


				<div><p>ARCHITECTURE</p><p>T M P ARCHITECTURE I N C</p><p>1191 WEST SQUARE LAKE ROAD · BLOOMFIELD HILLS · MICHIGAN · 48302</p><p>PH · 248.338.4561 FX · 248.338.0223 EM · INFO@TMP-ARCHITECTURE.COM</p></div>				

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NOTE: MOUNTING HEIGHTS SHOWN ARE PROPOSED FOR ALL ACCESSORIES AND FIXTURES REQUIRED UNLESS OTHERWISE NOTED OR DIMENSIONED ON DRAWINGS FOR SPECIFIC CONDITIONS (B.F. - DENOTES ACCESSIBLE BARRIER FREE REQUIREMENTS)

MATERIAL DESIGNATIONS								
ELEVATION	SECTION	MATERIAL	ELEVATION	SECTION	MATERIAL	ELEVATION	SECTION	MATERIAL
		BRICK			FINISH HARDWOOD			GYPSUM DRYWALL (WALLBOARD)
		CONCRETE MASONRY UNITS (BLOCK)			WOOD BLOCKING/ NAILER (Continuous)			PLASTER OR VENEER PLASTER
		SOLID CONCRETE MASONRY UNITS			WOOD BLOCKING/ NAILER (Non-continuous)			CEMENT PLASTER AND METAL LATH
		PREFACED CONCRETE MASONRY UNITS			PARTICLE BOARD (Large Scale)			CERAMIC TILE (Large Scale)
		STRUCTURAL GLAZED FACING TILE			PLYWOOD (Large Scale)			TERRAZZO (Large Scale)
		CONCRETE			HARDWOOD VENEER PLYWOOD (Large Scale)			CARPET (Large Scale)
		STONE/ SLATE/ OR GRANITE			PLASTIC LAMINATE CLAD PLYWOOD OR PARTICLE BOARD (Large Scale)			VINYL COMPOSITION TILE (V.C.T.)
		EARTH			BATT OR BLANKET INSULATION			SEALANT AND BACKER ROD (Large Scale) (Depth Equal to Half Joint Width)
		POROUS FILL (GRAVEL OR STONE)			RIGID INSULATION			JOINT FILLER MATERIAL OR ISOLATION JOINT FILLER (Large Scale)
		COMPACTED DRAINAGE FILL (SAND)			ACoustical CEILING TILE OR PANEL			COLD FORMED METAL FRAMING
		MARBLE			GLASS (Large Scale)			STRUCTURAL STEEL SHAPES (Continuous Sections Hatched or Solid, Non-continuous Sections Open)
		STEEL AND FERROUS METAL (Large Scale)			GLASS (Small Scale)			
		ALUMINUM AND NON-FERROUS METAL (Large Scale)						

DETAIL IDENTIFICATION

DETAIL IDENTIFICATION NUMBER
(SAME NUMBER ON SHEET WHERE DRAWN OR REFERENCED)

DETAIL TITLE

SCALE: 1/8" = 1'-0"

SHEET IDENTIFICATION NUMBER
(INDICATES SHEET NUMBER WHERE DETAIL IS DRAWN OR SHEET NUMBER(S) TO REFER TO WHEN REFERENCED ON THE SHEET WHERE THE DETAIL IS DRAWN)

DETAIL LOCATION INDICATION

DETAIL LOCATION INDICATION FOR ENLARGED PLANS

The diagram illustrates the location of a detail on a sheet. A circle on the left contains the text "1." and "A1.1". Two curved arrows originate from this circle: one points to the text "DETAIL IDENTIFICATION NUMBER" and the other points to the text "SHEET IDENTIFICATION NUMBER (INDICATES SHEET NUMBER WHERE DETAIL IS DRAWN)". A horizontal line extends from the right side of the circle to a dashed rectangular box on the right, representing the detail location on the sheet.

SHEET IDENTIFICATION NUMBER
(INDICATES SHEET NUMBER WHERE SECTION IS DRAWN OR SHEET NUMBER(S) TO REFER TO WHEN REFERENCED ON THE SHEET WHERE THE SECTION IS DRAWN)

SECTION LOCATION INDICATION

SECTION IDENTIFICATION NUMBER

ELEVATION TITLE

SCALE: 1/8" = 1'-0"

SHEET IDENTIFICATION NUMBER
(INDICATES SHEET NUMBER WHEN ELEVATION IS DRAWN OR SHEET NUMBER(S) TO REFER TO WHEN REFERENCED ON THE SHEET WHERE THE ELEVATION IS DRAWN)

ELEVATION INDICATION

ATCH LINE INDICATION

SHEET IDENTIFICATION NUMBER
(INDICATES SHEET NUMBER OF DRAWING)

ZONE 'A'

ZONE 'B'

SHEET IDENTIFICATION NUMBER
(INDICATES SHEET NUMBER WHERE DRAWING IS CONTINUED)

DOOR NAME AND NUMBER INDICATION		DOOR IDENTIFICATION	
<div> <div> SAMPLE ROOM NAME </div> <div> 101 </div> </div> <div>ROOM IDENTIFICATION NUMBER</div>	<div> <div> NEW DOOR </div> <div> EXISTING DOOR </div> <div> EXISTING DOOR TO BE REMOVED </div> </div>	<div>DOOR TO ROOM SHALL REPEAT ROOM NUMBER ASSIGNED TO ROOM. MULTIPLE DOORS TO ROOM SHALL REPEAT ROOM NUMBER WITH A POSTSCRIPT LETTER FOR EACH ADDITIONAL DOOR REQUIRED.</div>	<div>101 / 101A / 101B FOR NUMBER REPEATED</div>

COLUMN INDICATION

COLUMN IDENTIFICATION LETTER OR NUMBER FOR NEW CONSTRUCTION

COLUMN IDENTIFICATION LETTER OR NUMBER FOR EXISTING CONSTRUCTION

NORTH INDICATION

ASSUMED NORTH IF TRUE NORTH OR PLAN NORTH WHERE TRUE NORTH IS INDICATED BY ARROW NOTATION

10 T. (11 R.)

UP (DN)

STAR DIRECTION TO FLOOR ABOVE (UP) OR BELOW (DOWN)

NUMBER OF TREADS (OR RISERS) IN STAR RUN

10'-0"

NOTE: DO NOT DRAWINGS WITH GRAPHIC SCALE PROPORTIONS THAN 1:1

MATERIAL OR WORK DIVISION NOTATION

MATERIAL "A"
(NEW CONST.)

MATERIAL "B"
(EXIST. CONST.)

JOINT BETWEEN MATERIALS

DRAWING NOTATION INDICATION

MATERIAL NOTATION AND INFORMATION
(REFER TO TECHNICAL SPECIFICATION FOR MATERIAL DESCRIPTIONS AND METHOD OF CONSTRUCTION)



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**Weekside
Intermediate
School Bldg.
Automation
Systems
Enter Community
ools**

Discussion

E DATES

2023	CONSTRUCTION DOCUMENTS
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SUBJECT NO.

31

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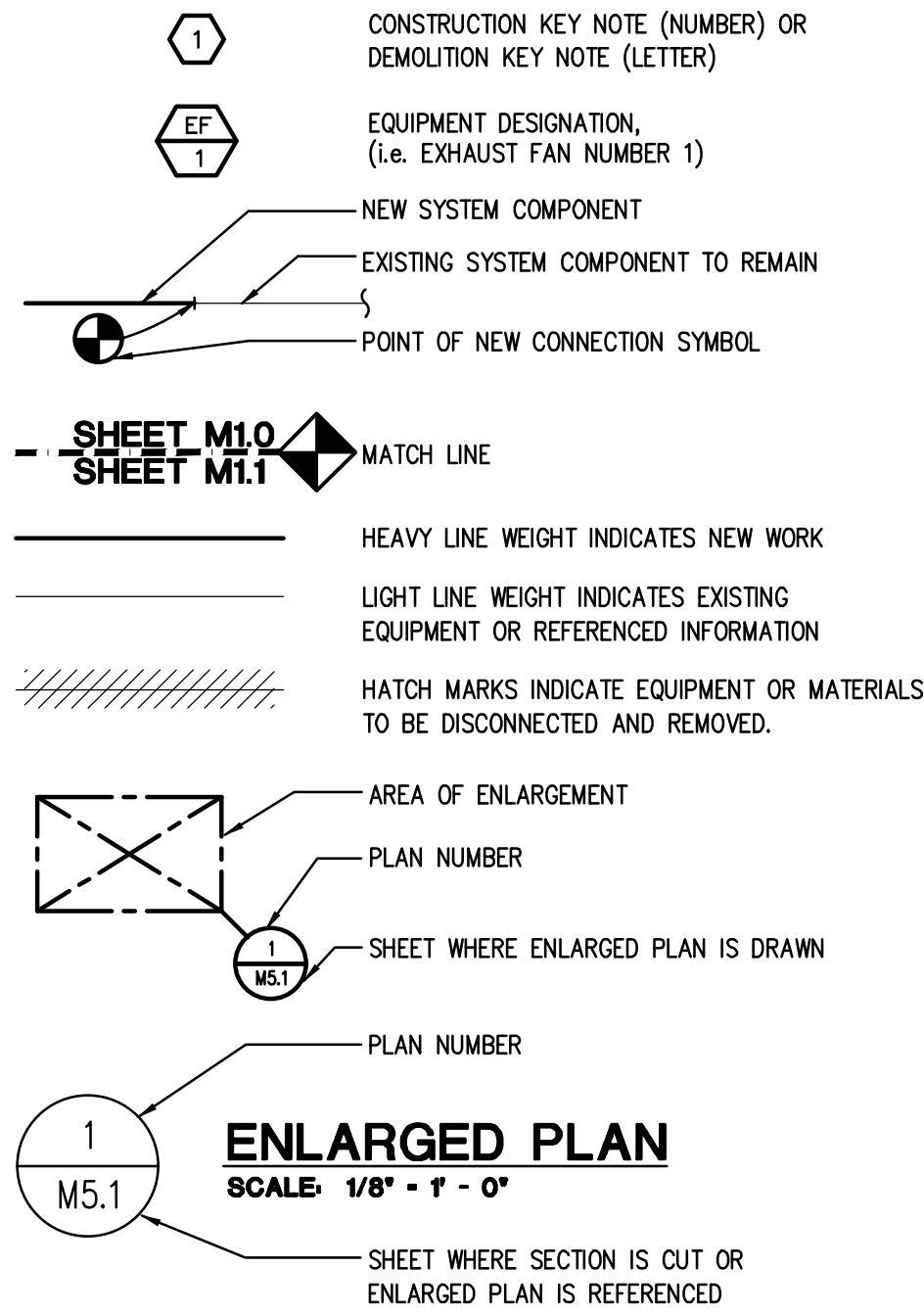
TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
	AQUASTAT, STRAP ON BULB
	CARBON DIOXIDE SENSOR - WALL MOUNTED
	CARBON DIOXIDE SENSOR - DUCT MOUNTED
	CURRENT SWITCH
	DAMPER - OPPOSED BLADE
	DAMPER - PARALLEL BLADE
	DAMPER MOTOR
	DIFFERENTIAL PRESSURE SWITCH
	DIFFERENTIAL PRESSURE TRANSMITTER
	FLOW METER
	FLOW SWITCH
	FREEZE/STAT
	GUARD FOR STAT OR SENSOR
	SPACE HUMIDITY SENSOR
	HUMIDITY SENSOR, DUCT MOUNTED
	LINE - ELECTRIC
	LINE - PNEUMATIC
	MAIN AIR
	MOTOR STARTER
	OCCUPANCY SENSOR
	PRESSURE TRANSMITTER
	RELAY, ELECTRIC
	SELECTOR SWITCH, (N=NUMBER OF POSITIONS)
	SIGNAL - DDC/BAS, ANALOG INPUT
	SIGNAL - DDC/BAS, ANALOG OUTPUT
	SIGNAL - DDC/BAS, DIGITAL INPUT
	SIGNAL - DDC/BAS, DIGITAL OUTPUT
	SIGNAL - PACKAGED EQUIPMENT, ANALOG INPUT
	SIGNAL - PACKAGED EQUIPMENT, ANALOG OUTPUT
	SIGNAL - PACKAGED EQUIPMENT, DIGITAL INPUT
	SIGNAL - PACKAGED EQUIPMENT, DIGITAL OUTPUT
	SMOKE DETECTOR - DUCT MOUNTED
	START/STOP RELAY
	STATIC PRESSURE PROBE (DUCT OR SPACE)
	STATIC PRESSURE TRANSMITTER

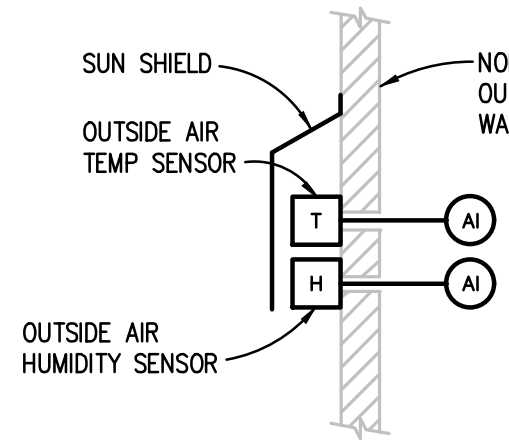
- NOTES:
- SOME SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.
 - REFER TO MECHANICAL STANDARDS ON DRAWING M0.1 FOR ADDITIONAL SYMBOLS & ABBREVIATIONS THAT MAY BE USED ON TEMPERATURE CONTROL DRAWINGS.

STANDARD METHODS OF NOTATION



OA SENSOR INSTALLATION DETAIL

- NO SCALE
- NOTES:
- OA SENSOR SHALL BE LOCATED ON NORTH BUILDING EXPOSURE. COORDINATE LOCATION WITH OWNER.
 - DEW POINT TEMPERATURE SHALL BE CALCULATED AND USED FOR ECONOMIZER LOCKOUT LOGIC WHERE APPLICABLE AS DESCRIBED IN CONTROL SEQUENCES OF OPERATION.
 - INDICATE CALCULATED DEW POINT TEMP ON GRAPHICS ALONG WITH OA TEMP AND HUMIDITY VALUES.



ABBREVIATION LIST

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
AAV	AUTOMATIC AIR VENT	ERCP	ELECTRIC RADIANT CEILING PANEL	NC	NORMALLY CLOSED
ACC	AIR COOLED CONDENSER	ERU	ENERGY RECOVERY UNIT	NCIC	NORMALLY CLOSED TIMED CLOSED
ACCU	AIR COOLED CONDENSING UNIT	EUH	ELECTRIC UNIT HEATER	NCICD	NORMALLY CLOSED TIMED OPEN
AD	ACCESS DOOR	EWB	ENTERING WET BULB	NIC	NOT IN CONTRACT
AF	ABOVE FINISHED FLOOR	EWT	ENTERING WATER TEMPERATURE	NFPA	NATIONAL FIRE PROTECTION AGENCY
AHU	AIR HANDLING UNIT	EXH	EXHAUST	NO	NORMALLY OPEN
ALT	ALTERNATE			NOTC	NORMALLY OPEN TIMED CLOSED
AMP	AMPERE	F	DEGREES FAHRENHEIT	NOTO	NORMALLY OPEN TIMED OPEN
APD	AIR PRESSURE DROP	F&B	FACE AND BYPASS DAMPER	NSB	NIGHT SETBACK
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS	FAS	FIRE ALARM SYSTEM		
AUX	AUXILIARY	FCU	FAN COIL UNIT	OA	OUTSIDE AIR
BAS	BUILDING AUTOMATION SYSTEM	FM	FLOW MEASURING DEVICE	OAT	OUTSIDE AIR TEMPERATURE
		FT	FEET		
		FTR	FINNED TUBE RADIATION	PACU	PACKAGED AIR CONDITIONING UNIT
C	COMMON	GP	GALLONS PER MINUTE	PD	PRESSURE DROP (FEET OF WATER)
CFM	CUBIC FEET PER MINUTE	GRH	GRAVITY RELIEF HOOD	PHR	PERIMETER HEAT RETURN
CH	CHILLER			PHS	PERIMETER HEAT SUPPLY
CHWP	CHILLED WATER PUMP	HOA	HAND/OFF/AUTO	PNL	PANEL
CHWR	CHILLED WATER RETURN	HP	HEAT PUMP	PPM	PARTS PER MILLION
CHWS	CHILLED WATER SUPPLY	HP	HORSEPOWER	PRV	PRESSURE REDUCING VALVE
CLS	COOLING	HPLP	HEAT PUMP LOOP PUMP	PSI	POUNDS PER SQUARE INCH
CLP	COMPUTER LOOP PUMP	HPLR	HEAT PUMP LOOP RETURN		
CLR	COMPUTER LOOP RETURN	HPLS	HEAT PUMP LOOP SUPPLY	R	RETURN
CLS	COMPUTER LOOP SUPPLY	HR	HOUR	RA	RETURN AIR
CO2	CARBON DIOXIDE	HTG	HEATING	RAT	RADIANT CEILING PANEL
COND	CONDENSATE	HV	HEATING VENTILATING	RELA	RELIEF AIR
CONT	CONTINUATION OR CONTINUED	HVAC	HEATING, VENTILATING, AIR CONDITIONING	REQD	REQUIRED
CONTR	CONTRACTOR	HW	HOT WATER HEATING	RF	RETURN FAN
CONV	CONNECTOR	HWHR	HOT WATER HEATING RETURN	RH	RELATIVE HUMIDITY
COS	CENTRAL OPERATOR STATION	HWHS	HOT WATER HEATING SUPPLY	RTU	ROOF TOP UNIT
CP	CIRCULATING PUMP	HW	DOMESTIC HOT WATER		
CT	COOLING TOWER	HWR	DOMESTIC HOT WATER RETURN	SA	SUPPLY AIR
CUH	CABINET UNIT HEATER	HX	HEAT EXCHANGER	SF	SUPPLY FAN
CW	DOMESTIC COLD WATER			SP	STATIC PRESSURE
CWP	CONDENSER WATER PUMP	IAQ	INDOOR AIR QUALITY	S/S	START/STOP
CWR	CONDENSER WATER RETURN	IN	INCHES	STD	STANDARD
CWS	CONDENSER WATER SUPPLY	JC	JANITOR'S CLOSET	STM	STEAM
				SZ	SUMMER/WINTER
DA	DISCHARGE AIR	KW	KILOWATT	SW	SWITCH
DAT	DISCHARGE AIR TEMPERATURE	KWH	KILOWATT-HOUR		
DB	DRY BULB TEMPERATURE	LBS/HR	POUNDS PER HOUR	TC	TEMPERATURE CONTROL
DDC	DIRECT DIGITAL CONTROL			TCP	TEMPERATURE CONTROL PANEL
DEG	DEGREES	MA	MIXED AIR	TEMP	TEMPERATURE
DMPR	DAMPER	MAT	MIXED AIR TEMPERATURE	THR	TERMINAL HEATING RETURN
D/N	DAY/NIGHT	MAU	MAKE-UP AIR UNIT	THS	TERMINAL HEATING SUPPLY
DN	DOWN	MAX	MAXIMUM	TSP	TOTAL STATIC PRESSURE
DPR	DAMPER	MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR	TU	(AIR) TERMINAL UNIT
DWG	DRAWING	MCC	MOTOR CONTROL CENTER	TYP	TYPICAL
DWH	DOMESTIC WATER HEATER	MECH	MECHANICAL		
DX	DIRECT EXPANSION	MEZZ	MEZZANINE	UH	UNIT HEATER
(E)	EXISTING	MFR	MANUFACTURER	UL	UNDERWRITER'S LABORATORY
EA	EACH	MIN	MINIMUM	UV	UNIT VENTILATOR
EAT	ENTERING AIR TEMPERATURE	MISC	MISCELLANEOUS		
EAH	ELECTRIC AIR HANDLING UNIT	MMB	MILLION BRITISH THERMAL UNITS PER HOUR	VAV	VARIABLE AIR VOLUME
EQH	ELECTRIC CABINET UNIT HEATER	M/S	MOTOR STARTER	VFC	VARIABLE FREQUENCY CONTROLLER
EDB	ENTERING DRY BULB	MTD	MOUNTED	VUV	VERTICAL UNIT VENTILATOR
EF	EXHAUST FAN	MTR	MOTOR	VS	VELOCITY SENSOR (AIRFLOW)
EFF	EFFICIENCY	MV	MANUAL AIR VENT	WC	WATER COLUMN
EH	ELECTRIC HEATING COIL	MZ	MULTI-ZONE	XFMR	TRANSFORMER
ELEC	ELECTRIC				

TC FLOOR PLAN EQUIPMENT TAG NOTATIONS

NOTE: ALL TAGS SHOWN MAY NOT APPLY TO THIS PROJECT.

	AIR HANDLING UNIT		ENERGY RECOVERY UNIT		PUMP
	AIR COOLED CONDENSING UNIT		EXHAUST FAN		PACKAGED AIR CONDITIONING UNIT
	BOILER		REMOTE EVAPORATOR, DX		RELIEF DAMPER
	BOOSTER COIL (HWH)		FAN COIL UNIT		RETURN FAN
	CHILLER		FINNED TUBE RADIATION		RELIEF HOOD
	CONVECTOR (HWH)		HORIZONTAL UNIT VENTILATOR		REHEAT COIL (HWH)
	COOLING TOWER		HEATING VENTILATING UNIT		RADIANT PANEL (HWH)
	CABINET UNIT HEATER		INTAKE HOOD		UNIT HEATER (HWH)
	DOMESTIC WATER HEATER		MAKE-UP AIR UNIT		VARIABLE AIR VOLUME TERMINAL UNIT W/REHEAT COIL
					VERTICAL UNIT VENTILATOR

- BACnet-MS/TP OPEN PROTOCOL INTERFACE TO BAS COMMUNICATING BUT NOT LIMITED TO THE FOLLOWING POINT DATA AS AVAILABLE:
- ON/OFF ACTIVE COMMAND STATUS
 - ON/OFF RUN STATUS
 - COMMON ALARM STATUS
 - REMOTE VFC (ALARM) RESET
 - CURRENT SPEED COMMAND (0-100%)
 - CURRENT OPERATING FREQUENCY (Hz)
 - RUNTIME HOURS
 - RUNTIME HOURS RESET
 - MOTOR VOLTAGE
 - MOTOR AMPS
 - MOTOR TORQUE
 - POWER (KW)
 - ACCUMULATED KWH
 - ACCUMULATED KWH RESET
 - DC LINK VOLTAGE
 - MOTOR THERMAL (0-100%)
 - INVERTER THERMAL (0-100%)
 - HEAT SINK TEMPERATURE

VFC BACnet INTERFACE & MONITORING REQUIREMENTS

- TYPICAL FOR NEW FAN & PUMP VFCs
- NOTE:
- TC CONTRACTOR SHALL COORDINATE BACnet-MS/TP OPEN PROTOCOL WIRE TERMINATION REQUIREMENTS AND POINT INTEGRATION CAPABILITIES WITH VFC SUPPLIER/MANUFACTURER AND PROVIDE APPROPRIATE BAS COMPONENTS FOR COMMUNICATION INTERFACE TO BAS.

TEMPERATURE CONTROLS DRAWING INDEX

SHEET NO.	SHEET TITLE
M0.1	TEMPERATURE CONTROL SYMBOLS, ABBREV, STANDARDS AND DRAWING INDEX
M0.2	TEMPERATURE CONTROL STANDARD DETAILS AND GENERAL NOTES
M0.3	EXISTING BAS NETWORKS - FOR REFERENCE ONLY
M0.4	EXISTING BAS NETWORKS - FOR REFERENCE ONLY
M0.5	EXISTING BAS NETWORKS - FOR REFERENCE ONLY
M0.6	EXISTING BAS NETWORKS - FOR REFERENCE ONLY
M0.7	EXISTING BAS NETWORKS - FOR REFERENCE ONLY
M1.1	TEMPERATURE CONTROL COMPOSITE PLAN
M2.1	TEMPERATURE CONTROLS
M2.2	TEMPERATURE CONTROLS
M2.3	TEMPERATURE CONTROLS
M2.4	TEMPERATURE CONTROLS
M2.5	TEMPERATURE CONTROLS
M2.6	TEMPERATURE CONTROLS
M2.7	TEMPERATURE CONTROLS



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PBA Project No: 2022.0360

PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community
Schools

DRAWING TITLE

TEMPERATURE CONTROL
SYMBOLS, ABBREV,
STANDARDS AND
DRAWING INDEX

ISSUE DATES

05-25-2023 CONSTRUCTION DOCUMENTS
03-15-2023 OWNER REVIEW

DATE: ISSUED FOR:

DRAWN: WJU

CHECKED: JWC

APPROVED: SVM

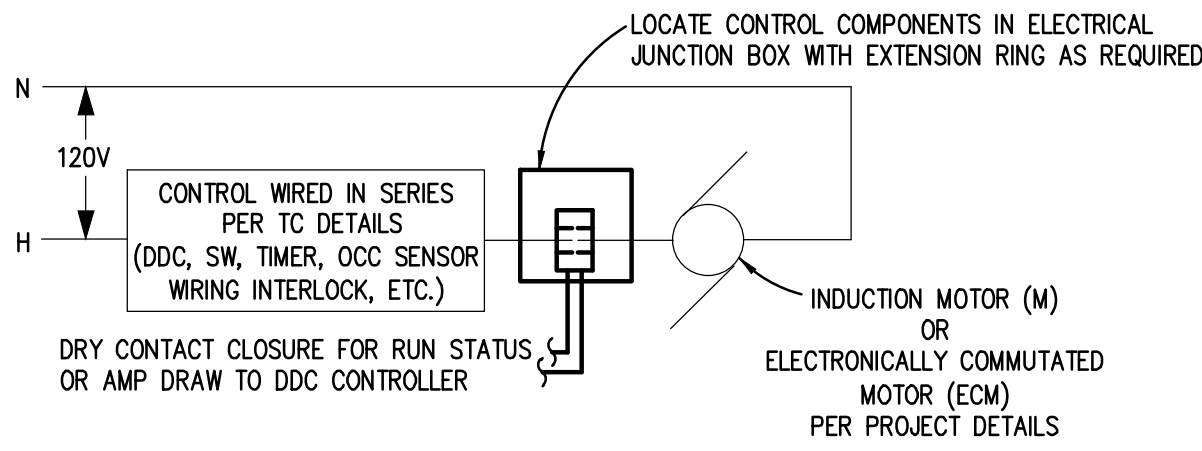
PROJECT NO.

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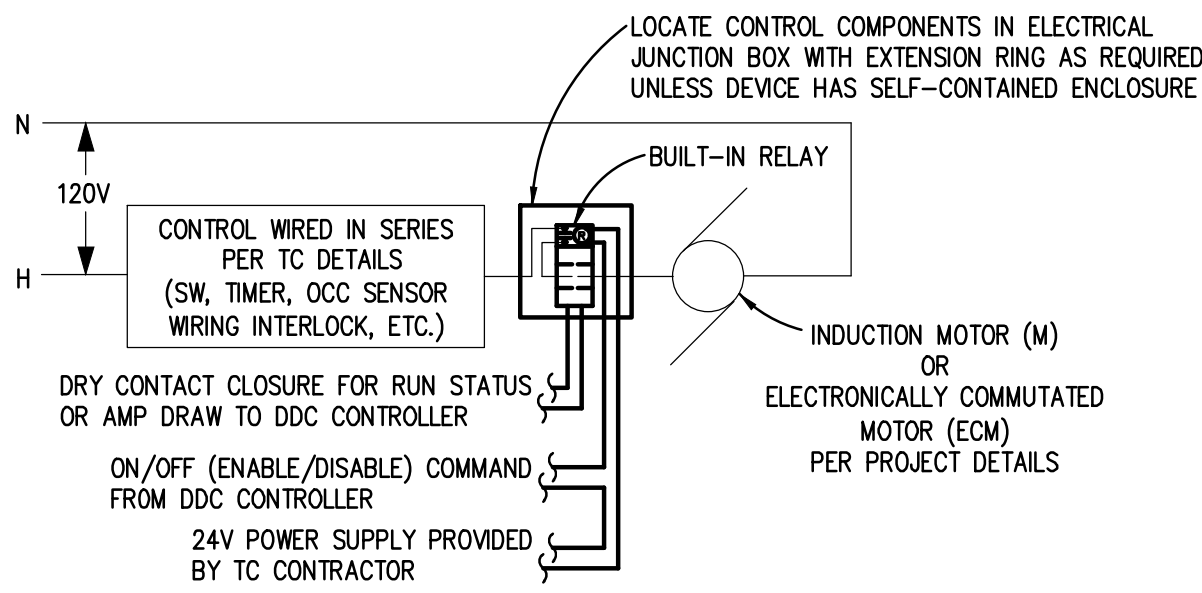
DRAWING NO.

M0.1

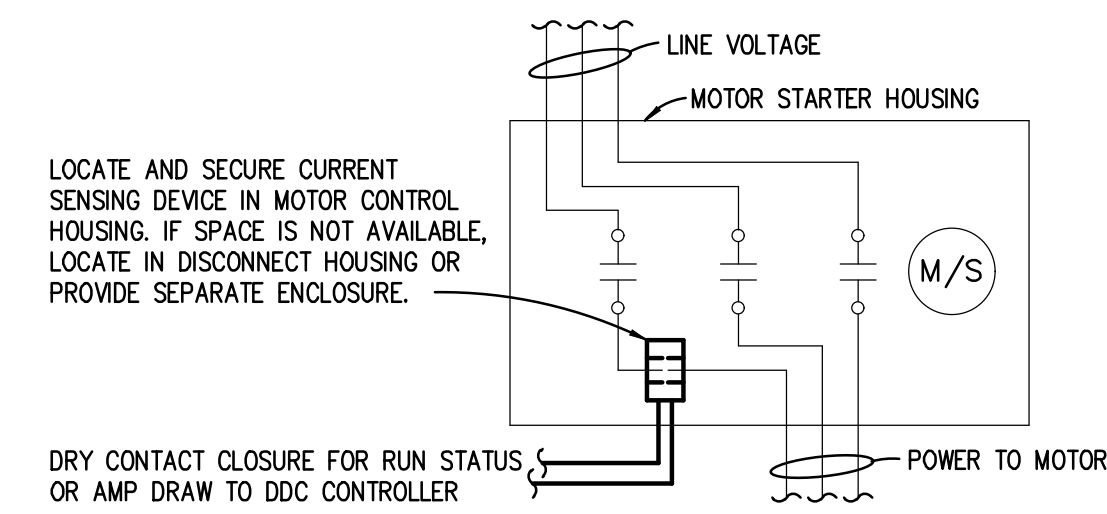
g:\2022\2022-0380-00\CAO\2022-0380-M0-IND.dwg, M0.2, 5/25/2023 11:45:25 AM, Remy Ruffin, None, 0.13652, Peter Basso Associates Inc.



1-PHASE POWER APPLICATION - DDC MONITORING



1-PHASE POWER APPLICATION - COMBO DDC MONITORING & CONTROL



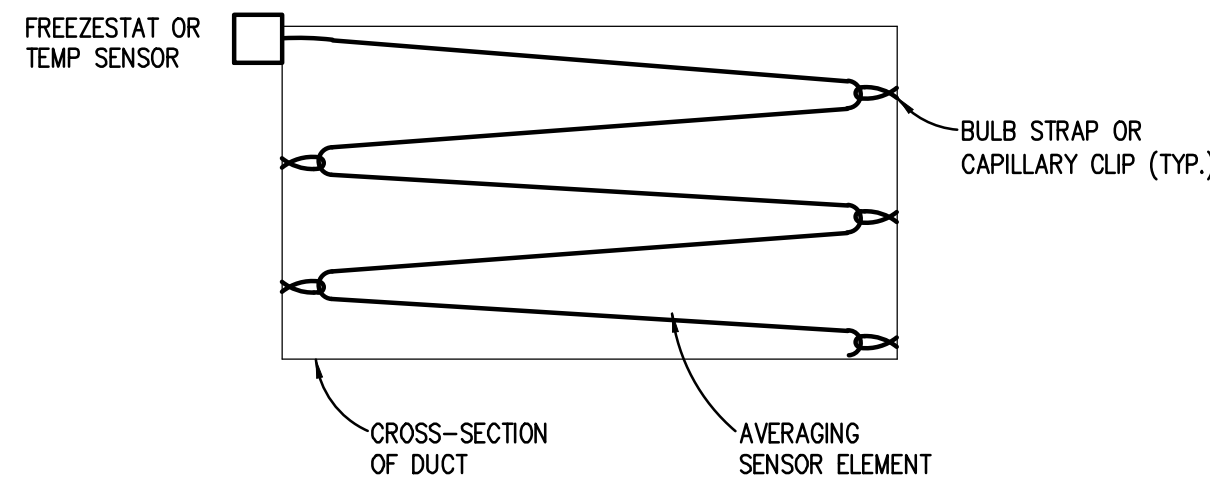
9-PHASE POWER APPLICATION - DDC MONITORING

CURRENT SWITCH INSTALLATION DETAILS

TYPICAL

NOTES:

- CURRENT SWITCH (CS) OR CURRENT TRANSDUCER (CT) AMP MONITORING AS APPLICABLE PER CONTROL DETAILS SHALL BE INSTALLED FOR DDC SYSTEM STATUS INDICATION OF FAN OR PUMP OPERATION. APPROPRIATE TIME DELAY FOR STATUS FEEDBACK UPON DDC START AND STOP COMMANDS SHALL BE INCLUDED WITH THE DDC LOGIC TO AVOID NUISANCE OPERATIONAL ALARMS.
- REVIEW EQUIPMENT SHOP DRAWINGS TO DETERMINE POTENTIAL AMPERAGE RANGE OF FAN OR PUMP OPERATION FOR AMPERAGE TRIP SETTING REQUIREMENTS PRIOR TO SELECTING APPROPRIATE CURRENT SWITCH (MINIMUM SPEED AMPERAGE FOR FPU WITH ECM CAN BE VERY LOW).
- FOR ECM CURRENT SWITCH APPLICATIONS: PROVIDE CURRENT SWITCH RATED FOR ECM OPERATION WITH AMPERAGE TRIP SETTING HIGHER THAN TRICKLE/OLE/STANDBY AMPERAGE ASSOCIATED WITH ECM WHEN OFF AND AMPERAGE TRIP SETTING LOWER THAN THE MINIMUM SPEED OPERATION OF FAN OR PUMP AS SET BY THE TAB CONTRACTOR.
- FOR INDUCTION MOTOR CURRENT SWITCH APPLICATIONS (AS APPLICABLE): AMPERAGE TRIP SETTING SHALL BE ADJUSTABLE TO ACCOMMODATE VFC MINIMUM SPEED SETTING, TO DETECT FAN BELT LOSS, OR TO DETECT PUMP COUPLING DETACHMENT.
- WHEN FAN OR PUMP IS ON AND NOT IN ALARM, DDC SYSTEM SHALL TOTALIZE RUN TIME HOURS FOR OPERATOR INFORMATION FROM BUILDING AUTOMATION SYSTEM OPERATOR INTERFACE.

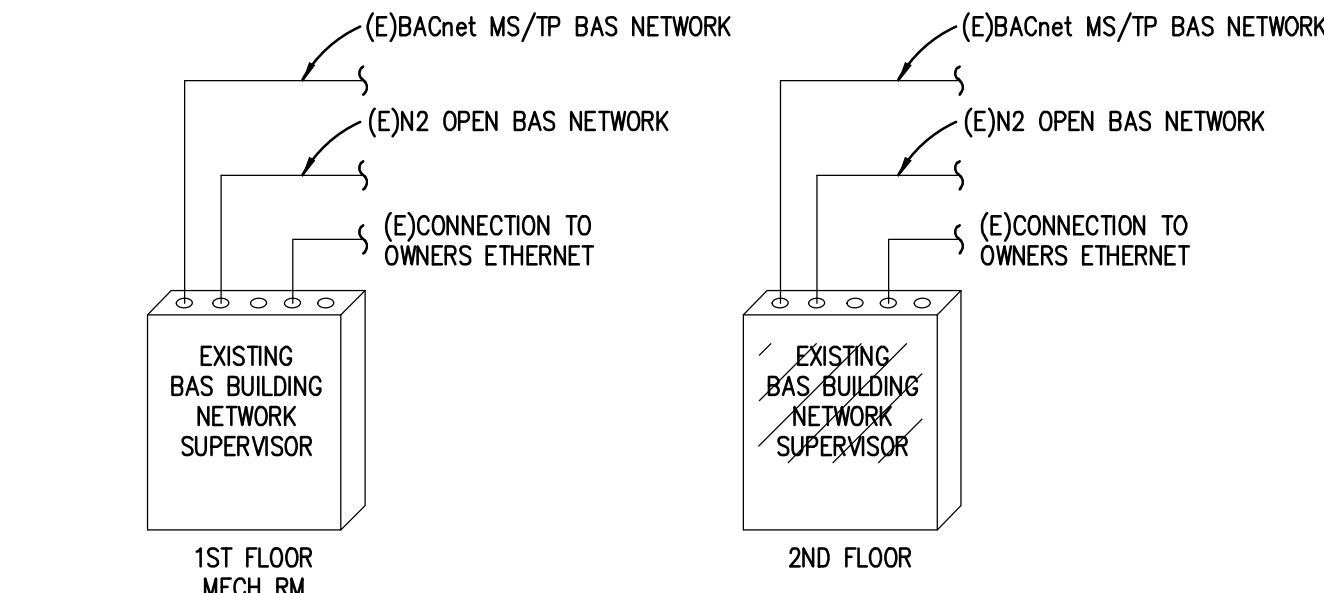


AVERAGING ELEMENT INSTALLATION DETAIL

TYPICAL

NOTES:

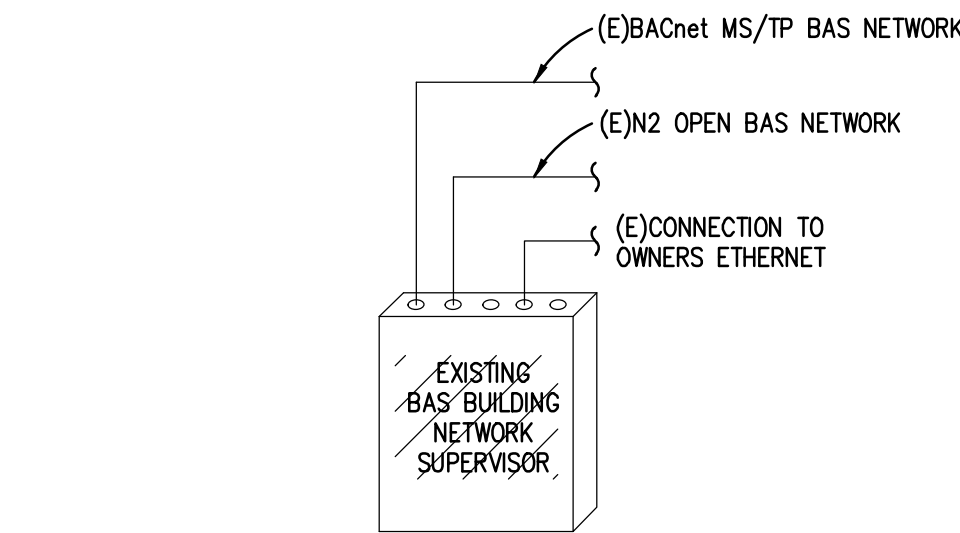
- FREEZE/STAT QUANTITY SHALL BE ONE PER 20 SQ. FT. OF CROSS-SECTIONAL AREA.
- AVERAGING DDC SENSOR QUANTITY SHALL BE SUFFICIENT TO COVER AND SENSE THE CROSS-SECTIONAL AREA.
- PROVIDE REQUIRED CAPILLARY STRAP OR CLIPS TO SUPPORT SENSOR TO PREVENT VIBRATION FROM AIR MOVEMENT.
- PROVIDE PROTECTION AT EACH CAPILLARY STRAP OR CLIP TO PREVENT ABRASION TO CAPILLARY.



MILL CREEK (E)BAS NETWORK SUPERVISOR

NOTES:

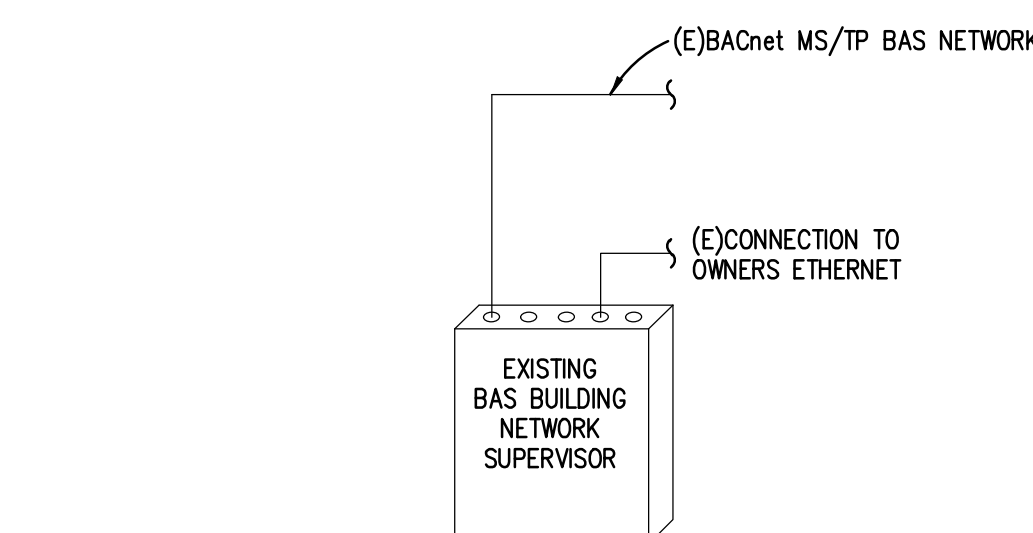
- EXISTING BAS NETWORK SUPERVISOR (JCI FX-80) LOCATED ON 1ST FL. MECHANICAL ROOM SHALL REMAIN, REPLACED UNDER PREVIOUS PROJECT.
- EXISTING BAS NETWORK SUPERVISOR (JCI FX-60) LOCATED ON 2ND FLOOR SHALL BE REMOVED AND REPLACED WITH NEW JCI FX VERSION JACE. PROVIDE ALL NECESSARY DRIVERS, SVR SOFTWARE MAINTENANCE AGREEMENT AND MINIMUM CORE DEVICE LICENSE FOR 100 DEVICES, 5,000 POINTS. REFER TO M0.5, M0.6 & M0.7 FOR ADDITIONAL INFORMATION.



ANCHOR (E)BAS NETWORK SUPERVISOR

NOTES:

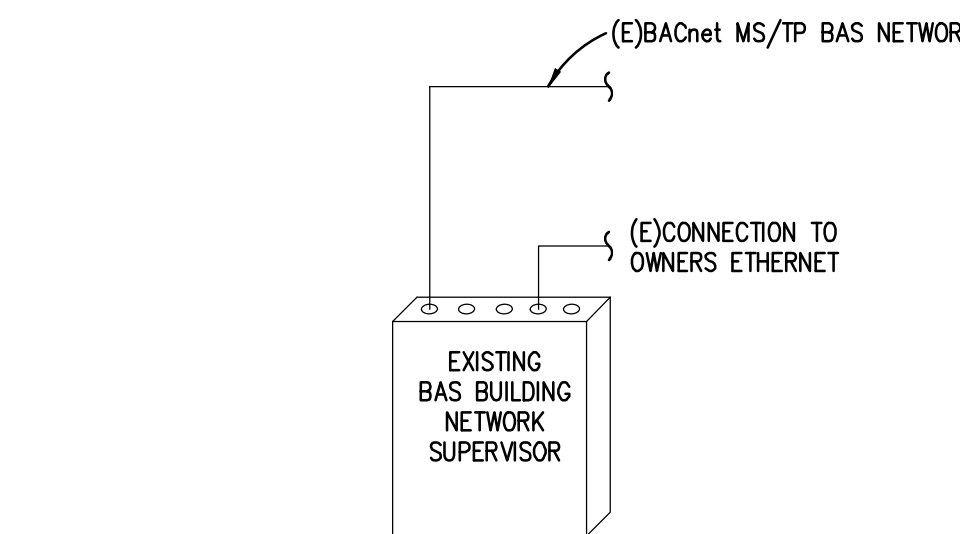
- EXISTING BAS NETWORK SUPERVISOR (JCI FX-60) SHALL BE REMOVED AND REPLACED WITH NEW JCI FX VERSION JACE. PROVIDE ALL NECESSARY DRIVERS, SVR SOFTWARE MAINTENANCE AGREEMENT AND MINIMUM CORE DEVICE LICENSE FOR 100 DEVICES, 5,000 POINTS. REFER TO M0.4 FOR ADDITIONAL INFORMATION.



BEACON (E)BAS NETWORK SUPERVISOR

NOTES:

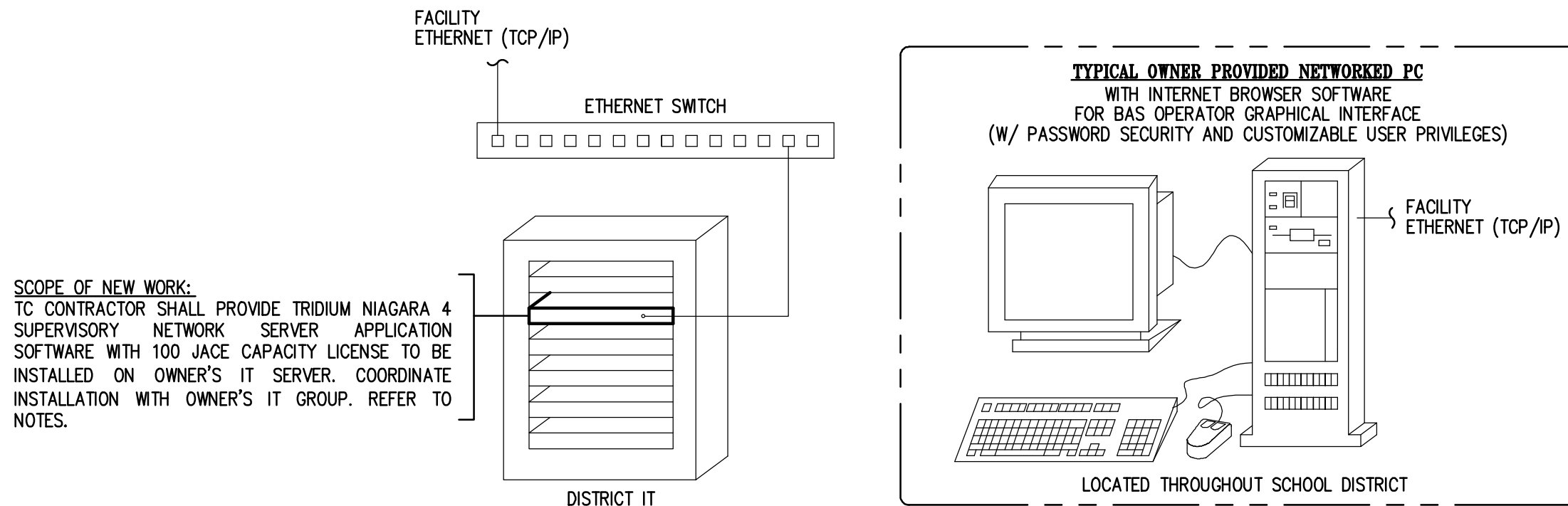
- EXISTING BAS NETWORK SUPERVISOR (JCI FX-80) SHALL REMAIN. REFER TO M0.3 FOR ADDITIONAL INFORMATION.



TRANSPORTATION BLDG (E)BAS NETWORK SUPERVISOR

NOTES:

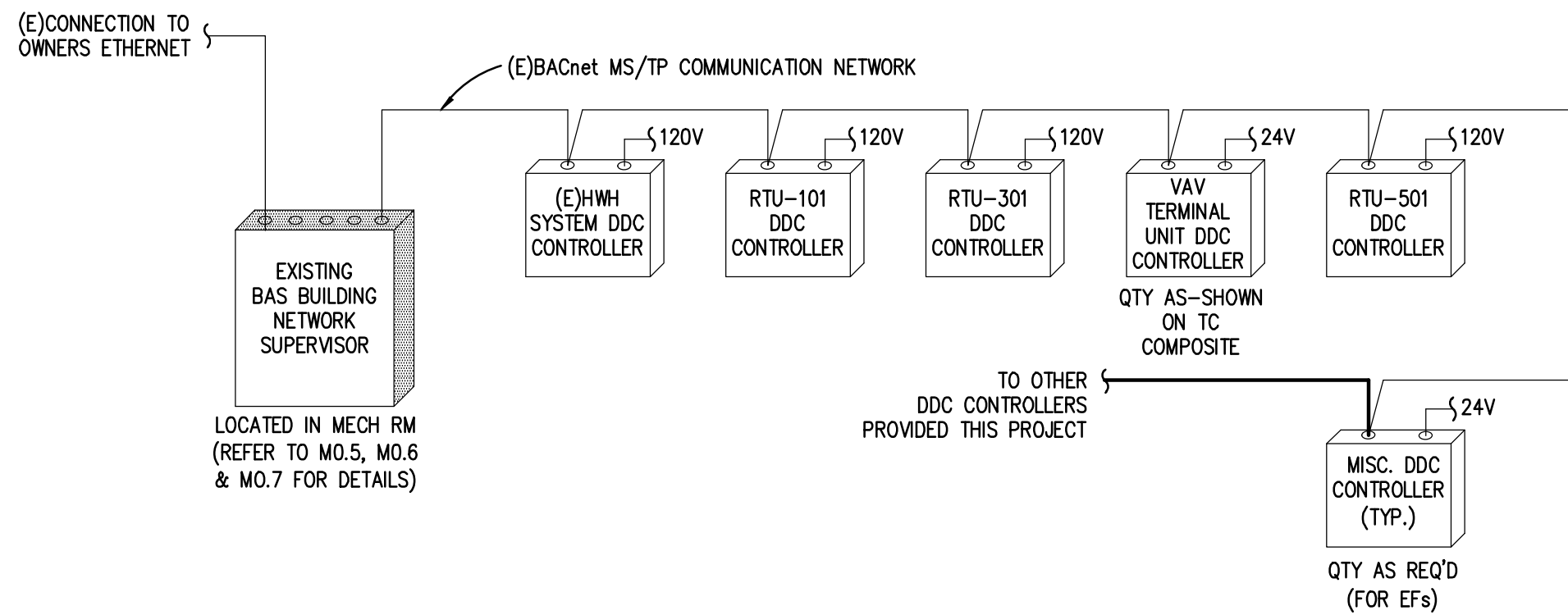
- EXISTING BAS NETWORK SUPERVISOR (NCE2560) SHALL REMAIN. REFER TO M0.3 FOR ADDITIONAL INFORMATION.



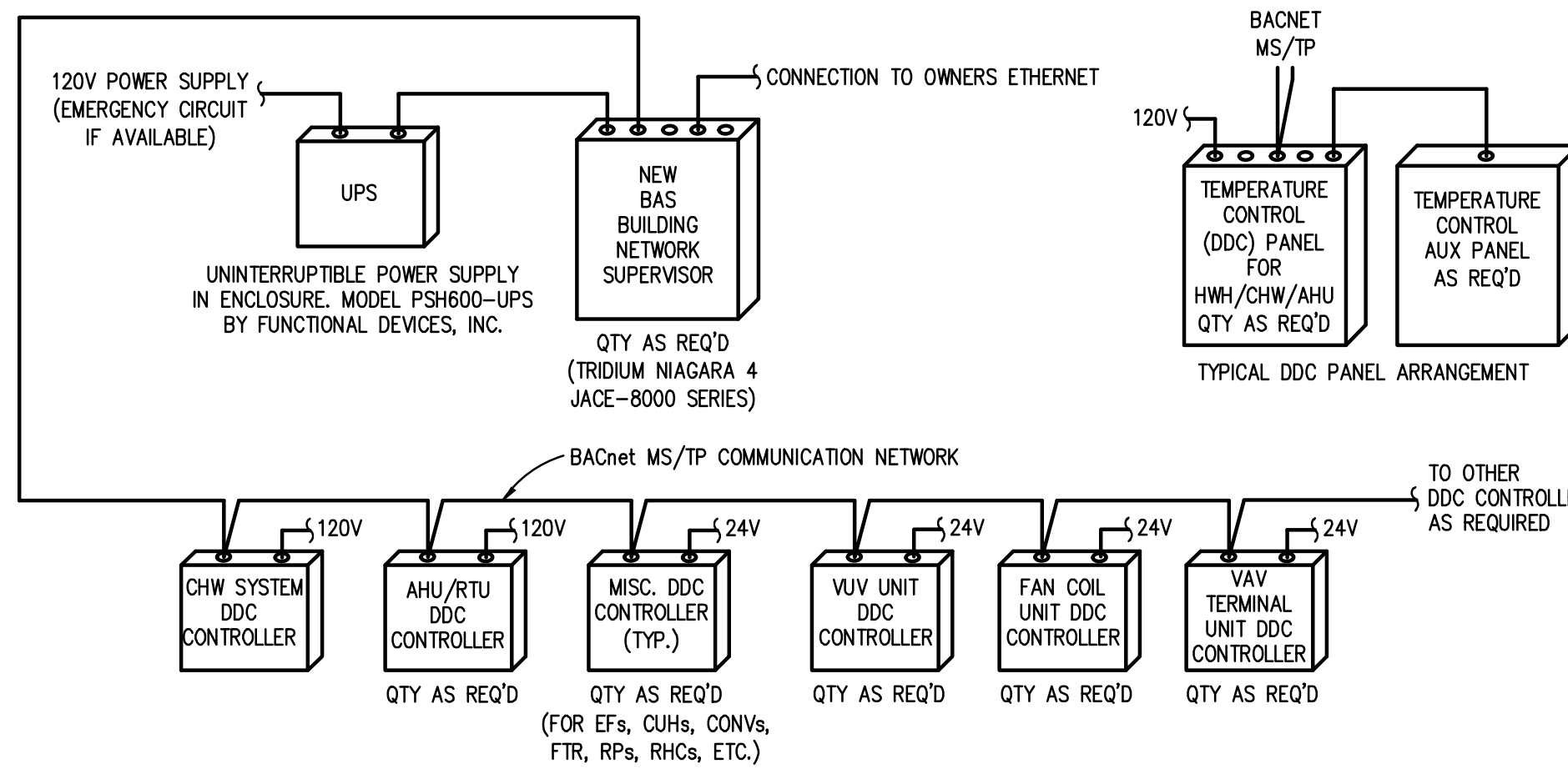
NEW BAS NETWORK SERVER

NOTES:

- THE TRIDIUM NIAGARA 4 SERVER APPLICATION SOFTWARE SHALL BE LICENSED TO HANDLE UP TO 10 TRIDIUM-BASED NETWORK SUPERVISORY (JACE 8000) CONTROLLERS LOCATED WITHIN SCHOOL DISTRICT BUILDING(S). THE APPLICATION SOFTWARE SHALL BE THE WEB-SERVER FOR OPERATOR GRAPHICAL INTERFACE FOR ALL CONNECTED BUILDINGS.
- TC CONTRACTOR SHALL BE RESPONSIBLE TO DEVELOP ALL SYSTEM GRAPHICS FOR THE NEW TRIDIUM N4 PLATFORM AND NEW CONTROLS PROVIDED FOR THE DISTRICT WIDE TEMPERATURE CONTROLS REPLACEMENT PROJECT. GRAPHICS SHALL INCLUDE DISTRICT MAP WITH BUILDING LOCATIONS, BUILDING LAYOUT, FLOOR PLANS, SYSTEMS MONITORING AND CONTROL, ETC. PER THE SPECIFICATIONS. TC CONTRACTOR SHALL MAP CONTROL AND MONITORING POINTS FROM EACH BUILDING'S NETWORK SUPERVISORY CONTROLLER TO MAKE THE GRAPHICS FUNCTIONAL ON THE NEW SERVER APPLICATION.
- TC CONTRACTOR SHALL CREATE ALL NECESSARY BACnet OPEN PROTOCOL OBJECTS FOR REMOTE SCHEDULING, CONTROL, MONITORING, ALARMING AND POINT TRENDRING OF SYSTEMS FOR THE SCHOOL DISTRICT.



EXISTING TRIDIUM BUILDING AUTOMATION SYSTEM ARCHITECTURE



NEW TRIDIUM BUILDING AUTOMATION SYSTEM ARCHITECTURE

NOTES:

- REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED FOR EACH SYSTEM.
- TC CONTRACTOR SHALL DETERMINE DDC CONTROLLER QUANTITY BASED ON POINT DENSITIES AND LOCATIONS PER AVAILABLE MOUNTING SPACE. UNLESS SPECIFICALLY NOTED IN DESIGN DRAWINGS, TC CONTRACTOR SHALL LOCATE BACNET DDC PANELS AND COORDINATE LOCATIONS WITH OWNER.
- TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM EXISTING TEMPERATURE CONTROL POWER CIRCUITS OR FROM EXISTING ELECTRICAL PANELBOARDS WHERE AVAILABLE (SEE GENERAL NOTES).
- TC CONTRACTOR SHALL PROVIDE 24V TRANSFORMERS REQUIRED FOR CONTROLLERS AS REQUIRED. TRANSFORMERS SHALL BE LOCATED WITHIN EQUIPMENT ENCLOSURES OR OTHER TC PROVIDED ENCLOSURES TO BE LOCATED IN MECHANICAL OR ELECTRICAL ROOMS - COORDINATE LOCATIONS. MAXIMUM TRANSFORMER SIZE SHALL BE 100VA.
- BUILDING DDC NETWORK SHALL BE CONNECTED TO THE SCHOOL DISTRICT ETHERNET. TC CONTRACTOR SHALL FURNISH AND INSTALL WIRING FOR DATA OUTLET FROM THE BUILDING IT NETWORK RACK. COORDINATE DATA OUTLET WIRING REQUIREMENTS, CONNECTION AND I/P ADDRESS WITH OWNER'S INFORMATION TECHNOLOGY PERSONNEL.
- EXISTING CONTROLLERS PROVIDED THROUGH EQUIPMENT SUPPLIERS WITH BACnet MS/TP INTERFACE CARDS SHALL BE INTERFACED TO NEW BAS. TC CONTRACTOR TO PROVIDE BACNET NETWORK WIRING TO CONTROLLERS AS REQUIRED.

SCHOOL DISTRICT STANDARD SETPOINTS

NOTE:

PROVIDE A BUILDING GLOBAL SETPOINT GRAPHICAL INTERFACE PAGE WITH THE FOLLOWING SCHOOL DISTRICT STANDARDS THAT SHALL BE APPLIED TO ALL EQUIPMENT AND ZONE CONTROL AS APPLICABLE PER SPECIFIC CONTROL DETAILS AND SEQUENCES OF OPERATION. INDIVIDUAL EQUIPMENT OR ZONES SETPOINTS SHALL THEN BE CAPABLE OF BEING OVERRIDDEN BY SCHOOL DISTRICT MAINTENANCE AS REQUIRED.

AIR HANDLING EQUIPMENT ZONES (VAVs, AHUs, RTUs, HVAC UNITS):

- OCCUPIED HEATING = 70°F
- STANDBY HEATING = 68°F
- UNOCCUPIED HEATING = 62°F
- OCCUPIED COOLING = 74°F
- STANDBY COOLING = 76°F
- UNOCCUPIED COOLING = 80°F (UNLESS SET HIGH TO KEEP UNIT OFF)
- LOCAL WARM/COOL ADJUSTMENT RANGE FOR OCCUPIED SETPOINTS (WHERE APPLICABLE) SHALL BE +/- 2°F
- ECONOMIZER LOCKOUT SETPOINT (AS APPLICABLE), OA-DEWPOINT = 52°F OR OA-DRY BULB = 65°F.

PERIMETER HEATING ZONES (CUH, FTR)

- OCCUPIED HEATING = 68°F
- UNOCCUPIED HEATING = 55°F

TC GENERAL NOTES

- THESE GENERAL NOTES SHALL BE APPLICABLE FOR ALL DRAWINGS.
- PROJECT SHALL BE TURKEY AS PROVIDED BY TEMPERATURE CONTROLS (TC) CONTRACTOR. TC CONTRACTOR SHALL BE RESPONSIBLE TO SUB-CONTRACT ELECTRICAL CONTRACTOR FOR CONTROLS INSTALLATION AND EXISTING CONTROLS DEMOLITION AND ANY POWER RELATED ITEMS. MECHANICAL CONTRACTOR FOR CONTROL VALVE AND MISCELLANEOUS CONTROL COMPONENT INSTALLATIONS, AND TEST & BALANCING SERVICES AS REQUIRED FOR ALL WORK RELATED TO TEMPERATURE CONTROLS REPLACEMENT.
- EXISTING NOVAR BUILDING AUTOMATION SYSTEM SHALL BE REMOVED AND REPLACED WITH NEW BAS OPEN PROTOCOL. OPEN DISTRIBUTION CONTROLLERS FOR CONNECTION TO NEW BUILDING SUPERVISORY CONTROLLERS BASED ON THE TRIDIUM NIAGARA N4 BAS PLATFORM. EXISTING END DEVICE CONTROL COMPONENTS SHALL BE REPLACED AS INDICATED ON CONTROL DETAILS. WIRING FOR END DEVICES WHERE COMPATIBLE MAY BE REUSED. NEW BAS NETWORK COMMUNICATION WIRING TO CONTROLLERS SHALL BE PROVIDED.
- TC CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION OF EXISTING NOVAR BUILDING AUTOMATION SYSTEM. TC CONTRACTOR SHALL REMOVE ALL EXISTING CONTROL COMPONENTS THAT ARE VISIBLE TO REMOVE, INCLUDING INSTRUMENTATION TUBING & WIRING THAT ARE ABANDONED DUE TO INSTALLATION OF NEW CONTROL SYSTEMS. ALL REMOVED COMPONENTS SHALL BE HAULED AWAY FROM THE SITE BY TC CONTRACTOR AT TC CONTRACTOR'S EXPENSE, EXCEPT FOR NOVAR CONTROLLERS WHICH SHALL BE TURNED OVER TO OWNER.
- ALL DDC CONTROL VALVES AND DAMPER ACTUATORS SHALL BE REPLACED AS INDICATED ON CONTROL DETAILS.
- ANY ISSUES WITH EXISTING EQUIPMENT AND SYSTEMS DISCOVERED DURING CONSTRUCTION SHALL BE RECORDED AND SUMMARIZED FOR OWNER TO ADDRESS AS REQUIRED.
- "PROVIDE" AS USED THROUGHOUT DRAWINGS IS DEFINED AS "FURNISH AND INSTALL".
- TC CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
- ALL DETAILED INFORMATION IDENTIFIED WITH HEAVY LINE WEIGHT SHALL BE FURNISHED AND/OR INSTALLED BY TC CONTRACTOR. ALL OTHER INFORMATION IDENTIFIED WITH LIGHT LINE WEIGHT IS EXISTING, UNLESS OTHERWISE NOTED.
- ALL CONTROL SCHEMATICS AND WIRING DIAGRAMS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS' WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION. FIELD VERIFY EXISTING CONDITIONS AS REQUIRED.
- TC CONTRACTOR SHALL PROVIDE DDC CONTROLLERS AS REQUIRED TO MEET INTENT OF DESIGN DOCUMENTS. REFER TO THE PLANS FOR THE DDC FUNCTIONS THAT APPLY TO EACH MECHANICAL SYSTEM.
- ALL TC PROVIDED COMPONENTS, AND ALL TC CONTRACTOR INSTALLED PANELS, COMPONENTS AND WIRING SHALL BE LABELED PER SPECIFICATIONS.
- ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE SPECIFICATIONS.
- ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE BY TC CONTRACTOR. TC CONTRACTOR SHALL FIELD VERIFY EXISTING MOTOR STARTERS FOR INTERFACE WIRING REQUIREMENTS AND TERMINATION POINTS AS REQUIRED.
- ALL DDC SIGNAL WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
- ALL ELECTRICAL WIRING AND RACEWAY SYSTEMS SHALL COMPLY WITH LOCAL CODE REQUIREMENTS. WHERE RACEWAY IS REQUIRED, TWO SEPARATE ELECTRICAL RACEWAY SYSTEMS SHALL BE PROVIDED: ONE FOR 120V WIRING AND THE OTHER FOR 24V WIRING.
- ALL 120V WIRING SHALL BE INSTALLED IN CONDUIT OR EMT. SIZE SHALL BE 3" MINIMUM.
- ALL 24V CONTROL WIRING IN MECHANICAL ROOMS SHALL BE INSTALLED IN CONDUIT OR EMT. PLENUM RATED CABLE IS ACCEPTABLE ABOVE CEILINGS AND SHALL BE SECURED EVERY FIVE FT AND BE INSTALLED PERPENDICULAR OR PARALLEL TO WALLS, CEILINGS, OR STRUCTURAL MEMBERS. AT TRANSITION FROM RACEWAY TO EXPOSED PLENUM CABLE, CONDUIT SLEEVES OR ENDS ARE TO BE FITTED WITH PLASTIC BUSHINGS TO PREVENT DAMAGE TO CONDUCTORS.
- CONDUIT OR EMT SHALL BE EXPOSED ONLY IN MECHANICAL AND ELECTRICAL ROOMS. SIZE CONDUIT OR EMT TO BE FILLED AT 40% CAPACITY MAXIMUM.
- ALL 24V CONTROL WIRING SHALL BE CONCEALED IN WALLS AND ABOVE CEILINGS IN FINISHED AREA WHERE POSSIBLE. EXPOSED WORK IN NON-MECHANICAL ROOM AREAS SHALL BE INSTALLED IN STEEL METAL RACEWAY PERPENDICULAR OR PARALLEL TO WALLS, CEILINGS, OR STRUCTURAL MEMBERS.
- TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED.
- POWER SUPPLIES (120VAC) REQUIRED FOR NEW TC COMPONENTS SHALL BE FROM EXISTING PANELBOARDS. SPARE CIRCUIT BREAKERS MAY BE USED WHEN AVAILABLE. IN PANELBOARDS THAT DO NOT HAVE SPARE CIRCUIT BREAKERS, NEW BREAKERS TO MATCH EXISTING SHALL BE INSTALLED IN BLANKED OUT SPACES WHERE AVAILABLE. CIRCUIT BREAKERS SHALL BE BOLT ON TYPE WITH PROPER INTERRUPTING RATING. PANEL AND CIRCUIT NUMBERS USED SHALL BE INDICATED WITHIN ENCLOSURE AT DEVICE WHERE POWER SUPPLY IS USED.
- TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
- NEW SPACE TEMPERATURE SENSORS SHALL BE MOUNTED 4'-0" ABOVE FINISHED FLOOR. FOR EXISTING THERMOSTAT AND TEMPERATURE SENSOR REPLACEMENTS, TC CONTRACTOR SHALL MOUNT NEW SENSORS AT SAME LOCATION REGARDLESS OF HEIGHT REQUIREMENT. ALL EXISTING SPACE TEMPERATURE SENSOR AND THERMOSTAT GUARDS SHALL BE REMOVED AND ANY EXISTING MOUNTING HOLES SHALL BE FILLED WITH TOUCH-UP PAINTING PER SPECIFICATIONS.
- TC CONTRACTOR SHALL PROVIDE NEW GUARDS FOR SPACE TEMPERATURE SENSORS WHERE NOTED. STAINLESS-STEEL FLAT PLATE SENSORS ARE ACCEPTABLE ALTERNATIVE FOR SPACE TEMPERATURE MONITORING ONLY APPLICATIONS.
- TC CONTRACTOR SHALL PROVIDE AUXILIARY PANELS FOR REQUIRED PANEL MOUNTED EQUIPMENT SUCH AS RELAYS, TRANSDUCERS, CONTROL TRANSFORMERS, ETC. AUXILIARY PANELS SHALL BE LOCATED NEXT TO ASSOCIATED DDC PANEL.
- REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSE IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.
- CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL LOAD.
- NEW FREEZE-STATS, WHERE REQUIRED, SHALL BE MOUNTED WHERE INDICATED ON CONTROL DETAILS. FREEZE-STAT QUANTITY SHALL BE ONE PER 20 SQ FT OF CROSS SECTIONAL AREA.
- CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE.
- ALL NEW CONTROL VALVES, CONTROL DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR.
- TC CONTRACTOR MAY REUSE THERMOWELLS FOR EXISTING DDC SYSTEM COMPONENT REPLACEMENTS WHERE COMPATIBLE WITH NEW CONTROL COMPONENTS; OTHERWISE, TC CONTRACTOR SHALL PROVIDE NEW THERMOWELLS FOR APPLICATION. TC CONTRACTOR SHALL FIELD VERIFY EXISTING SIZES AND THREADED CONNECTIONS AS REQUIRED.
- TC CONTRACTOR SHALL COORDINATE WITH MECHANICAL SUBCONTRACTOR TO INSTALL ALL CONTROL VALVES AND THERMOWELLS FURNISHED BY THE TC CONTRACTOR. ALL PIPE PENETRATIONS AND BASIC FITTINGS REQUIRED FOR CONTROL VALVES AND SENSOR INSTALLATIONS SHALL BE PROVIDED BY MECHANICAL SUBCONTRACTOR.
- TC CONTRACTOR SHALL COORDINATE WITH MECHANICAL SUBCONTRACTOR TO INSTALL ALL CONTROL DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS FURNISHED BY THE TC CONTRACTOR WHERE INDICATED.



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PBA Project No: 2022.0380

PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community
Schools

DRAWING TITLE

TEMPERATURE CONTROL
STANDARD DETAILS AND
GENERAL NOTES

ISSUE DATES

05-25-2023 CONSTRUCTION DOCUMENTS

03-15-2023 OWNER REVIEW

DATE: ISSUED FOR:

DRAWN: WJU

CHECKED: JWC

APPROVED: SVM

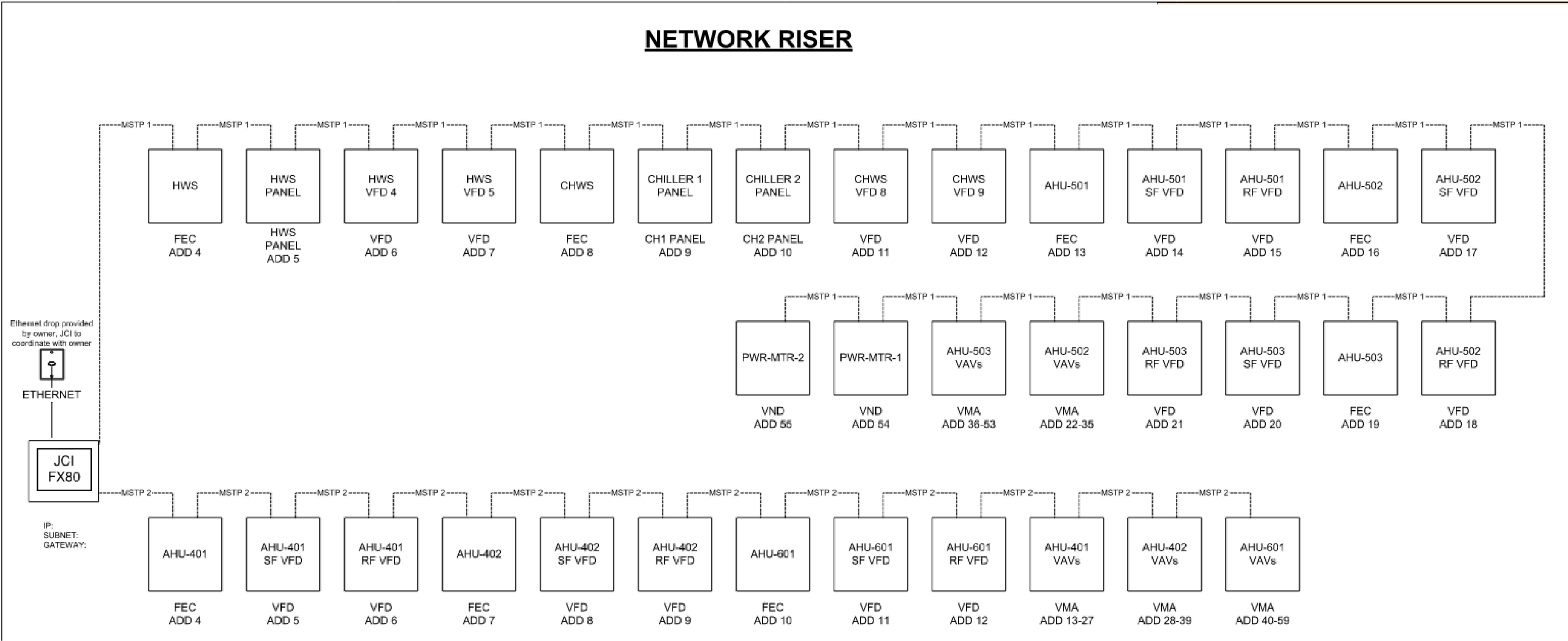
PROJECT NO.

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DRAWING NO.

M0.2

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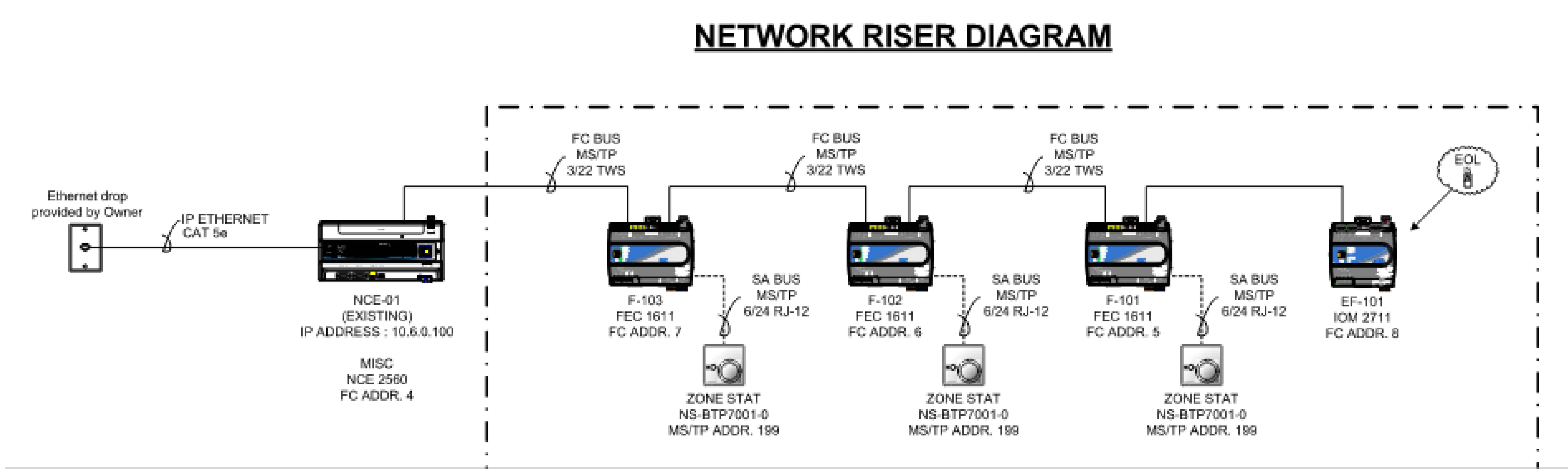


BEACON EARLY ENTRY (E)BAS NETWORK

FOR REFERENCE ONLY

NOTES:

1. TC CONTRACTOR SHALL FIELD VERIFY EXISTING NETWORK WIRING AND ALL CONNECTED DEVICES.
2. TC CONTRACTOR SHALL PROVIDE LABOR & MATERIAL FOR 5YR RENEWAL SOFTWARE MAINTENANCE AGREEMENT (SMA). UPGRADE JACE FIRMWARE TO THE LATEST VERSION OF NIAGARA 4 UPON PROJECT COMPLETION.
3. TC CONTRACTOR SHALL PROVIDE LABOR TO MIGRATE EXISTING DEVICES AND GRAPHICS TO NEW N4 SERVER.



TRANSPORTATION BLDG (E)BAS NETWORK

FOR REFERENCE ONLY

NOTES:

1. TC CONTRACTOR SHALL FIELD VERIFY EXISTING NETWORK WIRING AND ALL CONNECTED DEVICES.
2. EXISTING NATIVE BACnet NCE SHALL REMAIN. TC CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR TO MIGRATE DEVICES TO NIAGARA 4 SERVER VIA BACnet OVER IP.
3. TC CONTRACTOR SHALL BE REQUIRED TO PROVIDE ALL NECESSARY LABOR TO ADD EXISTING GRAPHICS TO NIAGARA 4 SERVER.



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PBA Project No: 2022.0380

PROJECT TITLE

Creekside
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EXISTING BAS NETWORKS -
FOR REFERENCE ONLY

ISSUE DATES

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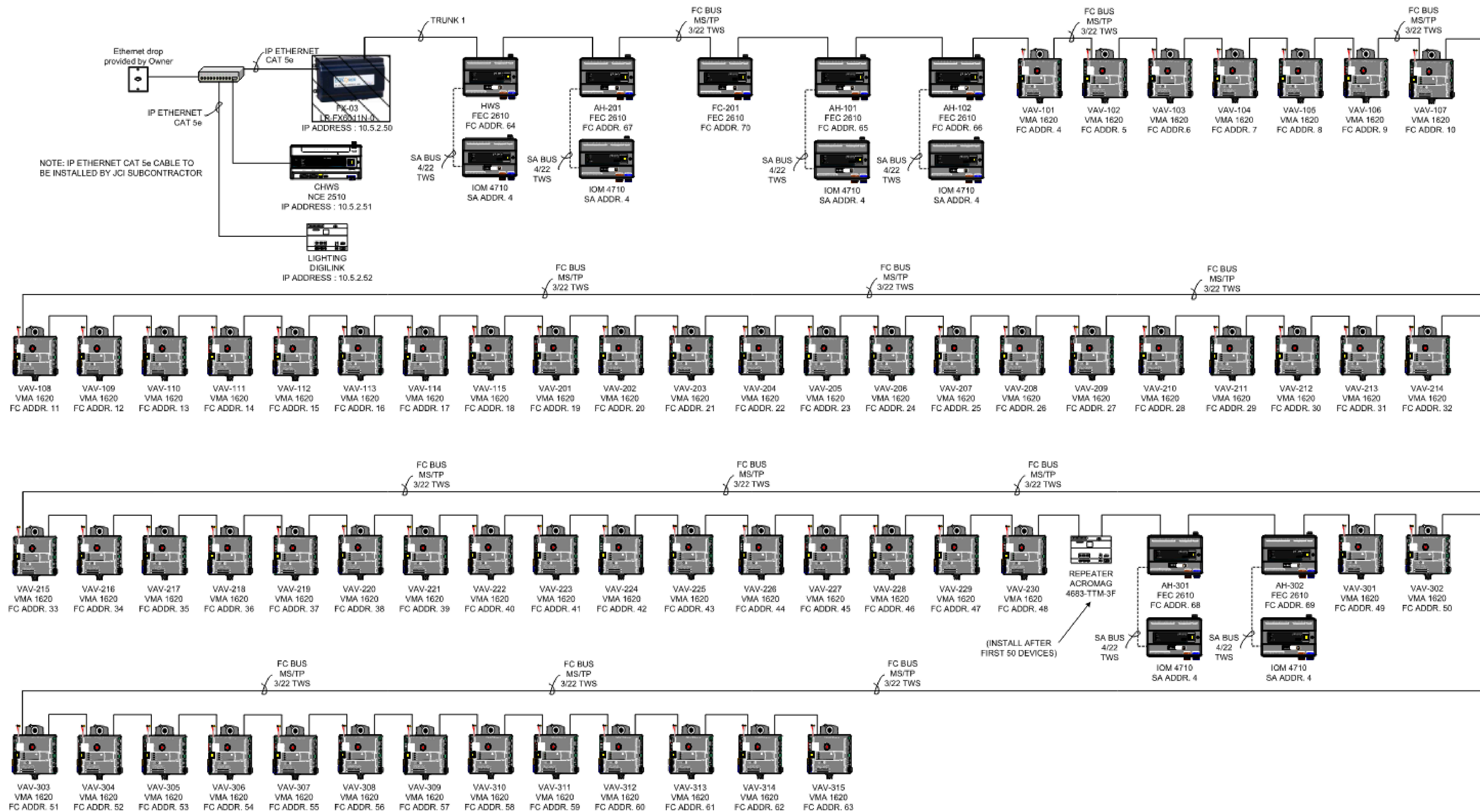
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NOTES:
EXISTING JCI FX-60 SHALL BE REPLACED UNDER THIS PROJECT. REUSE IP ADDRESS.
EXISTING NCE FOR CHW SYSTEM SHALL REMAIN.

**NETWORK RISER DIAGRAM
(FIRST FLOOR)**



ANCHOR EARLY ENTRY (E)BAS NETWORK

FOR REFERENCE ONLY
NOTES:

1. TO CONTRACTOR SHALL FIELD VERIFY EXISTING NETWORK WIRING AND ALL CONNECTED DEVICES.
2. TO CONTRACTOR SHALL PROVIDE LABOR & MATERIAL TO REMOVE AND REPLACE EXISTING JACE WITH NEW JCI FX60 VERSION. PROVIDE 5YR SOFTWARE MAINTENANCE AGREEMENT (SMA).
3. TO CONTRACTOR SHALL PROVIDE LABOR TO MIGRATE EXISTING DEVICES AND GRAPHICS TO NEW N4 SERVER.
4. EXISTING NATIVE BACnet NCE SHALL REMAIN. TO CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR TO MIGRATE CHW SYSTEM AND LIGHTING DIGILINK TO NIAGARA 4 SERVER VIA BACnet OVER IP.

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PROJECT TITLE

Creekside
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EXISTING BAS NETWORKS -
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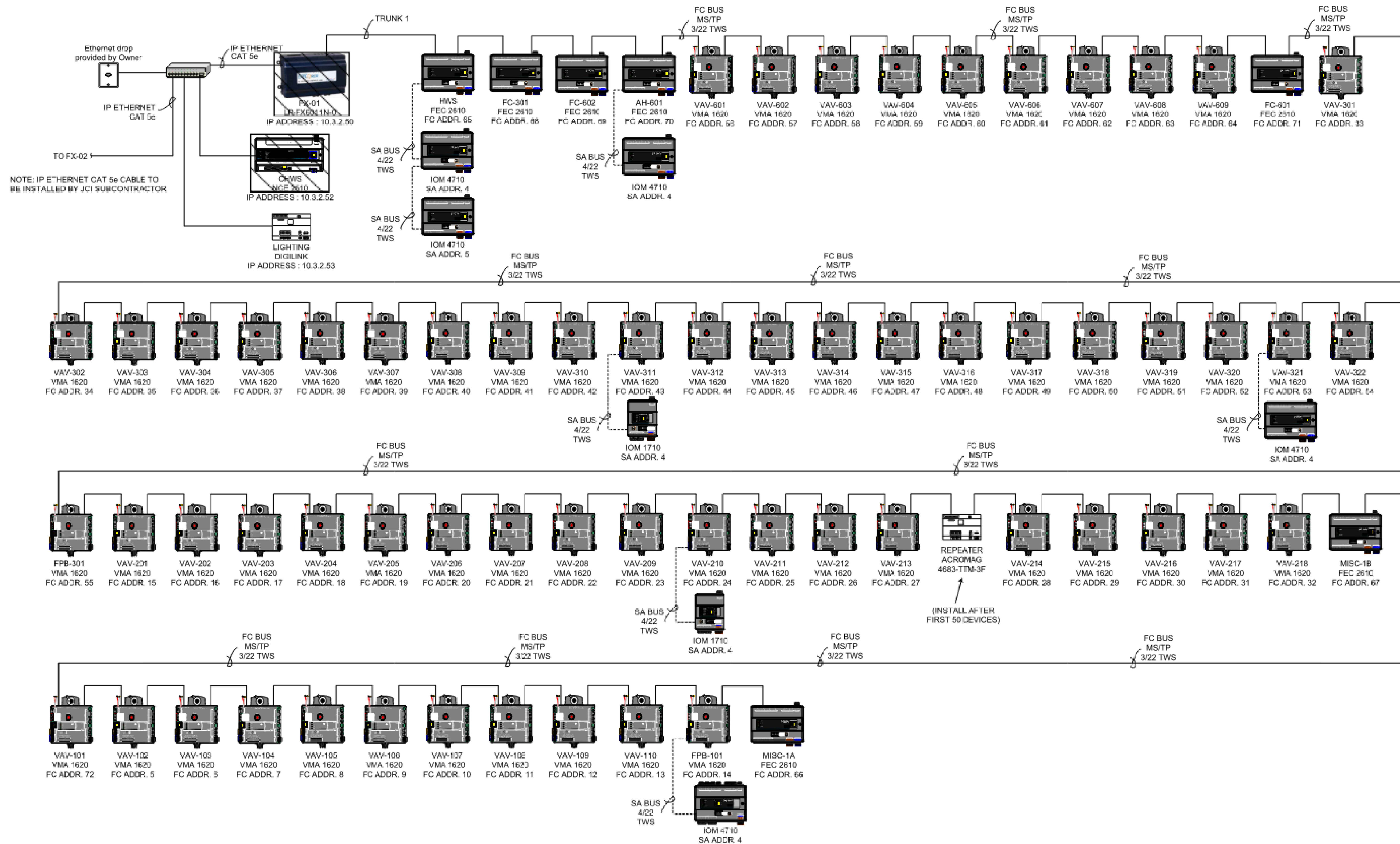
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EXISTING JCI FX-60 SHALL BE REPLACED UNDER THIS PROJECT. REUSE IP ADDRESS.

(FIRST FLOOR)

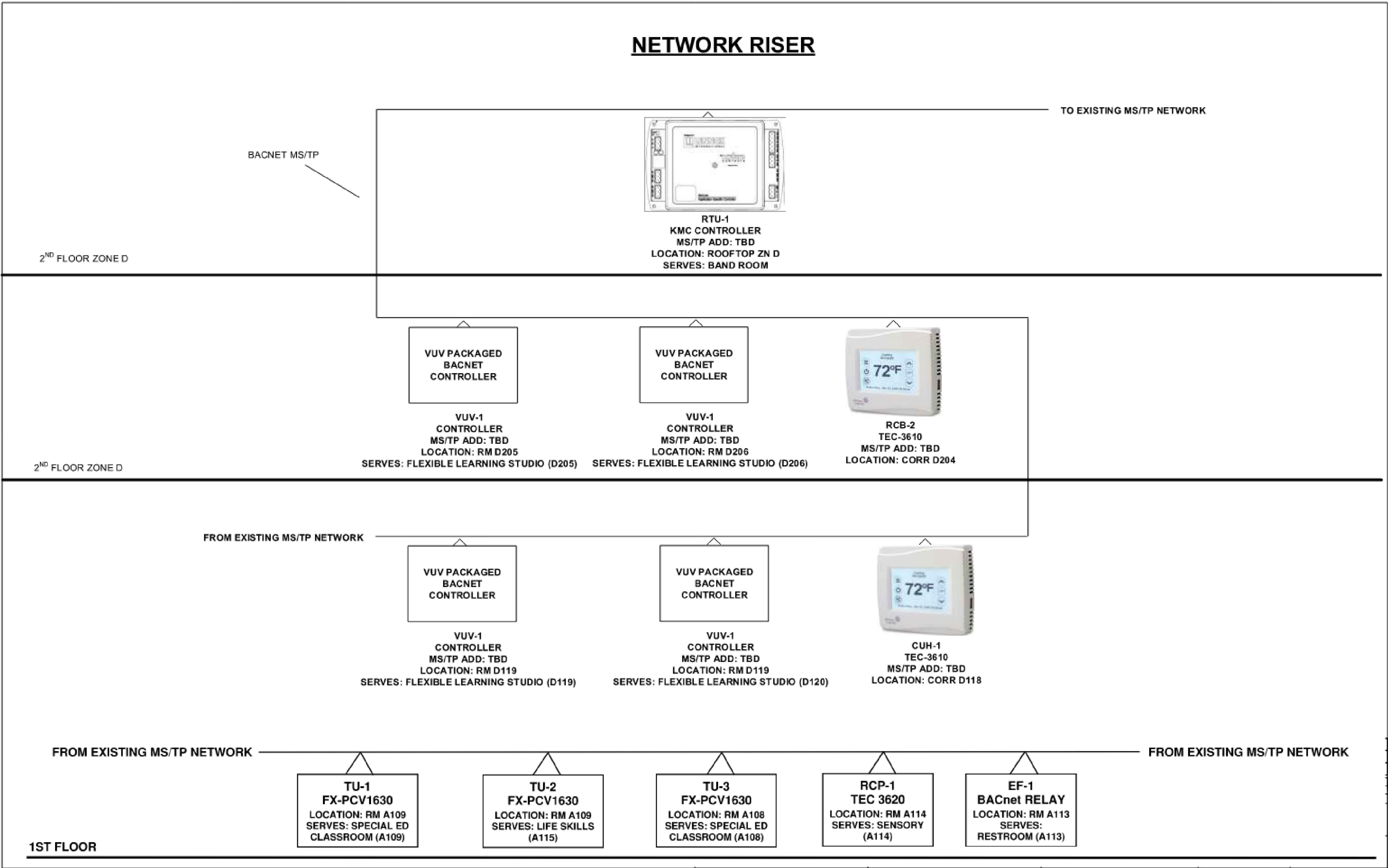


FOR REFERENCE ONLY

NOTES:

1. TC CONTRACTOR SHALL FIELD VERIFY EXISTING NETWORK WIRING AND ALL CONNECTED DEVICES.
2. TC CONTRACTOR SHALL PROVIDE LABOR & MATERIAL TO REMOVE AND REPLACE EXISTING JACE WITH NEW JCI FX80 VERSION. PROVIDE 5YR SOFTWARE MAINTENANCE AGREEMENT (SMA).
3. TC CONTRACTOR SHALL PROVIDE LABOR TO MIGRATE EXISTING DEVICES AND GRAPHICS TO NEW N4 SERVER.
4. EXISTING JACE SHALL REMAIN. TC CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR TO MIGRATE CXT SYSTEM AND LIGHTING DIGILINK TO NIAGARA 4 SERVER.

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MILL CREEK (E)BAS NETWORK - FIRST FL CON'T

FOR REFERENCE ONLY

NOTES:

1. TC CONTRACTOR SHALL FIELD VERIFY EXISTING NETWORK WIRING AND ALL CONNECTED DEVICES.
2. TC CONTRACTOR SHALL PROVIDE LABOR TO MIGRATE EXISTING DEVICES AND GRAPHICS TO NEW N4 SERVER.



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PROJECT TITLE

**Creekside
Intermediate
School Bldg.
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Systems**

**Dexter Community
Schools**

DRAWING TITLE

**EXISTING BAS NETWORKS -
FOR REFERENCE ONLY**

ISSUE DATES

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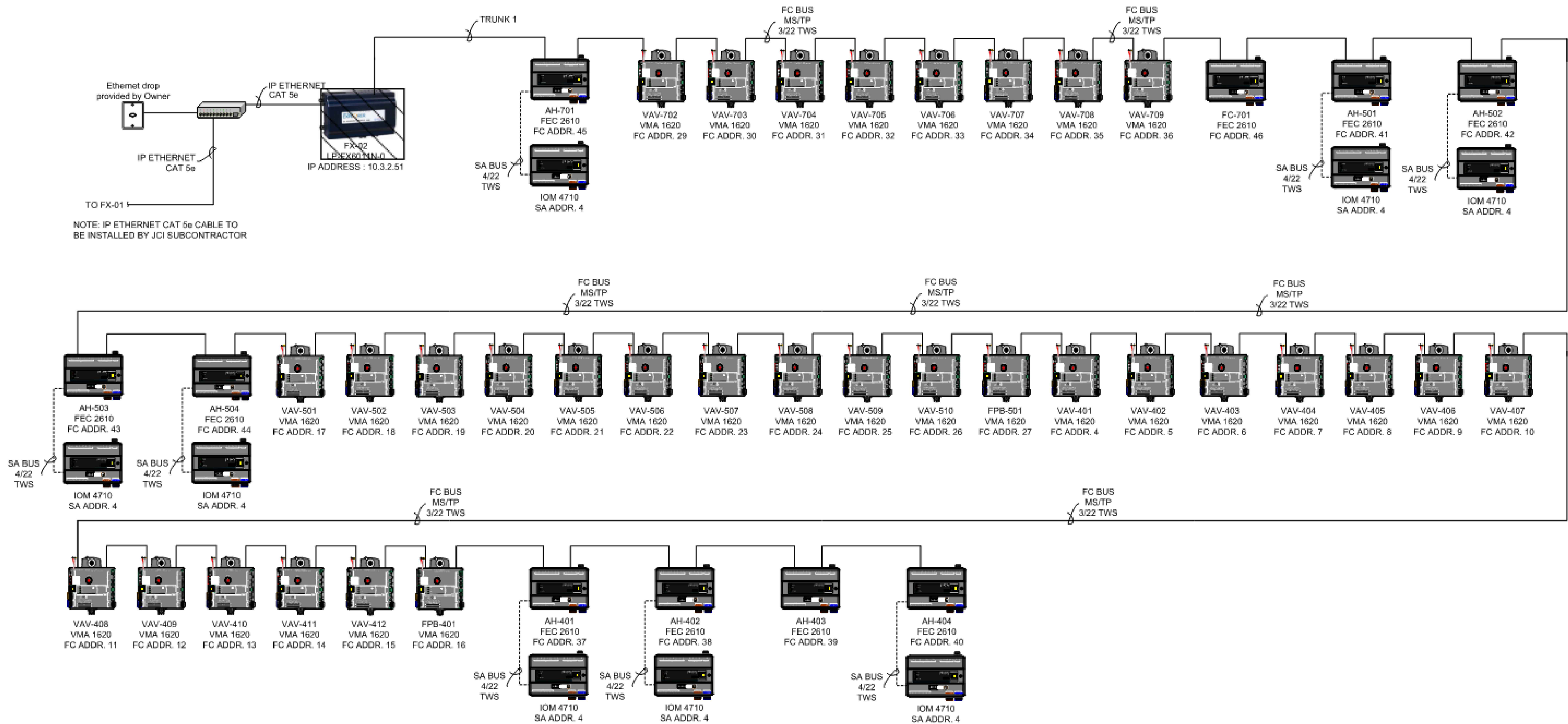
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NOTES:
EXISTING JCI FX-60 SHALL BE REPLACED UNDER THIS PROJECT. REUSE IP ADDRESS.

NETWORK RISER DIAGRAM
(SECOND FLOOR)



MILL CREEK (E)BAS NETWORK - SECOND FL
FOR REFERENCE ONLY
NOTES:
1. TC CONTRACTOR SHALL FIELD VERIFY EXISTING NETWORK WIRING AND ALL CONNECTED DEVICES.
2. TC CONTRACTOR SHALL PROVIDE LABOR & MATERIAL TO REMOVE AND REPLACE EXISTING JACE WITH NEW JCI FX80 VERSION. PROVIDE 5YR SOFTWARE MAINTENANCE AGREEMENT (SMA).
3. TC CONTRACTOR SHALL PROVIDE LABOR TO MIGRATE EXISTING DEVICES AND GRAPHICS TO NEW N4 SERVER.
4. EXISTING JACE SHALL REMAIN. TC CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR TO MIGRATE CHW SYSTEM AND LIGHTING DIOGLINK TO NIAGARA 4 SERVER.



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PROJECT TITLE

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Schools

DRAWING TITLE

EXISTING BAS NETWORKS -
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ISSUE DATES

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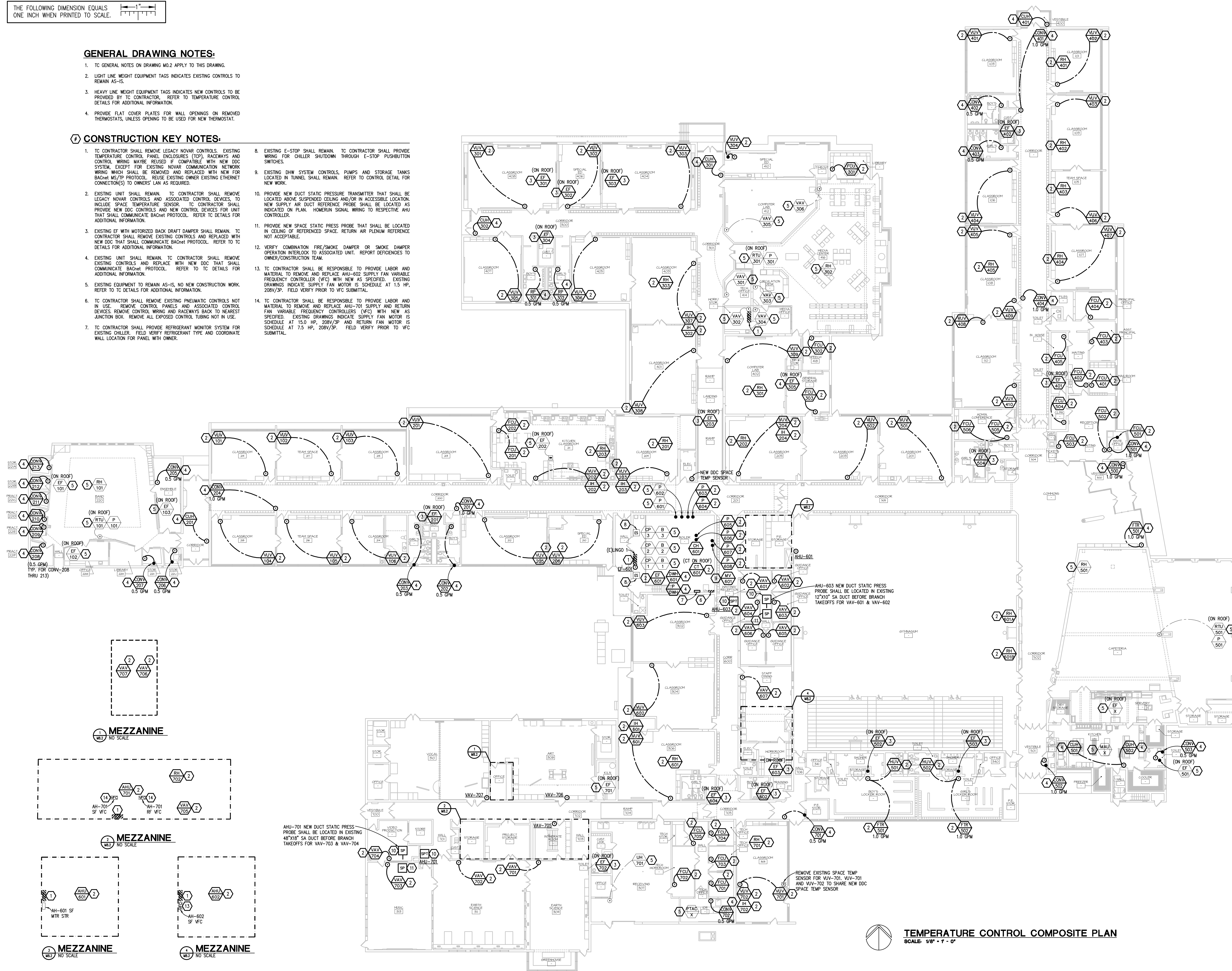
M0.7

GENERAL DRAWING NOTES:

1. TC GENERAL NOTES ON DRAWING M0.2 APPLY TO THIS DRAWING.
2. LIGHT LINE WEIGHT EQUIPMENT TAGS INDICATES EXISTING CONTROLS TO REMAIN AS-IS.
3. HEAVY LINE WEIGHT EQUIPMENT TAGS INDICATES NEW CONTROLS TO BE PROVIDED BY TC CONTRACTOR. REFER TO TEMPERATURE CONTROL DETAILS FOR ADDITIONAL INFORMATION.
4. PROVIDE FLAT COVER PLATES FOR WALL OPENINGS ON REMOVED THERMOSTATS, UNLESS OPENING TO BE USED FOR NEW THERMOSTAT.

CONSTRUCTION KEY NOTES:

1. TO CONTRACTOR SHALL REMOVE LEGACY NOY CONTROLS. EXISTING TEMPERATURE CONTROL PANEL ENCLOSURES (TOP), RACEWAYS AND CONTROL WIRING MAYBE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. WIRING TO BE REMOVED AND REPLACED WITH NEW DDC WIRING WHICH SHALL BE REMOVED AND REPLACED WITH NEW DDC W/57P/PT PROTOCOL. REUSE EXISTING OWNER EXISTING ETHNET CONNECTIONS TO OWNERS AS IS WITH NO NEW INFORMATION.
2. EXISTING UNIT SHALL REMAIN. TO CONTRACTOR SHALL REMOVE LEGACY NOY CONTROLS AND ASSOCIATED CONTROL DEVICES, TO INCLUDE SPACE TEMPERATURE SENSOR. TO CONTRACTOR SHALL PROVIDE NEW DDC CONTROLS AND ASSOCIATED DEVICES AND NETWORK THAT SHALL COMMUNICATE BACnet PROTOCOL. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
3. EXISTING E/F WITH MOTORIZED BACK DRAFT DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING CONTROLS AND REPLACE WITH NEW DDC THAT SHALL COMMUNICATE BACnet PROTOCOL. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
4. EXISTING UNIT SHALL REMAIN. TO CONTRACTOR SHALL REMOVE EXISTING CONTROLS AND REPLACE WITH NEW DDC THAT SHALL COMMUNICATE BACnet PROTOCOL. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
5. EXISTING EQUIPMENT TO REMAIN AS-IS, NO NEW CONSTRUCTION WORK. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
6. TO CONTRACTOR SHALL REMOVE EXISTING PNEUMATIC CONTROLS NOT IN USE TO INCLUDE EXISTING PNEUMATIC AND ASSOCIATED CONTROL DEVICES. REMOVE CONTROL WIRING AND RACEWAYS BACK TO NEAREST JUNCTION BOX. REMOVE ALL EXPOSED CONTROL TUBING NOT IN USE.
7. TO CONTRACTOR SHALL PROVIDE REFRIGERANT MONITOR SYSTEM FOR EXISTING CHILLER. FIELD VERIFY REFRIGERANT TYPE AND COORDINATE WALL LOCATION FOR PANEL WITH OWNER.
8. EXISTING E-STOP SHALL REMAIN. TO CONTRACTOR SHALL PROVIDE WIRING FOR CHILLER SHUTDOWN SWITCHES.
9. EXISTING DHW SYSTEM CONTROLS, PUMPS AND STORAGE TANKS LOCATED IN TUNNEL SHALL REMAIN. REFER TO CONTROL DETAIL FOR ADDITIONAL INFORMATION.
10. PROVIDE NEW DUCT STATIC PRESSURE TRANSMITTER THAT SHALL BE LOCATED ABOVE SUSPENDED CEILING AND/OR IN ACCESSIBLE LOCATION. NEW SUPPLY AIR DUCT REFERENCE POINT SHALL BE LOCATED AS SHOWN ON PLAN. HOREMUN SIGNAL WIRING TO RESPECTIVE AHU CONTROLLER.
11. PROVIDE NEW SPACE STATIC PRESSURE POINT THAT SHALL BE LOCATED IN CEILING OF REFERENCED SPACE. RETURN AIR PLENUM REFERENCE NOT ACCEPTABLE.
12. VERIFY COMBINATION FIRE/SMOKE DAMPER OR SMOKE DAMPER OPERATION INTERLOCK TO ASSOCIATED UNIT. REPORT DEFICIENCIES TO OWNER/CONTRACTOR TEAM.
13. TO CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE LABOR AND MATERIALS TO REPLACE AHU #02 SUPPLY FAN VARIABLE FREQUENCY CONTROLLER (VFC) WITH NEW AS SPECIFIED. EXISTING DRAWINGS INDICATE SUPPLY FAN MOTOR IS SCHEDULE AT 1.5 HP, 208V/3P, FIELD VERIFY POWER TO VFC SUBMITAL.
14. TO CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE LABOR AND MATERIALS TO REPLACE AHU #02 RETURN FAN VARIABLE FREQUENCY CONTROLLER (VFC) WITH NEW AS SPECIFIED. EXISTING DRAWINGS INDICATE SUPPLY FAN MOTOR IS SCHEDULE AT 15.0 HP, 208V/3P, AND RETURN FAN MOTOR IS SCHEDULE AT 7.5 HP, 208V/3P. FIELD VERIFY POWER TO VFC SUBMITAL.



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PBA Project No.: 2022.0380

PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community
Schools

DRAWING TITLE

TEMPERATURE CONTROL COMPOSITE PLAN

ISSUE DATES

05-25-2023 CONSTRUCTION DOCUMENTS

03-15-2023	OWNER REVIEW
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DATE: ISSUED FOR

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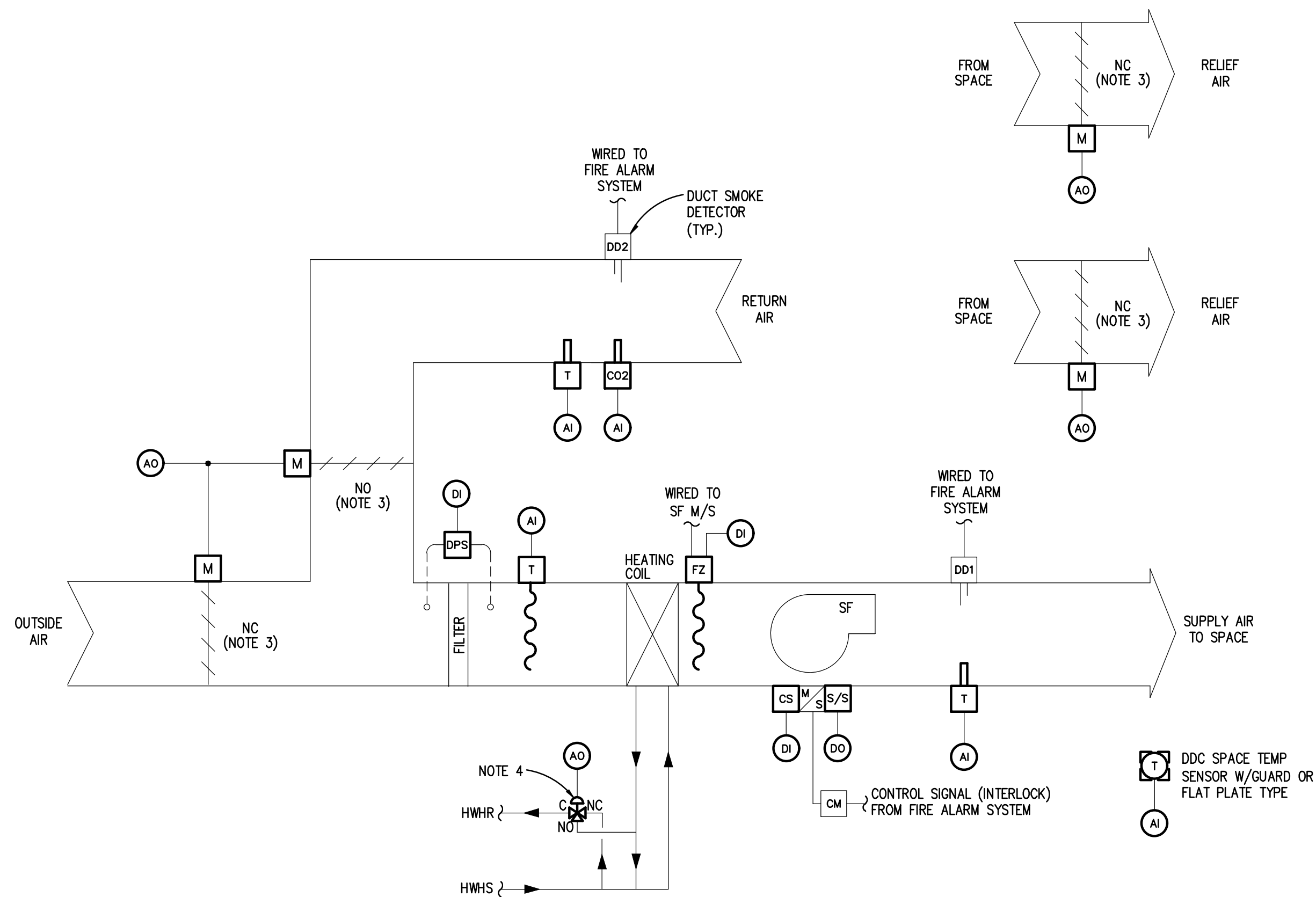
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DRAWING NO.

M1.1

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(E) AIR HANDLING UNIT (AHU-601) CONTROL RETROFIT

AHU-601 SERVES GYM

NOTES:

- REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
- REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED. EXISTING WIRING MAY BE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. SPLICING OF SENSOR CABLING/WIRING NOT PERMITTED.
- EXISTING CONTROL DAMPERS SHALL REMAIN. TO CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATORS AND REPLACE WITH NEW AS SPECIFIED. TO CONTRACTOR SHALL RECORD/MARK EXISTING OUTSIDE AIR DAMPER MINIMUM POSITION AND SET NEW CONTROL OF MINIMUM OUTSIDE AIR DAMPER POSITION TO MATCH EXISTING.
- EXISTING HEATING COIL CONTROL VALVE SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TO CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
- TO CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF MOTOR SAFETY SHUTDOWN.
- TO CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

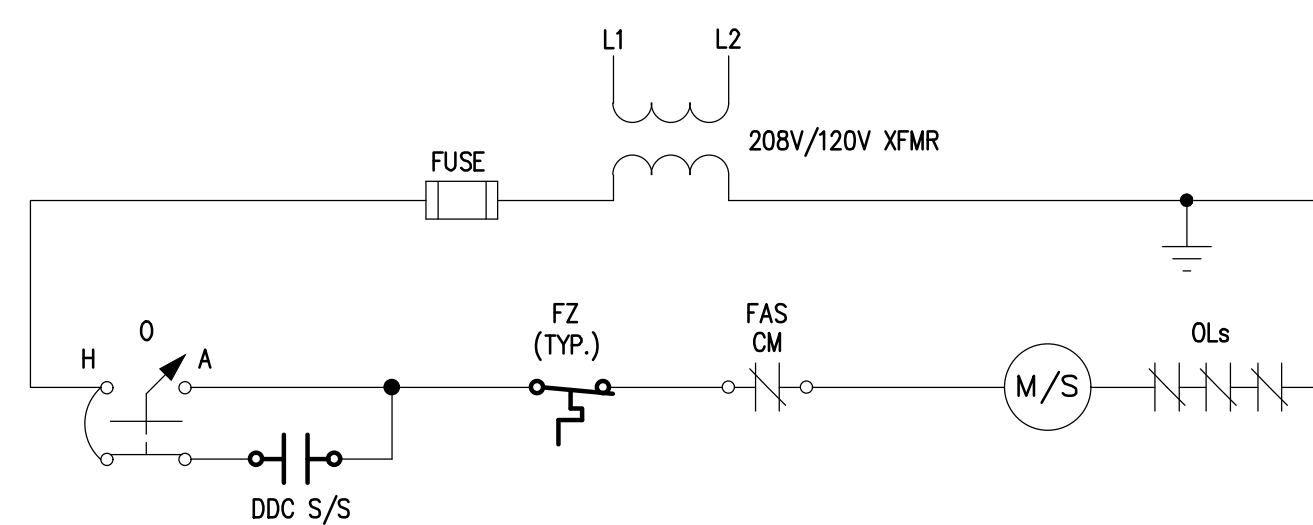
NOTE: ALL SETPOINTS INCLUDING RESET SCHEDULE SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. ALL CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON SYSTEM STATUS TO PREVENT LOOP WINDUP.

- SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. AHU SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM) AND UNOCCUPIED CYCLE MODE.
- FOR OCCUPIED MODE, AHU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
- FOR UNOCCUPIED MODE, AHU SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
- SUPPLY FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION FOR SF SHALL ACTIVATE ALARM.
- WHEN AHU IS ACTIVATED DURING OCCUPIED MODE, OUTSIDE & RETURN AIR DAMPERS (HEREIN REFERRED TO AS DAMPERS) SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN AHU IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE MODE OR MORNING WARM-UP MODE, DAMPERS SHALL REMAIN IN NORMAL POSITIONS (CLOSED TO OA).
- DDC SHALL RESET DA TEMP SETPOINT BASED ON DEVIATION FROM SPACE TEMP AND SPACE TEMP SETPOINT (CASCADE CONTROL LOGIC) FOR HEATING MODE. DA TEMP SETPOINT SHALL BE LIMITED BETWEEN 55°F AND 90°F.
- OA ECONOMIZER MODE SHALL BE MADE AVAILABLE WHEN DA TEMP IS LESS THAN RA TEMP AND OA DEWPOINT IS LESS THAN OR EQUAL TO ECONOMIZER LOOKOUT SETPOINT OF 52°F.
- WHEN SPACE TEMP IS ABOVE SETPOINT AND ECONOMIZER IS AVAILABLE, DDC SHALL MODULATE DAMPER OA ECONOMIZER TO MAINTAIN SPACE TEMP SETPOINT.
- WHEN SPACE TEMP IS ABOVE SETPOINT AND ECONOMIZER IS NOT AVAILABLE, DAMPERS SHALL REMAIN AT MINIMUM OA POSITION.
- WHEN SPACE TEMP IS BELOW SETPOINT, DDC SHALL MODULATE DAMPERS TOWARDS MINIMUM OA POSITION AND MODULATE HEATING COIL CONTROL VALVE TO MAINTAIN DISCHARGE AIR TEMP SETPOINT AS RESET THROUGH CASCADE CONTROL LOOP.
- A MIXED AIR TEMP LOW LIMIT SETPOINT 45°F SHALL PROVIDE OVERRIDE CONTROL OF MIXED AIR DAMPERS AND ALLOW MODULATION BELOW MINIMUM OA DAMPER POSITION SETPOINT.
- MINIMUM OA DAMPER SETPOINT SHALL BE RESET PROPORTIONALLY BETWEEN MIN/MIN (BASE LOAD VENTILATION REQUIREMENT) AND MAX/MIN (FULL OCCUPANCY REQUIREMENT) BASED ON RETURN AIR CARBON DIOXIDE LEVEL AS FOLLOWS:

CO2	OA DAMPER MIN POSITION
600 PPM	MIN-MIN SET CFM (5% OF MAX-MIN POSITION)
1,100 PPM	MAX-MIN SET CFM (SEE AHU SCHEDULE)

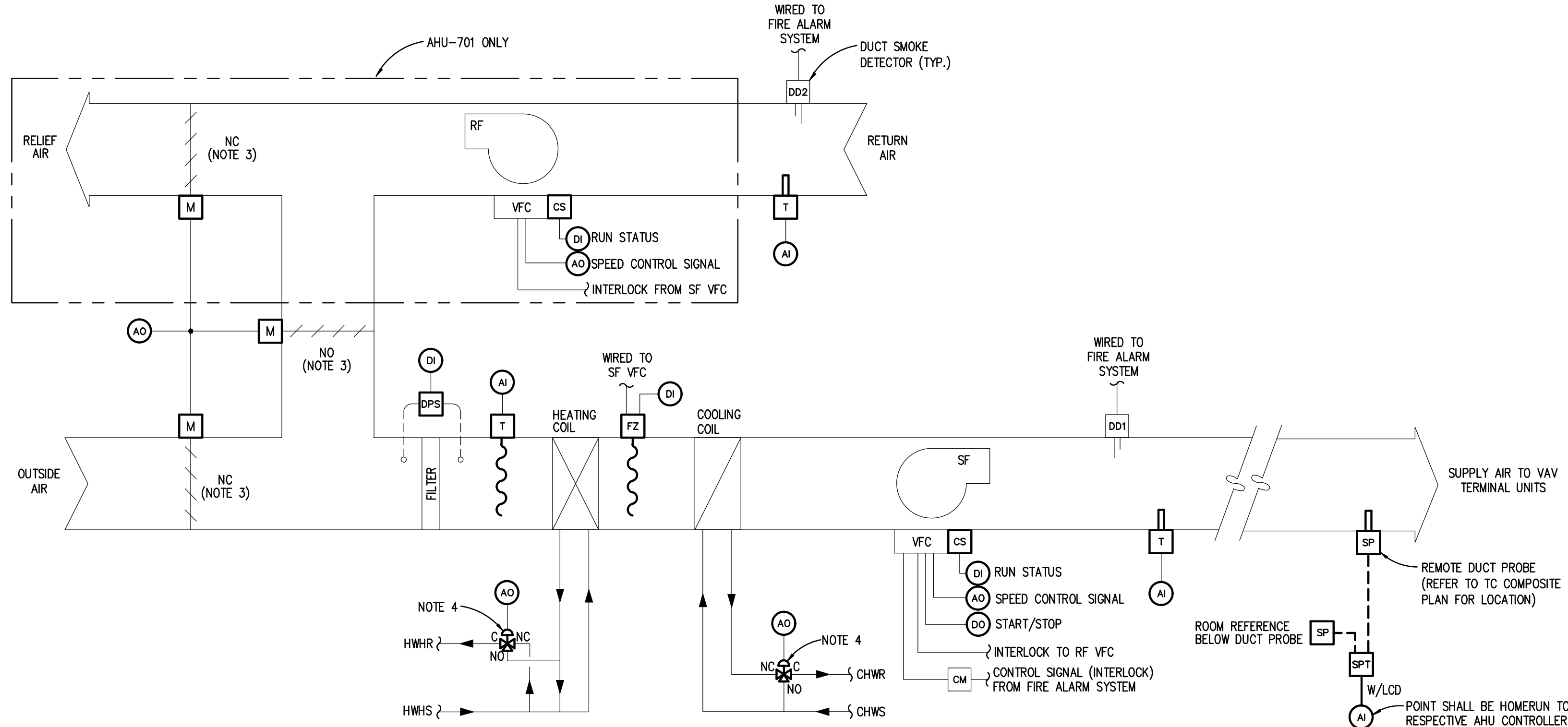
TO CONTRACTOR SHALL COORDINATE RESPONDING DAMPER MIN-MIN AND MAX-MIN CONTROL % SETPOINTS (ADJUSTABLE) WITH AIR BALANCE CONTRACTOR.

- FREEZE/STAT(S) SHALL DEACTIVATE SUPPLY FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZE/STAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
- DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
- FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE SWITCH. WHEN DP REACHES SETPOINT, DDC SHALL ACTIVATE DIRTY FILTER ALARM.
- WHEN AHU IS DEACTIVATED, DAMPERS SHALL RETURN TO NORMAL POSITION (CLOSED TO OA). COOLING COIL VALVE SHALL REMAIN CLOSED.
- WHEN OA TEMP IS BELOW 45°F AND AHU IS DEACTIVATED, HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MIXED AIR TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



AHU SF M/S WIRING

TYPICAL



(E) AIR HANDLING UNIT (AHU-602 & AHU-701) CONTROL RETROFIT

AHU-602 SERVES OFFICES
AHU-701 SERVES ART, VOCAL & TECH AREAS

NOTES:

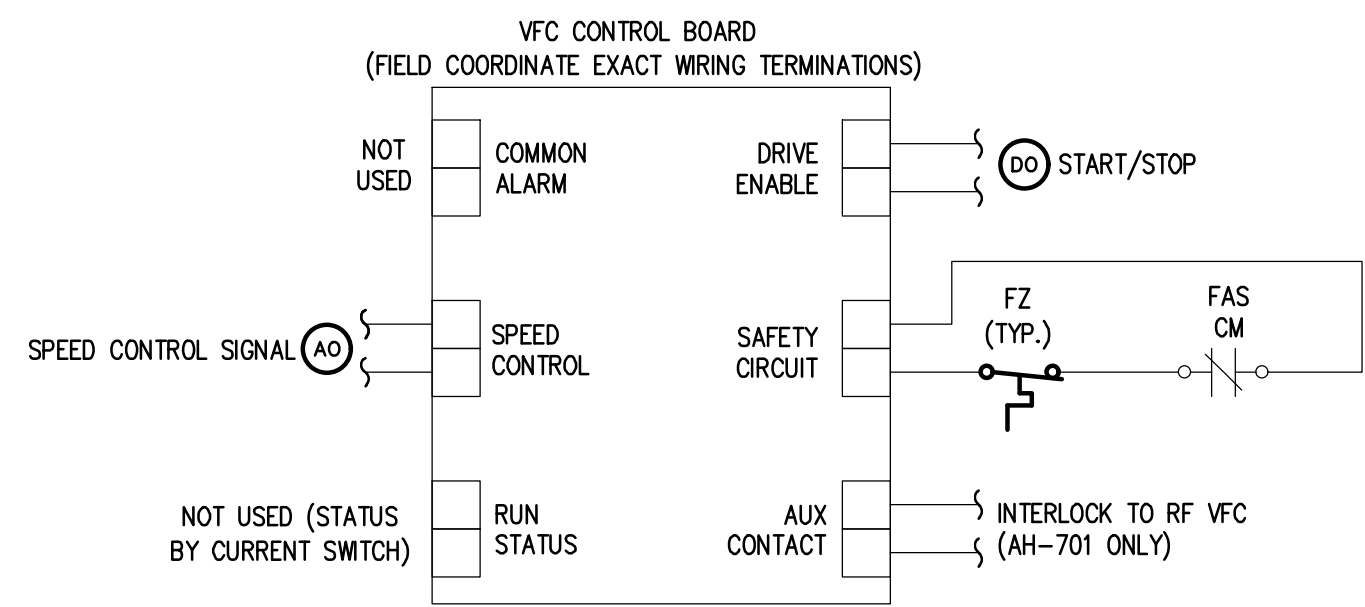
- REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
- REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED. EXISTING WIRING MAY BE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. SPLICING OF SENSOR CABLING/WIRING NOT PERMITTED.
- EXISTING CONTROL DAMPERS SHALL REMAIN. TO CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATORS AND REPLACE WITH NEW AS SPECIFIED. TO CONTRACTOR SHALL RECORD/MARK EXISTING OUTSIDE AIR DAMPER MINIMUM POSITION AND SET NEW CONTROL OF MINIMUM OUTSIDE AIR DAMPER POSITION TO MATCH EXISTING.
- EXISTING HEATING & COOLING COIL CONTROL VALVES SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TO CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVES REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
- TO CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF MOTOR SAFETY SHUTDOWN.
- TO CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. ALL CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON SYSTEM STATUS TO PREVENT LOOP WINDUP.

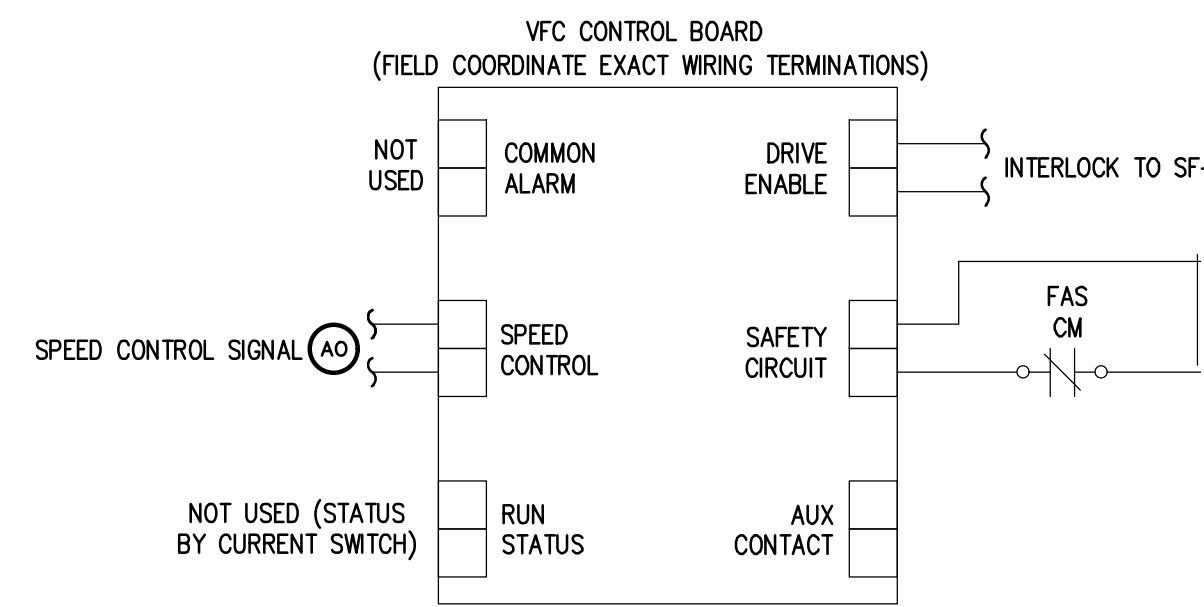
- SUPPLY FAN (WITH INTERLOCKED RETURN FAN AH-701 ONLY) SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. AHU SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM), TEMPORARY OCCUPIED MODE (SET FOR 2 HRS ENABLED FROM OVERRIDE SWITCH ON ASSOCIATED VAV TERMINAL UNIT TEMPERATURE SENSORS) AND UNOCCUPIED CYCLE MODE.
- FOR OCCUPIED MODE, AHU SHALL RUN CONTINUOUSLY TO MAINTAIN DISCHARGE AIR TEMP SETPOINT AND ZONE VAV TERMINAL UNITS WITH ASSOCIATED TEMPERING COILS SHALL BE CONTROLLED BY TERMINAL UNIT DDC CONTROLLERS TO MAINTAIN RESPECTIVE SPACE TEMP SETPOINT (REFER TO VAV TERMINAL UNIT CONTROL DETAILS AND SEQUENCE OF OPERATION AND FOR ADDITIONAL INFORMATION).
- FOR UNOCCUPIED HEATING MODE, AHU SHALL CYCLE SHALL UTILIZE NIGHT CYCLE MODE TO MAINTAIN A UNOCCUPIED SETBACK SPACE TEMP OF 62°F. DDC SHALL REFERENCE ALL VAV TERMINAL UNITS ASSOCIATED WITH RESPECTIVE AHU AND CYCLE BASED ON LOWEST SPACE TEMP READING.
- FOR UNOCCUPIED COOLING MODE, AHU SHALL REMAIN OFF.
- SUPPLY FAN (AND RETURN FAN AHU-701 ONLY) STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
- WHEN AHU IS ACTIVATED DURING OCCUPIED MODE, OUTSIDE AIR, RETURN AIR & (RELIEF AIR DAMPER AH-701 ONLY) (HEREIN REFERRED TO AS DAMPERS) SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN AHU IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE MODE OR MORNING WARM-UP MODE, DAMPERS SHALL REMAIN IN NORMAL POSITIONS (CLOSED TO OA).
- AHU-701 ONLY: OA ECONOMIZER MODE SHALL BE MADE AVAILABLE WHEN OA TEMP IS LESS THAN RA TEMP AND OA DEWPOINT IS LESS THAN OR EQUAL TO ECONOMIZER LOOKOUT SETPOINT OF 52°F.
- AHU-701 ONLY: WHEN ECONOMIZER IS AVAILABLE, DDC SHALL MODULATE MIXED AIR DAMPERS ABOVE MINIMUM OA POSITION IN SEQUENCE WITH COOLING COIL CONTROL VALVE TO MAINTAIN DA TEMP SETPOINT.
- AHU-701 ONLY: WHEN ECONOMIZER IS NOT AVAILABLE, DDC SHALL MODULATE MIXED AIR DAMPERS TO MAINTAIN MINIMUM OA POSITION AND MODULATE COOLING COIL CONTROL VALVE TO MAINTAIN DA TEMP SETPOINT.

- AHU-601 ONLY: ECONOMIZER NOT AVAILABLE, DDC SHALL MAINTAIN DAMPERS AT OA MINIMUM POSITION FOR VENTILATION.
 - A MIXED AIR TEMP LOW LIMIT SETPOINT 50°F SHALL PROVIDE OVERRIDE CONTROL OF MIXED AIR DAMPERS AND ALLOW MODULATION BELOW MINIMUM OA DAMPER POSITION SETPOINT.
 - DISCHARGE AIR TEMP SETPOINT SHALL BE BASED ON THE FOLLOWING OUTDOOR AIR TEMP RESET SCHEDULE:
- | QAT | QAT |
|--------|------|
| ≤ 50°F | 60°F |
| ≥ 55°F | 55°F |
- DURING MORNING WARM-UP OR UNOCCUPIED CYCLE MODES, DISCHARGE AIR TEMP SETPOINT SHALL BE 50°F UNTIL BUILDING OCCUPANCY TIME OR WHEN OCCUPIED MODE SPACE TEMPERATURE IS REACHED IN ONE OF THE ASSOCIATED ZONES.
 - SF VFC SHALL BE MODULATED BY DDC TO MAINTAIN SYSTEM SUPPLY AIR STATIC PRESSURE SETPOINT THAT SHALL BE RESET BASED ON DAMPER POSITION FEEDBACK FROM ASSOCIATED VAV BOX CONTROLLERS AS FOLLOWS: SETPOINT SHALL BE ADJUSTED TO ALLOW 3 SA TERMINAL UNITS TO OPERATE AT 90% OPEN DAMPER POSITION, BELOW 3 AT 90% SETPOINT SHALL BE SLOWLY DECREASED, ABOVE 3 AT 90% SETPOINT SHALL BE SLOWLY INCREASED. SETPOINT RANGE SHALL BE 0.5" W.G. TO 1.5" W.G. (BOTH ADJUSTABLE).
 - AHU-701 ONLY: RF VFC SHALL BE MODULATED TO MAINTAIN A CONTROL SIGNAL OFFSET. COORDINATE AIRFLOW OFFSET WITH AIR BALANCE CONTRACTOR. FOR WARM-UP AND UNOCCUPIED CYCLE MODES (WHEN DAMPERS ARE IN NORMAL POSITION), THE CFM DIFFERENTIAL SHALL BE ZERO AND SUPPLY STATIC PRESSURE CONTROL SHALL BE LIMITED BY THE MAXIMUM RF AIRFLOW.
 - FREEZE/STAT(S) SHALL DEACTIVATE SUPPLY FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZE/STAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
 - DUCT SMOKE DETECTOR(S) THRU FIRE ALARM SYSTEM CONTROL MODULE SHALL DEACTIVATE SF (AND INTERLOCKED RF AHU-701 ONLY) WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
 - FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE SWITCH. WHEN DP REACHES SETPOINT, DDC SHALL ACTIVATE DIRTY FILTER ALARM.
 - WHEN AHU IS DEACTIVATED, DAMPERS SHALL RETURN TO NORMAL POSITION (CLOSED TO OA). COOLING COIL VALVE SHALL REMAIN CLOSED AND HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MIXED AIR TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



AHU SF VFC WIRING

TYPICAL



AHU RF VFC WIRING

FOR AH-701 ONLY

TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M0.2 APPLY TO THIS DRAWING.



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PBA Project No: 2022.0380

PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community
Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

05-25-2023 CONSTRUCTION DOCUMENTS

03-15-2023 OWNER REVIEW

DATE: ISSUED FOR:

DRAWN: WJU

CHECKED: JWC

APPROVED: SVM

PROJECT NO.

22071C

DRAWING NO.

M2.1

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(E)VERTICAL UNIT VENTILATOR CONTROL RETROFIT - TYPE A

TYPICAL FOR TYPE A VUV'S

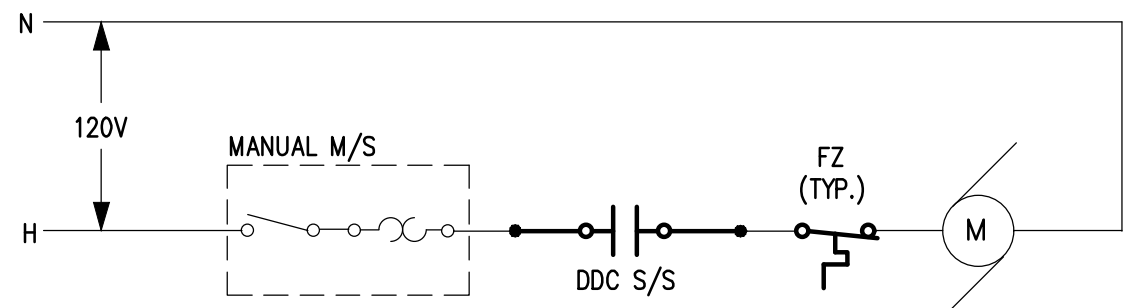
NOTES:

1. REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
2. REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED. EXISTING WIRING MAY BE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. SPLICING OF SENSOR CABLES/WIRING NOT PERMITTED.
3. WHERE INDICATED ON TC COMPOSITE PLANS, SPACE TEMP SHALL BE REFERENCED TO MULTIPLE VUV CONTROLLERS VIA DDC NETWORK.
4. EXISTING CONTROL DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATORS AND REPLACE WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL RECORD/MARK EXISTING OUTSIDE AIR DAMPER MINIMUM POSITION AND SET NEW CONTROL OF MINIMUM OUTSIDE AIR DAMPER POSITION TO MATCH EXISTING.
5. EXISTING HEATING & COOLING COIL CONTROL VALVES SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVES REPLACEMENT. REFER TO VUV CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
6. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF MOTOR SAFETY SHUTDOWN.
7. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

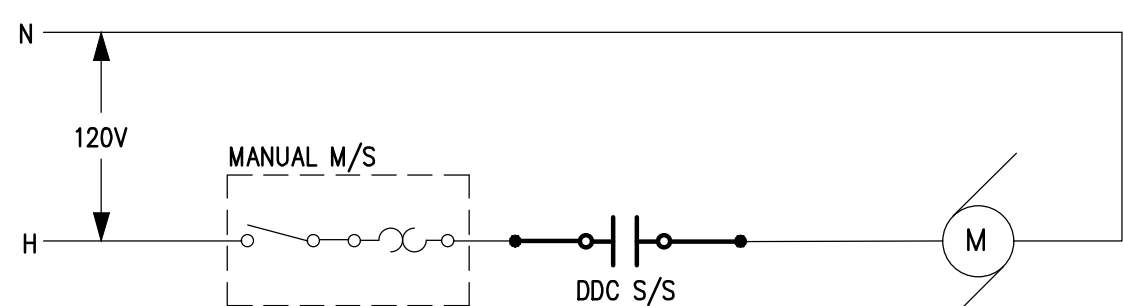
NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. FAN SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM), TEMPORARY OCCUPIED MODE (SET FOR 2 HRS ENABLED FROM OVERRIDE SWITCH ON TEMPERATURE SENSOR) AND UNOCCUPIED CYCLE MODE.
2. FOR HEATING OCCUPIED MODE, VUV SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
3. FOR COOLING OCCUPIED MODE, VUV SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 74°F.
4. FOR HEATING UNOCCUPIED MODE, VUV SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
5. FOR COOLING UNOCCUPIED MODE, VUV SHALL REMAIN OFF.
6. EXHAUST FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM AND SHALL BE SOFTWARE INTERLOCKED WITH SF TO BE ACTIVATED DURING THE OCCUPIED MODE WHENEVER MIXED AIR DAMPER IS OPERATING IN ECONOMIZER MODE AND EXCEEDS 50% OPEN.
7. SUPPLY FAN AND EXHAUST FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION FOR SF OR EF SHALL ACTIVATE ALARM.
8. WHEN VUV IS ACTIVATED DURING OCCUPIED MODE, MIXED AIR DAMPER SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN VUV IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE MODE, OR MORNING WARM-UP MODE, MIXED AIR DAMPER SHALL REMAIN IN NORMAL POSITION (CLOSED TO OA).
9. MIXED AIR LOW LIMIT OF 45°F SHALL PROVIDE OVERRIDE CONTROL OF MIXED AIR DAMPER AND ALLOW TO MODULATION BELOW MINIMUM OA POSITION SETPOINT.
10. WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL KEEP MIXED AIR DAMPER AT MINIMUM OA POSITION AND MODULATE HEATING COIL CONTROL VALVE TO MAINTAIN A DISCHARGE AIR TEMPERATURE SETPOINT THAT SHALL BE RESET BASED ON DEVIATION FROM SPACE TEMP SETPOINT (CASCADE CONTROL LOGIC). HEATING MODE DISCHARGE AIR TEMP SETPOINT RANGE SHALL BE 65°F TO 65°F.
11. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS LESS THAN SPACE TEMP AND OUTSIDE AIR DEWPOINT IS LESS THAN ECONOMIZER LOCKOUT SETPOINT OF 52°F, DDC SHALL MODULATE THE COOLING COIL VALVE IN SEQUENCE WITH MIXED AIR DAMPER OA ECONOMIZER TO MAINTAIN SPACE TEMP SETPOINT.
12. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS GREATER THAN SPACE TEMP AND OUTSIDE AIR DEWPOINT IS ABOVE ECONOMIZER LOCKOUT SETPOINT OF 52°F, MIXED AIR DAMPER SHALL REMAIN AT MINIMUM OA POSITION AND DDC SHALL MODULATE THE COOLING COIL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
13. DURING MORNING WARM-UP, DAT SETPOINT SHALL BE 90°F UNTIL ZONE OCCUPANCY TIME IS REACHED OR WHEN OCCUPIED MODE SPACE TEMPERATURE IS REACHED.
14. AUTO-RESET FREEZE/STAT CUTOFF SHALL BE WIRED TO DEACTIVATE SF, FULLY CLOSE OA DAMPER AND FULLY OPEN HHV COIL VALVE WHEN OA TEMP IS 35°F OR BELOW. BAS LOW-LIMIT FREEZE/STAT ALARM SHALL BE ACTIVATED AND DDC SOFTWARE LOCKOUT SHALL HOLD UNIT OFF UNTIL IT IS RESET BY OPERATOR FROM GRAPHICAL INTERFACE FOR UNIT.
15. WHEN VUV IS DEACTIVATED, MIXED AIR DAMPER SHALL RETURN TO NORMAL POSITION (CLOSED TO OA) AND COOLING COIL VALVE SHALL REMAIN CLOSED.
16. WHEN OA TEMP IS BELOW 40°F AND VUV IS DEACTIVATED, HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MIXED AIR TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



VUV SF M/S WIRING

TYPICAL



VUV EF M/S WIRING

TYPICAL



(E)VERTICAL UNIT VENTILATOR CONTROL RETROFIT - TYPE B

TYPICAL FOR TYPE B VUV'S

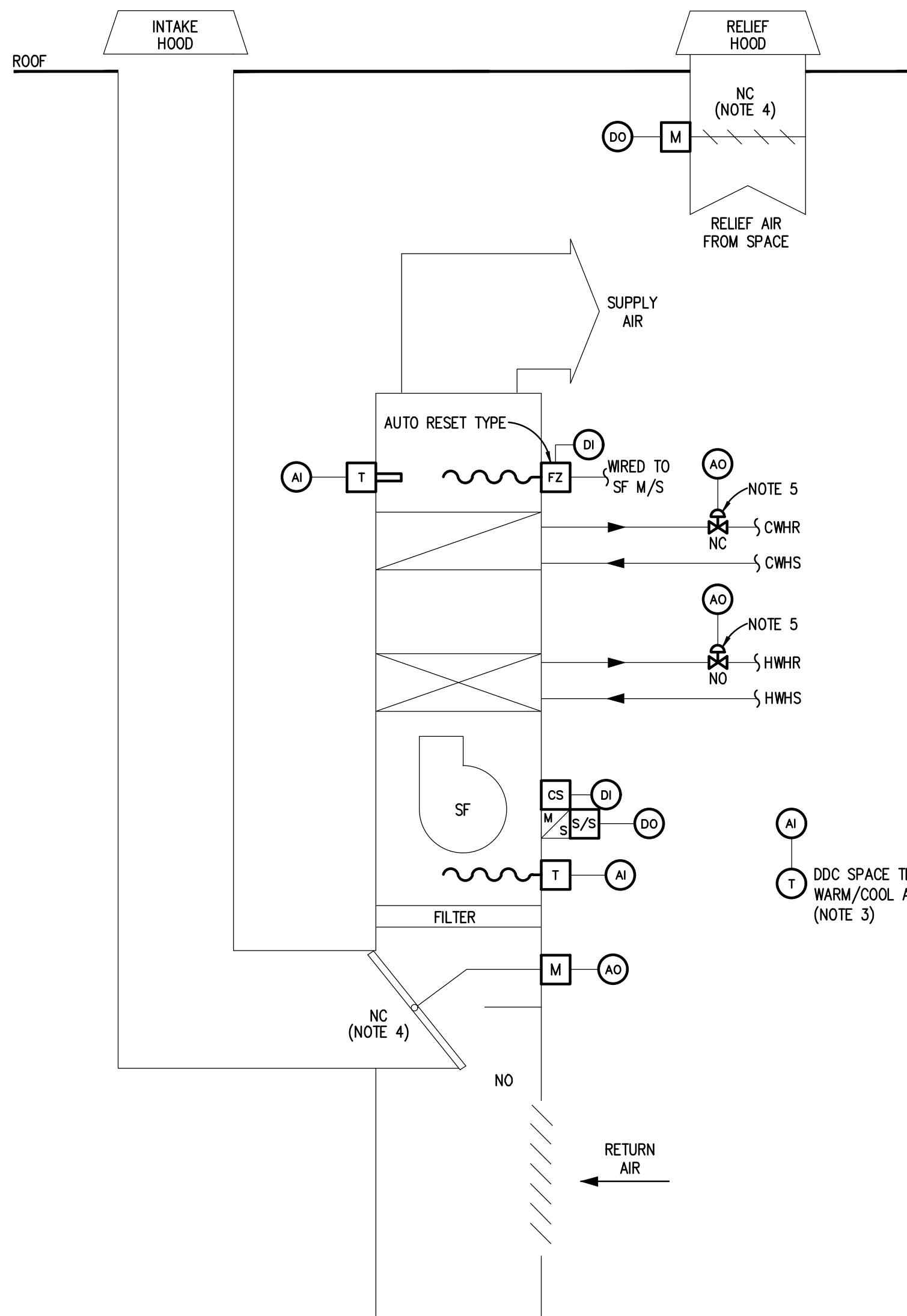
NOTES:

1. REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
2. REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED. EXISTING WIRING MAY BE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. SPLICING OF SENSOR CABLES/WIRING NOT PERMITTED.
3. WHERE INDICATED ON TC COMPOSITE PLANS, SPACE TEMP SHALL BE REFERENCED TO MULTIPLE VUV CONTROLLERS VIA DDC NETWORK.
4. EXISTING CONTROL DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATORS AND REPLACE WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL RECORD/MARK EXISTING OUTSIDE AIR DAMPER MINIMUM POSITION AND SET NEW CONTROL OF MINIMUM OUTSIDE AIR DAMPER POSITION TO MATCH EXISTING.
5. EXISTING HEATING & COOLING COIL CONTROL VALVES SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVES REPLACEMENT. REFER TO VUV CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
6. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF MOTOR SAFETY SHUTDOWN.
7. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

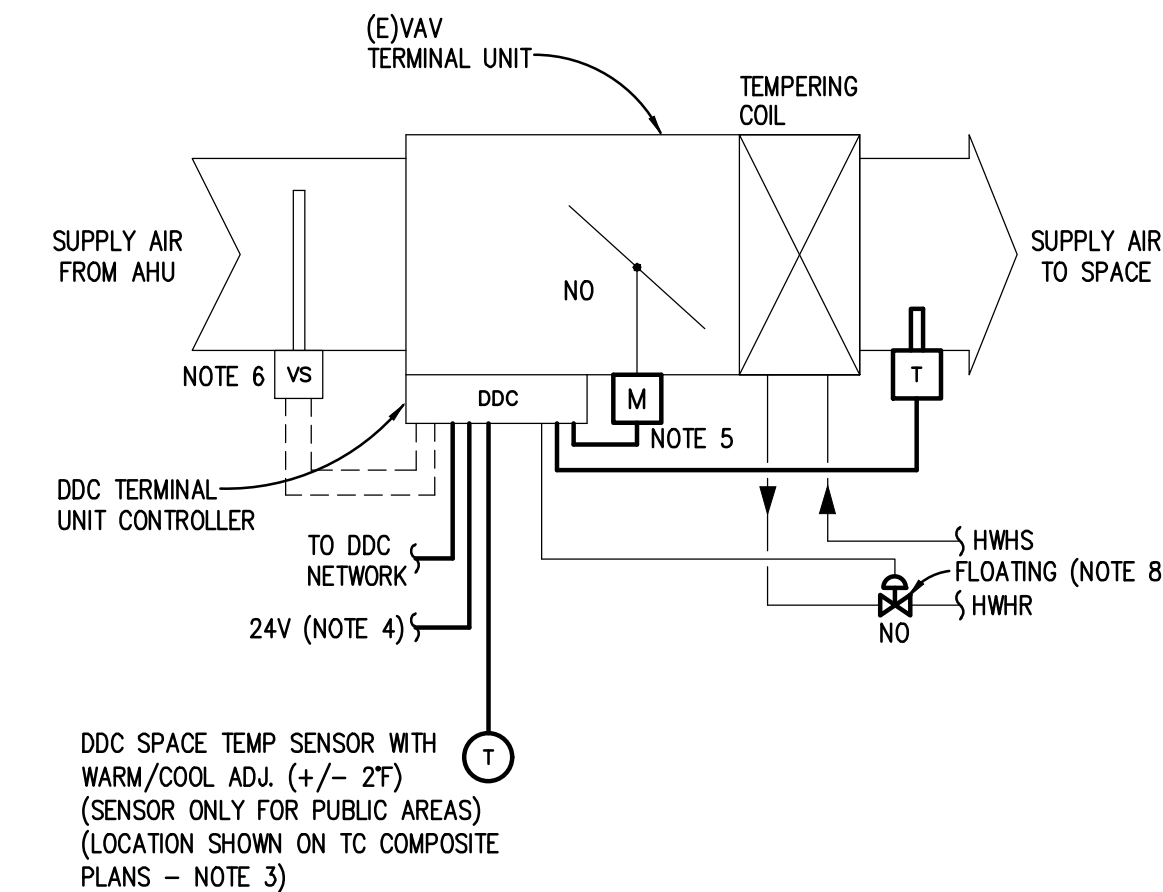
NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. FAN SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM), TEMPORARY OCCUPIED MODE (SET FOR 2 HRS ENABLED FROM OVERRIDE SWITCH ON TEMPERATURE SENSOR) AND UNOCCUPIED CYCLE MODE.
2. FOR HEATING OCCUPIED MODE, VUV SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
3. FOR COOLING OCCUPIED MODE, VUV SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 74°F.
4. FOR HEATING UNOCCUPIED MODE, VUV SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
5. FOR COOLING UNOCCUPIED MODE, VUV SHALL REMAIN OFF.
6. SUPPLY FAN SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION FOR SF SHALL ACTIVATE ALARM.
7. WHEN VUV IS ACTIVATED DURING OCCUPIED MODE, MIXED AIR DAMPER SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN VUV IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE OR MORNING WARM-UP MODE, MIXED AIR DAMPER SHALL REMAIN IN NORMAL POSITION (CLOSED TO OA).
8. RELIEF AIR DAMPER SHALL HAVE OPEN/CLOSE CAPABILITY FROM THE DDC SYSTEM AND SHALL BE SOFTWARE INTERLOCKED WITH SF TO BE ACTIVATED DURING THE OCCUPIED MODE WHENEVER MIXED AIR DAMPER IS OPERATING IN ECONOMIZER MODE AND EXCEEDS 50% OPEN. WHEN VUV IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE OR MORNING WARM-UP MODE, RELIEF AIR DAMPER SHALL REMAIN CLOSED.
9. MIXED AIR LOW LIMIT OF 45°F SHALL PROVIDE OVERRIDE CONTROL OF MIXED AIR DAMPER AND ALLOW TO MODULATION BELOW MINIMUM OA POSITION SETPOINT.
10. WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL KEEP MIXED AIR DAMPER AT MINIMUM OA POSITION AND MODULATE HEATING COIL CONTROL VALVE TO MAINTAIN A DISCHARGE AIR TEMPERATURE SETPOINT THAT SHALL BE RESET BASED ON DEVIATION FROM SPACE TEMP SETPOINT (CASCADE CONTROL LOGIC). HEATING MODE DISCHARGE AIR TEMP SETPOINT RANGE SHALL BE 65°F TO 65°F.
11. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS LESS THAN SPACE TEMP AND OUTSIDE AIR DEWPOINT IS LESS THAN ECONOMIZER LOCKOUT SETPOINT OF 52°F, DDC SHALL MODULATE THE COOLING COIL VALVE IN SEQUENCE WITH MIXED AIR DAMPER OA ECONOMIZER TO MAINTAIN SPACE TEMP SETPOINT.
12. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS GREATER THAN SPACE TEMP AND OUTSIDE AIR DEWPOINT IS ABOVE ECONOMIZER LOCKOUT SETPOINT OF 52°F, MIXED AIR DAMPER SHALL REMAIN AT MINIMUM OA POSITION AND DDC SHALL MODULATE THE COOLING COIL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
13. DURING MORNING WARM-UP, DAT SETPOINT SHALL BE 90°F UNTIL ZONE OCCUPANCY TIME IS REACHED OR WHEN OCCUPIED MODE SPACE TEMPERATURE IS REACHED.
14. AUTO-RESET FREEZE/STAT CUTOFF SHALL BE WIRED TO DEACTIVATE SF, FULLY CLOSE OA DAMPER AND FULLY OPEN HHV COIL VALVE WHEN OA TEMP IS 35°F OR BELOW. BAS LOW-LIMIT FREEZE/STAT ALARM SHALL BE ACTIVATED AND DDC SOFTWARE LOCKOUT SHALL HOLD UNIT OFF UNTIL IT IS RESET BY OPERATOR FROM GRAPHICAL INTERFACE FOR UNIT.
15. WHEN VUV IS DEACTIVATED, MIXED AIR DAMPER SHALL RETURN TO NORMAL POSITION (CLOSED TO OA) AND COOLING COIL VALVE SHALL REMAIN CLOSED.
16. WHEN OA TEMP IS BELOW 40°F AND VUV IS DEACTIVATED, HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MIXED AIR TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



TC GENERAL NOTES

TC GENERAL NOTES ON DRAWING M0.2 APPLY TO THIS DRAWING.



(E)VAV AIR TERMINAL UNIT CONTROL RETROFIT

TYPICAL

NOTES:

1. REFER TO TC COMPOSITE PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
3. WHERE INDICATED ON TC COMPOSITE PLANS, SPACE TEMP SHALL BE REFERENCED TO MULTIPLE VAV TERMINAL UNIT CONTROLLERS VIA DDC NETWORK.
4. TC CONTRACTOR SHALL PROVIDE 24V POWER SUPPLY TO VAV TERMINAL UNIT CONTROLLER.
5. EXISTING TERMINAL UNIT DAMPER TO BE REUSED. TC CONTRACTOR SHALL PROVIDE NEW DDC FLOATING DAMPER ACTUATOR INTEGRAL TO VAV TERMINAL UNIT CONTROLLER.
6. EXISTING VAV TERMINAL UNIT VELOCITY SENSOR TO BE REUSED. TC CONTRACTOR TO REPLACE AIRFLOW TUBING TO NEW CONTROLLER.
7. TC CONTRACTOR SHALL COORDINATE WITH TAB CONTRACTOR TO DETERMINE DAMPER CONTROL SETTINGS TO ACHIEVE SCHEDULED MINIMUM AND MAXIMUM CFMS. REFER TO VAV TERMINAL UNIT SCHEDULE FOR DETAILS.
8. EXISTING TEMPERING COIL CONTROL VALVE SHALL BE REPLACED WITH NEW AS SPECIFIED. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO VAV TERMINAL UNIT SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. ALL TU'S ASSOCIATED WITH A SINGLE SPACE TEMP SENSOR SHALL CONTROL IN UNISON.
2. SUPPLY AIR TERMINAL UNIT'S (TU) VAV MINIMUM AND MAXIMUM AIRFLOW SETTINGS SHALL BE AS INDICATED ON THE VAV TERMINAL UNIT SCHEDULES. WHERE MINIMUM AND MAXIMUM AIRFLOW SETTINGS ARE THE SAME, THE TU CONTROLLER SHALL PERFORM CONSTANT AIR VOLUME CONTROL.
3. IN ALL MODES OF HEATING, TU DISCHARGE AIR TEMP SENSOR SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90°F DAT.
4. IN ALL MODES OF OPERATION, TU DISCHARGE AIR TEMP SENSOR SHALL PROVIDE LOW LIMIT SETPOINT OF 45°F. IF TEMPERING COIL VALVE IS MODULATED TO FULL OPEN POSITION, TU DAMPER SHALL BE MODULATED TO CLOSED POSITION. DDC SHALL ACTIVATE "LOW LIMIT CONTROL" ALARM UPON THE OPERATING CONDITION (OPERATOR SHOULD VERIFY TEMPERING COIL OPERATION).
5. WHEN SPACE TEMP RISES ABOVE THE COOLING SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL KEEP THE TEMPERING COIL VALVE CLOSED AND MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM SETTINGS.
6. WHEN SPACE TEMP FALLS BELOW HEATING SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL FIRST MODULATE TU DAMPER TOWARDS ITS MIN AIRFLOW SETTING. WHEN AIRFLOW IS AT MIN, CONTROLLER SHALL MODULATE TEMPERING COIL CONTROL VALVE OPEN. IF THE ROOM TEMP IS BELOW SETPOINT WITH TEMPERING COIL VALVE FULL OPEN, THE SUPPLY AIR TU CONTROLLER SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM SETTING TO MAINTAIN SPACE TEMP.
7. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
HEATING UNOCCUPIED SETPOINT = 62°F
HEATING OCCUPIED SETPOINT = 72°F
COOLING OCCUPIED SETPOINT = 75°F
COOLING UNOCCUPIED SETPOINT = 80°F
8. WHEN RESPECTIVE AHU IS DEACTIVATED, THE TERMINAL UNIT TEMPERING COIL CONTROL VALVE SHALL REMAIN CLOSED.
9. THE DDC TU CONTROLLER SHALL RECALIBRATE THE AIRFLOW SENSOR AND RESET FLOATING CONTROL DAMPER AND CONTROL VALVE ACTUATORS ONCE A WEEK MINIMUM. THE RECALIBRATION AND RESET PROCESS SHALL OCCUR WHEN RESPECTIVE AHU IS DEACTIVATED.
10. TU DISCHARGE AIR TEMP SHALL BE MONITORED FOR SYSTEM DIAGNOSTICS AND PROVIDE HIGH AND LOW LIMIT CONTROL AS DESCRIBED.
11. WHEN RESPECTIVE AHU IS OPERATING IN PURGE MODE, THE TERMINAL UNIT SHALL MAINTAIN ITS MAXIMUM AIRFLOW SETTING UNTIL SPACE OCCUPIED TEMPERATURE SETPOINT IS ACHIEVED.
12. CONTROL SIGNALS FOR AIR TERMINAL UNIT DAMPER ACTUATOR AND HEATING CONTROL OUTPUT(S) SHALL BE DISPLAYED WITH SYSTEM GRAPHICS.



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PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community
Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

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05-25-2023 CONSTRUCTION DOCUMENTS

03-15-2023 OWNER REVIEW

DATE: ISSUED FOR:

DRAWN: WJU

CHECKED: JWC

APPROVED: SVM

PROJECT NO.

22071C

DRAWING NO.

M2.2

REGISTRATION SEAL

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PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

05-25-2023	CONSTRUCTION DOCUMENTS
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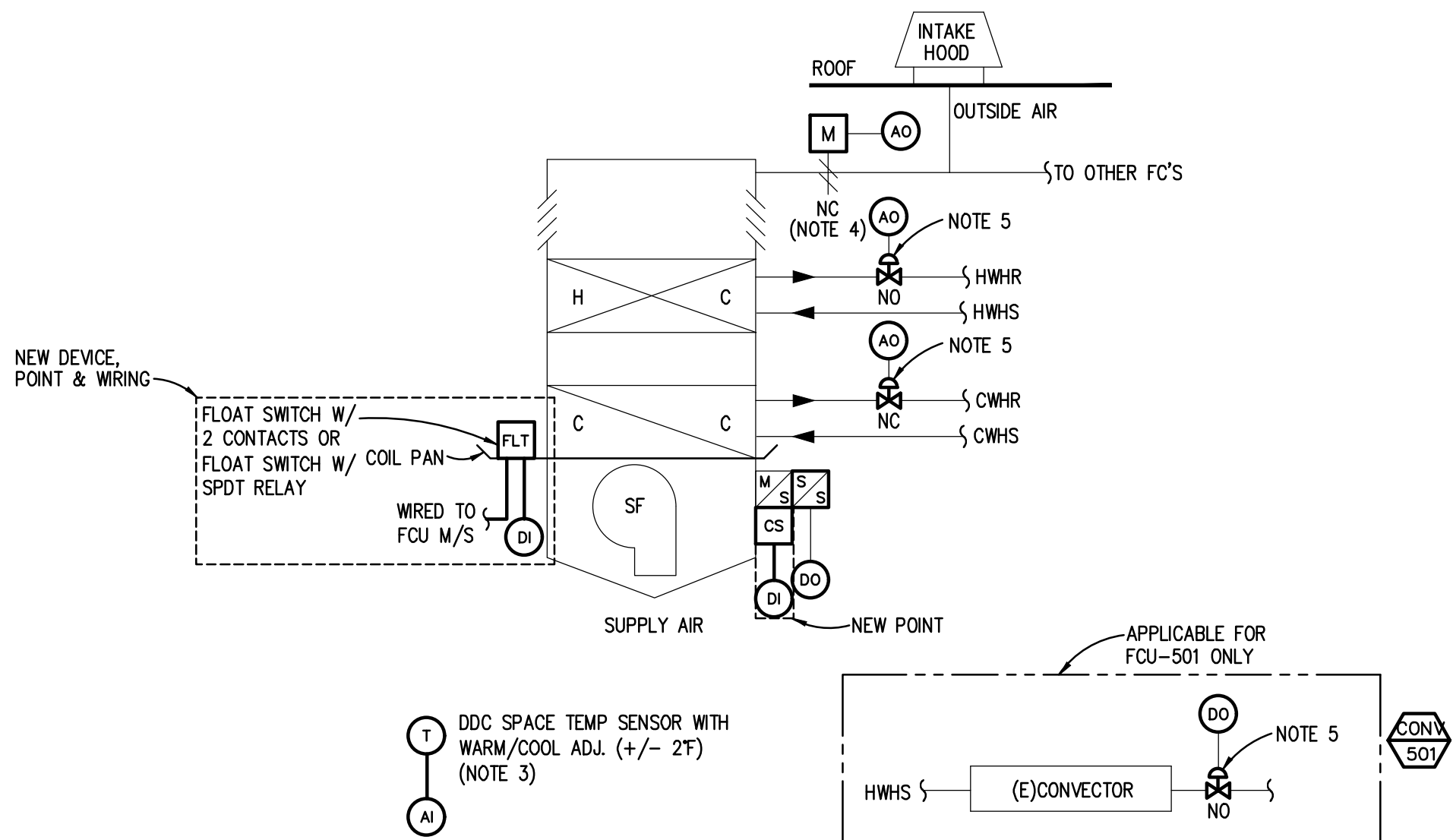
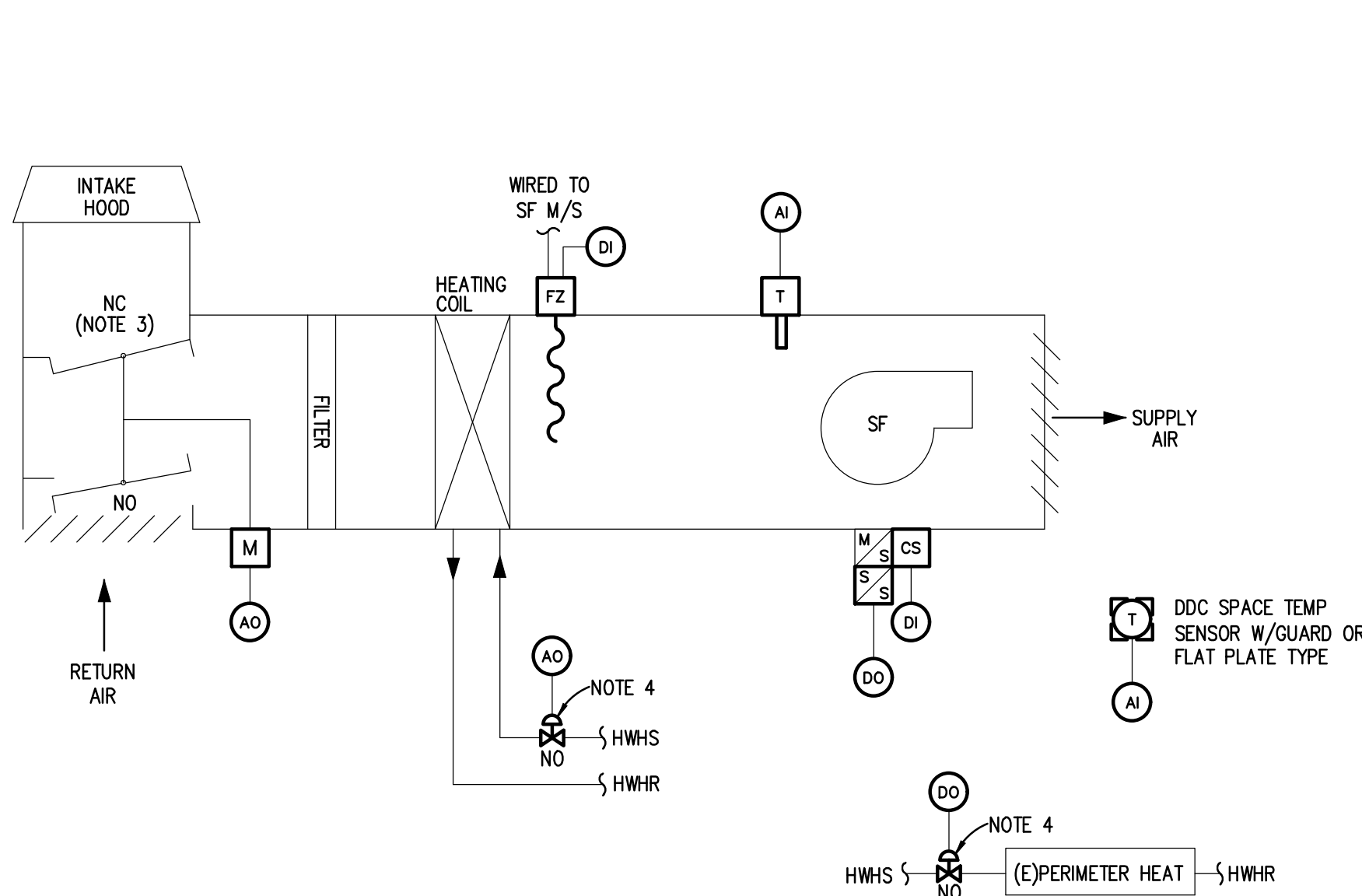
PROJECT NO.

22071C

DRAWING NO.

M2.3

TC GENERAL NOTES ON DRAWING M0.2 APPLY TO THIS DRAWING



HUV-501 & FTR-501 SERVES BOYS LOCKER ROOM
HUV-502 & FTR-502 SERVES GIRLS LOCKER ROOM

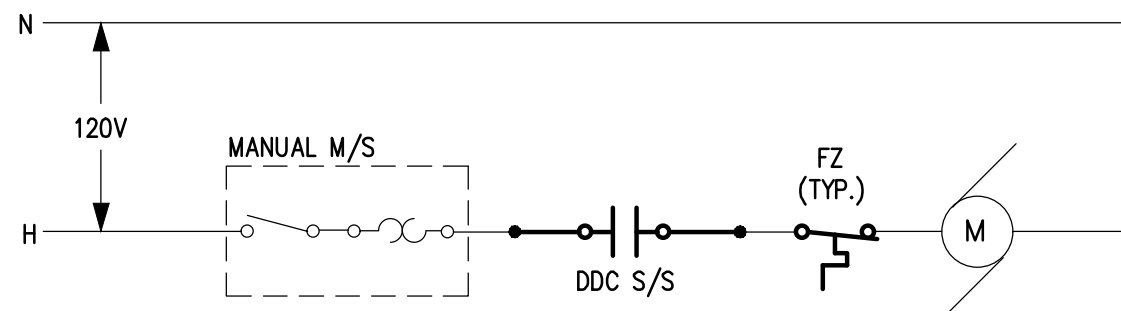
NOTES:

1. REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
2. REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED. EXISTING WIRING MAY BE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. SPlicing OF SENSOR CABLEING/WIRING NOT PERMITTED.
3. EXISTING CONTROL DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATORS AND REPLACE WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL RECORD/MARK EXISTING OUTSIDE AIR DAMPER MINIMUM POSITION AND SET NEW CONTROL OF MINIMUM OUTSIDE AIR DAMPER POSITION TO MATCH EXISTING.
4. EXISTING HEATING COIL CONTROL VALVE SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED TO CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO HU/C CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO E/ MOTOR SAFETY SHUTDOWN.
6. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. FAN SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM) TEMPORARY OCCUPIED MODE (GET 20% HRS EMERGED FROM OVERIDE SWITCH ON TEMPERATURE SENSORS) AND UNOCCUPIED CYCLE MODE.
2. FOR OCCUPIED MODE, HUV SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
3. FOR UNOCCUPIED MODE, DDC SHALL OPEN PERMITTER RADIATION VALVE TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F. IF PERMITTER RADIATION CANNOT MAINTAIN SPACE TEMP SETPOINT, HUV SHALL CYCLE ON AND OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
4. EXHAUST FAN (E2-502 AND E2-503) SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. EXHAUST FAN SHALL HAVE SOFTWARE LOGIC WITH RESPECTIVE HUV TO BE ACTIVATED DURING OCCUPIED MODE. E2'S SHALL REMAIN OFF DURING UNOCCUPIED MODE.
5. SUPPLY FAN SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION FOR HV SF SHALL ACTIVATE ALARM.
6. WHEN HV IS ACTIVATED DURING OCCUPIED MODE, MIXED AIR DAMPER SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN HUV IS DEACTIVATED OR OPERATING IN UNOCCUPIED CYCLE MODE, HUV SHALL WIND-UP TO 100% VALVE POSITION AND REMAIN IN NORMAL POSITION.
7. WHEN SPACE TEMP IS BELOW SETPOINT, DDC SHALL KEEP MIXED AIR DAMPER AT MINIMUM OF POSITION, OPEN PERMITTER RADIATION VALVE AND MODULATE HEATING COIL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
8. WHEN SPACE TEMP IS ABOVE SETPOINT, DDC SHALL KEEP MIXED AIR DAMPER AT MINIMUM OF POSITION.
9. AUTO-RESET FREEZE/STADT OUTOUT SHALL BE WIRED TO DEACTIVATE SF, FULLY CLOSE OA DAMPER AND FULLY OPEN HHV COIL VALVE WHEN OA TEMP IS 35°F OR BELOW. BAS LOW-LIMIT FREEZE/STADT SHALL BE ACTIVATED AND DDC SOFTWARE LOCKOUT SHALL HOLD OUT UNTIL IT IS RESET BY OPERATOR FROM GRAPHICAL INTERFACE FOR UNIT.
10. WHEN HUV IS DEACTIVATED, MIXED AIR DAMPER SHALL RETURN TO NORMAL POSITION (CLOSE TO OA).
11. WHEN OA TEMP IS BELOW 40°F AND HUV IS DEACTIVATED, HEATING COIL VALVE SHALL BE DEACTIVATED AND DDC SHALL BE ALLOWED TO DISCHARGE AIR TEMP TO MAINTAIN LOW LIMIT FLENUM TEMP SETPOINT OF 50°F.



HUV SF M/S WIRING

TYPICAL



TYPICAL

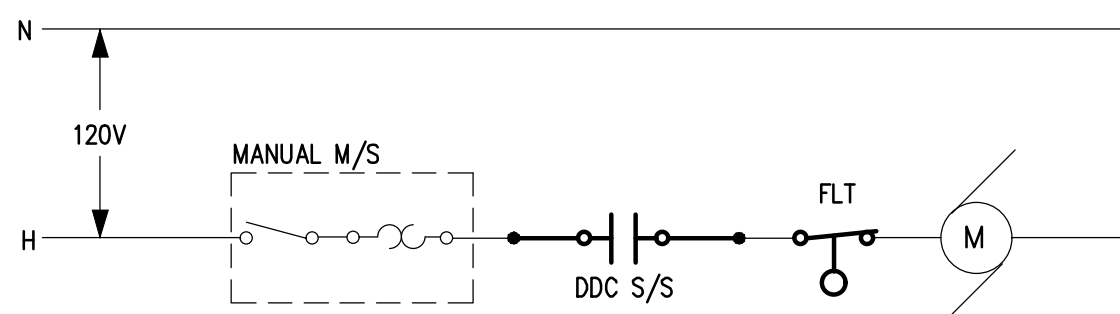
NOTES:

1. REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
2. REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
3. WHERE INDICATED ON TC COMPOSITE PLANS, SPACE TEMP SHALL BE REFERENCED TO MULTIPLE FOU CONTROLLERS VIA DDC NETWORK.
4. EXISTING CONTROL DAMPER SHALL REMAIN. TO CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATOR AND REPLACE WITH NEW AS SPECIFIED.
5. EXISTING HEATING & COOLING COIL CONTROL VALVES SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TO CONTRACTOR IS RESPONSIBLE FOR CONTROL VALVES REPLACEMENT. REFER TO FOU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
6. TO CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL IN F&E MOTOR SAFETY SHUTDOWN.
7. TO CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS, OCCUPIED/UNOCCUPIED MODE SCHEDULING, MONITORED TEMPERATURES AND VARIOUS ALARMS AS DESCRIBED IN SEQUENCE SHALL BE ACCESSIBLE BY SYSTEM OPERATORS THRU BAS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. UNIT SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (WITH MORNING WARM-UP), TEMPORARY OCCUPIED MODE (SET FOR 2 HOURS), ENABLED FROM OVERRIDE SWITCH ON TEMPERATURE SENSOR) AND UNOCCUPIED CYCLE MODE.
2. FOR HEATING OCCUPIED MODE, FCU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
3. FOR COOLING OCCUPIED MODE, FCU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 74°F.
4. FOR HEATING UNOCCUPIED MODE, FCU SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
5. FOR COOLING UNOCCUPIED MODE, FCU SHALL REMAIN OFF.
6. SUPPLY FAN STATUS SHALL BE MONITORED BY DDC THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION FOR SF SHALL ACTIVATE ALARM.
7. WHEN FCU IS ACTIVATED DURING OCCUPIED MODE, OUTSIDE AIR DAMPER SHALL OPEN TO ALLOW FRESH AIR TO SPACE (AS SET BY AIR BALANCE CONTRACTOR - REFER TO FAN COIL UNIT SCHEDULE FOR O/F FLOW REQUIREMENTS) FOR OCCUPIED MODE. WHEN FCU IS DEACTIVATED OR OPERATING IN UNOCCUPIED OR MORNING WARM-UP MODE, OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.
8. WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL MODULATE HWI COIL CONTROL VALVE TO MAINTAIN A SPACE TEMP SETPOINT. FOR SPACES WITH CONNECTORS, DDC SHALL OPEN CONNECTOR CONTROL VALVE FOR FIRST STAGE OF HEAT.
9. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT, DDC SHALL MODULATE CWH COIL CONTROL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
10. FLOAT SWITCH MOUNTED IN COOLING COIL DRAIN PAN IS TO BE HARDWIRED INTERLOCKED TO SF MOTOR START AND MONITORED BY DDC. SHOULD WATER LEVEL REACH SETPOINT, FCU SF SHALL BE DEACTIVATED AND DDC SHALL CLOSE COOLING COIL VALVE AND GENERATE ALARM AT BAS.



FCU SF M/S WIRING

TYPICAL

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TC GENERAL NOTES
TC GENERAL NOTES ON DRAWING M0.2 APPLY TO THIS DRAWING.



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PSA Project No. 2022.0380

PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community
Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

05-25-2023 CONSTRUCTION DOCUMENTS
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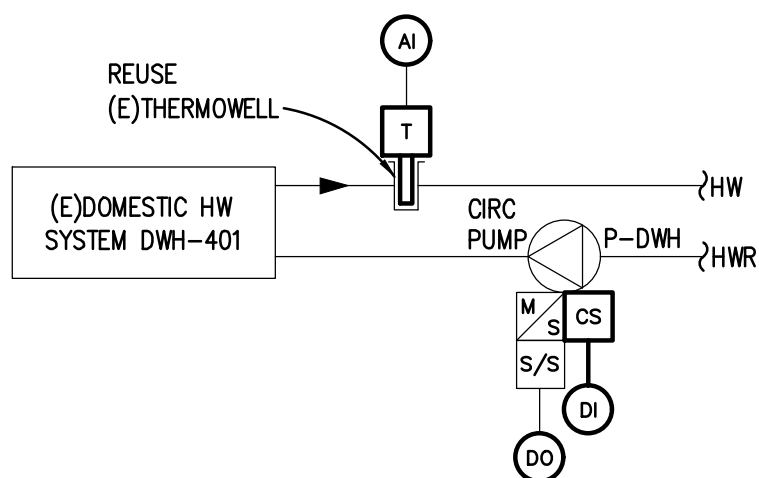
APPROVED: SVM

PROJECT NO.

22071C

DRAWING NO.

M2.5



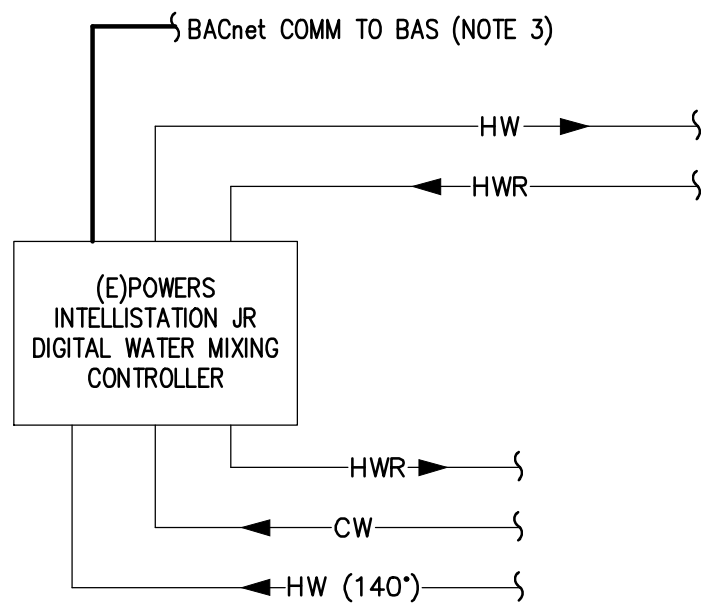
(E)DOM HW SYSTEM MONITORING & CONTROL

NOTES:

- REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
- REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED. EXISTING WIRING MAY BE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. SPLICING OF SENSOR CABLING/WIRING NOT PERMITTED.
- TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

- DDC SHALL ACTIVATE DOMESTIC HW ORC PUMP BASED ON TIME SCHEDULE. ABNORMAL OPERATING STATUS SHALL ACTIVATE AN ALARM.
- DDC SYSTEM SHALL MONITOR DOMESTIC HW SYSTEM SUPPLY TEMP FOR REMOTE SYSTEM DIAGNOSTIC CAPABILITY BY OWNER.



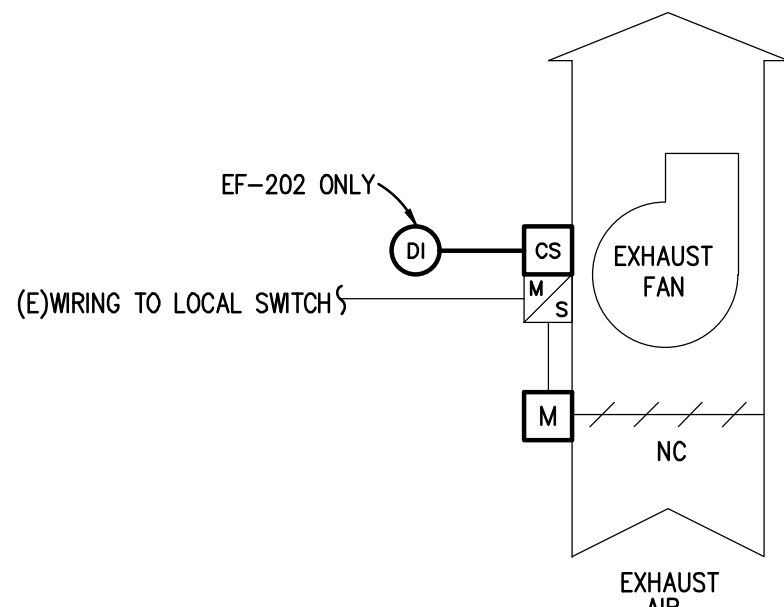
(E)DHW MIXING VALVE MONITORING

NOTES:

- UNIT LOCATED IN TUNNEL OF BOILER ROOM.
- ALL EXISTING PACKAGED CONTROLS FOR DWH SYSTEM SHALL REMAIN AS-IS.
- TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING FROM DWH MIXING CONTROLLER TO BAS NETWORK SUPERVISOR. TC CONTRACTOR SHALL PROVIDE ALL LABOR TO COORDINATE PROGRAMMING UNIT INTEGRATION TO BAS NETWORK. THE FOLLOWING POINTS SHALL BE MADE AVAILABLE FOR GRAPHIC DISPLAY:

ANALOG PARAMETERS:
OBJECT 0 MIXED WATER OUTLET TEMPERATURE (TO BAS)
OBJECT 1 MIXING VALVE POSITION (TO BAS)
OBJECT 2 MIXED WATER HIGH WATER TEMPERATURE (TO BAS)
OBJECT 3 MIXED WATER LOW TEMPERATURE (TO BAS)
OBJECT 6 HIGH WATER TEMP ALARM (TO BAS)
OBJECT 7 LOW WATER TEMP ALARM (TO BAS)
OBJECT 8 ERROR CODE

ANALOG VALVE OBJECTS:
MIXED WATER OUTLET SETPOINT (TO/FROM BAS)



(E)EXHAUST FAN CONTROL - LOCAL SWITCH

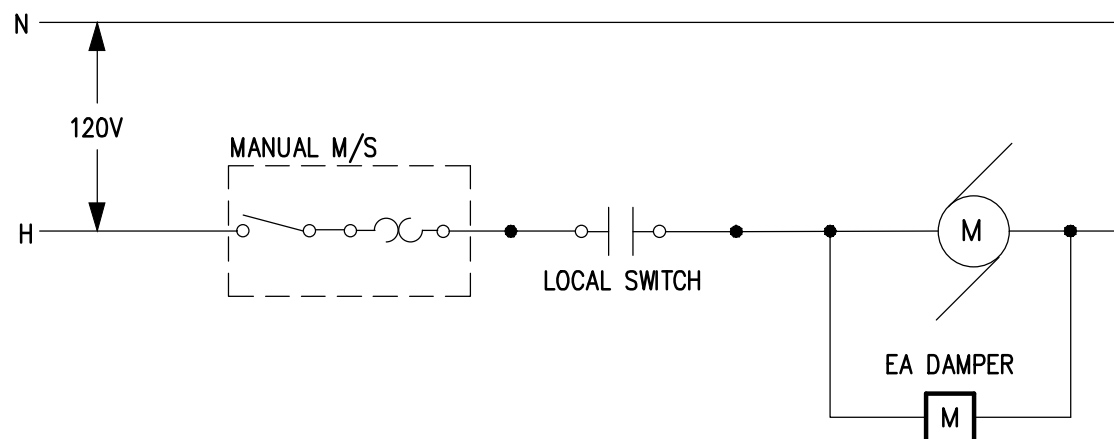
TYPICAL - REFER TO EXHAUST FAN CONTROL SCHEDULE

NOTES:

- REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNIT.
- REMOVE ALL EXISTING DDC CONTROLS AND REPLACED WITH NEW AS SPECIFIED.
- EXISTING CONTROL DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATOR AND REPLACE WITH NEW AS SPECIFIED.

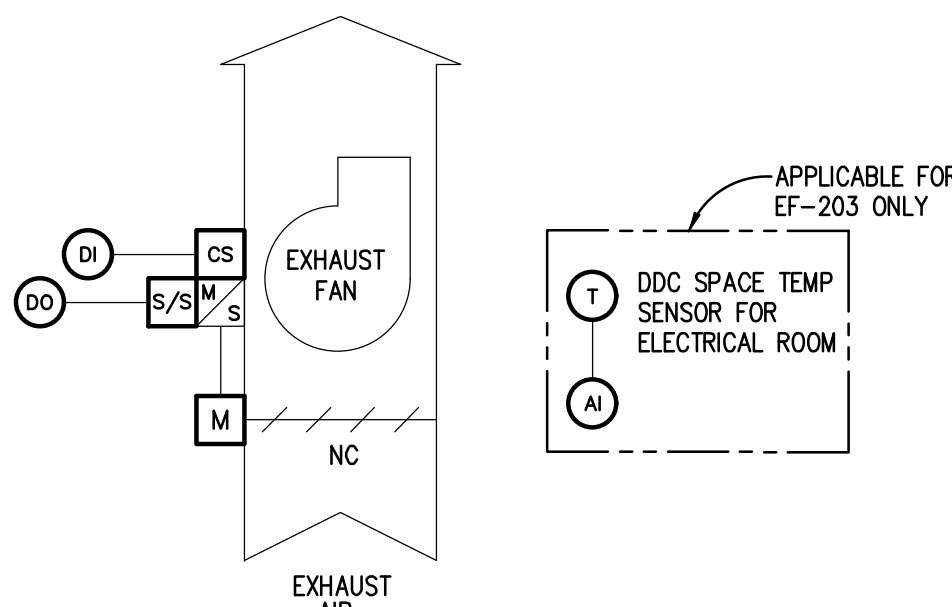
SEQUENCE OF OPERATION:

- EXHAUST FAN SHALL BE STARTED AND STOPPED BY LOCAL CONTROL SWITCH. WIRING INTERLOCK SHALL OPEN EXHAUST AIR DAMPER.
- DDC SYSTEM SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH.



EXHAUST FAN M/S WIRING

TYPICAL



(E)EXHAUST FAN CONTROL - DDC

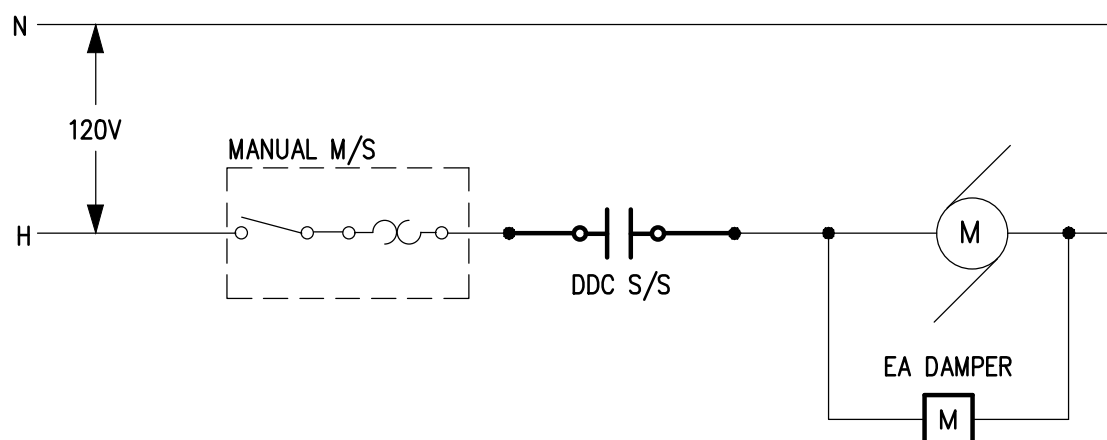
TYPICAL - REFER TO EXHAUST FAN CONTROL SCHEDULE

NOTES:

- REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNIT.
- REMOVE ALL EXISTING DDC CONTROLS AND REPLACED WITH NEW AS SPECIFIED.
- EXISTING CONTROL DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATOR AND REPLACE WITH NEW AS SPECIFIED.

SEQUENCE OF OPERATION:

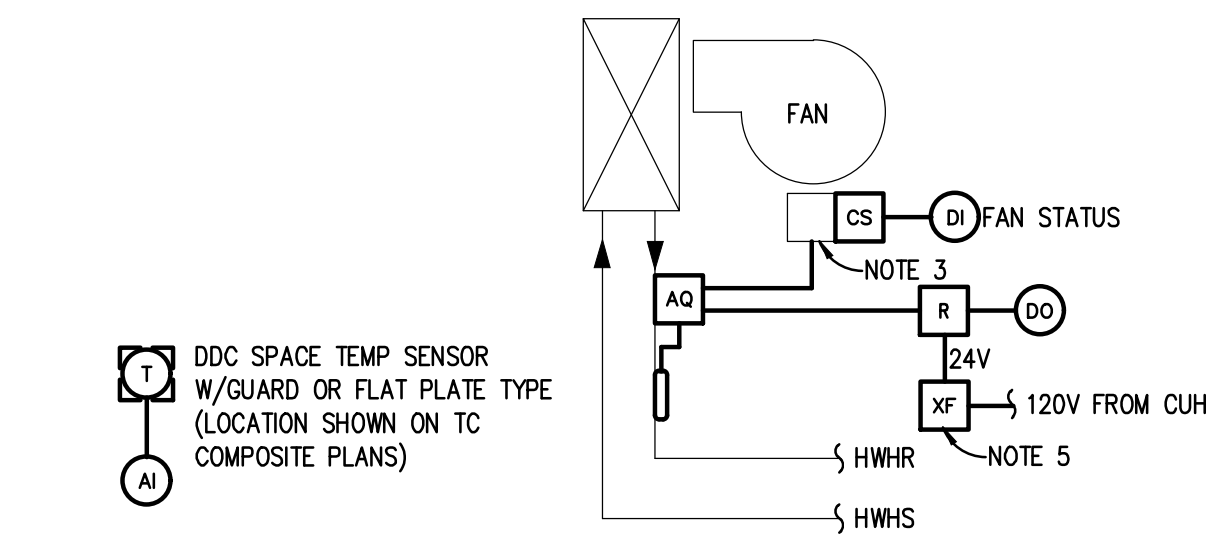
- EF SHALL BE STARTED AND STOPPED BASED ON TIME SCHEDULE. WIRING INTERLOCK SHALL OPEN EXHAUST AIR DAMPER.
- DDC SYSTEM SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM TO BAS.
- EF-203 ONLY: DURING UNOCCUPIED HOURS, DDC SHALL ACTIVATE EF-203 WHEN SPACE TEMP IN ELECTRICAL ROOM IS ABOVE 80°F (ADJUSTABLE). WIRING INTERLOCK SHALL OPEN EXHAUST AIR DAMPER.



EXHAUST FAN M/S WIRING

TYPICAL

EXHAUST FAN CONTROL SCHEDULE				
UNIT IDENTIFICATION	SERVICE	CONTROL		REMARKS
		DDC	LOCAL SWITCH	
EF-200	200 RESTROOMS	Y		SCHEDULED
EF-201	BOYS & GIRLS TOILETS 200 WING	Y		SCHEDULED
EF-202	KITCHEN CLASSROOM HOODS		Y	EXISTING SWITCH
EF-203	ELEC RM, CLASSROOM 209 & COMPUTER LAB	Y		SCHEDULED/TEMP
EF-301	CLASSROOM 408	Y		SOFTWARE INTERLOCK WITH VUV-301
EF-302	SPECIAL ED 406	Y		SOFTWARE INTERLOCK WITH VUV-302
EF-303	CLASSROOM 404	Y		SOFTWARE INTERLOCK WITH VUV-303
EF-304	BOYS & GIRLS TOILETS 400 WING	Y		SCHEDULED
EF-305	GENERAL STORAGE	Y		SOFTWARE INTERLOCK WITH FCU-303
EF-401	STAFF TOILET	Y		SCHEDULED
EF-402	BOYS & GIRLS TOILETS 100 WING	Y		SCHEDULED
EF-502	BOY'S LOCKER ROOM	Y		SOFTWARE INTERLOCK WITH HUV-501
EF-503	GIRL'S LOCKER ROOM	Y		SOFTWARE INTERLOCK WITH HUV-502
EF-504	BOYS & GIRLS TOILETS 500 WING	Y		SCHEDULED
EF-602	BOY'S RESTROOM	Y		SCHEDULED
EF-603	WORKROOM	Y		SCHEDULED
EF-604	GIRL'S RESTROOM & TOILET	Y		SCHEDULED
EF-702	STAFF TOILET	Y		SCHEDULED



(E)HWH CUH CONTROL RETROFIT

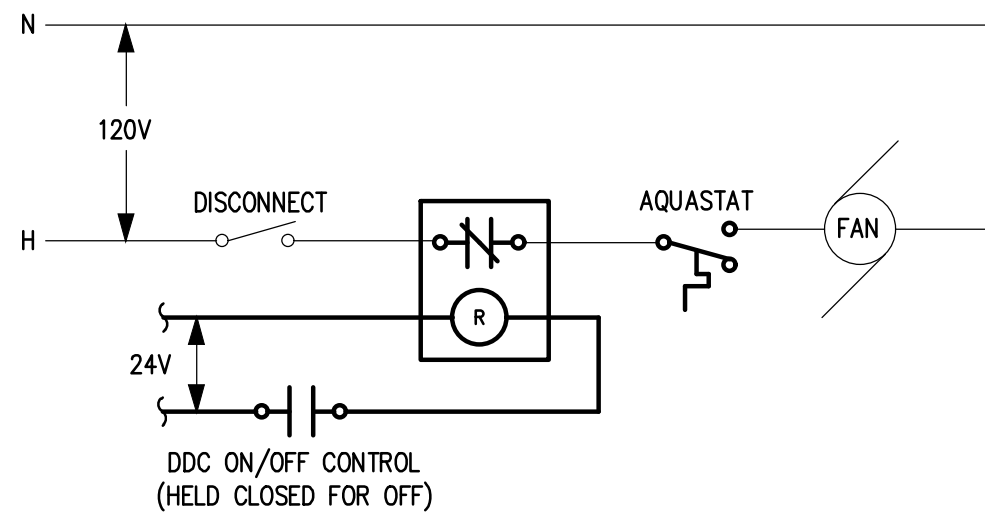
TYPICAL

NOTES:

- REFER TO TC COMPOSITE PLAN FOR QUANTITY AND LOCATION OF UNITS.
- TC CONTRACTOR SHALL REMOVE EXISTING CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
- AQUASTAT SHALL BE WIRING IN SERIES WITH FAN CONTROL WIRING CIRCUIT.
- DDC SPACE TEMP SENSORS SHALL REPLACE EXISTING THERMOSTATS.
- TC CONTRACTOR SHALL PROVIDE 24V POWER SUPPLY AS REQUIRED.

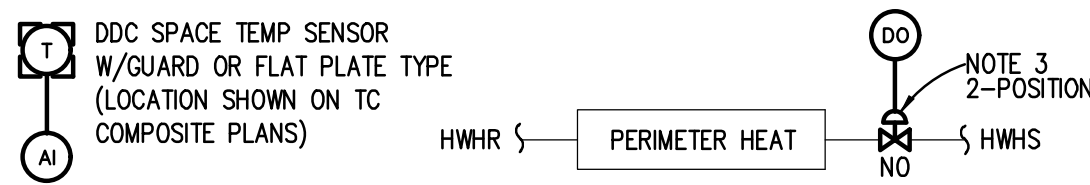
SEQUENCE OF OPERATION:

- ALL SETPOINTS AND DEADBANDS SHALL BE ADJUSTABLE THROUGH DDC.
- DDC SHALL ENABLE/DISABLE FAN CIRCUIT AS REQUIRED TO MAINTAIN SPACE TEMP SETPOINT OF 68°F DURING BLDG OCCUPANCY AND 55 °F DURING BLDG UNOCCUPANCY. FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQ.
- DDC SHALL MONITOR FAN OPERATION. ABNORMAL OPERATING STATUS SHALL ACTIVATE AN ALARM.



(E)HWH CUH WIRING

TYPICAL



(E)PERIMETER HEATING CONTROL RETROFIT

TYPICAL

NOTES:

- REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
- REMOVE ALL EXISTING CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
- EXISTING HEATING CONTROL VALVE SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR IS RESPONSIBLE FOR CONTROL VALVES REPLACEMENT. REFER TO TC COMPOSITE DRAWING FOR CONTROL VALVE SIZING PARAMETERS.
- TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

- ALL SETPOINTS AND DEADBANDS SHALL BE ADJUSTABLE THROUGH DDC.
- DDC SHALL OPEN/CLOSE HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F DURING BLDG OCCUPANCY AND 62°F DURING BLDG UNOCCUPANCY.
- DDC SHALL PROVIDE A 2°F DEADBAND AROUND SETPOINTS FOR CONTROL.

AIR HANDLING UNIT SCHEDULE (FOR REFERENCE ONLY)

VERTICAL UNIT VENTILATOR SCHEDULE (FOR REFERENCE ONLY)

HORIZONTAL UNIT VENTILATOR SCHEDULE (FOR REFERENCE ONLY)

FAN COIL UNIT SCHEDULE (FOR REFERENCE ONLY)

VAV TERMINAL UNIT SCHEDULE (FOR REFERENCE ONLY)

NOTE:-

REGISTRATION SEAL



Peter Basso Associates Inc
CONSULTING ENGINEERS

PROJECT TITLE

DRAWING TITLE

[illegible]

05-25-2023

DATE: ISSUED FOR

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PROJECT NO.

22071C

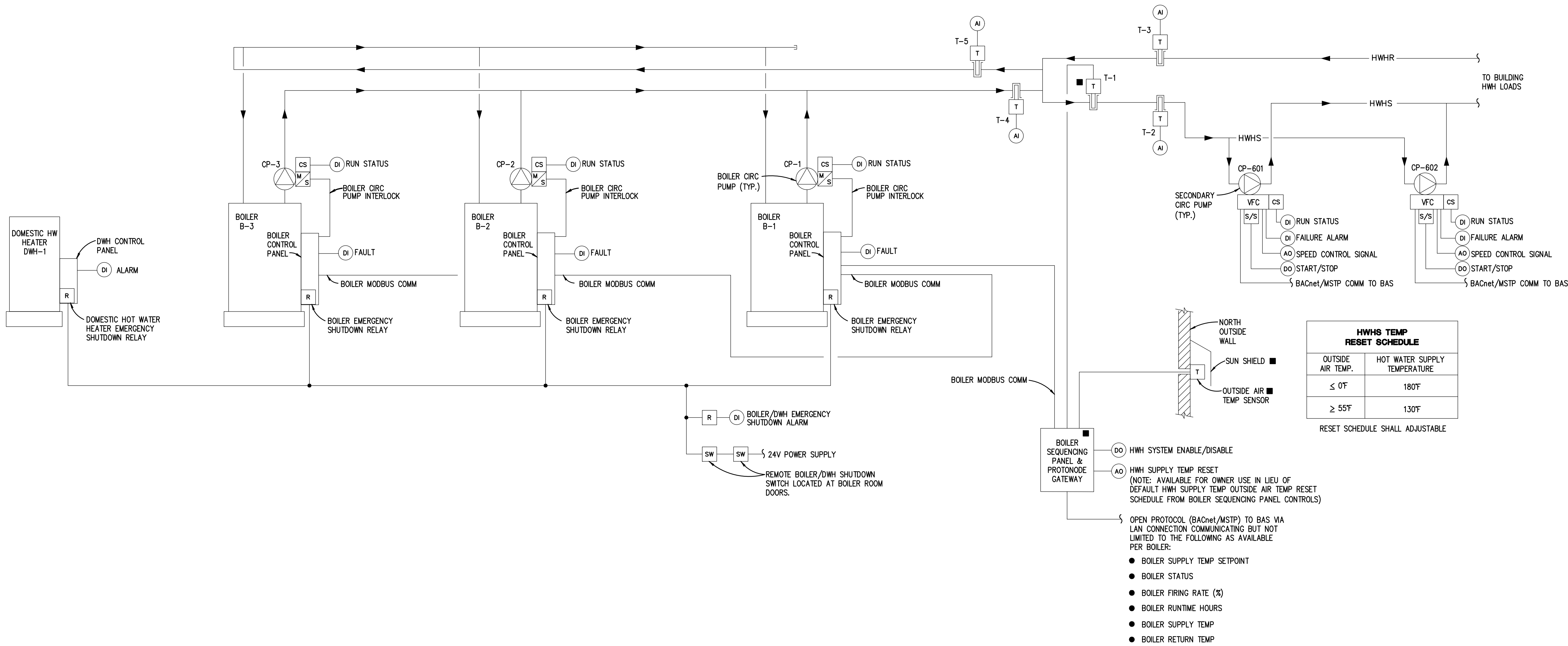
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M2.6

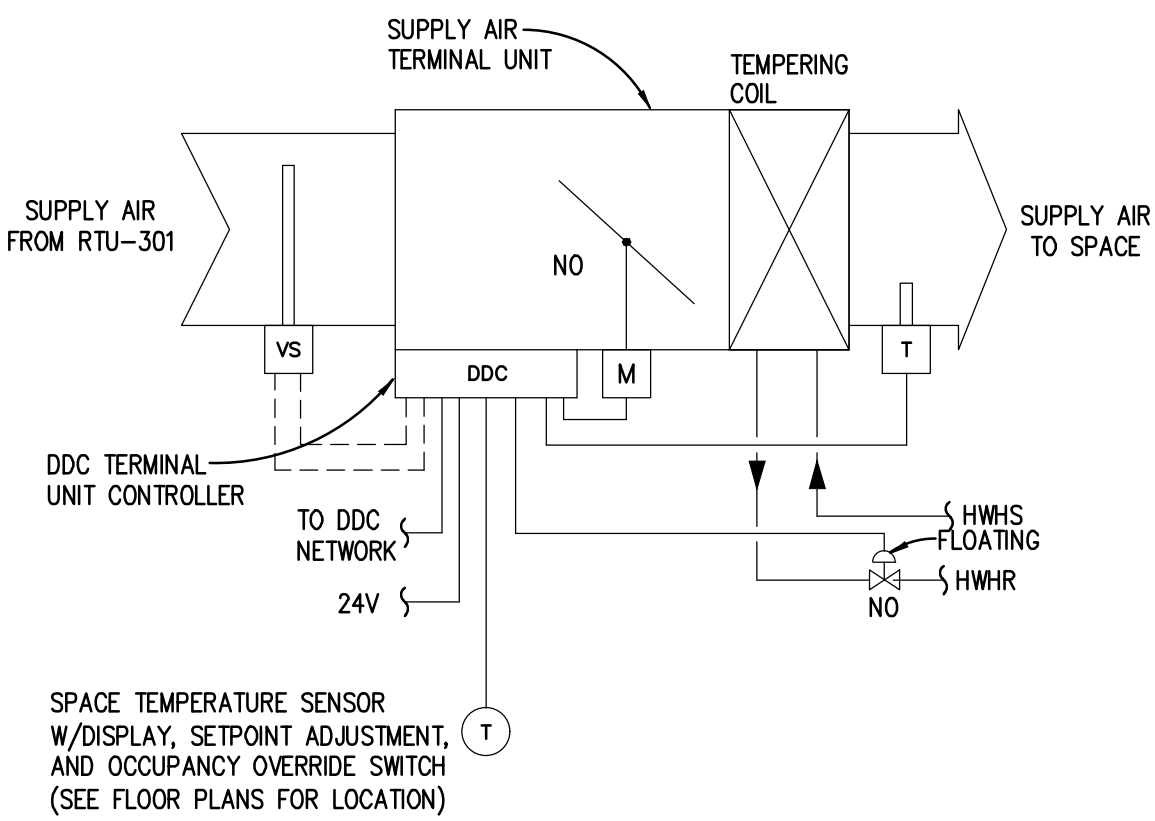
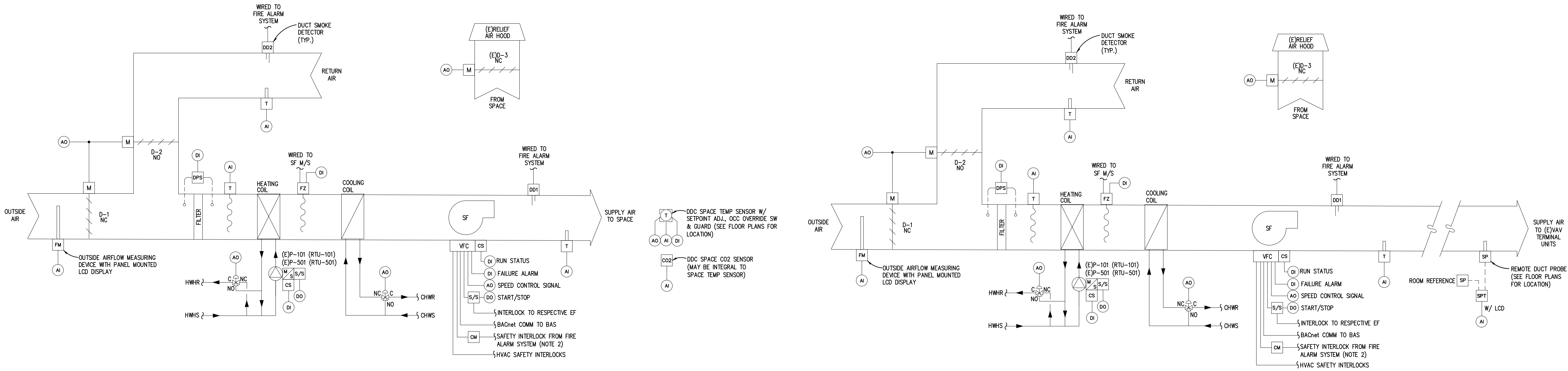
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TC WORK SHOWN WAS COMPLETED UNDER PREVIOUS PROJECT
FOR REFERENCE ONLY - USE FOR GRAPHIC DISPLAY GENERATION

TC GENERAL NOTES
TC GENERAL NOTES ON DRAWING M0.2 APPLY TO THIS DRAWING.



(E)HOT WATER HEATING SYSTEM CONTROL



(E)ROOFTOP UNIT (RTU-301) CONTROL

RTU-301 SERVES MEDIA CENTER TERMINAL UNITS



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PBA Project No: 2022.0360

PROJECT TITLE

Creekside
Intermediate
School Bldg.
Automation
Systems

Dexter Community
Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

05-25-2023 CONSTRUCTION DOCUMENTS
03-15-2023 OWNER REVIEW

DATE: ISSUED FOR:

DRAWN: WJU

CHECKED: JWC

APPROVED: SVM

PROJECT NO.

22071C

DRAWING NO.

M2.7