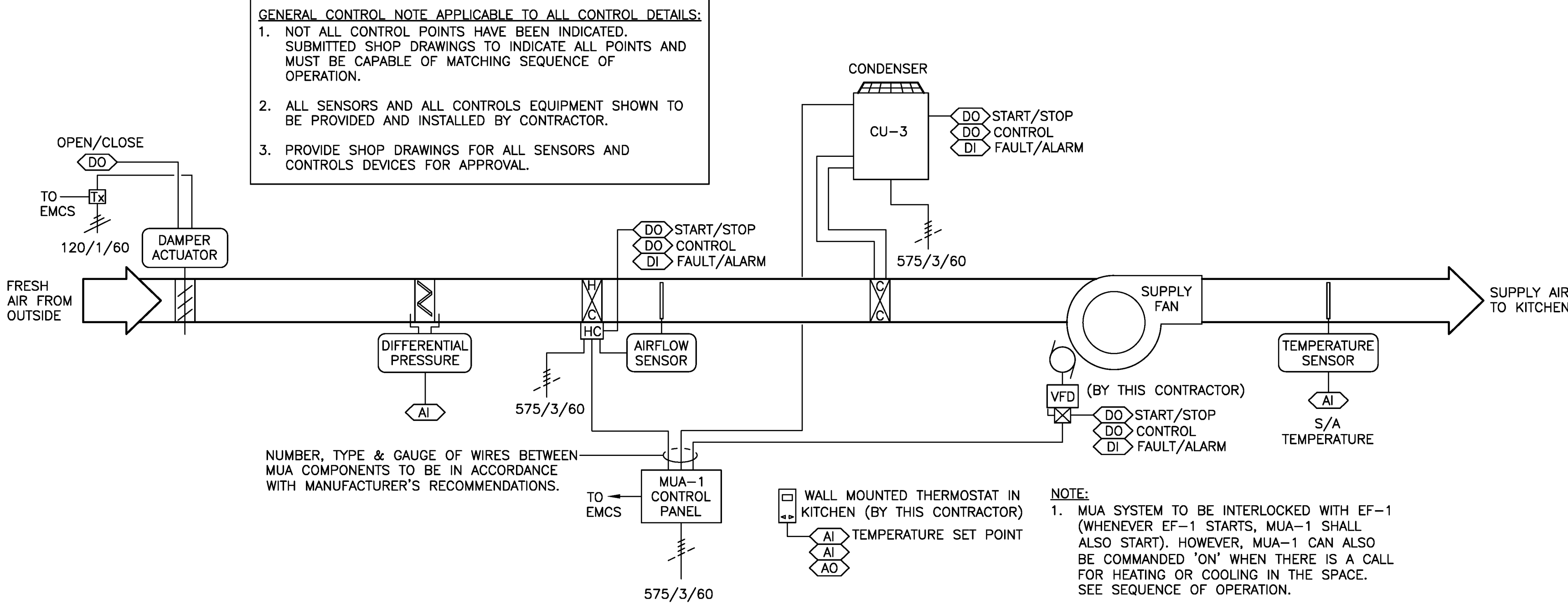
HEATING / COOLING MODE (WHEN OAT IS BETWEEN 8°C AND 18°C):  
THE ROOM THERMOSTAT SHALL MODULATE AND SEQUENCE THE HC AND CC TO MAINTAIN SpAT AT SET POINT WHEN OAT IS BETWEEN 8°C AND 18°C.

COOLING MODE (WHEN OAT IS GREATER THAN 18°C):  
WHEN THE OAT IS GREATER THAN 18°C, THE HC WILL BE FULLY DE-ENERGIZED AND CU-3 WILL MODULATE TO MAINTAIN THE SpAT OF 21°C (USER ADJUSTABLE).

DURING UNOCCUPIED PERIODS: MUA-1 WILL NOT NORMALLY OPERATE AND THE EXISTING BASEBOARD HEATERS WILL BE ENERGIZED AS REQUIRED TO MAINTAIN SpAT. CU-3, SUPPLY FAN AND HC WILL ALL BE DE-ENERGIZED. MUA-1 SHALL ONLY BE COMMANDED ON SHOULD SpAT DROP BELOW 15°C (USER ADJUSTABLE) BUT CU-3 WILL NEVER BE STARTED UP DURING UNOCCUPIED PERIODS.

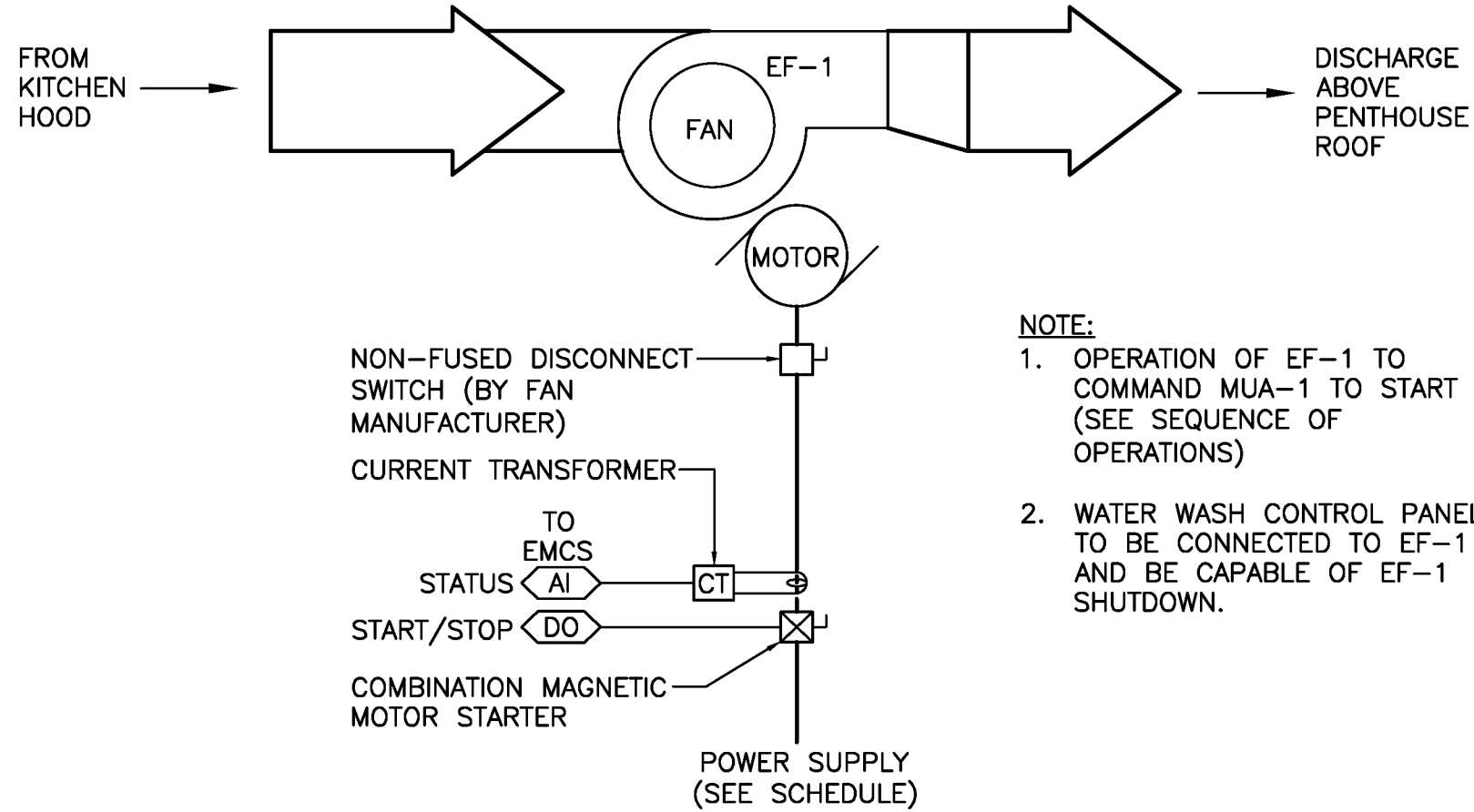
MORE OPERATIONAL NOTES AND NEW EQUIPMENT:  
NEW AIRFLOW SWITCH ON SUPPLY AIR SHALL SEND A SIGNAL TO SHUT DOWN CU-3 AND REFRIGERANT FLOW TO THE CC WHEN THERE IS NO AIRFLOW IN COOLING MODE, WITH ALARM SENT TO OWS DISPLAY. IN HEATING MODE, A NO AIRFLOW CONDITION WILL DE-ENERGIZE THE HC AND AN ALARM WILL ALSO BE SENT TO THE OWS GRAPHIC.

CONTROLS SHOP DRAWINGS TO BE SUBMITTED FOR REVIEW TO PROVIDE THE CONTROL OF THE SYSTEMS AS OUTLINED IN THE SEQUENCE OF OPERATION AND AS SHOWN ON THE CONTROLS DETAILS DRAWING. THIS SHALL INCLUDE ALL CONTROL POINTS FOR STATUS (START/STOP), ALARMS, SENSORS, ALL CONTROL DEVICES, ETC. AND UPDATING OF THE EXISTING OWS GRAPHIC.



CONTROL DIAGRAM - MUA-1

SCALE : N.T.S.



CONTROL DIAGRAM - ROOFTOP KITCHEN HOOD EXHAUST FAN (EF-1)

SCALE : N.T.S.

#### GENERAL NOTES (CONT'D):

- PROVIDE ALL MATERIALS & LABOUR REQUIRED TO INSTALL ALL REQUIRED COMPONENTS IN ACCORDANCE WITH APPLICABLE CODES, REGULATIONS & DRAWINGS THAT FORM PART OF THIS CONTRACT.
- DO NOT SCALE FROM DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
- SEE ADDITIONAL NOTES ON DRAWING H-2.

#### GENERAL NOTES:

- INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
- LOCATE ALL PENETRATIONS ON BOTH SIDES OF WALL, FLOOR, ROOF ETC PRIOR TO CUTTING.
- REVIEW ENTIRE DUCT ROUTE PRIOR TO INSTALLATION.
- COORDINATE INTEGRATION OF SYSTEM CONTROLS WITH OWNERS BUILDING CONTROLS SERVICE PROVIDER.
- CONTRACTOR TO VISIT SITE PRIOR TO COMMENCING WORK. TRACE OUT ALL SYSTEMS BEFORE INITIATING WORK.
- COORDINATE SYSTEM SHUT DOWNS & SERVICE INTERRUPTIONS WITH OWNER.

A	DETAIL NO.
B	LOCATION DRAWING NO. WHERE DETAIL WAS TAKEN FROM.
C	DRAWING NO. WHERE DETAIL IS DRAWN

A	PLAN/SECTION/ELEVATION OR DETAIL NO.
B	NO. OF DRAWING WHERE ABOVE IS DRAWN

C	REISSUED FOR TENDER	JUL 4 2018
B	ISSUED FOR TENDER	JUN 8 2018
A	ISSUED FOR 99% REVIEW	APR 3 2018
revisions		date

project northwest atlantic fisheries centre (nafc) cooling & ventilation renovations for pod g10

drawing design

#### MECHANICAL SCHEDULES, CONTROLS DETAILS AND SEQUENCE OF OPERATION

designed	conçu
date 04/07/2018	
drawn	dessiné
date 04/07/2018	
approved	approuvé
date 04/07/2018	
Tender	Soumission
PWGSC Project Manager	Administrateur de projets TPISGC
project number	no. du projet
R.999102.002	
drawing no.	no. du dessin
H-3	