



UPTON MIDDLE SCHOOL - IAQ UPGRADES

IGNYTE
MECHANICAL + ELECTRICAL DESIGN

UPTON MIDDLE SCHOOL - IAQ UPGRADES ST. JOSEPH PUBLIC SCHOOLS

2521 Stadium Dr, St Joseph, MI 49085

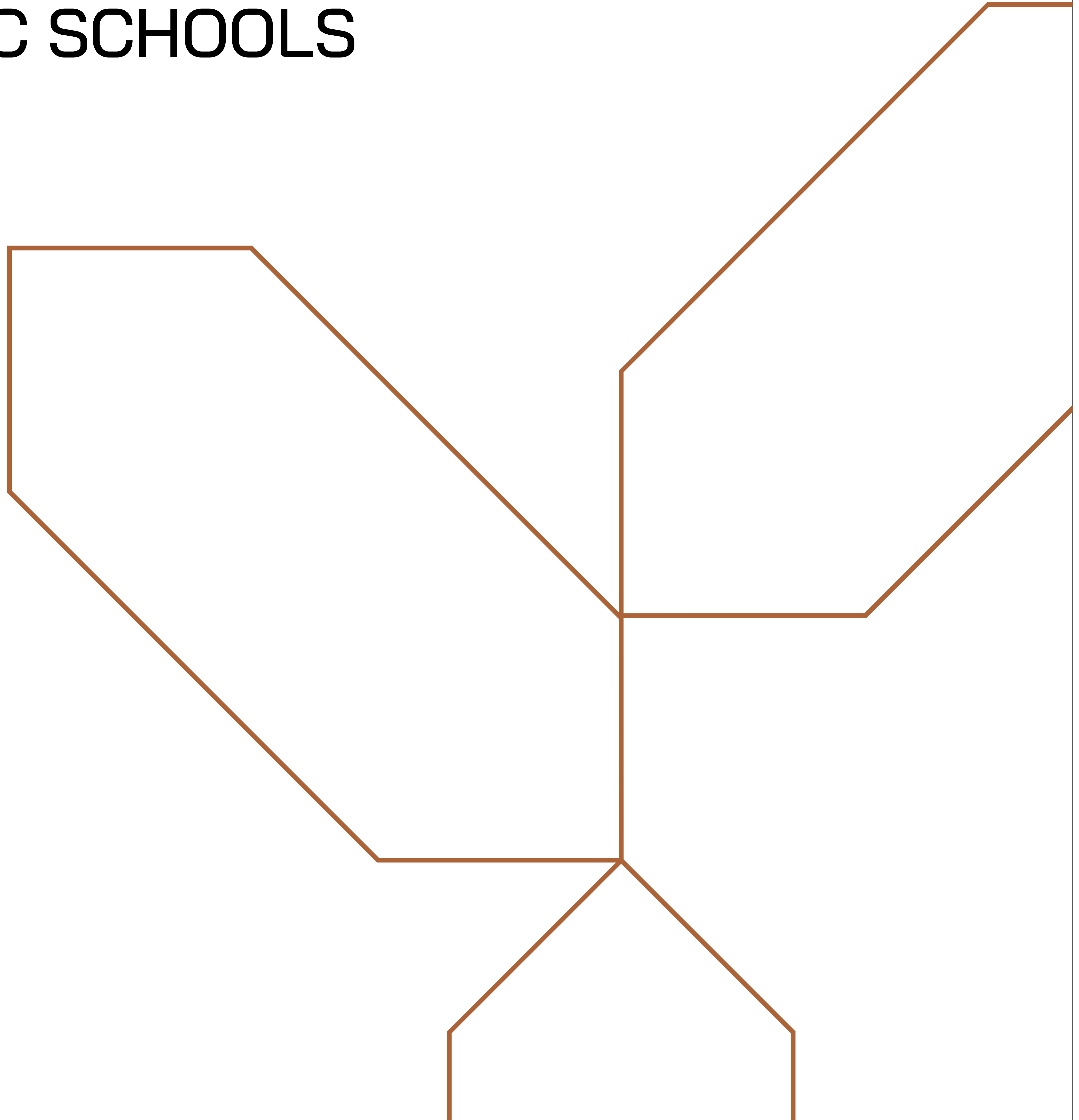
MEP Engineer / Project Manager:

IGNYTE DESIGN
38 COMMERCE SW, SUITE 450
GRAND RAPIDS, MI 49503

WWW.IGNYTE.DESIGN

Applicable Codes:

- 2015 MICHIGAN BUILDING CODE
- 2015 MICHIGAN MECHANICAL CODE
- 2018 MICHIGAN PLUMBING CODE
- 2015 MICHIGAN ENERGY CODE
- 2017 NATIONAL ELECTRIC CODE



Project Status	4.18.2023
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THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

SCALE

Drawing Title:

COVER SHEET

Project Number

G000

MECHANICAL ABBREVIATION LIST

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
A	COMPRESSED AIR	FD	FLOOR DRAIN	O	OXYGEN
AL_(#)	COMPRESSED AIR (SPECIFIC PSIG)	FDD	FUNNEL FLOOR DRAIN	OA	OUTSIDE AIR
AAV	AUTOMATIC AIR VENT	FH	FIRE HYDRANT	OD	OPPOSED BLADE DAMPER
ACC	AIR COOLED CONDENSER	FHC	FIRE HOSE CABINET	OC	ON CENTER/CENTER TO CENTER
ACCU	AIR COOLED CONDENSER UNIT	FHR	FIRE HOSE RACK	OD	OUTSIDE DIAMETER
AD	ACCESS DOOR	FHV	FIRE HOSE VALVE	OED	OPEN ENDED DUCT
AD	AREA DRAIN	FLA	FULL LOAD AMPS	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
AE	AIR EXTRACTOR	FLM	FLOOR	OFPI	OWNER FURNISHED, OWNER INSTALLED
AFF	ABOVE FINISHED FLOOR	FM	FLOW METER	OL	OVERLOAD
AFMS	AIRFLOW MEASURING STATION	FMS	FLOW MEASURING STATION	ORC	OVERFLOW RAIN CONDUCTOR
AG	ABOVE GRADE	FPM	FEET PER MINUTE	ORD	OVERFLOW ROOF DRAIN
AHU	AIR HANDLING UNIT	FP	FIRE PUMP	OS&Y	OUTSIDE SCREW AND YOKE
ALT	ALTERNATE	FPTU	FAN POWERED (AIR) TERMINAL UNIT	OV	OUTLET VELOCITY
AMP	AMPERE	FS	FLOOR SINK	OWS	OPERATOR WORKSTATION
APD	AIR PRESSURE DROP	FSE	FOOD SERVICE EQUIPMENT	FT	FEET
AR	ARGON	FT	FINNED TUBE RADIATION	PAQU	PACKAGED AIR CONDITIONING UNIT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS	FTR	FACE VELOCITY	PBD	PARALLEL BLADE DAMPER
ASR	AUTOMATIC SPRINKLER RISER	FV	FACE VELOCITY	PC	PUMPED CONDENSATE
AUX	AUXILIARY	G	NATURAL GAS	PCW	PROCESS COOLING WATER
AV	ACID VENT	GA	GAUGE	PCWR	PROCESS COOLING WATER RETURN
AVTR	ACID VENT THROUGH ROOF	GAL	GALLON	PCWS	PROCESS COOLING WATER SUPPLY
AW	ACID WASTE	GH	GROUND HYDRANT	PD	PRESSURE DROP (FEET OF WATER)
BAS	BUILDING AUTOMATION SYSTEM	GRH	GRAVITY RELIEF HOOD	PH	PERIMETER HEAT
BCU	BLOWER COIL UNIT	HP	HORSEPOWER	PHR	PERIMETER HEAT RETURN
BDD	BACK DRAFT DAMPER	HPH	HIGH PRESSURE DOMESTIC HOT WATER	PHS	PERIMETER HEAT SUPPLY
BDF	BELOW FINISHED FLOOR	HPHW	HIGH PRESSURE DOMESTIC HOT WATER RETURN	PNL	PANEL
BFP	BACKFLOW PREVENTER	HPS	HIGH PRESSURE STEAM	PPM	PARTS PER MILLION
BHP	BRAKE HORSEPOWER	HPLR	HEAT PUMP LOOP RETURN	PRESS	PRESSURE
BOD	BOTTOM OF DUCT	HPLS	HEAT PUMP LOOP SUPPLY	PRV	PRESSURE REDUCING VALVE
BOP	BOTTOM OF PIPE	HRA	HEAT RADIANT AIR	PSAN	POUNDS PER SQUARE INCH
BTU	BRITISH THERMAL UNIT	HRS	HEATING RADIANT SUPPLY	PSI	POUNDS PER SQUARE INCH
BTUH	BRITISH THERMAL UNIT PER HOUR	HTG	HEATING	PSIA	POUNDS PER SQUARE INCH - ABSOLUTE
BWV	BACKWATER VALVE	HV	HEATING VENTILATING	PSIG	POUNDS PER SQUARE INCH - GAUGE
C	COMMON	HVAC	HEATING, VENTILATING, AIR CONDITIONING	PSST	PUMPED STORM
CAP	CAPACITY	HW	HEATING HOT WATER	PW	PURIFIED WATER
CAV	CONSTANT AIR VOLUME	HHW	HEATING HOT WATER RETURN	PWR	PURIFIED WATER RETURN
CB	CATCH BASIN	HHWR	HEATING HOT WATER RETURN	PWS	PURIFIED WATER SUPPLY
CC	COOLING COIL	HWWS	HEATING HOT WATER SUPPLY	(R)	RELOCATED
CD	COLD DECK	HWT	HEATING WATER	R	RETURN GRILLE OR REGISTER
CD	CONDENSATE DRAIN	HWR	HEATING WATER RETURN	RA	RETURN AIR
CFI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED	HWTR	HEATING WATER RETURN	RAT	RETURN AIR TEMPERATURE
CFH	CUBIC FEET PER HOUR	HWWS	HEATING HOT WATER SUPPLY	RCP	RAIN CONDUCTOR
CFM	CUBIC FEET PER MINUTE	HWT	HEATING WATER	RD	ROOF DRAIN
CH	CHILLER	HWR	HEATING WATER RETURN	REQD	REQUIRED
CHW	CHILLED WATER	IC	INDIRECT WASTE	REF	ROOF EXHAUST FAN
CHWR	CHILLED WATER RETURN	IC	INDIRECT WASTE	RF	RETURN FAN
CHWS	CHILLED WATER SUPPLY	IC	INDIRECT WASTE	RH	RELATIVE HUMIDITY
CLG	COOLING	IC	INDIRECT WASTE	RL	REFRIGERANT LIQUID
CND	CONDENSATE	IC	INDIRECT WASTE	RLFA	REFRIGERANT LIQUID
CND_(#)	CONDENSATE (SPECIFIC PSIG)	IC	INDIRECT WASTE	RPM	REVOLUTIONS PER MINUTE
CO	CLEAN OUT	IC	INDIRECT WASTE	RS	REFRIGERANT SUCTION
CO2	CARBON DIOXIDE	IC	INDIRECT WASTE	RTU	ROOFTOP UNIT
CONT	CONTINUATION OR CONTINUED	IC	INDIRECT WASTE	SA	SUPPLY AIR DIFFUSER OR GRILLE
CONTR	CONTRACTOR	IC	INDIRECT WASTE	SA	SOUND ATTENUATOR
CONV	CONVECTOR	IC	INDIRECT WASTE	SA	SUPPLY AIR
COP	COEFFICIENT OF PERFORMANCE	IC	INDIRECT WASTE	SAN	SANITARY WASTE
CP	CIRCULATING PUMP	IC	INDIRECT WASTE	SAW (GREASE)	SANITARY WASTE - GREASE
CRU	CONDENSATE RETURN UNIT	IC	INDIRECT WASTE	SAT	SUPPLY AIR TEMPERATURE
CSS	CLINICAL SERVICE SINK	IC	INDIRECT WASTE	SCW	SOFTENED DOMESTIC COLD WATER
CT	COOLING TOWER	IC	INDIRECT WASTE	SCWF	SOFTENED DOMESTIC COLD WATER FILTERED
CJH	CABINET UNIT HEATER	IC	INDIRECT WASTE	SECT	SECTION
CW	DOMESTIC COLD WATER	IC	INDIRECT WASTE	SF	SUPPLY FAN
CWF	DOMESTIC COLD WATER FILTERED	IC	INDIRECT WASTE	SH	SHOWER
CWR	CONDENSER WATER RETURN	IC	INDIRECT WASTE	SHW	SOFTENED DOMESTIC HOT WATER
CWS	CONDENSER WATER SUPPLY	IC	INDIRECT WASTE	SHW (140)	SOFTENED DOMESTIC HOT WATER (140)
D&T	DRIP AND TRAP	IC	INDIRECT WASTE	SHWR	SOFTENED DOMESTIC HOT WATER RETURN
DA	DISCHARGE AIR	IC	INDIRECT WASTE	SHWR (140)	SOFTENED DOMESTIC HOT WATER RETURN (140)
DAT	DISCHARGE AIR TEMPERATURE	IC	INDIRECT WASTE	SK	SNOW MELT RETURN
DB	DRY BULB	IC	INDIRECT WASTE	SK	SNOW MELT SUPPLY
DDC	DIRECT DIGITAL CONTROL	IC	INDIRECT WASTE	SMR	STATIC PRESSURE
DEG	DEGREE	IC	INDIRECT WASTE	SMS	SNOW MELT SUPPLY
DFU	DRAINAGE FIXTURE UNITS	IC	INDIRECT WASTE	SP	STATIC PRESSURE
DIA	DIAMETER	IC	INDIRECT WASTE	SPEC	SPECIFICATION
DMPR	DAMPER	IC	INDIRECT WASTE	SPKLR	SPRINKLER
D/N	DAY/NIGHT	IC	INDIRECT WASTE	SGFT	SQUARE FOOT/SQUARE FEET
DN	DOWN	IC	INDIRECT WASTE	S/S	START/STOP
DNZ	DOWNSPOUT NOZZLE	IC	INDIRECT WASTE	SS	SERVICE SINK
DS	DUCT SILENCER	IC	INDIRECT WASTE	ST	STANDARD
DT	DRAIN TILE	IC	INDIRECT WASTE	STD	STACK
DTC	DRAIN TILE CONNECTION	IC	INDIRECT WASTE	STM	STEAM
DWH	DOMESTIC WATER HEATER	IC	INDIRECT WASTE	STM_(PSI)	STEAM (SPECIFIC PSIG)
DWG	DRAWING	IC	INDIRECT WASTE	S/W	SUMMER/WINTER
(E)	EXISTING	IC	INDIRECT WASTE	SW	SWITCH
EXIST	EXISTING	IC	INDIRECT WASTE	TA	TRANSFER AIR GRILLE
EA	EXHAUST GRILLE OR REGISTER	IC	INDIRECT WASTE	TC	TEMPERATURE CONTROL
EACH	EACH	IC	INDIRECT WASTE	TC	TEMPERATING COIL
EA	EXHAUST AIR	IC	INDIRECT WASTE	TC	TEMPERATURE CONTROL PANEL
EAT	ENTERING AIR TEMPERATURE	IC	INDIRECT WASTE	TD	TRENCH DRAIN
EC	EXPANSION COMPENSATOR	IC	INDIRECT WASTE	TEMP	TEMPERATURE
ECUH	ELECTRIC CABINET UNIT HEATER	IC	INDIRECT WASTE	TEMP	TEMPORARY
EDB	ENTERING DRY BULB	IC	INDIRECT WASTE	TH	TERMINAL HEATING
EER	ENERGY EFFICIENCY RATIO	IC	INDIRECT WASTE	THA	TOTAL HEAT ABSORBED
EEW/S	EMERGENCY EYE WASH / SHOWER	IC	INDIRECT WASTE	THR	TERMINAL HEATING RETURN
EEW	EMERGENCY EYE WASH	IC	INDIRECT WASTE	THR	TOTAL HEAT REJECTED
EF	EXHAUST FAN	IC	INDIRECT WASTE	THS	TERMINAL HEATING SUPPLY
EFF	EFFICIENCY	IC	INDIRECT WASTE	TSP	TOTAL STATIC PRESSURE
CHC	ELECTRIC HEATING COIL	IC	INDIRECT WASTE	TU	TERMINAL UNIT
EJ	EXPANSION JOINT	IC	INDIRECT WASTE	TV	TURNING VANES
EL	ELEVATION	IC	INDIRECT WASTE	TYP	TYPICAL
ELEC	ELECTRICAL	IC	INDIRECT WASTE	UH	UNIT HEATER
EMS	ENERGY MANAGEMENT SYSTEM	IC	INDIRECT WASTE	UL	UNDERWRITER'S LABORATORY
ERL	ENERGY RECOVERY LOOP	IC	INDIRECT WASTE	UNO	UNLESS NOTED OTHERWISE
ERLR	ENERGY RECOVERY LOOP RETURN	IC	INDIRECT WASTE	UV	UNIT VENTILATOR
ERLS	ENERGY RECOVERY LOOP SUPPLY	IC	INDIRECT WASTE	V	VALVE
ERU	ENERGY RECOVERY UNIT	IC	INDIRECT WASTE	V	VENT
ESH	EMERGENCY SHOWER	IC	INDIRECT WASTE	VAC	VACUUM
ESP	EXTERNAL STATIC PRESSURE	IC	INDIRECT WASTE	VAV	VARIABLE AIR VOLUME
EUH	ELECTRIC UNIT HEATER	IC	INDIRECT WASTE	VAB	VACUUM BREAKER
EWB	ENTERING WET BULB	IC	INDIRECT WASTE	VD	VOLUME DAMPER (MANUALLY ADJUSTABLE)
EW	ELECTRIC WATER COOLER	IC	INDIRECT WASTE	VOL	VOLUME
EWT	ENTERING WATER TEMPERATURE	IC	INDIRECT WASTE	VFC	VARIABLE FREQUENCY CONTROLLER
EXH	EXHAUST	IC	INDIRECT WASTE	VTR	VENT THROUGH ROOF
F	FIRE PROTECTION	IC	INDIRECT WASTE	VTU	VENTURI TERMINAL UNIT
F&B	DEGREES FAHRENHEIT	IC	INDIRECT WASTE	VUV	VERTICAL UNIT VENTILATOR
F&T	FACE AND BYPASS	IC	INDIRECT WASTE	W	WASTE
FA	FLOAT AND THERMOSTATIC	IC	INDIRECT WASTE	W&V	WASTE AND VENT
FCU	FAN COIL UNIT	IC	INDIRECT WASTE	WB	WET BULB
		IC	INDIRECT WASTE	WC	WATER CLOSET
		IC	INDIRECT WASTE	WC	WATER COLUMN
		IC	INDIRECT WASTE	WG	WATER GAUGE
		IC	INDIRECT WASTE	WPD	WATER PRESSURE DROP
		IC	INDIRECT WASTE	WT	WEIGHT
		IC	INDIRECT WASTE	XFMR	TRANSFORMER

TEMPERATURE CONTROL - PARTIAL SYMBOLS LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CARBON DIOXIDE SENSOR		OCCUPANCY SENSOR
	CARBON MONOXIDE SENSOR		PRESSURE TRANSMITTER
	DIFFERENTIAL PRESSURE TRANSMITTER		STATIC PRESSURE SENSOR OR PROBE
	FLOW METER		VALVE - 2 WAY CONTROL VALVE
	GUARD FOR STAT OR SENSOR		VALVE - 3 WAY CONTROL VALVE
	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)		THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)

NOTE: LIST OF ADDITIONAL SYMBOLS & ABBREVIATIONS ASSOCIATED WITH TEMPERATURE CONTROLS ARE IDENTIFIED ON TC DRAWINGS.

MECHANICAL SYMBOL LIST

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	AIR VENT - AUTOMATIC		AIR TERMINAL UNIT
	AIR VENT - MANUAL		AIR TERMINAL UNIT WITH HEATING COIL
	BACKFLOW PREVENTER		VENTURI AIR TERMINAL UNIT
	CATCH BASIN		VENTURI AIR TERMINAL UNIT WITH HEATING COIL
	CIRCULATING PUMP		DAMPER - HORIZONTAL FIRE (EXISTING, NEW)
	CLEAN OUT - IN FLOOR		DAMPER - HORIZONTAL FIRE / SMOKE (EXISTING, NEW)
	CLEAN OUT - FLANGE		DAMPER - SMOKE (EXISTING, NEW)
	DIRECTION OF FLOW		DAMPER - VERTICAL FIRE (EXISTING, NEW)
	DIRECTION OF PITCH - DOWN		DAMPER - VERTICAL FIRE / SMOKE (EXISTING, NEW)
	FINNED TUBE RADIATION		DAMPER - BACK DRAFT
	FIRE PROTECTION - SIAMESE CONNECTION - FREE STANDING		DAMPER - MOTORIZED
	FIRE PROTECTION - SIAMESE CONNECTION - WALL MOUNTED		DAMPER - VOLUME (MANUALLY ADJUSTABLE)
	FIRE PROTECTION - SPRINKLER HEAD, CONCEALED		DIFFUSER - BLANK OFF
	FIRE PROTECTION - SPRINKLER HEAD, PENDANT		DIFFUSER - LINEAR SLOT
	FIRE PROTECTION - SPRINKLER HEAD, UPRIGHT		DIFFUSER - SQUARE OR RECTANGULAR
	FIRE PROTECTION - SPRINKLER HEAD, SIDEWALL		DUCT CROSS SECTION - SUPPLY
	FLOOR DRAIN		DUCT CROSS SECTION - RETURN
	FLOOR DRAIN - ELEVATION		DUCT CROSS SECTION - EXHAUST
	FLOOR DRAIN - FUNNEL, ELEVATION		DUCT - FLEXIBLE CONNECTION
	FLOW MEASURING DEVICE (FOR TEST AND BALANCING)		DUCT - FLEXIBLE DUCT
	FLOW SWITCH		DUCT TAKE-OFF - ROUND CONICAL
	FLOW METER		DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	HOSE BIBB		ELBOW - RECTANGULAR WITH TURNING VANES
	MANHOLE		ELBOW - RECTANGULAR/ ROUND SMOOTH RADIUS
	OPEN SITE DRAIN		ELBOW DOWN - RECTANGULAR
	PIPE - ANCHOR		ELBOW DOWN - ROUND
	PIPE - CAP OR PLUG		ELBOW UP - RECTANGULAR
	PIPE - ELBOW DOWN		ELBOW UP - ROUND
	PIPE - ELBOW UP		FAN - AXIAL
	PIPE - EXPANSION JOINT OR COMPENSATOR		FAN - CENTRIFUGAL (ELEVATION)
	PIPE - FLANGE		HEATING COIL
	PIPE - HOSE AND BRAID FLEXIBLE CONNECTION		INCLINED DROP IN DIRECTION OF AIRFLOW
	PIPE - RUBBER FLEXIBLE CONNECTION		INCLINED RISE IN DIRECTION OF AIRFLOW
	PIPE - RELIEF		INTAKE OR RELIEF HOOD
	PIPE - GUIDE		REGISTER - RETURN OR EXHAUST
	PIPE - TEE DOWN		REGISTER - RETURN WITH BOOT
	PIPE - TEE UP		REGISTER - TRANSFER GRILLE
	PIPE - UNION		ROOF EXHAUST FAN
	PRESSURE AND TEMPERATURE TEST PLUG		TRANSITION - CONCENTRIC
	PRESSURE GAUGE AND COCK		TRANSITION - ECCENTRIC
	REDUCER - CONCENTRIC		UNIT HEATER - HORIZONTAL THROW
	REDUCER - ECCENTRIC		UNIT HEATER - VERTICAL THROW
	ROOF/OVERFLOW DRAIN		DOUBLE LINE DUCTWORK SYMBOLS
	STEAM TRAP - FLOAT AND THERMOSTATIC		SYMBOL
	STRAINER		DESCRIPTION
	STRAINER WITH VALVE AND BLOW-OFF		DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	THERMOMETER		DUCT TAKE-OFF - ROUND CONICAL
	TRAP		ELBOW - RECTANGULAR WITH TURNING VANES
	VALVE - ANGLE		ELBOW - RECTANGULAR SHORT RADIUS WITH SPLITTER VANES
	VALVE - BALL		ELBOW - ROUND
	VALVE - BALANCE (i.e. BALANCE VALVE TO 0.5 GPM)		ELBOW - RECTANGULAR SMOOTH RADIUS
	VALVE - COMBINATION BALANCE & FLOW MEASURING (i.e. BALANCE VALVE TO 0.5 GPM)		ELBOW DOWN - RECTANGULAR
	VALVE - BUTTERFLY		ELBOW DOWN - ROUND
	VALVE - CHECK		ELBOW UP - RECTANGULAR
	VALVE - SPRING CHECK		ELBOW UP - ROUND
	VALVE - GAS (MANUAL)		HEATING COIL
	VALVE - GLOBE		INCLINED DROP IN DIRECTION OF AIRFLOW
	VALVE - ISOLATION		INCLINED RISE IN DIRECTION OF AIRFLOW
	VALVE - NEEDLE		TRANSITION - CONCENTRIC
	VALVE - OS&Y		TRANSITION - ECCENTRIC
	VALVE - PLUG		DOUBLE LINE DUCTWORK SYMBOLS
	VALVE - PRESSURE REGULATING		SYMBOL
	VALVE - PRESSURE REDUCING		DESCRIPTION
	VALVE - PRESSURE RELIEF		DUCT TAKE-OFF - RECTANGULAR WITH SHOE TAP
	VALVE - PRESSURE & TEMPERATURE RELIEF		DUCT TAKE-OFF - ROUND CONICAL
	VALVE - VENT THROUGH ROOF		ELBOW - RECTANGULAR WITH TURNING VANES
	VALVE - WALL HYDRANT		ELBOW - RECTANGULAR SHORT RADIUS WITH SPLITTER VANES
	DOUBLE LINE PIPING SYMBOLS		ELBOW - ROUND
	SYMBOL		ELBOW - RECTANGULAR SMOOTH RADIUS
	DESCRIPTION		ELBOW DOWN - RECTANGULAR

SHEET METAL KEYED NOTES

- 1 ADD BIPOLAR IONIZATION TO EXISTING ROOF TOP UNIT, SIMILAR TO GPS AIR MODEL NO. DM-48 & DM-2
- 2 SUPPLY AIRFLOW IS AN ESTIMATE



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MECHANICAL ROOF PLAN
1" = 20'-0"

Project Status: 4.18.2023
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STAMP
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.
SCALE

Drawing Title:

MECHANICAL ROOF PLAN

Project Number

M320