

GENERAL SYMBOLS	
	THICK, DARK SOLID LINES INDICATE NEW OR RELOCATED ITEMS OR NEW RACEWAY AND WIRING
	THIN, LIGHT LINES INDICATE EXISTING ITEMS OR RACEWAY TO REMAIN IN PLACE AND BE REUSED
FITTINGS AND VALVES	
	PIPE TEE DOWN
	PIPE ELBOW UP OR PIPE TEE UP
	PIPE ELBOW DOWN
	TAKEOFF FROM TOP OF MAIN PIPE
	TAKEOFF FROM BOTTOM OF MAIN PIPE
HVAC SYMBOLS	
	SUPPLY PIPING, REFER TO ABBREVIATION LIST FOR DESIGNATION (XXX)
	RETURN PIPING, REFER TO ABBREVIATION LIST FOR DESIGNATION (XXX)
ELECTRICAL SYMBOLS	
	CONTROL WIRING
	DISCONNECT SWITCH
	THERMOSTAT

MECHANICAL AND ELECTRICAL ABBREVIATIONS			
AIAMP	AMPERE	RE	EXISTING EQUIPMENT TO BE DISCONNECTED AND REMOVED
AC	ALTERNATING CURRENT	RGS	RIGID GALVANIZED STEEL CONDUIT
AFF	ABOVE FINISHED FLOOR	RL	EXISTING EQUIPMENT TO BE DISCONNECTED, REMOVED AND RELOCATED
AIC	AMPS INTERRUPTING CURRENT	RM	ROOM
AMB	AMBIENT	RFD	REDUCED PRESSURE DEVICE
ANSI	AMERICAN NATIONAL STANDARDS	RPM	REVOLUTIONS PER MINUTE
AS	AIR SEPARATOR	RWL	RAIN WATER LEADER
ATC	AUTOMATIC TEMPERATURE CONTROL	S&R	SUPPLY AND RETURN
AVG	AVERAGE	SP	STATIC PRESSURE
AWG	AVERAGE WIRE GAUGE	SPDT	SINGLE POLE DOUBLE THROW
AWT	AVERAGE WATER TEMPERATURE	SPEC	SPECIFICATION
BTU	BRITISH THERMAL UNITS	SPST	SINGLE POLE SINGLE THROW
BTUH	BRITISH THERMAL UNITS/HOUR	SQ	SQUARE
C	CONDUIT(S)	SS	STAINLESS STEEL
C/B	CIRCUIT BREAKER	STD	STANDARD
CI	CAST IRON	SW	SWITCH
CKT	CIRCUIT	SWBD	SWITCHBOARD
CU FT	CUBIC FEET	TAG	IDENTIFICATION OF EQUIPMENT
CW	COLD WATER	TD	TEMPERATURE DIFFERENCE
D	DEPTH	TEMP	TEMPERATURE
DC	DIRECT CURRENT	TSP	TOTAL STATIC PRESSURE
DCV	DOUBLE CHECK VALVE	TYP	TYPICAL
DEG or °	DEGREE	UF	UNUSED
DN or Ø	DIAMETER	V	VOLTAGE
DN	DOWN	VA	VOLT AMPERE
DWG	DRAWING	VE	VELOCITY
EAT	ENTERING AIR TEMPERATURE	VIF	VERIFY IN FIELD
ELEC	ELECTRICAL	VOL	VOLUME
EM	EMERGENCY	W	WATT
EMT	ELECTRICAL METALLIC TUBING	WG	WIREGUARD
ET	EXPANSION TANK (HVAC)	WI	WIDTH
EWT	ENTERING WATER TEMPERATURE	WPD	WATER PRESSURE DROP
EXP	EXPANSION	WTR	WATER
F	FAHRENHEIT		
FD	FLOOR DRAIN		
FMC	FLEXIBLE METALLIC TUBING		
FOR	FUEL OIL RETURN		
FOS	FUEL OIL SUPPLY		
FT	FOOT OR FEET		
GA	GAUGE		
GAL	GALLONS		
GF	GROUND FAULT		
GND	GROUND		
GPM	GALLONS PER MINUTE		
H	HEIGHT		
HP	HORSEPOWER		
HVAC	HEATING, VENTILATION AND AIR CONDITIONING		
HW	HOT WATER		
HWR	HOT WATER RETURN		
HWS	HOT WATER SUPPLY		
HZ	FREQUENCY (CYCLES PER SECOND)		
ID	INSIDE DIAMETER		
IN	INCHES		
IN WG	INCHES OF WATER, GAUGE (PRESSURE)		
IW	INDIRECT WASTE		
JB	JUNCTION BOX		
KVA	KILOVOLT AMPERE		
KW	KILOWATT		
L	LENGTH		
LF	LINEAR FEET		
LWT	LEAVING WATER TEMPERATURE		
MA	MILLIAMPERE		
MAX	MAXIMUM		
MBH	BTU PER HOUR (THOUSAND)		
MC	METAL CLAD CABLE		
MECH	MECHANICAL		
MFR	MANUFACTURER		
MIN	MINIMUM		
MLO	MAIN LUGS ONLY		
N.C.	NORMALLY CLOSED		
N.O.	NORMALLY OPEN		
NEC	NATIONAL ELECTRICAL CODE		
NIC	NOT IN CONTRACT		
NTS	NOT TO SCALE		
OA	OUTSIDE AIR		
OD	OUTSIDE DIAMETER		
P	POLE		
PD	PRESSURE DROP		
PF	POWER FACTOR		
PH / Ø	PHASE		
PNL	PANELBOARD		
PRESS	PRESSURE		
PRV	PRESSURE REDUCING VALVE		
PSI	POUNDS PER SQUARE INCH		
QTY	QUANTITY		

MECHANICAL & ELECTRICAL GENERAL NOTES

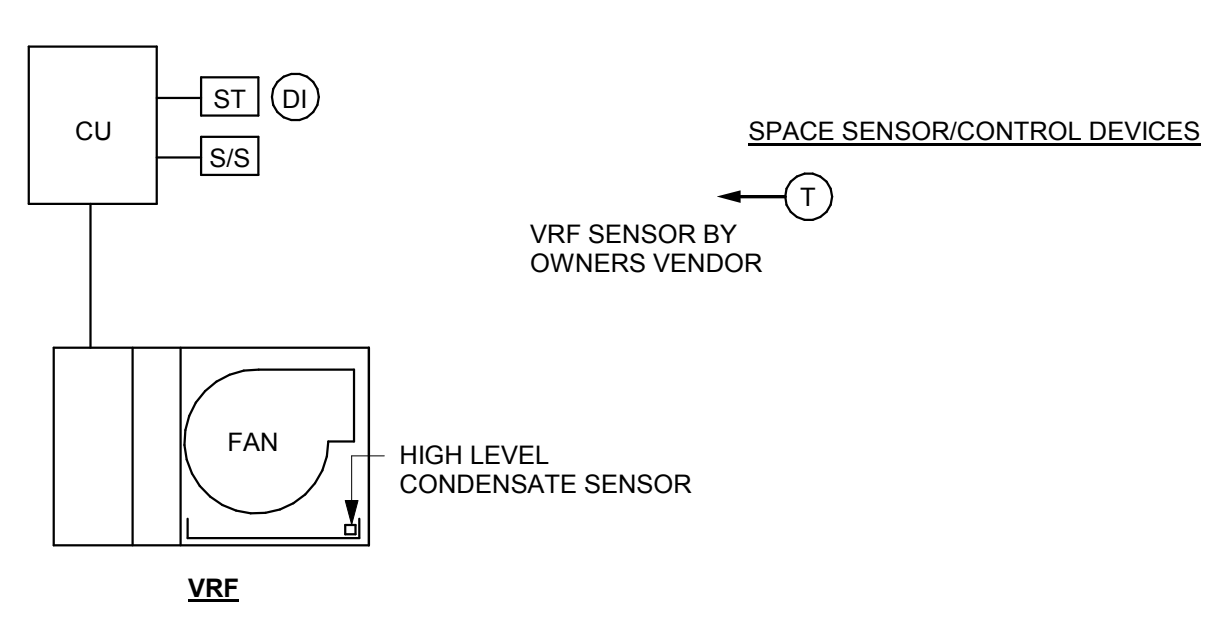
- GENERAL**
- THE PROJECT DRAWINGS AND SPECIFICATIONS ARE BASED ON THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI) DOCUMENTATION FORMAT. SPECIFICATION AND DRAWING CONTENTS ARE ARRANGED BY TOPIC AND CATEGORY AND ARE NOT INTENDED TO AWARD DIVISION OF WORK.
 - THE INTENT OF THESE DOCUMENTS IS FOR THE MEP TRADES TO FURNISH AND INSTALL COMPLETE MECHANICAL AND ELECTRICAL SYSTEMS. THE SPECIFIED HVAC AND ELECTRICAL SYSTEMS SHALL BE COMPLETE IN ALL RESPECTS; OPERATIONAL, TESTED, ADJUSTED, CALIBRATED, APPROVED BY THE AUTHORITIES HAVING JURISDICTION AND READY FOR BENEFICIAL USE BY THE OWNER.
 - DIFFERENCES BETWEEN THE DESIGN INTENT AND/OR ACTUAL INSTALLATION LOCATION, MEANS AND METHODS ARE INCLUDED IN THIS CONTRACT AND SHALL NOT CONSTITUTE A CHANGE ORDER ON THE BASIS OF DRAWING, ENGINEERING AND/OR COORDINATION TIME.
 - THE TRADES SHALL OBTAIN AND REVIEW ALL CONTRACT DOCUMENTS BEFORE SUBMITTING A BID. INFORMATION IS PROVIDED ON THE VARIOUS DRAWINGS, SCHEDULES, SPECIFICATIONS AND ALL OF THE VARIOUS DOCUMENTS IN THE BIDDING PACKAGE. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY AND FORM A TOTAL PROJECT DESIGN AND INFORMATION SOURCE FOR CONSTRUCTION PURPOSES.
 - THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THE CONTRACT. COORDINATE LOCATIONS OF EQUIPMENT WITH OTHER TRADES BEFORE AND DURING CONSTRUCTION. ANY MODIFICATION TO THE EQUIPMENT LAYOUT, REQUIRED FOR INSTALLATION, IS TO BE PERFORMED UNDER THE CONTRACT AGREEMENT AT NO ADDITIONAL COST.
 - PERFORM ALL WORK IN COMPLIANCE WITH THE SPECIFICATIONS, APPLICABLE CODES, ORDINANCES AND THE REGULATORY AGENCIES HAVING JURISDICTION. THE SPECIFICATIONS MAY EXCEED THE REQUIREMENTS OF THE CODE, IN WHICH CASE, THE SPECIFICATION MUST BE FOLLOWED.
 - WHERE A CONFLICT OCCURS BETWEEN THE DOCUMENTS, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER, CARRY AS PART OF THE BID THE LARGER QUANTITY AND/OR MORE EXPENSIVE ITEM(S).
 - PROVIDE THE REQUIRED/SPECIFIED SLEEVES AND SEALS FOR PIPES OR CONDUIT PENETRATING INTERIOR WALLS OR FLOOR SLABS.
 - ENCLOSED CONTROLLERS SHALL BE PROVIDED BY THE CONTRACTOR PROVIDING THE EQUIPMENT REQUIRING AN ENCLOSED CONTROLLER. REQUIREMENTS ARE SPECIFIED UNDER DIVISION 26: "ENCLOSED CONTROLLERS". MOTOR EFFICIENCIES SHALL BE AS INDICATED IN THE SPECIFICATIONS. PROVIDE PIPING, CONDUIT AND ALL OTHER ACCESSORIES AS REQUIRED FOR PROPER AND PROFESSIONAL SYSTEMS INSTALLATION.
 - TEST ALL MECHANICAL AND ELECTRICAL SYSTEMS. PROVIDE ADDITIONAL TESTS AS REQUIRED BY THE SPECIFICATIONS.
 - DO NOT INSTALL PIPING OR DUCTWORK OVER ELECTRICAL PANELS, OR TRANSFORMERS.
 - PROVIDE ADDITIONAL TRANSITIONS AND OFFSETS IN ALL PIPING, OR CONDUIT FOR COORDINATION WITH BUILDING STRUCTURE AND CONSTRUCTION.

- RENOVATION**
- THIS PROJECT INVOLVES THE RENOVATION OF AN EXISTING FACILITY. BEFORE SUBMITTING THE BID, CONTRACTORS SHALL VISIT THE SITE AND BECOME THOROUGHLY FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH THE PROJECT IS TO BE COMPLETED.
 - CONTRACTORS SHALL BE HELD RESPONSIBLE FOR ASSUMPTIONS, OMISSIONS OR ERRORS MADE AS A RESULT OF FAILURE TO BECOME FULLY FAMILIAR WITH THE EXISTING CONDITIONS.
 - IT IS NOT THE INTENT OF THESE DOCUMENTS TO SHOW EVERY DEVICE, APPURTENANCE, PIPE, WIRE OR CONDUIT TO BE REMOVED. MEP EQUIPMENT, UNITS, AND SYSTEMS NOT BEING REUSED, SHALL BE REMOVED IN THEIR ENTIRETY INCLUDING ASSOCIATED HANGERS, SUPPORTS, BASES, PADS, PIPES, CONDUITS, WIRES, INSULATION, AND CONTROLS BACK TO THE POINT OF ORIGIN. EQUIPMENT, PIPING, OR CONDUIT SHALL NOT BE ABANDONED IN-PLACE UNLESS SPECIFICALLY SO NOTED.
 - RELOCATE EXISTING EQUIPMENT, DEVICES, PIPING, WIRING, AND RELATED SYSTEMS AS REQUIRED FOR CONSTRUCTION PURPOSES. ALL EXISTING SYSTEMS SHALL BE FULLY OPERATIONAL, INCLUDING RECONNECTION TO SERVICES AND UPGRADED SYSTEMS. ALL RELOCATED EQUIPMENT SHALL BE PROTECTED DURING CONSTRUCTION.

- ELECTRICAL**
- IT IS NOT THE INTENTION TO SHOW EVERY FITTING, WIRE, OR DEVICE. ALL SUCH ITEMS SHALL BE FURNISHED AND INSTALLED AS NECESSARY FOR A COMPLETE SYSTEM.
 - CONCEAL RACEWAYS IN FINISHED AREAS. RACEWAYS WITHIN MECHANICAL AND ELECTRICAL ROOMS MAY BE SURFACE MOUNTED.
 - DO NOT INSTALL CONDUIT IN CONCRETE SLABS, UNLESS SPECIFICALLY APPROVED BY THE STRUCTURAL ENGINEER.
 - PROVIDE POWER TO MECHANICAL EQUIPMENT SHOWN ON MECHANICAL PLANS. REFER TO MECHANICAL PLANS AND SCHEDULES ON MEP DRAWINGS FOR LOCATIONS AND SPECIFIC ELECTRICAL REQUIREMENTS. COORDINATE EXACT LOCATION AND ORIENTATION OF EQUIPMENT WITH OTHER TRADES.

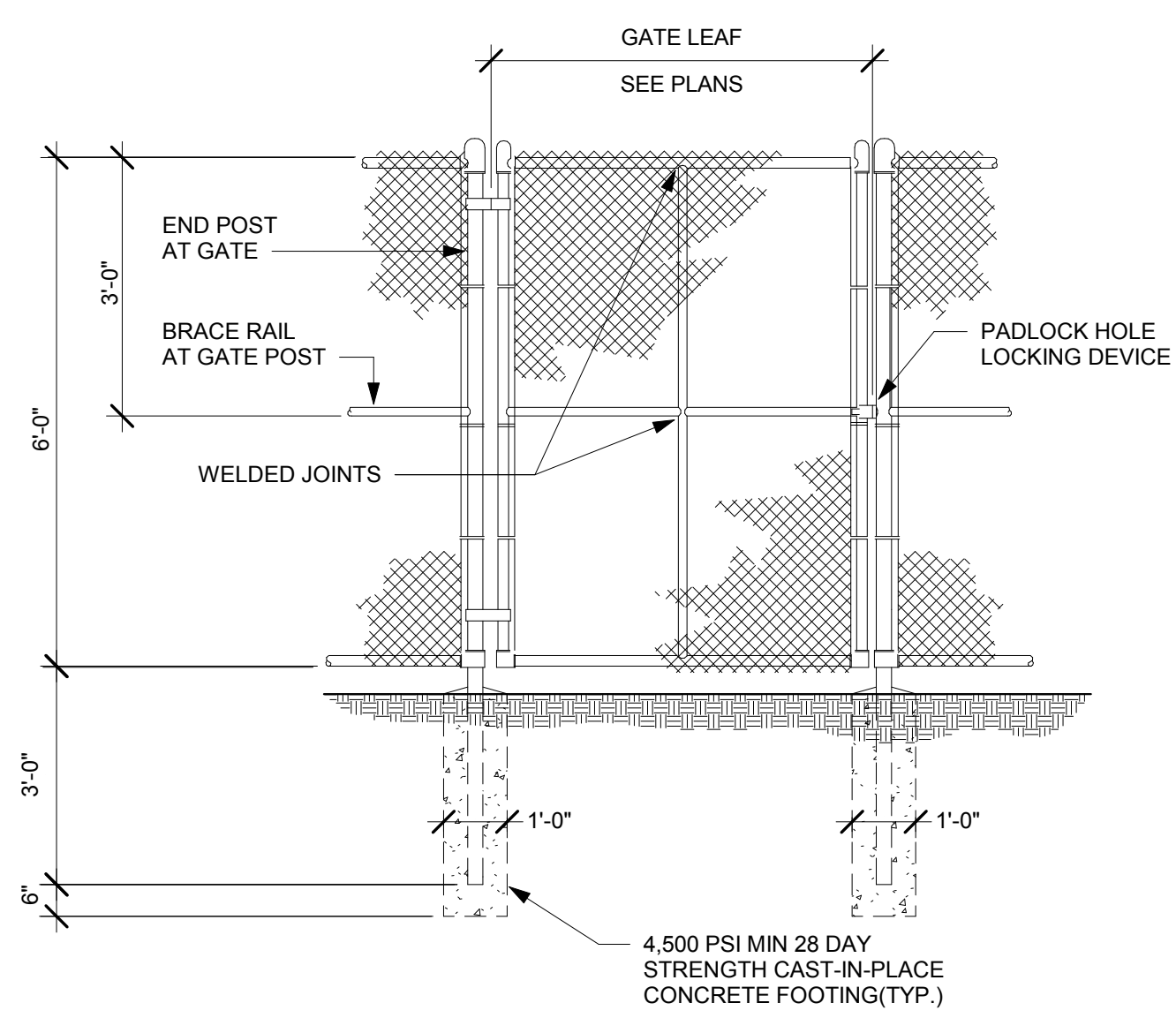
CODES LISTED BELOW APPLY TO ALL DRAWINGS AND SPECIFICATIONS ON THIS PROJECT

- 2006 CONNECTICUT STATE BUILDING CODE WITH 2009 AND 2011 AND 2013 AMENDMENTS
- 2006 CONNECTICUT STATE FIRE SAFETY CODE WITH 2012 AMENDMENT
- THE FOLLOWING AS REFERENCED BY THE ABOVE CODES AND AMENDMENTS:
 - 2003 INTERNATIONAL BUILDING CODE (IBC)
 - 2003 INTERNATIONAL MECHANICAL CODE (IMC)
 - 2003 INTERNATIONAL PLUMBING CODE (IPC)
 - 2009 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)



- 1. SEQUENCE OF OPERATION**
- ON A CALL FOR COOLING, AS SENSED BY A FACTORY REMOTE SPACE TEMPERATURE SENSOR, THE VRF SHALL CYCLE ITS DX COIL TO MAINTAIN SPACE TEMPERATURE SETPOINT (74°F ADJ.) BASED ON OWN SAFETIES. FAN SHALL BE COMMANDED TO RUN CONTINUOUSLY, BASED ON AN OCCUPIED/UNOCCUPIED SCHEDULE ESTABLISHED THROUGH THE BMS.
 - HEATING MODE THE VRF SHALL BE LOCKED OUT AND OPERABLE THROUGH THE BMS.
 - A HIGH AND LOW SPACE TEMPERATURE ALARM SHALL BE SENT TO THE BMS.
 - ON HIGH LEVEL CONDENSATE AN OVERFLOW SAFETY SENSOR SHALL BE ACTIVATED AND SHUT DOWN THE UNIT. AN ALARM SHALL BE SENT TO THE BMS.
 - FOR ALL SYSTEMS READ-WRITE POINTS OFFERED BY THE EQUIPMENT VENDOR SHALL BE INTERFACED WITH THE DDC SYSTEM. SYSTEMS HAVING CENTRAL CONTROLLERS SERVING THE VRF SHALL BE BACNET IP ADDRESSABLE.
- 2. ALARMS**
- HIGH SPACE TEMP (77°F ADJ.)
 - LOW SPACE TEMP (68°F ADJ.)
 - HIGH LEVEL CONDENSATE
- 3. GRAPHICS**
- ALARM CONDITION
 - CONDENSING UNIT STATUS
 - SPACE TEMPERATURE
 - ALL VRF CONTROL POINTS

VRF CONTROL DIAGRAM
NOT TO SCALE



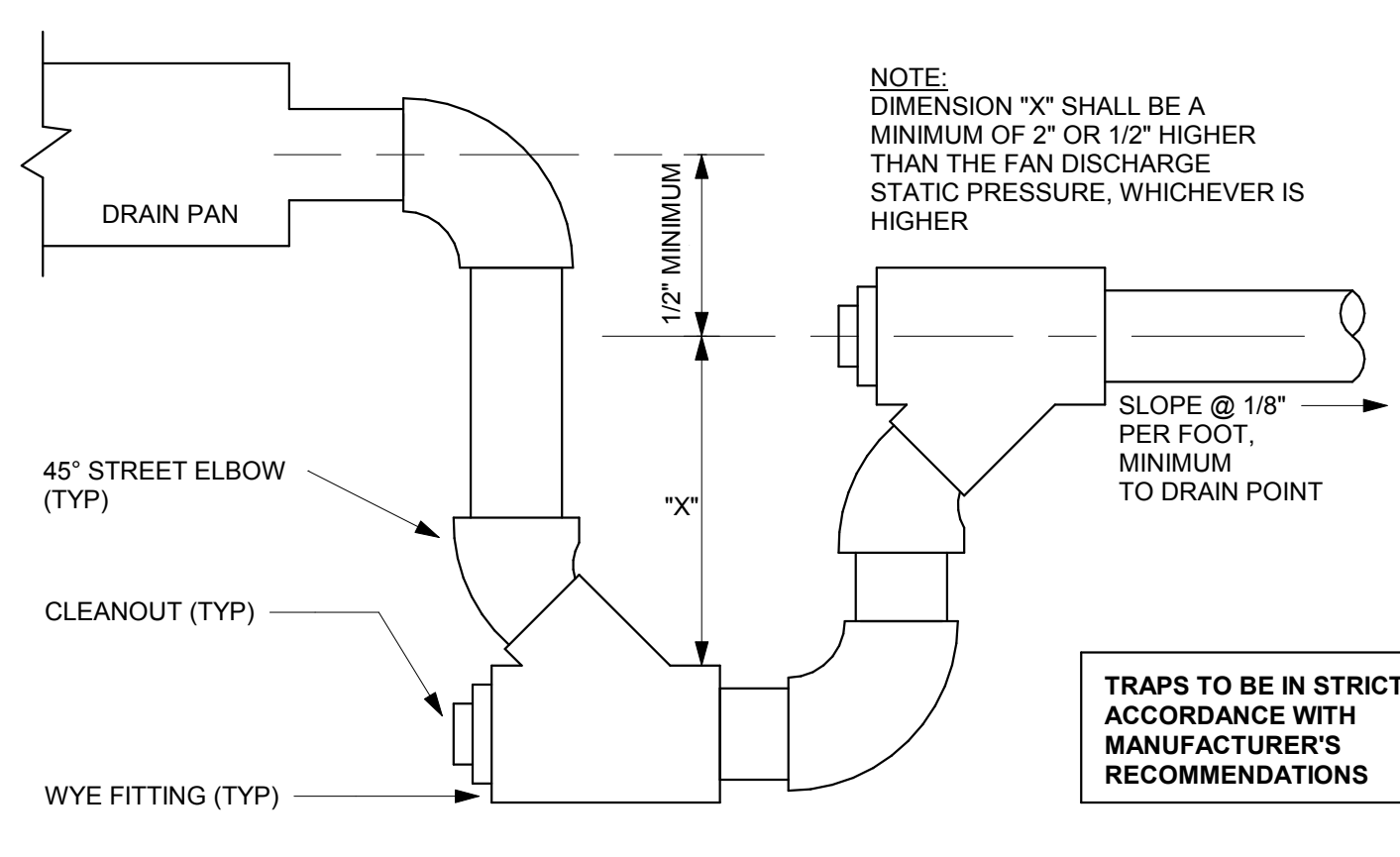
TYPICAL SINGLE SWING GATE DETAIL
NOT TO SCALE

VARIABLE REFRIGERANT FLOW - OUTDOOR

NOTES:
1. VRFU-A-1,2,3 ARE ALTERNATE #1
2. PROVIDE LOW AMBIENT CONTROL (0°F) FOR ALL UNITS

TAG	MFR	MODEL	COOLING CAPACITY (MBH)	COOLING EAT (°F)	HEATING CAPACITY (MBH)	HEATING EAT (°F)	WEIGHT (LBS)
VRFU-A-1	DAIKIN	FXS360A-8	32,000	95	36,000	0	141
VRFU-A-2	DAIKIN	FXS360A-8	32,000	95	36,000	0	141
VRFU-A-3	DAIKIN	FXS360A-8	32,000	95	36,000	0	141
VRFU-B-1	DAIKIN	FXS360A-8	32,000	95	36,000	0	141
VRFU-B-2	DAIKIN	FXS360A-8	32,000	95	36,000	0	141
VRFU-B-3	DAIKIN	FXS360A-8	32,000	95	36,000	0	141
VRFU-B-4	DAIKIN	FXS360A-8	32,000	95	36,000	0	141

TAG	COOLING MODE POWER INPUT (KW)	HEATING MODE POWER INPUT (KW)	COEFFICIENT OF PERFORMANCE (COP)	REFRIGERANT TYPE	MCA	FLA	VOLTAGE	PHASE
VRFU-A-1	4.36	7.6	3.84	2.69	R-410A	21	0.76	208 V 1
VRFU-A-2	4.36	7.6	3.84	2.69	R-410A	21	0.76	208 V 1
VRFU-A-3	4.36	7.6	3.84	2.69	R-410A	21	0.76	208 V 1
VRFU-B-1	4.36	7.6	3.84	2.69	R-410A	21	0.76	208 V 1
VRFU-B-2	4.36	7.6	3.84	2.69	R-410A	21	0.76	208 V 1
VRFU-B-3	4.36	7.6	3.84	2.69	R-410A	21	0.76	208 V 1
VRFU-B-4	4.36	7.6	3.84	2.69	R-410A	21	0.76	208 V 1



COOLING COIL CONDENSATE TRAP DETAIL FOR BLOW-THRU COILS
NOT TO SCALE

VARIABLE REFRIGERANT FLOW - INDOOR

NOTES:
1. ALL UNITS TO USE R-410A REFRIGERANT.
2. VRFU-A-1,2,3 ARE ALTERNATE #1

TAG	MFR	MODEL	SERVED	OUTDOOR UNIT	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	CFM	SOUND LEVEL L-M-H (dB)	MCA	VOLTS	PHASE	NOTES
VRF-A-1	DAIKIN	FXS360A-1	CAFETERIA	VRFU-A	33,200	36,000	800	32/42/49	1	208 V	1	
VRF-A-2	DAIKIN	FXS360A-1	CAFETERIA	VRFU-A	33,200	36,000	800	32/42/49	1	208 V	1	
VRF-A-3	DAIKIN	FXS360A-1	CAFETERIA	VRFU-A	33,200	36,000	800	32/42/49	1	208 V	1	
VRF-B-1	DAIKIN	FXS360A-1	AUDITORIUM	VRFU-B	33,200	36,000	800	32/42/49	1	208 V	1	PROVIDE INTEGRAL CONDENSATE PUMP
VRF-B-2	DAIKIN	FXS360A-1	AUDITORIUM	VRFU-B	33,200	36,000	800	32/42/49	1	208 V	1	PROVIDE INTEGRAL CONDENSATE PUMP
VRF-B-3	DAIKIN	FXS360A-1	AUDITORIUM	VRFU-B	33,200	36,000	800	32/42/49	1	208 V	1	PROVIDE INTEGRAL CONDENSATE PUMP
VRF-B-4	DAIKIN	FXS360A-1	AUDITORIUM	VRFU-B	33,200	36,000	800	32/42/49	1	208 V	1	PROVIDE INTEGRAL CONDENSATE PUMP

KEY PLAN

REVISIONS

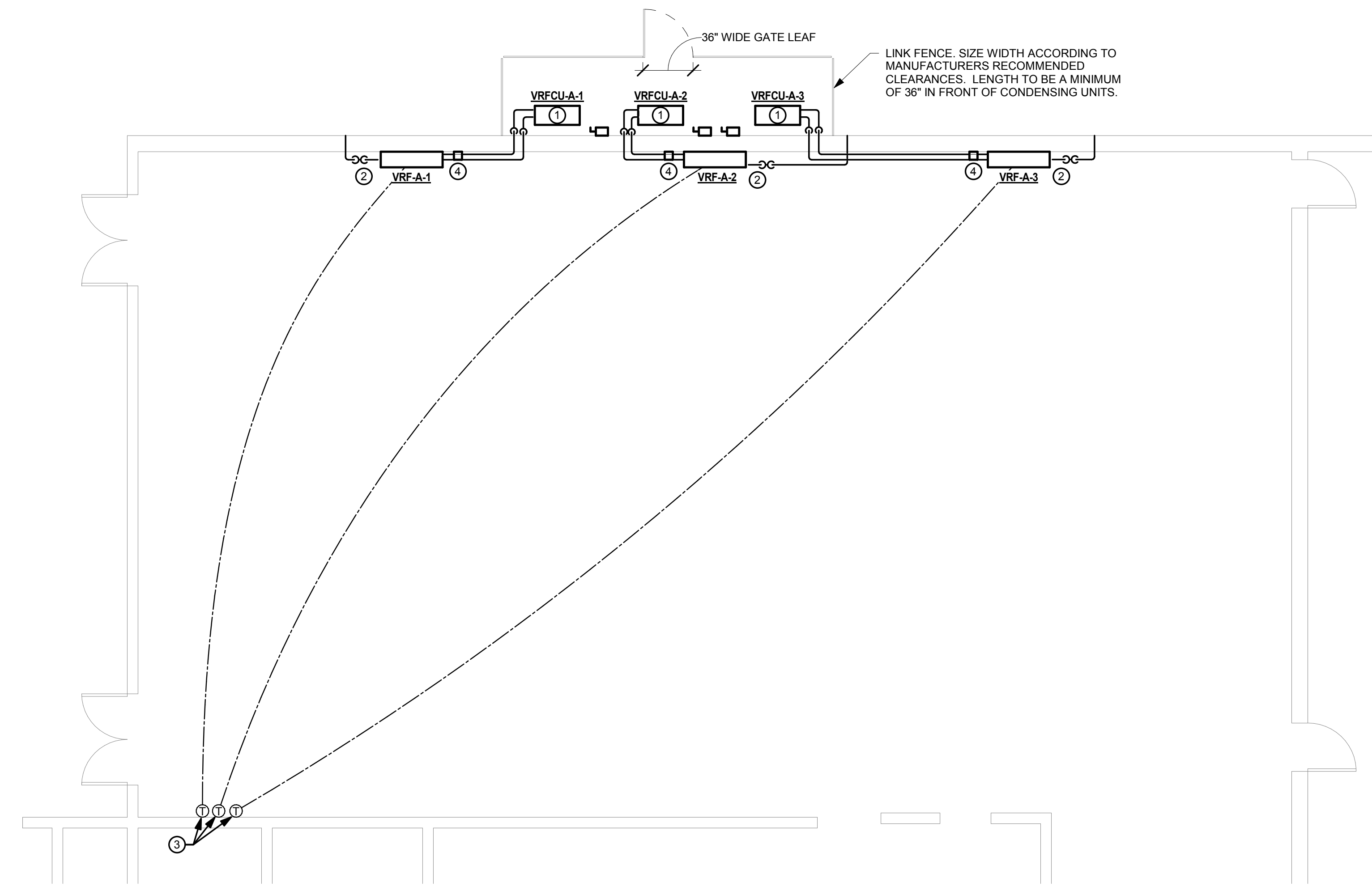
NO.	DATE	ISSUE

DATE: **04.23.2018**
SCALE: **As Indicated**
DRAWN: **NRC**
CHECKED: **ARA**
JOB NO.: **21-18-024**

SHEET TITLE:
MECH. & ELEC. GENERAL NOTES, ABBREVIATIONS & SYMBOL LIST

DRAWING NO:
ME-001

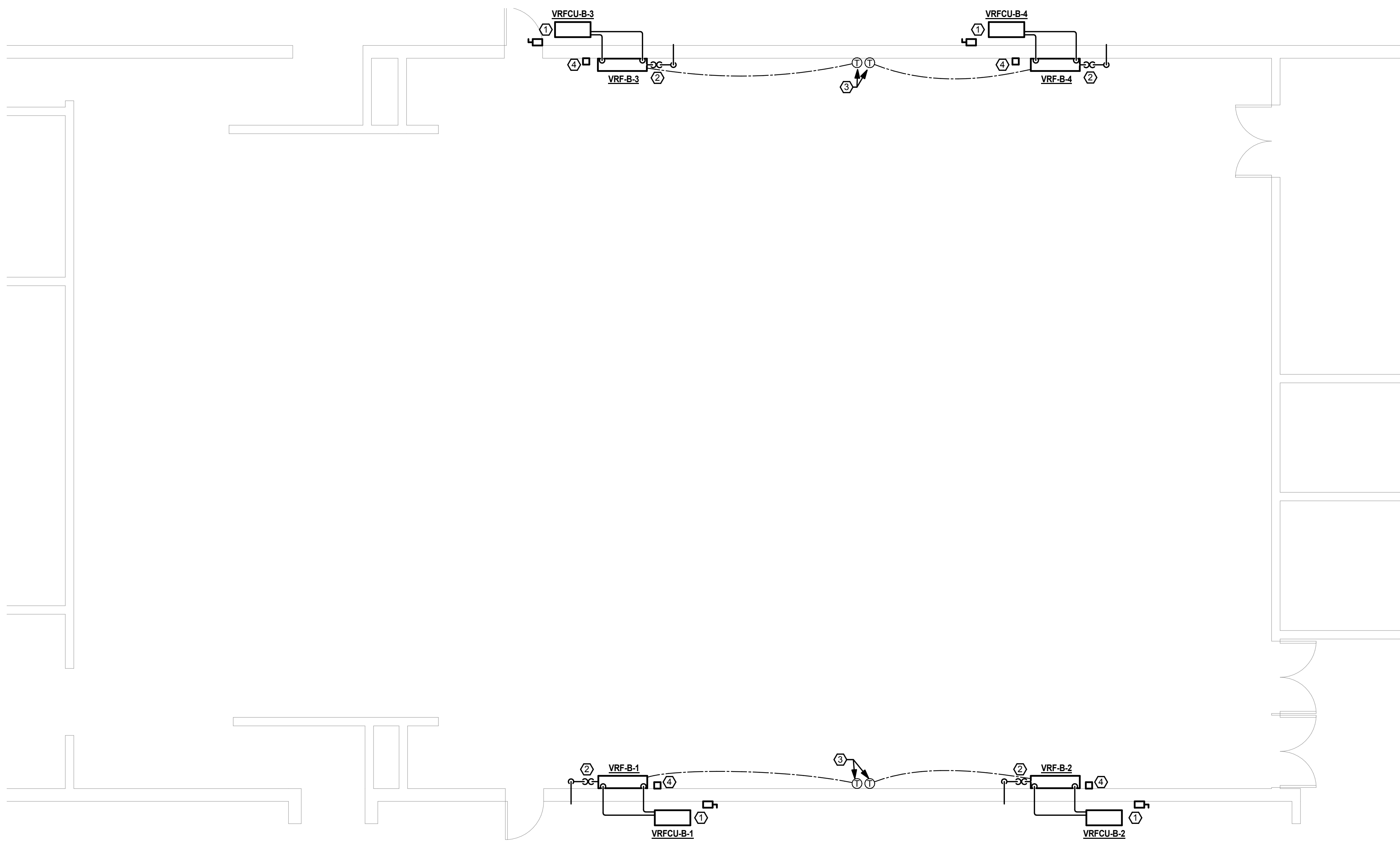
Boiler Replacement Project
East Windsor Middle School
 38 Main St, Broad Brook, CT 06016



① CAFETERIA PLAN
3/16" = 1'-0"

- HVAC DRAWING GENERAL NOTES**
1. CONTRACTOR TO COORDINATE MOUNTING HEIGHTS OF INDOOR UNITS WITH OWNER.
 2. PROVIDE NEMA3R (3)#10&(1)#10G IN 3/4" CONDUIT TO DISCONNECT SWITCH (TYP.). POWER WIRING FROM DISCONNECT TO PANEL SHALL BE OWNERS ELECTRICIAN.
 3. PROVIDE GUARDS FOR ALL THERMOSTATS.
 4. SEAL ALL WALL PENETRATIONS WITH SILICONE CAULK (COLOR TO MATCH BRICK).

- CAFETERIA HVAC DRAWING NOTES**
- ① CONTRACTOR TO PROVIDE MITSUBISHI SUPPORTS, MODEL QSWB2000M-1; 24" MIN. HIGH (ADJ. COORDINATE WITH OWNER ON EXACT HEIGHT), OR ACCEPTABLE EQUIVALENT.
 - ② PROVIDE 1" CONDENSATE CONNECTION TO INDOOR UNIT. DRAIN THROUGH WALL TO GRADE. ADJUST DRAINAGE TO NOT BE LOCATED INTO FENCED OFF AREA.
 - ③ BMS TEMPERATURE SENSOR TO BE FURNISHED, INSTALLED, AND WIRED BY OWNERS ATC CONTRACTOR. OWNER BMS CONTRACTOR IS SNE BUILDING SYSTEMS, JEFF HAMMICK 860-653-5095.
 - ④ MITSUBISHI PAC-US444CN-1, INTEGRATE WITH OWNER SUPPLIED BMS TEMPERATURE SENSOR.



② AUDITORIUM PLAN (ALT #1)
3/16" = 1'-0"

- AUDITORIUM HVAC DRAWING NOTES (ALT #1)**
- ① CONTRACTOR TO PROVIDE MITSUBISHI SUPPORTS, MODEL QSWB2000M-1; 24" MIN. HIGH (COORDINATE WITH OWNER ON EXACT HEIGHT), OR ACCEPTABLE EQUIVALENT. CONDENSING UNITS AND ASSOCIATED DISCONNECT SWITCHES ARE TO BE LOCATED ON ROOF ALONG AUDITORIUM WALL.
 - ② PROVIDE 1" CONDENSATE CONNECTION TO INDOOR UNIT. DRAIN THROUGH WALL TO ROOF.
 - ③ BMS TEMPERATURE SENSOR TO BE FURNISHED, INSTALLED, AND WIRED BY OWNERS ATC CONTRACTOR. OWNER BMS CONTRACTOR IS SNE BUILDING SYSTEMS, JEFF HAMMICK 860-653-5095.
 - ④ MITSUBISHI PAC-US444CN-1, INTEGRATE WITH OWNER SUPPLIED BMS TEMPERATURE SENSOR.

KEY PLAN

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SCALE	3/16" = 1'-0"
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SHEET TITLE:
MECHANICAL & ELECTRICAL PLANS

DRAWING NO.
ME-101