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DEXTER HIGH SCHOOL - BLDG. AUTOMATION SYSTEM

DEXTER COMMUNITY SCHOOLS

DEXTER, MICHIGAN 48130

PROJECT NUMBER 22070C

CONSTRUCTION DOCUMENTS-BID PACK #3

CONSULTANTS:

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CIVIL ENGINEER — CONSULTANT

STRUCTURAL ENGINEER — CONSULTANT

LIST OF DRAWINGS

GENERAL INFORMATION
TS.1 COVER SHEET
TG.1 GENERAL INFORMATION

CIVIL

STRUCTURAL

ARCHITECTURAL

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M2.13 TEMPERATURE CONTROLS
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ELECTRICAL

TECHNOLOGY

PROJECT DATA:

LOCATION MAP

DEXTER, MI — NO SCALE

ADDRESS: DEXTER HIGH SCHOOL
2200 N PARKER RD.
DEXTER, MICHIGAN 48130

BUILDING:

EXISTING BUILDING AREA = 296,270 SQ. FT.

CODE:

GOVERNING CODES :

- 2016 SCHOOL FIRE SAFETY RULES
  (2012 Life Safety Code, plus amendments)
- 2015 MICHIGAN BUILDING CODE
- 2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS
- 2015 MICHIGAN PLUMBING CODE
- 2015 MICHIGAN MECHANICAL CODE
- 2015 MICHIGAN UNIFORM ENERGY CODE
  (ANSI/ASHRAE/IES Standard 90.1-2013)
- 2014 MICHIGAN ELECTRICAL RULES (2014 NEC, plus Part 8 Rules)
- 2010 MICHIGAN ELEVATOR RULES
  (ASME A17.1-2010, ASME A18.1-2011)
- MICHIGAN BARRIER FREE CODE
  (Michigan Building Code 2015 and ICC A117.1-2009)
- 2013 MICHIGAN BOILER CODE RULES
  (ASME Boiler and Pressure Vessel Code, 2010 edition, plus 2011a addenda)
  (National Board Inspection Code [NBIC], 2011 edition)

CONSTRUCTION CLASSIFICATION : TYPE II (000) (NFPA)
TYPE II B (MBC)

USE GROUP CLASSIFICATION : "E" EDUCATION

DATE	ISSUED FOR:
05-25-2023	CONSTRUCTION DOCUMENTS

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PROJECT TITLE
Dexter High School Bldg. Sys.

PROJECT NO.
22070C

DRAWING NO.
TS.1

Drawing File: Q:\Jobs\22070\dwgs\22070c\22070c_ref\22070c_bt1.dwg
May 25, 2023 - 1:20pm

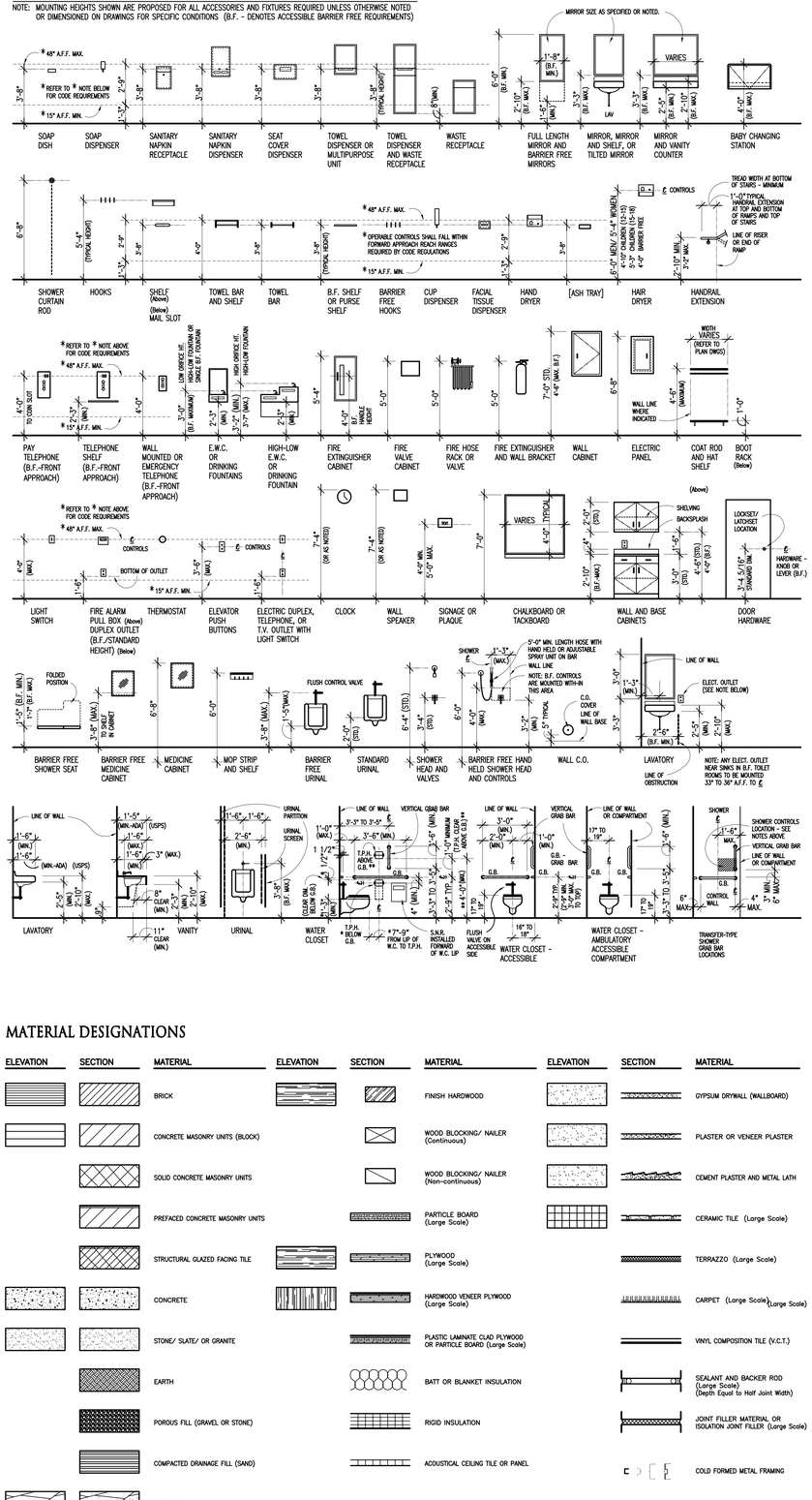
ABBREVIATIONS

A	
ABV.	ABOVE
A.F.F.	ABOVE FINISH FLOOR
A.R.F.	ABOVE REFERENCE FLOOR
ABR.	ABRASIVE
ABS.	ABSORBING
ACC.	ACCESS
ACC. PNL	ACCESS PANEL
AC.	ACOUSTIC/ACOUSTICAL
ACT	ACOUSTIC TILE
AC. INSUL.	ACOUSTIC INSULATION
ADD.	ADDENDUM
ADDN.	ADDITION
ADDNL.	ADDITIONAL
ADH.	ADHESIVE
ADJ.	ADJUSTABLE
AGGR.	AGGREGATE
A.C.B.	AIR CIRCUIT BREAKER
A/C	AIR CONDITIONING
A.C.C.	AIR CONDITIONING COMPRESSOR
A.C.U.	AIR CONDITIONING UNIT
A.H.U.	AIR HANDLING UNIT
ALT.	ALTERNATE
ALUM./AL	ALUMINUM
AMT	AMOUNT
AMP	AMPHERE
AMPL.	AMPLIFIER
ANCH.	ANCHOR
A.B.	ANCHOR BOLT
&	AND
ANG./ L or ∠	ANGLE
ANOD.	ANODIZED
APT.	APARTMENT
APPR.	APPROVED
APPROX.	APPROXIMATE
ARCH.	ARCHITECT/ARCHITECTURAL
A-	ARCHITECTURAL DRAWING-NO.
A. T.	ASH TRAY
ATM	AUTOMATIC TELLER MACHINE
ASPH.	ASPHALT
ASSY.	ASSEMBLY
@	AT
AUTO.	AUTOMATIC
A.S.R.	AUTOMATIC SPRINKLER RISER
AUX.	AUXILIARY
AVG.	AVERAGE
B	
B/B	BACK-TO-BACK
B.F.P.	BACK FLOW PREVENTER
B.D.D.	BACK DRAFT DAMPER
B.F.	BARRIER FREE
B.B.R.	BASE BOARD RADIATION
B.PL	BASE PLATE
BSMT	BASEMENT
BA.	BATH ROOM
BM	BEAM
B/C	BACK OF CURB
BRG	BEARING
B.R.	BEDROOM
B.M.	BENCH MARK
BT	BENT
BETW.	BETWEEN
BEV.	BEVEL
BIT.	BITUMINOUS
B.I.	BLACK-IRON
BLK.	BLOCK
BLKG	BLOCKING
BD	BOARD
BLR	BOILER
BLR. F.	BOILER FEED
BLR. H.	BOILER HOUSE
BK. SH.	BOOK SHELVES
B.S.	BOTH SIDES
B.W.	BOTH WAYS
BOT.	BOTTOM
BOT. EL.	BOTTOM ELEVATION
BLVD	BOULEVARD
BDRY	BOUNDARY
BRKT	BRACKET
BR.	BRASS
BRKR	BREAKER
BRK	BRICK
BTU	BRITISH THERMAL UNIT
BRZ	BRONZE
BLDG.	BUILDING
B.L.	BUILDING LINE
B.U.R.	BUILT-UP ROOFING
B.N.	BULLNOSE
BLKD	BULKHEAD
BULL.	BULLETIN
B.A.	BURGLAR ALARM
BUZZ.	BUZZER
C	
CAB.	CABINET
C.U.H.	CABINET UNIT HEATER
CAP.	CAPACITY
CPT	CARPET
C.R.S.	CARPET REDUCER STRIP
CSMT	CASEMENT
CSWRK	CASEWORK
CSG	CASING
C.I.	CAST IRON
C.I.F.	CAST IRON FRAME
C.I.P.	CAST IRON PIPE/CAST-IN-PLACE
CSTG	CASTING
CAT. NO.	CATALOG NUMBER
C.B.	CATCH BASIN
CLG.	CEILING
C.D.	CEILING DIFFUSER
CLG. HT.	CEILING HEIGHT
CEM.	CEMENT
CEM. PLAS.	CEMENT PLASTER
CTR	CENTER
℄	CENTERLINE
C/C	CENTER-TO-CENTER
CER.	CERAMIC
C.T.	CERAMIC TILE
C.BD.	CHALKBOARD
CHAM.	CHAMFER
CHG.	CHANGE
CHAN. or ⊏	CHANNEL
CHKD. PL.	CHECKERED PLATE
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CHD	CHORD
CIRCUM.	CIRCUMFERENCE
CIR.	CIRCLE/CIRCULAR
CIRC.	CIRCUIT
C.BR	CIRCUIT BREAKER
C-	CIVIL DRAWING-NO.
CL.	CLASS
CLRM	CLASSROOM
C.O.	CLEAN OUT
CLR	CLEAR
CLR GL.	CLEAR GLASS
CLR W.GL	CLEAR WIRE GLASS
CL.	CLOSET
CLO.	CLOSURE
C.OL.	COAT CLOSET
COEF.	COEFFICIENT
CW	COLD WATER
COL.	COLUMN
CO.	COMPANY
COMPT.	COMPARTMENT
COMPO.	COMPOSITION
CA	COMPRESSED AIR
COMPR.	COMPRESSOR
CONC.	CONCRETE
C.M.U.	CONCRETE MASONRY UNIT
CWR	CONDENSING WATER RETURN
CWS	CONDENSING WATER SUPPLY
COND.	CONDUIT
CONF.	CONFERENCE
CONN.	CONNECT
CONST.	CONSTRUCTION
C.J.	CONTROL JOINT
CONT.	CONTINUE/CONTINUOUS
CONTR.	CONTRACTOR
C.P.	CONTROL PANEL
CONV.	CONVECTOR
CNVYR	CONVEYOR
COR.	CORNER
C.G.	CORNER GUARD
CORR.	CORRIDOR/CORRUGATED
CPR	COPPER
CNTR	COUNTER
CTSK	COUNTERSINK
CRS.	COURSE
COV.	COVER
COV. PL.	COVER PLATE
C.C.T.	CUBICAL CURTAIN TRACK
CU.FT.	CUBIC FEET/ CUBIC FOOT
CFM	CUBIC FEET PER MINUTE
CY	CUBIC YARD
CULV.	CULVERT
C.D.	CUP DISPENSER
CYL.	CYLINDER
CYC.	CYCLES
D	
DMPR	DAMPER
DMPFG	DAMPPROOFING
D.L.	DEAD LOAD
DB	DECIBEL
D.	DEEP
DWG.	DRAWING
DMT. PARTN	DEMOUNTABLE PARTITION
DEPT.	DEPARTMENT
DEPR.	DEPRESSED
DES.	DESIGN
DET.	DETAIL
D.E. CO.	DETROIT EDISON COMPANY
DIAG.	DIAGONAL
DGM	DIAGRAM
DIA.	DIAMETER
DIFF.	DIFFUSER
DIM.	DIMENSION
D.R.	DINING ROOM
DIR.	DIRECTORY
DISC.	DISCONNECT
DISCONT.	DISCONTINUOUS
DW	DISHWASHER
DISP.	DISPENSER
DIST.	DISTANCE
D.P.	DISTRIBUTION PANEL
DO	DITTO (DO OVER)
DIV.	DIVIDER/DIVISION
DR.	DOOR
D.O.	DOOR OPENING
DR. OP.	DOOR OPERATOR
DBL.	DOUBLE
D.A.	DOUBLE ACTING
D.H.	DOUBLE HUNG
DWL.	DOWEL
DN	DOWN
D.S.	DOWNSPOUT
DRN	DRAIN
D.T.	DRAIN TILE
D.T.C.	DRAIN TILE CONNECTOR
DWR	DRAWER
DWG	DRAWING
D.F.	DRINKING FOUNTAIN
D.B.	DRY BULB
D.S.P.	DRY STAND PIPE
DBWTR	DUMBWAITER
DUP.	DUPLICATE
D.DR.	DUTCH DOOR
E	
EA	EACH
E.F.	EACH FACE
E.W.	EACH WAY
E	EAST
E.I.F.S.	EXTERIOR INSULATION FINISH SYSTEM
ELAST.	ELASTOMERIC
ELAST. FLASH.	ELASTOMERIC FLASHING
ELAST. W.P.	ELASTOMERIC WATERPROOFING
E.S.R.	ELASTOMERIC SHEET ROOFING
ELEC.	ELECTRIC/ELECTRICAL
ELEC. CL.	ELECTRICAL CLOSET
ELEC. CAB.	ELECTRICAL CABINET
E.C.	ELECTRICAL CONTRACTOR
E-	ELECTRICAL DRAWING-NO.
E.P.	ELECTRICAL PANEL
EWC	ELECTRIC WATER COOLER
ELEC. OPER.	ELECTRICALLY OPERATED
EL.	ELEVATION
ELEV.	ELEVATOR
EMERG.	EMERGENCY
ENCL.	ENCLOSURE
ENGR	ENGINEER
E/E	END-TO-END
ENTR.	ENTRANCE/ENTRY
EP.	EPOXY
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
EQ.	EQUAL
EQUIP.	EQUIPMENT
EQUIV.	EQUIVALENT
ESC.	ESCALATOR
EST.	ESTIMATE
EXC.	EXCAVATED
EXH.	EXHAUST
E.D.	EXHAUST DUCT
E.F.	EXHAUST FAN
E.G.	EXHAUST GRILLE
E.R.	EXHAUST REGISTER
EX./EXIST.	EXISTING
EXP.	EXPANSION
EXP.B.	EXPANSION BOLT
E.J.	EXPANSION JOINT
EXPL.P.	EXPLOSION PROOF
EXP'D	EXPOSED
EXT'N	EXTENSION
EXT.	EXTERIOR
E.I.F.S.	EXTERIOR INSULATION FINISH SYSTEM
E.H.	EXTRA HEAVY
EXTR.	EXTRUDED
E.S.P.	EXTERNAL STATIC PRESSURE
F	
FAB.	FABRICATED/FABRIC
F/F	FACE-TO-FACE
F. FIN.	FACTORY FINISH
F/F/F	FACTORY FINISH FACE-TO-FACE
FAN	FAN COIL UNIT
F.S.	FAR SIDE
FAST.	FASTENER
FDR	FEEDER
FT or '	FEET/FOOT
FPM	FEET PER MINUTE
FN	FENCE
F.BD.	FORM BOARD
FIG.	FIGURE
FIN.	FINISH/FINISHED
FIN. FLR/F.F.	FINISH FLOOR
F.T.R.	FINNED TUBE RADIATION
F.A.	FIRE ALARM
F.A.C.P.	FIRE ALARM CONTROL PANEL
F. BRK	FIRE BRICK
F.D.	FIRE DAMPER
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.H.C.	FIRE HOSE CABINET
F.H.	FIRE HYDRANT
F.L.	FIRE LINE
F.R.	FIRE RETARDANT/FIRE RATED
F.R.T.WD	FIRE RETARDANT TREATED WOOD
F.V.C.	FIRE VALVE CABINET
FP.	FIREPLACE
FPRFG.	FIREPROOFING
FIXT.	FIXTURE
FL.	FLASH.
FHMS	FLAT HEAD MACHINE SCREW
FHWS	FLAT HEAD WOOD SCREW
F.C.	FLEXIBLE CONNECTION
FLR	FLOOR
F.C.O.	FLOOR CLEAN OUT
F.D.	FLOOR DRAIN
FLR. FIN.	FLOOR FINISH
FLUOR.	FLUORESCENT
FLDG	FOLDING
FTG	FOOTING
FM. BD	FORMBOARD
FDN	FOUNDATION
FR.	FRAME
FR/COV.	FRAME AND COVER
FRWG	FRAMING
FRZR	FREEZER
F.S.	FULL SIZE
FURN.	FURNISH/FURNISHED
FURR.	FURRING/FURRED
FUT.	FUTURE
G	
GA.	GAUGE
GAL.	GALLON
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GALV.	GALVANIZED
GALV. I.	GALVANIZED IRON
G	GAS
GSKT	GASKET
G.V.& B.	GATE VALVE AND BOX
GEN'L.	GENERAL
GL.	GLASS
GLZ	GLAZING
G.H.T.	GLAZED HOLLOW TILE
G.B.	GRAB BAR
GR.	GRADE/GRILLE
GB	GRADE BEAM
GRAT.	GRATING
G.L.	GRID LINE
GRN	GRANITE
G.S.	GREASE SEPARATOR
G.T.	GREASE TRAP
GND	GROUND
G.F.I.	GROUND FAULT INTERRUPTER
GT	GROUT
G.	GUTTER ELEVATION
GYP.	GYPSUM
GYP.BD.	GYPSUM BOARD
H	
HNDCP	HANDICAPPED
H.R.	HANDRAIL
H.BD	HARDBOARD
HDWE	HARDWARE
HDWD	HARDWOOD
HD	HEAD
HDR	HEADER
H.A. GL.	HEAT ABSORBING GLASS
H.R.U.	HEAT RECOVERY UNIT
HTR	HEATER
HTG	HEATING
H/V	HEATING AND VENTILATING
H.V.A.C.	HEATING, VENTILATING AND AIR CONDITIONING
HHWR	HEATING HOT WATER SUPPLY
HHWS	HEATING HOT WATER RETURN
HGT	HEIGHT
HEX.	HEXAGON
H.	HIGH
H.I.D.	HIGH INTENSITY DISCHARGE
H.P.	HIGH POINT
H.PR.	HIGH PRESSURE
H.S.	HIGH STRENGTH
H.S.B.	HIGH STRENGTH BOLT
H.V.	HIGH VOLTAGE
HWY	HIGHWAY
HSTWY	HOISTWAY
H.C.	HOLLOW CORE
H.M.	HOLLOW METAL
HNYCB	HONEYCOMB
HK	HOOK
HORIZ.	HORIZONTAL
HP	HORSEPOWER
H.B.	HOSE BIBB
H.S.P.	HOSE STAND PIPE
H.V.C.	HOSE VALVE CABINET
HOSP.	HOSPITAL
H.W.	HOT WATER
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HR.	HOUR
H.O.	HUB OUTLET
HYD.	HYDRANT/HYDRAULIC
H	HYDROGEN
I	
I.D.	IDENTIFICATION
INCAND.	INCANDESCENT
IN. or "	INCH/INCHES
INCIN.	INCINERATOR
INCL.	INCLUDE/INCLUDING
IW.	INDIRECT WASTE
INFO.	INFORMATION
I.D.	INSIDE DIAMETER
I.F.	INSIDE FACE
INST'L.	INSTALL/INSTALLATION
INSUL.	INSULATE/INSULATION
INT.	INTERIOR
INTER.	INTERMEDIATE
INV.	INVERT
I.E.	INVERT ELEVATION
J	
J.C.	JANITOR CLOSET
JT	JOINT
JST	JOIST
J.B.	JUNCTION BOX
JR	JUNIOR
K	
K.P.	KICK PLATE
KV	KILOVOLT
KVA	KILOVOLT AMPHERE
KW	KILOWATT
K	KIP (1000#)
KIT.	KITCHEN
K.S.	KNEE SPACE
K.O.	KNOCK DOWN
K.O.P.	KNOCK-OUT PANEL
L	
LBL.	LABEL
LAB.	LABORATORY
LAD.	LADDER
L.B.	LAG BOLT
LAM.	LAMINATE/LAMINATED
LDG	LANDING
L-	LANDSCAPE DRAWING-NO.
LGE	LARGE
LDRY	LAUNDRY
LAV.	LAVATORY
L.H.	LEFT HAND
L.H.R.B.	LEFT HAND REVERSE BEVEL
LGTH	LENGTH
LEV.	LEVEL
LIB.	LIBRARY
LT.	LIGHT
LPRF	LIGHTPROOF
LTG	LIGHTING
L.P.	LIGHTING PANEL
L.R.P.	LIGHTING RECEPTACLE PANEL
LWT	LIGHTWEIGHT
LTWT. CONC.	LIGHTWEIGHT CONCRETE
LMS	LIMESTONE
LTL	LINTEL
LIN. DIFF.	LINEAR DIFFUSER
L.F.	LINEAR FEET/FOOT
LIQ	LIQUID
LPG	LIQUID PROPANE GAS
L.P.G.	LIQUID PETROLEUM GAS
L.	LIVE LOAD
L.R.	LIVING ROOM
LOC.	LOCATION
LKR	LOCKER
LG	LONG
L.L.H.	LONG LEG HORIZONTAL
L.L.V.	LONG LEG VERTICAL
LVR	LOUVER
L.O.	LOUVER OPENING
L.P.	LOW POINT
L.PR.	LOW PRESSURE
LBR	LUMBER
LBS. or #	POUNDS
M	
MACH.	MACHINE
M.B.	MACHINE BOLT
MACH. RM	MACHINE ROOM
M.A.U.	MAKE-UP AIR UNIT
M.D.P.	MAIN DISTRIBUTION PANEL
M.S.B.	MAIN SWITCH BOARD
MAINT.	MAINTENANCE
MH.	MANHOLE
MFR	MANUFACTURER
MAR.	MARBLE
MK	MARK
MAS.	MASONRY
M.O.	MASONRY OPENING
MATL	MATERIAL
MAX.	MAXIMUM
MECH.	MECHANICAL
M-	MECHANICAL DRAWING-NO.
M.C.	MEDICINE CABINET
MED.	MEDIUM
MEMB.	MEMBRANE
MET.	METAL
M.D.S.	METAL DIVIDER STRIP
M.E.S.	METAL EDGE STRIP
M.L.	METAL LATH
M.L.& PLAS.	METAL LATH AND PLASTER
M.T.	METAL THRESHOLD
MET. W.P.	METALLIC WATERPROOFING
MEZZ.	MEZZANINE
MDOT	MICHIGAN DEPARTMENT OF TRANSPORTATION
MWK	MILLWORK
MIN.	MINIMUM
MIR.	MIRROR
M.& S.	MIRROR AND SHELF
MISC.	MISCELLANEOUS
M.I.	MISCELLANEOUS IRON
MOD.	MODEL
MON.	MONUMENT
M.S.& S.	MOP STRIP AND SHELF
M.O.D.	MOTOR OPERATED DAMPER
MLDG	MOLDING
MTD	MOUNTED
MTG	MEETING/MOUNTING
MOV.	MOVEABLE
MOV. PARTN.	MOVEABLE PARTITION
MULL	MULLION
M	THOUSAND (1000)
N	
NAT.	NATURAL
N.S.	NEAR SIDE
NEUT.	NEUTRAL
NRC	NOISE REDUCTION COEFFICIENT
NOM.	NOMINAL
NOR.	NORMAL
N	NORTH
NOS.	NOSING
N.I.C.	NOT-IN-CONTRACT
N.T.S.	NOT-TO-SCALE
NO. or #	NUMBER
O	
OBS.	OBSCURE
OBS.GL.	OBSCURE GLASS
OFF.	OFFICE
O.C.	ON CENTER
OPQ.	OPAQUE
OPG.	OPENING
OPER.	OPERATOR
OPP.	OPPOSITE
OPP.HD.	OPPOSITE HAND
ORIG.	ORIGINAL
ORN.	ORNAMENTAL
OZ.	OUNCE
O/O	OUT-TO-OUT
O.A.	OUTSIDE AIR
O.D.	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
O.H.S.	OVAL HEAD SCREW
O.A.	OVERALL
OHD	OVERHEAD
OHD.DR	OVERHEAD DOOR
OXY.	OXYGEN
P	
PTD	PAINTED
PR	PAIR
PG.	PAGE
PNL	PANEL
P.T.D.	PAPER TOWEL DISPENSER
P.T.W.R.	PAPER TOWEL WASTE RECEPTACLE
PRL	PARALLEL
PKG	PARKING
P.BD	PARTICLE BOARD
PRTN	PARTITION
PASS.	PASSAGE
PAT.	PATENT
PVMT	PAVEMENT
PVG	PAVING
PED.	PEDESTAL
PERF.	PERFORATED
PERIM.	PERIMETER
PERM.	PERMANENT
PERP.	PERPENDICULAR
P. or Φ	PHASE
PHOTO.	PHOTOGRAPH
P.H.	PHYSICALLY HANDICAPPED
PC.	PIECE
PCS.	PIECES
PLAS.	PLASTER
PL. LAM.	PLASTIC LAMINATE
PL.	PLATE
PL. GL.	PLATE GLASS
PLAT.	PLATFORM
PLBG	PLUMBING
PLWD	PLYWOOD
PT	POINT
P.T.	POINT OF TANGENCY
P.C.	POINT OF CURVATURE
POL.	POLISH/POLISHED
PVC	POLYVINYL CLORIDE
PORC.	PORCELAIN
PORC. ENAM.	PORCELAIN ENAMEL
POR.	POROUS
PORT.	PORTABLE
POS.	POSITION
P.I.V.	POST INDICATOR VALVE
PLF	POUNDS PER LINEAR FOOT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PCF	POUNDS PER CUBIC FOOT
P.P	POWER PANEL
P/C	PRECAST
P.T.R.	PRECAST TERRAZZO RECEPTOR
PREFAB.	PREFABRICATED
PFN.	PREFINISHED
P.T.WD	PRESERVATIVE TREATED WOOD
P.G.	PRESSURE GAUGE
P.R.V.	PRESSURE REDUCING VALVE
PRIM.	PRIMARY
PROJ.	PROJECT/PROJECTION
PROP.	PROPERTY/PROPOSED
P.L.	PROPERTY LINE
P.A.	PUBLIC ADDRESS
P.S.	PURSE SHELF
P.B.	PUSH BUTTON
Q	
QTY	QUANTITY
Q.T.	QUARRY TILE
QTR	QUARTER
QTR. RD	QUARTER ROUND
R	
RBT	RABBET
RAD. or R.	RADIUS
R.W.C.	RAIN WATER CONDUCTOR
R.R.	RAILROAD
RECV.	RECEIVE/RECEIVING
RECPT.	RECEPTACLE
R.P.	RECEPTACLE PANEL
REC.	RECESS
RECT.	RECTANGLE/RECTANGULAR
RED.	REDUCER
RWD	REDWOOD
REF.	REFER/REFERENCE
REFL.	REFLECTED/REFLECTIVE
REFR.	REFRIGERATOR
REG.	REGISTER
REINF.	REINFORCE/REINFORCING/ REINFORCEMENT
REM.	REMOVE/REMOVABLE
REP.	REPAIR/REPLACE
REQ'D.	REQUIRED
RESIL.	RESILIENT
RET.	RETURN
R.A.	RETURN AIR
R.A.D.	RETURN AIR DIFFUSER
R.A.F.	RETURN AIR FAN
REV.	REVISED/REVISION
RPM	REVOLUTIONS PER MINUTE
R.	RISER
R.H.	RIGHT HAND
R.H.R.B.	RIGHT HAND REVERSE BEVEL
R.O.W.	RIGHT OF WAY
RVT	RIVET
RD	ROAD
R.S.C.	ROLLING STEEL CURTAIN
RF	ROOF
R.C.	ROOF CONDUCTOR
R.D.	ROOF DRAIN
RF.H.	ROOF HATCH
R.S.	ROOF SUMP
R.V.	ROOF VENTILATOR
RFG	ROOFING
R.T.U.	ROOF TOP UNIT
RM	ROOM
R.O.	ROUND OPENING
RND or ◯	ROUND
RHMS	ROUND HEAD MACHINE SCREW
RHWS	ROUND HEAD WOOD SCREW
R.T.	RUBBER TILE
S	
SAN.	SANITARY
S.N.D.	SANITARY NAPKIN DISPENSER
S.N.R.	SANITARY NAPKIN RECEPTACLE
SCHED.	SCHEDULE
SCN	SCREEN
STG	SEATING
SECT.	SECTION
SERV.	SERVICE
S.S.	SERVICE SINK
SHTHG	SHEATHING
SHT	SHEET
SHT. MET.	SHEET METAL
SH.& R.	SHELF AND ROD
SHWR	SHOWER
S.C.R.	SHOWER CURTAIN ROD
S.DR	SHOWER DOOR
S.W.	SIDEWALK
SIM.	SIMILAR
SGL.	SINGLE
SIK	SINK
S.D.	SOAP DISPENSER
S.C.	SOLID CORE
STC	SOUND TRANSMISSION CLASS
S	SOUTH
SP.	SPACE
SPR.	SPARE
SPKR	SPEAKER
SPEC.	SPECIFICATIONS
S.D.	SPLITTER DAMPER
SPRYED	SPRAYED
SPKLR	SPRINKLER
SQ.	SQUARE
S.F.	SQUARE FEET/SQUARE FOOT
STAG.	STAGGERED
ST.STL	STAINLESS STEEL
STD	STANDARD
SP.	STANDPIPE
S.P.	STATIC PRESSURE
STA.	STATION
STM	STEAM
STL	STEEL
STL. PL.	STEEL PLATE
STIFF.	STIFFENER
STO. FR.	STOREFRONT
STOR.	STORAGE
STR.	STRAIGHT
ST.	STREET
STRUCT.	STRUCTURAL
S-	STRUCTURAL DRAWING-NO.
S.G.F.T.	STRUCTURAL GLAZED FACING TILE
S.STL	STRUCTURAL STEEL
SS.D.	SUBSOIL DRAIN
SS.D.C.	SUBSOIL DRAIN CONNECTION
SUB.	SUBSTATION
S.A.G.	SUPPLY AIR GRILLE
S.D.	SUPPLY DIFFUSER/ DUCT
SUBST.	SUBSTITUTE
S.A.R.	SUPPLY AIR REGISTER
S.F.	SUPPLY FAN
S	
SW.	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMBOL/ SYMMETRICAL
SYS.	SYSTEM
SUPP.	SUPPORT
SURF.	SURFACE/ SURFACING
SUSP.	SUSPEND/ SUSPENSION
T	
T.BD	TACKBOARD
TAN.	TANGENT
TECH.	TECHNICAL
TEL.	TELEPHONE
TEL. CAB.	TELEPHONE CABINET
TV	TELEVISION
TV.M	TELEVISION MONITOR
TEMP.	TEMPERATURE
TEMP. GL.	TEMPERED GLASS
T.U.	TERMINAL UNIT
TERR.	TERRAZZO
T.B.	TEST BORING
T.	THERMOSTAT
THK	THICK/ THICKNESS
T.S.	THICKENED SLAB
THD	THREAD
THRESH.	THRESHOLD
THRU	THROUGH
T.	TILE
T./ TOIL.	TOILET
T.P.D.	TOILET PAPER DISPENSER
T.P.H.	TOILET PAPER HOLDER
T & G	TONGUE AND GROOVE
T & B	TOP AND BOTTOM
T/C	TOP OF CURB
T/EL.	TOP ELEVATION
T/F	TOP OF FOOTING
T/G	TOP OF GUTTER
T/M	TOP OF MASONRY
T/P	TOP OF PARAPET
T/PR	TOP OF PAVEMENT
T/R	TOP OF RIM
T/S	TOP OF STEEL
T/W	TOP OF WALL
T.B.	TOWEL BAR
T.D.	TOWEL DISPENSER
TD & WR	TOWEL DISPENSER AND WASTE RECEPTACLE
T.G.	TRANSFER GRILLE
TRFR	TRANSFORMER
TRAN.	TRANSOM
T	TREAD
T.D.	TRENCH DRAIN
TS	TUBE SECTION
T.V.	TURNING VANE
T.T.	TWIN TEE
TYP.	TYPICAL
U	
U.C.	UNDERCUT
U.G.	UNDER GROUND
U.L.	UNDERWRITER'S LABORATORY
ULT.	ULTIMATE
UNFIN.	UNFINISHED
U.H.	UNIT HEATER
U.SUB.	UNIT SUBSTATION
U.V.	UNIT VENTILATOR
USGS	UNITED STATES GEOLOGICAL SURVEY
U.O.N.	UNLESS OTHERWISE NOTED
UR.	URINAL
V	
VAC.	VACUUM
V.B.	VACUUM BREAKER
V.C.O.	VACUUM CLEANER OUTLET
V. BARR.	VAPOR BARRIER
VAR.	VARIABLE
VARN.	VARNISH
VNR	VENEER
V. PLAS.	VENEER PLASTER
V.	VENT
VTR	VENT THRU ROOF
VENT.	VENTILATE/ VENTILATION
V.I.F.	VERIFY IN FIELD
VS.	VERSUS
VERT.	VERTICAL/ VERTICALLY
VERT. C.	VERTICAL CURVE
VEST.	VESTIBULE
V.I.	VIBRATION ISOLATOR
VNY	VINYL
VCT	VINYL COMPOSITION TILE
VIN. FAB.	VINYL FABRIC
V.R.S.	VINYL REDUCER STRIP
VIT.	VITREOUS
VCP	VITRIFIED CLAY PIPE
VOL.	VOLUME
V.D.	VOLUME DAMPER
V	VOLTS
W	
WAINS.	WAINSCOT
W.CAB.	WALL CABINET
W.C.O.	WALL CLEAN OUT
W.H.	WALL HYDRANT
W/W	WALL-TO-WALL
W.V.	WALL VENT
WHSE	WAREHOUSE
W.F.	WASH FOUNTAIN
W.	WASTE/ WATTS
W & V	WASTE AND VENT
W.R.	WASTE RECEPTACLE
W.C.	WATER CLOSET
W.G.	WATER GAUGE
W.H.	WATER HEATER
WP	WATERPROOFING
W.PRFG.	WEATHERPROOFING
W.STPG.	WEATHERSTRIPPING
WT.	WEIGHT
W.W.F.	WELDED WIRE FABRIC
W	WEST
W.B.	WET BULB
W.	WIDE/ WIDTH
W_x_	WIDE FLANGE SECTION
WT	WIDE FLANGE TEE SECTION
W.O.	WINDOW OPENING
W.GL.	WIRE GLASS
W.M.	WIRE MESH
w/	WITH
w/o	WITHOUT
WD	WOOD
W.L.	WORK LINE
W.P.	WORK POINT
W.I.	WROUGHT IRON
X	
Y	
YD	YARD
Y.P.	YIELD POINT
Y.S.	YIELD STRENGTH
YR	YEAR
Z	
ZC	ZINC

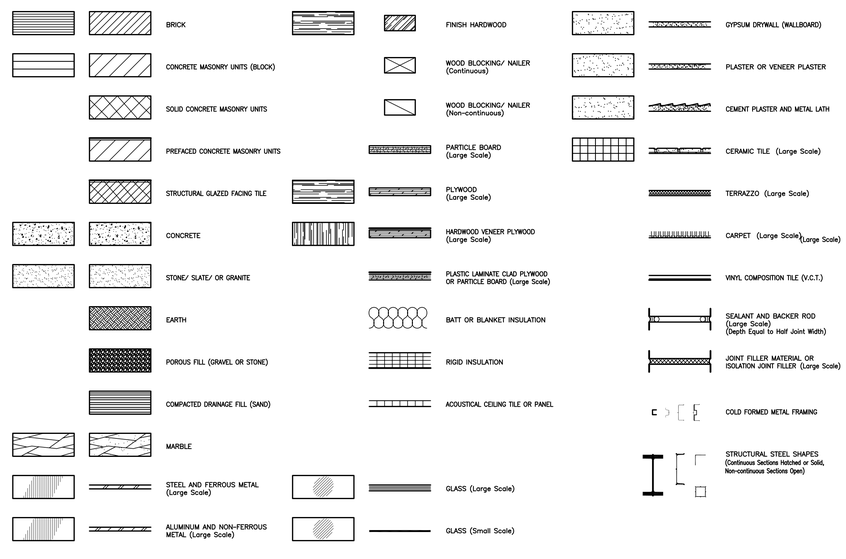
TYPICAL MOUNTING HEIGHTS

MISCELLANEOUS ACCESSORIES, TOILET ACCESSORIES AND FIXTURES

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
BRICK
CONCRETE M

TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
AQ	AQUASTAT, STRAP ON BULB
CO2	CARBON DIOXIDE SENSOR – WALL MOUNTED
CO2	CARBON DIOXIDE SENSOR – DUCT MOUNTED
CS	CURRENT SWITCH
	DAMPER – OPPOSED BLADE
	DAMPER – PARALLEL BLADE
M	DAMPER MOTOR
DPS	DIFFERENTIAL PRESSURE SWITCH
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FM	FLOW METER
FS	FLOW SWITCH
FZ	FREEZESTAT
	GUARD FOR STAT OR SENSOR
H	SPACE HUMIDITY SENSOR
H	HUMIDITY SENSOR, DUCT MOUNTED
	LINE – ELECTRIC
	LINE – PNEUMATIC
M	MAIN AIR
M/S	MOTOR STARTER
OS	OCCUPANCY SENSOR
PT	PRESSURE TRANSMITTER
R	RELAY, ELECTRIC
N	SELECTOR SWITCH, (N=NUMBER OF POSITIONS)
AI	SIGNAL – DDC/BAS, ANALOG INPUT
AO	SIGNAL – DDC/BAS, ANALOG OUTPUT
DI	SIGNAL – DDC/BAS, DIGITAL INPUT
DO	SIGNAL – DDC/BAS, DIGITAL OUTPUT
AI	SIGNAL – PACKAGED EQUIPMENT, ANALOG INPUT
AO	SIGNAL – PACKAGED EQUIPMENT, ANALOG OUTPUT
DI	SIGNAL – PACKAGED EQUIPMENT, DIGITAL INPUT
DO	SIGNAL – PACKAGED EQUIPMENT, DIGITAL OUTPUT
DD	SMOKE DETECTOR – DUCT MOUNTED
S/S	START/STOP RELAY
SP	STATIC PRESSURE SENSOR OR PROBE

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
T	TEMPERATURE SENSOR – DUCT MOUNTED AVG ELEMENT
T	TEMPERATURE SENSOR – DUCT MOUNTED RIGID ELEMENT
T	TEMPERATURE SENSOR
T	THERMOSTAT – ELECTRIC, LINE VOLTAGE
	GUARD – FOR TEMPERATURE SENSOR OR THERMOSTAT
	VALVE – 2 WAY CONTROL VALVE
	VALVE – 3 WAY CONTROL VALVE
VFC	VARIABLE FREQUENCY CONTROLLER
XF	TRANSFORMER

WIRING SYMBOLS

SYMBOL	DESCRIPTION
M/S	COIL – MOTOR STARTER CONTACTOR
R	COIL – RELAY
	CONTACT – INSTANT OPERATING, NO
	CONTACT – INSTANT OPERATING, NC
	GROUND
	MOTOR, SINGLE PHASE
1 2	SWITCH – 2 POSITION SELECTOR
H O A	SWITCH – 3 POSITION SELECTOR HAND/OFF/AUTO
	SWITCH – TEMPERATURE ACTUATED, NO
	THERMAL OVERLOAD, SINGLE PHASE
OLs	THERMAL OVERLOAD CONTACTS – 3 PHASE
	TRANSFORMER
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
BAS	BUILDING AUTOMATION SYSTEM
DDC	DIRECT DIGITAL CONTROL
TC	TEMPERATURE CONTROLS
NO	NORMALLY OPEN
NC	NORMALLY CLOSED

NOTES:

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

ABBREVIATION LIST

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

TEMPERATURE CONTROLS DRAWING INDEX

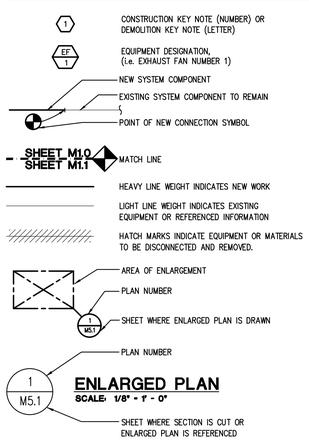
SHEET NO.	SHEET TITLE
M0.1	TEMPERATURE CONTROL SYMBOLS, ABBREV, STANDARDS AND DRAWING INDEX
M0.2	TEMPERATURE CONTROL STANDARD DETAILS AND GENERAL NOTES
M1.1	FIRST LEVEL TEMPERATURE CONTROL COMPOSITE PLAN – ZONES A–G
M1.2	FIRST LEVEL TEMPERATURE CONTROL COMPOSITE PLAN – ZONES H–K
M1.3	SECOND LEVEL TEMPERATURE CONTROL COMPOSITE PLAN – ZONES A–G
M1.4	SECOND LEVEL TEMPERATURE CONTROL COMPOSITE PLAN – ZONES H–K
M1.5	THIRD LEVEL TEMPERATURE CONTROL COMPOSITE PLAN – ZONES H–K
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
M2.8	TEMPERATURE CONTROLS
M2.9	TEMPERATURE CONTROLS
M2.10	TEMPERATURE CONTROLS
M2.11	TEMPERATURE CONTROLS
M2.12	TEMPERATURE CONTROLS
M2.13	TEMPERATURE CONTROLS
M2.14	TEMPERATURE CONTROLS

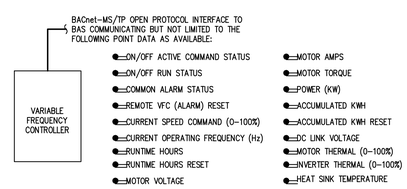
TC FLOOR PLAN EQUIPMENT TAG NOTATIONS

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

TAG	DESCRIPTION
AHU X	AIR HANDLING UNIT
ACCU X	AIR COOLED CONDENSING UNIT
B X	BOILER
BC X	BOOSTER COIL (HWH)
CH X	CHILLER
CONV X	CONVECTOR (HWH)
CT X	COOLING TOWER
CUH X	CABINET UNIT HEATER
DWH X	DOMESTIC WATER HEATER
ERU X	ENERGY RECOVERY UNIT
EF X	EXHAUST FAN
EVAP X	REMOTE EVAPORATOR, DX
FCU X	FAN COIL UNIT
FTR X	FINNED TUBE RADIATION
HUV X	HORIZONTAL UNIT VENTILATOR
HV X	HEATING VENTILATING UNIT
IH X	INTAKE HOOD
MAU X	MAKE-UP AIR UNIT
P X	PUMP
PTAC X	PACKAGED AIR CONDITIONING UNIT
RD X	RELIEF DAMPER
RF X	RETURN FAN
RH X	RELIEF HOOD
RHC X	REHEAT COIL (HWH)
RP X	RADIANT PANEL (HWH)
UH X	UNIT HEATER (HWH)
VAV X	VARIABLE AIR VOLUME TERMINAL UNIT W/REHEAT COIL
VUV X	VERTICAL UNIT VENTILATOR

STANDARD METHODS OF NOTATION





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.

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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROL SYMBOLS, ABBREV, STANDARDS AND DRAWING INDEX

ISSUE DATES

DATE:	ISSUED FOR:
05-25-2023	CONSTRUCTION DOCUMENTS
03-15-2023	OWNER REVIEW

DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M0.1

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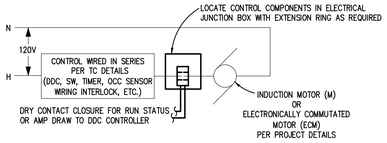
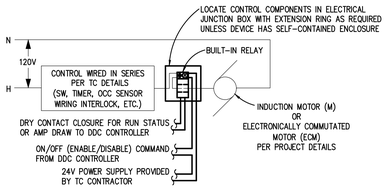
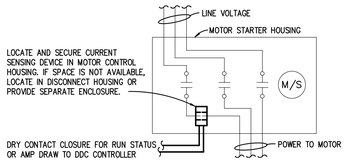


1-PHASE POWER APPLICATION - DDC MONITORING



1-PHASE POWER APPLICATION - COMBO DDC MONITORING & CONTROL



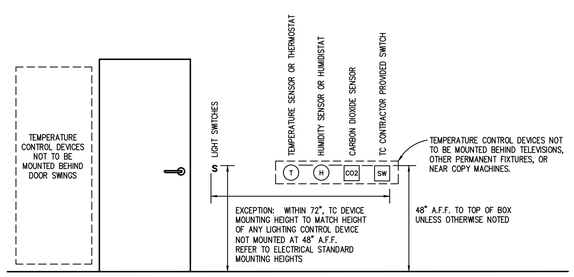
3-PHASE POWER APPLICATION - DDC MONITORING

CURRENT SWITCH INSTALLATION DETAILS

TYPICAL

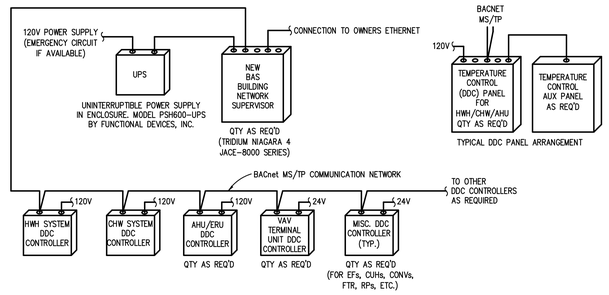
NOTES:

1. 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.
2. 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 FPTU WITH ECM CAN BE VERY LOW).
3. FOR ECM CURRENT SWITCH APPLICATIONS: PROVIDE CURRENT SWITCH RATED FOR ECM OPERATION WITH AMPERAGE TRIP SETTING HIGHER THAN TRICKLE/IDLE/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.
4. 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.
5. 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.



TC DEVICE STANDARD MOUNTING HEIGHTS DETAIL

NO SCALE



NEW TRIDIUM BUILDING AUTOMATION SYSTEM ARCHITECTURE

NOTES:

1. REFER TO TEMPERATURE CONTROL SCHEMATICS FOR THE REQUIRED POINTS ASSOCIATED FOR EACH SYSTEM.
2. 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 WITH OTHER TRADES.
3. TC CONTRACTOR SHALL PROVIDE REQUIRED POWER SUPPLIES FROM EXISTING TEMPERATURE CONTROL POWER CIRCUITS OR FROM EXISTING ELECTRICAL PANELBOARDS WHERE AVAILABLE (SEE GENERAL NOTES).
4. 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.
5. 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 LOCATION SHOWN ON BUILDING FLOOR PLAN. COORDINATE DATA OUTLET WIRING REQUIREMENTS, CONNECTION AND I/P ADDRESS WITH OWNER'S INFORMATION TECHNOLOGY PERSONNEL.
6. DDC PANELS AND CONTROLLERS PROVIDED THROUGH EQUIPMENT SUPPLIERS SHALL BE PROVIDED WITH BACnet MS/TP INTERFACE CARDS FOR THIS PROJECT. TC CONTRACTOR TO PROVIDE BACNET NETWORK WIRING TO PACKAGED CONTROLLERS.
7. EXISTING NOVAR/TREND BAS NETWORK AND ASSOCIATED DDC COMPONENTS TO REMAIN AS-IS.

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 (VUVs, AHUs, RTUs, HVAC UNITS):

- OCCUPIED HEATING = 70°F
- STANDBY HEATING = 68°F
- UNOCCUPIED HEATING = 62°F

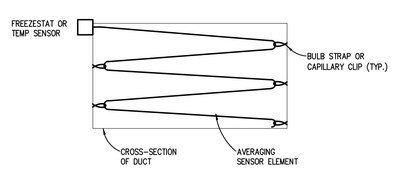
- OCCUPIED COOLING = 74°F
- STANDBY COOLING = 76°F
- UNOCCUPIED COOLING = 80°F (UNLESS SET HIGH TO KEEP UNIT OFF)

- 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

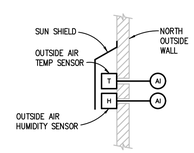


AVERAGING ELEMENT INSTALLATION DETAIL

TYPICAL

NOTES:

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



OA SENSOR INSTALLATION DETAIL

NO SCALE

NOTES:

1. OA SENSOR SHALL BE LOCATED ON NORTH BUILDING EXPOSURE. COORDINATE LOCATION WITH OWNER.
2. DEW POINT TEMPERATURE SHALL BE CALCULATED AND USED FOR ECONOMIZER LOCKOUT LOGIC WHERE APPLICABLE AS DESCRIBED IN CONTROL SEQUENCES OF OPERATION.
3. INDICATE CALCULATED DEW POINT TEMP ON GRAPHICS ALONG WITH OA TEMP AND HUMIDITY VALUES.

TC GENERAL NOTES

1. THESE GENERAL NOTES SHALL BE APPLICABLE FOR ALL DRAWINGS.
2. PROJECT SHALL BE TURNKEY 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.
3. 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.
4. 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.
5. ALL DDC CONTROL VALVES AND DAMPER ACTUATORS SHALL BE REPLACED AS INDICATED ON CONTROL DETAILS.
6. ANY CONTROL RELATED DEFICIENCIES AND ISSUES WITH EXISTING EQUIPMENT AND SYSTEMS DISCOVERED DURING CONSTRUCTION SHALL BE RECORDED AND SUMMARIZED FOR OWNER TO ADDRESS AS REQUIRED.
7. "PROVIDE" AS USED THROUGHOUT DRAWINGS IS DEFINED AS "FURNISH AND INSTALL".
8. TC CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
9. 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.
10. ALL CONTROL SCHEMATICS AND WIRING DIAGRAMS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS'S WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION. FIELD VERIFY EXISTING CONDITIONS AS REQUIRED.
11. 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.
12. ALL TC PROVIDED COMPONENTS, AND ALL TC CONTRACTOR INSTALLED PANELS, COMPONENTS AND WIRING SHALL BE LABELED PER SPECIFICATIONS.
13. ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE SPECIFICATIONS.
14. 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.
15. ALL DDC SIGNAL WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
16. 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.
17. ALL 120V WIRING SHALL BE INSTALLED IN CONDUIT OR EMT. SIZE SHALL BE ¾" MINIMUM.
18. 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.
19. CONDUIT OR EMT SHALL BE EXPOSED ONLY IN MECHANICAL AND ELECTRICAL ROOMS. SIZE CONDUIT OR EMT TO BE FILLED AT 40% CAPACITY MAXIMUM.
20. 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 SURFACE METAL RACEWAY PERPENDICULAR OR PARALLEL TO WALLS, CEILINGS, OR STRUCTURAL MEMBERS.
21. TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED.
22. 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.
23. TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
24. 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.
25. 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.
26. 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.
27. REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSE IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.
28. CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL LOAD.
29. 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.
30. CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE.
31. ALL NEW CONTROL VALVES, CONTROL DAMPERS AND COMBINATION FIRE/SMOKE DAMPERS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR.
32. 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.
33. 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.
34. 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.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROL STANDARD DETAILS AND GENERAL NOTES

ISSUE DATES

DATE:	ISSUED FOR:
05-25-2023	CONSTRUCTION DOCUMENTS
03-15-2023	OWNER REVIEW

DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M0.2

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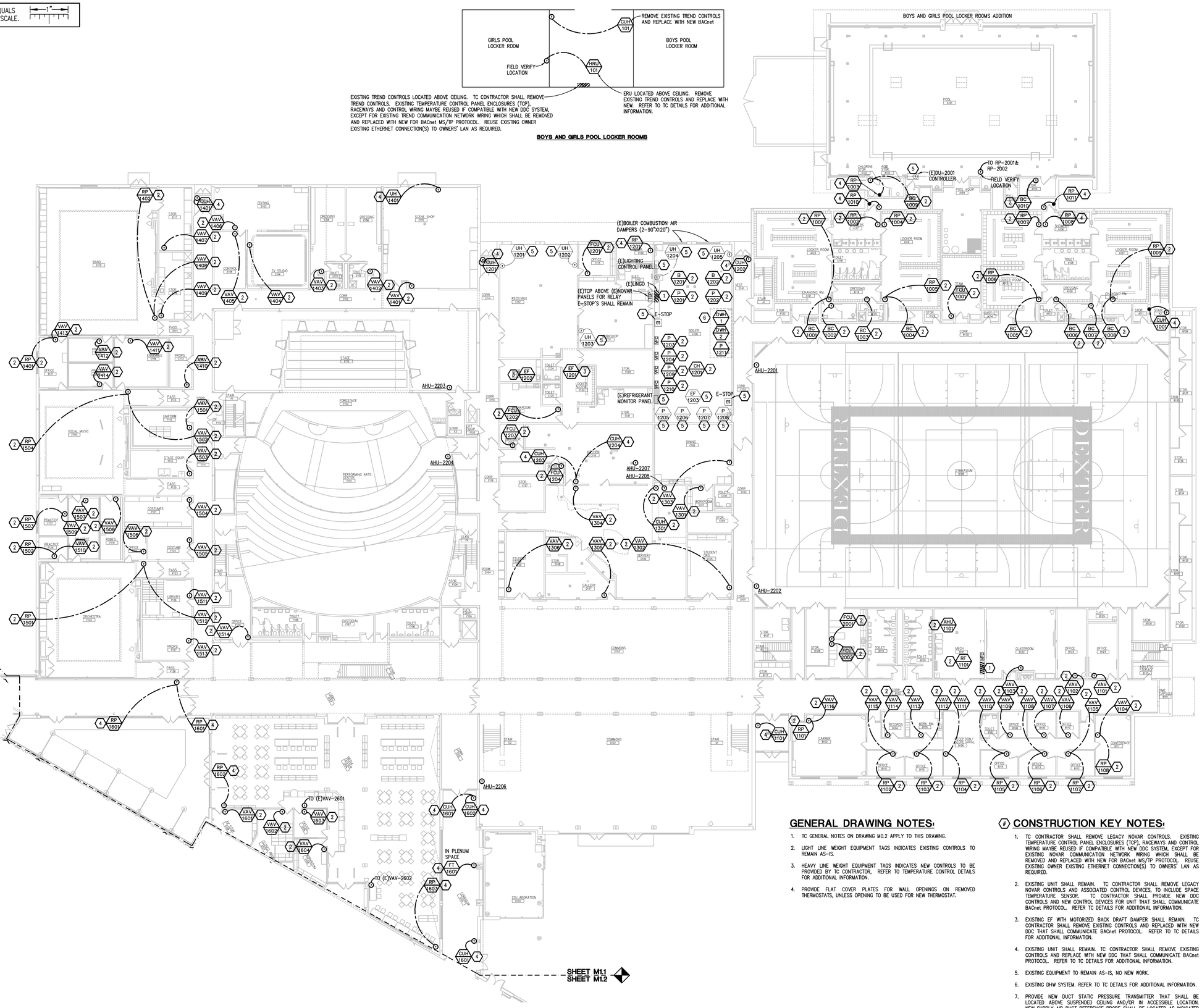
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

EXISTING TREND CONTROLS LOCATED ABOVE CEILING. TC CONTRACTOR SHALL REMOVE TREND CONTROLS. EXISTING TEMPERATURE CONTROL PANEL ENCLOSURES (TCP), RACEWAYS AND CONTROL WIRING MAYBE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM, EXCEPT FOR EXISTING TREND COMMUNICATION NETWORK WIRING WHICH SHALL BE REMOVED AND REPLACED WITH NEW FOR BACnet MS/TP PROTOCOL. REUSE EXISTING OWNER EXISTING ETHERNET CONNECTION(S) TO OWNERS' LAN AS REQUIRED.

ERU LOCATED ABOVE CEILING. REMOVE EXISTING TREND CONTROLS AND REPLACE WITH NEW. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.

BOYS AND GIRLS POOL LOCKER ROOMS



FIRST LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES A-G

SCALE: 1/16" = 1' - 0"

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. TC CONTRACTOR SHALL REMOVE LEGACY NOVAR CONTROLS. EXISTING TEMPERATURE CONTROL PANEL ENCLOSURES (TCP), RACEWAYS AND CONTROL WIRING MAYBE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM, EXCEPT FOR EXISTING NOVAR COMMUNICATION NETWORK WIRING WHICH SHALL BE REMOVED AND REPLACED WITH NEW FOR BACnet MS/TP PROTOCOL. REUSE EXISTING OWNER EXISTING ETHERNET CONNECTION(S) TO OWNERS' LAN AS REQUIRED.
2. EXISTING UNIT SHALL REMAIN. TC CONTRACTOR SHALL REMOVE LEGACY NOVAR CONTROLS AND ASSOCIATED CONTROL DEVICES, TO INCLUDE SPACE TEMPERATURE SENSOR. TC CONTRACTOR SHALL PROVIDE NEW DDC CONTROLS AND NEW CONTROL DEVICES FOR UNIT THAT SHALL COMMUNICATE BACnet PROTOCOL. REFER TC DETAILS FOR ADDITIONAL INFORMATION.
3. EXISTING EF WITH MOTORIZED BACK DRAFT DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING CONTROLS AND REPLACED WITH NEW DDC THAT SHALL COMMUNICATE BACnet PROTOCOL. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
4. EXISTING UNIT 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.
5. EXISTING EQUIPMENT TO REMAIN AS-IS, NO NEW WORK.
6. EXISTING DHW SYSTEM. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
7. PROVIDE NEW DUCT STATIC PRESSURE TRANSMITTER THAT SHALL BE LOCATED ABOVE SUSPENDED CEILING AND/OR IN ACCESSIBLE LOCATION. NEW SUPPLY AIR DUCT REFERENCE PROBE SHALL BE LOCATED AS INDICATED ON PLAN. HOMERUN SIGNAL WIRING TO RESPECTIVE AHU CONTROLLER.
8. PROVIDE NEW SPACE STATIC PRESS PROBE THAT SHALL BE LOCATED IN CEILING OF REFERENCED SPACE. RETURN AIR PLENUM REFERENCE NOT ACCEPTABLE.
9. VERIFY COMBINATION FIRE/SMOKE DAMPER OR SMOKE DAMPER OPERATION INTERLOCK TO ASSOCIATED UNIT. REPORT DEFICIENCIES TO OWNER/CONSTRUCTION TEAM.

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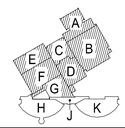
DRAWING TITLE

FIRST LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES A-G



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PROJECT NO.

22070C

DRAWING NO.

M1.1

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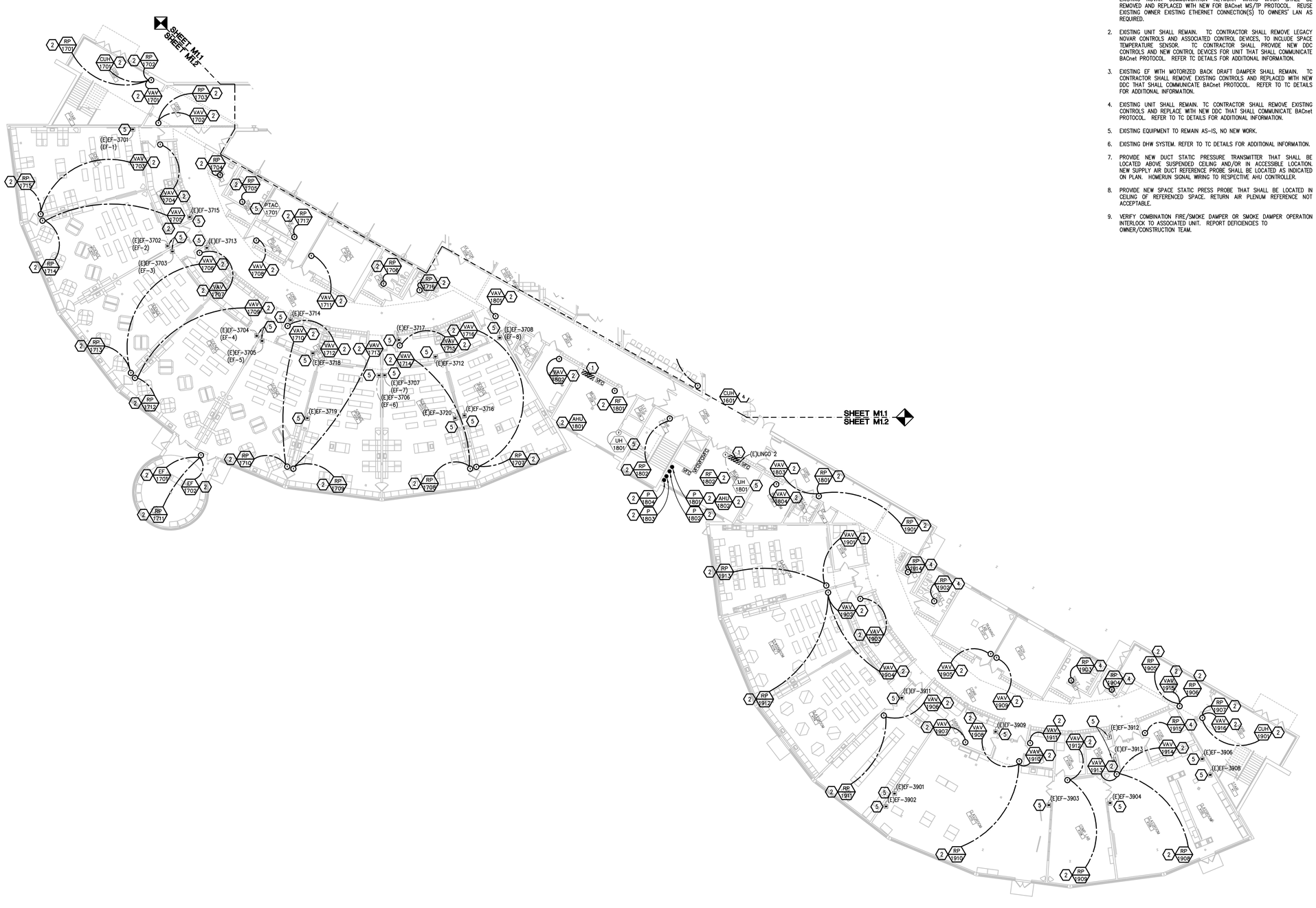
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



FIRST LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES H-K

SCALE: 1/16" = 1' - 0"

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.
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CONSTRUCTION KEY NOTES:

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2. EXISTING UNIT SHALL REMAIN. TC CONTRACTOR SHALL REMOVE LEGACY NOVAR CONTROLS AND ASSOCIATED CONTROL DEVICES, TO INCLUDE SPACE TEMPERATURE SENSOR. TC CONTRACTOR SHALL PROVIDE NEW DDC CONTROLS AND NEW CONTROL DEVICES FOR UNIT THAT SHALL COMMUNICATE BACnet PROTOCOL. REFER TC DETAILS FOR ADDITIONAL INFORMATION.
3. EXISTING EF WITH MOTORIZED BACK DRAFT DAMPER SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING CONTROLS AND REPLACED WITH NEW DDC THAT SHALL COMMUNICATE BACnet PROTOCOL. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
4. EXISTING UNIT 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.
5. EXISTING EQUIPMENT TO REMAIN AS-IS, NO NEW WORK.
6. EXISTING DHW SYSTEM. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
7. PROVIDE NEW DUCT STATIC PRESSURE TRANSMITTER THAT SHALL BE LOCATED ABOVE SUSPENDED CEILING AND/OR IN ACCESSIBLE LOCATION. NEW SUPPLY AIR DUCT REFERENCE PROBE SHALL BE LOCATED AS INDICATED ON PLAN. HOMERUN SIGNAL WIRING TO RESPECTIVE AHU CONTROLLER.
8. PROVIDE NEW SPACE STATIC PRESS PROBE THAT SHALL BE LOCATED IN CEILING OF REFERENCED SPACE. RETURN AIR PLENUM REFERENCE NOT ACCEPTABLE.
9. VERIFY COMBINATION FIRE/SMOKE DAMPER OR SMOKE DAMPER OPERATION INTERLOCK TO ASSOCIATED UNIT. REPORT DEFICIENCIES TO OWNER/CONSTRUCTION TEAM.

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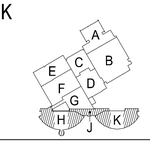

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22070C

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M1.2

g:\2022\2022-0379-00\CAD\2022-0379-M1-CMP1.dwg, M1.2, 5/25/2023 11:44:42 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

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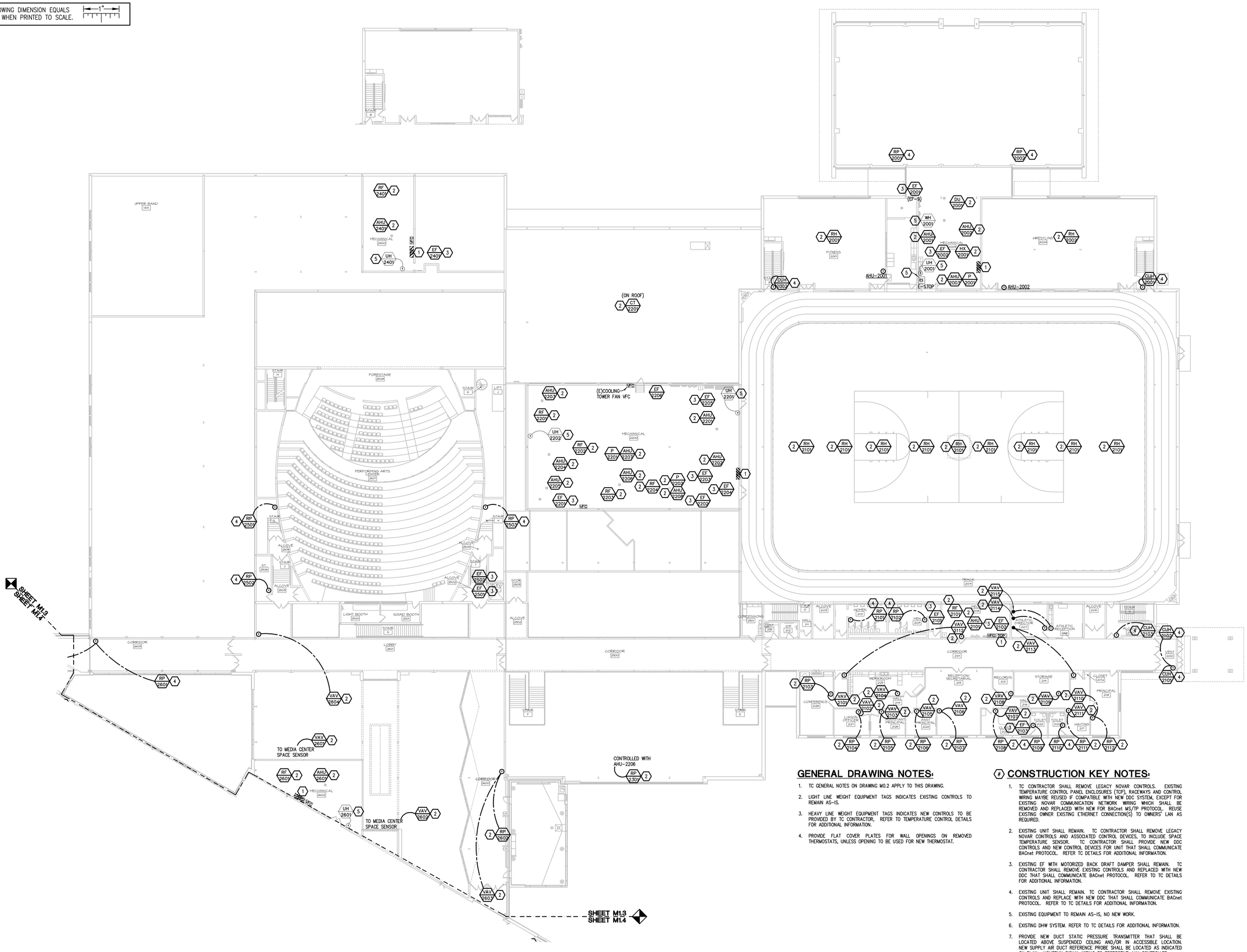

SECOND LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES A-G

SCALE: 1/16" = 1' - 0"

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. TC CONTRACTOR SHALL REMOVE LEGACY NOVAR CONTROLS. EXISTING TEMPERATURE CONTROL PANEL ENCLOSURES (TCP), RACEWAYS AND CONTROL WIRING MAYBE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM, EXCEPT FOR EXISTING NOVAR COMMUNICATION NETWORK WIRING WHICH SHALL BE REMOVED AND REPLACED WITH NEW FOR BACnet MS/TP PROTOCOL. REUSE EXISTING OWNER EXISTING ETHERNET CONNECTION(S) TO OWNERS' LAN AS REQUIRED.
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5. EXISTING EQUIPMENT TO REMAIN AS-IS, NO NEW WORK.
6. EXISTING DHW SYSTEM. REFER TO TC DETAILS FOR ADDITIONAL INFORMATION.
7. PROVIDE NEW DUCT STATIC PRESSURE TRANSMITTER THAT SHALL BE LOCATED ABOVE SUSPENDED CEILING AND/OR IN ACCESSIBLE LOCATION. NEW SUPPLY AIR DUCT REFERENCE PROBE SHALL BE LOCATED AS INDICATED ON PLAN. HOMERUN SIGNAL WIRING TO RESPECTIVE AHU CONTROLLER.
8. PROVIDE NEW SPACE STATIC PRESS PROBE THAT SHALL BE LOCATED IN CEILING OF REFERENCED SPACE. RETURN AIR PLENUM REFERENCE NOT ACCEPTABLE.
9. VERIFY COMBINATION FIRE/SMOKE DAMPER OR SMOKE DAMPER OPERATION INTERLOCK TO ASSOCIATED UNIT. REPORT DEFICIENCIES TO OWNER/CONSTRUCTION TEAM.

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www.PeterBassoAssociates.com
PBA Project No.: 2022.0379

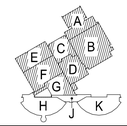
PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

SECOND LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES A-G



ISSUE DATES

DATE:	ISSUED FOR:
05-25-2023	CONSTRUCTION DOCUMENTS
03-15-2023	OWNER REVIEW

DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M1.3

g:\2022\2022-0379-00\CAD\2022-0379-M1-CMP2.dwg, M1.3, 5/25/2023 11:44:50 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

SECOND LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES H-K

SCALE: 1/16" = 1' - 0"

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.
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CONSTRUCTION KEY NOTES:

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PBA Project No.: 2022.0379

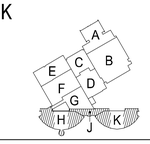
PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

SECOND LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES H-K



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DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M1.4

g:\2022\2022-0379-00\CAD\2022-0379-M1-CMP2.dwg, M1.4, 5/25/2023 11:44:51 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

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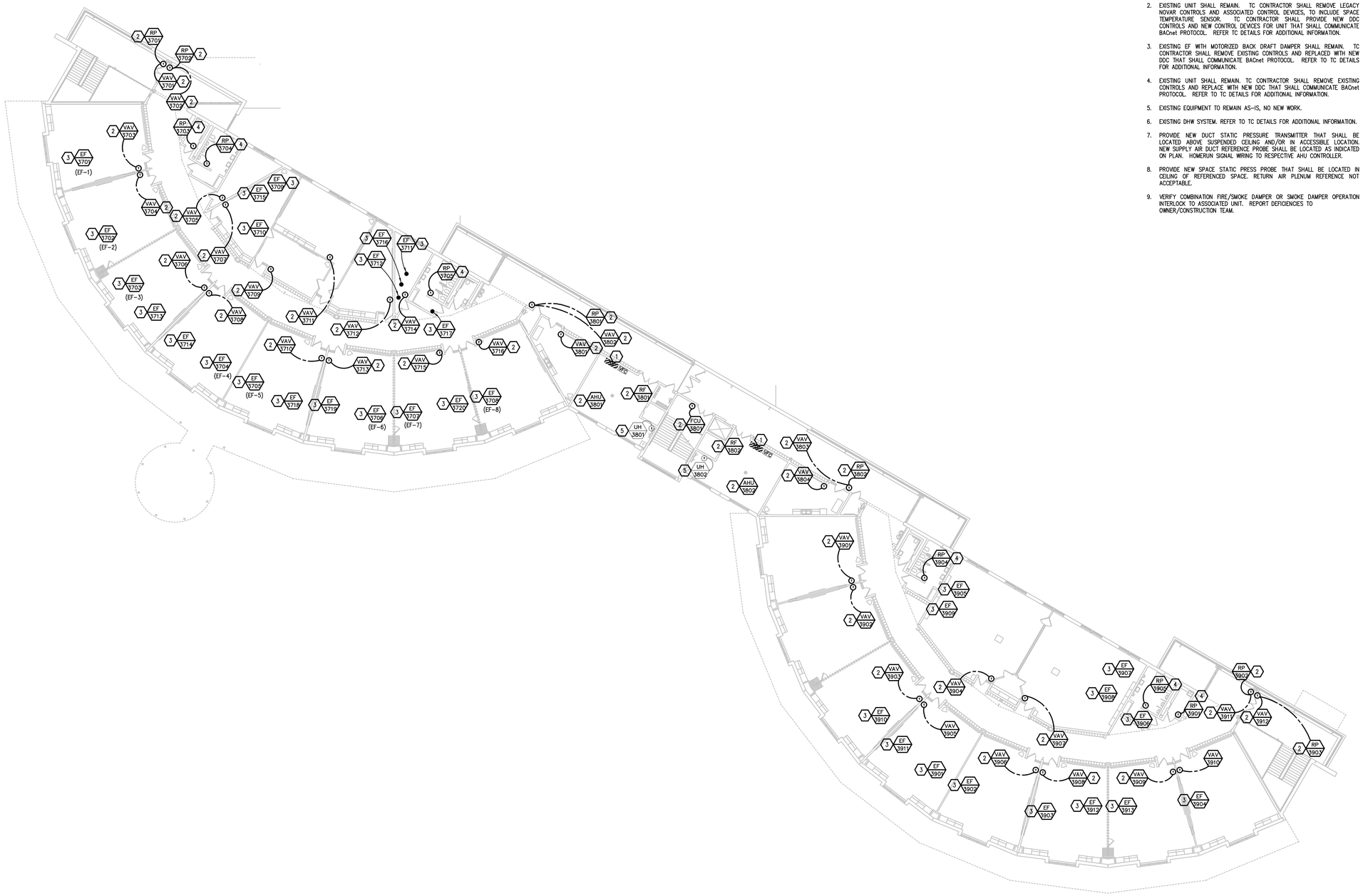

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THIRD LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES H-K

SCALE: 1/16" = 1' - 0"

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PROJECT TITLE

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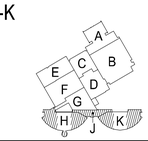
Dexter Community Schools

DRAWING TITLE

THIRD LEVEL TEMPERATURE CONTROL COMPOSITE PLAN - ZONES H-K



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DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M1.5

g:\2022\2022-0379-00\CAD\2022-0379-M1-CMP3.dwg, M1.5, 5/25/2023 11:44:58 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

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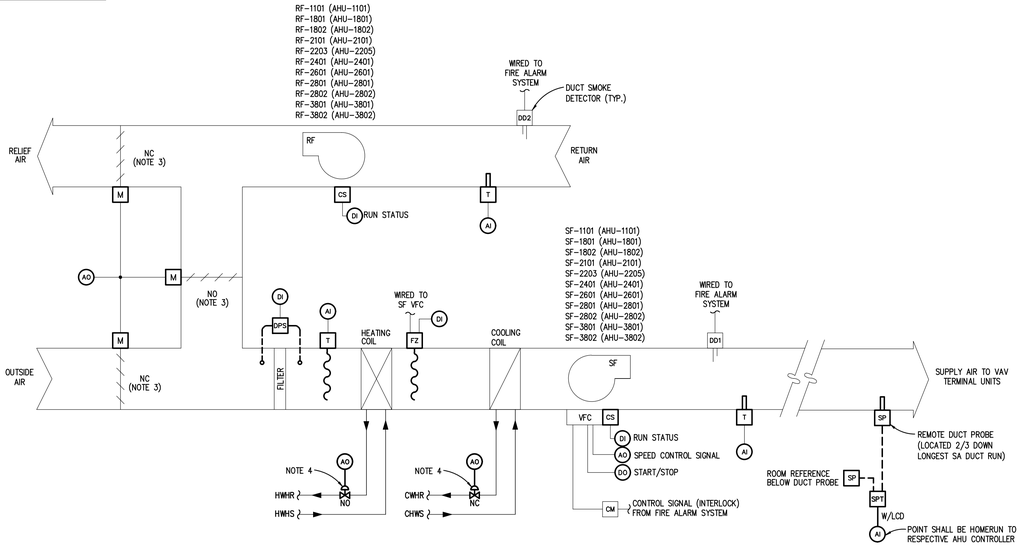
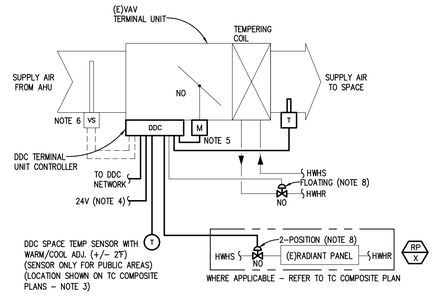
TC GENERAL NOTES

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





AHU 110 RF 110 AHU 180 RF 180 AHU 180 RF 180
AHU 210 RF 210 AHU 220 RF 220 AHU 240 RF 240
AHU 260 RF 260 AHU 280 RF 280 AHU 280 RF 280
AHU 380 RF 380 AHU 380 RF 380

(E)VAV AIR HANDLING UNIT CONTROL RETROFIT

TYPICAL

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 CABLING/WIRING NOT PERMITTED.
3. EXISTING CONTROL DAMPERS 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 & COOLING COIL CONTROL VALVES SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF & RF MOTOR SAFETY SHUTDOWN.
6. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

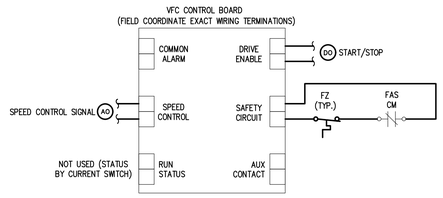
SEQUENCE OF OPERATION:

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. 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.

1. SUPPLY AND RETURN FAN 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 NIGHT CYCLE MODE.
2. FOR HEATING SEASON UNOCCUPIED PERIODS, AHU SHALL UTILIZE NIGHT CYCLE MODE TO MAINTAIN A NIGHT SETBACK TEMPERATURE OF 62°F. DDC SHALL REFERENCE ALL VAV BOX CONTROLLERS ASSOCIATED WITH RESPECTIVE AHU AND CYCLE AHU BASED ON LOWEST SPACE TEMP READING.
3. FOR COOLING SEASON UNOCCUPIED PERIODS, AHU SHALL UTILIZE NIGHT CYCLE MODE TO MAINTAIN A NIGHT SETUP TEMPERATURE OF 80°F. DDC SHALL REFERENCE ALL VAV BOX CONTROLLERS ASSOCIATED WITH RESPECTIVE AHU AND CYCLE AHU BASED ON HIGHEST SPACE TEMP READING.
4. SUPPLY FAN AND RETURN FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
5. WHEN AHU IS ACTIVATED DURING OCCUPIED MODE; OUTSIDE AIR, RETURN AIR & RELIEF AIR DAMPERS (HEREIN REFERRED TO AS DAMPERS) SHALL BE ALLOWED TO MODULATE AS DESCRIBED. WHEN AHU IS DEACTIVATED OR OPERATING IN NIGHT CYCLE MODE OR MORNING WARM-UP MODE, DAMPERS SHALL REMAIN IN NORMAL POSITIONS (OA & EA DAMPERS FULLY CLOSED).
6. WHEN OA TEMP IS 55°F OR BELOW, DDC SHALL MODULATE DAMPERS, ABOVE MINIMUM OA POSITION, IN SEQUENCE WITH HEATING COIL VALVE AND COOLING COIL VALVE TO MAINTAIN DA TEMP SETPOINT.
7. WHEN OA TEMP IS ABOVE 55°F AND OA TEMP IS GREATER THAN RA TEMP OR OA DEWPOINT IS ABOVE ECONOMIZER SETPOINT OF 52°F, DAMPERS SHALL REMAIN AT MINIMUM OA POSITION AND COOLING COIL VALVE SHALL BE MODULATED TO MAINTAIN DA TEMP SETPOINT.
8. WHEN OA TEMP IS ABOVE 55°F AND OA IS LESS RA TEMP AND OA TEMP IS BELOW OA DEWPOINT IS BELOW ECONOMIZER LOCKOUT SETPOINT OF 52°F, OA ECONOMIZER CYCLE SHALL MODULATE DAMPERS IN SEQUENCE WITH COOLING COIL VALVE MODULATION TO MAINTAIN DA TEMP SETPOINT.
9. DISCHARGE AIR TEMP SETPOINT SHALL BE BASED ON THE FOLLOWING OUTDOOR AIR TEMP RESET SCHEDULE:

OAT	DAT
≤ 30°F	60°F
≥ 55°F	55°F

10. DURING MORNING WARM-UP, DAT SETPOINT SHALL BE 90°F UNTIL BUILDING OCCUPANCY TIME OR WHEN OCCUPIED MODE SPACE TEMPERATURE IS REACHED IN ONE OF THE ASSOCIATED ZONES.
11. DDC SHALL MODULATE DAMPERS ACCORDINGLY TO MAINTAIN MINIMUM OA CFM. REFER TO SCHEDULES FOR MINIMUM OUTDOOR AIR INFORMATION.
12. AHU SUPPLY AND RETURN FANS SHALL BE MODULATED SIMULTANEOUSLY (BY SINGLE VFC) 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).
13. FREEZESTAT(S) SHALL DEACTIVATE SUPPLY FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZESTAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
14. DUCT SMOKE DETECTOR(S) THRU FIRE ALARM SYSTEM CONTROL MODULE SHALL DEACTIVATE SF & INTERLOCKED RF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
15. FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE SWITCH.
16. WHEN AHU IS DEACTIVATED, COOLING COIL VALVE SHALL REMAIN CLOSED AND HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MA TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.
17. VAV BOXES WITH ASSOCIATED TEMPERING COILS SHALL BE CONTROLLED BY UNITARY DDC CONTROLLERS (REFER TO VAV TERMINAL UNIT SEQUENCE OF OPERATION.)



AHU SF/RF VFC WIRING

TYPICAL

VAV X

(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 AND RADIANT PANEL CONTROL VALVE SHALL BE REPLACED WITH NEW AS SPECIFIED. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO VAV TERMINAL UNIT AND RADIANT PANEL SCHEDULES 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 RADIANT PANEL HEATING CONTROL VALVE (WHERE APPLICABLE) CLOSED AND SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM SETTINGS.
6. FOR ZONES WITHOUT RADIANT PANEL HEATING: 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 SPACE 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. FOR ZONES WITH RADIANT PANEL HEATING: WHEN OA TEMP IS 60°F OR BELOW AND SPACE TEMP FALLS BELOW SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL FIRST MODULATE TU DAMPER TOWARDS ITS MIN AIRFLOW SETTING. WHEN AIRFLOW IS AT MIN, TU CONTROLLER SHALL MODULATE THE RADIANT PANEL HEATING CONTROL VALVE FOLLOWED BY TEMPERING COIL CONTROL VALVE TO MAINTAIN THE SPACE TEMP SETPOINT. IF THE SPACE 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 ROOM TEMPERATURE
8. FOR ZONES WITH RADIANT PANEL HEATING: WHEN OA TEMP IS ABOVE 60°F AND SPACE TEMP FALLS BELOW 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 TOWARDS OPEN. IF THE SPACE 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. RADIANT PANEL HEATING CONTROL VALVE SHALL REMAIN CLOSED.
9. 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
10. WHEN RESPECTIVE AHU IS DEACTIVATED, THE TERMINAL UNIT TEMPERING COIL CONTROL VALVE SHALL REMAIN CLOSED.
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. 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.
13. TU DISCHARGE AIR TEMP SHALL BE MONITORED FOR SYSTEM DIAGNOSTICS AND PROVIDE HIGH AND LOW LIMIT CONTROL AS DESCRIBED.
14. CONTROL SIGNALS FOR AIR TERMINAL UNIT DAMPER ACTUATOR AND HEATING CONTROL OUTPUT(S) SHALL BE DISPLAYED WITH SYSTEM GRAPHICS.

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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

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DRAWN WJU
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PROJECT NO.

22070C

DRAWING NO.

M2.1

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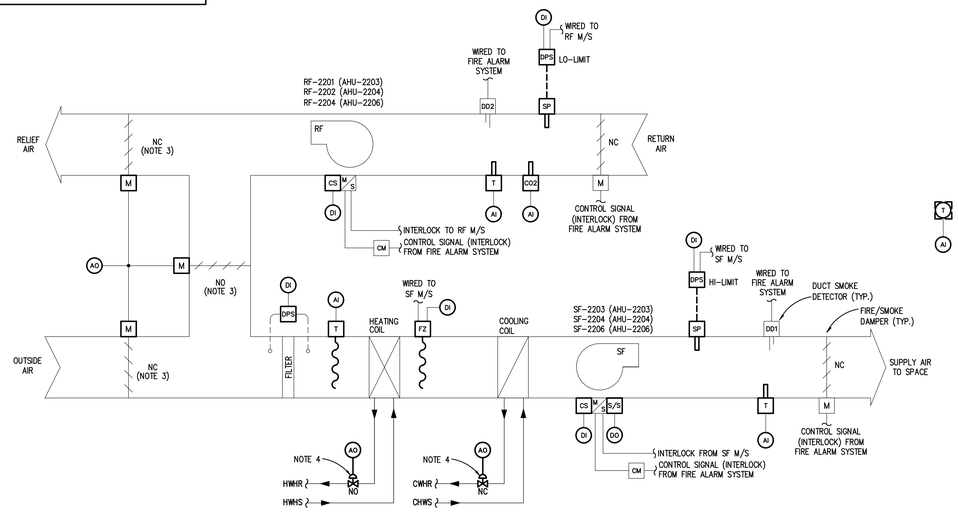
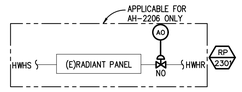
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

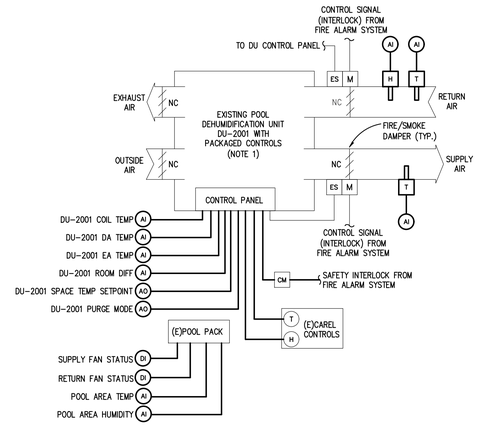


DDC SPACE TEMP SENSOR W/GUARD OR FLAT PLATE TYPE (LOCATION SHOWN ON TC COMPOSITE PLANS)



TC GENERAL NOTES

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



(E)CAV W/RF AIR HANDLING UNIT CONTROL RETROFIT

AHU 220 RF 220 / AHU 220 RF 220 / AHU 220 RF 220

TYPICAL

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 CABLING/WIRING NOT PERMITTED.
3. EXISTING CONTROL DAMPERS 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 & COOLING COIL CONTROL VALVES SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF & RF MOTOR SAFETY SHUTDOWN.
6. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

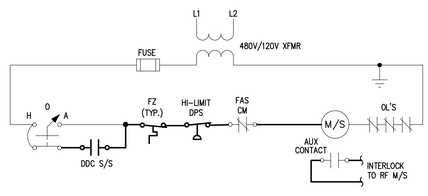
NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. ALL CONTROL LOOPS SHALL BE ENABLED AND DISABLED BASED ON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

1. SUPPLY FAN WITH INTERLOCKED RETURN FAN 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 TEMPERATURE SENSOR) AND UNOCCUPIED CYCLE MODE.
2. FOR HEATING OCCUPIED MODE, AHU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
3. FOR COOLING OCCUPIED MODE, AHU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 74°F.
4. FOR HEATING UNOCCUPIED MODE, AHU SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
5. FOR COOLING UNOCCUPIED MODE, AHU SHALL CYCLE ON & OFF TO MAINTAIN A SETUP SPACE TEMP SETPOINT OF 80°F.
6. SUPPLY FAN AND RETURN FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION FOR SF OR RF SHALL ACTIVATE ALARM.
7. 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.
8. WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL MODULATE DAMPERS TOWARDS MINIMUM OA POSITION AND MODULATE HEATING COIL VALVE CONTROL TO MAINTAIN SPACE TEMP SETPOINT. IN HEATING MODE, DISCHARGE AIR TEMP LOW LIMIT OF 55°F AND HIGH LIMIT OF 90°F SHALL PROVIDE OVERRIDE CONTROL OF HEATING COIL CONTROL VALVE. WHERE APPLICABLE; RADIANT PANEL CONTROL VALVE SHALL BE MODULATED IN SEQUENCE WITH HEATING COIL CONTROL VALVE.
9. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS LESS THAN RA TEMP, DDC SHALL MODULATE DAMPER OA ECONOMIZER TO MAINTAIN SPACE TEMP SETPOINT. DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 55°F SHALL OVERRIDE CONTROL.
10. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS GREATER THAN RA TEMP, DAMPERS SHALL REMAIN AT MINIMUM OA POSITION AND DDC SHALL MODULATE THE COOLING COIL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
11. MIXED AIR LOW TEMP LIMIT OF 45°F SHALL PROVIDE OVERRIDE CONTROL OF MIXED AIR DAMPERS AND ALLOW MODULATION BELOW THE MINIMUM OA DAMPER POSITION SETPOINT.
12. 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)

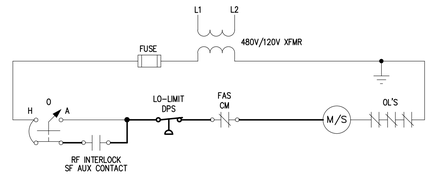
TC CONTRACTOR SHALL COORDINATE RESPONDING DAMPER MIN-MIN AND MAX-MIN CONTROL % SETPOINTS (ADJUSTABLE) WITH AIR BALANCE CONTRACTOR.

13. FREEZESTAT(S) SHALL DEACTIVATE SF AND RF WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZESTAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
14. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF AND RF WHEN PRODUCTS OF COMBUSTION ARE DETECTED. WHERE APPLICABLE; SMOKE/FIRE DAMPERS SHALL BE ACTIVATED THRU FIRE ALARM SYSTEM.
15. DISCHARGE AIR STATIC PRESSURE HIGH LIMIT SWITCH SHALL DEACTIVATE SUPPLY FAN WHEN PRESSURE IS 3.5" W.G. OR ABOVE. DDC SHALL MONITOR HIGH LIMIT SWITCH STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
16. RETURN AIR STATIC PRESSURE LOW LIMIT SWITCH SHALL DEACTIVATE RETURN FAN WHEN PRESSURE IS -3.5" W.G. OR BELOW. DDC SHALL MONITOR LOW LIMIT SWITCH AND ACTIVATE ALARM IF CONDITION OCCURS.
17. FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE SWITCH.
18. WHEN AHU IS DEACTIVATED, COOLING COIL VALVE SHALL REMAIN CLOSED.
19. WHEN OA TEMP IS BELOW 40°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



AHU RF M/S WIRING

TYPICAL

(E)PACKAGED DU-2001 CONTROL RETROFIT

DU 200

NOTES:

1. EXISTING POOL DEHUMIDIFICATION UNIT PACKAGED CONTROLS TO REMAIN.
2. REMOVE EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
3. COORDINATE INSTALLATION AND WIRING REQUIREMENTS WITH OWNER.

SEQUENCE OF OPERATION:

1. EXISTING DEHUMIDIFICATION UNIT WITH PACKAGED CONTROLS SHALL MAINTAIN SPACE TEMPERATURE AND HUMIDITY SETPOINTS.
2. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE DEHUMIDIFICATION UNIT AND CLOSE FIRE SMOKE DAMPERS THRU FIRE ALARM SYSTEM CONTROL MODULE WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
3. DDC SHALL MONITOR THE PACKAGED DEHUMIDIFICATION UNIT AT THE BAS.

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PROJECT NO.

22070C

DRAWING NO.

M2.2

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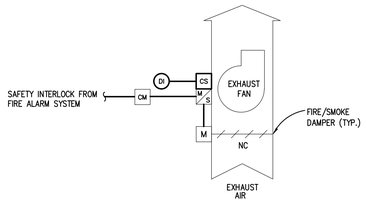


EF 200 (EF-9)

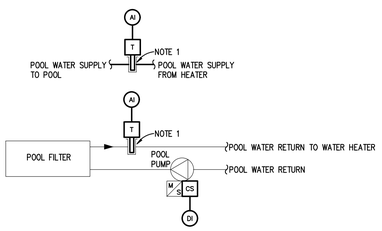
(E)POOL CHEMICAL STORAGE ROOM CONTROL

NOTES:

1. REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNIT.

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL RUN CONTINUOUSLY.
2. FIRE ALARM CONTROL MODULE SHALL DEACTIVATE EXHAUST FAN AND CLOSE FIRE SMOKE DAMPERS.
3. DDC SHALL MONITOR FAN STATUS THRU CURRENT SWITCH. DDC SHALL ACTIVATE CRITICAL ALARM IF LOSS OF FAN STATUS IS DETECTED.



(E)POOL FILTER PUMP MONITORING

NOTES:

1. COORDINATE INSTALLATION AND WIRING REQUIREMENTS WITH OWNER. REUSE EXISTING WELLS FOR IMMERSION TEMP SENSORS.

SEQUENCE OF OPERATION:

1. POOL PUMP SHALL RUN CONTINUOUSLY.
2. DDC SHALL MONITORED PUMP STATUS THRU CURRENT SWITCH. DDC SHALL ACTIVATE CRITICAL ALARM IF LOSS OF PUMP STATUS IS DETECTED.

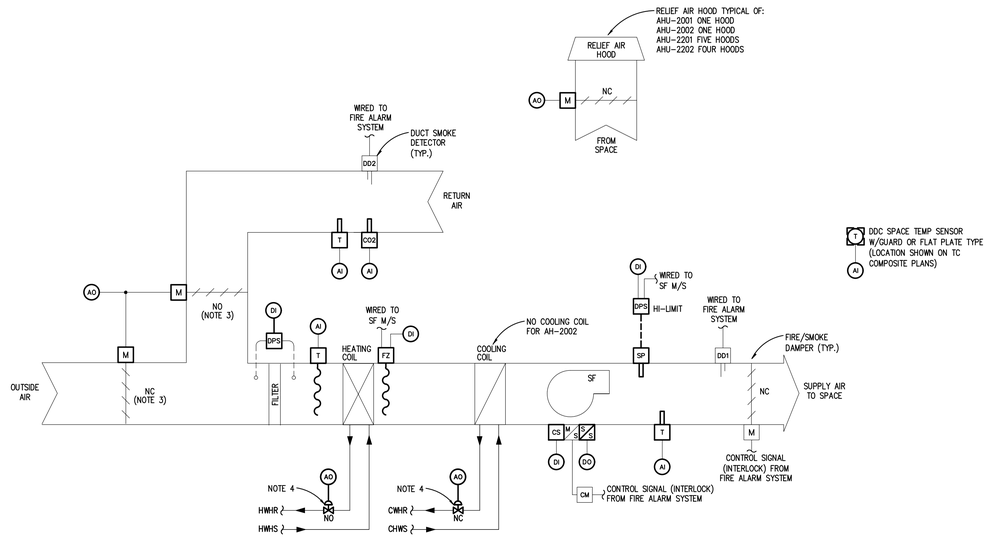
(E)POOL CONTROL PANEL MONITORING

NOTES:

1. DDC SHALL MONITOR POOL CONTROL PANEL FOR CHLORINE AND PH LEVELS.
2. COORDINATE INSTALLATION AND WIRING REQUIREMENTS WITH OWNER.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR POOL WATER CHLORINE AND PH LEVEL AT THE BAS.



AHU 2001 AHU 2002 AHU 2201 AHU 2202

(E)CAV AIR HANDLING UNIT CONTROL RETROFIT

TYPICAL

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 CABLING/WIRING NOT PERMITTED.
3. EXISTING CONTROL DAMPERS 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 & COOLING COIL CONTROL VALVES SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF 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. 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.

1. 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.
2. FOR HEATING OCCUPIED MODE, AHU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 70°F.
3. FOR COOLING OCCUPIED MODE, AHU SHALL BE CONTROLLED TO MAINTAIN SPACE TEMP SETPOINT OF 74°F.
4. FOR HEATING UNOCCUPIED MODE, AHU SHALL CYCLE ON & OFF TO MAINTAIN A SETBACK SPACE TEMP SETPOINT OF 62°F.
5. FOR COOLING UNOCCUPIED MODE, AHU SHALL CYCLE ON & OFF TO MAINTAIN A SETUP SPACE TEMP SETPOINT OF 80°F.
6. SUPPLY FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION FOR SF SHALL ACTIVATE ALARM.
7. 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.
8. WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL MODULATE DAMPERS TOWARDS MINIMUM OA POSITION AND MODULATE HEATING COIL VALVE CONTROL TO MAINTAIN SPACE TEMP SETPOINT. IN HEATING MODE, DISCHARGE AIR TEMP LOW LIMIT OF 55°F AND HIGH LIMIT OF 90°F SHALL PROVIDE OVERRIDE CONTROL OF HEATING COIL CONTROL VALVE.
9. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS LESS THAN RA TEMP, DDC SHALL MODULATE DAMPER OA ECONOMIZER TO MAINTAIN SPACE TEMP SETPOINT. DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 55°F SHALL OVERRIDE CONTROL.
10. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT AND OA TEMP IS GREATER THAN RA TEMP, DAMPERS SHALL REMAIN AT MINIMUM OA POSITION AND WHERE APPLICABLE DDC SHALL MODULATE THE COOLING COIL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
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CO2	OA DAMPER MIN POSITION
600 PPM	MIN-MIN SET CFM (5% OF MAX-MIN POSITION)
1,100 PPM	MAX-MIN CFM (SEE AHU SCHEDULE)

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

13. FREEZESTAT(S) SHALL DEACTIVATE SUPPLY FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZESTAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
14. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF WHEN PRODUCTS OF COMBUSTION ARE DETECTED. WHERE APPLICABLE; SMOKE/FIRE DAMPERS SHALL BE ACTIVATED THRU FIRE ALARM SYSTEM.
15. DISCHARGE AIR STATIC PRESSURE HIGH LIMIT SWITCH SHALL DEACTIVATE SUPPLY FAN WHEN PRESSURE IS 3.5" W.G. OF ABOVE. DDC SHALL MONITOR HIGH LIMIT SWITCH STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
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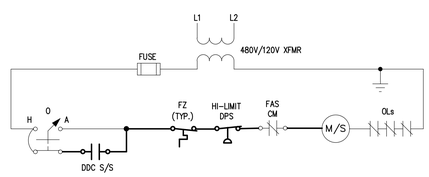
17. WHEN AHU IS DEACTIVATED, COOLING COIL VALVE SHALL REMAIN CLOSED.
18. WHEN OA TEMP IS BELOW 40°F AND AHU IS DEACTIVATED, HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON MIXED AIR TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



AHU SF M/S WIRING

TYPICAL

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PROJECT NO.

22070C

DRAWING NO.

M2.3

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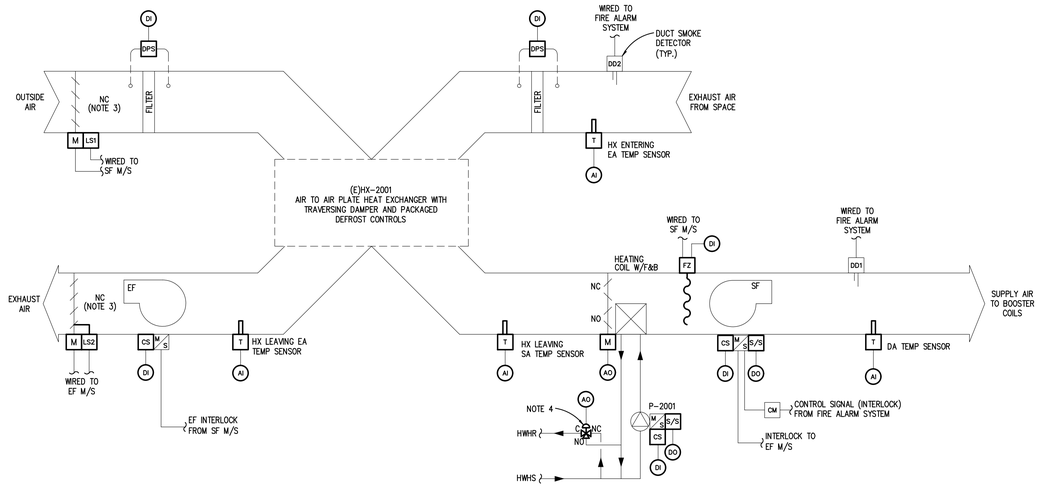

(E)CAV AIR HANDLING UNIT W/HX CONTROL RETROFIT

AHU 200 EF 200 HX 200 P 200

TYPICAL

NOTES:

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4. EXISTING HEATING COIL CONTROL VALVE SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF & EF MOTOR SAFETY SHUTDOWN.
6. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

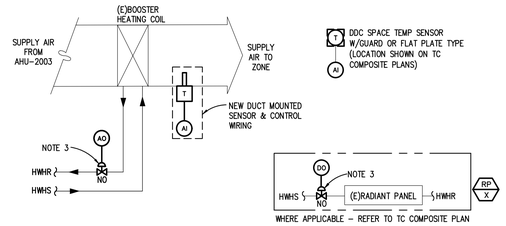
SEQUENCE OF OPERATION:

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. 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.

1. SUPPLY FAN WITH INTERLOCKED EXHAUST FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. AHU SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM), UNOCCUPIED CYCLE MODE.
2. FOR HEATING SEASON UNOCCUPIED PERIODS, AHU SHALL UTILIZE NIGHT CYCLE MODE TO MAINTAIN A NIGHT SETBACK TEMPERATURE OF 62°F. DDC SHALL REFERENCE LOWEST BOOSTER HEATING COIL SPACE TEMP.
3. OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE INTERLOCKED TO RESPECTIVE FAN MOTOR STARTER. SUPPLY FAN AND EXHAUST FAN SHALL BE ACTIVATED WHEN RESPECTIVE DAMPER LIMIT SWITCHES ARE CLOSED.
4. SUPPLY AND EXHAUST FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
5. DDC SHALL ACTIVATE HEATING COIL CIRC PUMP WHENEVER OA TEMP IS BELOW 55°F WITH SF ACTIVATED OR WHENEVER OA TEMP IS BELOW 40°F WITH SF DEACTIVATED. PUMP STATUS SHALL BE MONITORED BY DDC THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
6. WHEN OA TEMP IS 38°F AND ABOVE, FACE & BYPASS DAMPERS SHALL BE IN FULL FACE POSITION AND HEATING COIL VALVE SHALL MODULATE FOR TO MAINTAIN DISCHARGE AIR TEMP SETPOINT AS RESET BY OA TEMP. DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 60°F AND HIGH LIMIT OF 90°F SHALL PROVIDE OVERRIDE CONTROL.
7. WHEN OA TEMP IS 38°F OR BELOW, HEATING COIL VALVE SHALL BE FULLY OPEN AND FACE & BYPASS DAMPERS SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMP SETPOINT AS RESET BY OA TEMP. DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 60°F AND HIGH LIMIT SETPOINT OF 90°F SHALL PROVIDE OVERRIDE CONTROL.
8. DISCHARGE AIR TEMP SETPOINT WHICH SHALL BE BASED ON THE FOLLOWING OUTDOOR AIR TEMP RESET SCHEDULE:

OAT	DAT
≤ 30°F	60°F
≥ 55°F	55°F

9. FREEZESTAT(S) SHALL DEACTIVATE SUPPLY FAN AND INTERLOCKED EXHAUST FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZESTAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
10. DUCT SMOKE DETECTOR(S) SHALL DEACTIVATE SF & EF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
11. FILTER STATUS FOR SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE SWITCH.
12. WHEN AHU IS DEACTIVATED, DAMPERS SHALL CLOSE AND HEATING COIL CONTROL VALVE SHALL BE MODULATED BY DDC BASED ON DA TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



(E)BOOSTER HEATING COIL CONTROL RETROFIT

BC X

TYPICAL

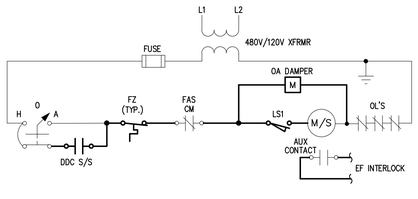
NOTES:

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. EXISTING BOOSTER HEATING COIL AND RADIANT PANEL CONTROL VALVES SHALL BE REPLACED WITH NEW AS SPECIFIED. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO BOOSTER HEATING COIL AND RADIANT PANEL SCHEDULES FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

BOOSTER HEATING COIL CONTROL:

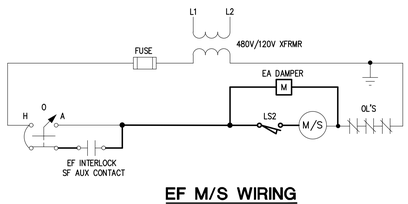
NOTE: ALL SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

1. IN ALL MODES OF HEATING, BOOSTER HEATING COIL DISCHARGE AIR TEMP SENSOR SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90°F DAT.
2. FOR ZONES WITHOUT RADIANT PANEL HEATING: WHEN SPACE TEMPERATURE FALLS BELOW SETPOINT, DDC CONTROLLER SHALL MODULATE THE BOOSTER HEATING COIL CONTROL VALVE TO MAINTAIN THE SPACE TEMP SETPOINT.
3. FOR ZONES WITH RADIANT PANEL HEATING: WHEN OA TEMP IS 60°F OR BELOW AND SPACE TEMP FALLS BELOW SETPOINT, DDC CONTROLLER SHALL MODULATE THE BOOSTER HEATING COIL AND RADIANT PANEL HEATING CONTROL VALVE IN SEQUENCE TO MAINTAIN THE SPACE TEMP SETPOINT.
4. FOR ZONES WITH RADIANT PANEL HEATING: WHEN OA TEMP IS ABOVE 60°F AND SPACE TEMP FALLS BELOW SETPOINT, DDC CONTROLLER SHALL MODULATE BOOSTER HEATING COIL CONTROL VALVE TO MAINTAIN SPACE TEMP SETPOINT. RADIANT PANEL HEATING CONTROL VALVE SHALL REMAIN CLOSED.



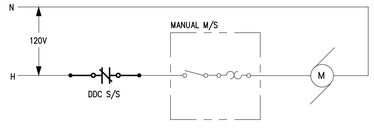
AHU SF M/S WIRING

TYPICAL



EF M/S WIRING

TYPICAL



HEATING COIL CIRC PUMP M/S WIRING

TYPICAL

TMP ARCHITECTURE

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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
05-25-2023	CONSTRUCTION DOCUMENTS
03-15-2023	OWNER REVIEW

DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

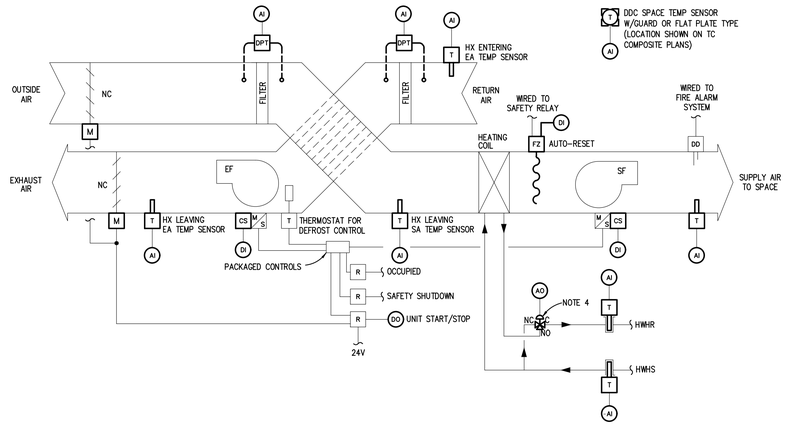
M2.4

g:\2022\2022-0379-00\CAD\2022-0379-M2-CP.dwg, M2.4, 5/25/2023 11:45:11 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

TC GENERAL NOTES

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



(E)HEAT RECOVERY UNIT CONTROL RETROFIT

HRU 101

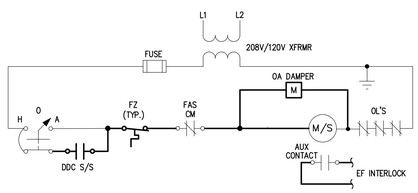
NOTES:

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 CABLING/WIRING NOT PERMITTED.
3. EXISTING CONTROL DAMPERS SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATORS AND REPLACE WITH NEW AS SPECIFIED.
4. EXISTING HEATING COIL CONTROL VALVE SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF & EF MOTOR SAFETY SHUTDOWN.
6. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

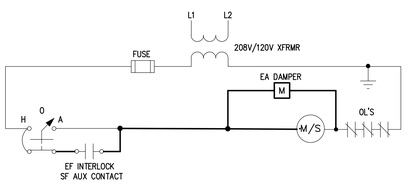
SEQUENCE OF OPERATION:

NOTE: ALL SETPOINTS 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.

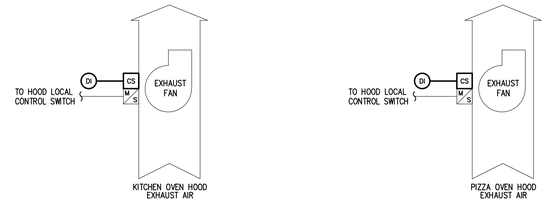
1. SUPPLY FAN WITH INTERLOCKED EXHAUST FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. AHU SHALL OPERATE BASED ON TIME SCHEDULED OCCUPIED MODE (COMPENSATED BY OPTIMUM START PROGRAM), UNOCCUPIED CYCLE MODE.
2. FOR OCCUPIED MODE, ERU SHALL BE CONTROLLED TO MAINTAIN TEMP SPACE SETPOINT OF 72°F.
3. FOR UNOCCUPIED MODE, ERU SHALL CYCLE ON & OFF TO MAINTAIN SPACE TEMP SETPOINT OF 62°F.
4. OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL BE INTERLOCKED TO RESPECTIVE FAN MOTOR STARTER. SUPPLY FAN AND EXHAUST FAN SHALL BE ACTIVATED WHEN RESPECTIVE DAMPER LIMIT SWITCHES ARE CLOSED.
5. SUPPLY AND EXHAUST FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
6. DDC SHALL MODULATE HEATING COIL CONTROL VALVE TO MAINTAIN DISCHARGE AIR TEMP SETPOINT AS RESET BY SPACE TEMP AND SPACE TEMP SETPOINT (CASCADE CONTROL). DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 60°F AND HIGH LIMIT OF 90°F SHALL PROVIDE OVERRIDE CONTROL.
7. FREEZESTAT(S) SHALL DEACTIVATE SUPPLY FAN AND INTERLOCK EXHAUST FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZESTAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
8. DUCT SMOKE DETECTOR(S) THRU FIRE ALARM SYSTEM CONTROL MODULE SHALL DEACTIVATE SF AND EF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
9. FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE TRANSMITTER.
10. WHEN OA TEMP IS BELOW 40°F AND SF IS DEACTIVATED, HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON DA TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



ERU SF M/S WIRING



ERU EF M/S WIRING

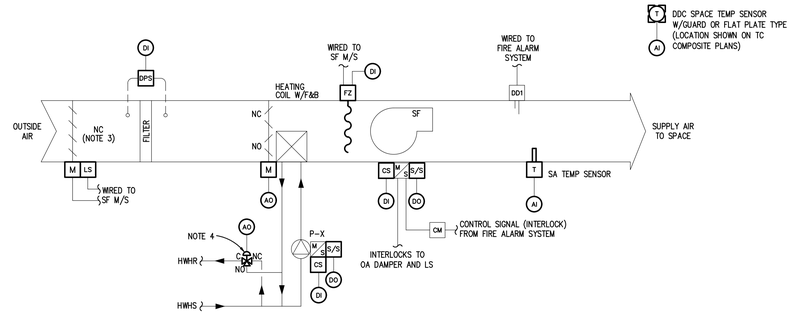


EF-2203 CONTROL

SERVES KITCHEN OVEN HOOD

EF-2202 CONTROL

SERVES PIZZA OVEN HOOD



(E)MAKE-UP AIR HANDLING UNIT CONTROL RETROFIT

AHU 220 P 220 AHU 209 P 220

TYPICAL

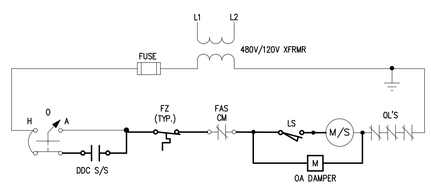
NOTES:

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 CABLING/WIRING NOT PERMITTED.
3. EXISTING CONTROL DAMPERS SHALL REMAIN. TC CONTRACTOR SHALL REMOVE EXISTING DAMPER ACTUATORS AND REPLACE WITH NEW AS SPECIFIED.
4. EXISTING HEATING COIL CONTROL VALVE SHALL BE REMOVED AND REPLACED WITH NEW AS SPECIFIED. TC CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO AHU CONTROL SCHEDULE FOR CONTROL VALVE SIZING PARAMETERS.
5. TC CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO SF MOTOR SAFETY SHUTDOWN.
6. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

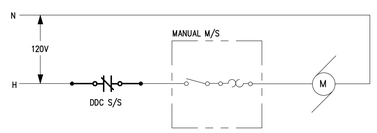
NOTE: ALL SETPOINTS INCLUDING RESET SCHEDULE SETPOINTS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION. ALL CONTROL LOOPS SHALL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

1. SUPPLY FAN SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. UNIT SHALL BE ACTIVATED UPON RUN PROOF STATUS OF RESPECTIVE HOOD EXHAUST FAN.
2. FOR OCCUPIED MODE, MAU SHALL BE CONTROLLED TO MAINTAIN TEMP SPACE SETPOINT OF 70°F.
3. FOR UNOCCUPIED MODE, MAU SHALL CYCLE ON & OFF TO MAINTAIN SPACE TEMP SETPOINT OF 62°F.
4. WIRING INTERLOCK SHALL OPEN MAU OA DAMPER. SF SHALL BE ACTIVATED UPON PROOF OF DAMPER LIMIT SWITCH.
5. SUPPLY FAN STATUS SHALL BE MONITORED BY DDC THRU RESPECTIVE CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
6. DDC SHALL ACTIVATE HEATING COIL CIRC PUMP WHENEVER OA TEMP IS BELOW 55°F WITH SF ACTIVATED OR WHENEVER OA TEMP IS BELOW 40°F WITH SF DEACTIVATED. PUMP STATUS SHALL BE MONITORED BY DDC THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
7. WHEN OA TEMP IS 38°F AND ABOVE, FACE & BYPASS DAMPERS SHALL BE IN FULL FACE POSITION AND HEATING COIL VALVE SHALL MODULATE FOR TO MAINTAIN DISCHARGE AIR TEMP SETPOINT AS RESET BY SPACE TEMP AND SPACE TEMP SETPOINT (CASCADE CONTROL). DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 60°F AND HIGH LIMIT OF 90°F SHALL PROVIDE OVERRIDE CONTROL.
8. WHEN OA TEMP IS 38°F OR BELOW, HEATING COIL VALVE SHALL BE FULLY OPEN AND FACE & BYPASS DAMPERS SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMP SETPOINT AS RESET BY SPACE TEMP AND SPACE TEMP SETPOINT (CASCADE CONTROL). DISCHARGE AIR TEMP LOW LIMIT SETPOINT OF 60°F AND HIGH LIMIT SETPOINT OF 90°F SHALL PROVIDE OVERRIDE CONTROL.
9. FREEZESTAT(S) SHALL DEACTIVATE SUPPLY FAN WHEN TEMPERATURE IS 35°F OR BELOW. DDC SHALL MONITOR FREEZESTAT STATUS AND ACTIVATE ALARM IF CONDITION OCCURS.
10. DUCT SMOKE DETECTOR(S) THRU FIRE ALARM SYSTEM CONTROL MODULE SHALL DEACTIVATE SF WHEN PRODUCTS OF COMBUSTION ARE DETECTED.
11. FILTER STATUS SHALL BE MONITORED BY DDC THRU DIFFERENTIAL PRESSURE SWITCH.
12. WHEN OA TEMP IS BELOW 40°F AND SF IS DEACTIVATED, HEATING COIL VALVE SHALL BE MODULATED BY DDC BASED ON DA TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50°F.



MAU SF M/S WIRING

TYPICAL



HEATING COIL CIRC PUMP M/S WIRING

TYPICAL

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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
05-25-2023	CONSTRUCTION DOCUMENTS
03-15-2023	OWNER REVIEW

DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

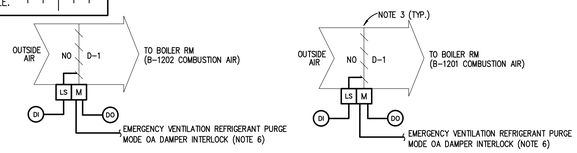
22070C

DRAWING NO.

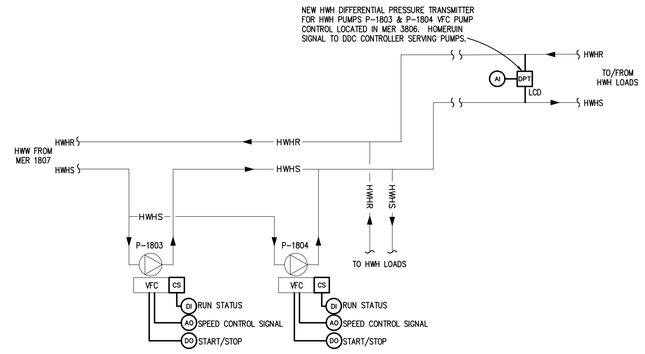
M2.5

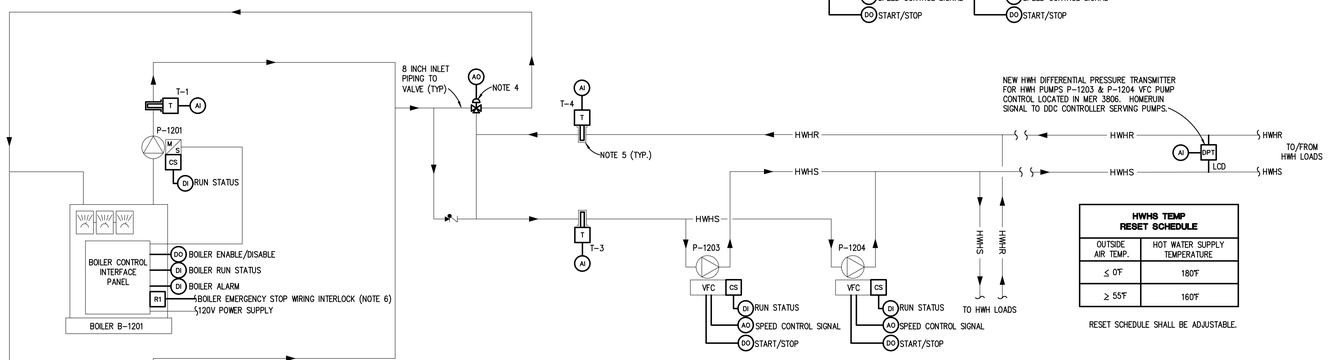
g:\2022\2022-0379-00\CAD\2022-0379-M2-CP.dwg, M2.5, 5/25/2023 11:45:12 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"



COMBUSTION AIR DAMPER CONTROL





HWHS TEMP RESET SCHEDULE	
OUTSIDE AIR TEMP.	HOT WATER SUPPLY TEMPERATURE
≤ 0°F	180°F
≥ 55°F	160°F

RESET SCHEDULE SHALL BE ADJUSTABLE.

(E)HOT WATER HEATING SYSTEM CONTROL RETROFIT

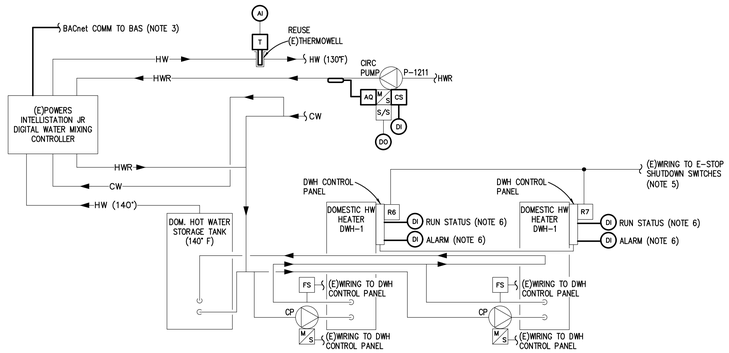
NOTES:

1. REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
2. REMOVE 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.
3. EXISTING OUTSIDE AIR DAMPER TO BE REUSED. TC CONTRACTOR TO PROVIDE NEW DAMPER ACTUATORS.
4. EXISTING 3-WAY HEATING CONTROL VALVE TO BE REPLACED WITH NEW. TC CONTRACTOR TO PROVIDE NEW CONTROL VALVE WITH DDC ACTUATOR.
5. REUSE EXISTING WELLS FOR NEW IMMERSION TEMPERATURE SENSORS.
6. SEE DRAWING M2.9 FOR BOILER SAFETY SHUTDOWN WIRING AND SEQUENCE OF OPERATION. TC CONTRACTOR RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO BOILER 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, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY SYSTEM OPERATORS (CREATE REQUIRED VIRTUAL POINTS). 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.

1. HOT WATER HEATING SYSTEM SHALL BE ACTIVATED FOR CONTINUOUS OPERATION DURING BUILDING OCCUPANCY OR WHEN OUTDOOR AIR TEMPERATURE IS BELOW 50°F FOR BUILDING UNOCCUPANCY. HWH SYSTEM SERVES TERMINAL UNITS WITH TEMPERING COILS FOR REHEAT DURING COOLING SEASON.
2. HW PUMPS P-1203/P-1204 & P-1803/P-1804 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE PUMP FROM EACH SET OF PUMPS SHALL BE ACTIVATED BY DDC TO OPERATE WHEN HOT WATER HEATING SYSTEM IS ACTIVATED. THE OTHER PUMP FROM EACH SET WILL SERVE AS STANDBY.
3. DDC SHALL ALTERNATE PUMP OPERATION FOR EACH SET OF PUMPS BASED ON RUNTIME HOURS OR AT THE BEGINNING OF EACH MONTH – OPERATOR SELECTABLE.
4. DDC SHALL MONITOR OPERATING STATUS OF EACH PUMP. UPON PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE STANDBY PUMP.
5. DDC SHALL MODULATE THE VARIABLE FREQUENCY CONTROLLER ON THE HOT WATER HEATING SYSTEM PUMP FROM EACH SET OF PUMPS TO MAINTAIN HOT WATER HEATING LOOP DIFFERENTIAL PRESSURE SETPOINT OF 20 FT OF HEAD (SETPOINT TO BE ADJUSTED AT SYSTEM BALANCING).
6. BOILER CONTROLS SUPPLIED WITH LOCAL/REMOTE CONTROL CAPABILITIES AND ALL REQUIRED SAFETIES. THE LOCAL/OFF/REMOTE SWITCH SHALL NORMALLY BE SET IN "REMOTE" MODE POSITION BY OPERATORS.
7. WHEN HEATING HOT WATER SYSTEM IS ACTIVATED, DDC SHALL ACTIVATE COMBUSTION AIR DAMPER OF "LEAD" BOILER. DDC SYSTEM SHALL ENABLE "LEAD" BOILER WHEN COMBUSTION AIR DAMPER LIMIT SWITCH PROVES THAT RESPECTIVE DAMPERS ARE FULLY OPEN. THE BOILER WILL OPERATE UNDER LOCAL CONTROL AS REQUIRED TO MAINTAIN BOILER DISCHARGE HOT WATER SUPPLY TEMP SETPOINT AS SET BY OPERATORS.
8. DDC SHALL MODULATE PRIMARY HEATING 3-WAY CONTROL VALVE TO MAINTAIN HWH SUPPLY TEMP (T-3) SETPOINT BASED ON OUTSIDE AIR RESET SCHEDULE.
9. DDC SHALL INCLUDE SOFTWARE OPERATOR SELECTABLE BOILER LEAD/LAG OPERATION OR FIRST ON/FIRST OFF OPERATION. DDC SHALL IMMEDIATELY ACTIVATE LAG BOILER UPON LEAD BOILER FAULT INDICATION.
10. WHEN BOILERS ARE OFF-LINE FOR MAINTENANCE, THE LOCAL/OFF/REMOTE SWITCH SHALL BE SET IN "OFF" POSITION BY OPERATORS.
11. EACH BOILER SAFETY CONTROLS SHALL INCLUDE AN AUTO-RESET HI-LIMIT (BOILER OPERATOR) WITH SETPOINT OF 220°F AND A MANUAL-RESET HI-LIMIT WITH SETPOINT OF 240°F.
12. BOILER SHALL NOT FIRE UNTIL FLOW IS PROVEN BY FLOW SWITCH.
13. EACH BOILER'S PRIMARY CIRC PUMP SHALL BE HARDWIRE INTERLOCKED TO ITS ASSOCIATED BOILER'S CONTROL PANEL SO THAT PUMP IS ACTIVATED WHEN ASSOCIATED BOILER FIRES. WHEN A BOILER IS DE-ACTIVATED, PRIMARY CIRC PUMP DE-ACTIVATION SHALL BE DELAYED.
14. DDC SHALL MONITOR BOILER RUN STATUS FOR EACH BOILER THROUGH DRY CONTACTS AVAILABLE IN BOILER CONTROL PANEL.
15. DDC SHALL MONITOR BOILER FAULT ALARM FOR EACH BOILER THROUGH DRY CONTACTS AVAILABLE IN THE BOILER CONTROL PANEL.
16. DDC SHALL MONITOR BOILER HWH DISCHARGE TEMPERATURES (T-1 & T-2) FOR DIAGNOSTIC PURPOSES. IF HWH SUPPLY TEMP (T-3) DROPS BELOW 150°F, DDC SHALL ACTIVATE ALARM. IF HWH RETURN TEMP (T-4) DROPS BELOW 140°F, DDC SHALL ACTIVATE WARNING ALARM FOR SYSTEM OPERATORS.



(E)DHW SYSTEM MONITORING & CONTROL

NOTES:

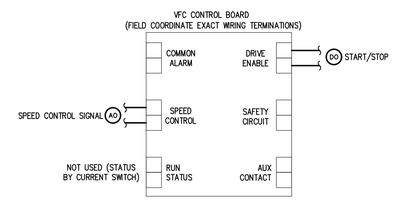
1. REFER TO TC COMPOSITE PLANS FOR LOCATION OF UNITS.
2. REMOVE EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED. EXISTING WIRING MAY BE REUSED IF COMPATIBLE WITH NEW DDC SYSTEM. SPLICING OF SENSOR CABLING/WIRING NOT PERMITTED.
3. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION INTERFACE WIRING 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)
4. REUSE EXISTING WELLS FOR NEW IMMERSION TEMPERATURE SENSORS.
5. SEE DRAWING M2.9 FOR DWH SAFETY SHUTDOWN WIRING AND SEQUENCE OF OPERATION. TC CONTRACTOR RESPONSIBLE TO FIELD VERIFY ALL HARDWIRED SAFETIES ARE PROPERLY WIRED AND OPERATIONAL INTO BOILER SAFETY SHUTDOWN.
6. DRY CONTACTS FOR REMOTE SYSTEM MONITORING SHALL BE PROVIDED WITH DOMESTIC WATER HEATER CONTROL PANEL. FIELD VERIFY TERMINATIONS AND WIRING REQUIREMENTS.
7. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

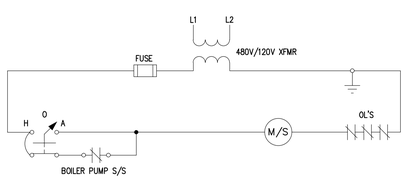
SEQUENCE OF OPERATION:

1. DOMESTIC HW CIRC PUMP SHALL BE ENABLED BY DDC SYSTEM TO OPERATE DURING BUILDING OCCUPIED HOURS. PUMP SHALL CYCLE PER AQUASTAT SETTING.
2. DDC SHALL MONITOR DOMESTIC PUMP STATUS THRU CURRENT SWITCH FOR RUNTIME TOTALIZATION.
1. DDC SYSTEM SHALL MONITOR SUPPLY TEMPS FOR REMOTE SYSTEM DIAGNOSTIC CAPABILITY BY OWNER.
2. DDC SHALL MONITOR RUN STATUS AND GENERAL ALARM AT EACH DOMESTIC HW HEATER.
3. WHEN ONE OF THE REMOTE BOILER EMERGENCY SHUTDOWN SWITCHES IS PUSHED, BURNER CONTROLS FOR DOMESTIC WATER HEATER SHALL BE DE-ENERGIZED THRU HARDWIRE INTERLOCK. DDC SHALL MONITOR SWITCH CIRCUIT AND ACTIVATE ALARM WHEN REMOTE BOILER SHUTDOWN CONDITION OCCURS. REFER TO "BOILER/CHILLER REMOTE EMERGENCY SHUTDOWN WIRING" DETAIL ON DRAWING M2.9.



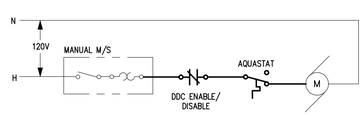
HWH SECONDARY PUMPS VFC WIRING

TYPICAL FOR P-1203, P-1204, P-1803 & P-1804



BOILER PRIMARY PUMPS M/S WIRING

TYPICAL FOR P-1201 & P-1202



DHW CIRC PUMP (P-1211) M/S WIRING

TC GENERAL NOTES

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

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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

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DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

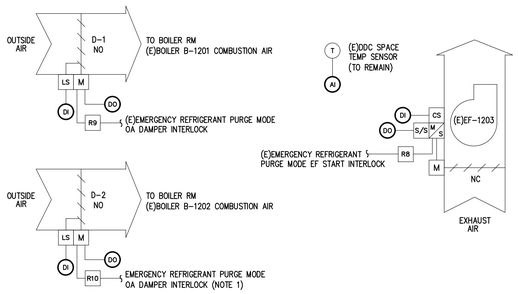
DRAWING NO.

M2.6

g:\2022\2022-0379-00\CAD\2022-0379-M2-CP.dwg, M2.6, 5/25/2023 11:45:13 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

FOR REFERENCE ONLY - REFRIGERANT MONITOR SYSTEM INSTALLED UNDER PREVIOUS PROJECT

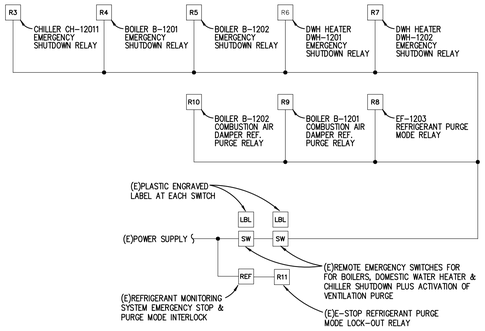


BOILERS COMBUSTION AIR, MECH RM VENTILATION AND EMERGENCY REFRIGERANT PURGE MODE CONTROL

SERVES BOILER ROOM C108

NOTES:

1. EXISTING RELAYS, CONTROL DEVICES, DAMPERS AND ACTUATORS TO REMAIN. TC CONTRACTOR SHALL DISCONNECT POINTS FROM LEGACY NOVAR AND RECONNECT TO NEW DDC SYSTEM.



(E)REMOTE EMERGENCY SHUTDOWN AND REFRIGERANT PURGE MODE CONTROL

SERVES BOILER ROOM C108

TC GENERAL NOTES

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

SEQUENCE OF OPERATION

REMOTE EMERGENCY SHUTDOWN AND REFRIGERANT MONITORING & PURGE MODE:

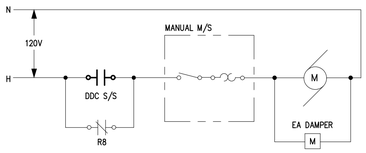
1. UNDER NORMAL OPERATING CONDITIONS THE EMERGENCY SHUTDOWN SWITCH CIRCUIT SHALL BE ENERGIZED AND THE CUT-OUT RELAY'S NORMALLY OPEN (NO) CONTACTS SHALL BE CLOSED TO ENERGIZE CHILLER, BOILERS AND DOMESTIC HW CONTROL CIRCUITS. NORMALLY CLOSED (NC) CONTACTS USED FOR FAILSAFE OPERATION OF EXHAUST FAN AND ASSOCIATED OA DAMPERS SHALL BE HELD OPEN UNTIL REFRIGERANT PURGE MODE IS ACTIVATED.

2. WHEN ONE OF THE REMOTE EMERGENCY SHUTDOWN SWITCHES IS PUSHED (LATCHED) THE RELAY CONTACTS SHALL OPEN AND INTERRUPT THE CHILLER, BOILERS AND DOMESTIC HW HEATERS CONTROL CIRCUITS, DEACTIVATING EQUIPMENT IN A EMERGENCY OFF CONDITION. WHEN EMERGENCY SHUTDOWN SWTCH IS RELEASED, THE RELAY SHALL BE ENERGIZED AND ITS NORMALLY OPEN CONTACTS SHALL CLOSE, ACTIVATING THE EQUIPMENT CONTROL CIRCUITS, ALLOWING THE EQUIPMENT TO RETURN TO NORMAL OPERATION. REFRIGERANT PURGE VENTILATION MODE SHALL REMAIN OFF (THRU HARDWIRED INTERLOCKS) WHENEVER ANY OF THE REMOTE EMERGENCY SHUTDOWN SWITCHES IS ACTIVATED.

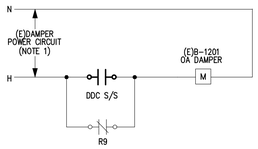
3. WHEN REFRIGERANT LOW LEAK (AEL LEVEL) WARNING IS DETECTED BY REFRIGERANT MONITORING PANEL THE AMBER WARNING BEACON AT THE REFRIGERANT MONITOR PANEL SHALL BE ACTIVATED FOR LOCAL NOTIFICATION. RED ALARM BEACONS AND HORNS SHALL REMAIN DEACTIVATED DURING LOW LEAK LEVEL ALARM.

4. WHEN REFRIGERANT HIGH LEAK (TLV-TWA) ALARM IS DETECTED BY REFRIGERANT MONITORING PANEL THE RED ALARM BEACON AND HORN AT THE REFRIGERANT ALARM PANEL AND AT ALL EXTERIOR ROOM ENTRANCE DOORS SHALL BE ACTIVATED. REFRIGERANT MONITORING PANEL RELAY INTERLOCKS SHALL ACTIVATE EMERGENCY PURGE MODE EXHAUST FAN (EF-1203). WIRING INTERLOCK SHALL OVERRIDE OPEN BOILERS (B-1201 & B-1202) COMBUSTION OUTSIDE DAMPERS AND DEACTIVATE CHILLER (CH-1201), BOILERS (B-1201 & B-1202) AND DOMESTIC WATER HEATERS (DWH-1201 & DWH-1202).

5. THE ALARM HORN MAY BE SILENCED AT THE REFRIGERANT MONITORING INTERFACE PANEL OR OUTSIDE THE CHILLER ROOM AS INDICATED ON REFRIGERANT MONITORING SYSTEM SCHEMATIC. THE RED ALARM BEACONS REMAIN FLASHING UNTIL THE SYSTEM IS RESET AT THE REFRIGERANT MONITORING INTERFACE PANEL.



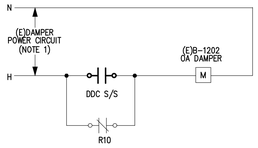
(E)EF-1203 M/S WIRING



(E)BOILER B-1201 OA DAMPER EMERGENCY REFRIGERANT PURGE MODE WIRING

NOTES:

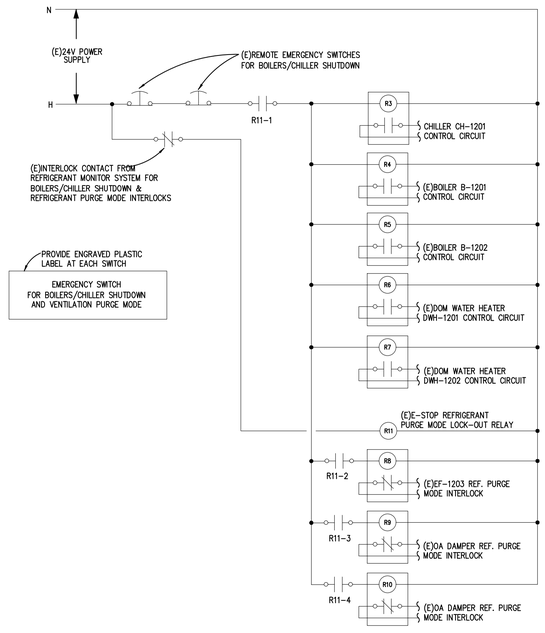
1. FIELD VERIFY POWER REQUIREMENTS FOR OA DAMPER EMERGENCY REFRIGERANT PURGE MODE.



(E)BOILER B-1202 OA DAMPER EMERGENCY REFRIGERANT PURGE MODE WIRING

NOTES:

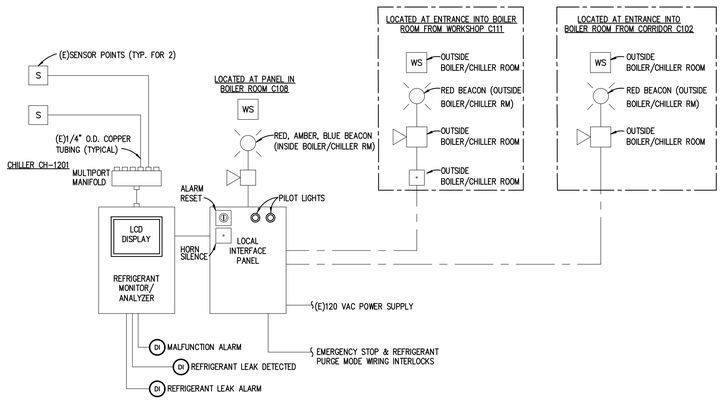
1. FIELD VERIFY POWER REQUIREMENTS FOR OA DAMPER EMERGENCY REFRIGERANT PURGE MODE.



(E)REMOTE EMERGENCY SHUTDOWN AND REFRIGERANT PURGE MODE WIRING

NOTES:

1. ALL EXISTING DEVICES TO REMAIN.



(E)REFRIGERANT MONITORING SYSTEM SCHEMATIC

NO SCALE

NOTES:

1. EXISTING RELAYS, CONTROL DEVICES, REFRIGERANT MONITOR SYSTEM TO REMAIN. TC CONTRACTOR SHALL DISCONNECT POINTS FROM LEGACY NOVAR AND RECONNECT TO NEW DDC SYSTEM.

SYMBOLS:

- ALARM HORN
- ALARM BEACON
- WS — WARNING SIGN
- ALARM HORN SILENCE SWITCH

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TEMPERATURE CONTROLS

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DRAWN WJU

CHECKED JWC

APPROVED SVM

PROJECT NO.

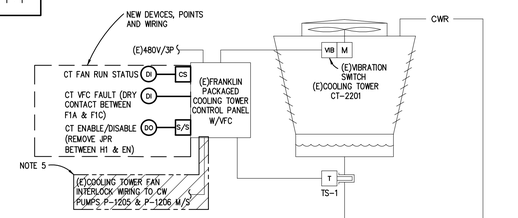
22070C

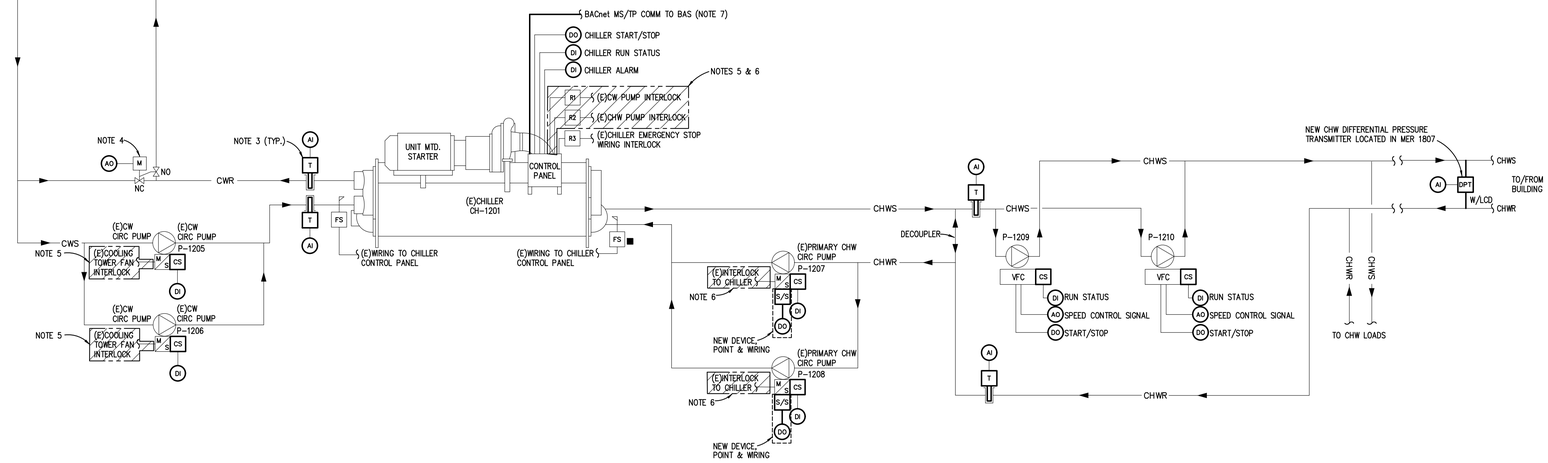
DRAWING NO.

M2.7

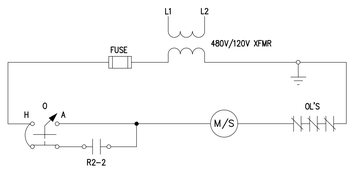
g:\2022\2022-0379-00\CAD\2022-0379-M2-CP.dwg, M2.7, 5/25/2023 11:45:15 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

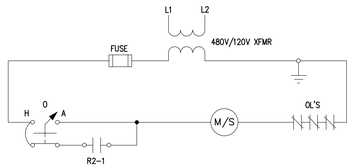




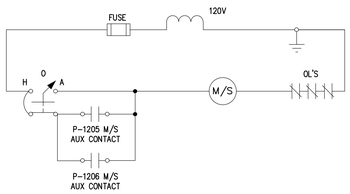
(E)M/S WIRING FOR REFERENCE ONLY



(E)CHW PUMP P-1208 M/S WIRING

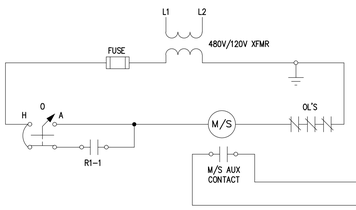


(E)CHW PUMP P-1207 M/S WIRING

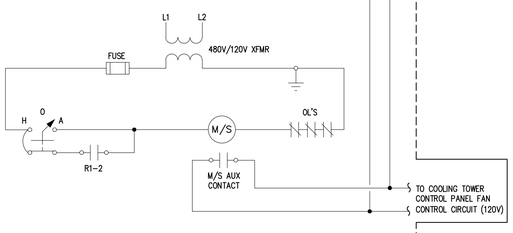


(E)COOLING TOWER CT-2201 FAN M/S WIRING

FIELD VERIFY EXACT TERMINATIONS AT FRANKLIN COOLING TOWER CONTROL PANEL



(E)CW PUMP P-1205 M/S WIRING



(E)CW PUMP P-1206 M/S WIRING

TC GENERAL NOTES

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

(E)CHILLED WATER SYSTEM CONTROL RETROFIT

CH 1201 | P 1207 | P 1208 | P 1209 | P 1210 | CT 2201 | P 1205 | P 1206

NOTES:

1. REFER TO FLOOR AND TC COMPOSITE PLANS FOR LOCATION OF UNITS.
2. REMOVE ALL EXISTING DDC CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
3. REUSE EXISTING WELLS WHERE APPLICABLE FOR NEW IMMERSION TEMPERATURE SENSORS.
4. EXISTING CT BY-PASS VALVE SHALL REMAIN, MATCH EXISTING CONTROL SIGNAL TO NEW DDC.
5. REMOVE EXISTING WIRING INTERLOCKS OF CW PUMPS P-1205 & P-1206 TO COOLING CONTROL PANEL. CONTROL OF PUMPS SHALL BE THRU DDC SYSTEM.
6. REMOVE EXISTING WIRING INTERLOCKS OF CHW PUMPS P-1207 & P-1208 TO CHILLER CONTROL PANEL. CONTROL OF PUMPS SHALL BE THRU DDC SYSTEM.
7. TC CONTRACTOR SHALL PROVIDE BACnet COMMUNICATION TO CHILLER FROM NEW BUILDING SUPERVISOR (JACE)

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.

CHILLER, PRIMARY CHW & CW PUMP CONTROL:

1. CHILLER CH-1201 PACKAGED CONTROLS SHALL BE SET FOR REMOTE ENABLE FUNCTION BY OPERATOR WHEN COOLING SEASON IS TO BEGIN. DDC SYSTEM SHALL ACTIVATE CHILLER DURING BUILDING OCCUPIED MODE WHENEVER OA TEMP IS ABOVE 55°F AND THERE IS A CHW DEMAND FROM AHU'S.
2. PRIMARY CHW PUMPS P-1207 & P-1208 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC WHEN CHILLED WATER SYSTEM ENABLED. THEN OTHER PUMP WILL SERVE AS STANDBY.
3. DDC SHALL ALTERNATE PRIMARY CHW PUMP OPERATION BASED ON RUNTIME HOURS OR AT THE BEGINNING OF EACH WEEK – OPERATOR SELECTABLE. ALTERNATION SHALL OCCUR AT BEGINNING OF NEXT CHILLER START CYCLE.
4. CW PUMPS P-1205 & P-1206 SHALL HAVE START/STOP CAPABILITY FROM THE DDC SYSTEM. ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC WHEN CHILLED WATER SYSTEM IN ENABLED. THE OTHER PUMP WILL SERVE AS STANDBY.
5. DDC SHALL ALTERNATE CW PUMP OPERATION BASED ON RUNTIME HOURS OR AT THE BEGINNING OF EACH WEEK – OPERATOR SELECTABLE. ALTERNATION SHALL OCCUR AT BEGINNING OF NEXT CHILLER START CYCLE.
6. DDC SHALL MONITOR OPERATING STATUS OF EACH CHW & CW PUMP. UPON PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE STANDBY PUMP.
7. WHEN CHW AND CW FLOWS ARE PROVEN BY DIFFERENTIAL PRESSURE SWITCHES, CHILLER INTERLOCKS ARE COMPLETE AND THE CHILLER PACKAGED CONTROL PANEL WITH INTEGRAL TEMPERATURE SENSORS SHALL SEQUENCE CHILLER OPERATION TO MAINTAIN THE CHILLER'S CHW SUPPLY SETPOINT OF 42°F (ADJUSTABLE THROUGH BAS).
8. DDC SHALL MONITOR CHILLER RUN STATUS AND CHILLER FAILURE ALARM FOR CHILLER CH-1201.
9. WHEN CHILLER IS DEACTIVATED, CHILLER CONTROLS SHALL KEEP CHW AND CW PUMPS RUNNING UNTIL CHILLER COMMANDS FOR RESPECTIVE PUMPS ARE OFF.

COOLING TOWER CONTROL:

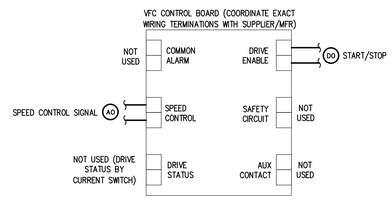
10. COOLING TOWER CT-2201 PACKAGED CONTROLS SHALL BE SET FOR REMOTE ENABLED FUNCTION BY OPERATOR WHEN COOLING SEASON IS TO BEGIN. DDC SHALL ACTIVATE COOLING TOWER WHENEVER CHILLED WATER SYSTEM IS ENABLED.
11. PACKAGED COOLING TOWER CONTROLS SHALL MODULATE COOLING TOWER FAN VFC TO MAINTAIN CW SUPPLY TEMP (TS-1) SETPOINT OF 85°F (ADJUSTABLE).
12. COOLING TOWER FAN VIBRATION SWITCH SHALL DEACTIVATE COOLING TOWER THRU HARDWIRED INTERLOCK TO COOLING TOWER CONTROL PANEL.

SECONDARY CHW PUMP CONTROL:

13. CHW SECONDARY PUMPS P-1209 & P-1210 SHALL HAVE START/STOP CAPABILITY FROM DDC SYSTEM. ONE OF THE TWO PUMPS SHALL BE ACTIVATED BY DDC TO OPERATE DURING COOLING SEASON. THE OTHER PUMP WILL SERVE AS STANDBY.
14. DDC SHALL ALTERNATE PUMP OPERATION BASED ON RUNTIME HOURS OR AT THE BEGINNING OF EACH WEEK – OPERATOR SELECTABLE.
15. DDC SHALL MONITOR OPERATING STATUS OF EACH PUMP THRU RESPECTIVE CURRENT SWITCH. UPON PUMP FAILURE, DDC SHALL ACTIVATE FAILURE ALARM AND AUTOMATICALLY START THE STANDBY PUMP.
16. DDC SHALL MODULATE THE VARIABLE FREQUENCY CONTROLLER ON THE HOT WATER HEATING SYSTEM PUMP FROM EACH SET OF PUMPS TO MAINTAIN CHILLED WATER LOOP DIFFERENTIAL PRESSURE SETPOINT OF 20 FT OF HEAD (SETPOINT TO BE ADJUSTED AT SYSTEM BALANCING).

CHILLER EMERGENCY SHUTDOWN:

17. UNDER NORMAL OPERATING CONDITIONS THE EMERGENCY SHUTDOWN SWITCH CIRCUIT SHALL BE ENERGIZED AND THE RELAY'S NORMALLY OPEN (NO) CONTACTS SHALL BE CLOSED TO ALLOW NORMAL OPERATION OF HVAC EQUIPMENT. NORMALLY CLOSED (NC) CONTACTS USED FOR FAILSAFE OPERATION OF VENTILATION HVAC EQUIPMENT AND DDC SYSTEM ALARMING SHALL BE HELD OPEN UNTIL EMERGENCY SHUTDOWN AND VENTILATION PURGE MODE IS NEEDED.
18. WHEN A EMERGENCY SHUTDOWN SWITCH IS PUSHED (LATCHED), THE RELAY CONTACTS SHALL OPEN AND INTERRUPT THE CHILLER CONTROL CIRCUITS TO SHUTDOWN EQUIPMENT. WHEN EMERGENCY SHUTDOWN SWITCH IS RELEASED, THE RELAY SHALL BE ENERGIZED AND ITS NORMALLY OPEN CONTACTS SHALL CLOSE, ENERGIZING THE EQUIPMENT CONTROL CIRCUITS.

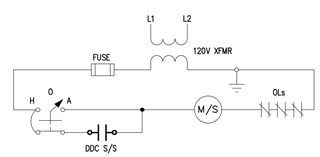


CHW PUMPS P-1209 & P-1210 VFC WIRING

TYPICAL FOR P-1209 & P-1210

NOTE:

1. WIRING DETAIL IDENTIFIES INTENT AND DOES NOT INDICATE ACTUAL WIRING REQUIREMENTS. FIELD VERIFY ACTUAL WIRING REQUIREMENTS.



CHW & CW PUMPS M/S WIRING

TYPICAL P-1205, P-1206, P-1207 & P-1208

TMP ARCHITECTURE

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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

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DRAWN WJU
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APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M2.8

g:\2022\2022-0379-00\CAD\2022-0379-M2-CP.dwg, M2.8, 5/25/2023 11:45:16 AM, Remy Ruffin, None ,0.1695, Peter Basso Associates Inc.

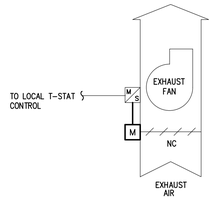
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

TC GENERAL NOTES

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

EXHAUST FAN CONTROL SCHEDULE

UNIT IDENTIFICATION	SERVICE	CONTROL		REMARKS
		DDC	LOCAL SWITCH	
EF-1201	GENERAL	Y		
EF-1202	DISHWASHER		Y	INTERLOCKED WITH DISHWASHER
EF-1203	CHILLER/BOILER ROOM	Y		SEE RESPECTIVE CONTROL DETAIL FOR ADDITIONAL INFO
EF-1701	GREENHOUSE	Y		SEE RESPECTIVE CONTROL DETAIL FOR ADDITIONAL INFO
EF-1702	GREENHOUSE	Y		SEE RESPECTIVE CONTROL DETAIL FOR ADDITIONAL INFO
EF-2001	POOL CHEMICAL STORAGE		24/7	
EF-2002	LOCKERS	Y		INTERLOCKED TO AHU-2003
EF-2101	GENERAL	Y		
EF-2102	GENERAL	Y		
EF-2103	GENERAL	Y		
EF-2202	PIZZA OVEN HOOD		Y	
EF-2203	KITCHEN OVEN HOOD		Y	
EF-2204	GYM/TRACK	Y		
EF-2205	GYM/TRACK	Y		
EF-2206	GENERAL	Y		
EF-2401	GENERAL	Y		
EF-2501	GENERAL	Y		
EF-2502	GENERAL	Y		
EF-3701	CLASSROOM 1704		Y	
EF-3702	CLASSROOM 1705		Y	
EF-3703	CLASSROOM 1707		Y	
EF-3704	CLASSROOM 1708		Y	
EF-3705	CLASSROOM 1711		Y	
EF-3706	CLASSROOM 1712		Y	
EF-3707	CLASSROOM 1714		Y	
EF-3708	CLASSROOM 1715		Y	
EF-3709	1700, 2700 & 3700 SOUTH GENERAL	Y		
EF-3710	1700 CHEMICAL STORAGE CLOSETS		24/7	
EF-3711	1700, 2700 & 3700 NORTH GENERAL	Y		
EF-3712	CLASSROOM 1713 FUMEHOOD		Y	
EF-3713	CLASSROOM 1706 CHEMICAL PREP		Y	
EF-3714	CLASSROOM 1710 CHEMICAL PREP		Y	
EF-3715	CLASSROOM 1703 CHEMICAL PREP		Y	
EF-3716	CLASSROOM 1715 FUME HOOD		Y	
EF-3717	CLASSROOM 1713 CHEMICAL PREP		Y	
EF-3718	CLASSROOM 1711 FUMEHOOD		Y	
EF-3719	CLASSROOM 1712 FUME HOOD		Y	
EF-3720	CLASSROOM 1714 FUME HOOD		Y	
EF-3901	CLASSROOM 1912		Y	
EF-3902	CLASSROOM 1910		Y	
EF-3903	CLASSROOM 1910		Y	
EF-3904	CLASSROOM 1905		Y	
EF-3905	1900, 2900 & 3900 SOUTH GENERAL	Y		
EF-3906	CLASSROOM 1904 PAINT BOOTH		Y	
EF-3907	1900, 2900 & 3900 NORTH GENERAL	Y		
EF-3908	CLASSROOM 1904 PAINT BOOTH		Y	
EF-3909	CLASSROOM 1911 FUME EXTRACTOR		Y	
EF-3910	1900 CHEMICAL STORAGE CLOSETS		24/7	
EF-3911	CLASSROOM 1912		Y	



(E)EXHAUST FAN CONTROL - LOCAL THERMOSTAT

EF X

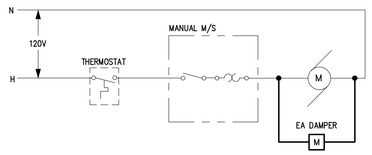
TYPICAL FOR EF-3912 & EF-3913

NOTES:

1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. EXISTING EXHAUST AIR DAMPER TO BE REUSED. TC CONTRACTOR SHALL PROVIDE NEW DAMPER ACTUATOR.

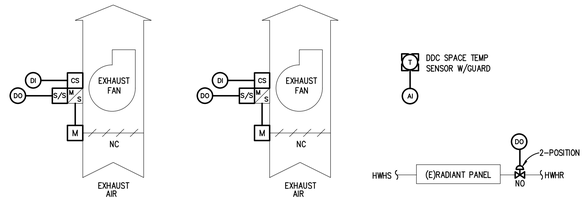
SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED WHEN SPACE TEMPERATURE IS ABOVE SETPOINT OF 78°F (ADJUSTABLE). WIRING INTERLOCK SHALL OPEN EXHAUST AIR DAMPER.



EXHAUST FAN M/S WIRING

TYPICAL FOR EF-3912 & EF-3913



(E)GREENHOUSE TEMPERATURE CONTROL RETROFIT

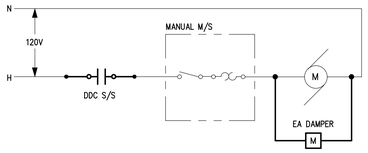
EF 170 EF 170 RP 171

NOTES:

1. REFER TO TC COMPOSITE PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. EXISTING EXHAUST AIR DAMPER TO BE REUSED. TC CONTRACTOR TO PROVIDE NEW DDC DAMPER ACTUATOR.
3. EXISTING RADIANT PANEL CONTROL VALVE TO BE REUSED. TC CONTRACTOR TO PROVIDE NEW DDC VALVE ACTUATOR.

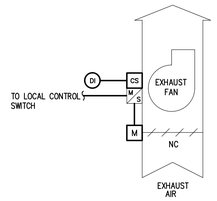
SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY DDC. DDC SHALL ACTIVATE FAN WHEN SPACE TEMP RISES ABOVE 78°F (ADJUSTABLE). WIRING INTERLOCK SHALL OPEN FAN EXHAUST AIR DAMPER.
2. DDC SHALL MONITOR FAN STATUS THRU CURRENT SWITCH. DDC SHALL ACTIVATE ALARM IF ABNORMAL FAN STATUS IS DETECTED.
3. DDC SHALL OPEN/CLOSE RADIANT PANEL HEATING VALVE AS REQUIRED TO MAINTAIN SPACE TEMP SETPOINT OF 72°F (ADJUSTABLE).
4. DDC SHALL ACTIVATE REMOTE ALARM IF HIGH OR LOW TEMP LIMIT SETPOINTS ARE REACHED.



EXHAUST FAN M/S WIRING

TYPICAL FOR EF-1701 & EF-1702



(E)EXHAUST FAN CONTROL - LOCAL SWITCH

EF X EF X

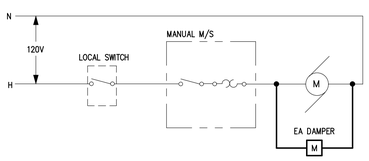
TYPICAL - REFER TO EXHAUST FAN CONTROL SCHEDULE

NOTES:

1. REFER TO TC COMPOSITE PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. EXISTING EXHAUST AIR DAMPER TO BE REUSED. TC CONTRACTOR SHALL PROVIDE NEW DAMPER ACTUATOR.

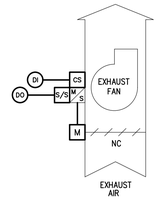
SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL BE STARTED AND STOPPED BY LOCAL CONTROL SWITCH. WIRING INTERLOCK SHALL OPEN EXHAUST AIR DAMPER.
2. DDC SYSTEM SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. IF EXHAUST FAN IS ACTIVATED FOR MORE THAN 24 HRS, NOTIFY BAS INDICATING THAT "EXHAUST FAN IN CONTINUOUS OPERATION, NOT SWITCHED OFF IN CLASSROOM".



EXHAUST FAN M/S WIRING

TYPICAL



(E)EXHAUST FAN CONTROL - DDC

EF X

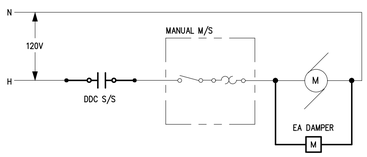
TYPICAL - REFER TO EXHAUST FAN CONTROL SCHEDULE

NOTES:

1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. EXISTING EXHAUST AIR DAMPER TO BE REUSED. TC CONTRACTOR SHALL PROVIDE NEW DAMPER ACTUATOR.

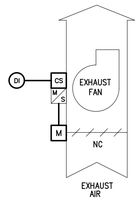
SEQUENCE OF OPERATION:

1. EF SHALL BE STARTED AND STOPPED BY DDC SYSTEM BASED ON TIME SCHEDULE. WIRING INTERLOCK SHALL OPEN EXHAUST AIR DAMPER.
2. DDC SYSTEM SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM TO BAS.



EXHAUST FAN M/S WIRING

TYPICAL



(E)EXHAUST FAN CONTROL - 24/7 OPERATION

EF X

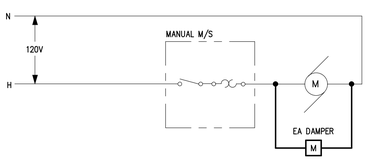
TYPICAL - REFER TO EXHAUST FAN CONTROL SCHEDULE

NOTES:

1. REFER TO FLOOR PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. TC CONTRACTOR SHALL PROVIDE NEW CONTROL DAMPER ACTUATOR.

SEQUENCE OF OPERATION:

1. EXHAUST FAN SHALL RUN CONTINUOUSLY. WIRING INTERLOCK SHALL OPEN EXHAUST AIR DAMPER.
2. DDC SYSTEM SHALL MONITOR EF RUN STATUS THRU CURRENT SWITCH. LOSS OF STATUS CONDITION SHALL ACTIVATE CRITICAL ALARM TO BAS.



EXHAUST FAN M/S WIRING

TYPICAL

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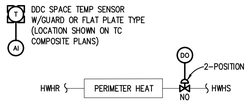


(E)PERIMETER HEATING CONTROL

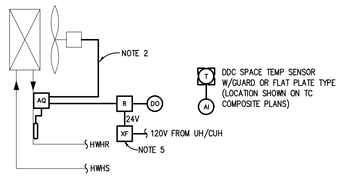
TYPICAL

NOTES:

1. REFER TO TC COMPOSITE PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. REMOVE ALL EXISTING CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
3. 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 & SCHEDULES FOR CONTROL VALVE SIZING PARAMETERS.
4. TC CONTRACTOR SHALL NOTIFY OWNER IF ANY EXISTING COMPONENTS ARE NOT FUNCTIONING PROPERLY FOR OWNER TO ADDRESS.

SEQUENCE OF OPERATION:

1. ALL SETPOINTS AND DEADBANDS SHALL BE ADJUSTABLE THROUGH DDC.
2. 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.
3. DDC SHALL PROVIDE A 2°F DEADBAND AROUND SETPOINTS FOR CONTROL.



(E)HWH UH & CUH CONTROL RETROFIT

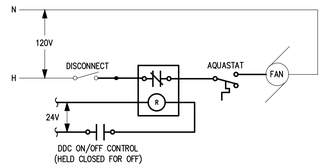
TYPICAL

NOTES:

1. REFER TO TC COMPOSITE PLANS FOR QUANTITY AND LOCATION OF UNITS.
2. REMOVE ALL EXISTING CONTROLS AND REPLACE WITH NEW AS SPECIFIED.
3. AQUASTAT SHALL BE WIRING IN SERIES WITH FAN CONTROL WIRING CIRCUIT.
4. DDC SPACE TEMP SENSOR SHALL REPLACE EXISTING THERMOSTATS.
5. TC CONTRACTOR SHALL PROVIDE 24V POWER SUPPLY AS REQUIRED.

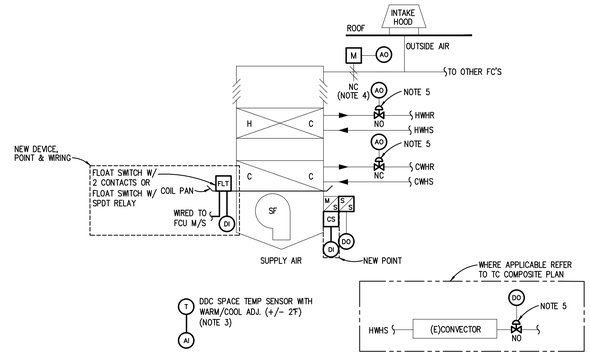
SEQUENCE OF OPERATION:

1. ALL SETPOINTS AND DEADBANDS SHALL BE ADJUSTABLE THROUGH DDC.
2. 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.



HWH UH & CUH WIRING

TYPICAL FOR EXISTING UNITS



(E)CEILING CASSETTE FCU CONTROL RETROFIT

TYPICAL

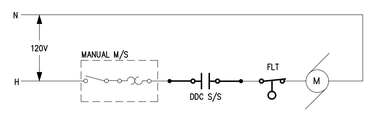
NOTES:

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 FCU CONTROLLERS VIA DDC NETWORK.
4. EXISTING CONTROL DAMPER SHALL REMAIN. TC 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. TC CONTRACTOR IS RESPONSIBLE FOR CONTROL VALVES REPLACEMENT. REFER TO FCU 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, 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 HRS 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.
6. WHEN FCU IS ACTIVATED DURING OCCUPIED MODE, OUTSIDE AIR DAMPER SHALL OPEN TO ALLOW VENTILATION TO SPACE (AS SET BY AIR BALANCE CONTRACTOR – REFER TO FAN COIL UNIT SCHEDULE FOR OA FLOW REQUIREMENTS) FOR OCCUPIED MODE. WHEN FCU IS DEACTIVATED OR OPERATING IN UNOCCUPIED OR MORNING WARM-UP MODE, OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.
7. WHEN SPACE TEMP IS BELOW HEATING SETPOINT, DDC SHALL MODULATE HWH COIL CONTROL VALVE TO MAINTAIN A SPACE TEMP SETPOINT. FOR SPACES WITH CONVECTORS, DDC SHALL OPEN CONVECTOR CONTROL VALVE FOR FIRST STAGE OF HEAT.
8. WHEN SPACE TEMP IS ABOVE COOLING SETPOINT, DDC SHALL MODULATE CHW COIL CONTROL VALVE TO MAINTAIN SPACE TEMP SETPOINT.
9. FLOAT SWITCH MOUNTED IN COOLING COIL DRAIN PAN IS TO BE HARDWIRED INTERLOCKED TO SF MOTOR STARTER 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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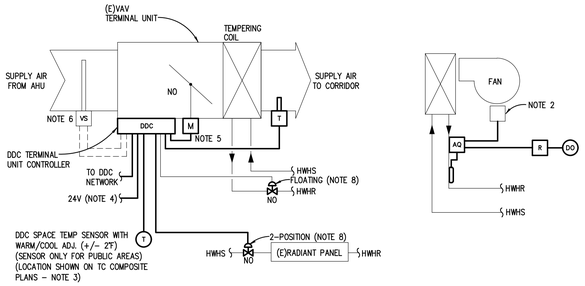


VAV 170 RP 170 RP 170 CUH 170 VAV 190 RP 190 CUH 190

FIRST LEVEL CORRIDOR CONTROL RETROFIT

TYPICAL FOR CORRIDOR'S 1700 & 1900

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 AND RADIANT PANEL CONTROL VALVES SHALL BE REPLACED WITH NEW AS SPECIFIED. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROL VALVE REPLACEMENT. REFER TO VAV TERMINAL UNIT AND RADIANT PANEL SCHEDULES 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.

OCCUPIED MODE: WITH RESPECTIVE AHU ACTIVATED

1. WHEN SPACE TEMP RISES ABOVE THE COOLING SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL KEEP THE TEMPERING COIL AND RADIANT PANEL HEATING CONTROL VALVES CLOSED AND MODULATE THE SUPPLY AIRFLOW BETWEEN ITS MINIMUM AND MAXIMUM SETTINGS.
2. WHEN OA TEMP IS 60°F OR BELOW AND SPACE TEMP FALLS BELOW SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL FIRST MODULATE TU DAMPER TOWARDS ITS MIN AIRFLOW SETTING. WHEN AIRFLOW IS AT MIN, TU CONTROLLER SHALL MODULATE THE RADIANT PANEL HEATING CONTROL VALVE FOLLOWED BY TEMPERING COIL CONTROL VALVE TO MAINTAIN THE SPACE TEMP SETPOINT. IF THE SPACE 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 TEMPERATURE.
3. WHEN OA TEMP IS ABOVE 60°F AND SPACE TEMP FALLS BELOW 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 TOWARDS OPEN. IF THE SPACE 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. RADIANT PANEL HEATING CONTROL VALVE SHALL REMAIN CLOSED.
4. CABINET UNIT HEATER SHALL REMAIN DEACTIVATED.

UNOCCUPIED MODE: WITH RESPECTIVE AHU DEACTIVATED

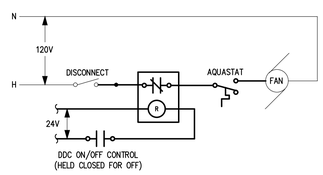
7. TERMINAL UNIT TEMPERING COIL CONTROL VALVE SHALL REMAIN CLOSED.
8. RADIANT PANEL HEATING CONTROL VALVE SHALL MODULATE TO MAINTAIN UNOCCUPIED HEATING SETPOINT. IF SPACE TEMP IS BELOW SETPOINT WITH RADIANT PANEL HEATING CONTROL VALVE FULL OPEN, DDC SHALL CYCLE CABINET UNIT HEATER FAN TO MAINTAIN SPACE TEMPERATURE.
9. SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:

   HEATING UNOCCUPIED SETPOINT = 62°F

   HEATING OCCUPIED SETPOINT = 72°F

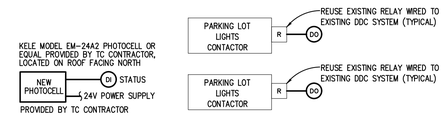
   COOLING OCCUPIED SETPOINT = 75°F

   COOLING UNOCCUPIED SETPOINT = 85°F



HWH CUH WIRING

TYPICAL



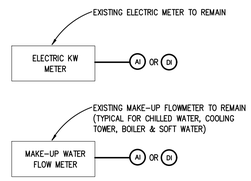
(E)EXISTING PARKING LOT LIGHTING CONTROL RETROFIT

NOTES:

1. EXTERIOR LIGHTING CONTROL PANEL LOCATED IN BOILER ROOM.

SEQUENCE OF OPERATION:

1. DDC SHALL CONTROL PARKING LOT POLE LIGHTS BASED PHOTOCELL ACTIVATION. DDC SHALL MONITOR PHOTOCELL AND ACTIVATE LIGHTS "ON" AT 5 FOOT-CANDLES OR LESS. (SUNSET) AND "OFF" (SUNRISE) WHEN PHOTOCELL DEADBAND IS REACHED.
2. BAS MAY PROVIDE OVERRIDE "OFF" DURING NIGHT TIME OPERATION (E.G. MIDNIGHT) BASED ON OWNER SCHEDULE IN LIEU OF PHOTOCELL.
3. BAS SHALL CONTAIN A SNOW PLOWING SCHEDULE TO ACTIVATE PARKING LOT LIGHTING MANUALLY BY SYSTEM OPERATOR WHEN SNOW PLOWING IS TO OCCUR AT NIGHT.
2. DDC MONITORED PHOTOCELL SHALL BE USED FOR "OFF" OVERRIDE CONTROL OF SCHEDULED OPERATION IF DURING DAYLIGHT.



(E)MISC. MONITORING CONTROL

NOTES:

1. MAKE-UP WATER FLOWMETERS LOCATED IN BOILER ROOM.
2. FIELD VERIFY LOCATION OF ELECTRIC KW METER.
3. FIELD VERIFY POINT TYPE ANALOG OR ACCUMULATOR.

SEQUENCE OF OPERATION:

1. DDC SHALL MONITOR MAKE-UP WATER FLOW METER USAGE FOR DISPLAY AT THE BAS.
2. DDC SHALL MONITOR ELECTRICAL KW USAGE FOR DISPLAY AT THE BAS.

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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

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03-15-2023	OWNER REVIEW

DRAWN WJU

CHECKED JWC

APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M2.11

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

TC GENERAL NOTES

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

FAN COIL UNIT SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	AREA SERVED	AIR FLOW (CFM)	OA FRESH AIR (PCT)	HEATING COIL (GPM)	COOLING COIL (GPM)	CONTROL VALVE TYPE	HWH SUPPLY & RETURN PIPE SIZE TO UNIT	CHW SUPPLY & RETURN PIPE SIZE TO UNIT	REMARKS
FCU-1001	TEAM ROOM	550	33	1.75	3.25	2-WAY	3/4 INCH	3/4 INCH	
FCU-1201	OFFICE	510	10	0.75	2.0	2-WAY	3/4 INCH	3/4 INCH	
FCU-1202	BREAK ROOM	510	33	0.75	1.5	2-WAY	3/4 INCH	3/4 INCH	
FCU-1203	DRY STORAGE	300	10	0.5	1.0	2-WAY	3/4 INCH	3/4 INCH	
FCU-1204	OFFICE	300	10	0.5	1.0	2-WAY	3/4 INCH	3/4 INCH	
FCU-2001	TRAINING	510	33	0.5	1.75	2-WAY	3/4 INCH	3/4 INCH	
FCU-2002	TRAINING	510	33	0.5	1.75	2-WAY	3/4 INCH	3/4 INCH	
FCU-3801	STAIR Q	1125	10	5.0	5.0	2-WAY	1.0 INCH	1.0 INCH	

BOOSTER HEATING COIL SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	AREA SERVED	SUPPLY AIRFLOW (CFM)	HEATING COIL (GPM)	CONTROL VALVE TYPE	RADIANT PANEL	HHW SUPPLY & RETURN PIPE SIZE TO UNIT	REMARKS
BC-1001	WOMENS PE LOCKERS	1,060	2.75	2-WAY	RP-1001	1 INCH	
BC-1002	WOMENS CHANGING ROOM	160	0.5	2-WAY	NA	3/4 INCH	
BC-1003	WOMENS DRESSING	250	0.75	2-WAY	NA	3/4 INCH	
BC-1004	WOMENS JV LOCKERS	1060	2.75	2-WAY	RP-1005	1 INCH	
BC-1005	MENS JV LOCKERS	1060	2.75	2-WAY	RP-1006	1 INCH	
BC-1006	MENS DRESSING	250	0.75	2-WAY	NA	3/4 INCH	
BC-1007	MENS CHANGING ROOM	160	0.5	2-WAY	NA	3/4 INCH	
BC-1008	MENS PE LOCKERS	1060	2.75	2-WAY	RP-1009	1 INCH	
BC-1009	CHLORINE STORAGE	300	0.5	2-WAY	RP-1003	3/4 INCH	
BC-1010	STORAGE	300	0.5	2-WAY	NA	3/4 INCH	

AIR HANDLING UNIT SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	AREA SERVED	SUPPLY AIRFLOW (CFM)	OA FRESH AIR (PCT)	RETURN AIRFLOW (CFM)	HEATING COIL (GPM)	COOLING COIL (GPM)	CONTROL VALVE TYPE	HWH SUPPLY & RETURN PIPE SIZE TO UNIT	CHW SUPPLY & RETURN PIPE SIZE TO UNIT	REMARKS
VARIABLE AIR VOLUME UNITS										
AHU-1101	COUNCILING AREA	5,345	26.6	5,345	6.5	42.25	2-WAY	1 INCH	2 INCH	
AHU-1801	SOUTH WING 300 CLASSROOMS	17,350	22.2	17,350	17.75	143.5	2-WAY	2 INCH	4 INCH	
AHU-1802	NORTH WING 300 CLASSROOMS	20,360	14.7	20,360	15.0	155.0	2-WAY	1-1/2 INCH	4 INCH	
AHU-2101	MAIN OFFICE AREA	7,485	7.0	7,485	3.25	45.75	2-WAY	1-1/4 INCH	2 INCH	
AHU-2205	SERVERY, STAFF DINING	4,685	9.6	4,685	2.5	34.25	2-WAY	3/4 INCH	2 INCH	
AHU-2401	BAND, MUSIC, DRESSING ROOMS	22,715	12.6	22,715	14.75	150.25	2-WAY	1-1/2 INCH	4 INCH	SA & RA SMOKE/FIRE DAMPERS
AHU-2601	MEDIA CENTER	10.950	7.1	10,950	4.25	77.75	2-WAY	1 INCH	FIELD VERIFY	
AHU-2801	SOUTH WING 400 CLASSROOMS	15,080	30.0	15,080	20.0	141.0	2-WAY	2 INCH	4 INCH	
AHU-2802	NORTH WING 400 CLASSROOMS	17,400	23.1	17,400	18.5	124.5	2-WAY	2 INCH	3 INCH	
AHU-3801	SOUTH WING 500 CLASSROOMS	18,040	22.8	18,040	19.0	178.5	2-WAY	2 INCH	4 INCH	
AHU-3802	NORTH WING 500 CLASSROOMS	17,800	25.4	17,800	20.5	178.5	2-WAY	2 INCH	4 INCH	
CONSTANT AIR VOLUME UNITS										
AHU-2003	LOCKERS	5,060	100	5,060	20.3	–	–	3-WAY	1-1/2 INCH	INTERLOCKED TO EF-2002
AHU-2001	FITNESS AREA	1,960	26.0	–	4.0	16.25	2-WAY	1 INCH	1-1/2 INCH	
AHU-2002	WRESTLING	1,710	26.3	–	3.25	–	–	1 INCH	–	
AHU-2201	GYM	11,500	10.4	–	15.75	91.75	2-WAY	1-1/2 INCH	3 INCH	
AHU-2202	GYM	11,500	10.4	–	15.75	91.75	2-WAY	1-1/2 INCH	3 INCH	
AHU-2203	STAGE	3,300	22.7	3,300	7.5	26.75	2-WAY	1 INCH	2 INCH	
AHU-2204	AUDITORIUM	15,460	16.8	15,460	15.75	88.5	2-WAY	1-1/2 INCH	3 INCH	
AHU-2206	COMMONS	24,840	11.3	24,840	40.5	176.0	2-WAY	2 INCH	4 INCH	
AHU-2207	KITCHEN OVEN HOOD	4,200	100	4,200	19.25	–	3-WAY	1-1/2 INCH	–	
AHU-2208	PIZZA OVEN HOOD	3,420	100	3,420	15.75	–	3-WAY	1-1/2 INCH	–	
HRU-101	BOYS & GIRLS POOL LOCKER ROOM	FIELD VERIFY	100	FIELD VERIFY	SEE REMARKS	–	3-WAY	1 INCH	–	MATCH EXISTING CONTROL VALVE BELIMO B311 Cv = 1.9

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CHECKED JWC

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PROJECT NO.

22070C

DRAWING NO.

M2.12

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VAV TERMINAL UNIT SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	INLET SIZE (IN)	AREA SERVED	UNIT SERVED FROM	AIR FLOW				TEMPERING COIL		RADIANT PANEL	REMARKS
				COOLING MAX (CFM)	COOLING MIN. (CFM)	HEATING MAX. (CFM)	HEATING MIN. (CFM)	FLOW (GPM)	CONTROL VALVE TYPE		
VAV-1101	5	PE OFFICE	AHU-1101	290	290	290	290	0.75	2-WAY	NA	
VAV-1102	6	OFFICE	AHU-1101	360	360	360	360	0.75	2-WAY	NA	
VAV-1103	8	PE CLASSROOM	AHU-1101	800	800	800	800	1.75	2-WAY	NA	
VAV-1104	6	CONFERENCE	AHU-1101	410	410	410	410	1.75	2-WAY	RP-1108	
VAV-1105	4	COUNSELOR	AHU-1101	220	165	220	165	0.75	2-WAY	RP-1107	
VAV-1106	4	COUNSELOR	AHU-1101	105	105	105	105	0.5	2-WAY	NA	
VAV-1107	4	COUNSELOR	AHU-1101	135	135	135	135	0.25	2-WAY	NA	
VAV-1108	4	COUNSELOR	AHU-1101	220	155	220	155	0.75	2-WAY	RP-1106	
VAV-1109	4	SPECIALIST	AHU-1101	135	135	135	135	0.5	2-WAY	NA	
VAV-1110	4	COUNSELOR	AHU-1101	220	165	220	165	0.75	2-WAY	RP-1105	
VAV-1111	9	RECEPTION	AHU-1101	930	930	930	930	2.75	2-WAY	RP-1104	
VAV-1112	4	COUNSELOR	AHU-1101	220	165	220	165	0.75	2-WAY	RP-1103	
VAV-1113	4	WORKROOM	AHU-1101	175	175	175	175	0.5	2-WAY	NA	
VAV-1114	4	RECORDS	AHU-1101	105	105	105	105	0.5	2-WAY	NA	
VAV-1115	4	COUNSELOR	AHU-1101	220	165	220	165	0.75	2-WAY	RP-1102	
VAV-1116	8	CAREER RESOURCE CTR	AHU-1101	800	800	800	800	3.0	2-WAY	RP-1101	
VAV-1301	4	STAFF WORKROOM	AHU-2205	120	120	120	120	0.5	2-WAY	NA	
VAV-1302	6	STUDENT ORG	AHU-2205	490	490	490	490	1.25	2-WAY	NA	
VAV-1303	8	STAFF DINING	AHU-2205	820	820	820	820	2.0	2-WAY	NA	
VAV-1304	14	SERVERY	AHU-2205	2,250	2,250	2,250	2,250	5.5	2-WAY	NA	
VAV-1305	7	GALLEY	AHU-2205	555	555	555	555	1.25	2-WAY	NA	
VAV-1306	6	STUDENT STORE	AHU-2205	450	450	450	450	1.0	2-WAY	NA	
VAV-1401	12	SCENE SHOP	AHU-2401	1,520	580	1,520	580	4.0	2-WAY	NA	
VAV-1402	7	DRESSING	AHU-2401	500	500	500	500	1.5	2-WAY	NA	
VAV-1403	7	DRESSING	AHU-2401	500	500	500	500	1.5	2-WAY	NA	
VAV-1404	6	TV STUDIO	AHU-2401	460	140	460	140	0.75	2-WAY	NA	
VAV-1405	5	CONTROL ROOM	AHU-2401	330	330	330	330	1.0	2-WAY	NA	
VAV-1406	10	VIDEO PRODUCTION 112	AHU-2401	1,200	700	1,200	700	3.5	2-WAY	NA	
VAV-1407	6	PERCUSSION	AHU-2401	385	385	385	385	1.25	2-WAY	NA	
VAV-1408	24X16	BAND 115	AHU-2401	5,300	5,300	5,300	5,300	18.5	2-WAY	RP-1402	
VAV-1409	6	INSTRUMENT	AHU-2401	400	400	400	400	1.0	2-WAY	NA	
VAV-1410	4	PROPS	AHU-2401	205	205	205	205	0.5	2-WAY	NA	
VAV-1411	6	ENSEMBLE	AHU-2401	440	440	440	440	1.25	2-WAY	NA	
VAV-1412	5	PRACTICE	AHU-2401	225	225	225	225	0.5	2-WAY	NA	
VAV-1413	5	OFFICE	AHU-2401	270	270	270	270	1.25	2-WAY	RP-1401	
VAV-1414	5	PRACTICE	AHU-2401	225	225	225	225	0.5	2-WAY	NA	
VAV-1501	5	UNIFORMS	AHU-2401	450	450	450	450	1.25	2-WAY	NA	
VAV-1502	16	VOCAL MUSIC 134	AHU-2401	3,380	3,380	3,380	3,380	11.25	2-WAY	RP-1504	
VAV-1503	5	STAGE EQUIP	AHU-2401	300	300	300	300	0.75	2-WAY	NA	
VAV-1504	6	COSTUMES	AHU-2401	370	370	370	370	1.0	2-WAY	NA	
VAV-1505	5	COSTUME	AHU-2401	255	255	255	255	0.75	2-WAY	NA	
VAV-1506	4	OFFICE	AHU-2401	135	135	135	135	0.5	2-WAY	NA	
VAV-1507	5	PRACTICE	AHU-2401	240	240	240	240	0.75	2-WAY	NA	
VAV-1508	4	ROBES	AHU-2401	200	200	200	200	0.5	2-WAY	NA	
VAV-1509	5	PRACTICE	AHU-2401	290	290	290	290	1.25	2-WAY	RP-1503	
VAV-1510	4	PRACTICE	AHU-2401	200	200	200	200	0.75	2-WAY	RP-1502	
VAV-1511	5	LIBRARY	AHU-2401	340	340	340	340	1.0	2-WAY	NA	
VAV-1512	16	ORCHESTRA 144	AHU-2401	3,960	3,960	3,960	3,960	13.0	2-WAY	RP-1501	
VAV-1513	6	PROPS	AHU-2401	365	365	365	365	1.0	2-WAY	NA	
VAV-1514	5	OFFICE	AHU-2401	270	270	270	270	0.75	2-WAY	NA	
VAV-1601	4	AV STORAGE	AHU-2601	215	215	215	215	0.75	2-WAY	NA	
VAV-1602	5	CLOSED RESRV	AHU-2601	315	315	315	315	1.0	2-WAY	NA	
VAV-1603	4	OFFICE	AHU-2601	165	165	165	165	0.5	2-WAY	NA	
VAV-1604	5	WORK ROOM	AHU-2601	245	245	245	245	0.75	2-WAY	NA	
VAV-1701	10	CORRIDOR	AHU-1801	1,070	400	1,070	400	2.75	2-WAY	RP-1701 & CUH-1701	
VAV-1702	9	CORRIDOR	AHU-1801	905	360	905	360	2.5	2-WAY	RP-1703	
VAV-1703	12	PHYSICS 301	AHU-1801	1,620	1,440	1,620	1,440	5.75	2-WAY	RP-1715	
VAV-1704	6	PHYSICS/BIO PREP	AHU-1801	370	370	370	370	1.0	2-WAY	NA	
VAV-1705	12	ESS 302	AHU-1801	1,590	1,440	1,590	1,440	5.25	2-WAY	RP-1714	
VAV-1706	12	BIOLOGY 304	AHU-1801	1,590	1,440	1,590	1,440	5.25	2-WAY	RP-1713	
VAV-1707	6	BIOLOGY PREP	AHU-1801	370	370	370	370	1.0	2-WAY	NA	
VAV-1708	4	BIOLOGY STORAGE	AHU-1801	145	145	145	145	0.5	2-WAY	NA	
VAV-1709	12	BIOLOGY 305	AHU-1801	1,590	1,440	1,590	1,440	4.75	2-WAY	RP-1712	
VAV-1710	12	BIOLOGY 308	AHU-1801	1,440	1,440	1,440	1,440	4.75	2-WAY	RP-1710	
VAV-1711	7	SCIENCE MULTI	AHU-1801	500	500	500	500	2.0	2-WAY	NA	
VAV-1712	6	CHEM/BIO PREP	AHU-1801	370	370	370	370	1.0	2-WAY	NA	
VAV-1713	12	CHEMISTRY 309	AHU-1801	1,440	1,440	1,440	1,440	5.25	2-WAY	RP-1709	
VAV-1714	12	CHEMISTRY 311	AHU-1801	1,440	1,440	1,440	1,440	5.25	2-WAY	RP-1708	
VAV-1715	6	CHEMISTRY PREP	AHU-1801	370	370	370	370	1.0	2-WAY	RP-1102	
VAV-1716	12	CHEMISTRY 312	AHU-1801	1,440	1,440	1,440	1,440	5.25	2-WAY	RP-1101	

NOTE:
1. TC CONTRACTOR TO FIELD VERIFY ALL INLET SIZES.

VAV TERMINAL UNIT SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	INLET SIZE (IN)	AREA SERVED	UNIT SERVED FROM	AIR FLOW				TEMPERING COIL		RADIANT PANEL	REMARKS
				COOLING MAX (CFM)	COOLING MIN. (CFM)	HEATING MAX. (CFM)	HEATING MIN. (CFM)	FLOW (GPM)	CONTROL VALVE TYPE		
VAV-1801	8	CORRIDOR	AHU-1801	750	225	750	225	1.5	2-WAY	NA	
VAV-1802	6	WORKROOM	AHU-1801	350	280	350	280	0.75	2-WAY	NA	
VAV-1803	14	CORRIDOR	AHU-1802	2,345	850	2,345	850	6.0	2-WAY	RP-1801 & RP-1901	
VAV-1804	6	WORKROOM	AHU-1802	350	280	350	280	0.75	2-WAY	NA	
VAV-1901	14	NUTRITION 383	AHU-1802	2,220	1,310	2,220	1,310	5.0	2-WAY	RP-1913	
VAV-1902	12	SCIENCE LAB 382	AHU-1802	1,500	1,300	1,500	1,300	4.75	2-WAY	RP-1912	
VAV-1903	4	PE CLASSROOM	AHU-1802	185	185	185	185	0.5	2-WAY	NA	
VAV-1904	12	SCIENCE LAB 382	AHU-1802	1,500	1,300	1,500	1,300	4.75	2-WAY	NA	SHARE SPACE TEMP WITH VAV-1902
VAV-1905	7	TRAINING LAB	AHU-1802	500	500	500	500	2.0	2-WAY	NA	
VAV-1906	10	WORK/OFFICE	AHU-1802	1,200	955	1,200	955	3.5	2-WAY	RP-1911	
VAV-1907	6	DARKROOM	AHU-1802	440	440	440	440	1.0	2-WAY	NA	
VAV-1908	12	GRAPHIC ARTS	AHU-1802	1,530	1,260	1,530	1,260	4.75	2-WAY	RP-1910	
VAV-1909	7	SUPPORT TECH	AHU-1802	500	500	500	500	2.0	2-WAY	NA	
VAV-1910	12	GRAPHIC ARTS 377	AHU-1802	1,530	1,260	1,530	1,260	4.75	2-WAY	NA	SHARE SPACE TEMP WITH VAV-1908
VAV-1911	4	OFFICE	AHU-1802	150	150	150	150	0.5	2-WAY	NA	
VAV-1912	12	COMPUTER LAB	AHU-1802	1,890	880	1,890	880	3.25	2-WAY	RP-1909	
VAV-1913	10	ART 372	AHU-1802	1,380	1,380	1,380	1,380	5.25	2-WAY	RP-1908	
VAV-1914	8	ART 372	AHU-1802	690	690	690	690	2.75	2-WAY	NA	SHARE SPACE TEMP WITH VAV-1913
VAV-1915	12	CORRIDOR	AHU-1802	1,420	520	1,420	520	5.75	2-WAY	RP-1905 & RP-1906	
VAV-1916	9	CORRIDOR	AHU-1802	1,030	390	1,030	390	2.75	2-WAY	RP-1907 & CUH-1901	
VAV-2101	7	CONFERENCE	AHU-2101	500	430	500	430	1.75	2-WAY	RP-2103	
VAV-2102	5	LIAISON OFFICER	AHU-2101	310	180	310	180	1.0	2-WAY	RP-2104	
VAV-2103	5	ASSIST. PRINCIPAL	AHU-2101	310	180	310	180	1.0	2-WAY	RP-2105	
VAV-2104	6	WORKROOM	AHU-2101	360	360	360	360	1.0	2-WAY	NA	
VAV-2105	5	ASSIST. PRINCIPAL	AHU-2101	310	165	310	165	1.0	2-WAY	RP-2106	
VAV-2106	10	RECEPTION	AHU-2101	1,050	1,050	1,050	1,050	3.5	2-WAY	RP-2107	
VAV-2107	7	CLINIC	AHU-2101	600	415	600	415	1.75	2-WAY	RP-2108	
VAV-2108	4	RECORDS	AHU-2101	220	220	220	220	0.5	2-WAY	NA	
VAV-2109	4	STORAGE	AHU-2101	140	140	140	140	0.5	2-WAY	NA	
VAV-2110	6	PRINCIPAL	AHU-2101	450	365	450	365	2.0	2-WAY	RP-2112	
VAV-2111	7	WAITING	AHU-2101	550	400	550	400	1.5	2-WAY	RP-2111	
VAV-2112	12	CORRIDOR	AHU-2101	1,400	525	1,400	525	3.75	2-WAY	NA	
VAV-2113	8	CORRIDOR	AHU-2101	800	305	800	305	2.25	2-WAY	NA	
VAV-2114	5	ATHLETIC DIR.	AHU-2101	245	245	245	245	0.75	2-WAY	NA	
VAV-2115	5	ATHLETIC RECEP.	AHU-2101	240	240	240	240	0.5	2-WAY	NA	
VAV-2601	14	MEDIA CENTER	AHU-2601	2,610	2,610	2,610	2,610	12.0	2-WAY	NA	
VAV-2602	16	MEDIA CENTER	AHU-2601	3,465	3,465	3,465	3,465	15.75	2-WAY	NA	
VAV-2603	12	MEDIA CENTER	AHU-2601	1,625	595	1,625	595	4.25	2-WAY	NA	
VAV-2604	14	CORRIDOR	AHU-2601	2,310	1,560	2,310	1,560	11.0	2-WAY	NA	
VAV-2701	12	CORRIDOR	AHU-2801	1,500	565	1,500	565	4.0	2-WAY	RP-2701	
VAV-2702	7	CORRIDOR	AHU-2801	585	370	585	370	2.5	2-WAY	RP-2601	
VAV-2703	10	CLASSROOM 400	AHU-2801	1,160	960	1,160	960	3.75	2-WAY	NA	
VAV-2704	10	CLASSROOM 402	AHU-2801	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2705	10	CLASSROOM 404	AHU-2801	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2706	10	CLASSROOM 403	AHU-2801	1,660	1,350	1,660	1,350	4.5	2-WAY	NA	
VAV-2707	10	CLASSROOM 406	AHU-2801	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2708	10	CLASSROOM 408	AHU-2801	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2709	12	CLASSROOM 407	AHU-2801	1,575	1,265	1,575	1,265	4.25	2-WAY	NA	
VAV-2710	10	CLASSROOM 410	AHU-2801	1,100	960	1,100	960	3.5	2-WAY	NA	
VAV-2711	9	CLASSROOM 412	AHU-2801	1,000	960	1,000	960	3.5	2-WAY	NA	
VAV-2712	9	CLASSROOM 413	AHU-2801	960	960	960	960	3.5	2-WAY	NA	
VAV-2801	7	CORRIDOR	AHU-2801	525	160	525	160	0.5	2-WAY	NA	
VAV-2802	6	WORKROOM 441	AHU-2801	375	375	375	375	1.0	2-WAY	NA	
VAV-2803	14	CORRIDOR	AHU-2802	2,470	905	2,470	905	6.5	2-WAY	RP-2801	
VAV-2804	6	WORKROOM 445	AHU-2802	375	375	375	375	1.0	2-WAY	NA	
VAV-2901	10	CLASSROOM 485	AHU-2802	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2902	10	CLASSROOM 483	AHU-2802	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2903	5	OFFICE 484	AHU-2802	250	250	250	250	1.0	2-WAY	NA	
VAV-2904	10	CLASSROOM 481	AHU-2802	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2905	9	EMI 480	AHU-2802	960	960	960	960	3.0	2-WAY	NA	
VAV-2906	10	CLASSROOM 479	AHU-2802	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2907	12	CLASSROOM 477	AHU-2802	1,620	1,440	1,620	1,440	5.75	2-WAY	NA	
VAV-2908	9	AI 476	AHU-2802	975	975	975	975	3.25	2-WAY	NA	
VAV-2909	10	CLASSROOM 475	AHU-2802	1,160	960	1,160	960	3.5	2-WAY	NA	
VAV-2910	5	BOOKS	AHU-2802	250	250	250	250	1.0	2-WAY	NA	
VAV-2911	10	CLASSROOM 473	AHU-2802	1,100	960	1,100	960	3.5	2-WAY	NA	
VAV-2912	10	CLASSROOM 471	AHU-2802	1,060	960	1,060	960	3.5	2-WAY	NA	
VAV-2913	12	CORRIDOR	AHU-2802	1,700	730	1,700	730	5.25	2-WAY	RP-2903	
VAV-2914	10	CORRIDOR	AHU-2802	1,380	780	1,380	780	5.5	2-WAY	RP-2904	

NOTE:
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PBA Project No.: 2022.0379

PROJECT TITLE

Dexter High School Bldg. Automation System

Dexter Community Schools

DRAWING TITLE

TEMPERATURE CONTROLS

ISSUE DATES

DATE:	ISSUED FOR:
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03-15-2023	OWNER REVIEW

DRAWN WJU
CHECKED JWC
APPROVED SVM

PROJECT NO.

22070C

DRAWING NO.

M2.13

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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE. 1"

TC GENERAL NOTES

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

VAV TERMINAL UNIT SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	INLET SIZE (IN)	AREA SERVED	UNIT SERVED FROM	AIR FLOW				TEMPERING COIL		RADIANT PANEL	REMARKS
				COOLING MAX. (CFM)	COOLING MIN. (CFM)	HEATING MAX. (CFM)	HEATING MIN. (CFM)	FLOW (GPM)	CONTROL VALVE TYPE		
VAV-3701	12	CORRIDOR	AHU-3801	1,520	545	1,520	545	3.75	2-WAY	RP-3701	
VAV-3702	9	CORRIDOR	AHU-3801	1,035	610	1,035	610	4.25	2-WAY	RP-3702	
VAV-3703	10	CLASSROOM 501	AHU-3801	1,240	980	1,240	980	3.75	2-WAY	NA	
VAV-3704	10	CLASSROOM 503	AHU-3801	1,240	980	1,240	980	3.75	2-WAY	NA	
VAV-3705	5	STORAGE	AHU-3801	265	265	265	265	1.0	2-WAY	NA	
VAV-3706	10	CLASSROOM 505	AHU-3801	1,240	980	1,240	980	3.75	2-WAY	NA	
VAV-3707	7	CLASSROOM 506	AHU-3801	520	520	520	520	1.75	2-WAY	NA	
VAV-3708	10	CLASSROOM 507	AHU-3801	1,240	980	1,240	980	3.75	2-WAY	NA	
VAV-3709	6	CONFERENCE	AHU-3801	350	350	350	350	1.0	2-WAY	NA	
VAV-3710	10	CLASSROOM 509	AHU-3801	1,220	980	1,220	980	3.75	2-WAY	NA	
VAV-3711	8	CLASSROOM 510	AHU-3801	740	740	740	740	2.75	2-WAY	NA	
VAV-3712	7	CLASSROOM 512	AHU-3801	520	520	520	520	1.75	2-WAY	NA	
VAV-3713	10	CLASSROOM 511	AHU-3801	1,160	980	1,160	980	3.75	2-WAY	NA	
VAV-3714	5	BOOKS	AHU-3801	265	265	265	265	1.0	2-WAY	NA	
VAV-3715	10	CLASSROOM 513	AHU-3801	1,080	980	1,080	980	3.75	2-WAY	NA	
VAV-3716	9	CLASSROOM 515	AHU-3801	980	980	980	980	3.75	2-WAY	NA	
VAV-3801	6	WORKROOM 540	AHU-3801	380	380	380	380	1.0	2-WAY	NA	
VAV-3802	16	CORRIDOR	AHU-3801	3,045	945	3,045	945	6.75	2-WAY	RP-3801	
VAV-3803	14	CORRIDOR	AHU-3802	2,325	815	2,325	815	5.75	2-WAY	RP-3802	
VAV-3804	6	WORKROOM 544	AHU-3802	380	380	380	380	1.0	2-WAY	NA	
VAV-3901	10	CLASSROOM 584	AHU-3802	1,200	980	1,200	980	4.0	2-WAY	NA	
VAV-3902	10	CLASSROOM 583	AHU-3802	1,200	980	1,200	980	4.0	2-WAY	NA	
VAV-3903	10	CLASSROOM 581	AHU-3802	1,200	980	1,200	980	4.0	2-WAY	NA	
VAV-3904	12	CLASSROOM 578	AHU-3802	1,705	1,350	1,705	1,350	4.75	2-WAY	NA	
VAV-3905	10	CLASSROOM 579	AHU-3802	1,200	980	1,200	980	4.0	2-WAY	NA	
VAV-3906	10	CLASSROOM 577	AHU-3802	1,180	980	1,180	980	4.0	2-WAY	NA	
VAV-3907	12	CLASSROOM 574	AHU-3802	1,620	1,265	1,620	1,265	4.5	2-WAY	NA	
VAV-3908	10	CLASSROOM 575	AHU-3802	1,120	980	1,120	980	4.0	2-WAY	NA	
VAV-3909	9	CLASSROOM 573	AHU-3802	1,020	980	1,020	980	4.0	2-WAY	NA	
VAV-3910	9	CLASSROOM 571	AHU-3802	980	980	980	980	4.0	2-WAY	NA	
VAV-3911	10	CORRIDOR	AHU-3802	1,240	740	1,240	740	5.25	2-WAY	RP-3902	
VAV-3912	12	CORRIDOR	AHU-3802	1,430	540	1,430	540	3.75	2-WAY	RP-3903	

NOTE:
1. TC CONTRACTOR TO FIELD VERIFY ALL INLET SIZES.

RADIANT PANEL SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	AREA SERVED	HEAT OUTPUT (MBH)	FLOW (GPM)	CONTROL VALVE TYPE	REMARKS
RP-1001	WOMEN'S PE LOCKERS	18.5	1.75	2-WAY	
RP-1002	WOMENS'S SHOWERS	5.1	0.5	2-WAY	
RP-1003	CHLORINE STORAGE	3.1	0.5	2-WAY	
RP-1004	WOMEN'S ATHLETIC ROOM	16.4	1.75	2-WAY	
RP-1005	WOMENS'S JV LOCKERS	6.3	0.75	2-WAY	
RP-1006	MEN'S JV LOCKERS	6.3	0.75	2-WAY	
RP-1007	MEN'S ATHLETIC ROOM	16.4	1.75	2-WAY	
RP-1008	MEN'S SHOWERS	5.1	0.5	2-WAY	
RP-1009	MEN'S PE LOCKERS	18.5	1.75	2-WAY	
RP-1010	ALCOVE	1.2	0.5	2-WAY	
RP-1011	ALCOVE	1.2	0.5	2-WAY	
RP-1101	CAREER RESOURCE CTR	18.9	2.0	2-WAY	
RP-1102	COUNSELOR	5.4	0.5	2-WAY	
RP-1103	COUNSELOR	5.4	0.5	2-WAY	
RP-1104	RECEPTION	5.3	0.5	2-WAY	
RP-1105	COUNSELOR	5.4	0.5	2-WAY	
RP-1106	COUNSELOR	5.4	0.5	2-WAY	
RP-1107	COUNSELOR	5.5	0.5	2-WAY	
RP-1108	CONFERENCE	14.3	1.5	2-WAY	
RP-1201	STORAGE	5.3	0.5	2-WAY	
RP-1401	OFFICE	7.6	0.75	2-WAY	
RP-1402	BAND 115	41.0	4.0	2-WAY	
RP-1501	ORCHESTRA 144	11.4	1.25	2-WAY	
RP-1502	PRACTICE	2.9	0.5	2-WAY	
RP-1503	PRACTICE	5.5	0.5	2-WAY	
RP-1504	VOCAL MUSIC 134	16.0	1.5	2-WAY	
RP-1601	CORRIDOR	27.5	2.75	2-WAY	
RP-1602	MEDIA CENTER	13.9	1.5	2-WAY	
RP-1603	MEDIA CENTER	21.2	2.0	2-WAY	
RP-1701	CORRIDOR	9.9	1.0	2-WAY	
RP-1702	CORRIDOR	4.0	0.5	2-WAY	
RP-1703	CORRIDOR	17.2	1.75	2-WAY	SHARED SPACE TEMP WITH RP-1702
RP-1704	CUSTODIAN	2.5	0.5	2-WAY	
RP-1705	MEN'S RESTROOM	4.4	0.5	2-WAY	
RP-1706	WOMEN'S RESTROOM	4.4	0.5	2-WAY	
RP-1707	CHEMISTRY 312	12.7	1.25	2-WAY	
RP-1708	CHEMISTRY 311	12.7	1.25	2-WAY	
RP-1709	CHEMISTRY 309	12.7	1.25	2-WAY	
RP-1710	BIOLOGY 308	9.0	1.0	2-WAY	
RP-1711	GREENHOUSE	22.4	2.25	2-WAY	
RP-1712	BIOLOGY 305	9.0	1.0	2-WAY	
RP-1713	BIOLOGY 304	12.7	1.25	2-WAY	
RP-1714	ESS 302	12.7	1.25	2-WAY	
RP-1715	PHYSICS 301	12.7	1.25	2-WAY	
RP-1716	MDF	2.0	0.5	2-WAY	
RP-1717	STAFF TOILET	8.4	0.75	2-WAY	
RP-1801	CORRIDOR	19.7	2.0	2-WAY	
RP-1802	STAIR	5.3	0.5	2-WAY	
RP-1901	CORRIDOR	5.8	0.5	2-WAY	
RP-1902	WOMEN'S RESTROOM	4.4	0.5	2-WAY	
RP-1903	MEN'S RESTROOM	4.4	0.5	2-WAY	
RP-1904	CUSTODIAN	2.5	0.5	2-WAY	
RP-1905	CORRIDOR	5.8	0.5	2-WAY	
RP-1906	CORRIDOR	10.6	1.0	2-WAY	
RP-1907	CORRIDOR	19.2	2.0	2-WAY	
RP-1908	ART 372	18.8	2.0	2-WAY	
RP-1909	COMPUTER LAB	8.3	0.75	2-WAY	
RP-1910	GRAPHIC ARTS 377	23.6	2.25	2-WAY	
RP-1911	WORK/OFFICE	9.0	1.0	2-WAY	
RP-1912	SCIENCE LAB 382	24.3	2.5	2-WAY	
RP-1913	NUTRITION 383	12.2	1.25	2-WAY	
RP-1914	STAFF TOILET	2.0	0.5	2-WAY	
RP-1915	STORAGE	2.0	0.5	2-WAY	

RADIANT PANEL SCHEDULE (FOR REFERENCE ONLY)

UNIT IDENTIFICATION	AREA SERVED	HEAT OUTPUT (MBH)	FLOW (GPM)	CONTROL VALVE TYPE	REMARKS
RP-2001	POOL	55.2	5.5	2-WAY	
RP-2002	POOL	50.4	5.0	2-WAY	
			0.5		
RP-2101	WOMEN'S RESTROOM	4.5	0.5	2-WAY	
RP-2102	MEN'S RESTROOM	4.5	0.5	2-WAY	
RP-2103	CONFERENCE	15.2	1.5	2-WAY	
RP-2104	LIAISON OFFICER	5.5	0.5	2-WAY	
RP-2105	ASSIST. PRINCIPAL	5.4	0.5	2-WAY	
RP-2106	ASSIST. PRINCIPAL	4.6	0.5	2-WAY	
RP-2107	RECEPTION	6.9	0.75	2-WAY	
RP-2108	CLINIC	7.9	0.75	2-WAY	
RP-2109	TOILET	2.1	0.5	2-WAY	
RP-2110	TOILET	2.1	0.5	2-WAY	
RP-2111	WAITING	3.6	0.5	2-WAY	
RP-2112	PRINCIPAL	14.2	1.5	2-WAY	
RP-2301	COMMONS	22.7	2.25	2-WAY	
RP-2501	STAIR L	9.0	1.0	2-WAY	
RP-2502	STORAGE	7.2	0.75	2-WAY	
RP-2503	STAIR H	7.7	0.75	2-WAY	
RP-2601	CORRIDOR	27.3	2.75	2-WAY	
RP-2602	CORRIDOR				DELETED FOR NEW ADDITION
RP-2701	CORRIDOR	19.2	2.0	2-WAY	
RP-2702	CORRIDOR	17.4	1.75	2-WAY	
RP-2703	TOILET	3.6	0.5	2-WAY	
RP-2704	TOILET	3.6	0.5	2-WAY	
RP-2801	CORRIDOR	16.6	1.75	2-WAY	
RP-2802	STAIR Q	5.3	0.5	2-WAY	
RP-2901	STAIR Q	3.6	0.5	2-WAY	
RP-2902	TOILET	3.6	0.5	2-WAY	
RP-2903	CORRIDOR	10.3	1.0	2-WAY	
RP-2904	CORRIDOR	19.2	2.0	2-WAY	
RP-3701	CORRIDOR	19.2	2.0	2-WAY	
RP-3702	CORRIDOR	15.9	1.5	2-WAY	
RP-3703	CUSTODIAN	3.6	0.5	2-WAY	
RP-3704	MEN'S RESTROOM	4.0	0.5	2-WAY	
RP-3705	WOMEN'S RESTROOM	4.0	0.5	2-WAY	
RP-3801	CORRIDOR	28.3	2.75	2-WAY	
RP-3802	CORRIDOR	16.5	1.75	2-WAY	
RP-3901	CUSTODIAN	3.6	0.5	2-WAY	
RP-3902	CORRIDOR	10.6	1.0	2-WAY	
RP-3903	CORRIDOR	19.2	2.0	2-WAY	
RP-3904	TOILET	4.0	0.5	2-WAY	
RP-3905	TOILET	4.0	0.5	2-WAY	

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PBA Project No.: 2022.0379

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Dexter Community Schools

DRAWING TITLE

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22070C

DRAWING NO.
M2.14

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